Spring 2021

Technical and Business Writing
SS153

Technical and Business writing;SS153

FAST-NU (KARACHI CAMPUS)

Thank-You Letter after an Interview

Remember to obtain names, addresses, and phone numbers during your interview so that you can follow-up in writing.

After interviewing for a position, send a thank-you letter within 24 hours to the individuals who interviewed you. This courtesy may put you ahead of the competition. Make it businesslike and concise.

Include your name, mailing address, phone number, and e-mail address in the letterhead. Balance the content on the page. Include the date, followed by one or more blank lines, then the interviewer's name, company name, and mailing address.

In the first paragraph, thank the interviewer for the interview and clearly signify your interest in working for the company if the job is "right" for you. If the job is not for you, thank the interviewer and briefly indicate that the job does not fit your interests. Be careful making this decision, because you cannot professionally change your mind.

In the second paragraph, mention again your qualifications and include any positive qualities that you may have forgotten to mention at the interview.

Close the letter with a final thank you and express your interest in hearing from the interviewer and the company. Provide the interviewer with your phone number and e-mail address. If you prefer to have 32 more control of the communication, notify the interviewer/company of a specific time when you will follow your letter with a phone call.

Remember to make each thank-you letter a separate entity. Do not use form letters. Personalize the letter, so that the reader will get a positive feeling from the text. If you get a rejection, follow the above procedure. The positive value of your response may open up new doors to employment.

In cover letters, thank-you letters, and resumes, it is best to use the same kind and color of paper.

Send a similar thank-you letter to your employer after finalizing your plans for an internship, co-operative position, or full-time employment.

Follow-up Letter after an Initial Contact

Include your name, mailing address, phone number and e-mail address in the letterhead. Include the date, followed by one or more blank lines, then the recommended contact person's name, company name, and mailing address. Limit the content to one page and center it vertically.

Use "Dear" followed by Mr. or Ms. and then the recommended contact person's name as the salutation. If uncertain about the person's gender, use RE: followed by the subject of the correspondence instead of addressing the letter to a specific person, for example: "RE: Advertised Design Engineer Position in your Detroit Office."

In the opening paragraph, refer to the initial contact and express your appreciation for this contact. Mention what was discussed and what interested you. Be specific, giving examples that are professional and will make you distinctive. Use employer terminology and customize

the letter to fit the job description. Use action verbs, write clearly and concisely, and use the pronoun "I" selectively. Be honest and positive. Include your degree and graduation date or the date you are available for employment.

In the second paragraph, summarize your skills and strengths, especially those that piqued the interest of the company contact person. Give details of your conversation that are relevant to the company's needs. Remember that your resume is attached, so limit this paragraph to additional skills and accomplishments or those experiences that are unique to this position or the company. Descriptions of actions and experiences that demonstrate your skills are more effective than generalizations. For example, "Last semester I traveled to Costa Rica to study Food Safety. While I was there, I assisted an engineering professors with the installation of water treatment systems at schools and healthcare facilities in rural areas that did not have electricity."

Make the closing paragraph active by taking the initiative to contact the company. Indicate a date that you will follow-up. Remember, you have two contact names to follow-up with, your initial contact and the recipient of this letter.

Close the letter using "Sincerely," followed by four blank lines, and then your name. Sign the letter just above your printed name.

Type "c:' followed by your initial contact person's name. This signifies that this person has been sent a copy of this letter, so remember to do so.

Type the word "Enclosure" if you have enclosed your resume or other documents.

RESEARCH

Research can be defined as ***the search for knowledge***, or as any ***systematic investigation***, with ***an open mind***, to establish novel facts, solve new or existing problems, prove new ideas, or develop new theories.

Think of the word "research" as an acronym.

R
E
S
E
A
R
C
H

The Traditional Scientific Method:

The traditional scientific method consists of the following activities:

Observation of selected parts of nature------Explanation and Critical analysis of the findings------Formulation of hypothesis-------Verification through experimentation-------Fact/Knowledge generated.

Purposes of a Research:

Generally, the aim of a research is the advancement of human knowledge. Specifically, a formal research may have one of the following purposes:

1. To discover facts and ideas not previously known
2. To test existing theories and explanations for various issues and subjects
3. To achieve better and more complete understanding of something
4. To find causes behind specific occurrences and events
5. To discover new techniques and methods for things if existing one are not yielding satisfactory results
6. To improvise and redefine a product to increase sales, and many more……

Qualities of a Good Researcher:

- Curious
- Probing and a detective
- Critical thinker
- Creative
- Disciplined
- Hardworking and courageous
- Determined and strong-willed

- Intuitive
- Sincere and honest
- Risk taking

Importance of Research:

Research is the pumping heart of any field of study and inquiry. Crafts, techniques, technology, methodologies: everything becomes outdated and obsolete with the passage of time. The reason for this is man's thirst and passion for more information, knowledge, and improvisation; in short, research. Continuous researches and experimentations are realized as innovation and modernization. Therefore, societies lacking research culture simply fail to keep up with the pace of developed countries in the race of advancement and progress.

STEPS IN CONDUCTING A SYSTEMATIC SCIENTIFIC RESEARCH

STEP 1: SEARCHING FOR A PROBLEM TO INVESTIGATE:

In this context, the word 'Problem' means an issue, a question, a problem, a technique, a difficulty, etc which a researcher aims to study and investigate thoroughly.

Our earliest ancestors were intrigued by questions such as,

- What are the lights in the sky?
- What makes the grass grow?
- How deep is the sea?
- How far is the moon?

The basics of 'new' science are found in primitive people's ability to identify and articulate the unknowns of life and in their crude attempts to find solutions to such questions. Civilization grew as humans observed the phenomena of their world, recognized and isolated their problems, investigated them, and arrived at answers.

Therefore, a systematic scientific research begins with the recognition and selection of a problem to investigate. After selection, the problem needs to be stated in the form of a clear, guiding, and controlling statement or question. Dewey, a famous research expert, maintains that, "A problem well put is half solved".

The problem helps researchers decide what direction they must take, what is relevant and what is not, what methodology will work, etc. In this way, the problem guides them in reaching the correct answer to the question.
Here are some guidelines to help you select and define your problem:

1. Is the problem important or significant? Is the question worthwhile for the expenditure of time, energy, and funds involved? What is its societal relevance?
2. Can the problem be stated in question form? Finding the answer then becomes the objective of the study.
3. Can the problem be delimited and narrowed? Can boundaries be defined?
4. Are resources of information available and the state of the art practical?
5. Does it interest you?
6. Do you have the required background to undertake the inquiry under question?

There are three types of problems:

1. Problems of Fact: these problems seek answers to what the facts are. For example, 'Is the earth flat or round?'
2. Problems of Value: Problems of value are involved in setting up standards or criteria. Standards of safety, health efficiency, tolerance, economy, etc within a particular situation can be some examples.
3. Problems of Technique: Such problems concern the methods for accomplishing a desired result, like, 'How can a space station be launched in the mesosphere?'

Sometimes researches select a problem themselves, where as, mostly, they are hired or assigned the problem to investigate by some authority.

Hypothesis: A hypothesis is a tentative solution or answer to the problem. It is just a working guess. Scientists test their hypothesis by experiments. As a result of experiments, a hypothesis may be proved, disproved, revised, etc.

STEP 2: DETERMINING THE PURPOSE OF THE RESEARCH:

The problem can be stated as the issue which you want to investigate. On the other hand, the purpose is defined as the reason why the investigation is undertaken. It seeks to answer the following questions?

1. What is the purpose of this research?
2. Who needs the answers?
3. Who will use the answers?
4. What is the benefit of this research?
5. What is the limitation and scope of the research?

Write a specific purpose statement to avoid deviation from the research objective.

Study the example below:
Problem: What are the dietary needs of the elderly in nursing homes?
Purpose: To determine the dietary needs of the elderly in nursing homes so as to better satisfy and treat them.
Exercise: For the following research problems, try to generate specific purpose statements.

1. How can heat loss be prevented in a two-storey brick house?
2. How are writing skills taught in the secondary section of government schools?
3. Why did the coliseum roof collapse?
4. How can the overeating of non-vegetarian food affect a person's spirituality?
5. What are the factors behind the increasing criminal activities in Karachi?

STEP 3: GATHERING BACKROUND INFORMATION ON YOUR TOPIC:

With purpose and research problem narrowed and finalized, the next most important step is to gather all information that already exists on the subject under study. For this, refer only to established material. You will report this information in the chapter titled "Review of Literature" or "Background" in your report.

This step is very important because a researcher can not make a worthwhile contribution if s/he is completely ignorant of what is already known about the problem. A good literature study can sometimes even yield answers to a research question. Literature review is done to achieve two goals: to find already available information about the problem, and to acquire a good background in the area of research.

Literature on any subject can be found in libraries, digital libraries, automated data and information systems. Browse through the catalog of holdings in a library. Type of texts you will read would be

1. Standard Encyclopedia
2. Handbooks (Compact reference manuals containing the state-of-the-art data and information on particular subjects)
3. Standard Subject Textbooks
4. Periodicals (Read through the abstracts of researches)
5. Research reports, surveys, case studies, research papers, conference presentations
6. Established websites
7. Articles written by reliable writers in magazines, etc
8. Interviews of experts

While conducting literature search, take notes to record findings (material, facts, opinions, historical background, etc). Also, write the names of the books, journals, etc from where you are collecting information. Remember to write the title, author, page number, year of publication, and publication house. This is important to avoid plagiarism.

STEP 4: PREPARING A RESEARCH DESIGN:

Research design is the military plan of attack you make to conduct your research. It includes the following:

1. Information and data collection methodology/tools
2. A plan or procedure with tasks sequentially and logically arranged

A schedule of tasks with deadline Your research purpose, problem under study, resources, time allotted, and the report's word limit are the factors which will help you prepare a suitable research design. Let's study different data and information collection tools in detail.

a. OBSERVATION:

A common and traditional means for conducting research is through direct observation-a cornerstone of the scientific method. Observation is a serious and careful examination of object or issue under study. Follow the instructions below for a good observation to get the required data:

1. Select venue, and obtain permission from the owner.
2. Arrange access for an appropriate length of time.
3. Carry a notebook, camera, tape recorder with you.
4. Have a clear conception of the phenomena to be observed.
5. Try to ignore any preconceived notions or opinions you have in order to be objective and honest.
6. Record what you perceive. Also, describe in detail what you find.

b. EVALUATION/CRITICAL ANALYSIS:

Evaluation is systematic determination of merit, worth, and significance of something or someone using authentic criteria (a set of standards).

c. EXPERIMENTING:

In experiment, events are made to occur under known conditions. Follow the instructions below for conducting experiments if required in your research:

1. Work out the procedure of the experiment.
2. Make sure you are aware of any precautionary measures that are to be taken.
3. Get the apparatus, equipment, devices, and other things that you will require.
4. Conduct the experiment.
5. Jot down the findings

d. INTERVIEWS:

There are two types of research interviews:

1. *Structured Interview:* A structured interview (also known as a standardized interview or a researcher-administered survey) is a quantitative research method commonly employed in survey research. The aim of this approach is to ensure that each interview is presented with exactly the same questions in the same order. Structured interviews are a means of collecting data for a statistical survey. A structured interview also standardizes the order in which questions are asked of survey respondents, so the questions are always answered within the same context. It generates objective numerical data.
2. *Semi-Structured Interview:* A semi-structured interview is flexible, allowing new questions to be brought up during the interview as a result of what the interviewee says. The interviewer in a semi-structured interview generally has a framework of themes to be explored.

Here are some points to consider for a successful interview:

1. Select the right person(s). Find out his/her position/designation.
2. Make a definite appointment by telephone, letter, or email.
3. Now, prepare for the interview by formulating the right questions so that you get the desired information.
4. Tape the interview. If not possible, then take notes.
5. Arrive on time.
6. Do only as much talking as is necessary.
7. If the interviewee gets off the subject, be ready with a question that can get him/her back on track.

e. QUESTIONNAIRES:

Questionnaires require judicious handling. It should be designed to require as little time as possible for completion. Some guidelines for designing suitable questionnaires are:

1. First jot the questions you require.
2. Then phrase questions as short sentences. Avoid very lengthy questions.
3. Choose the write words to be clear and precise.
4. The first few questions should be easy so that you can secure cooperation of the participants.
5. One question should stimulate interest in the other.
6. Questions should be designed in such a way that a yes, no, one-word answer, ticking an option, etc would be enough to answer it.

For questions, whether used in an interview or a questionnaire, the following is important to understand. There are different type of questions:

1. ***Closed Questions:*** A closed question usually receives a single word or very short, factual answer. For example, "Are you thirsty?" The answer is "Yes" or "No"; "Where do you live?" The answer is generally the name of your town or your address. Closed questions are good for:
2. ***Open Questions:*** Open questions elicit longer answers. They usually begin with what, why, how. An open question asks the respondent for his or her knowledge, opinion or feelings. "Tell me" and "describe" can also be used in the same way as open questions. Here are some examples:

- What happened at the meeting?
- Why did he react that way?
- How was the party?
- Tell me what happened next.
- Describe the circumstances in more detail.

3. ***Funnel Questions:*** This technique involves starting with general questions, and then homing in on a point in each answer, and asking more and more detail at each level. It's often used by detectives taking a statement from a witness:

   "How many people were involved in the fight?"
   "*About ten*."
   "Were they kids or adults?"
   "*Mostly kids.*"
   "What sort of ages were they?"
   "*About fourteen or fifteen.*"
   "Were any of them wearing anything distinctive?"
   "*Yes, several of them had red baseball caps on*."

4. ***Leading Questions:*** Leading questions try to lead the respondent to your way of thinking. They can do this in several ways:

- With an assumption: "How late do you think that the project will deliver?". This assumes that the project will certainly not be completed on time.

Leading questions are good for:

- Getting the answer you want but leaving the other person feeling that they have had a choice.
- Closing a sale: "If that answers all of your questions, shall we agree a price?"

STEP 5: SYSTEMATIZING, ANALYSING, AND INTERPRETING THE DATA:

The data you have obtained from your investigation now needs to be systematized, organized, and interpreted to find answers to your research problem.

How to Systematize Your Data: Arrange and organize your data by grouping it into different parts. Each part will bear information to a particular element or aspect of your problem. Give headings to each part of the data, and sub-headings if required.

How to Analyze and Interpret Your Data: Analysis and Interpretation will require you to use a range of critical thinking skills like:

1. Examining
2. Analyzing
3. Conceptualizing
4. Defining
5. Inferring
6. Understanding facts, opinions, assumptions, etc
7. Evaluating

Study each part of the data stepwise and record your findings. By this time you will have found the answer to your research problem. Now it's time to report your findings to the world. So we move to the next step which is as challenging as the research itself.

STEP 6: WRITE A REPORT TO SHARE THE RESULTS WITH THE WORLD:

The next chapter discusses report writing in great detail.

THE WRITING OF A PROPOSAL

Proposals will either be accepted or rejected. Obviously, you want your proposal to be accepted. To help make this possible, follow the six steps listed below.

1. ***Your proposal should define the problem and state how you plan to solve the problem.*** Your proposal should assure your readers that you can solve the problem effectively. Everything in the proposal should revolve around the problem and an effective way to solve it.
2. ***Do not assume that your readers will believe your solution is the best.*** The purpose of your proposal is to convince your readers that your solution is the best. You should not be over confident that they will approve of your solution. Do your best to look at the proposal and solution from the reader's point of view.
3. ***Your proposal should be researched thoroughly.*** If possible, you should provide readers with examples and facts. These items usually make your proposal more meaningful and convincing. Try to keep your opinions out of the proposal. Opinions are not facts, and most readers will not support them. The best advice is to research other articles and proposals on your topic. You can always include this information in your own proposal.
4. ***Your proposal should prove that your solution works.*** Make sure that your solution is possible. You should include an analysis of your plan and possible results of your solution. Try a pre-test of your solution to see if it works. You may need to revise your solution before submitting your proposal.
5. ***Your proposal should be financially feasible.*** Think about the finances of the company or person to whom you are writing the proposal. Make sure that they can afford the

solution you are proposing. Make sure to explain why your solution would be worth their time and money.

6. ***Your finished proposal should look attractive.*** The finished proposal should be as perfect as you can get it. This includes the overall appearance of the proposal and the content inside the proposal.

Project Name

Proposal, Technical Project
Plan X
to be presented on *[presentation date]*

[Student Name]

[Client name]

[Contact address]
[Contact phone]
[Contact email]

Option: XXXXXXXXXXXXXX

Advisor: XXXXX

TABLE OF CONTENTS

1. INTRODUCTION

[Immediately indicate whether a Plan A or Plan B technical project is to be pursued.]

Summarize briefly the problem, project objective, and expected benefits of the technical proposal.

In your summary statement, indicate why the work requires 6-credits of effort, if a Plan A is pursued.]

1.1 PROBLEM STATEMENT

Element	Description
The problem of ...	Describe the problem
Affects ...	Identify stakeholders affected by the problem
And results in ...	Describe the impact of this problem on stakeholders and business activity
Benefits of a solution ...	Indicate the proposed solution and list a few key benefits

1.2 BACKGROUND

[Describe the background information about the project, including the description of the current solutions and the problems you have discovered.]

1.3 NEEDS STATEMENT

[State short-comings apparent in current organization or system to be addressed by the project.]

1.4 OBJECTIVE

[Identify changes desired to be seen upon completion of effort.]

2. PROPOSED TECHNICAL APPROACH

[Define clearly a well thought-out and solid technical plan for applying information technology to the proposed project. This section should include a description of the methodology to be used to complete the project, a specific plan for gathering requirements, an architecture design, best practice for implementation, and quality assurance.]

2.1 REQUIREMENTS

[Present the requirements as understood at this time through contacts with the stakeholder. Include a high-level diagram such as a use case system diagram or block diagram to capture the situation being addressed.]

2.2 ARCHITECTURE DESIGN

[Explain the technology to be used in the project. Describe hardware, software, or network components as relevant and as understood at this time. Draw a high-level architecture diagram to illustrate the proposed system components and the relationships between them.]

[OPTIONAL CONTENT: Include an as-is system or block diagram.]

2.3 IMPLEMENTATION DESIGN

[Describe your methodology for implementation.]

[OPTIONAL CONTENT: Include a best-practice approach to be followed.]

2.4 QUALITY ASSURANCE PLAN

[Describe the potential risks related to the software quality. Provide the project management plan to enable quality. Describe the salient, planned testing considerations.]

[OPTIONAL CONTENT: Include any analysis plan for usability and acceptance testing.]

3. EXPECTED PROJECT RESULTS

[List deliverables expected to be produced for the project, for the CIS Department, and for the stakeholder.]

[OPTIONAL CONTENT: Identification of any currently operational aspects of the project and how the behavior would change.]

[OPTIONAL CONTENT: Itemize expected, measurable results of the effort.]

3.1 MEASURES OF SUCCESS

[Describe an assessment plan to identify the degree of achievement obtained by the operation of the project. List a measure, its relevancy to the organization, its current value, and its projected improved value. A measure should also correspond to the stated objectives of the project.

4. Schedule

[attach schedule]

Sample Technical Proposal

Date: July 4, 2017
To: Sheils Campbell, Computer Resource Project Leader
From: Mary Silvers, VITR Project Manager
Re: Proposal to upgrade CAD computer systems

Summary

As you know, H.J.R. has just won the contract from Emory Bros. Inc. to provide them with detailed drawings that graphically display all the machinery that produces titanium in their plant. This contract is very important for the future health of our company as you are aware. In order to provide a quality end product, our department will need to upgrade its nine computers immediately.

Our current computers are running AutoCAD Rel.12, but we must upgrade to Rel.16 which Emory Bros. is supplying to our staff. Our computers do not have sufficient memory or speed to accommodate this new AutoCAD version. The new AutoCAD software requires 21 inch monitors so that our designers can see the detail that the software generates.

Our computer technician, Sharon Jones, has explored the various computer options and has chosen the Val-U-Mate computers as the most cost effective and reliable for meeting the contract requirements. We propose that our company immediately purchase nine of these computer systems for our staff.

Description

Technical Information

To meet the requirements of the contract, H.J.R. will need new computer systems that still keep costs in the budget.

Computer Specifications: The new computers that will run the AutoCAD Rel.16 have a minimum of:

- Pentium III processor
- 20 Gigabite Hard drive

- 128 MB SDRAM
- 8XMax DVD ROM Drive

Monitor Specifications: The AutoCAD requires monitor that:

- Measure 21inchs
- Are compatible with a 32MB AGP Graphics Card.

After carefully researching the many computers that fit our specifications and budget. We found that the Val-U-Mates were superior in all categories.

Computer Committee

Sharon Jones, H.J.R. network supervisor, was the head of the selection committee. The other members of the selection committee were Bob Anderson, lead design engineer, and Andy White, project supervisor. All three members have been company employee for at least last eight years.

Schedule

Obviously, we need the before we can begin any computer work on the contract. Val-U-Mate has promised us next-day-delivery as soon as they get the order. Because we have a few preliminary details to take care of before we are ready to start the project, we can wait a week before we need the computers. Emory Bros., Inc., had already delivered AutoCAD Rel.16 to our office. Ous schedule follows:

Event	**Date Needed**
Purchase computers	Mon. , July 17
Deliver computers	Wed. , July26
Assemble computers	Thurs., July 27
Load and test software	Fri., July 28
Begin contract work	Mon., July 31

Cost

A chart detailing each computer, the technical details, and cost is included in the Appendix. A summary follows:

Item	**Cost**	**Number Needed**	**Total Cost**
Computers	$2399	9	$21591
Monitor	$420	9	$3780
Zip Disk	$6	200	$1200
Total Cost			$26571

Conclusion

We are very excited about the new contract with Emory Bros., Inc. This opportunity to apply our design skill and drafting expertise to a challenging project is very exciting. Delivering our final drawings to Emory will open the door to future work of this kind not only from their company but also from other companies who are looking for similar products. With our upgraded hardware, we look forward to aggressively bidding on other RFPs. We are proud that our department is able to contribute substantially to the continued financial health to H.J.R.

PROPOSAL REVISION EXERCISE

The following short proposal consists of 266 words and 9 sentences of an average length of 29 words. 55% of the sentences are in passive voice. Revise the proposal - making it easier to read - by considering the following criteria:

- Subheadings help organize a document and make it more accessible to the reader;
- Shorter sentences and active voice are easier to read;
- Sentences are easier to understand when the subject and verb come early;
- Strings of prepositional phrases are difficult to understand;
- Ambiguous words and phrases require clarification;
- Redundant pairs of words and excessive modifiers can be eliminated.

This request to the United States Geological Survey is in reference to the $15,000 allocated by the Office of Coal Management to the Ames District for the use in hydrologic assistance. At this time and stage of access and interpretation of existing data on record in the form of computer storage and publications in print that we many not be aware of is our main concern. Due to the U.S. Geological Survey having vast storage of and access to this data we would like to suggest the available funds be used in the following two areas if possible.

The first area may be handled by the Geological Survey district office in Wilson due to the accessibility and central locale to all literature and data sources. By compiling this data a comprehensive interpretation of surface water, i.e., quantity, quality, salinity etc. for site specific coal leases can be provided to the Ames District hydrologist. Thus, due to time constraints, time may be spent on analyzing these interpretations and conducting on-site calculations.

Secondly, another area we foresee as a positive and very useful endeavor is the expertise that can be provided by the Water Resource Division of the Geological Survey in Mountainview. Because the sub-district office and the White River Resource Area office are both located in Mountainview, we may obtain their help in the form of infrequent consultations, informal review of tract analysis and field reconnaissance on a one time basis of any lease area lacking available hydrologic data.

The foregoing should provide adequate justification for requesting the U.S. Geological Survey's assistance.

WRITING TECHNICAL REPORTS:
A Reconstruction of an Investigation

A technical report is a document that describes the process, progress, or results of technical or scientific research or the state of a technical or scientific research problem.

A report is written to communicate factual and objective information obtained after a careful scientific research or scrutiny. It is usually written for a well-defined audience. The audiences require this document for an important well-defined purpose.

Importance of a Report:

- Reports are written for specific individuals because these individuals need the information for future actions.
- Reports add to the body of knowledge by conveying important opinions and findings which then serve as a basis for further progress and advancement.

Types of Reports (Functional):

1. **INFORMATIONAL REPORT:** An informational report provides information about a specific topic. It does not offer criticism, evaluation, or recommendations. It would discuss past and present information on a topic. For example, news reports, weekly or monthly or annual reports on sales, production, or progress, etc.
2. **ANALYTICAL OR EVALUATIVE REPORT:** This type of report contains an analysis and evaluation of findings along with the presentation of facts. It may contain conclusion, recommendation, opinions, etc as well.

Types of Reports (General):

1. **Research Report:** It communicates the results and the procedure of scientific investigation.
2. **Feasibility Report:** It tells whether a project is feasible-that is, whether it is practical or financially and technologically possible.
3. **Recommendation Report:** It studies a problem or opportunity and then makes a recommendation. It may compare two or more alternatives and recommend one.
4. **Laboratory Report:** It documents laboratory procedures and their results.
5. **Periodic, Progress, and Trip Report:** It communicates progress on projects and events to those concerned with their completion and success. Readers review, and may revise, scheduled courses of action as a result of information included in these reports.
6. **Personnel Evaluation Report:** It reviews the performance of employees.

Elements/Components of a Report with a Standard Organizational Pattern:

COVER MATERIALS:

- Cover and title page
- Cover letter or memo (optional)
- Invoice (optional)
- Letter of Transmittal
- Abstract
- Acknowledgements

- Executive Summary
- Table of contents
- List of figures or illustrations
- List of tables

BEGINNING OF THE REPORT:

- Introduction:
    - The purpose of the investigation
    - The research problem (its nature)
    - Significance of investigating the problem
    - Scope or limitation of the research
    - A list of personnel engaged in the research with a brief sketch of their background and duties (optional)
    - Organization of the report
- Historical Background (Review of Literature):
    - Background information on the problem
    - Known facts, opinions are discussed
    - Nomenclature, definitions are given for new or unusual terms or those having a specialized meaning
    - A list of symbols, acronyms, and abbreviations

In small scale research reports, all the items above are written in a single chapter with clear defining headings. However, in large scale research reports, 'Introduction' and 'Historical Background' are written as two separate chapters as there would be a lot of information and details to convey.

BODY OF THE REPORT:

- Discussion of research methodology (for a small scale research, this would be very brief)
- Analysis of data, results, findings, Discussion of results

ENDING OF THE REPORT:

- Conclusions
- Recommendations and alternatives (optional)
- References
- Bibliography
- Appendix
    - Raw data (Questionnaires, interview questions, checklists)
    - Notes taken during observations
    - Rough results of experiments
    - Tables or charts, photographs, etc

How to Write the Elements of the Report:

COVER & TITLE PAGE:

The title page must have the following features:

1. Neat and organized
2. Clearly indicates the subject title in the upper half of the page
3. The title of the report should specifically identify both the report's function and subject
4. The person or organization writing the report and the person or organization receiving the report, the date of submittal appear in the lower half of the page

Look at the example below:

FEASIBILITY STUDY OF OFFICE EXPANSION
FOR UNITED COMPUTER TECHNOLOGIES, INC.

Prepared for
Joanne R. Galloway
Senior Vice President
United Computer Technologies, Inc

By
William D. Santiago
Senior Partner
PRT Management Consultants, Inc.

March 3, 2021

EXERCISE: Design a title page using the information given below:

1. Geologic Report on The Physiographical Development of the Colorado Piedmont Area
2. By Maurice De Valliere, Geology Student
3. Submitted to Dr. Herman M. Weisman, Professor of Technical Journalism, Colorado Polytechnic University, Fort Collins, CO 80521
4. November 30, 2020

LETTER OR TRANSMITTAL:

The letter of transmittal is addressed to the official who authorized the report and is signed by the official authorized to produce the report. It is the official acknowledgement of completion of the report and includes a statement of its transmittal. It contains the following information:

1. The title and subject of the report
2. Can include a very brief summary
3. It can acknowledge those who assisted in preparing the report
4. It has a formal tone.

Study the sample letter of transmittal below and try to write one for your own project.

December 9, 1982

David McMurrey, Chairman
Coastal Real-Estate Developers
400 Baywater Blvd.
Corpus Christi, Texas

Dear Mr. McMurrey:

As agreed in our September 21 contract, we are submitting the attached report entitled *The Effects of Increased Atmospheric Carbon Dioxide*.
This report examines the problem of CO_2 accumulation in the earth's atmosphere. The climatic changes caused by excessive CO_2 concentrations in the atmosphere, and the implications of these changes, will be discussed. Also discussed are the mechanisms of the greenhouse effect, the sources of atmospheric carbon dioxide, and some possible remedies to the problem.

I hope you find this report satisfactory.

Sincerely yours,

William R. Waters, President
Environmental Research Associates, Inc.
1212 Trace Dr., Suite 3
Austin, Texas 78741

WRW:mb
Enclosures

ABSTRACT:

An abstract tells the potential reader the contents of the report. An abstract gives the gist of essentials of the investigation or the contents of the report. It may explain the problem and how it was studied. It gives enough description that would be sufficient for the reader to determine whether the report pertains to their interest or not. It has a standard word limit from 100-250 words depending on the size of the report.
Study the example below:

Abstract

This report investigates the current state of scanner technology and examines the predicted future advancements of scanners. A brief history of the scanner and its operation is initially outlined. The discussion then focuses on the advantages and limitations of the five main types of scanners in common use today: drum, flatbed, sheet-fed, slide, and hand held scanners. The performance of these scanners is examined in relation to four main criteria: resolution, bit-depth, dynamic range and software. It is concluded that further technological advances in these four areas as well as the deployment of new sensor technology will continue to improve the quality of scanned images. It is also suggested that specialized scanners will increasingly be incorporated into other types of technology such as digital cameras.

EXERCISE: Read the abstract below and answer the questions that follow.

ABSTRACT

Software Quality Assurance (SQA) is a group of related activities employed throughout the software life cycle to positively influence and quantify the quality of the delivered software.

This report provides an overview of SQA, outlining process and product assurance and the methods and technologies typically employed to accomplish them. These methods include audits, assessment activities (e.g., ISO 9000), analysis functions such as reliability prediction, and embedded defect detection methods such as formal inspection. The overview is intended to help the reader identify specific SQA activities for more in-depth study.

This report also describes several representative publications on the subject of software quality assurance, assessment standards, and inspection to help the reader find a reliable source for further research. It concludes with an annotated bibliography of public-domain papers on the subject of SQA.

1. What is the purpose of the report?
2. What are limitations of this report?
3. Write a clear title for this report?
4. How does this study benefit society?
5. Who might be the target readers of this report?

Read the following abstract and identify background, method, findings, and conclusion. Note the verb tenses in each section:

Proteomics-based approaches complement the genome initiatives and may be the next step in attempts to understand the biology of cancer. We used matrix-assisted laser desorption/ionisation mass spectrometry directly from 1mm regions of single frozen tissue sections for profiling of protein expression from surgically resected tissues to classify lung tumours. Proteomic spectra were obtained and aligned from 79 lung tumours and 14 normal lung tissues. We built a class-prediction model with the proteomic patterns in a training cohort of 42 lung tumours and eight normal lung samples, and assessed their statistical significance. We then applied this model to a blinded test cohort, including 37 lung tumours and six normal lung samples, to estimate the misclassification rate. We obtained more than 1600 protein peaks from histologically selected 1mm diameter regions of single froze sections from each tissue. Class-prediction models based on differentially expressed peaks enabled us to perfectly classify nodal involvement with 85% accuracy in the training cohort. This model nearly perfectly classified samples in the independent blinded test cohort. We also obtained a proteomic pattern comprised of 15 distinct mass spectrometry peaks that distinguished between patients with resected non-small-cell lung cancer who had poor prognosis (median survival 6 months, n=25) and those who had good prognosis (median survival 33 months, n=4, $p<0.0001$). Proteomic patterns obtained directly from small amounts of fresh frozen lung-tumour tissue could be used to accurately classify and predict histological groups as well as nodal involvement and survival in resected non-small-cell lung cancer.

Yanangisawa, K. et al. Proteomic patterns of tumour subsets in non-small-cell lung cancer. Lancet 2003; 362: 433.

Read the following abstracts of the reports, and revise them if they require improvement:

1. The risk taking tendency of entrepreneurs of new and old ventures has been objectively obtained using questionnaire and personally administered interviews. Relevant research from a number of business personalities is summarized. The model is intended to be a preliminary concept of risk taking in business. The findings suggest that risk taking has been profitable for entrepreneurs. The research can be modified by adding strategic risk management techniques and decision making.
2. In most of developing countries such as Pakistan electioneering process normally yields unjust results such as double registration, votes by ineligible voters etc. Whereas, electronic voting like, Biometric system of voting in elections is more reliable and efficient at the present era, this has been proved by the approval of this system in KPK region of Pakistan for upcoming provincial elections, although there are certain limitations to biometric systems like some of the genuine registered voters are not recognized, eligible voters are disfranchised due to software bugs, some citizens that are physically challenged with no fingers are also denied to vote because the system used for the registration made use of fingerprints only. This paper will confer comparison between old-fashioned (Polling System) and modern (e-voting) systems of voting. The paper proposes some technologies to eradicate the problem of eligible registered voters disfranchised by the biometric system like a multi scan system that

allows citizens to use other body parts instead of fingerprints alone. The proposed system for general elections will create room for full participation of all eligible voters, eliminate multiple voting and also increase the confidence of the people in Pakistan in the electioneering process. Till now we have establish that e-voting like Biometric system is far better and advantageous than polling system in yielding transparent results despite of its limitations but there are ongoing projects to overcome these limitations. In this context we will collect research information mainly by using convenience sampling technique and surveying some particular people of Pakistan and will also take some interviews of NADRA or other government officials.

3. Information Technology (IT) has revolutionized the entire world, doesn't matter of which field you are talking about, it has grabbed each and everyone's attention to it. From dawn to dusk we are surrounded by multiple application of IT. This study was designed to serve as comprehensive development report on the future of IT in Pakistan. In this context, the study aims to give small attention to important changes that occurred in IT since independence and a lot to what is expected in next 10 years from Pakistan, especially in terms of usage. IT is concerned with the improvements in a variety of human and organizational problem-solving endeavors through the design, development, and use of technologically based systems and processes that enhance the efficiency and effectiveness of information in a variety of strategic, tactical, and operational situations. We have surveyed many individuals related to IT which includes users, IT professionals, IT teachers, and IT students to collect the data using convenient sampling. The study is a qualitative and quantitative analysis based on information taken from both secondary and primary information. The discussion concentrates on structure, access, quality, and future prospects of information technology in Pakistan. Statistical analysis of this study predicts that in next 10 years Pakistan is going to be one of the most promising centers of IT in the world and will be valued more than now.

4. Online shopping is slowly becoming a social norm all along the world. With the ease of just a few simple clicks involving a simple process of selection and transaction, one can easily purchase virtually anything he would want. Online shopping has expanded in recent to items such as machinery, home accessories, work equipment and even groceries. Especially in Karachi, one of the largest cities of the world as well as one of the fastest growing, online shopping is quickly growing in popularity. There are still some reasons due to which people hesitate from online buying. The attitudes of the people towards buying online are different. Some refuse to use it as they are simply unaware of the features available to them. Some prefer not to as they are doubtful when it comes to online consumer privacy and security. This study will focus on these reasons and which things they are dependent on. The statement of the problem is that whether people today prefer shopping online or would rather shop in the more traditional and conventional method of going to the store themselves. There is very limited knowledge about online consumer behavior because it is a complicated socio-technical phenomenon and involves too many factors but our methodology will focus on the most important and vital variables which will prove an accurate result to prove our hypothesis. Focusing on a variable amount of locations which will mimic the ratio

of types of population within the city, an estimated sample size of 400 people covering an age demographic of young adults to elderly people, we plan on collecting information using online forms and spreading questionnaires.

5. We conducted a statistical Survey on
   "Contradictions in social and religious believes in Pakistan"
   in order to determine the existing state of mind or in more layman terms the "thinking/mentality" of the different oriented societies existing in Pakistan and hence reaching to a more realistic observation. To do so we distributed and urged people with distinguishing mindset to go through the survey and fill them out. We reached our own universities colleagues as well as collected surveys from notable institutions so that we can attain a result that has no chance of being bias. We distributed and collected the surveys from wide range of people from being a student ,to being a normal citizen. From being a conservative to being a liberal and most of all the Contradictive. We also conducted online surveys to extend our research further and also to get data from the supposed educated and modern people. Distinguishing people from their thoughts is the best way to filter out the existing approach and frame of mind of the society. Hence we adopted this same procedure by dividing people by their Thoughts and then entering the data of the surveys in Statistical Software to reach to a conclusion. We compiled all our data in SPSS and did all the mathematics to reach to a conclusion. The result is then determined by comparing the actual data with the standard set at the beginning by ourselves to conclude if Contradiction exists or not. If the results are inclined towards either Conservative or liberal Standards then we conclude that there is no Contradiction in the society.
6. The intense power crisis has an overall adverse effect on the development and progress of any country. The purpose of this paper is to determine the REAL and actual reasons for the power crisis in Karachi; the reasons, NOT those which are commonly known by the people through common unreliable sources, but the reasons which are actually the cause of power crisis in Karachi, the production level and industrial level reasons which are the real major cause of the crisis. Hypothetically this research revealed that the factor of insolvability of power crisis comes not under the authorities of the power generation or distribution plants, but it is majorly a result of mismanagement and lack of governance. The data collected is majorly on exploratory basis from personal investigation of technical personnel related to the power sector. The findings revealed expected results; the Karachi Electric is capable of producing enough power for the whole of Karachi but they are being given a limited amount of resources, like gas or oil. According to 70-80 percent of technical people related to power sector, the crisis is majorly due to a mere mismanagement and lack of governance at the upper hand. Along with the alternate sources, Pakistan should rely on some permanent and long lasting sources of power production such as nuclear power. Despite of its heavy investment, nuclear power is cheaper once installed and repays the investment in a very short period of time.

EXECUTIVE SUMMARY:

Executive summaries are written for busy administrators and decision makers who will not have the time to read the entire report. Also, executive summary is written to save a person from reading a report on issues or subjects in which s/he lacks the required background. Guidelines for writing a good ES are:

1. Read the entire report to grasp its full content.
2. Your summary should be one-quarter of the original text.
3. Write persuasively to motivate readers to read the report.
4. Discuss your research problem, the purpose of the study, the methodology used, the findings and results. Also, make recommendations if required.
5. Use headings to facilitate reading.
6. Be simple and formal.

Study the example ES below:

Executive Summary This report provides an analysis and evaluation of the current and prospective profitability, liquidity and financial stability of Outdoor Equipment Ltd. Methods of analysis include trend, horizontal and vertical analyses as well as ratios such as Debt, Current and Quick ratios. Other calculations include rates of return on Shareholders Equity and Total Assets and earnings per share to name a few. All calculations can be found in the appendices. Results of data analysed show that all ratios are below industry averages. In particular, comparative performance is poor in the areas of profit margins, liquidity, credit control, and inventory management. The report finds the prospects of the company in its current position are not positive. The major areas of weakness require further investigation and remedial action by management. Recommendations discussed include: • improving the average collection period for accounts receivable· • improving/increasing inventory turnover· • reducing prepayments and perhaps increasing inventory levels The report also investigates the fact that the analysis conducted has limitations. Some of the limitations include: forecasting figures are not provided nature and type of company is not known nor the current economic conditions data limitations as not enough information is provided or enough detail i.e. monthly details not known results are based on past performances not present	subject matter methods of analysis Findings Conclusions Recommendations (note that conclusions and recommendations can be bulleted) Limitations of the report.
Executive Summary 2 This report was commissioned to examine why the sales volume of Choice Chocolate has dropped over the past two years since its peak in 1998 and to recommend ways of increasing the volume. The research draws attention to the fact that in 1998, the	Terms of reference Statement of problem/ topic Formal language appropriate

market share of Choice Chocolate was 37%. The shares of their key competitors such as Venus and Bradbury were 22% and 18% respectively. The size of the chocolate market then was $36 million. Over the next two years, although Choice Chocolate retained its market share the volume of sales in the whole market decreased to $29 million. Further investigations reveal that this market shrinkage coincided with an increase in health awareness amongst consumers who regard the milk and sugar ingredients in chocolate as negative;moreover, since the second half of 1999, an increasing number of rival 'health candies' had appeared on the market. These claimed to offer the consumers a healthy alternative. These factors appear to be the major causes of the decreased sales volume of Choice Chocolate. Slim Choice is the latest chocolate range put forward by the R & D Department of Choice Chocolate. The report evaluates this range and concludes that it would be an ideal candidate to meet the challenge presented by the market and could satisfy the new consumer demand since it uses significantly reduced milk and sugar ingredients and is endorsed by renowned health experts. According to 97% of the 2000 subjects tested recently, it also retains the same flavour as the original range. It is recommended: • that Choice Chocolate take immediate measures to launch and promote Slim Choice alongside its existing product range; • that Slim Choice adopt a fresh and healthy image; • that part of the launch campaign contains product endorsement statements by renowned health experts; • that Slim Choice be available in health food shops as well as in traditional chocolate retail outlets	to report writing Key findings summarised Problem solution summarised Recommendations summarized
Executive Summary 3 Every time a business or consumer purchases products or services they display forms of buyer behaviour that are influenced by many factors. The following report looks at the fast food industry and will analyse four McDonalds' key products and services.It highlights what type of consumer buying or business buying behaviours are displayed in the purchase of a product or service and explains why each behaviour may occur. This enables a conclusion to be drawn from applying theory to reality. Although a full comprehension of buying behaviour is impossible, since everyone is an individual, it is useful to reflect on common behaviours and attempt to divide behaviours in types and stages. Even McDonalds, a leader in marketing cannot always predict consumer behaviour.	Background to problem Report's aims Outlines what information the report deals with but FAILS to provide a summary of the results gained, conclusions drawn and recommendations made. These are the functions of an executive summary and are absent in this example. The information in this executive summary is vague rather than summarising what the report found.

TABLE OF CONTENTS/LIST OF FIGURES/TABLES:

A well-constructed table of contents helps readers determine the subject matter of the report, its organization, and the location of sections of interest. Divide the material into major headings, subheadings, and further subheadings. Number all the headings for quick reference. Two formats for numbering headings are:

1. The traditional (I.,I.A.,I.A.1, and so on)
2. The multiple decimal format (1.0,1.1.1,1.1.2,1.2,1.2.1 and so on)

Study the example below:

TABLE OF CONTENTS

INTRODUCTION OF THE REPORT:

Introductions contain details on research purpose, problem, and the rationale for the investigation. It points out the scope of the study. It discusses the background of the research problem with a review of its literature.

EXERCISE: Critically analyze the 'Introduction' of a report given below. Does it contain literature review.

Report
on
DVD TECHNOLOGY AND APPLICATIONS

I. INTRODUCTION

Digital Versatile Disc, or DVD is a collection of new optical disc technologies that have the potential to significantly improve the quality of a number of consumer electronics and personal computer products. These discs are capable of holding up to 17 gigabytes (GB) of data storage, with current research offering a potential for 15 times more storage. This technology is made available through advances in laser technology and advances in manufacturing processes for optical discs. A Digital Versatile Disc is basically a double density, double sided, compact disc. In addition, the laser used to read a DVD utilizes a shorter wavelength, allowing the storage surface of each of these layers to be more compact.

The purpose of this report is to present the format, creation, current applications, and economic forecasts for DVD technology. To emphasize the advances afforded using this technology, a side by side comparison with current Compact Disc technology will be used. Motorola's Research and Development is currently investigating the possibilities for implementation of a DVD Group to interact with current research and product groups. This report will give the introduction and background necessary to determine the feasibility of DVD integration into current marketing and research products. This report will provide a simplified explanation of the construction methods required for DVD replication, solely for the purpose of presenting the difference in construction needed to manufacture a DVD.

The four parts of this report will discuss (1) a technological overview of DVD, utilizing a comparison of CD vs. DVD technologies, (2) the construction of a DVD, (3) current applications utilizing DVD, and (4) projected sales and revenues of DVD devices. The technological overview section will use a comparison of current CD specifications vs. DVD specifications to convey the advances made possible using DVD. The construction section explains the manufacture of a DVD to show the physical advantages of DVD for data storage and retrieval. The section covering current applications examines the five current formats for DVD specifications and how they are currently being used today. Finally, the sales and revenues section includes forecasts of DVD sales and distribution, based upon current sales and technology release.

The principle of a "robot" is an ancient one. The word robot in Czech means labourer or worker. Commercial robots do not have the 'intelligence' to think independently. This project aims to address this inadequacy by improving existing robotic technology.
Thomas Ross built the first robot mouse in the 1930s, but subsequently robotics developed at a very slow pace until the late 1970s, when useful industrial robots became a practical proposition.
The project team had to build a computer controlled maid robot that could successfully serve drinks and food as ordered.
The mini-robotic toy described here, which we have built and called RoboMaid, is an important step in this direction in that it can serve cold drinks and food only. The use of computer control not only greatly increases the scope and capabilities of the robot, but the machine itself takes programming out the two dimensional world of the visual display unit into the three dimensional world.
Our objective was to produce a mini-robot which consisted of three units: the computing and processing unit, the transceiver unit and the driving unit.
A range of programming was developed so that the robot can sense its environment via the sensing device coupled to its "shell". Although the robot is able to serve cold drinks, it works most effectively if only one type of drink is ordered.
We designed it to be controlled by 4 data lines derived from the Motorola G4 AltiVec computer processor. Binary bits are used to control the motor drive circuits. By turning on, or off, different combinations of the bits 0-4, quite a variety of movements can be executed. The action of the control will be described in the software part. We used a transceiver unit which transmitted or received infra red and the signal was manipulated by the computing and processing unit.

EXERCISE: INTRODUCTION OF A TECHNICAL REPORT

Match the following headings with the appropriate SECTION of the text in the table:

1. Existing work related to the project
2. The scope and limitations of the project
3. Assignment Definition
4. The field of study
5. Claims for the project
6. Outline of the procedure
7. The purpose

Literature Review

Exercise#1

Chief Economists David Langdon, George, McKittrick, David Beede, Beethika Khan, and Mark Doms (July 2011) analyzed the STEM Education and STEM Jobs for the past and future 10 years by using the sample of public through population surveys. Growth rate of STEM and Non STEM Employment, Occupations in STEM, Availability of Jobs, Workers and their wages, STEM diploma holders, undergraduates, degree holders and their average earnings has been used as variables. Comparisons of wages, Regression analysis, American Community Surveys, calculations of the regression-adjusted earnings techniques are used. Analysis of data shows that the growing rates of STEM jobs are the main cause to economic validity. They are essential in the development of technological and scientific innovations.

In 2012 Hispanic Scholarship Fund (HSF) examined the STEM occupation; this report is an excerpt from HSF's full-length College to Career analysis that profiles science, technology, engineering, and math (STEM) occupations. The analysis looked at recent college graduates'

chosen fields of study and how they relate to the career opportunities available in a range of STEM industries and occupations. This data was then compared to the projected number of entry-level job openings from 2012 to 2018 in the highest-demand occupations of this sector. College graduates and number of employments are used as the variables. Bar charts and pie charts are used as techniques for comparisons. According to HSF's research "computer systems analyst" will be in demand till 2018.

Daniel Costa (2012) investigated that Microsoft Corporation recently published report which examines the number of American college graduates in computer science and all of the available job openings in computer-related occupations between now and 2020 in America. Shortage of workers in computer-related occupations, College graduates in Computer science, number of H1 visa allowed, number of STEM graduates has been used as variables. Linear regression approach has been applied which shows unemployment rate as the years progresses. Results have shown that in CS jobs opening less than one-fourth to less than one-half of workers in computing occupations have a computer science degree and the unemployment rate which Microsoft have provided is totally wrong as unemployment rate in America have never gone above 3.7. Once the unemployment rate for college-educated workers in computer-related occupations begins to approach the true measure of full employment for the occupation, it will make sense to debate whether new STEM green cards should be created and if H-1B levels should increase.

Ben Cover, John I. Jones, and Audrey Watson examines the STEM occupations its demands and employment occupation for guiding the youngsters about which field to choose by using the sample of Occupational Employment Statistics (OES) in May, 2009. Fields in demand, Employment and Occupation has been used as the variables. Bar Graphs used for simple comparisons, Bubble Chart and Data Mapping analysis have been applied. Result shows that the highest paying STEM occupation is "Natural Sciences Manager". The STEM occupations are increasing in the places where technology is evolving and these areas give high wages to their employees.

Michael Anft, Observed that the payment which technology workers get is fairly high then the Salaries which chemical, civil engineers get in America. This is due to the large number of job openings and less number of workers in IT department. Shortage of IT workers, salaries, number of jobs is the variables. Due to the shortage of IT workers private companies are forced to bring workers from different countries so that they can work on different projects but to bring them to America companies have to offer large sum of salaries and different packages which some times in the end becomes costly for companies. As a result companies now offer scholarships for high School graduates so that they pursue BS CS degree and companies expect government to do the same.

Example#2

Afia Malik (2012) analized the crisis in Pakistan in terms of crisis in Governance. She found that the power crisis is majorly a result of internal crisis in governance. According to her study the demand supply gap resulted in a regular load shedding for up to twenty hours in several rural areas. Quick increase in demand, high system losses, and lack of generation lead to this gap. She found out that poor decisions, and bad governances lead to the downfall of the power sector inPakistan.

Power crisis is considered to be a core hurdle in the development of any country. Muazam Rashid Dar (2013) and Muhammad Azeem (2013) examined the impact of power crisis on the

economy of Pakistan. They specifically determined and came up with the facts that power crisis adversely affects the economy of Pakistan to such a great extent. As economy is one of the building blocks of any nation's development, so is the case here. According to them, proper exploration of energy resources could be one of the optimal solutions to the power crisis.
Masnoon S. Ahmed (2005) studied the importance of nuclear power generation in the development. The reviews show that there has been consistent shortage of power since 2006-07 in Pakistan. And consistently the shortage of power is increasing every year. The reasons suggest that this is due to the improper and lack of infrastructure facilities. Masnoon S. Ahmed (2005) emphasized on the dependency on nuclear power as a solution for the power crisis.
As the population is rapidly growing, so is the demand of energy is increasing. Pakistan explores and exploits different energy resources such as gas, coal, petroleum and Nuclear energy, in order to fulfill its power requirements.

BODY OF THE REPORT:

This is the longest section of the report. It contains the following:

1. The research methodology: It contains a technical description of the research design. Second, it offers a rationale or justification for selecting the respective research methods (data collection methods). It discusses in detail the procedure with steps arranged in the right chronological order. It discusses the sampling strategy used along with a rationale for it.
2. It analyzes the data. Different elements of the data are analyzed separately by referring to the appendix for a closer look at the raw data mass. It discusses the answers that the data yield. It discusses everything that the data disclose. It presents the information in a highly organized and readable form. Use charts, graphs, tables, headings and subheadings, pictures, diagrams-anything that can ease the process of reading.
3. It utilizes many visuals (graphs, charts, diagrams, etc) to ease the presentation and explanation of key points.

EXERCISE: Critically analyze the body of the report below. It studies a problem and offers solutions. Also, study the conclusion.

A pencil is sharpened by an inclined rotating blade. The torque is generated by a motor through some form of transmission.
The motorised sharpener consists of a cutting blade, a push button, a motor, two shafts, two bearings, a set of compound spur gear trains and various dimensions of perspex that make up the casing.
This sharpener **is** DC **operated** with a three volt supply from batteries. The activated motor transmits a certain power to drive a compound gear train. The driving gears in turn drive the cutting blade of the sharpener to sharpen the pencil.
After designing the motorised pencil sharpener, analysis of the product **was required** before the assembly and manufacturing phase.
The information regarding the design of the motorised pencil sharpener **was arrived at** by drawings, an exploded three-dimensional view of the product and a prototype of the product.Following this, the design **was analysed** for manual handling and manual insertion using the Boothroyd Dewhurst method.
There were two problems encountered during the design stage: getting an appropriate and attractive shape and conforming to the given specifications.

This problem was solved through brain-storming sessions, consultation with lecturers and knowledge gained during the course of study at the Polytechnic.
Finally a design that was both attractive and within the specifications was created.
The assembly procedures of the motorised pencil sharpener are as follows:

- The motor together with its holder and pinion **were screwed** to the base using two self tapping screws.
- The driven gear **was fitted** tightly into the shaft. The residue plate was then slid into position.
- The sharpener holder was fitted tightly to the shaft and the sharpener was fastened to its holder with two capped screws.
- The whole assembly was aligned in such a way that it was directly below the hole in the top plate.
- The battery bracket was tightened to its holder and this together with the sharpener was fastened to the side plate with self tapping screws.
- The four side plates were glued together after the assembly of all the internal components.
- The contact switch was then screwed to the top plate using self tapping screws.

Finally the top plate and the contact switch were glued on to the top of the four side plates.

Once the assembly was completed the motorised sharpener was tested using a HB pencil.
The motorised pencil sharpener **was constructed**. However because of some manufacturing/assembly problems and time constraints, the sharpener did not cut the pencil properly.
One of the main causes for this could be the lack of proper alignment of the components.
The other possibility could be inadequate torque transmitted.
However, these problems could be overcome by taking the time for proper alignment and calculating appropriate transmission ratios.

THE CONCLUSION OF A REPORT

The concluding section of the report usually comprises three components as outlined below. Notice that the first component looks back at what has been done and the last two components look ahead or beyond your project using the new experience gained from your project.

1) Meeting of objectives

Here you are required to tell the reader whether you met your objectives, and if not, the extent to which you did meet them. If there was any change in your initial objectives you must give the reasons for this change.

2) Proposing/Recommending Design improvements to your project

Having worked on your project for some time, you may have thought of other ideas that could improve your piece of work in terms of its cost, efficiency to design, etc. These should be indicated at this juncture.
Remember that when you are making recommendations you are saying what *should* be done to remedy a situation or to improve something. Look at the example below:

The following recommendations are made: 4.1 *(the correct no)* the feasibility of using perspex *should be* considered; 4.2 the base *should be* attached with super glue instead of screws; *(Appropriate no e.g. 4) Recommendations:* It is recommended that : 4.1 (the correct no.) the feasibility of using perspex be considered; 4.2 the base be attached with Superglue instead of screws; The above use of be by itself is the use of the subjunctive i.e. we use just "be" instead of *should be*. When you make suggestions you are no longer saying what should be done; you are offering ideas about what could be done. Suggestions: 1. the base of the sharpener could be extended to give it greater stability; 2. the sharpener could be made in different colours to make it more attractive.
The following recommendations are made: 4.1 *(the correct no)* the feasibility of using perspex *should be* considered; 4.2 the base *should be* attached with super glue instead of screws; *(Appropriate no e.g. 4) Recommendations:* It is recommended that : 4.1 (the correct no.) the feasibility of using perspex be considered; 4.2 the base be attached with Superglue instead of screws; The above use of be by itself is the use of the subjunctive i.e. we use just "be" instead of *should be*. When you make suggestions you are no longer saying what should be done; you are offering ideas about what could be done. Suggestions: 1. the base of the sharpener could be extended to give it greater stability; 2. the sharpener could be made in different colours to make it more attractive.

3) Suggesting New Lines of Study

Here you are required to move away from the confines of your own project and tell the reader if the ideas contained in your work could be applied elsewhere, giving rise to new assignments, projects and new areas of study.

EXERCISE: CONCLUSION OF REPORTS:

Look at the content of the two conclusions A and B below taken from a project report and answer the following questions.

1. In what way are they similar?
2. In what way are they different?
3. Study the use of passive voice.
4. What modal verbs are used to give suggestions and recommendations?

Conclusion A :

A robot called RoboMaid **was successfully built** by our team.

The robotic toy could , **however, be further improved** to do other tasks **by** using more sophisticated software and a wider range of programs.

Using the same principle, future projects should undertake the construction of other appliances which could perform more useful tasks than just serving drinks.

Conclusion B :

The Automatic Firewall and Routing Apple OS X server **was successfully completed** by our team. Most of our objectives were met. This project **was also nominated** one of the three outstanding awards of Temasek Polytechnic, School of Engineering Project Show 2000. We were able to build a machine that was able to access 5000 iMacs in a flexible and user-friendly manner. The machine is fully integrated and is easy to operate.

The machine could be further improved in numerous areas. The following changes **have been recommended** :

1) Adding memory cards to increase limited RAM space of the controller.
2) Using a G5 microprocessor to control and stabilise the current source during start up.
3) Using discrete digital selector and display to select current level.

More work has to be done in the following areas :

1) The function of the machine could be expanded to access Linux computers.
2) Another UNIX server could be integrated for security purposes.

Read the following conclusion and recommendation and critically analyze it.

This study investigates the impact of the foreign capital inflows and economic growth on stock market capitalization in 18 Asian countries by using the panel data from the period of 2000-2010. The ARDL bound testing co integration approach confirms the valid long run relationship between considered variables. Results indicate that foreign direct investment has

significant negative economic growth has significant positive relationship with the stock market capitalization; whereas, the results of workers' remittances is found insignificant in long run. The error correction model confirms the significant positive relationship of economic growth workers' remittances while, FDI has negative and significant impact on stock market capitalization in short run. Results of causality test based on Toda and Yamamoto (1995) show the bidirectional causal relationship of foreign direct investment and direct economic growth with stock market capitalization. However, no causal relationship is found in between workers' remittances and stock market capitalization. It suggested that investor should not idealize the inflow of workers' remittances to invest in Asian stock markets in long run. Simultaneously, size of the economy is a better leading indicator for Asian stock markets. On the other hand, inflows of FDI may mislead the investor to invest. Investor should keep an eye whether FDI come in the competition of domestic market or not? If this happens so investor should not invest in the stock market of host country.

For the given conclusion, write recommendations.

i. **Price and quality of food**
While it was generally agreed that the price was reasonable and the variety wide, more than half of those surveyed felt that the quality of food should could be improved upon particularly in the areas of the taste of the food, size of food portions and freshness of ingredients.

ii. **Competition**
Many canteen users, especially staff, were attracted by a new food court at the new neighborhood shopping centre opposite the polytechnic. Canteen takings were also affected by six newly installed non-carbonated health drinks vending machines located in the canteen. Many staff also found sandwiches from the sandwich bar located outside lecture theatre 4 of DP tasty and healthy. Compounding the problem could be the canteen did not seem to serve enough types of healthy food.

iii. **Canteen operating hours**
Respondents, majority of whom were staff, were dissatisfied with the canteen operating hours. They wished the canteen to be opened as early as 8 am to cater to those wanted to have breakfast or avoid the lunch crowd.

iv. **Ambiance of the canteen**
The ambiance of the canteen was not conducive for having meals due to the lack of air conditioning and high noise levels. The music played by the newly installed juke box worsens the situation as the selection of music turns away the adults. Hence, to improve the canteen recommendation must address the problems identified in the above areas.