University of Your Choice

School of Engineering and Computer Science

MSc Computer Science (with your specific course)

Module: MSc CS Project

Detailed Project Proposal

Project title – A study on …… (your project title goes here. The title is important)

Your Name

Level 7

Academic Year 202X-2X

**Proposal Report Structure**

*This is an example of the report structure that can be used for the Proposal:*

Make sure you have a title page

All reports should have a contents page

Section and subsection headings must be numbered and indented

A Project Proposal on the topic of your choice can be structured as follows:

The keyword is **mindset**

1. **Project Introduction**



This is a background to the project, which will include:

* The field of study
* The problem statement
* Your inspiration for the project (or reasons for choosing this project)
* A short introduction to this proposal

(detailed explanations of the above points)

The first paragraph will introduce the topic of the Project. As already explained in the teaching materials from the module leader, and in the guidance for the Project Proposal, this topic relates to your field of study. If you are a Software Engineering student, then it may relate to algorithms used in gaming, or other applications. If you are an AI student, then the topic is similar, but related to AI applications. However, it will relate to the effectiveness of the algorithmic solution for the type of application you are developing.

Then you explain the problem – the need for this project.

This will be accompanied by the reason why you have chosen this particular project, what you expect to achieve from it, from the personal point of view, and how it relates to what you will be doing in your career.

Then you explain what comes next in this proposal. You prepare the reader for what comes next.

2.0 Project Goal or Aim

This is the same as the project title, but better explained here.

It can be divided into two aims or goals, it depends on you.

Example:

The aim of this project is to investigate the accuracy and efficiency of machine learning algorithms such as Multi-Layer Perception Model and Naïve Bayes in detecting android apps with malware.

If you have a second aim, it can be: Comparing the efficiency and accuracy of two chosen algorithm, with the purpose of recommending the best one for this purpose.

**2.0 – Project requirements (or features, or functionalities)**

Whatever you call them (requirements, features, functionalities, aims, goals) they are the most important aspects of the project. The success of the project will be determined by the achievement of these aims – what you promise to do.

This section explains the following:

2.1 Core project requirements

In bullet points here, you need to outline what you intend to do and how you intend to do it. You can’t just say that “This project is about malware detection using machine learning”. There is nothing wrong with this statement, but it does not say anything. You have to explain what you are going to build for the purpose of malware detection, how it is going to be used, which detection method is going to be used, what machine learning algorithm(s) is going to be used, etc.

You need to explain in well described bullet points how your system will work and what it is going to achieve. Example:

* To select, design and implement two ML algorithms for the purpose of detecting android malware
* To train and test the implemented algorithm, with the purpose of obtain analysable results
* To continue the training and testing until the maximum possible level of accuracy and efficiency is reached
* To obtain results for false positives and false negatives and to improve these results to a reasonable level
* And so on,

This section has to be very detailed.

2.2 Advanced Project aims

Same as above, but this will outline the advanced features, what you expect to achieve at a higher level, which will give you the very good and excellent marks.

For example:

* To obtain highest possible levels of accuracy for the two selected algorithms with the purpose of comparing them.
* To compare the results of this project with the state-of-the-art research that has been done in this field.
* And so on

Again, this has to be very detailed. You are proposing something,

**3.0 – Secondary Research Aims (Literature Review)**

Explain here why you intend to conduct literature review, and what you expect to achieve from the literature.

Remember that learning how an algorithm works is not literature review. Secondary research is about researching state-of-the-art work that has been done in the same field, what algorithms they have used, to what levels of accuracy and efficiency, obtain their results that you will use later to compare with yours, and decide what algorithm you are going to use for your project.

Remember the goals of the Literature Review:

* To select the algorithms for this purpose
* To establish which elements of an APK will be used for detection
* To collect results for the state-of-the-art research that has been done, in order to compare that with your own work.

A literature review that does not results in some conclusion and recommendation for the project and does not obtains results of the other people that have done the same work as you is not a good literature review.

So in this section, you need to write thos three bullet points for your own project, as your Secondary Research aims.

**4.0 – Primary Research**

This is about explaining your own work, how you intend to collect your own data. If you are going to use a dataset, for example for Data Analytics, how are you going to research for it, and how you intend to pre-process that dataset.

Then you explain how you intend to build the artefact, the system, the program, or whatever you need to develop as part of this investigative project.

After that you need to list the phases of the investigative work. For example, if you are doing a Data Analytics project using Machine Learning algorithms, then you can explain the following:

* How you intend to train your implemented algorithm with the dataset
* How you intend to test the algorithm, again with the dataset that you have obtained from somewhere. Think about how much time you will allow for these phases, because planning your project is extremely important
* How you intend to evaluate your results. Have you established the criteria for evaluation in the Literature Review? Have you planned to collect results from other projects as well?

5.0 Project resources

Hardware and software resources that you may need for this project.

REMEMBER - Time is the most important resource that you have. It is not going to be listed here, but that is what you have.

**6.0 Project risks and their mitigation**

A table should be created here with project risk information:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Risk description** | **Probability** | **Possible effects** | **Mitigation methods** |
|  |  | Low/Medium/High |  |  |
|  |  |  |  |  |

If you don’t plan for risk mitigation, then you will not be able to respond to it, if it happens and when it happens.

**7.0 Project Plan**

* Project objectives (this is what most students get wrong
* The most overdone word here is SMART Objectives

So, how can you write SMART objectives? Don’t even think about the word SMART. It is just a confusing acronym. Think about this:

* Your objectives are what you need to do to achieve your goals
* They need to answer the questions what, how, why, and when.

If you satisfy the above criteria, your objectives will be SMART. For example:

Objective 1 – To undertake literature review into ML algorithms to select the most suitable ones for this project, understand the parameters used for detection, and to obtain results from state-of-the-art research in this field, by <date>

Objective 2 – To select a suitable dataset to be used with the selected algorithm and preprocess it by <date>

Objective 3 – (Can you continue yourself now with the other objectives?)

**7.0 Project outcomes and lessons to be learned**

In this section you summarise everything that you think your project will achieve. In bullet points, you explain what you expect to achieve from it, from the personal point of view, and how it relates to what you will be doing in your career.