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#LifeKoKaroLift

Effective Thesis Writing

By Dr. Rupal Bhargava

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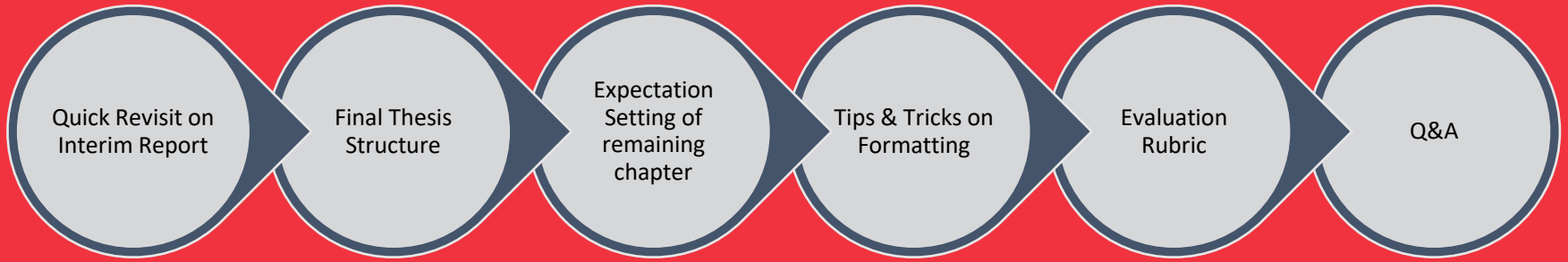
Agenda

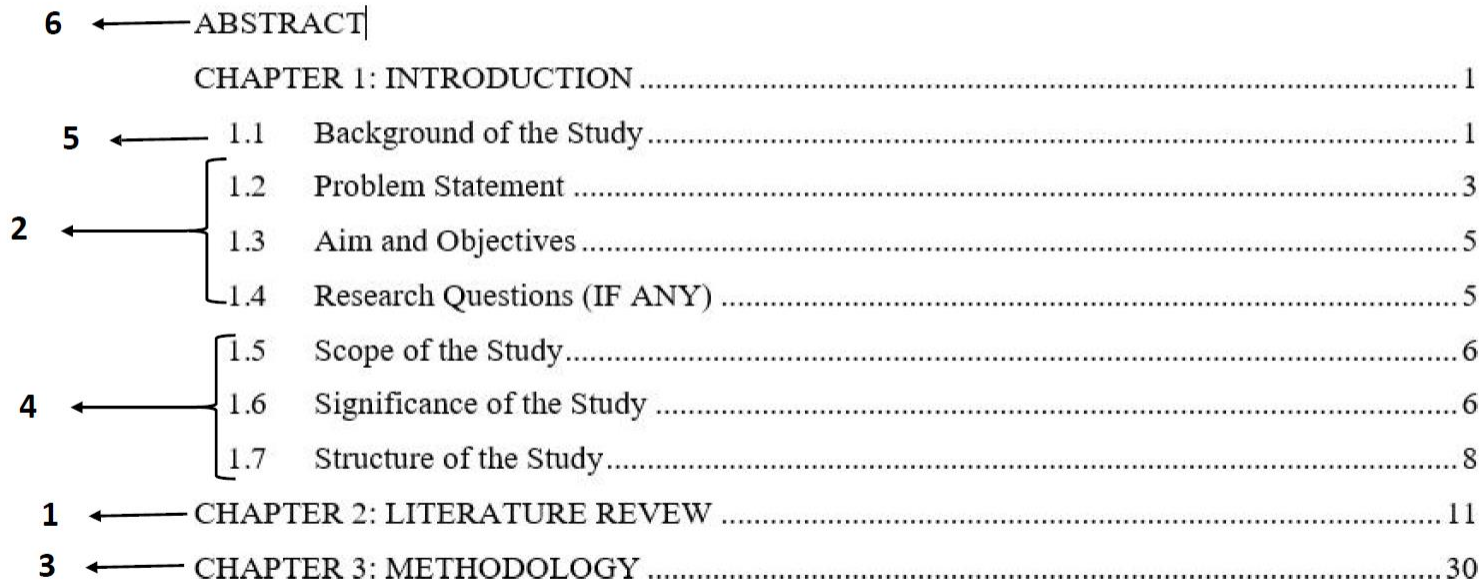


Structure

Interim report/Mid-thesis

Note: Slide is taken from live session on Thesis structure, upGrad by Dr. Manoj Jayabalan

In which order do you write your report?



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Literature Review

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Should cover the purpose of the study (The theme/research contextualization)
Should guide reader to understand the importance of your domain.
You need to answer What, Why and sometimes where
First show the forest(context) and then focus on the tree(specific areas)
Explore published thesis, scientific papers.(peer reviewed)
Avoid blogs and newspaper articles in systematic literature reviews
Look for Survey paper, if there is none. You have a good chance of publishing the same based on SLR. You can check out related survey papers instead.
Try to build a story line, talk about research gaps and challenges
Explore flowcharts and figures
Explain yourself: do not write something you are not confident about
Do not be too much basic, do not be so much perfectionist (maintain a balance)
You can screen papers by their abstract and if that entice you read conclusion/future recommendation as well

Introduction

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Theme of your research in brief

Set the context of the problem and hypothesis

A scenario with key information to understand meaning of your objectives (should build into motivation)

Highlight the gaps and how your research will contribute to these gaps

International and National implications

Introduction is not a literature review but its a glimpse of the total information

Last but not least present your general objective

Introduction

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Setting your objective

- The main objective/purpose of the research
- Specific objectives are expected to be around three listed in order of importance
- Objective is not methodology! For achieving your objectives you may use one or more methods
- Your methodology is based on your objective. Thus be careful while choosing them!

Aim & Objectives - Sample

Aim and Objectives

Clear aim

The main aim of this research is to propose a model to predict the occurrence of breast cancer based on their risk factors. The identification of the breast cancer incidence using the well-studied risk factors allows for a quick and cost-effective diagnosis and the recurrence of this disease can also be predicted based on the disease model generated.

Primary goal

The research objectives are formulated based on the aim of this study, which are as follows:

Analyzing →
- To analyze the pattern and relationship between the risk factors of breast cancer via visualization to improve the comprehensibility of diagnosis for clinicians and patients.

Pre-processing →
- To suggest a suitable balancing technique that can be applied on the imbalanced dataset.

Models →
- To compare between the predictive models to identify the most accurate model to classify breast cancer occurrence based on its risk factors.

Model evaluation →
- To evaluate the performance of the classifiers based on the balancing techniques.

Note: Slide is taken from live session on Research Proposal Structure, upGrad by Dr. Manoj Jayabalan

Aim & Objectives - Sample

Aim and Objectives

Clear aim

The main aim of this research is to develop a personalised blood glucose prediction model using only non-CGM data. The goal of this research is to contribute to the vast majority of diabetic patients that do not use CGM for self-monitoring of blood glucose levels.

Primary goal

The research objectives are formulated based on the aim of this study, which are as follows:

LR →
- To investigate the performance of existing blood glucose prediction models developed using non-CGM data

Model →
- To develop a personalised prediction model using only non-CGM data

Model evaluation →
- To evaluate the performance of the proposed blood glucose prediction model

Note: Slide is taken from live session on Research Proposal Structure, upGrad by Dr. Manoj Jayabalan

Aim & Objectives - Sample

Research Aim and Objectives

Clear aim

The aim of this research is to propose an approach to enhance the projecting capability of the Lee-Carter model and fit the model to the Mauritian mortality data from 1984 to 2018[1]. The goal of this study is to forecast the mortality rate of Mauritius and provide solutions to insurance companies and pension providers to alleviate the effects of ageing population.

Primary goal

The objectives of the research are outlined as follows.

LR →
- To investigate state-of-the-art approaches to the Lee-Carter model used in modelling and forecasting mortality rate.

Pre-processing →
- To determine the optimum technique to estimate the parameters of the Lee-Carter model.
- To propose a deep-learning model to forecast the mortality index parameter.
- To evaluate the performance of the Lee-Carter model.

Models

Model

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Structure of the Study

The structure of the thesis is as follows. Chapter 1 presents the background of the research in EHR, discuss the problem statements. The study aim and objectives are discussed in section 1.3. Section 1.4 presents the research contribution to the body of knowledge. The significance of the study provided in section 1.5

Chapter 2 presents the necessary theoretical background and highlights the problems given in Chapter 1 by systematically reviewing the access control model utilized in the EHR. Section 2.2 presents the discussion about the two ISO standards such as ISO 22600-1:2014 and ISO 29115-2013. The scope of the EHR, privacy and security challenges and the information system security mechanism articulated in section 2.3. The section 2.4 to present the gap, approaches, and explain the different techniques handled for the efficient risk analysis. The analysis of different user behavior learning methods in authentication is articulated in section 2.5. The emergency access procedures and accountability are given in section 2.6. The summary of the reviews is discussed and concluded in section 2.7.

Chapter 3 discusses the research design and the proposed framework. The research design given in section 3.2 describes the research process and introducing the validation approach to be carried out on the proposed model. Section 3.3 presents an overview of emerging access control workflow and validation of the model through extensive case scenarios with a combination of possibilities and various uncertainties. Finally, the analytical model using game theory to evaluate the residual risk. The summary of the chapter given in section 3.5.

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Methodolgy

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You need to address “HOW?”

Verb usage

Describe how will you address different objectives

Be consistent with the order of importance

For each method, cite the proper reference.

You can include following:

- Workflow
- Dataset Description
- Data Preprocessing
- Transformation/Augmentation
- Modelling Techniques
- Evaluation Metrics

For each objective there should be a method

Chapter 3 Sample TOC

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Research Approach [OR]
Proposed Model [OR]
{Some Novel name}

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In which order do you write your thesis?

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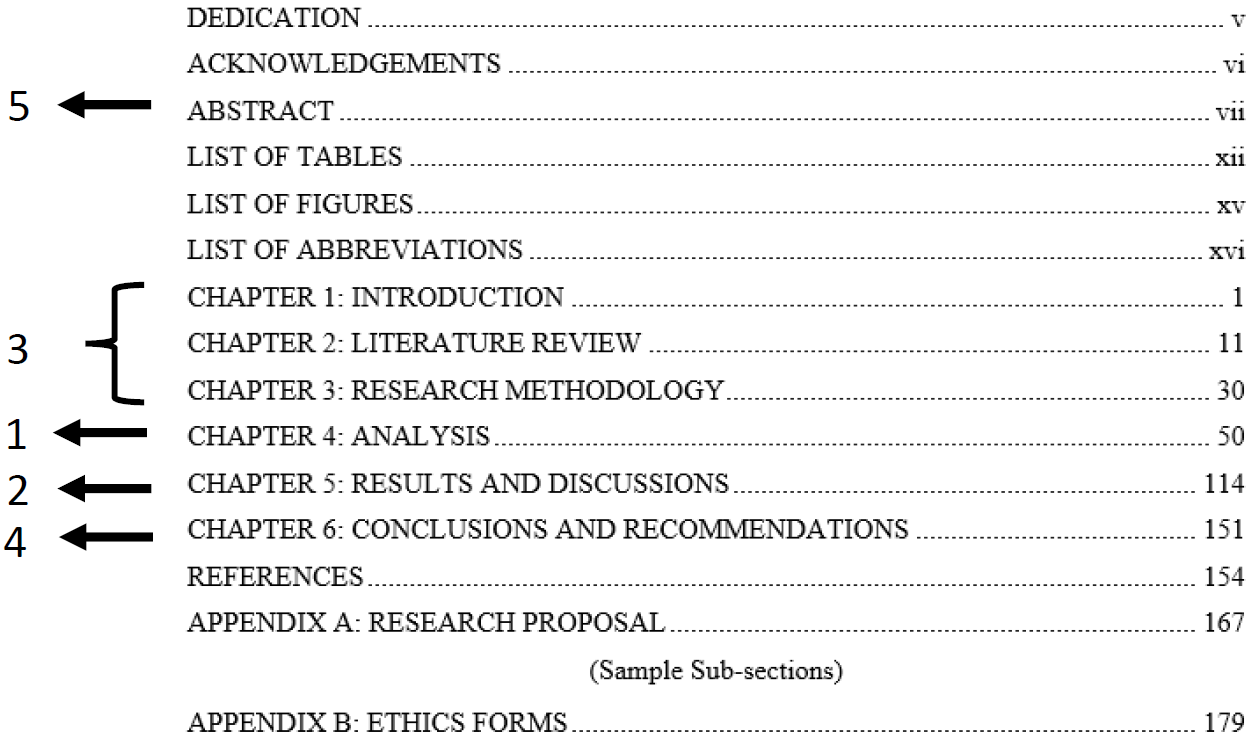

Chapter 4 TOC Sample

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Analysis and Design

Compulsory

Chapter 4 TOC Sample 2

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Chapter 4 Analysis & Design/ Implementation

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EDA

Hyperparameter tuning

Experiment Details

Chapter 5 Sample TOC

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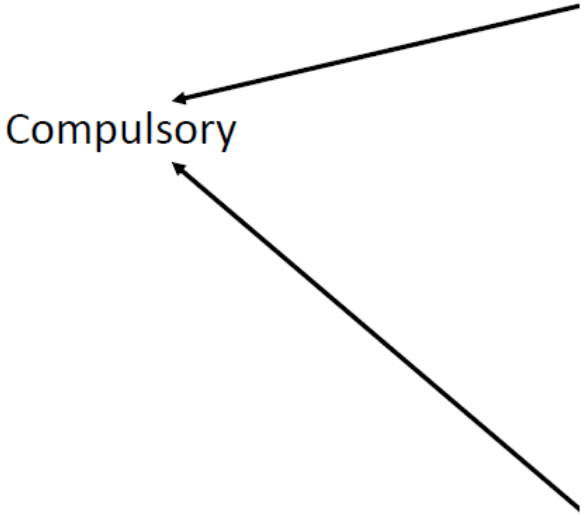

Describing your Results

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For each objective there should be a result. Answer each specific objective
Describe your results clearly and concisely
Do not be personal (I understand, I feel, I believe), or use people names. This is not scientific
Avoid pronouns, qualifiers and adverbs (extremely, possibly, of course, naturally, obviously, just), qualifying non qualifiable(unique, optimal, infinite)
Do not cite references unless it makes part of our objectives(comparison and discussion)
Be concise without being superficial, explore each result whether be positive or negative
Spell out numbers less than 10(except when used mathematically)
Tables, graphics and figures: only if they have a meaning. Refer them in text and do not repeat their captions in paragraphs
Clear legends, axis labels and line types
For flowcharts, you can use draw.io
Figure should be of good resolution

Discussing your results

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Approach your research in the context of current/past research

For each results you have finding in literature of the study from same dataset are they similar or different

Be critical: Do not copy paste ideas. Elaborate your own understanding

Explain possible differences in light of statistical significance, if applied

Find recent papers to discuss

Be careful with plagiarism

Set limitations of study and what did you do to minimize them

Chapter 6 Sample TOC

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Conclusion

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Objective---->Method1---->Result---->Meaning---> Conclusion

Summarize the principal findings

Be organised

Do not include references/citation

Set the perspective: directions for future research

Abstract

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Project Proposal/Interim Report:

- Introduction
- Objectives
- Methodology
- Perspective’

Thesis

- Introduction
- Objective
- Methodology
- Results
- Conclusion

Read abstract from scientific abstracts(observe journal rules)

Do not use reference/citations or any graphic element in abstract

Be short, Concise and deep

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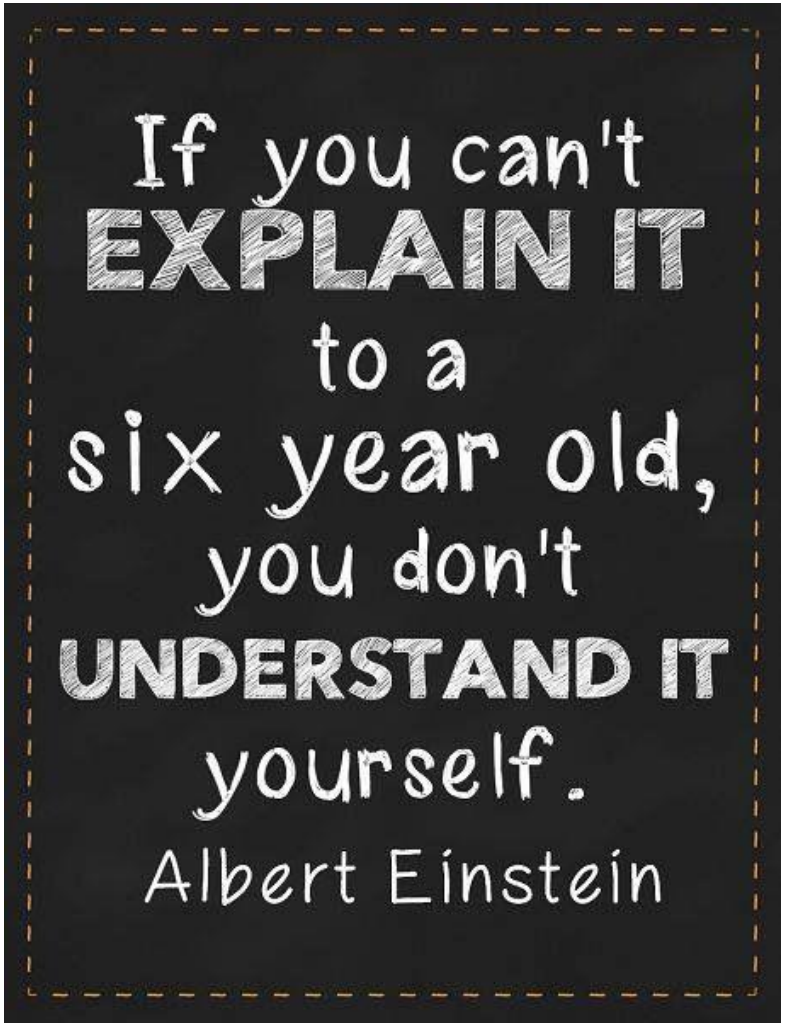
If you can't
EXPLAIN IT
to a
six year old,
you don't
UNDERSTAND IT
yourself.
Albert Einstein

Few Tips!!!

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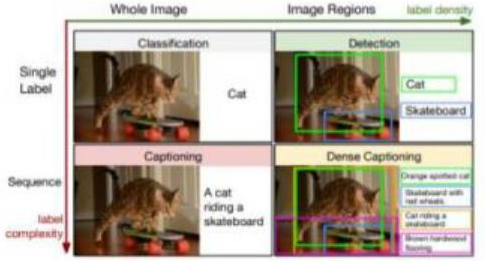
Read and Read more scientific articles
Improve Vocabulary
Literature experience
Make records
Make notes
Writing with clarity
Avoid slangs and popular idiomatic expression
Use consistence tense
Be simple
Avoid too long sentence
Avoid very long paragraphs
Refer: Writing for computer Science by Justin Zobel

Suggestions

- Each “Chapter” should start in a new page.
- Justify your text (CTRL + J).
- Table caption should be above the Table.
- Figure caption should be below the Figure.
- Do not start a section with Figure or Table.

2.3.4 Classification based on number of captioning

Fig.2.11(Zakir Hossain et al., 2019)



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Suggestions

- Section/subsection can be started in a new page.

5.3 Model Output

This section provides the output of few generated captions from the implemented model to showcase the performance of the model.

2.4 Applications of Image Captioning System

This section provides the details of few applications where image captioning methods can be applied and can be useful

Aid to Blind: Blind people always need assistance in order to understand about the surrounding things, to walk on a road, they will always be very keen to know about the things happening in

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Suggestions

- Table and Figure number should be used in the statement.

Chan, 2019)						
Reinforcement based learning method (Ren et al., 2017c)	MSCOCO	-	0.7	0.25	0.93	0.52

Above table shows the performance comparison of the implemented models with the various other different kind of models of other researchers and with the basic reference model.

Reference model is a very basic encoder-decoder based model which is giving considerably low scores for all performance metrics.

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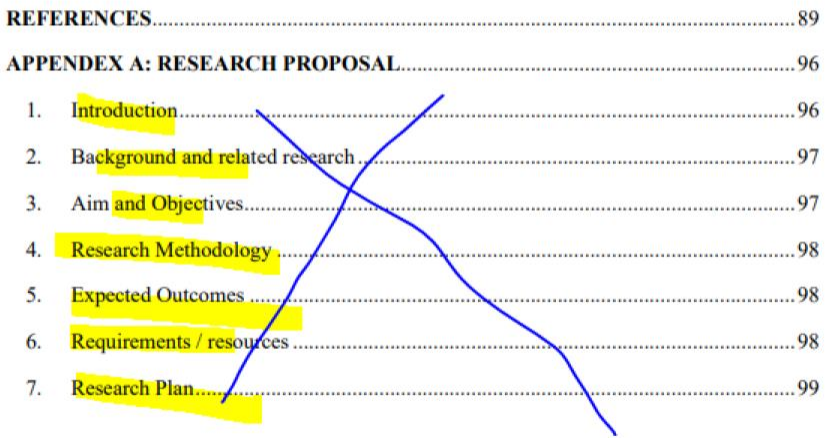
Suggestions

- Research proposal structure in Thesis Appendix.



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Final Thesis Rubrics

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Criteria	Weightage
General Structure, Formatting, Grammar and Spelling, Writing style and Layout	5
Introduction	10
Literature review	15
Description of materials and methods used	20
Experiments, Implementation, Tools, Development, Simulation etc.	20
Results, Analysis, Findings, and Discussion	15
Conclusion, Implication, and Recommendations	10
Citation and references	5

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Thank You !