Pre-FYP1

Prepared by:

Dr. Mohana Muniandy

Introduction

What is a proper topic that I can choose?

How can I conduct my project?

What methodology and which one is good enough for my project?

What are the stages that I should go through?

What kind of tools should I use?

How can I prepare my report?

What kind of documents should I submit?

Project Guidelines & Requirements

- Every student undertaking an Honours degree programme is required to complete an individual project under the supervision of one staff member (Project Supervisor). This is a substantial piece of work and a requirement in an Honours degree programme.

Project Guidelines & Requirements

Attributes of Good Project Title

- Focused/targeted on a specific area
- Problem to solve – some issues to look into
- Something to improve
- Some new idea to implement
- Some new technology
- Something to analyze, measure
- Clear application of business/ management concepts

Project Guidelines & Requirements

A good project should be able to address some of the following questions:

- How will a particular problem be solved?
- What is the contribution of your project to the identified area/ field?
- What are you going to learn from it?
- Does your project address any research goals?
  - e.g. to test a hypothesis, to illustrate the application of a technique, to test the feasibility of an idea, or use of new technology, etc.

Project Guidelines & Requirements

Attributes of a Bad Project Title

- No research area defined
- No implementation, only research based
- Title that has been implemented before with no new enhancements
- Not related to major of study / specialization

- **NOTE : Just producing a working programme is NOT GOOD enough!**

A Good Project – An Idea (1)

- A balance between a [strong] conceptual study and application of concept into system implementation
  - Conceptual study is the study of underlying theories / techniques / technology
  - System developed must incorporate / include the understanding / application of the concept studied / researched

A Good Project – Criteria (2)

- Analytical
- New idea, new method, techniques, technology
- Challenging
- Technical
- Having research values

Project Guidelines & Requirements

- The project is intended to give you the opportunity:
  - To **study** a particular area of your major / specialization, in depth.
  - To **explore** new topics, beyond what is taught, independently and to work on a particular problem within the selected area.
  - To give you the necessary **training and experience** in project research, development, and management.
  - To **communicate** your findings and results.

Project Guidelines & Requirements

- In doing your project, you are expected:
- To **demonstrate an understanding** of the particular problem you are addressing on.
- To **identify and apply appropriate formal techniques** adopted in project development such as the problem analysis, design models and development methods all of which should be reflected in the documentation of your project dissertation.
- To **manage your time critically** and submit the needed project deliverables on time.
- To **produce relevant project reports** with a high degree of **accuracy**, **originality** and **creativity** in presenting its content.

Project Guidelines & Requirements

A. Selecting A Project

There are three important areas to consider:

- Project Title selection
- Project Objectives
- Project Scope

Project Guidelines & Requirements

1. Project Title selection:

- Was there any previous work done on this topic?
- What are the new areas or opportunities worth exploring in this topic?
- Have you checked your project title against the projects done in the past?
- Have you investigated the suggested future work opportunities by the previous researcher?
- Do you have enough references for this project?

Project Guidelines & Requirements

2. Project Objectives:

- What problem do you want to address or solve?
- What contribution do you want to give in your project?
- What is the purpose of the project?
- What is it intended to demonstrate?
- What are you going to learn from it?
- A research project is required to address some research goals: e.g. to test some hypothesis, to illustrate the application of some techniques, to test the feasibility of an idea, or to identify some design principles.

Again, just writing a working program that does something nice is not enough.

Project Objectives

Should have a SMART criteria.

- S – specific (from the statement, we can know the output/result/product
- M – measurable (result can be seen/observed)
- A – achievable
- R – relevant
- T – timeliness (within 2 semester output can be produced)

Project Guidelines & Requirements

3. Project Scope:

- The project must be large enough to warrant credit at Honours programme.
- It must also be small enough that a student can complete it within 2 semesters / terms.
- The **BIGGEST DANGER** here is that a student start out with ideas that are **too GRAND** **or** **too VAGUE** to allow him/her to complete anything worth giving marks in the time available.
- How are you going to break the work into **manageable phases**?

Project Guidelines & Requirements

B. Typical Scope Of Work

- Review of present literature and existing works or materials
- Investigate the problems or areas to be addressed
- Critically analyze the problem
- Suggest various ways of solving that problem
- Designing a suitable solution to the problem, using suitable design models
- Implement the solution by applying suitable techniques and tools
- Evaluation of the solution
- Identification of future work opportunities and possible enhancements

Project Guidelines & Requirements

C. Project Supervision / Evaluation

- Project Supervisor
  - evaluates proposal
  - evaluates FYP1 & FYP2
  - technical and content advisor

- Moderator
  - Evaluates FYP1 & FYP2

WARNING : Students are expected to conduct independent work and should not expect too much “hand-holding” from their supervisors!

Bachelor of Computer Science (Hons.) Projects

- More towards the implementation of new technology to improve current situation.
- Software Engineering projects emphasizes more on designing and developing software systems with innovative methodologies and sophisticated tools.
- Game Development projects integrates fundamental concepts of software engineering with both technical and creative aspects of game design and development.
- Data Science projects emphasizes on designing and developing solutions to draw useful insights from the availability of large volumes of data, known as Big Data.
- Cybersecurity projects focuses on the array of sophisticated techniques and innovative approaches used to protect data and information systems.

Bachelor of Information Technology (Hons.) Information Systems Projects

- using information systems effectively, and to contribute significantly in planning, design, implement and maintain information systems solutions for critical business problems

How to Choose a Project

- To choose a proper topic is the first step in doing your project.
- supervisors have project topics before the beginning of every term of FYP1
- students may suggest their own ideas and topics for their final year projects. However, whether the FYP Committee accepts the suggestion or not depends on the criteria that they consider in their proposal acceptance process.

Choosing a Topic from the Project List

- First step is to choose your project topic
- It is very important to dedicate a proper amount of time to make your decision.
- You have to live with your project for 2 trimesters, so it is better to choose a topic, which is truly of your interest.
- Do not forget that you should be wise enough to choose a topic that you can accomplish.
- You should be as honest and frank with yourself as possible.

Choosing a Topic from the Project List

- Sometimes, the supervisor who is supposed to supervise you may know your background and advise you to do not take the project that you have selected and choose another one instead.
- In the majority of cases, it is better to take this kind of advice.
- If you could not strongly defend your suggestion and to convince your supervisor that you would be able to accomplish the project, it would be wiser and safer if you reconsider your proposal and change your topic.

Tips on choosing a project topic

- Study the topics carefully and thoroughly. This is important because if you miss a topic that can be suitable for you, one of your classmates may take it.
- Consider the harmony between the heart and the brain!
- Choose a topic that is attractive but at the same time you think that it is doable. This is important to understand that no matter how much the topic is attractive at the end of the day if you do not deliver its minimum requirements, you cannot receive a pass grade.
- Choose among the topics of a supervisor(s) with whom you feel that you can comfortably communicate.
- Choose more than one topic to have more flexibility; three is a good number, then!

Activity # 1

Suppose that you have chosen three project topics, among 100 that are available and you have prepared a short list of which, without any prioritization, as below:

1. A Speech to Text System
2. An Asset Management System
3. An SMS Cryptographer

How can you prioritize this short-list?

Activity # 1

	Programming and Technical Skills	Knowledge of other subject areas
A Speech to Text System	Higher level of programming challenges	Speech related technologies
An Asset Management System	Basic programming skills	Good knowledge of business system analysis and database applications
An SMS Cryptographer	Higher level of programming challenges	Mobile computing and applications & cryptography

How can you make your final decision?

- you have to measure each project's "suitability " degree to you.
- a method that helps in this measurement process
- some measurable parameters to each project and we call them selection parameters
- we summarize these selection parameters into three categories, namely, Interesting, Background Knowledge, and Required Skills.
- In addition, to measure each parameter, we assign each one two attributes, namely a Coefficient and a Percentage.
- a proper foundation based on which we can apply our method

Parameter / Projects	Interesting			Background Knowledge			Required Skills			Final Result
	Coefficient 1-5	Degree 0-100	Result	Coefficient 1-5	Degree 0-100	Result	Coefficient 1-5	Degree 0-100	Result	
Speech to Text System										
Asset Manage-ment System										
SMS Crypto-grapher										

Table 1.1: Project Prioritization Template

Example

Parameter / Projects	Interesting			Background Knowledge			Required Skills			Final Result
	Coefficient 1-5	Degree 0-100	Result	Coefficient 1-5	Degree 0-100	Result	Coefficient 1-5	Degree 0-100	Result	
Speech to Text System	3	50	150	4	20	80	3	30	90	320
Asset Manage-ment System	3	60	180	4	40	160	3	60	180	520
SMS Crypto-grapher	3	70	210	4	30	120	3	40	120	450

Table 1.2: Project Prioritization Sample

Proposing Your Own Topic

Tips on proposing your own topic

- Be creative. Look around at the faculty, university, your hometown, province, state, and country and try to find a subject, which can be improved with AI / automation / gaming / cybersecurity etc.
- Look at new technologies. You can find many areas that these technologies can be applied for the first time. Clearly, this situation is more popular in developing countries and regions.
- Focus on the subjects that you like their status to be improved using automated systems and computers. These subjects can be selected from different origins such as education, health, globalization, tourism, global warming, lifestyle, culture, entertainment (specifically gaming), etc.
- Choose three topics in order to provide your faculty and yourself proper flexibility with your proposals.
- Write a couple of paragraphs that state the problem area and why you think this topic is important to be considered as a final year project. The writing process provides you an opportunity to rethink about the topics and to establish the grounds based on which you can defend your proposals.

Proposing Your Own Topic

- Identify field of interest or your strength
- Read widely initially – conduct in-depth study on the interested topics – preferably about 10 literatures e.g. journals, published books, pc magazines, conference papers, office al news sites. **DO NOT** REFER to WIKI or blogs.
- Zoom/focus into a specific area that you want to investigate/ study /research
- Identify the keywords – outstanding terms, new technology
- Compose a rough title with the keywords
- Refine the title to ensure that the title reflect/express the issue you want to research or study
- Compose a final title for submission

The Proposed Title Should

- be **descriptive** – able to tell/describe what you intend to do
- be composed of **keywords** [e.g. technical jargon]
- be **interesting** to look at
- be **catchy** – attract people at one glance
- convey the **intention** of the author clearly
- be **impressive** – leave lasting impression

Tips on choosing a supervisor

Choose among the topics of a supervisor with whom you feel you can comfortably communicate. However, you should consider the topics based on the topic selection, at the first step (refer to choosing a project topic).

- Choose a supervisor that has the knowledge of the area of the chosen topic.
- Consult with graduate students about their experiences on different supervisors.
- Choose more than one supervisor and prioritize your list.
- Talk to the prospect supervisors as soon as you can and register your name with them.
- If you have selected more than one supervisor, let them be informed that you have done so.

Bachelor of Computer Science (Hons.)
Finding Topic and Area of Study

- Coverage of topic must be clearly defined. This includes problem of current situation and how to solve the problem.
- Must emphasizes on specialization in solving the problem.
- Must have in-depth knowledge about current system process and confirm that the new technology / methodology / tools / algorithms / model provides better solution than the current system.

Bachelor of Computer Science (Hons.)
Finding Topic and Area of Study

Software Engineering:

- Focuses on designing and developing software systems with innovative methodologies and sophisticated tools. Analyzing user requirements and specifications, as well as the design, implementation and verification of software system.

Game Development:

- Integrates fundamental concepts of software engineering with both technical and creative aspects of game design and development; various types of game production – from 2D to 3D, and from virtual to augmented reality game projects.

Bachelor of Computer Science (Hons.)
Finding Topic and Area of Study

Data Science:

- Focuses on designing and developing solutions to draw useful insights from the availability of large volumes of data, known as Big Data; processing of Big Data for analytics that can be impactful to business.

Cybersecurity:

- sophisticated techniques and innovative approaches used to protect data and information systems; both offensive and defensive security methodologies such as ethical hacking, digital forensics and network security, as well as policies and ethical issues of cybersecurity.

Bachelor of Information Technology (Hons.) Information Systems
Finding Topic and Area of Study

- Select one business process that interest you the most.
- Find whether you can enhance or change the current business process for better management / better benefits / more efficient.
- You can select any technology to enhance the current business process.
- Ensure that the business process is better after the enhancement.
- Use information systems effectively, but also to contribute significantly to plan, design, implement and maintain information systems solutions for critical business problems.

Example of Bachelor of Computer Science Software Engineering Project Idea :

Smart Parking Lot

current situation

- information on empty spaces of parking lot is not available.
- Drivers need to go to the parking lot and find parking by driving by slowly at every lane.
- user can not manage their time efficiently when they are rushing.

improvement

- IoT technology will detect if the spaces are empty/occupied.
- mobile app is developed to show the information of available parking lots for the potential users.
- mobile app provides feature for user to book the spaces and make payment in advance.

Example of Bachelor of Information Technology (Hons.) Information Systems Project Idea:

Restaurant Mobile App For Order And Delivery

current situation

- restaurant cooks food for dine-in customer
- web app is available for displaying information only (food, price, etc.), but not for transaction (reservation and payment).

improvement

- restaurant cooks food for dine-in and delivery service.
- mobile app is used for reserving tables for dine-in customers and provides features of food ordering (for delivery service).
- using QR code for dine-in customers' reservation and delivery.

Examples of past projects

- Drone-based Application for Crop Disease Detection and Management System Interface with Android Technology
- Vehicle's Diagnostic and Monitoring System Using Onboard Diagnostics II (OBD2) on Android Technology with Recommendations
- Face Recognition System Using Deep Learning Technology for Attendance Taking
- Smart Attendance Tracking and Management System with Bluetooth Low Energy (BLE) Beacons, Android and ASP.NET
- IoT Based Automated Rainwater Harvesting to Generate Hydroelectricity and Monitoring Using Mobile Application
- Safety Android Application with Realtime Location and Status Tracking plus Community-wide Alert System

Software Engineering Project IDEAS

- Reminder App Powered by AI Chatbot
- AI Shopping System
- Sentiment Analysis
- Image encryption using Advanced Encryption Standard (AES) Algorithm
- Opinion Mining for Social Networking Platforms
- Credit Card Fraud Detection
- Prediction system

Cybersecurity Project IDEAS

- Zero Trust Architecture Implementation
- AI-Driven Threat Detection Systems
- Blockchain for Secure Transactions
- Advance Phishing Protection Techniques
- IoT Security Enhancements
- Using Cryptographic Algorithms for Text Encryption (Beginner)
- Keylogger Programs (Beginner)
- Facial Authentication System for Web (Intermediate)
- System for Image Steganography (Advanced)

Data Science Project IDEAS

- Forecasting the Sales of a Supermarket During Festival Season
- Sales Conversion Optimization
- Employee Attrition and Performance
- Predicting Sales in Tourism for the Next 4 Years
- Predicting the Success of an Upcoming Movie
- Customer Segmentation
- Prediction system using classification technique
- Recommender System based on Data Mining
- Fraud detection Using machine learning

Game Development – Project IDEAS

- Augmented Reality (AR) and Virtual Reality Game
  - Zombie-themed
  - Healthcare integrated
- Story Games
  - Mystery e.g. Harry Potter Hogwarts Mystery
  - Story game with arcade theme like Blaze
- Sports Games
  - Cricket game like Nextwave Multimedia
  - Archery games like Archery Club
- Smartwatch Games
- Mental Health Games
- Fantasy and Sci-Fi Game
- Educational Games

Bachelor of Information Technology (Hons.) Information Systems – Project IDEAS

- CRM – Customer Relationship Management
- Sales and Invoice Tracking System
- Loan Automation System
- Advanced Restaurant Management System
- Online Auction System

Project Guidelines & Requirements

REFERENCES :

- Library: published materials e.g. Journals, IT magazines, Computimes (NST), In.Tech (Star), books, etc.
- unpublished materials e.g. white papers, etc.

ONLY PROPER ACADEMIC REFERENCES ARE ALLOWED!

NO WIKIPEDIA, BLOGS, ABOUT.COM, WHATIS.COM, ETC.

Activity # 2

1. Identify current situation (problems)
2. Create improvement idea (solutions)
3. State the technology / methodology / tools / algorithms / models used (as solution)
4. Write the possible title