Research Methods
&
Thesis Writing

By:

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Workshop Objective

The main objective this course is to inspire the participants to think about their own research idea and to prepare them for the Master/Doctorate Dissertation.

You will gain confidence about the process of completing your thesis...How do we search what we think we know, and why do we think we know it?...What is research? What is good research? What do we hope to accomplish with research? Choosing Methodology...
Qualitative versus Quantitative... Sampling... Questionnaire design... Collecting Quality Data...Analyzing Data... Virtues of Multi-Methodology Studies...Avoiding Plagiarism...Interpreting and Presenting Research Results... Research Ethics...
What is Research?
What is Research?

- Physician … Patient… What is the Process …
- Signs … Symptoms … Problem …
- Preliminary Investigation … Thinking …
- Doubt … Hypothesis … or Fact … Need more Data
- X-Ray … MRI … ECG … EEG … Blood Picture…
- Back to Physician … Processing … Analysis …
- Medical Decision … Treatment … Prescription …
- Journey … Start by doubt … and from the Unknown
- What we see is not what we research …
- Invisible … Visible (Hidden … Observable)
- It never ends … but we have to stop …

Definition of Research

Research = Re+Search

- Research is the systematic, critical, objective, and original scientific inquiry or investigation into a specific problem, undertaken with the purpose of finding answers or solutions to it, OR obtaining and confirming new and reliable knowledge.

- Systematic (following a series of steps)
- Critical (purpose is new reliable knowledge)
- Objective (done to fulfill a purpose, not accidental discovery)
- Original (not searching published research results on internet)
Criteria for Topic Selection

- Is the topic researchable, given time, resources, and availability of data?
- Is there a personal interest in the topic in order to sustain attention?
- Will the results from the study be of interest to others?
- Is the topic likely to be publishable?
- Does the study (a) fill a void, (b) replicate, (c) extend or (d) develop new ideas in the literatures?
- Will the project contribute to career goals?

Simulation Exercise

www.scholar.google.com

Select 3 Researchable Topics/Titles of Interest to you

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Types of Research

Research can be Classified according to:

**Purpose**
- The reasons why we are conducting it.

**Process**
- The way in which we will collect and analyze the data.

**Logic**
- Whether we are moving from general to specific or vice versa.

**Outcomes**
- Whether we are trying to solve a particular problem or make a general contribution to knowledge.

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Types of Business Research

Research Types:
- **Purpose**
  - *Exploratory*
  - *Descriptive*
  - *Analytical*
  - *Predictive*
- **Logic**
  - *Inductive*
  - *Deductive*
- **Process**
  - *Qualitative*
  - *Quantitative*
- **Outcomes**
  - *Applied*
  - *Basic*
Classification According to the Purpose

Exploratory Research

❖ In case of few or no earlier studies to refer to, or not much is known about the situation at hand.
❖ The aim is gaining insights about the subject area, or phenomena of interest (not for testing).
❖ It assesses which *theories / concepts* can be applied or confirm the need to develop *new one*.
❖ Data collected is *mostly qualitative*.
❖ Rarely it can provide conclusive answers to a problem.
❖ It can give guidance for future research.

Classification According to the Purpose

Descriptive Research

❖ The goal is to offer to the researcher a profile of the phenomena of interest from individual, organizational, industrial, or other perspective. *What are the demographics of different groups of employees?*
❖ It helps understand the characteristics of a group, think systematically about a given situation, offer ideas for further research, and/or make certain simple decisions.
❖ Data collected is often quantitative and statistical techniques are used to summarize the information.
Classification According to the Purpose

Analytical (Explanatory) Research

- Is a continuation of the Descriptive Research.
- It includes, not only describing the situation, but also the analysis and the explanation (Why, How).
- It aims to understand phenomena by discovering and measuring causal relations among the different factors (i.e. variables).
  - How can we reduce the number of complaints made by customers?
  - How can we improve the delivery times of our products?
  - How can we expand the range of our services?
- It relies on “hypothesis testing” to explain the variance in the variables defined to be able to make concrete decisions.

Classification According to the Purpose

Predictive Research

- It goes even further than the Analytical Research.
- It builds on the analytical research to forecast the future for a similar situation.
- It aims to generalize from the analysis by predicting certain phenomena on the basis of hypothesized, general relationships.
- The solution to a problem can be applicable to similar problems.
- It provides How, Why, Where, What if answers to current event.
Classification According to the Process

**Quantitative Vs. Qualitative Research**

- **Quantitative** approach is objective in nature and concentrates on measuring phenomena.
- **Quantitative** approach involves collecting and analyzing numerical data and applying statistical tests.
- **Qualitative** approach is subjective in nature.
- **Qualitative** approach involves examining and reflecting on perceptions in order to gain an understanding of social and human activities.

Classification According to the Logic

**Deductive Vs. Inductive Research**

- **Deductive** Research is a study in which a conceptual and theoretical structure is developed and then tested by empirical observation.
- **Deductive** Research is moving from General to Specific.
- **Inductive** Research is a study in which theory is developed from the observation of empirical reality. It’s about “Theory/Model Development”.
- **Inductive** Research is moving from Specific to General.
Classification According to the Outcome

Applied Vs. Basic (Fundamental) Research

- **Applied** Research is done with the intention of applying its findings to solve a specific, existing problem demanding a timely solution (Problem Solving).

- **Basic** Research aim is to make contribution to the knowledge through enhancing the understanding of certain problems that commonly occur in organizations, without immediate application (Theory Building).

- Despite this distinction, both types of research follow the same systematic steps of research.
The Research Process

Steps One and Two:

Broad Problem Area & Literature Review

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Step 1: The Broad Problem Area

- It refers to the entire situation where one sees possible need for research and problem solving.
- Several sources:
  1. Theoretical basis
  2. Professional practice
  3. Personal experience
- The specific sub-issues that need to be researched may not be identified at this stage.
- The broad problem area would be narrowed down to specific issues for investigation after some preliminary data gathering.

Examples of Broad Problem Area

- Not many people in Bahrain are using Islamic Banks.
- Inventory control is not effective in Company X.
- CRM function is not performing well in Company Y.
- The sales volume of a product is not picking up.
- The newly introduced PMS is not being used by the employees for whom it was primarily designed.
- There is a lot of water waste in Water Networks of EWA.
Preliminary Data Gathering

- Preliminary Data (i.e. Secondary data) are the data which already exist and do not have to be collected by the researcher.
- Researcher uses secondary data sources, or unstructured interviews to help better define the problem.
- Example: Many companies are introducing Employee Stock Ownership Plans (ESOP). Rather than immediately working toward making the package more attractive, talking to individuals might reveal that employees perceive ESOP as a tool to save taxes rather than providing a true opportunity for employee involvement and participation. This understanding help researcher attack the real issues, rather than working on the surface symptoms.
Sources of Secondary Data

- Internal
  - Expert Opinion
  - Unstructured Interviews
- External
  - Published Materials
  - Computerized Databases
  - Syndicated Services

Criteria for Evaluating Secondary Data

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Issues</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Collection Methodology</td>
<td>Data collection method, response rate, quality &amp; analysis of data, sampling technique &amp; size, questionnaire design, field work.</td>
<td>Data should be reliable, valid, &amp; generalizable to the problem.</td>
</tr>
<tr>
<td>Error &amp; Accuracy</td>
<td>Examine errors in approach, research design, sampling, data collection &amp; analysis, &amp; reporting.</td>
<td>Assess accuracy by comparing data from different sources.</td>
</tr>
<tr>
<td>Currency</td>
<td>Time lag between collection &amp; publication, frequency of updates.</td>
<td>Census data are updated by syndicated firms.</td>
</tr>
<tr>
<td>Objective</td>
<td>Why were the data collected?</td>
<td>The objective determines the relevance of data.</td>
</tr>
<tr>
<td>Nature</td>
<td>Definition of key variables, units of measurement, categories used, relationships examined.</td>
<td>Reconfigure the data to increase their usefulness.</td>
</tr>
<tr>
<td>Reliability &amp; Validity</td>
<td>Expertise, credibility, reputation, &amp; trustworthiness of the source.</td>
<td>Data should be obtained from an original source.</td>
</tr>
</tbody>
</table>
Refining Broad Problem Area

Is seeking all those sources of secondary data always necessary?

It depends on the researcher’s judgment based on the situation, and the type of problem investigated.

The main idea in gathering information is that these might reveal the root of the real problem.

Step 2: Literature Review

- Literature Review is the evaluation and documentation of a comprehensive reading of the published and unpublished work, from the secondary data sources, in the area of specific interest to the researcher.

- A start point is the Library: books, journal articles, magazines, conference proceedings, doctoral and master’s dissertations, government publications and reports.

- It is not compiling sources, it is about Critical Review to avoid reinventing the wheel.
Why Conducting Literature Review?

- The problem statement can be made more precise and clear.
- LR insures that no important factor (variable) that has been found to have an impact on the problem is ignored.
- LR would prevent such a waste of resources, i.e. the risk of “Reinventing the Wheel”.
- LR gives a good basis to proceed further with the research process, and provides the foundation for developing a comprehensive theoretical framework (What variables would be most important).
- LR also facilitates the creative integration of what is found in previous studies, and shed light on any gaps in, previous research.

Sources of Literature

1. Journal Articles
2. Books
3. Dissertations/Theses
4. Conference Proceedings
5. Government/Corporate Reports
6. Official Publications (UNDP, UNIDA, WHO, etc.)
7. Abstracts
8. Encyclopedias
How to conduct Literature Review?

1. Find it

2. Manage it

3. Use it and Review it

1. Identifying the Relevant Sources

- It involves identifying the various published and unpublished materials that are available on the topic of interest and gaining access to them.
- Today, almost every Publisher has an online system to locate published information on various topics (by topic, author, keyword, etc.)
- Databases are also available for statistical information (ReportLinker, OECD, etc.)
- Published articles in journals, newspapers, periodicals, and conference proceedings are now available on databases. 3 types of databases exist, these are:
  - The Abstract Databases
  - The Full-text Databases
2. Extracting the Relevant Information

Read... Group... Summarize... Extract... Comment

Use these 5 Questions to Evaluate Relevance and Value:
1) Why am I reading this?
2) How recent is it?
3) What is the writer saying that is relevant to what I want to find out?
4) How convincing is what the author is saying?
5) What use can I make of the reading?

3. Analytical/Critical Writing

- It is a clear, logical, and critical presentation of the relevant research work done so far in the area of investigation.
- LR should bring together all relevant studies/information in a logical manner instead of presenting them in a chronological order.
- Citation of references should be done at this stage.
- A Good LR should lead the reader logically to the problem statement. A suggested pattern is as follows:
  - Introduction/Background/Overview
  - Overview about the ABC (Theoretical Part)
  - Worldwide Cases Vs. Local Case (Bahrain)
  - Deficiencies in Literature
Critical Writing... An Example

Hence, the accumulation of a cumulative body of empirically supported competency literature has only started 20 years ago. Throughout the past 20 years, many researchers have contributed to the extensive literature concerned with competency modelling and reporting by studying a variety of job fields, such as engineering, management, scientific researching, as well as technical jobs (see for instance Barrett and Depinet, 1991; Bowen, Ledford, and Nathan, 1991; Dubois, 1993; Spencer and Spencer, 1993; Barrett, 1994; Lawler, 1994; Frazee, 1996; Mansfield, 1996; Marrelli, 1998; Catano, Cronshaw, Wiesner, Hackett and Methot, 1997; Cooper, 2000; Gatewood and Feild, 2000; Shippmann et al., 2000; Markus, Cooper-Thomas and Allpress, 2005; Jackson, 2009; Tripathi and Ranjan, 2009).

Critical Writing... Another Example

From the literature reviewed on competency in general and competency modelling in particular, the following research deficiencies were identified by the researcher. Firstly, with the majority of the prevailing studies on competency modelling based on US culture, this makes a large portion of the literature on competency in general and competency modelling in particular mostly reflecting the US culture, thus less reliably applicable to other areas of the globe. Secondly, the dominant proportion of competency studies existent in the literature is mainly concerned with exploring competency modelling approaches with little attention devoted to contextual factors affecting the selection of the proper approach, such as the kind of the organization, nature of the job/career domain or the culture in which job-holders are functioning.
The Research Process

1. Broad Problem Or Area of Research Interest
2. Preliminary Investigation & Literature Review
3. Research Problem & Research Objective
4. Theoretical/Conceptual Framework
5. Research Questions & Hypotheses
6. Research Design & Sampling
7. Data Collection Analysis and Interpretation
8. Deduction (Hypotheses Substantiated, RQs Answered)
9. No
10. Yes

Step Three:
Research Problem & Research Objective
Problem Definition

- A “Problem” does not necessarily mean that something is seriously going wrong with the current situation, and needs to be rectified immediately.
- A “Problem” could simply indicate an interest in an issue where finding the right answers might help improving an existing situation.
- Thus, researcher should define the “Problem Statement” as any situation where a gap exists between the actual and the desired ideal states.
- Symptoms of the problem should not be defined as the real problem. Example: a manager might have tried to increase productivity by increasing the piece rate, but with little success. Here, the low productivity may be a symptom of the real problem which is the low morale and motivation of the employees.

Problem Statement

It is a clear, precise, and to the point statement of ISSUE that is to be investigated with the goal of finding solution or building understanding

It is either existing problem where urgent solution is needed, situations in which improvement is desired, or areas where some conceptual clarity is needed for a better theory building.

It is Significant, Original, Feasible, Timed, and administratively Doable?
Research Objective

A specific, logical statement which identify the expected outcomes of the research, the theory to be employed, and refer to the study population.

✓ Stated in action verbs that could be evaluated (to describe, to identify, to measure, to compare, etc).
✓ It is normal to write in the passive.
✓ Use the future tense in the proposal.
✓ Use the present tense in the dissertation.

Research Objective… Possible Routes

To review and synthesize existing knowledge E.g. Modify a certain model to fit a different industry
To provide solutions to a problem E.g. Solving these problems
To explore and analyze more general issues E.g. Exploring effect of stress on employee performance
To construct or create a new procedure or system E.g. Create a new model for service quality in healthcare
To explain a new phenomenon E.g. Explain disease outbreaks in certain ME countries
Problem… Objective… An Example

Research Problem
Employee turnover is a major challenge facing mobile operator companies in Bahrain. The rate of turnover rate reaches critical levels, particularly at entry level positions. The problem in this research lies in identifying the relation between failure to implement various aspects of recruitment strategies in the three companies operating in Bahrain (Batelco, Zain and Viva), and decreased employee retention rate.

Research Objective
This study will investigate the link between the recruitment practices (on one side) and entry-level staff retention (on the other side) in the three mobile operators in Bahrain in order to develop a framework of optimized recruitment strategies that ensures higher retention.

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9. Yes
10. Prepare for Defense

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Step Four:

Development of Theoretical/Conceptual Framework

What is a Theory?

A formulation regarding the cause & effect relationships between two or more variables, which may or may not have been tested.

Theory or previously tested model helps the researcher to decide his/her approach to research design.
The Need for Theoretical/Conceptual Framework

- A Theoretical/Conceptual Framework is how one theorizes or makes logical sense of the relationships among the several factors (variables) that have been identified as important to the problem (It is the Map).
- This theory flows logically from the LR (documentation of previous related researches) or invented by researcher.
- TF/CF is no more than identifying the network of relationships among the variables considered important to any given problem situation.
- From TF, research questions and hypotheses can be developed and tested via primary data to examine whether the theory formulated is valid or not.
- Thus, the entire research rests on the basis of the TF/CF.

What is a Variable?

A variable is anything that can take on differing or varying values.

- **Production Units**: One worker in a manufacturing department may produce one packet per minute, a second might produce two per minute, and a third might produce five per minute.
- **Motivation**: The levels of motivation of employees to learn in a work team might take on varying values ranging from “very low” to “very high”.
Types of Variables

- The Dependent Variable (Effect)
- The Independent Variable (Cause)
- The Moderating Variable
- The Intervening Variable

Dependant Variable: Definition

- It is the variable of primary interest to the researcher.
- The goal of the research is to understand and describe, or to explain its variability, or to predict it.
- The researcher tries to analyze the dependent variable (i.e. finding what variables influence it) in order to find solutions to the problem.
- For that, the researcher will be interested in quantifying and measuring the dependent variable, as well as other variables that influence it.
- It is possible to have more than one dependent variable in a study.
Dependant Variable: Examples

- A manager is concerned that the sales of a newly introduced product is not meeting his expectations.
  - Since sales of the product can vary (low, medium or high) and since sales is the main focus of interest to the manager, it is the dependent variable.
- A vice president is concerned that the employees are not loyal to the organization. The DV in this case would be “organizational loyalty”.
  - The VP may want to know what accounts for the variance in the loyalty of employees, with the purpose of controlling it. If he finds that pay level affects loyalty, he can offer then pay raises to keep them in the organization.

Independent Variable: Definition

- It is the variable that influences the dependent variable in either a positive or a negative way (i.e. with each unit of increase in the independent variable, there is an increase or decrease in the dependent variable).
  - Thus, the variance in the dependent variable is accounted for by the independent variable.
  - This relationship is called: “Cause & Effect”.

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Independent Variable: Example

- Research Studies indicate that successful new product development has an influence on the stock market price of the company.
- The more successful the new product turns out to be, the higher will be the stock market price of that firm.
- In other words, the degree of success of the new product developed will explain the variance in the stock market price of the company.

Moderating Variable

- It is the variable that has a strong effect on the independent variable-dependent variable relationship.
- Thus, the presence of this variable modifies the original relationship between the independent and the dependent variables.
**Moderating Variable: Example**

By theory, the diversity of the workforce (comprising people of different ethnic origins, races and nationalities) contributes more to organizational effectiveness because each group brings its own special expertise and skills to the workplace. However, the effective utilization of different talents, perspectives, and capabilities of the various groups for enhanced organizational effectiveness is contingent on the skill of the managers to act as catalysts.

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**Distinction between Independent & Moderating Variable**

Sometimes confusion occurs between IV and MV. The decision whether to label them dependent, independent, or moderating depends on how they affect one another. An independent variable of one research might become a moderating variable in another different research.
Intervening Variable

The variables should be clearly identified and labeled.

The relationships between the identified variables should be clearly stated (how two or more variables are related to each other). USE Literature Support.

The direction of the relationships (whether positive or negative) should be indicated (on the basis of the findings of previous researches).

A schematic diagram of the theoretical framework should be sketched, indicating previously defined relationships directions.
Simulation Exercise:
College of Arts

Simulation Exercise:
College of Engineering
Simulation Exercise:
College of Information Technology

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Tie

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Step Five:

Developing Research Questions & Hypotheses

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Research Questions

- Major Research Question and Minor Research Questions.
- Major R.Q. ➞ the Broadest Question in the study.
- Major R.Q. = 1 and Minor R.Qs = No. of Moderating Variables.
- Minor R.Qs ➞ help design Data Collection Instrument.
- Begin with words “what”, “how”, or “to what extent”.
- Use wording that suggests a relationship between variables, such as “affect”, "influence", "impact".
- Use open-ended questions without reference to the literature or theory, unless otherwise dictated by the research design.

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Hypotheses Development

A hypothesis is a testable statement of logically defined relationship between two or more variables/groups.

Hypotheses are developed based on the theoretical framework to test whether the relationships that have been theorized do in fact hold true.

By testing the hypotheses (using software like SPSS), and confirming/ or rejecting relationships, it is expected that research question is answered in order to fulfill the research objective.

Hypotheses Classification

According to Type

Directional

OR

Non-Directional

According to Format

Null

&

Alternate

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**Directional Hypotheses**

**Directional Hypotheses** are those in which the direction of the relationship between 2 variables or 2 groups is indicated. They include terms such as *positive, negative, more than, less than.*

Examples:
- The greater the stress experienced in the job, the lower the job satisfaction of employees.
- Women are more motivated than men.

**Non-Directional Hypotheses**

**Non-Directional Hypotheses** are those which postulate a relationship or difference (between 2 variables or 2 groups), but offer no indication of the direction of these relationships or differences.

They are formulated either because the relationships or differences have never been previously explored, thus no basis for indicating direction, or because there have been conflicting findings in previous studies on the variables.

Examples:
- There is a relationship between age and job satisfaction.
- There is a difference between the work ethic values of American and Asian employees.
Null & Alternate Hypotheses

Null Hypothesis (H₀) a statement which express no significant relationship between 2 variables, or no significant difference between 2 groups (No Statistical Correlation).

Alternate Hypothesis (Hₐ) a statement which express a relationship between 2 variables, or indicate difference between 2 groups (Statistical Correlation).

Alternate hypothesis is the opposite of Null hypothesis.

Theory allows us to have faith in the Alternative hypothesis. Thus, Null hypothesis is formulated to be tested for possible rejection. If analysis lead us to rejecting the Null Hypothesis, then Alternative hypothesis could be supported.

Null & Alt Hypotheses… Example 1

Women are more motivated than men.

The Null Hypothesis for the above example

H₀: Mₘ = Mₗ OR H₀: Mₘ - Mₗ = 0

The Alternate Hypothesis for the above example

If Directional:

Hₐ: Mₘ < Mₗ OR Hₐ: Mₘ > Mₗ

If Non-Directional:

Hₐ: Mₘ ≠ Mₗ
Null & Alt Hypotheses… Example 2

There is no relationship between the stress experienced in the job and the satisfaction of the employee

Is this Hypothesis Null or Alternative?

Can you drive the Opposite?

Fail to Reject $H_0$

- The Questionnaire questions were not well designed, formulated or understood from the respondents.
- The Respondents were careless/not-serious in their answering the questions.
- The sample size (collected questionnaires) were not enough.
- Or, it is the reality and has to be validated empirically by another data collection tool (focus group).
Research Assumptions & Limitations

Example of Assumptions:
A1: The impact of Variable ABC will remain constant throughout the research period.
A2: Many ICT companies in Bahrain do not employ proper recruitment strategies.

Example of Limitations:
L1: This research will be limited to management consultancy versus technical consultancy (IT, Engineering, …).
L2: The research will be limited to the companies whose managers will agree to contribute to the research.

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Step Six:
Research Design & Sampling

Research Paradigms

Paradigm

It refers to the progress of the scientific practice based on people's philosophies and assumptions about the world and the nature of knowledge (Schools of Research). Paradigms offer a framework comprising an accepted set of theories, methods and ways of defining data.

Two types of Paradigm:

**Quantitative:** Objective, Scientific (Eng, IT, Science)

**Qualitative:** Subjective, Humanistic (Law, Arts, BA)
The Quantitative Paradigm

Features of Quantitative Research
- Tends to produce Quantitative data
- Uses large Sample
- Concerned with hypothesis testing
- Data is highly specific and precise
- Reliability is high
- Validity is low
- Generalizes from sample to population

The Qualitative Paradigm

Features of Qualitative Research
- Tends to produce Qualitative data
- Uses small Sample
- Concerned with generating theories
- Data is rich and subjective
- Reliability is low
- Validity is high
- Generalizes from setting to another
Research Methodology

Refers to the overall approach to research process, from the theoretical support to the collection and analysis of the data. Types of Research Methodology:

✓ Survey Research (Quantitative)
✓ Experimental Research (Quantitative)
✓ Ethnography Research (Qualitative)
✓ Case Study Research (Qualitative)
✓ Action Research (Qualitative)

1. Survey Research (Quantitative)

Sample from Population to make inferences about the population
Sample selection is critical and statistical techniques are needed

⇒ Cross-sectional Studies/Surveys
⇒ Involves the collection of information from any given sample of population only once to find correlation between variables
⇒ Conducted when there is constraint of time and resources

⇒ Longitudinal Studies/Surveys
⇒ Involves a fixed sample of population which is measured repeatedly. (i.e. Panel of same respondents are studied over time)
⇒ Very useful for measuring change in relationships over time
Survey Research: An Example

**Cross-Sectional Designs:**
- A marketing manager is interested in measuring customer demand towards a specific newly developed product that is to be launched by the company. Data are collected in mall survey pattern from the main 6 retailers outlets.

**Longitudinal Designs:**
- A marketing manager is interested in the pattern of consumer behavior towards a particular product in 4 different regions of the country on a quarterly basis for the next 2 years. Since data are collected several times to answer the same issues, it is considered longitudinal.

2. Experimental Research (Quantitative)

- Mostly used by Science, Engineering and IT students.
- Experiments done in an artificial environment known as **Lab Experiments**.
- Experiments done in the natural environment in which activities regularly take place know as **Field Experiments**.
- Allows two options:
  1) **Manipulation of the Independent Variable** (i.e. we create different levels of $Y$ to assess the impact on $X$).
  2) **Controlling the Exogenous variables** (i.e. eliminating the moderating variables or setting them as constant).
Experimental Research: An Example

**Lab Experiment:**
In the study of “Optimizing Real-Time Tasks Allocation in Cloud Computing Environment”, the researcher developed 4 different algorithms to schedule real-time tasks and test them to reach the optimal.

**Field Experiment:**
Production plant manager want to test the theory that depth of knowledge of various manufacturing technologies ($X$) is caused by rotating workers on all jobs of the production line ($Y$) for 4 weeks. He can manipulate the ($Y$) as follows:
A) Rotating 1st group of workers on ALL jobs for 4 weeks.
B) Rotating 2nd group of workers on HALF jobs for 4 weeks.
C) Leaving 3rd group continuing their job for 4 weeks without rotation.

3. Ethnography Research (Qualitative)

- **Ethno (folk) graphy (description) = People Description.**
- **It is the scientific description of peoples and cultures with their customs, habits, and mutual differences.**
- **It is used to understand the observed patterns of human activities, so data collection is done through observation.**
- **It takes long time.**

**Example:** In the study of “Assessing the Impact of Guidance Program on the Level of psychological security of orphan children in Bahrain”. The researcher divided the sample into 2 groups, applied the program (12 Sessions) on 1st group and left the 2nd group as control one. She measured the impact on their behavior immediately after the 12 sessions, and then again after one month to ensure that impact lasts.
4. Case Study Research (Qualitative)

- It focuses on understanding dynamics within single setting.
- It is mostly exploratory research, that needs in-depth and long time to understand, and to collect data.
- Suitable for Law, Psychology, and Sociology students.

**Examples:**
1. Efficiency of International Committees in observing Elections: Case Study on Egypt
   
   فعالية اللجان الدولية في مراقبة الانتخابات: دراسة حالة على مصر

2. Socio-cultural Factors of the Violence Phenomena Among University Youth: The Case of Oxford University
   
   العوامل السوسيوثقافية لظاهرة العنف لدى الشباب الجامعي: دراسة حالة على جامعة أكسفورد.

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5. Action Research (Triangulation)

- It is applied Research: Planning, acting, observing, reflecting
- Its main aim is to enter the situation, attempt to bring about change and to monitor the results.

**Example:** In the study of “Minimizing the Non-Revenue Water in Bahrain Networks”, the researcher started by a survey which revealed that the number of maintenance teams is not appropriate for the geographical area of Bahrain. As such, he developed a Queuing Model to find out the optimum number of Maintenance Teams, implemented the model in certain governorates and managed to prove that the new number of teams managed to minimized the wasted water.

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A Target Population is the collection of elements that possess the information sought by the researcher and about which inferences are to be made.

A Sample is made up of some of the members of the population.

A Representative Sample of any population should be so drawn that every member of that population has a specified non-zero probability of being included in the sample. In other words, Every member of the population has a statistically equal chance of being selected.

A Sampling Frame is a list of the population from which all the sampling units are drawn. For example, in a large company, a list of all employees will form the sampling frame from which you can take a sample.

Sample Size depends mainly on the size of your study, and the size of your population. You may use the entire population.

A good sample must be:

- Chosen at random.
- Large enough to satisfy the needs of the research.
- Unbiased (e.g. volunteers to participate in the study).
The Sampling Design Process

- Define target population
- Obtain or construct sampling frame
- Select Sampling Technique & Determine Sampling Size
- Execute the Sampling Process

Methods of Selecting A Sample

- Probability Sampling
- Non-Probability Sampling

**LOGIC Of Probability Sampling**

- Probability sampling provides an efficient method for selecting a sample that should adequately reflect the variation that exists in the population as a whole.

- A basic principle of Sampling is the following: “A sample will be representative of the population from which it is selected if all members of the population have an equal chance of being selected in the sample.”

- Probability Samples will never be perfectly representative of the population, but are typically more representative than other types of samples.

- Probability Theory permits you to estimate accuracy or representativeness of sample.
**Probability Vs. Non-Probability Sampling**

**Probability Sampling**: A sampling procedure in which each element of the population has a fixed probabilistic chance of being selected for the sample.

**Non-Probability Sampling**: Sampling technique that do not use chance selection procedures. Rather, they Rely on the personal judgment of the researcher.

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**Classification of Sampling Techniques**

- Sampling Techniques
  - Non-Statistical Sampling Techniques
    - Judgmental Sampling
  - Statistical Sampling Techniques
    - Convenience Sampling
      - Simple random Sampling
      - Stratified Sampling
      - Cluster Sampling
1. **Simple Random Sampling (for small & Large Sample):**
   - For small population, numbers might be chosen at random, where every member of the population is given a number.
   - For large populations, numbers are taken from “Tables of Random Numbers”.
   - Bias will occur if sample is chosen by a person, as it will lead to favoritism, or chosen haphazardly.

   **Example:**
   - Population: 7,500
   - Sample Size: 300

   Number the names from 1 to 7,500, and then use the Random Numbers Table to select a random sample of 300. The division of 300 into 7,500 is called the *Sampling Fraction*. In this case it is 25. That means, a random selection of one name in every 25. However, the selection must be *truly Random*.

2. **Stratified Sampling (for relatively small sample):**
   - Random sampling might result in some members of the population being significantly under or over represented.
   - Stratified sampling overcomes this problem as each identifiable “Strata” of the population is taken into account.

   **Example:**
   - Population: 850 (580 F and 270 M)
   - Sample Size: 100
   - 580/850*100=68 Females
   - 270/850*100=32 Males

   **Real Case:** If your sampling frame consists of all the employees in a particular company, you may identify the following strata: Directors, Managers, administrators, and production workers. And if 25% of the whole employees were production workers, then 25% of sample should be production workers.
Statistical Sampling, Cont.

3. Cluster Sampling (for reducing physical areas covered/ cost):
- Takes the advantage of the fact that most populations could be divided into sub-sections according to certain characteristics (i.e. they can be clustered).
- Random selection is made from a sampling frame listing groups rather than individuals. Every individual in a selected group is then surveyed.

Example: Population is clustered into 3 levels: State, region, and section
13 State, each contains 25-40 region, each contains 120-260 Sections.
- Work systematically from level to level with the table of random numbers,
- First we choose, say, 4 out of the 13 state at random. (4 States)
- From each of those four we choose, say, 6 regions at random. (24 Regions)
- From each of those 24 regions we choose, say, 8 sections at random. (192 Section)
- Finally, from each of those 192 sections, we choose 10 people at random.
- Result: <2,000 names/addresses, accurately representative & clustered geographically.

Non-Statistical Sampling

1. Judgmental Sampling (for Pilot Work, and Delphi)
- To select your sample on the basis of your own knowledge of the population, and the nature of your research aims.
- Researcher chooses the elements to be included in the sample, as he or she believes that they are representative of the population of interest.
- During the initial design of your questionnaire, you might want to select the widest variety of respondents to test the broad applicability of your questions.
- Findings would NEVER represent any meaningful population, but might effectively uncover any particular defects in your research instrument.
- Common examples include: test markets selected to determine the potential of a new product.
Non-Statistical Sampling, Cont.

2. Quota Sampling
   - Can be viewed as 2 stage restricted judgmental sampling.
   - The first stage consists of developing control categories, or quotas, of population elements.
   - The relevant control characteristics may include: sex, age, race, and are identified on the basis of judgment.
   - In the second stage, sample elements are selected based on judgment. The only requirement is that the elements selected fit the control characteristics.
   - Often, the quotas are assigned so that the proportion of the sample elements possessing the control characteristics is the same as the proportion of population elements with these characteristics.
   - Quota sampling attempts to obtain representative samples at a relatively low cost.
   - Under certain conditions, this method obtains results close to those of probability sampling.

Sample Size & Sampling Error

- A sample’s Accuracy is more important than its size.
- Statistical tables exist which will show the Sampling Error which is theoretically obtainable for samples of different sizes. Thus, the accuracy of a given result might be plus or minus: 2% of a sample of 2,000, OR 6.5% of a sample of 200

Example:
- A finding that 30% of our sample said ‘YES’ to a particular question must therefore be interpreted to mean that the true figure for the population will most likely lie between 28% - 32%, or between 23.5% - 36.5%, depending on Sample size.
- Theoretically, adequate sample should be 3%-6% of the total population. However, sample size will be determined by other factors such as: cluster size, required accuracy of estimates, nature of the population, and of course by the constraints of time and cost.
The Research Process

1. Broad Problem Or Area of Research Interest
2. Preliminary Investigation & Literature Review
3. Research Problem & Research Objective
4. Theoretical/Conceptual Framework
5. Research Questions & Hypotheses
6. Research Design & Sampling
7. Data Collection Analysis and Interpretation
8. Deduction (Hypotheses Substantiated, RQs Answered)
9. Thesis Writing
10. Prepare for Defense

Step Seven:
Data Collection & Analysis
Are all your variables measurable??

Operationalizing Variables

Observable & Measurable characteristic behaviors (Elements)
Concept of Achievement Motivation

Driven by work
Unable to relax
Impatience with ineffectiveness
Seeks moderate challenge
Seeks feedback

Constantly working
Perserving despite setbacks
Do not accept even small mistakes
Opt to do a challenging rather than a routine job
Opt to take moderate rather than overwhelming challenges

Very reluctant to take time off for anything
Thinks of work even at home
Does not have any hobbies
Does not like to work with slow or inefficient people
Asks everybody for feedback on how the job has been done
Impatient for immediate feedback

Source: Adopted from Sakaran, 2010

Data Collection Methods

Focus Groups
Interviewing:
- Unstructured Vs. Structured Interviews
- Face-to-Face Vs. Telephone Interviews
Surveys/Questionnaires
Delphi
Focus Group Discussions

- A Focus Group is an interview conducted by a trained moderator in an unstructured and natural manner with a small group of respondents. Number of focus groups that should be conducted depends on: 1) nature of problem, 2) time & cost.
- The main purpose of focus groups is to gain insights by listening to a group of people from the target market.
- The value of this technique lies in the unexpected findings often obtained from a free-floating group discussion.

Focus groups are so popular that many practitioners consider this technique synonymous with qualitative research.
Steps of Focus Group Discussions

Prepare for several focus groups. There may be variation between groups, but an individual group must be comprised of similar types of people. Participants are screened for verbal ability, experience and willingness to be candid about their opinions.

Setting is important. Many firms use central facilities with one-way mirrors and sophisticated electronic recording equipment. Hotel rooms and other meeting facilities can be quite acceptable venues for a focus group especially for the professional and business community.

Major issues are reviewed prior to the group. The moderator should prepare the agenda (also termed a "protocol") which will guide the group discussion.

Focus groups are usually Video/Audio-taped. Under no circumstances should this be kept secret; participants must be informed both of the recording devices and that they are being observed. Anyone who is uncomfortable may leave.

Characteristics of Focus Groups

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Size</td>
<td>8-12</td>
</tr>
<tr>
<td>Group Composition</td>
<td>Homogeneous, and respondents prescreening</td>
</tr>
<tr>
<td>Physical setting</td>
<td>Relaxed, informal atmosphere</td>
</tr>
<tr>
<td></td>
<td>Questions flow from general to specific</td>
</tr>
<tr>
<td>Time duration</td>
<td>1-3 hours</td>
</tr>
<tr>
<td>Recording</td>
<td>Use of audiocassettes and videotapes</td>
</tr>
<tr>
<td>Moderator</td>
<td>Observational, interpersonal, and communication skills of the moderator</td>
</tr>
</tbody>
</table>
Elements of Success of Focus Groups

**Group dynamics are critical.** The meeting must be positive and lead to easy interaction on the part of group members.

**Homogenous group composition** is the norm. It is usually unproductive to combine young and old, or junior and senior in the same group unless they are united by a strong common interest. The comfort level respondents have with each other is extremely important to gaining useful information.

**Moderator skill is very important.** It requires maturity, research experience, and substantive knowledge of the field.

**A clear agenda** for the group discussion is essential. The topic must be familiar to all participants with the agenda consisting of 5 – 10 main issues. A common mistake is to "load" the agenda with a detailed set of questions which need to be explored. When participants are rushed, they will not provide in-depth reactions. For example, in a two hour (120 minute) focus group of 12 participants with 20 issues, each has 30 seconds on average to react to each issue.

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**Key Qualifications of Moderator**

- A “Friendly” Leader
- Excellent Memory
- Good Listener
- Flexible yet Focused
- A “Big Picture” Thinker
Problems in Group Dynamics

**Tolerate silence.** It is important to respect the need for individuals to collect their thoughts. If you have spent time explaining why their thoughtful opinions are important to the research, why rush them for information?

**Enlist the aid of dominant participants.** Ask another person to react to the dominant participant’s comment. In this way, others have the opportunity to enter the discussion. Drawing out those who are reluctant to speak is the mark of a skilled moderator (i.e. ensure that everyone speaks).

**Conflict is an indicator of mixed opinions on the issue.** Exploring these differences is important. Of course, personality conflicts among group members are unproductive and mediation skills are another indicator of a good moderator.

**A minimum number of groups are needed if the population is low diverse.** Fewer sessions may be conducted if the range of issues is slight and if variation within the population is expected to be low.

(2)

**Personal Interviews**
Characteristics of Personal Interviews

- No other skill is as important to the research worker as the ability to conduct good interviews.
- Interview, unlike most other techniques, requires interpersonal skills of a high order:
  - Takes from 30 minutes to more than one hour,
  - Putting the respondent at ease,
  - Take notes without upsetting the conversational flow,
  - Giving support without introducing bias.
- They are essentially of two kinds:
  - Unstructured (Exploratory or Depth) Interviews
  - Structured (Standardized) Interviews

Unstructured (Depth) Interviews

- Unstructured interviews are so labeled because the interviewer does not enter the interview setting with a planned sequence of questions to be asked to the respondent. The objective of this type of interviews is to uncover underlying motivations, beliefs, attitudes, and feelings on a topic.
- Thus, depth interviews help in the formulation of the research problem, collect ideas and improve the conceptualization of research questions and articulation of hypotheses, based on “Hidden Agenda” of the researcher.
- The Hidden Agenda is only hidden in the sense that it should not be too obvious to the respondent. The interview should move naturally from topic to topic, and the interviewer may start with any of the topics on the Agenda and proceed in any order.
- No fixed questions. Every effort is made to get respondents to express their own ideas spontaneously in their own words.
**Structured Interviews**

Structured interviews are those conducted when it is known what information is needed. The interviewer has a list of predetermined questions to be posed to the respondents.

The same questions are asked to everybody. Sometimes, however, the experienced researcher, based on the situation might take a lead from an answer and ask other relevant questions not on the interview protocol.

At this point of research process, the interviewer does not have the luxury of initiating new topics, adding new questions, or even following up interesting ideas. You should be bound by the requirement of Stimulus Equivalence.

Interviewer should be able to distinguish three types of questions:

- **Factual Questions**, where he/she is expected to read out the question as printed, but has some latitude to offer explanations.
- **Attitude & Opinion Questions**, in which interviewers are forbidden to explain or reword in any way.

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**Unstructured Vs. Structured Interviews**

![Diagram showing the comparison between Unstructured and Structured Interviews]

- **Problem Definition**
- **Objective of the Study**
- **Theoretical Framework**

Redefine Problem

Unstructured Interviews (Ideas Collection)

Data Analysis & Interpretation

Structured Interviews (Data Collection)

Redefine Variables of Interest
### Depth Interviews Vs. Focus Groups

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Focus Groups</th>
<th>Depth Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Degree of Structure</td>
<td>Relatively high</td>
<td>Relatively medium</td>
</tr>
<tr>
<td>2. Probing of individual respondents</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>3. Moderator bias</td>
<td>Relatively medium</td>
<td>Relatively high</td>
</tr>
<tr>
<td>4. Interpretation bias</td>
<td>Relatively low</td>
<td>Relatively medium</td>
</tr>
<tr>
<td>5. Uncovering subconscious information</td>
<td>Low</td>
<td>Medium to high</td>
</tr>
<tr>
<td>6. Discovering innovative information</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>7. Obtaining sensitive information</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>8. Involve unusual behavior or questioning</td>
<td>No</td>
<td>To a limited extent</td>
</tr>
<tr>
<td>9. Overall usefulness</td>
<td>Highly useful</td>
<td>Useful</td>
</tr>
</tbody>
</table>

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Delphi Method Overview

The Delphi Method is based on a structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback.

The objective of most Delphi applications is the reliable and creative exploration of ideas for decision making or the production of qualitative data.

Single experts sometimes suffer biases; group meetings suffer from “follow the leader” tendencies and reluctance to abandon previously stated opinions.

The main point behind Delphi method is to overcome those cases where Personal Interviews and Focus groups cant be used.

Steps of the Delphi Method

1. Formation of a Delphi team
2. Selection of experts to participate
3. Development of the first round questionnaire
4. Transmission of the first questionnaire to the panelists
5. Analysis of the first round responses and feedback
6. Preparation and transmission of the second round questionnaire
7. Analysis of the second round responses (Steps 6 and 7 are repeated as long as desired)
8. Reporting on the exercise
Steps of the Delphi Method

1. Formation of a Delphi Team

The team will be responsible for developing the entire exercise, choice of experts, development of questionnaires, analyzing the questionnaires and for feedback, as well as for monitoring the process and for preparing report.

The Delphi technique requires a coordinator to organize requests for information, information received, and to be responsible for communication with the participants.

The Delphi technique also requires an efficient communication channel to link the coordinator with each of the participants.

2. Selection of Experts

Once the list of nominees is formed, each person should be contacted individually. Experts from the required disciplines are first identified and asked to participate in the inquiry.

The results of a Delphi depend on the knowledge and cooperation of the panelists.

Knowledgeable persons are usually identified through literature searches for who has published on the subject under study, recommendations from institutions.

One possibility that helps ensure that the required skills are represented is to form a matrix in which the required skills are listed.
Steps of the Delphi Method, Cont.

2. Selection of Experts, Cont.

The rows of the matrix consist of the names of the prospective participants.

The cells are checked to indicate the "coverage" that the nominees are expected to provide. One interesting method for choosing the experts is the so-called Lock-and-Key Approach.

In this approach, the researcher attempt to match the capabilities of participants with the requirements of the questions, and questions are addressed only to those respondents whose profiles match.

Weighted sum method is used to evaluate the experts based on the same parameters, which will be used to evaluate the questions.

<table>
<thead>
<tr>
<th>Desired question</th>
<th>weight</th>
<th>Expert 1</th>
<th>Expert 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materialist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generalist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology forecast</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Steps of the Delphi Method, Cont.

3. Development of the first questionnaire (1st Round)

The next step is to formulate the questions. The questions must be sharp and answerable. Phrasing of questions is important. For this reason, it is desirable to conduct a test of the instrument.

In-depth interviews with experts have been used with great success as an alternative to questionnaires. In this approach, the same kinds of experts are first identified, invited to participate, assured of their anonymity. Interview protocols are prepared and tested to elicit judgments. Feedback can be introduced if two rounds of interviews are employed; however, single-round studies are used more frequently. An advantage of one-on-one interviews is that they provide flexibility, which is absent in questionnaires.

Steps of the Delphi Method, Cont.

4. Transmission of the first round questionnaire

Once qualified in this way, the questionnaire would be sent to the participants. The cover letter would remind the participants about the objectives of the study, establish the schedule for the response, and include the return address.

In most cases, the first questionnaire poses the problem in broad terms and invites answers and comments. For example, what actions should be taken to improve the quality of services?

The first questionnaire asks each participant to engage in individual brainstorming so as to generate as many ideas as possible for dealing with the issue. Essay-type answers could be permitted at this stage. Each participant returns the list anonymously to the coordinator.
Steps of the Delphi Method, Cont.

5. Analysis of the first round responses and feedback iteration
Some studies indicate that a response rate from 40 to 75 percent of the participants can be anticipated.

Responses obtained from the panel are collated by a central coordinator and fed back to the respondents in a synthesized form. A feedback round would be used to present the results, the reasons for the extreme positions, and a call for reassessment.

The reasons, in Delphi style, would be placed in front of the participants who answered the first round. They would be then asked to reconsider their former answers in view of the reasons for the extreme opinions.

Steps of the Delphi Method, Cont.

6. Preparation & transmission of second round questionnaire
Responses to the first questionnaire are used to construct the second questionnaire. The coordinator prepares and sends a second questionnaire to participants that contains all of the ideas sent in response to the first questionnaire and provides space for participants to refine each idea, clarify issues, identify areas of agreement or disagreement, to comment on each idea’s strengths and weaknesses for addressing the issue, to develop priorities and to identify new ideas.

This interactive process can be repeated as many times as appropriate. The aim of each round or iteration is for responses to become stable. Participants anonymously record their responses to the second questionnaire and return them to the coordinator.
Steps of the Delphi Method, Cont.

7. Analysis of the second round responses

The coordinator analyses the responses, summarizes them, and asks for additional clarifications, strengths, weaknesses, and new ideas. Preparation, transmission, and analysis are reiterated as long as desired or necessary to achieve stability in the results.

If desired, the **coordinator performs iterations of the preceding process until it becomes clear that no new ideas are emerging** and that all strengths, weakness, and opinions have been identified.

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Steps of the Delphi Method, Cont.

8. Reporting on the exercise

The outcome of a Delphi sequence is nothing but opinion. The results of the sequence are only as valid as the opinions of the experts who made up the panel.

The data from a Delphi can be displayed in several ways. **The group judgment should be based on the median rather than the mean**, since single extreme answers can "pull" the mean unrealistically. Furthermore, it is incumbent on the analyst to show the spread of opinion, which can be done by showing the inter-quartile range (the range that contains the answers of 50 percent of the respondents).
Drawbacks of the Delphi

Delphi studies are difficult to perform well. A great deal of attention must be given to the choice of participants; the questionnaires must be meticulously prepared and tested to avoid ambiguity.

Multi-round studies require a great deal of time; inevitably, some participants will drop out during the process.

Finally, a weakness of the Delphi method is the time that it takes. A single round can easily require three weeks; a three-round Delphi is at least a three to four month affair, including preparation and analysis time.

(4) Surveys (Questionnaires)
Characteristics of Surveys

A survey (questionnaire) is a formalized written set of questions for obtaining information from respondents. Questionnaires are an efficient data collection mechanism when the researcher knows exactly what is required and how to measure variables of interest.

Advantages of the Survey Method:
1. Questionnaire is simple to administer.
2. Use of fixed-response questions reduces the variability in the responses which may be caused by interviewers.
3. Coding, editing and analysis of data are relatively simple.

Disadvantages of the Survey Method:
1. Respondents may be unable or unwilling to respond if the information requested is sensitive or personal.
2. Wording of questions is not easy.

Classification of Survey Methods

Survey Methods
  ↓
Self-Administered  ↓  Mail  ↓  Electronic
Questionnaire Design

Measurement and Scaling of Variables:

Fundamentals Techniques
Measurement & Scaling

Measurement is the Assignment of numbers or other symbols to characteristics of objects according to certain pre-specified rules.

Scaling is the generation of a continuum on which measured objects are located

Example: Measuring Consumers attitude towards Department Stores

Primary Scales of Measurement

- **Nominal Scale**: A scale whose numbers serve only as labels or tags for identifying and classifying objects with a strict one-to-one correspondence between the numbers and the objects.

- **Ordinal Scale**: A ranking scale in which numbers are assigned to objects to indicate the relative extent to which some characteristic is possessed. Thus, it is possible to determine whether an object has more or less of a characteristic than some other object.

- **Interval Scale**: A scale in which the numbers are used to rate objects such that numerically equal distances on the scale represent equal distances in the characteristic being measured.

- **Ratio Scale**: The scale. It allows the researcher to identify or classify objects, rank order the objects, and compare intervals or differences. It is also meaningful to compute ratios of scale values.
Primary Scales of Measurement

**Nominal**
- Numbers Assigned to Runners
- Finish

**Ordinal**
- Rank Order of Winners
- Finish

**Interval**
- Performance Rating on a 0 to 10 Scale
- First place: 9.6
- Second place: 9.1
- Third place: 8.2

**Ratio**
- Time to Finish, in Sec.
- First place: 13.4
- Second place: 14.1
- Third place: 15.2

A Comparison of Scaling Techniques

**Comparative Scales** The scaling technique in which there is direct comparison of stimulus objects with one another (Ordinal “Non-Metric” Scaling).

“Do you prefer X or Y?”

**Non-Comparative Scales** The scaling techniques in which each stimulus object is scaled independently of the other objects in the stimulus set (Interval or Ratio “Metric” Scaling).

“Evaluate X on a 1 to 6 preference scale”
Classification of Scaling Techniques

Rank Order Scaling

- A comparative scaling technique in which respondent is presented with several objects simultaneously and asked to order or rank them according to some criterion.
- Commonly used to measure preferences for brands.
- This approach is also comparative in nature, and it is still possible that the respondent may dislike the brand ranked 1 in the absolute sense. However, this type of scaling more closely resembles the shopping environment.
- The major disadvantage is that this technique produces only ordinal data.
Preference for Toothpaste Brands Using Rank Order Scaling

**Instructions:** Rank the various brands of toothpaste in order of preference. Begin by picking out the one brand that you like most and assign it a number 1. Then find the second most preferred brand and assign it a number 2. Continue this procedure until you have ranked all the brands of toothpaste in order of preference. The least preferred brand should be assigned a rank of 10.

No two brands should receive the same rank number.

The criterion of preference is entirely up to you. There is no right or wrong answer. Just try to be consistent.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Crest</td>
<td>__________</td>
</tr>
<tr>
<td>2. Colgate</td>
<td>__________</td>
</tr>
<tr>
<td>3. Signal</td>
<td>__________</td>
</tr>
<tr>
<td>4. Paradontox</td>
<td>__________</td>
</tr>
<tr>
<td>5. Macleans</td>
<td>__________</td>
</tr>
<tr>
<td>6. Ultra Brite</td>
<td>__________</td>
</tr>
<tr>
<td>7. Close Up</td>
<td>__________</td>
</tr>
<tr>
<td>8. Pepsodent</td>
<td>__________</td>
</tr>
<tr>
<td>9. Plus White</td>
<td>__________</td>
</tr>
<tr>
<td>10. Stripe</td>
<td>__________</td>
</tr>
</tbody>
</table>
Constant Sum Scaling

- A comparative scaling technique in which respondent is required to allocate a constant sum of units such as points among a set of stimulus objects with respect to some criteria.

- If attribute is twice as important as some other attribute, it receives as many points. The sum of all points should be 100, hence, the name of the scale.

- The attributes are scaled by counting the points assigned to each one by all the respondents and dividing by the number of respondents.

- This method should be considered an ordinal scale. The major disadvantage is that respondents may allocate more or fewer units than specified (e.g. 108, or 94).

Importance of Car Attributes Using Constant Sum Scale

Instructions

On the next slide are eight attributes of TV Program. Please allocate 100 points among the attributes so that your allocation reflects the relative importance you attach to each attribute. The more points an attribute receives, the more important the attribute is. If an attribute is not at all important, assign it zero points. If an attribute is twice as important as some other attribute, it should receive twice as many points.
Assessing A Program on Bahrain TV
Average Responses of Three Governorates

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Segment I</th>
<th>Segment II</th>
<th>Segment III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Program Time</td>
<td>8</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2. Content Depth</td>
<td>2</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>3. Content Variety</td>
<td>3</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>4. Decor</td>
<td>53</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>5. Clothing</td>
<td>9</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>6. Selection of Guests</td>
<td>7</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>7. Announcer</td>
<td>5</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>8. Social Media</td>
<td>13</td>
<td>60</td>
<td>15</td>
</tr>
</tbody>
</table>

Sum: 100 100 100

Classification of Scaling Techniques

Scaling Techniques

Comparative Scales

- Rank Order
- Constant Sum

Non-comparative Scales

- Likert
- Semantic Differential
- Stapel
**Likert Scale**

- Named after its developer, Rensis Likert.
- It is a widely used rating scale that requires the respondents to indicate a degree of agreement or disagreement with each of a series of statements about the stimulus objects.

<table>
<thead>
<tr>
<th>I get a feeling of accomplishment from the work I am doing</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td>Strongly Agree</td>
<td></td>
</tr>
</tbody>
</table>

- Likert scale is easy to construct and administer. Respondents readily understand how to use the scale, making it suitable for mail questionnaire and telephone interviews.
- The major disadvantage of this scale is that it takes longer to complete than other scales, because respondents have to read each statement.

**Semantic Differential Scale**

- In this technique, respondents rate objects on a seven-point rating scale bounded at each end by one of two bipolar adjectives.
- Respondents mark the blank that best indicates how they would describe the object being rated.
- The –ve adjective or phrase sometimes appears at the left side of the scale and sometimes at the right. This controls the tendency of some respondents (particularly those with very +ve or very –ve attitudes) to mark the right or left sides without reading the labels.
- It is popular in marketing research, and widely used in comparing brand, product, and company images.
Semantic Differential Scale for Measuring Self-Concepts and/or Product Concepts

1) Rugged :---:X:---:---:---:Delicate
2) Excitable :---:---:---:---:---:Calm
3) Uncomfortable :---:---:---:---:Comfortable
4) Dominating :---:---:---:---:---:Submissive
5) Thrifty :---:---:---:---:---:Indulgent
6) Pleasant :---:---:---:---:---:Unpleasant
7) Contemporary :---:---:---:---:---:Obsolete
8) Organized :---:---:---:---:---:Unorganized
9) Rational :---:---:---:---:---:Emotional
10) Youthful :---:---:---:---:---:Mature
11) Formal :---:---:---:---:---:Informal
12) Complex :---:---:---:---:---:Simple
13) Colorless :---:---:---:---:---:Colorful
14) Modest :---:---:---:---:---:Vain

Stapel Scale

- Named after its developer, Jan Stapel.
- It is a unipolar rating scale with 10 categories numbered from -5 to +5, without a neutral point (Zero). This scale is usually presented vertically. Respondents are asked to indicate how accurately or inaccurately each term describes the object by selecting an appropriate numerical response category.

- This scale produces results similar to the semantic differential. Moreover, Stapel scales do not require a pretest of the adjectives or the phrases to ensure true bipolarity.

- However, some researchers believe that this scale is confusing and difficult to apply. Of the 3 itemized rating scales, this is the least used.

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Balanced Vs Unbalanced Scales

Balanced Scale | Unbalanced Scale
---|---
**Extremely good** | **Extremely good**
**Very good** | **Very good**
**Good** | **Good**
**Bad** | **Somewhat good**
**Very bad** | **Bad**
**Extremely bad** | **Very bad**

Choosing a Scaling Technique

- Certain practical factors should be considered in selecting scaling techniques for a particular marketing research problem:
  - The level of information (nominal, ordinal, interval, or ratio) desired.
  - The capabilities and knowledge of the respondents.
  - Method of administration of data collection.
- As a general rule, using the scaling technique that will yield the highest level of information in a given situation will permit the use of the greatest variety of statistical analysis tools.
Framework for Questionnaire Design

Define Questionnaire Objective

The general principle is that the first “layer” of a questionnaire that needs to be dealt with is the questionnaire's objectives.

You can not begin to formulate questions and worry about wording and formatting unless you know what you want to accomplish with your questions and words.

Begin with an introduction which includes the questionnaire's purpose, who is conducting it, to what use the information will go, and confidentiality.
Types of Questions

There are 2 types for classifying questions:

- On the basis of FORMAT:
  1. Open-Ended Questions
  2. Closed-Ended Questions

- On the basis of Targeted Response:
  1. Factual Questions
  2. Non-Factual Questions
Types of Questions (Opened vs. Closed)

- **Open-ended questions** are those where respondents provide their own answers to the question, without any previously provided options. These are fill-in-the-blank responses. They allow respondents to express their own thoughts but are more demanding of both respondent and person doing the analysis.

- **Close-ended questions** have answer options provided and respondents must select either one answer or multiple answers from what is given. These questions have greater uniformity in responses but depend on your knowing and including all relevant responses. Responses for close-ended questions must be exhaustive [i.e. include all possible answers] and also mutually exclusive in providing for the selecting of a single response.

Types of Closed-Ended Questions

1. **Multiple-Choice Questions**: Respondents are asked to select one or more of the alternatives given.

   **How frequently is a systematic monitoring of work progressing?**
   - Every month
   - Every quarter
   - Twice a year
   - Once a year

   The response alternatives should include the set of all possible choices. The general guideline is to list all alternatives that may be of importance and include an alternative labeled “Other (Please Specify)”
Types of Closed-Ended Questions

2. **Dichotomous Questions:** Respondents have to choose only one out of 2 alternatives; Yes/No, approve/disapprove, and so on. Often a neutral alternative is supplemented.

   Do you intend to buy a new car within the next 6 months?
   - Yes
   - No
   - Don’t Know

3. **Rank Order Questions**
4. **Likert Scale Questions**
5. **Semantic Differential Questions**

Opened vs. Closed Questions

<table>
<thead>
<tr>
<th>Open-ended Questions</th>
<th>Closed-ended Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages:</strong></td>
<td><strong>Advantages:</strong></td>
</tr>
<tr>
<td>Freedom &amp; spontaneity of Answers.</td>
<td>Require little time.</td>
</tr>
<tr>
<td>Opportunity to probe.</td>
<td>No extended writing.</td>
</tr>
<tr>
<td>Useful for testing hypotheses about opinions &amp; ideas.</td>
<td>Low costs.</td>
</tr>
<tr>
<td></td>
<td>Easy to process.</td>
</tr>
<tr>
<td></td>
<td>Make comparisons easily.</td>
</tr>
<tr>
<td></td>
<td>Less interviewer training.</td>
</tr>
<tr>
<td><strong>Disadvantages:</strong></td>
<td><strong>Disadvantages:</strong></td>
</tr>
<tr>
<td>Time Consuming.</td>
<td>Loss of spontaneous responses.</td>
</tr>
<tr>
<td>Costly of interviewers time.</td>
<td>Bias in answer categories.</td>
</tr>
<tr>
<td>Coding: very costly and may be unreliable.</td>
<td>Sometimes vague.</td>
</tr>
<tr>
<td></td>
<td>May irritate respondents.</td>
</tr>
</tbody>
</table>
Types of Questions
(Factual vs. Non-Factual)

Factual questions deals essentially with FACTS. They might seem the easiest to design, since after all, they are questions to which there must be a “True” answer. However, experience shows that simple factual questions are often neither simple nor factual.

Non-Factual questions deal essentially with aspects of the state of mind of the respondent (opinions, awareness, and attitude questions). Therefore are more difficult to verify, and produce less reliable results.

Thus, it is often unwise to rely on single questions when dealing with Non-Factual questions.

The Build-up of Question Modules

Always bear in mind two sets of considerations: 1. Internal logic of inquiry; and 2. The likely reactions of respondents. Often, these will have conflicting requirements!

Piloting the questionnaire, however, may show us that the logic sequence is irritating to some respondents. Some respondents become very embarrassed by the “Knowledge” or “Awareness” questions at the beginning, because they feel it puts them “on the spot”.

Keep the Personal Questions’ Module till the end of the questionnaire.
Order of Questions within Modules

The Funnel Approach is a strategy of ordering questions in a questionnaire in which the sequence starts with the general questions, followed by progressively specific questions.

A “Filter Question” is used to exclude some respondents from a particular question sequence if those questions are irrelevant to them.

Always use the suggestions of the “Pilot Work”.

A simple way is to attain logical order is to prepare a flow chart for the logical possibilities and then develop branching questions and instructions based on it.

Wording of Questions

What’s wrong with the following question?

Do you approve or disapprove of people using Social Media

1. Yes
2. No

The answer categories (Yes or No) are not appropriate to the form of question. Approve/Disapprove might be better.

Fails to offer any kind of middle position, such as: “uncertain” OR “it depends”.

Does not have a “No” answer or “Not Applicable” to cater for people who have no experience with social media.

No question mark after “matches”.

The most serious deficiency: What is the Purpose of the Question?
Wording of Questions

Special Problems

- Use of Ambiguous Words
- Classification Questions
- Leading Questions
- Loaded Words

Special Wording Problems

1. Use of Ambiguous Words

In a typical month, how often do you shop in department stores?
- Never
- Occasionally
- Sometimes
- Often
- Regularly

In a typical month, how often do you shop in department stores?
- Less than Once
- 1 or 2 times
- 3 or 4 times
- More than 4 times

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2. Classification Questions

ARE special types of factual questions that asks about age, income, education, occupation, family size and so on.

Please specify in which of the following categories would you place your annual income:

- No income
- Less than 10,000 EGP
- 10,000 – 20,000 EGP
- 20,000 – 30,000 EGP
- 31,000 – 40,000 EGP

3. Leading Questions

Do you think Bahraini People should buy imported products when that would put Bahraini labour out of work?

- Yes
- No
- Don’t Know

Do you think Bahraini People should buy imported products?

- Yes
- No
- Don’t Know
### Wording of Questions

#### 4. Loaded Words

A “Loaded” word or phrase is one which is emotionally colored, and suggests an automatic feeling of approval or disapproval.

Here are some items from a questionnaire dealing with different aspects of "Job Choice":

- A job in which you do a lot of hard thinking. OR
- Where the pay is not very high, but you get pension when you retire.

- A job where, once you have learned it, you always know how to do it.
- Where pay is high, but you don’t get a pension when you retire.

Items are fairly balanced and respondents will express their preference without really reacting to such loaded words such as: “Routine Jobs”, “Creativity” Or “Security”.

---

#### Wording of Questions: Some Rules

- **Length**: Not more than twenty words. If longer is needed, break up into several shorter sentences. Always add “Introductory Sentences” before each section, and never forget the answering procedures on self-administered questionnaire.

- **Avoid Double-Barreled Questions**: “What is your evaluation of the price and convenience offered by BMW’s showroom?”. Would a positive answer refer to price, to convenience, or to both?

- **Avoid Double Negatives**: “Do you know if the deadline has expired yet?”. A negative answer might mean that the respondent does not know, or knows that the deadline has not yet expired. Always be Positive.

- **Don’t Know & Not Applicable**: In case of an opinion question such as “Do you think that the government is doing a good job?” a “Don’t Know” response makes good sense.

- **Use simple words, avoid Abbreviations & Technical Terms.**
Reliability & Validity of Questions

Validity is concerned with the factual (Concurrent Validity) here-and-now (Is the respondent telling you the truth?). But it might also be concerned with forecasting (Predictive Validity) (Will the respondent really consider buying this product?). I.e. tells

Reliability refers to the purity of a measure, i.e. to the probability of obtaining the same results again if the measure was to be duplicated.

Example: Clock:

It is possible to have a measure that is highly reliable yet of poor validity. If the measure has excellent validity, then it must also be reliable.

Reliability & Validity of Factual Questions

In this case, the respondent is used as “repository of facts”. An intermediary between the researcher and the required information.

To ascertain Reliability, you should plan to have a number of internal checks. Examples: (1) Introduction of non existent brand name or TV program, endorsement of such items would suggest guessing or carelessness on the part of the respondent. (2) Can you tell me if you have visited any of the following within the past two weeks? Followed by a question about frequency.

To ascertain Validity, a variety of technique, usually known as external checks, where a second, independent source of information is required.

In some cases, quality checks are made by highly trained group of senior interviewers, who can often track down a discrepancy.
Reliability & Validity of Non-Factual Questions

In this case, questions are more sensitive to changes in wording, context, emphasis, and so on. Thus, it is almost impossible to assess reliability by asking the same question in another form.

When measuring non-factual questions, we should have a set of questions (Attitude Scales). A set of questions are MORE RELIABLE than a single question.

By using SETS of questions, provided they all relate to the same attitude, we maximize the reliability by reducing the instability due to particular moderating factors such as: mood changes and so on.

Factor Analysis (Analytic Statistical Tool) can enable you to find out what are the main underlying dimensions of the SET of any Attribute/Variable. The chief difficulty in assessing the Validity of those questions is the lack of criteria.

Questionnaire Formatting Guidelines

Begin with an introduction which includes the questionnaire's purpose, who is conducting it, to what use the information will go, and confidentiality. In mailed questionnaires, use cover letter.

Make the first questions non-provoking and interesting. The beginning questions should not be open-ended or questions with a long list of answer choices.

Put the more important questions at the beginning.

Arrange the order of questions to achieve continuity and a natural flow.

Try to keep all questions on one subject together. Put the more general questions first, followed by a more specific question.

Place demographic questions (age, gender, race/ethnicity, etc.) at the end of the questionnaire.

Keep the whole question and its answers on the same page.

Pre-code items and response categories as much as possible, to help in data tabulation and analysis.

Use instructions for “self-Administered” Questionnaires.
Pre-testing the Questionnaire

This means a careful examination of the individual questions and the questionnaire as a whole. Unfortunately, too many people consider pilot testing as a superficial task they can avoid, but find later that the intended respondents did not understand well enough to deal with most questions.

- Is each question measuring what it is intended to measure?
- Are all the words understood?
- Are questions interpreted similarly by all respondents?
- Does each close-ended question have an answer that applies to each respondent?
- Does the questionnaire create a positive impression, one that motivates people to answer it?
- Are questions answered correctly? Are some missed?
- Does any part of the questionnaire suggest bias on the part of the researcher?

Piloting The Questionnaire

Questionnaires do not emerge suddenly, they have to be created, tested, adapted and developed to maturity before being used in a real field work.

Questionnaire have to be composed and tried out, improved and then tried out again, often several times until we become sure that they can do the assigned job.

This whole lengthy process of designing and trying out questions is usually referred to as: “Pilot Work”.

On whom should our questions be tried out? In principle, respondents in pilot work should be as similar as possible to those in the main enquiry, which means they should be a “Judgmental Sample” to test questions for relevance and sensitivity.

Can Experts help? This temptation should be firmly resisted, mainly because it is based on illusions.

What should be piloted? Every thing.
Approaches to Increase Response

- **Explanation of Selection:** Explaining sampling method. WHY ME?
- **Sponsorship:** Research organization pamphlet, Covering letter of introduction from someone expected to be influential.
- **Incentives:** Small may help, larger may not.
- **Confidentiality:** In the sense that only the researcher will have access to them. Steps must be taken to ensure that information will never be published about identifiable persons or organizations. Explicit statement or promise should be made.
- **Reminders:** May help in mail surveys.
- **Appearance:** Layout, face type, color, quality of papers.
- **Length:** Number of questions, time required.
- **Degree of Interest to Respondents:** It is the only motive to complete a long interview or questionnaire.
- **Rapport:** A personal skill that must be existing in the interviewer.
- **Return Envelops:** Will increase response rate for Postal Questionnaires.

Quantitative Vs. Qualitative Analysis

**Quantitative Data**
- Based on meanings derived from numbers.
- Collection results in numerical & standardized data.
- Analysis conducted through the use of diagrams & statistics.

**Qualitative Data**
- Based on meanings expressed through words.
- Collection results in non-standardized data requiring classification into categories.
- Analysis conducted through the use of conceptualization.
The Research Process

1. Broad Problem Or Area of Research Interest
2. Preliminary Investigation & Literature Review
3. Research Problem & Research Objective
4. Theoretical/Conceptual Framework
5. Research Questions & Hypotheses
6. Research Design & Sampling
7. Data Collection Analysis and Interpretation
8. Deduction (Hypotheses Substantiated, RQs Answered)
9. No
10. Yes

No

Yes

Thesis Writing

Prepare for Defense

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Thesis Structure

Chapter 1: Introduction
Includes, prob. def., objective, theoretical framework, questions, methodology,

Chapter 2: Literature Review
Where we stand, where we go and problem def, theories/models behind,..

Chapter 3: Theoretical Framework and Methodology
Road Map, development of data collection instrument like questionnaires

Chapter 4: Data Collection, Analysis, and Findings
In the finding you get back to the research questions, objectives

Chapter 5: Conclusion, Recommendations and Future Work

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Chapter 1: Introduction

- It must create reader interest in the topic.
- It must illustrate the significance of the study.
- It must place the study within the larger context of the literature.
- It must reach out to a specific audience.


Chapter 2: Literature Review

- It should include the relevant theories, models that have been used for similar cases or studies.
- It includes pointing out to the authors who worked in similar studies and mentioning their findings (the researcher is encouraged to put his/her input and opinion and justifications).
- Relevant Figures and tables from literatures can be used to facilitate explaining and writing.
- It is the reference for everything in the thesis. It is the database/information-base/knowledge-base/event-base, fact-based, Evidences-Based that you will rely on, in your design (chapter 3) and your arguments (chapter 4).
Chapter 3: Research Design & Methodology

- Chapter 3 is the Design and the Plan of the research. It has to be a reflection of what is written in chapter 2 (as outcomes).
- It is the Top-Down Design… Full of justifications…

Structure of Chapter 3:
3.1 Introduction
3.2 Problem Statement
3.3 Research Objective
3.4 Theoretical/Conceptual Framework
3.5 Research Questions and Hypotheses
3.6 Research Methodology (Type, Sampling, Data Collection, Analysis Techniques)

Chapter 4: Data Analysis, Findings & Discussions

Descriptive Analysis
It includes description of the collected data. Here, you can start with the reliability test for the data collection instrument (questionnaire) by reporting Cronbach alpha.

Then you start showing the relevant Histograms, Frequency tables (can also include Pie Chart, etc…) and you should comment on the results, but be careful, you are describing here the sample and not yet the population, so do not generalize yet the results.
Chapter 4: Data Analysis, Findings & Discussions, Cont.

Inferential Analysis (In Quantitative Paradigm)

This section is about Hypotheses testing. All $p$-values have to be mentioned and reported for each test. You should here comment and justify why you rejected or fail-to-rejected each particular hypothesis.

Do not be sad or disappointed that a lot of the hypotheses have been failed-to-reject. It can be because of the following options:

*The Questionnaire questions were not well designed, formulated or understood from the respondents, OR the Respondents were careless/not-serious in their answering the questions, OR the sample size (collected questionnaires) were not enough, OR, it is the reality.*

Chapter 4: Data Analysis, Findings & Discussions, Cont.

Inferential Analysis (In Qualitative Paradigm)

In this case (where no hypotheses testing) researcher has to rely mainly on his/her wording in the explanation. This starts by Categorization; which involves classifying your data into meaningful categories. Identification of these categories will be guided by the objective of your research. Two famous approaches lies here:

**Content Analysis**: is the manual coding of documents, transcripts, and other qualitative material, to obtain counts of words, and phrases, for purposes of identifying conceptual patterns.

**Thematic Analysis**: Thematic Analysis is the process of identifying themes or patterns in behavioural transcript.
Chapter 4: Data Analysis, Findings & Discussions, Cont.

Discussion of Findings

Here you have to link/compile all results with the objective to answer major and minor research questions. You have to refer to the literature in chapter 2 to support your findings.

Do not forget that this chapter is your own ground, i.e. you should use all your language and opinion in the interpretation of the results, of course with the support of the literature (it is about benchmarking your results with respect to the results and the finding from the other literatures) and the results that you got from your analysis of the data.

Chapter 5: Conclusion and Recommendations

Conclusion: Remind the reader with the problem and the objective, methodology, models/theories, sampling etc. Then you summarize the most important findings (from chapter 4).

Recommendations (Based on the findings)
2. Make sure that all recommendations HAVE to come from the research that has been done by you.
3. Be close to the tactic level, i.e. be away from the macro level
4. Be realistic in your recommendations

Future Work
Suggestions, new Ideas as a results from the research experience. Can come from the assumptions and limitations that are set in chapter 3.
Reference List

A list at the end of your thesis which includes all the information necessary to identify and retrieve each work (Journal Articles, Books, etc.). Most commonly used are: APA or Harvard System of Referencing.

For Journal Articles:

For Books:

Ethics in Research

✔ Data Gathering: Find it and tell it as is.

✔ Confidentiality: Offer and keep confidentiality or anonymity to participants in the research

✔ Informed Consent: Get agreement of the participation.

✔ Dignity: You are someone in authority!

✔ Publications: Need publications for career building.
Common Mistakes

➢ Don’t start with the Introduction Chapter.

➢ It’s never possible to cover all issues, otherwise you won’t finish…So, its highly appreciated to set limitations.

➢ Ideas become obvious to you, so you stop writing to a sufficient level of detail (especially first and last chapters).

➢ Avoiding feedback… Don’t do that… Always consult as you go.

➢ Do not think of your first draft as your last. Be prepared to rewrite your several times until you think it is the best you can do.

➢ Remember the three-step rule: tell them what you going to say, say it, then tell them what you've said.

What do Examiners Look for?

Review of Literature
✓ Is the literature relevant? Is it comprehensive?
✓ Is the review critical or just descriptive?
✓ Does it link to the methodology in the thesis?

Methodology
✓ Are variables defined clearly? Are the limitations identified?
✓ Is the methodology justified? Is the data collected appropriately?

Discussion of Findings and Deduction of Conclusions
✓ Have the hypotheses been tested? Is the data properly analyzed?
✓ Are the results presented clearly?
✓ Are patterns identified and summarized?
Wish You All the Best in Your Thesis Journey