FINAL YEAR PROJECT PROPOSAL GUIDELINES

Faculty of Information Science & Technology
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CONTENT

INTRODUCTION

This booklet contains information and guidelines regarding The TTT_4172 Project Proposal. The guidelines, project planning, and evaluation guidelines found in this booklet have been prepared by Final Year Project Committee. Students are advised to always discuss with the supervisor in the process of preparing their respective final year project proposal documents.

PROJECT CRITERIA ACCORDING TO THE PROGRAM

COMPUTER SCIENCE

Computer System Projects developed by students must meet the following general criteria:

i. Using different platforms for the development of an application.

ii. Applying algorithmic architecture, data structures, design patterns, or data representation.

iii. Ensure that the main function of the problem is solved based on one or a combination of several different approaches.

iv. Ensuring the correct use of data is emphasized in problem-solving

v. Generate testing and development of a protocol to solve problems.

<table>
<tr><td colspan="2" align="center">ARTIFICIAL INTELLIGENCE</td></tr>
<tr><td>Project Type</td><td>Specific Criteria</td></tr>
<tr><td>The development of a system or algorithm is related to one of the fields below:
1. <u>Knowledge-based System</u>
<i>Example: A Knowledge-Based System For Poverty Prediction Using Machine Learning Approach</i>
2. <u>Predictive Analytics</u>
<i>Example: Forecasting System of Water Quality Index in Chini Lake Using Decision Tree Method</i>
3. <u>Expert System</u>
<i>Example: Development of an Ontology-Based Malay Traditional Clothing Repository</i>
4. <u>Machine Learning (Machine Learning)</u>
<i>Example: Recognition of Jawi Letter Shapes Based on Arabic Letters Using Neural Networks Based on Backpropagation Algorithms.</i>
5. <u>Robotics</u>
<i>Example: Path planning for drones and recognizing obstacles</i>
6. <u>Image Processing (Image Processing)</u>
<i>Example: Vehicle Number Plate Recognition and Vehicle Classification using VGGNet and YOLOv2.</i></td>
<td>Project development must meet criteria based on the type of project as follows:

<u>System/Web/Mobile App:</u>
1. Able to use tools or libraries to analyze problems.
2. Able to select and use artificial intelligence techniques as a solution.
3. Develop interfaces for software systems and models.
4. Demonstrate analytical skills in problem-solving.

<u>Algorithm:</u>
1. Using real data or datasets in performance testing.
2. According to the data mining steps (data cleaning, data integration, data selection and transformation, data mining, model evaluation) @ image pre-processing steps on the data used.
3. Able to select and use artificial intelligence algorithms in performance testing.
4. Able to provide justification for experimental methods and results.
5. Exhibits analytical abilities and exhibits problem-solving abilities.</td></tr>
</table>

7. Sentiment Analysis (Sentiment Analysis) *Example: Analysis of Ethnic Sentiments in Current Malaysian Politics* 8. Data Mining (Data Mining) *Example: Forecasting Lake Chini Water Quality Using Data Mining Techniques In Python.* 9. Intelligent Systems *Example: Landmark Building Recognition System And Reclamation* 10. Vision Systems *Example: Application to Detect Vehicles Through Static Cameras at Different Times Using Deep Learning*	

SOFTWARE TECHNOLOGY	
Project Type	**Specific Criteria**
The system, application or algorithm developed is related to one of the fields below: 1. Mobile Application (Mobile Application) *Example: Student Attendance Mobile Application* 2. Web Technology *Example: Hotel Management System* 3. Database *Example: School Integration System Database* 4. Cloud Computing (Cloud Computing) *Example: School Management System Using AWS*	Project development must meet criteria based on the type of project as follows: 1. Develop projects by following a specific Software Development Process – for example, Waterfall, Incremental development. 2. Develop projects using a specific Software Development Approach – for example, Structured, Object-oriented. 3. Using a software development approach consistently for each phase of project development – for example, consistently using an object-oriented approach starting from the analysis phase, to the design phase, and then to the implementation phase. 4. Conduct testing using the most suitable Testing Techniques to test the developed software – for example, Unit testing, Black box testing. 5. Using the appropriate Software Architecture in developing software – for example, Model-ViewController pattern (standalone application/system), Distributed, Cloud. 6. Demonstrate the ability to analyze problems and provide appropriate software technology solutions. 7. Use appropriate tools and libraries to solve problems and be able to justify the selection.

NETWORK TECHNOLOGY	
Project Type	**Specific Criteria**
The system, application, or algorithm developed is related to one of the fields below: 1. Network Protocol (Network Protocol) *Example: Data Efficiency Rate for Indoor LiFi* 2. Internet of Things (Internet of Things) *Example: Internet of Things for Home Invasion Systems* 3. Network Security (Network Security) *Example: Security Operations Center* 4. Ad Hoc Network *Example: Routing Protocol for Ad hoc Networks* 5. Sensor Network (Sensor Network) *Example: Patient Tracking System* 6. Blockchain *Example: Secure Voting System based on Blockchain* 7. Cloud Computing (Cloud Computing) *Example: Cloud based Attendance System* 8. Cryptography *Example: Lightweight Cryptography Performance Rate*	Project development must meet criteria based on the type of project as follows: 1. Can build simulations for network protocols 2. Test and then analyze the results for comparison between two network protocols. 3. Using different parameters to produce new results. 4. Using a new situation for a newly built application. 5. Test and then analyze the results for a protocol that is built. 6. Construction of network applications, network protocols, and wireless applications – for example, zigbee. 7. Successfully fully developed the built application. 8. Analyze protocol usage in depth by way of code usage and application construction 9. Use of existing communication tools, techniques and protocols – examples of real world use of zigbee and WiFi .

INFORMATION TECHNOLOGY

The goal of the project is to produce innovations in the field of information technology that solve complex information technology-related problems. This project uses computer technology to achieve goals at the organizational, community and personal levels.

Information Technology projects developed by students must meet the following general criteria:

i.   The problems selected for the project are based on computing needs identified through the analysis of complex real-world problems at the organizational, societal and personal levels.

ii. The problem-solving process needs to use computing methods in the appropriate platform, i.e. hardware such as laptops, tablets, smartphones, and cloud computing; and software such as Windows, Linux, Android and iOS.

iii. The chosen computing method should involve a combination of knowledge gained through courses such as Programming, Networking, Human-Computer Interaction, Databases, Web and Mobile Systems, System and Network Administration and elective courses. Combinations are appropriate and able to highlight the complexity of the problem to be solved.

iv. The chosen computing method must be proven to successfully solve problems through the design, implementation and evaluation phases to meet computing needs in the context of information technology.

INFORMATION TECHNOLOGY	
Project Type	**Criteria**

1. Web application
i. Organization
   Example 1: Website with E-commerce.
   for Terengganu Copper Crafts.
   Example 2: A secure EzFinance Financial System using Django.
i. Society
   Example 1: Security Patrol System Based on Ez-Ronda2 Global Positioning System Technology
iii. Personal
   Example 1: A Mapping-Based Student Job Planning System.
	1. Proficient in web programming such as PHP, Python or equivalent.
	2. Able to use technologies that meet industry standards such as Laravel, Django or equivalent.
	3. Able to integrate data in structured formats such as XML or JSON synchronously and asynchronously.
	4. Able to validate data input on a client-server approach.
	5. Able to read and modify data in the server database.
	6. Able to apply design principles based on user experience (User Experience Design (UXD)).

2. <u>Mobile Application</u> i. Organization *Example 1: Student Services* *Mobile Application.* i. Society *Example 1: Application to* *Detect Drowsiness While* *Driving using Arduino* iii. Personal *Example 1: Mobile application* *for monitoring children's* *behavior and stimulation.* *Example 2: Interactive Stress* *Management Application* *Example 3: Budget Mobile* *Application For University* *Students In Malaysia.*	1. Proficient in mobile programming such as Java, C# or equivalent. 2. Able to use technology that meets industry standards such as Android Studio, Unity or equivalent. 3. Able to integrate data in structured formats such as XML, JSON or equivalent synchronously and asynchronously. 4. Able to validate data input on a client-server approach. 5. Able to read and modify data in the server database. 6. Able to apply design principles based on user experience (User Experience Design (UXD)).

SOFTWARE ENGINEERING
(INFORMATION SYSTEM DEVELOPMENT)

Information systems developed by students must meet the following general criteria:

i. Using IOS, Windows or Android platforms.

ii. Apply a mobile, web-based or cloud architecture.

iii. Ensure the main function of the problem is identified and solved (the use of real case studies and data is an advantage (added value)).

iv. Apply database based on client-server.

v. Produce documents related to Software Engineering (Project Plan, Software Requirements Specification, Software Design Specification, Software Testing Specification).

SOFTWARE ENGINEERING (INFORMATION SYSTEM DEVELOPMENT)	
Project Type	**Specific Criteria**
The development of an information system is related to one of the fields below:	Project development must meet criteria based on the following types of projects:
1. Management Information System, MIS An information system that automates the organization's management process and produces information systematically. *Example:* 　*i. Student Information System* 　*ii. Weather Information System* 　*iii. Accounting information system* 　*iv. Geographic Information System* 　*v. Health Information System*	Management Information System, MIS: 1. Students need to include elements of business processing. 2. Students need to ensure that the system can provide functions to plan, organize and control information. 3. Students need to produce a report that is oriented towards a combination of textual and graphical user-friendly features.
2. Transaction Processing System (TPS) An information system that helps management track the day-to-day work of operations and records them in a database. *Example:* 　*i. Financial / Accounting System* 　*ii. Stock Control System* 　*iii. Sales/Payment System* 　*iv. Ordering/Delivery System*	Transaction Processing System (TPS): 1. Using **real data or datasets** in a database. 2. Students need to use data processing techniques such as batch processing, real-time processing, *online processing* or *hybrid processing*. 3. Able to provide justification for the methods and decisions made.

3. Decision Support System (DSS) An interconnected set of computer programs and data is needed to support analysis and decision-making in an organization. *Example: Clinical Decision Support System*	Decision Support System (DSS): 1. Students need to use models or analytical techniques (statistical analysis) to make decisions automatically. 2. Students need to develop support models using a data science approach. 3. Students need to visualize analysis and reports using the 'dashboard' method and data science approach. 4. Students need to use a two-tier database.
4. Knowledge Management System *(KMS)* A system that captures, develops and shares information effectively by using organizational knowledge. *Example:* *i. Fruit Knowledge Management System* *ii. Document Management System* *iii. Portal System* *iv. Quality management system* *v. Audit Management System*	Knowledge Management System (KMS): 1. Students need to use KMS concepts/elements in system development. 2. Students need to integrate information from various sources in an organization and store this information in a centralized knowledge base to be shared. 3. Students need to provide facilities for knowledge-base queries to allow users to find and add information.

5. Executive Information System, (EIS)
An information system that provides systematic information for top management.
Example:
i. Human Resource Management Executive Information System
ii. UKM Executive Information System
iii. eProfiling system
	Executive Information System, (EIS):
	1. Students need to use DSS elements to supply users with decision-oriented information.
	2. Students need to provide information on the overall performance of the firm from various sources such as
	   - Internal database (corporate PD, e-mail, software library)
	   - External PD
	   - Social media, news to executives;
	3. Information can be manipulated: visual and graphic display, "drill down" – from general to specific information.
	4. Application of management concepts: CSF; Management by exception (general and special reports for cases that are out of the ordinary or expected; *mental model (information compression)*.

SOFTWARE ENGINEERING
(MULTIMEDIA SYSTEM DEVELOPMENT)

Multimedia system developed by students must meet the following general criteria:

i. Integrating multimedia elements (graphics, animation (2D & 3D), audio and video).

ii. Ensure the main function of the problem is identified and solved (the use of real case studies and data is an advantage (added value)).

iii. A multimedia system that applies a database, and uses appropriate multimedia software to manipulate data.

iv. Having the value of innovation and creativity they place the content of the interface.

v. Produce documents related to Software Engineering (Project Plan, Software Requirements Specification, Software Design Specification, Software Testing Specification).

SOFTWARE ENGINEERING (MULTIMEDIA SYSTEM DEVELOPMENT)	
Project Type	**Specific Criteria**
The development of a multimedia system is related to one of the fields below:	Project development must meet criteria based on the following types of projects:
1. Multimedia System related to Education & Training Education and training related systems that provide structured activities to users. *Example:* *i. Digital Storytelling* *ii. Fun learning* *iii. Computer-based Training Learning (Computer-based Training, CBT)*	Multimedia Systems related to Education & Training: 1. Develop three learning components/modules (concepts, exercises/tutorials, tests). 2. Involves data input from users that can be stored and processed into output in the form of information or knowledge. 3. Conduct usability/effectiveness testing. 4. Implement the concept of collaborative learning (bonus).

2. Serious Games
Serious games are games developed for a purpose other than mere entertainment, such as games for education, training, and therapy (health).
Example:
i. Health & Wellness Life
ii. General Education / Environment / Safety
iii. Natural Disasters / Natural Disaster Management / Education for Dealing with Natural Disasters
	Serious Games :
	1. Computer games produced:
	  - Meets the characteristics of digital games (having: concept/story; game objectives; levels, scores, strategies, and challenges).
	  - Potentially increases awareness of real-world domains.
	  - Potentially improves management and problem-solving skills in real-world domains
	  - Potentially sharpens sensitivity to important issues/points to consider in real-world domains
	2. Assessment usability/playability.
	3. Implement a collaborative game concept (bonus).

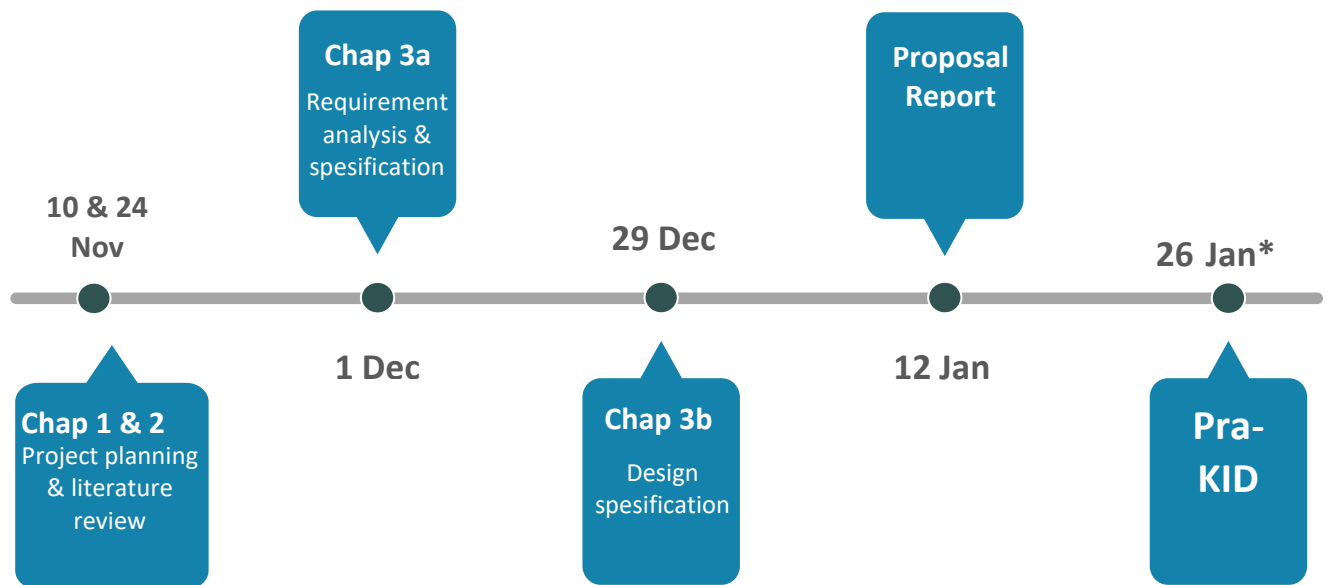|	
iv. Education based on Curriculum	

3. <u>Multimedia Information System</u>
Multimedia information system are used for the storage, search, and manipulation of information in visual form.
Example:
  i. Advisory Service Order System
  ii. Library Museum System
  iii. Multimedia Information Access System
  iv. Interactive Catalog System
  v. Maps (such as Airports, Campuses, and Malls)
	<u>Multimedia Information System:</u>
	1. A multimedia system that provides useful information/guidance without the need for counter service.
	2. Involves data input from users that can be stored and processed into output in the form of information or knowledge.
	3. Evaluation of usability/user acceptance.

4. <u>Virtual Reality/Expanded & Simulation</u>
Virtual/augmented reality and simulation are methods or ways in which users visualize, manipulate and interact with computers and complex data.
Example:
i. Medicine
  - Diagnosis (example: Virtual Bronchoscopy).
  - Virtual anatomy
  - Surgery
ii. Education
  - Exploration Learning (example: CyberMath- Algebra & Geometry)
  - Learning by Building Virtual Worlds (example: Virtual Garden)
iii. Arts & Entertainment (examples: Virtual Museums and Video Games)
iv. Military
  - Trainer Unit and Virtual Cockpit (example: Pilot Simulator)
  - Platoon Leadership Training
  - Virtual Environment for submarine ship handling training (VESUB)
	<u>Virtual Reality/Expanded & Simulation:</u>
	1. A multimedia system that prioritizes components:
	- Virtual world/environment (database- contains geometric representation and attributes for all objects in the environment).
	- Simulation engine (maintaining the virtual environment including interaction control – for example, visualizing info graphics for weather data).
	- Graphics engine (generates the image that the user sees which is accessed from the database, also involving textures, sounds and special effects).
	- User interface (controls how the user interacts, manipulates and navigates in the virtual environment).
	- input and output (usually independent of the software being used).
	2. Evaluation of usability/user acceptance.

PROJECT PROPOSAL PLANNING SCHEDULE

WEEK	DATE	DESCRIPTION
Week 1	17 – 21 Oct	First meeting of Supervisor and Student Getting to know each other and discussing topics
	21 Oct	● Skills Training Module 1: Project Management
Week 2	25 – 28 Oct	Present 1 - Discussion of Chapter 1 Project Planning with the Supervisor
	26 – 30 Oct	● Update project information on SPID
	28 Oct	Skills Training Module 2: Literature Review
Week 3	31 Oct - 2 Nov	Project title evaluation
	31 Oct –2 Nov	Independent
		● Writing Chapter 1
	3 Nov	Present 2 - Discussion of Chapter 2 Literature Review with the Supervisor
	4 Nov	Skills Training Module 3: Library Research - Information Search
Week 4	7 – 9 Nov	Independent
		● Writing Chapter 2
	10 Nov	Deliverable 1: Chapter 1 Project Planning
	11 Nov	Skills Training Module 4: Study Requirement
Week 5	14 – 16 Nov	Independent
		● Analyze and prepare requirements specifications
	17 Nov	Present 3 - Discussion of Chapter 3a Requirements Analysis and Specification with the supervisor.
Week 6	21 – 24 Nov	Independent
		● Analyze and prepare requirements analysis and specifications
	24 Nov	Deliverable 2: Chapter 2 Literature Review

	25 Nov	Skills Training Module 5: Project and Technical Writing
Week 7	28 – 30 Nov	Independent ● Improved Chapter 1 and Chapter 2 ● Writing Chapter 3a
	1 Dec	Deliverable 3: Chapter 3a – Requirements Analysis and Specification
	2 Dec	Skills Training Module 6: Software/Project Design Course
5 - 11 DEC MID-SEMESTER BREAK		
Week 8	12 – 14 Dec	Independent ● Provide Design Specifications
	15 Dec	Present 4 - Discussion of Chapter 3b Design Specifications with supervisor
Week 9	19 – 21 Dec	Independent ● Provide Design Specifications
	22 Dec	Present 5 - Discussion of Chapter 3b Design Specifications with supervisor
Week 10	26 - 28 Dec	Independent ● Writing Chapter 3b
	29 Dec	Deliverable 4: Chapter 3b Design Specifications
Week 11	2 Jan	Preparation of proposal report (Compilation of Chapter 1 – Chapter 3)
	2 – 6 Jan	Independent ● Writing a proposal report ● Refer to the Web Development and Data Analytics course to solidify the proposal report.
Week 12	9 – 12 Jan	Independent ● Writing a proposal report ● Refer to the Mobile Application Development, Gaming/IoT/Robotics/ Cyber surveillance course to strengthen the proposal report.

	12 Jan	Deliverable 5: Proposal Report
Week 13	16 – 19 Jan	Independent ● Preparation of Pra-KID slide presentation
	20 Jan	Present 6 – Pra-KID Demo and Mock presentation with the supervisor.
Week 14	23 – 27 Jan	**Pra-KID Presentation –26 Jan 2023 (*subject to change)**

KEY TRACK TTT_4172 PROJECT PROPOSAL

Chap 3a
Requirement analysis & spesification

Proposal Report

10 & 24 Nov

29 Dec

26 Jan*

1 Dec

12 Jan

Chap 1 & 2
Project planning & literature review

Chap 3b
Design spesification

Pra-KID

*Subject to change

All documents must:

- submitted to supervisor (hard or soft copy depending on supervisor)

AND

- upload the soft copy to the Digital Innovation Management System (SPID).

CHAPTER 1 PROJECT PLANNING

INTRODUCTION

- Introduce the title by briefly explaining the main points that led to the identification of the problem/requirement.
- State the importance of the title by giving background and appropriate information (ie by using facts and citing sources).

PROBLEM STATEMENT

- Clearly define the problem the project will address (ie a clear statement of the problem/need you have identified to address).
- Describe the problem.

PROPOSED SOLUTIONS

Based on the problem that has been identified, explain the possible solutions that the project will produce.

OBJECTIVE

State the project objectives based on the SMART approach:

- ✔ S – Specific
- ✔ M – Can be measured (Measurable)
- ✔ A – Achievable
- ✔ R – Relevant
- ✔ T – Duration (Timed)

SCOPE

Specify the scope of the final product (ie what will be included and what will not be included).

RESTRICTIONS

State the conditions, circumstances or events that may prevent and limit the implementation of the project (eg domain complexity, data confidentiality, access to experts and others).

METHODOLOGY

- Propose and explain the specific development process model that will be used in the project (eg Waterfall, Increment Development, Spiral, Reuse/Component-oriented, Rational Unified Process).
- Explain why the process model was chosen.

IMPLEMENTATION SCHEDULE

- State the tasks/activities to be implemented in the form of a Work Breakdown Structure (WBS).
- Identify the relationship between activities.
- Estimate the time required to perform each activity.
- Identify project milestones.
- Organize activities using a Gantt Chart (which shows the key relationships and tracks of activities).

CONCLUSION

- Give a summary of the contents of Chapter 1.
- Emphasize the importance of the project.

REFERENCE

- List sources of information that support the proposal (ie books, newspaper clippings, conference papers and journal articles, web portals, etc.).
- Use the UKM Style reference format.

CHAPTER 2 LITERATURE REVIEW

INTRODUCTION

Give a brief introduction about the document and why the literature review was conducted.

BACKGROUND

- Give the background of the research problem, which leads to the need for a solution.
- Give important definitions or concepts from reliable sources.

COMPARE AND CONTRAST

- Describe/criticize the existing system/technology.
- Compare and contrast existing systems/technology and discuss critically.
- Summary of research gaps
- Suggest a solution.

CONCLUSION

- Summarize the content of Chapter 2.

REFERENCE

- List sources of information that support the proposal (ie books, newspaper clippings, conference papers and journal articles, web portals, etc.).
- Use the GAYA UKM reference format.

APPENDIX

Include diagrams or charts related to this document.

CHAPTER 3a REQUIREMENTS ANALYSIS AND SPECIFICATION

INTRODUCTION

Explain how the proposed solution fits the overall strategic or business objectives of an organization/community (ie how it will work with other systems or environments) or fits the identified problem, based on the approach of the respective program area (for example artificial intelligence, networks, information science and others).

DEFINITION OF USER NEEDS

Describe the services provided for users (functional needs of users) using clear language that is easy for users to understand.

SYSTEM REQUIREMENT SPECIFICATIONS*

- Specify system functional requirements for each user functional requirement.
- Specify non-functional (quality) requirements and domain requirements.
- Determine hardware and software requirements during development (for developers to build the product) and deployment (for users to use the product).
- For projects in the network field, specify the system requirements through the OSI model to specify the protocols involved in network communication, or specify the cyber security requirements found in the developed system.

SYSTEM MODEL*

Choose ONE of the following two approaches: 1) Object-oriented approach, OR, 2) structured analysis; DO NOT combine the two.

Object-oriented approach:
- case diagrams and use case specifications to describe the functional requirements of the system.
- A sequence diagram to show the sequence of interactions between the user and the system.
- Activity diagram or flow chart to show the steps of the process in sequence.
- For projects in the field of networking, data communication diagrams through the OSI model.

OR

Structured analysis approach:
- Context diagram to show the scope and boundaries of the system.

- Flow diagram to show the level of detail of the process (at least up to the 2nd level).
- A flow chart to show the steps of the process in sequence.

CONCLUSION

- Summarize the content of Chapter 3a.

Note:

* This is a guide, it may not fit your project. You are asked to discuss with the supervisor or Program Leader to come up with the exact specifications and model of the system.

REFERENCE

- List sources of information that support the proposal (ie books, newspaper clippings, conference papers and journal articles, web portals, etc.).
- Use the GAYA UKM reference format.

APPENDIX

- Briefly explain the data selection method for product requirements (who, when, what, why, how). Include some evidence (examples of interview questions/scripts, survey questionnaires, photos as evidence of observations, etc.).
- Briefly describe the requirements validation process (such as testing, reviews/ walkthroughs, and prototyping).

CHAPTER 3b DESIGN SPECIFICATION

INTRODUCTION

Give an overview of the document:

- Describe the purpose of this document.
- Describe the scope of this document.
- Link this document with other related documents:
  - ✓ Documents that provide background and/or context for this document (eg Project Plan/Proposal, Requirements Specification).
- Define any important terms, acronyms or abbreviations.

ARCHITECTURAL DESIGN

- Identify and explain the appropriate architecture design to use to develop the system (eg Layered, Model-View-Controller, Repository, Client-Server, Pipe-Filter and others)
- Describe the modules/sub-systems and their relationships using appropriate diagrams (eg Module Hierarchy Chart/Structure Chart etc.).
- For projects in the network field, identify and explain the network topology design that is suitable to be used to develop the system (Logical and physical topology - hardware, MAC address, IP address and so on).

DATABASE DESIGN (If relevant)

- Class Diagram (for object oriented approach) OR
  Entity Relationship Diagram (for structured analysis approach).

- Data Dictionary to list attributes of each entity OR class.

ALGORITHM DESIGN

- Design the algorithm used to provide system functions (example pseudo code, decision table/tree, system/program flow chart).
- Describe the behavior of the system, if any (such as a Statechart diagram or a Sequence diagram of the interaction between objects for an object-oriented approach).

INTERFACE DESIGN

- Sketch user interfaces using low-fidelity (ie card-based prototyping) or high-fidelity prototyping (like Macromedia Director/Visual Basic/MS PowerPoint etc.).
- Design system interfaces between modules/sub-systems.
- Storyboard to illustrate the UI/UX of a multimedia system.

Note: The design required depends on the proposed solution and the respective field. Use as needed. Consult the Program Leader for more information.

CONCLUSION

- Summarize the contents of Chapter 3b.

REFERENCE

- List sources of information that support the proposal (ie books, newspaper clippings, conference papers and journal articles, web portals, etc.).
- Use the UKM Style reference format.

PROPOSAL REPORT

ABSTRACT

Provide a brief overview of the entire project (in one paragraph), containing the following information:
- The main aspect/object/subject of the project.
- The problem faced by the aspect/object/subject to be solved.
- Suggested solutions to overcome the stated problem.
- The methodology used to develop/produce the proposed solution.
- Expected project results.

CHAPTER 1: PROJECT PLANNING

- **Introduction:** Introduce the project by briefly explaining the main points that led to the identification of the problem/requirement. Demonstrate the importance of the project by providing appropriate information or background.
- **Problem Statement:** Clearly state the specific problem the project will address. Describe the problem.
- **Proposed Solution:** Based on the problem that has been identified, explain the possible solution that the project will produce. Explain how the proposed solution fits the overall strategic or business objectives of an organization/community (ie how it will work with other systems or environments) or fits the identified problem, based on the approach of the respective fields (for example artificial intelligence, networks, information science and others).
- **Objectives:** State the objectives of the project based on the SMART approach.
- **Scope:** Specify the scope of the final product (ie what will be included and what will not be included).
- **Constraints:** State the conditions, circumstances or events that can prevent and limit the implementation of the project (eg domain complexity, data confidentiality, access to experts and others).
- **Methodology:** Describe the specific approach or development process model used in the project (eg Waterfall, Increment Development, Spiral, Reuse/Component-oriented, Rational Unified Process). State why such a model or approach was chosen.
- **Implementation Schedule:** State the tasks/activities to be implemented in the form of a Work Breakdown Structure (WBS). Identify relationships between activities. Estimate the time required to perform each activity. Identify project milestones. Organize activities using a Gantt Chart (which shows the key relationships and tracks of activities).

CHAPTER 2: LITERATURE REVIEW
- **Introduction:** Introduce the chapter**.**
- **[Chapter content]:** Describe existing systems/technologies/approaches relevant to your project. Discuss the system/technology/approach. Compare and contrast existing systems/technologies/approaches and provide proposed solutions.
- **Conclusion:** Give a summary of the chapter.

CHAPTER 3: RESEARCH METHODOLOGY (Taken from CHAPTER 3a and 3b)
- **Introduction:** Introduce the chapter.
- **User Needs:** Describe the service provided for the user (functional user needs) using language that is easy for the user to understand.
- **System Requirements:** Specify system functional requirements for each user functional requirement. Specify non-functional (quality) requirements and domain requirements. Determine hardware and software requirements during development (for developers to build the product) and deployment (for users to use the product). For projects in the network field, specify the system requirements through the OSI model to specify the protocols involved in network communication, or specify the cyber security requirements found in the developed system.
- **System Model:** Explain the system model either using, 1) Object-oriented approach OR 2) structured analysis; DO NOT combine the two.
- **Architecture**: Identify and explain the appropriate architectural design to use to develop the system (eg *Layered, Repository, Model-View-Controller, Client-Server, Pipe-Filter* and others). Describe the modules/sub-systems and their relationships using appropriate diagrams (eg Module Hierarchy Chart/Structure Chart etc.). For projects in the network field, identify and explain the network topology design that is suitable to be used to develop the system (Logical and physical topology - hardware, MAC address, IP address and so on).
- **Database**: Database design either uses a Class Diagram (for an object-oriented approach) OR an Entity Relationship Diagram (for a structured analysis approach). Set up a Data Dictionary to list the attributes of each entity OR class.
- **Algorithms:** Design algorithms used to provide system functionality (e.g. pseudo code, decision tables/trees, system/program flow charts). Describe the behavior of the system, if any (such as a Statechart diagram or a Sequence diagram of the interaction between objects for an object-oriented approach).
- **Interface**: Sketch the user interface using fidelity low (i.e. card-based prototyping) or high-fidelity prototyping (such as *Macromedia Director/Visual Basic/MS PowerPoint* and others). Design system interfaces between modules/sub-systems. Storyboard to illustrate the UI/UX of a multimedia system.
- **Conclusion:** Give a summary of the chapter.

REFERENCE

- Recent and diverse references related to the project (books, newspaper clippings, conference papers and journal articles, web portals, etc.).
  - 5 years ago
  - Minimum of 10 references
  - journal reference
- Use the GAYA UKM reference format.

APPENDIX

- Any document or material that can support the project proposal.

Note*: The content of these chapters depends on the proposed solutions and their respective fields. Use as needed. Consult the Program Leader for more information.

RUBRIC OF ASSESSMENT

SCORES DISTRIBUTION

The evaluation of TTT_4172 is divided into two namely;

1. **Continuous assessment** which represents 40% of the mark and is assessed by the project supervisor.
2. **The final assessment** represents 60% of the mark and is assessed by the supervisor and also the examiner at the end of the semester (proposal presentation and final report).

Tables 1 to 5 show the distribution and scoring scheme.

Table 1: Score distribution based on learning domains

Learning Domain	Continuous (40%)		Final – Pra-KID (60%)		Total	Distribution of marks	
	Supervisor	Examiner	Supervisor	Examiner		Supervisor	Examiner
Affective (A)	20		5	10	35	25	10
Cognitive (K)	20		15	30	65	35	30
Total	40		20	40	100	60	40

Table 2: Score distribution based on indicators

Domain Learning	Supervisor		Examiner	
	Indicator	Percent	Indicator	Percent
Affective (A)	Present II-Chapter 1 and Chapter 2 (6%) Present III-Chapter 3a (7%) Present IV, V-Chapter 3b (7%) Present VI-Supervisor Form (5%)	25%	Presentation – Examiner Form	5%
			Demo of the system/product design – Examiner Form	5%
Cognitive (K)	Present I, II-Chapter 1 and Chapter 2 (8%) Present III-Chapter 3a (5%) Present IV, V-Chapter 3b (7%) Proposal Report–Supervisor Form (15%)	35%	Report (D4) – Examiner Form	30%
	Total	60%	Total	40%

Table 3: Continuous Assessment Scoring Scheme

CHAPTER 1: PROJECT PLANNING and CHAPTER 2: LITERATURE REVIEW (14%)		
Supervision and Presentation (K4% + A4%)	Contents of Chapter 1 and Chapter 2 (K4%)	Commitment (A2%)
0. No presentation took place. 1. The presentation was ineffective. 2. Presentation is less effective. 3. The presentation was quite effective. 4. Effective presentation. 5. The presentation of information is explained very effectively.	0. No report. 1. The writing of the report is unclear or does not discuss the main ideas required. 2. The writing of the prepared report is not clear. 3. The report writing contains some fairly clear information. 4. Report writing contains clear information. 5. The writing of the report contains very clear and sufficient information.	0. Students do not show any commitment. 1. Students show very low commitment. 2. Students show low commitment. 3. Students show moderate commitment. 4. Students show good commitment. 5. Students show high commitment.
CHAPTER 3a: METHODOLOGY (REQUIREMENTS ANALYSIS AND SPECIFICATION) (12%)		
Supervision and Presentation (K2% + A4%)	Contents of Chapter 3a (K3%)	Commitment (A3%)
0. No presentation took place. 1. The presentation was ineffective. 2. Presentation is less effective. 3. The presentation was quite effective. 4. Effective presentation. 5. The presentation of information is explained very effectively.	0. No report. 1. The writing of the report is unclear or does not discuss the main ideas required. 2. The writing of the prepared report is not clear. 3. The report writing contains some fairly clear information. 4. Report writing contains clear information. 5. The writing of the report contains very clear and sufficient information.	0. Students do not show any commitment. 1. Students show very low commitment. 2. Students show low commitment. 3. Students show moderate commitment. 4. Students show good commitment. 5. Students show high commitment.

CHAPTER 3b: METHODOLOGY (DESIGN SPECIFICATIONS) (14%)		
Supervision and Presentation (K2% + A4%)	Contents of Chapter 3b (K5%)	Commitment (A3%)
0. No presentation took place.	0. No report.	0. Students do not show any commitment .
1. The presentation was ineffective.	1. The writing of the report is unclear or does not discuss the main ideas required.	1. Students show very low commitment.
2. Presentation is less effective.	2. The writing of the prepared report is not clear.	2. Students show low commitment.
3. The presentation was quite effective.	3. The report writing contains some fairly clear information.	3. Students show moderate commitment.
4. Effective presentation.	4. Report writing contains clear information.	4. Students show good commitment.
5. The presentation of information is explained very effectively.	5. The writing of the report contains very clear and sufficient information.	5. Students show high commitment.

Table 4: Scoring Scheme of Final Evaluation by Supervisor

PRA-KID RUBRIC – SUPERVISOR (20%)								
PART A: COGNITIVE ELEMENTS (15%)								
HPK 1: Analyzing Literature Studies From Various Sources HPK 2: Proposing Solutions using appropriate methods and techniques								
Indicator: Proposal Document								
Evaluation Criteria	Indicator	0 No evidence	1 Weak	2 Moderate	3 Good	4 Very good	5 Excellent	
Background and problem statement have been improved.	Chapter 1							
The objectives and scope of the project were refined to match the background and problem statement.	Chapter 1							
Latest and various references related to the project. - 5 years ago - Minimum of 10 references - There must be a journal reference	Chapter 2							
The results of the analysis were discussed critically.	Chapter 2							
Summary of study gaps improved.	Chapter 2							
Data or functional specifications are identified using appropriate methods and meet the objectives.	Chapter 3							
Able to explain the phases in the methodology effectively.	Chapter 3							
Project design or software design uses standard, comprehensive, complex and grounded methods. (Example: using correct notation or correct phase).	Chapter 3							
Data design (data design for software or pre-processing related matters for datasets).	Chapter 3							
Process/architecture design (the process involved for the software or for each phase).	Chapter 3							
Display input and output (interface design, or expected results.	Chapter 3							
Able to write well and follow the UKM style format.	Project Proposal							

PART B: AFFECTIVE ELEMENTS (5%)							
HPK 3: Present and defend a proposal							
Indicator: Discussion							
Evaluation Criteria	Indicator	0 No evidence	1 Weak	2 Moderate	3 Good	4 Very good	5 Excellent
Present and answer questions clearly and confidently.							
Able to propose solutions to problems related to project management.							
Able to propose entrepreneurial value expectations.							

Table 5: Scoring Scheme of Final Assessment by Examiner

PRA-KID RUBRIC – EXAMINER (40%)								
PART A: COGNITIVE ELEMENTS (30%)								
HPK 1: Analyzing Literature Studies From Various Sources HPK 2: Proposing Solutions using appropriate methods and techniques								
Indicator: Proposal Document								
Evaluation Criteria	Indicator	0 No evidence	1 Weak	2 Moderate	3 Good	4 Very good	5 Excellent	
Background and problem statement are clearly discussed.	Chapter 1							
The objectives and scope of the project coincide with the background and problem statement.	Chapter 1							
Recent and diverse references related to the project. - 5 years ago - Minimum of 10 references - There must be a journal reference	Chapter 1							
The results of the analysis were discussed critically.	Chapter 2							
The summary of research gaps is clearly stated.	Chapter 2							
Able to explain the phases in the methodology effectively.	Chapter 3							
Data or functional specifications are identified using appropriate methods and meet the objectives.	Chapter 3							
Project design or software design uses standard, comprehensive, complex and grounded methods (Example: using correct notation or correct phase)	Chapter 3							
Data design (data design for software or pre-processing related matters for datasets)	Chapter 3							
Process/architecture design (the processes involved for the software or for each phase)	Chapter 3							
Display input and output (Interface design, or expected results or related)	Chapter 3							
Able to write well and follow the GAYA UKM format.	Proposed Report							

PART B: AFFECTIVE ELEMENTS (10%)							
HPK 3: Present and defend a proposal							
Indicator: Discussion							
Evaluation Criteria	Indicator	0 No evidence	1 Weak	2 Moderate	3 Good	4 Very good	5 Excellent
Present and answer questions clearly and confidently							
Presentations and demos using interesting tools (such as interface prototype demos using adobe xd, etc.).							

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