

RESEARCH METHODS FOR DATA SCIENCE

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Step 5: Writing a research proposal



My Notes

~Contents of a research proposal

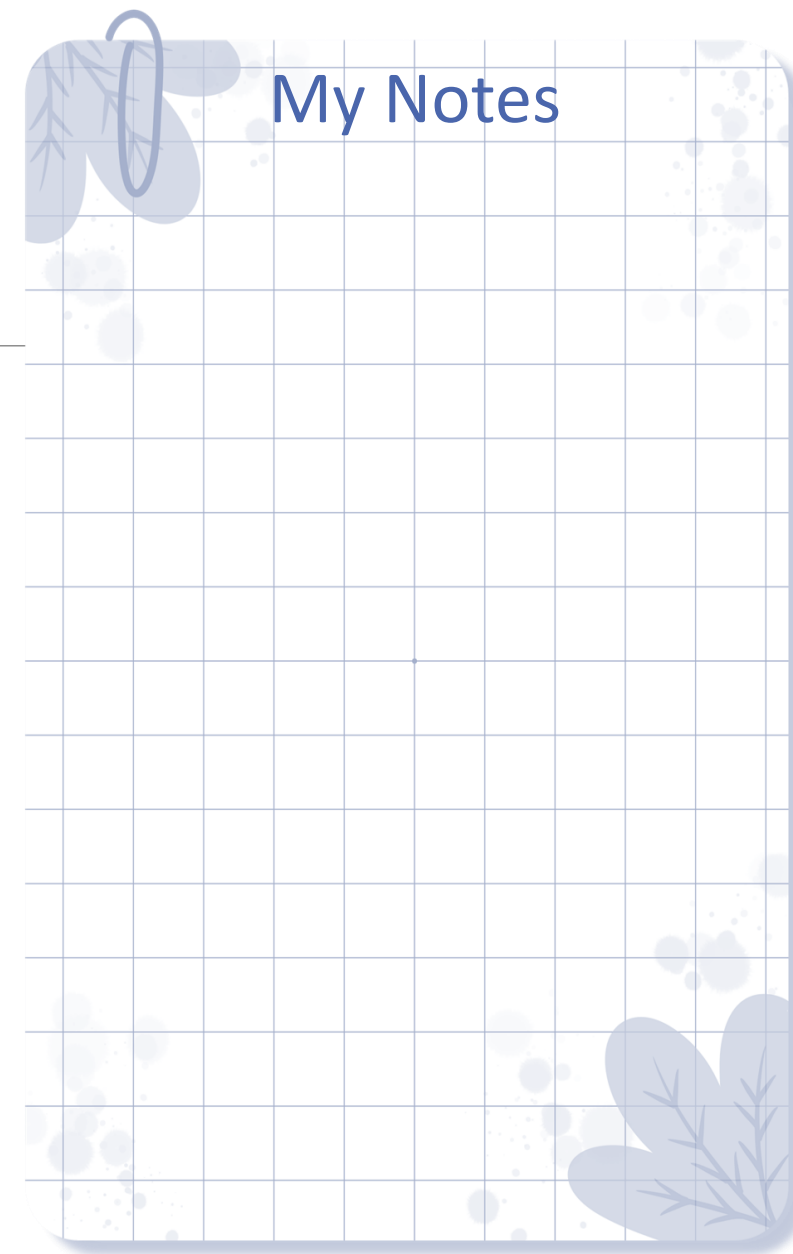
~Background/
Introduction

~Research
Problem

A Research Proposal

A research proposal describes **what** you will investigate, **why** it's important, and **how** you will do the research. The format of a research proposal varies between fields, but most proposals should contain at least these elements:

- Cover page
- Introduction
- Literature review
- Research design
- Reference list



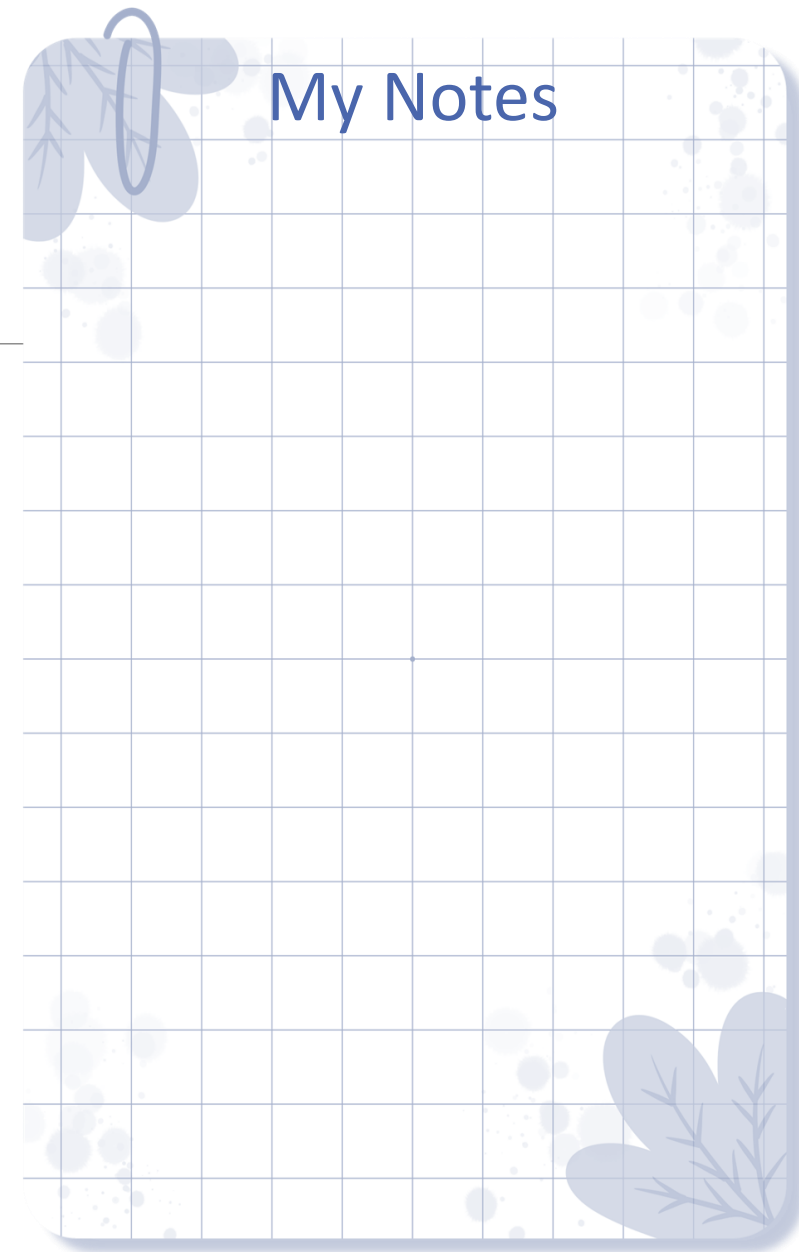
A Research Proposal

- It serves to remind you of what you are supposed to do at different steps of the research journey. It is the road map designed by you, and approved by your university, to guide you through your research journey. It is an overall plan designed to obtain answers to the research questions or problems that constitute your research project. It outlines the various tasks you plan to undertake to fulfil your research objectives, test hypotheses (if any) or obtain answers to your research questions. It should also state your reasons for undertaking the study. Broadly, a research proposal's main function is to detail the *operational plan for obtaining answers to your research questions*. In doing so it ensures and reassures the reader of the validity of the methodology for obtaining answers to your research questions accurately and objectively.
- It serves as a document for scientific scrutiny for others to judge the appropriateness of what you are proposing and provide their seal of approval. It serves to convince your research supervisor or a reviewer that your proposed methodology is meritorious, valid, appropriate and workable in terms of obtaining answers to your research questions or objective.

A Research Proposal

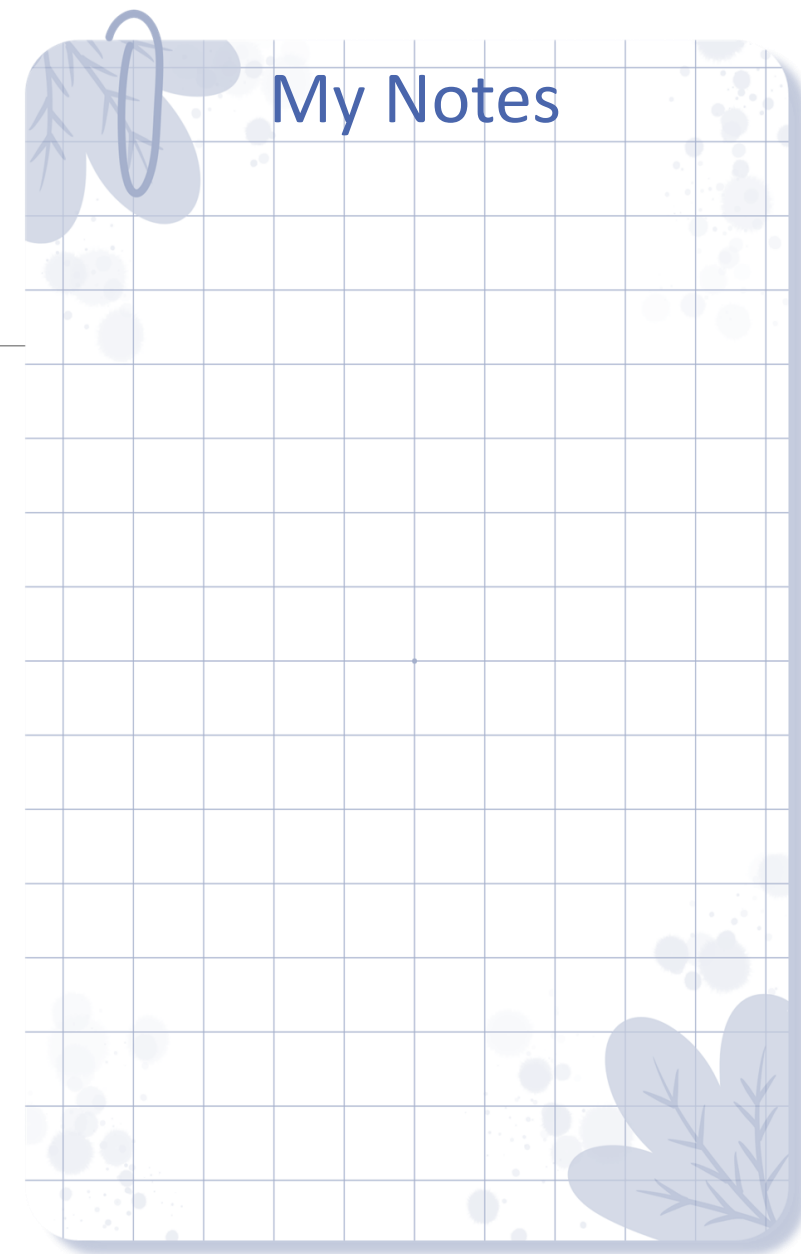
In order to achieve these functions, a research proposal must tell you, your research supervisor and reviewers:

- *what* you are proposing to do in your study;
- *how* you plan to find answers to *what* you are proposing;
- *why* you selected the proposed investigation strategies.



Detailed contents of a proposal

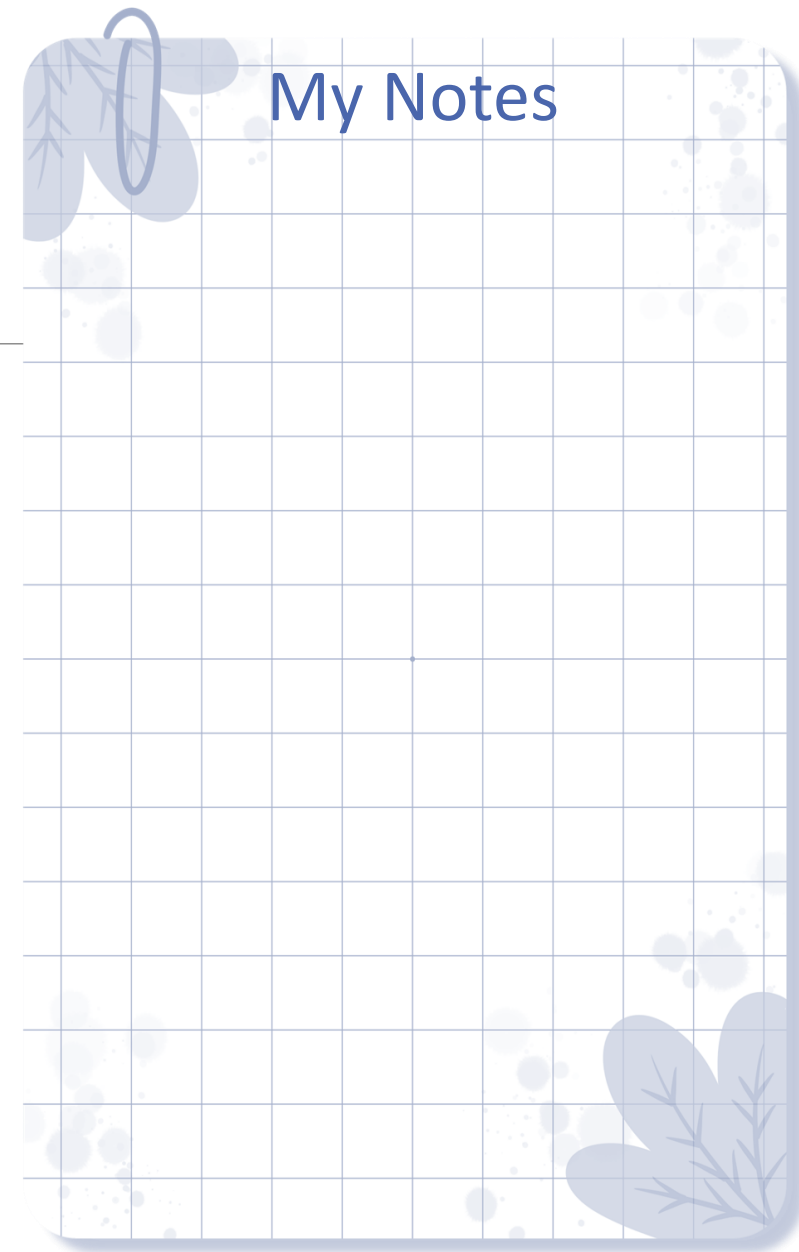
- an introduction, including a brief *literature review*;
- the *theoretical framework* that underpins your study;
- the *conceptual framework* that constitutes the basis of your study;
- the *objectives* or *research questions* of your study;
- the *hypotheses* to be tested, if applicable;
- the *study design* that you are proposing to adopt;
- the *setting* for your study;
- the *research instrument(s)* you are planning to use;
- the *sampling design* and *sample size*;
- the *ethical issues* involved and how you propose to deal with them;
- the *data processing procedures*;
- the *proposed chapters* of the report;
- the *problems* and *limitations* of the study;
- the proposed *time-frame* for the project.



Theoretical / Conceptual Framework

Your proposal should follow the suggested guidelines and be written in an academic style. It must contain appropriate references in the body of the text and a bibliography at the end. Your survey of the relevant literature should cover major publications on the topic. The **theoretical framework** for your study must emerge from this literature review and must have its grounding in empirical evidence. As a rule, the literature review includes:

- a **conceptual framework**, and theoretical and empirical information about the main issues under study;
- some of the major research findings relating to your topic, research questions raised in the literature and gaps identified by previous researchers.



Theoretical / Conceptual Framework

Theoretical framework: As you start reading the literature, you will soon discover that the problem you wish to investigate has its roots in a number of theories that have been developed from different perspectives. The information obtained from different sources needs to be sorted under the main themes and theories, highlighting agreements and disagreements among the authors. This process of structuring a 'network' of these theories that directly or indirectly have a bearing on your research topic is called the theoretical framework.

Conceptual framework: A conceptual framework stems from the theoretical framework and concentrates, usually, on one section of that theoretical framework which becomes the basis of your study. The latter consists of the theories or issues in which your study is embedded, whereas the former describes the aspects you selected from the theoretical framework to become the basis of your research enquiry. The conceptual framework is the basis of your research problem.



How to write the introduction?

My Notes

The proposal should start with an introduction to include some of the information listed below. Remember that some of the contents suggested in this section may not be relevant to certain studies, so use your discretion in selecting only what is pertinent to your study. In writing this section, the literature review (see Chapter 3 on reviewing the literature) is of central importance as it serves two main functions:

1. It acquaints you with the available literature in the area of your study, thereby broadening your knowledge base.
2. It provides you with information on the methods and procedures other people have used in similar situations and tells you what works and what does not.

The type, extent and quality of a literature review are mostly dependent upon the academic level for which you are writing the proposal. The contents of this section may also vary greatly according to the subject area under study.

How to write the introduction?

My Notes

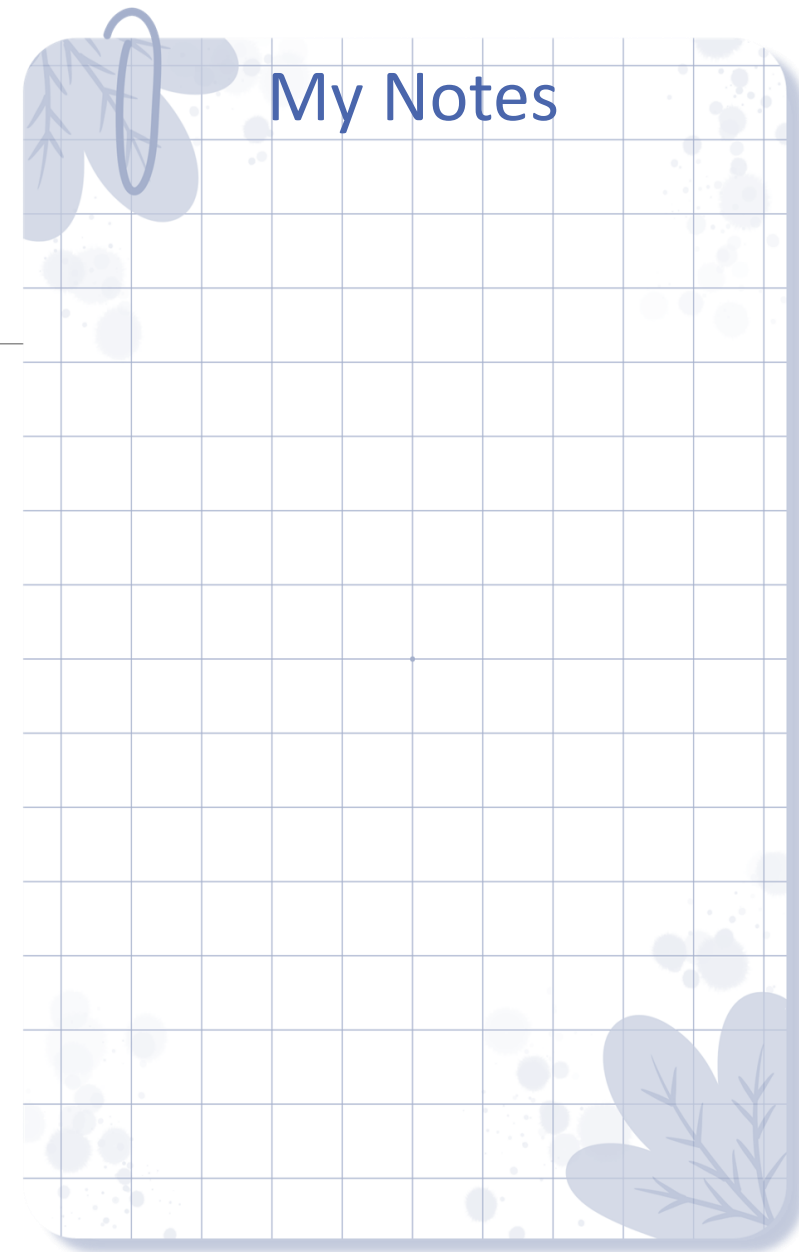
Start with a very broad perspective of the main subject area, before gradually narrowing the focus to the central problem under investigation. In doing so, cover the following aspects of your study area:

- an overview of the main area under study;
- a historical perspective (development, growth, etc.) pertinent to the study area;
- philosophical or ideological issues relating to the topic;
- trends in terms of prevalence, if appropriate;
- major theories, if any;
- the main issues, problems and advances in the subject area under study;
- important theoretical and practical issues relating to the central problem under study;
- the main findings relating to the core issue(s).

How to write the research problem?

Having provided a broad introduction to the area under study, now focus on issues relating to its central theme, identifying some of the gaps in the existing body of knowledge. Identify some of the main unanswered questions. Here some of the main research questions that you would like to answer through your study should also be raised, and a rationale and relevance for each should be provided. Knowledge gained from other studies and the literature about the issues you are proposing to investigate should be an integral part of this section. Specifically, this section should:

- identify the issues that are the basis of your study;
- specify the various aspects/perspectives on these issues;
- identify the main gaps in the existing body of knowledge;
- raise some of the main research questions that you want to answer through your study;
- identify what the literature says concerning your research questions, specifying the differences of opinion, if any, in the literature regarding these questions;
- develop a rationale for your study with particular reference to how your study will fill the identified gaps in the existing body of knowledge.



Objectives of the study

In this section include a statement of both your study's main objective and subobjectives (see Chapter 4). Your main objective indicates the central thrust of your study, whereas the subobjectives identify the specific issues you propose to examine.

The objectives of the study should be clearly stated and specific in nature. Each subobjective should delineate only one issue. Use action-oriented verbs such as 'to determine', 'to find out' and 'to ascertain' in formulating subobjectives, which should be numerically listed. If the objective is to test a hypothesis, you must follow the conventions of hypothesis formulation in wording the specific objectives.

Objectives of the study

Example C

Main objective:

- To examine the relationship between academic achievement and social environment.

Subobjectives:

- To find out the relationship, if any, between self-esteem and a student's academic achievement at school.
- To ascertain the association between parental involvement in a student's studies and his/her academic achievement at school.
- To examine the links between a student's peer group and academic achievement.
- To explore the relationship between academic achievement and the attitude of a student towards teachers.

Hypothesis to be tested

Hypotheses to be tested

A hypothesis is a statement of your assumptions about the prevalence of a phenomenon or about a relationship between two variables that you plan to test within the framework of the study (see Chapter 6). If you are going to test hypotheses, list them in this section. (Use the information developed in Exercise II in this section.)

When formulating a hypothesis you have an obligation to draw conclusions about it in the text of the report. Hypotheses have a particular style of formulation. You must be acquainted with the correct way of wording them. In a study you may have as many hypotheses as you want to test. However, it is *not* essential to have a hypothesis in order to undertake a study – you can conduct a perfectly satisfactory study without formulating a hypothesis.

Hypothesis to be tested

Example C

- H_1 = A student's self-esteem and academic achievement at school are positively correlated.
- H_2 = The greater the parental involvement in a student's studies, the higher the academic achievement.
- H_3 = A student's attitude towards teachers is positively correlated with his/her academic achievement in that subject.
- H_i = etc.

Ethical issues

All academic institutions are particular about any ethical implications of research. To deal with them, all institutions have some form of policy on ethics. You need to be acquainted with your institution's policy. It is imperative that in your proposal you identify any ethical issues and describe how you propose to deal with them. You need to look at the ethical issues particularly from the viewpoint of your respondents and, in case of any potential 'harm', psychological or otherwise, you need to detail the mechanism in place to deal with it.



My Notes

Problems and limitations

This section should list any problems you think you might encounter concerning, for example, the availability of data, securing permission from the agency/organisation to carry out the study, obtaining the sample, or any other aspect of the study.

You will not have unlimited resources and, as this may be primarily an academic exercise, you may have to do less than an ideal job. However, it is important to be aware of – and communicate – any limitations that could affect the validity of your conclusions and generalisations.

Here, the word *problems* refers to difficulties relating to logistical details; *limitations*, on the other hand, are structural problems relating to methodological aspects of the study – for example, if in your opinion the study design you proposed may not be the best but you adopted it for a number of considerations. This is also true for sampling or measurement procedures. Such limitations should be communicated to readers.

Budget

It is a good idea to have some estimate as to what the study is going to cost and ensure the availability of funds. Though most of the work that you will do is 'free', there are aspects of a study on which money will have to be spent. Think through and identify where you need to spend the money and how much. Where you need to spend, to a large extent, depends upon the type of study you are undertaking. The main difference in the cost is dependent upon two things: the method of data collection and the sample size. All other aspects of a study, irrespective of its design, would more or less entail similar expenses. Table 13.2 applies to most studies, but you can add others that are specific to yours.

My Notes

Appendix

Your proposal must include a list of references as an appendix. For a quantitative study, also attach your research instrument.



Watch this video: How to Write a Research Proposal



Watch this video: How To Write A Research Proposal For A Dissertation Or Thesis (With Examples) (41 min)





Done is better than perfect.

Sheryl Sandberg

“ quote fancy

@SalhaAlzahrani