

GUIDE AND INSTRUCTIONS IN WRITING CHAPTER 3

Define the means (resources) and modes (methods) of data collection and how a specific results is to be calculated.

A. FOR PURE INFORMATION TECHNOLOGY DEVELOPMENT/ SOFTWARE/ SYSTEM DEVELOPMENT

Here’s the content:

- ✓ Requirement Analysis
- ✓ Requirement Documentation
- ✓ Design of Software, Systems, Product and/ or Processes
- ✓ System Architectural Diagram
- ✓ Development and Testing
- ✓ Implementation Plan

A. 1: Requirement Analysis

In the beginning, the student-proponent should bear in mind that the proposed system or software must provide computing solutions to address the needs of the organization.

Thus, the proponent must first determine information requirements with regards to specific organization under study.

- Who** (the people who are involved)
- What** (the business activity)
- Where** (the environment in which the work takes)
- When** (the timing, scheduling, planning timetabling)
- How** (how the current procedures are performed)

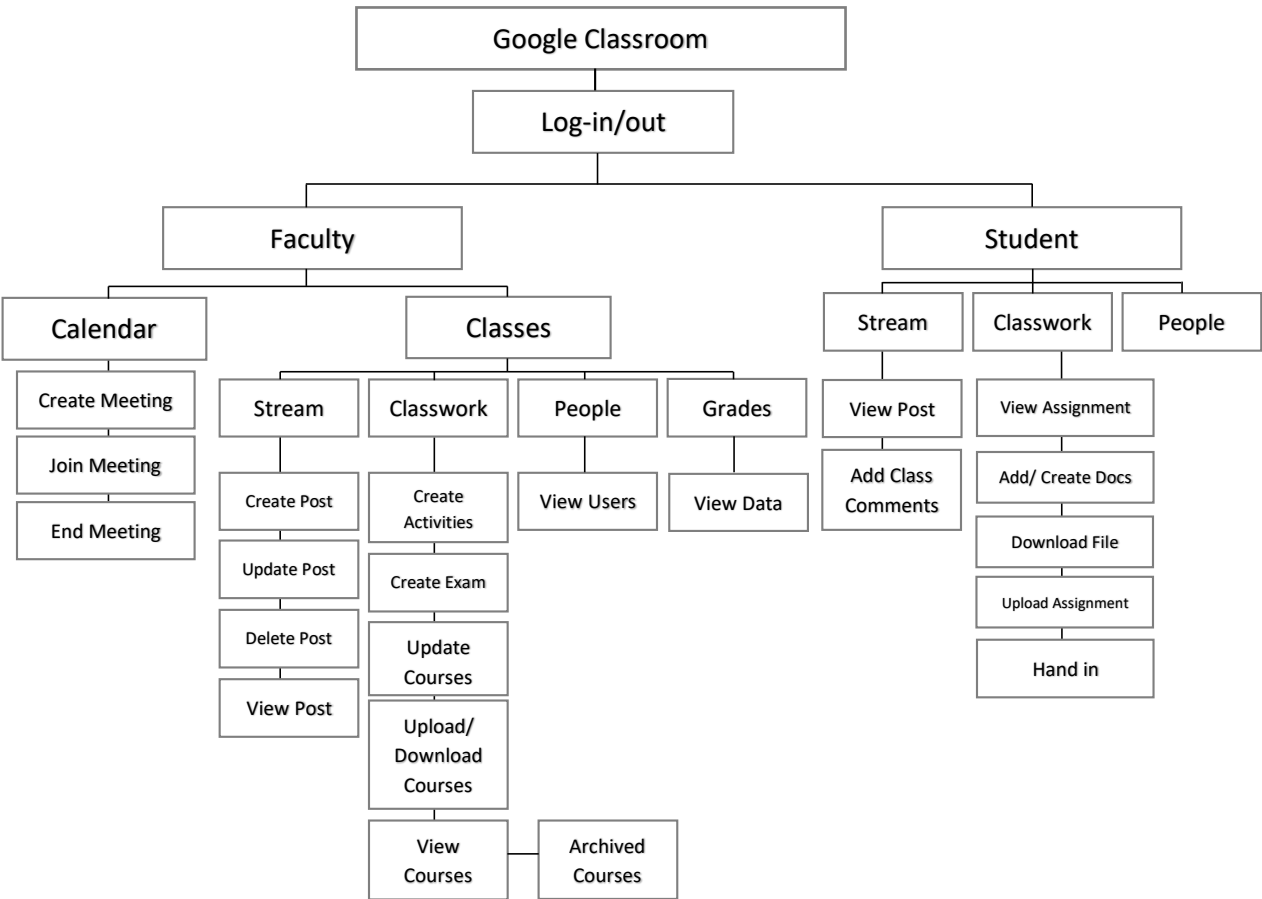
The proponent must know and analyze why the business uses the current system. There must be reasons why current methods are used and these should be considered when designing the proposed system.

Content Diagram (Existing & Proposed) (Any of the Following)

- Data flow diagram
 - Context Diagram
 - Diagram 0
 - Child Diagrams
- Unified Modeling Language
- System Flowchart
- Functional Decomposition Diagram (FDD)

Sample Functional Decomposition Diagram (FDD)

*Sample Functional Decomposition Diagram of an existing access of the Google Classroom



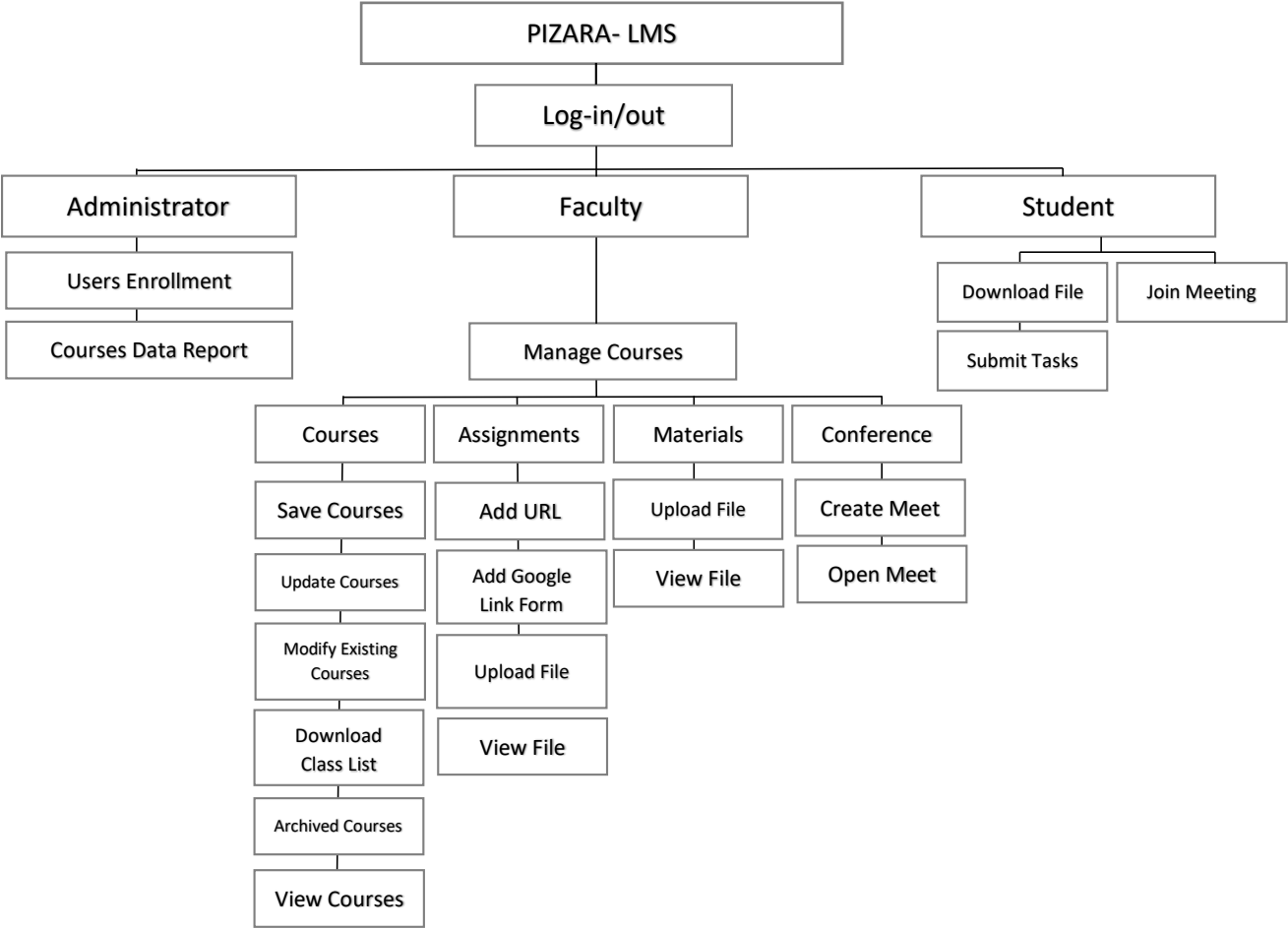
A. 2: Requirement Documentation NOTE: Presentation na to ng proposed system nyo.

Establishes the basis for agreement between the client and the developers on what the software product is to do. All software features are enumerated in details. “How the software will do”

Functional Decomposition Diagram - *Discuss the features of each Function/Process.*

Sample Functional Decomposition Diagram (FDD)

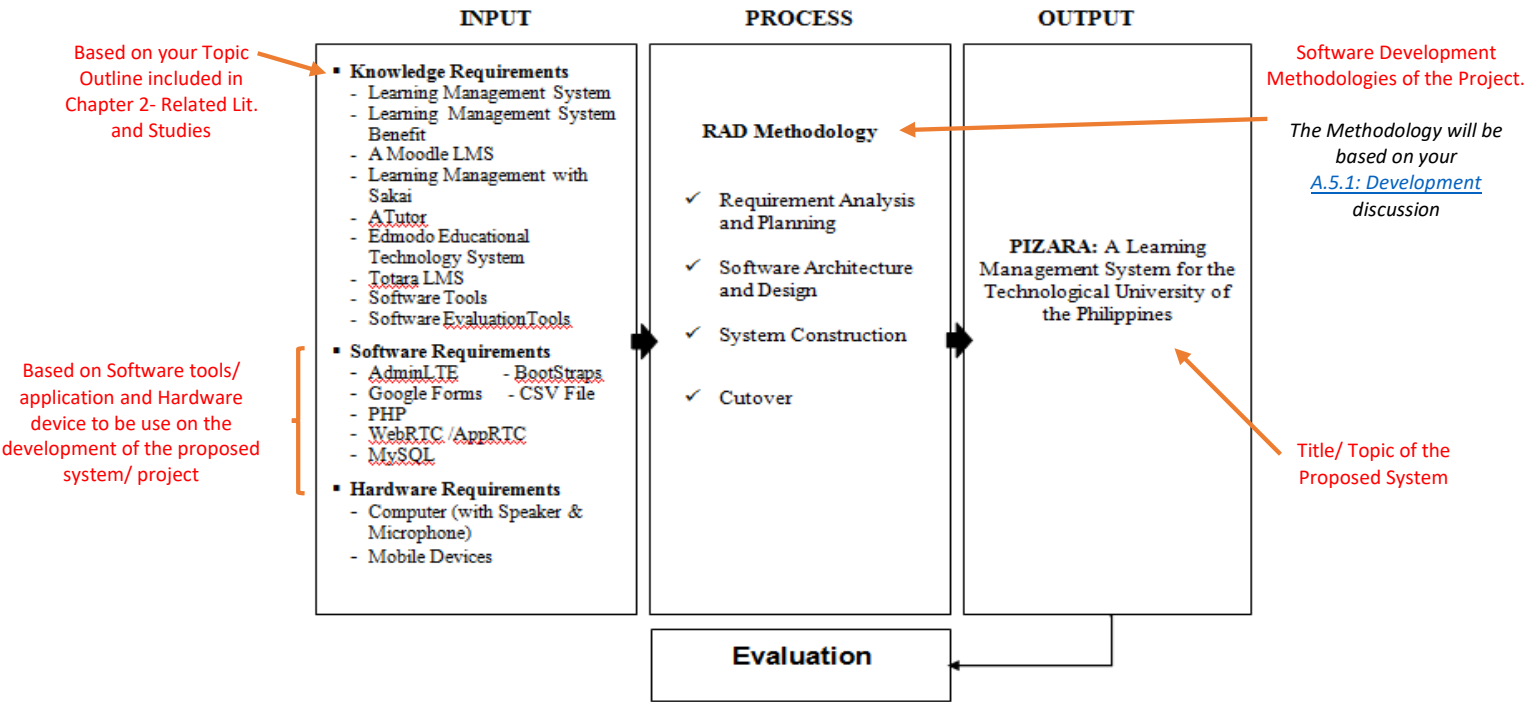
*Sample Functional Decomposition Diagram of the proposed PIZARA- Learning Management System



A. 3: Design of Software, Systems, Product and/or Processes

In this section, the proponent will describe in details how he/she will design the proposed system in accordance with standards.

See Sample format on how to write IPO diagram on your proposed system.



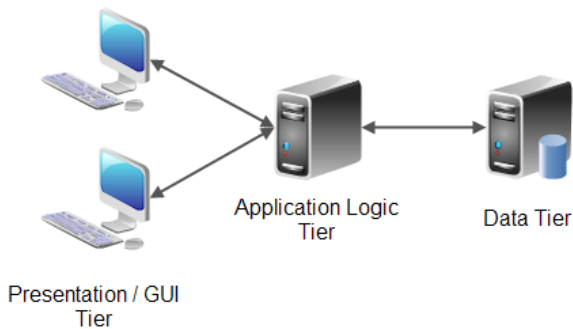
A. 4: System Architectural Diagram

Presentation of the proposed blueprint or architectural diagram of your system.

Content Diagram

- N-Tier System Architecture
 - N tier architecture means splitting up the system into N tiers, where N is a number from 1 and up. A1 tier architecture is the same as a single process architecture. A2 tier architecture is the same as a client / server architecture etc.
 - A3 tier architecture is a very common architecture. A3 tier architecture is typically split into a presentation or GUI tier, an application logic tier, and a data tier. This diagram illustrates a 3 tier architecture:

See Sample format:



Discussion:

The presentation or GUI tier contains the user interface of the application. The presentation tier is "dumb", meaning it does not make any application decisions. It just forwards the user's actions to the application logic tier. If the user needs to enter information, this is done in the presentation tier too.

The application logic tier makes all the application decisions. This is where the "business logic" is located. The application logic knows what is possible, and what is allowed etc. The application logic reads and stores data in the data tier.

The data tier stores the data used in the application. The data tier can typically store data safely, perform transactions, search through large amounts of data quickly etc.

A. 5: Development and Testing

Content

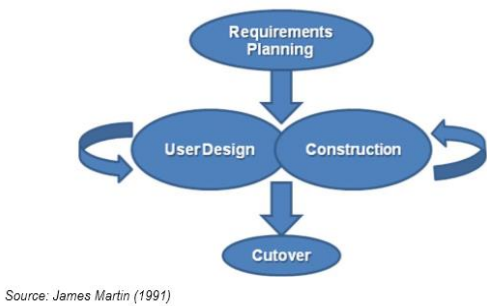
- Development
- Testing Procedures
- Project Evaluation

A.5.1: Development

Select an appropriate system development methodology that is a framework used to structure, plan, and control the process of developing an information system and discuss your plan of action in each stage.

- Systems Development Life Cycle (SDLC)/ Waterfall Model
- Joint Application Development (JAD)
- Rapid Application Development (RAD)
- Prototyping

Sample 1:



PROJECT DEVELOPMENT

The Rapid Application Development (RAD) model was used in developing the system. Each phase of the development is elaborated on this part of the study and discusses how the project was conducted and developed. It covers the procedure of construction of the mobile application and the website, as well as how the system was conceptualize and developed.

Figure 3. Rapid Application Development (RAD) model of EZ Biz

Discussion:

The Figure 3 shows the Project Development of the EZ Biz Mobile Application System using the Rapid Application Development method. The researchers' uses the RAD model because in software development methodology RAD uses minimal planning in favor of rapid prototyping. A prototype is a working model that is functionally equivalent to a component of the product. In this the DOST SETUP Link mobile application was use as a prototype for the development of the EZ Biz mobile application.

The RAD method divides the process into four distinct phases which the study begins by requirement planning phase which combined the element of system planning and system analysis stage, followed by user design phase which the users interact with the process that allows users to understand, modify, and eventually approve a working model of the system that meets their needs. The construction phase focuses on program and application development of the project. The last phase is the cutover phase: includes testing, introduction of the new system and user training.

Phase 1: Requirement Planning

In this phase, system processes definition and description occurs. The gathering of data is very important in this phase for proper system planning. The researchers and the DOST-NCR representatives discusses and agreed on the need of the project, its scope, constraint and system requirements. Data were also collected through online research in the internet for proper content of the system. There were continues discussion and meeting to the DOST-NCR representative for supplementation and verification of the data gathered. After the gathering all important data and agrees on the all key issues and obtain the management authorization the next phase process is next.

Phase 2: User Design

In this stage there were constant interactive process of the user were done on a model mobile application that represent all system processes, inputs, and outputs which is the DOST Setup Link mobile application. This is to know and verify the design needed by the users. The gathered data were adopted to design that would be the outcome of the system. The researchers allow the user to understand and adjust the working model according to the desired outcome of the system. The content of the EZ Biz mobile app where designed and followed based on the need and want of the customer.

Phase 3: Construction

This phase focuses on the application and development of the system. The EZ Biz mobile app was developed using the Eclipse - Android Development Tool (ADT) for android programming. Combination of Hypertext Markup Language (HTML) 5, JQuery and JavaScript was used in developing the mobile application. Cascading Style Sheet (CSS) and Bootstrap framework was also used to design the application. The development of CMS which is the back-end of the EZ Biz was developed using Hypertext Preprocessor (PHP). The database was designed using an open source relational database management system which is the MySQL and an open source cross-platform web server solution stack package which is the XAMPP. The CMS was uploaded on the internet to test the online function of the EZ Biz mobile app and to further improve the system of the developed application.

Phase 4: Cut-over

In this phase, the system were tested for actual operation by the users to authenticate if the program meets the requirement of the users and to validate as well if the programmer had satisfied the objectives of the research. The mobile application and even the CMS website of EZ Biz was presented to the DOST-NCR management to show the final outcome of the system. The EZ Biz mobile application was launch and introduced to the MSME for testing and evaluation of the performance of the developed system. In this stage, the system was presented to train the MSME as well as the representatives of the DOST-NCR on how the system works and how to use it. Maintenance operation are conducted when a defect or a bug is found ensure the standard quality of the developed EZ Biz mobile application.

Sample 2:

PROJECT DEVELOPMENT

The proponents used the Waterfall Model to illustrate the processes to undergo throughout have development of the system. The following will discuss each one of the phases of the model and how it will help the proponents in their study. Below are the phases of the conducted systems development.

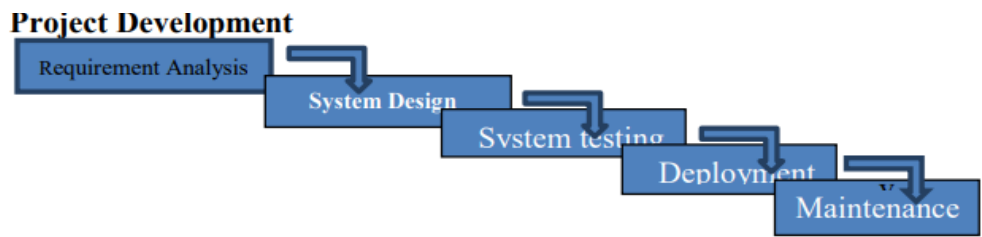


Figure 12. The Waterfall Model

Requirement Analysis phase, this is the primary phase in the Systems Development Life Cycle (SDLC). The proponent’s gathered as much as data through collecting different documents that are essential for the system. The proponents also observed the issues encountered by the center regarding when consulting. In addition, the proponents frequently interact with the beneficiary in order to determine the causes and effects such issues and acquire new ideas on how to come up with the solutions.

System Design phase, after the necessary data are gathered, the proponents proceeded to the System Design phase. This is where the proponents acquired both hardware and software requirements to be able to conduct the coding, designing of the user interface and designing database.

The design flow of the Health Center Information System starts with login whereas the user will provide the username and password.

Once the Username and Password is provided the user will see all the data of the patients. In case user lost or accidentally delete some of the data, it will still be available because there’s another copy on external/hard drive.

The user will be the one in control of the system and can manage the command **Add, Update and Delete.**

System Testing phase, this phase included the testing of the system’s functional and operational aspects using trial and error method. The proponents gathered respondents to test the system and acquire information regarding the system’s performance. This helped the proponents identify the bugs and glitches within the system and further improve the system’s functionality. It helped the proponents to determine if the system meets the software engineering standards, and the user’s needs.

Deployment phase, once the bugs and glitches have been identified and corrected, and the system’s functionality has been improved, the system’s deployment will take place. In this phase, the proponents will let the beneficiaries use the actual system with its full potential, fully functional and operational. Meaning, the system in this phase will be subject for longer usage.

Maintenance phase, the final phase of the SDLC, where the proponents will maintain the system’s functionality, integrate new features, which will make the system more reliable, efficient, and acceptable to the users. This also includes adding security features to the system in order to prevent data loss and modifications.

A.5.1: Testing Procedure

Testing procedure is needed when testing the program to determine the error occurs in the system. Although it cannot guarantee the complete removal of errors in a program, but it can reduce its number to the lowest possible level if the program is tested in an efficient and accurate way.

Program test were conducted in a specified order of testing to verify that a program and a system controlled by it can function according to specifications.

Sample format:

In **Functional Testing**, each module will be checked and validated. Every activity that has been test and complete is subject to test according to its *unit testing, integration testing, system testing and acceptance testing* to ensure that it conforms to all the requirements of each component as shown in Table 1.

(Sample No. 1)

Table 1
Testing Procedure undertaken by the Proponents

| Component / Module | Test Conducted |
|---|---|
| Online database connection of the mobile application. | a. Tap the check net button on the EZ Biz mobile application. b. Updated files should be loaded on the mobile app. |
| Data sending from mobile to the website | a. Select the comment box, type in some text message and tap the submit button. b. Check EZ Biz administrator website to see the send message. |
| Real-time update of the system | a. Add or update a product on the website. b. Check EZ Biz mobile application to view real-time update of the system. |
| Communication connection | a. Select from one button in the contact us section in the mobile app (SMS, Call, Email, Website) |
| Locate market | b. Tap the map button on the contact us section c. Google GPS map will display and point the location of the market where to buy the products. |

(Sample No. 2)

Table 1
Testing Procedure undertaken by the Proponents

| Component / Module | Test Conducted |
|-------------------------------|---|
| Offline Database Connectivity | a. User registration is expected to add and insert the data. b. Insert record data is expected to add the query. c. Queuing process is expected to add the value/ number to process the request. |
| UI Elements Functionality | a. Searching the ID of the user is expected to work run properly. b. Delete function button is expected to erase and remove the data. c. Add, Update, Submit function button is expected to work properly without error loading. d. Print function button is expected to provide a query data. e. Report function button is expected to provide statistical data. |
| Real-time Update | a. Queuing process is expected to run accurately according to input data. b. Descriptive analysis process is expected to display statistical data (table and graph/ chart). |

A.5.1: Project Evaluation

The evaluation instrument was based on the characteristics and sub-characteristics provided by ISO/IEC 25010:2011.

Respondents of the study were the individual users of the system such as the 10 Information Technology (I.T.) experts and 20 actual users. Purposive sampling was used to select the number of respondents. Purposive sampling is a non-probability sampling technique; it is a form of sampling in which the selection of the sample is based on the judgment of the researchers as to which subjects.

PROJECT
EVALUATION
- Just copy on your
term paper and no
need to change..
Same lang dn na
content ang laman
kaya applicable na
to sa nyong
proposed system.

Table 2
System Evaluation Characteristics ISO/IEC 25010:2011 Software Evaluation for both Users and IT Experts

| Software Characteristics | Description |
|---------------------------|---|
| Functionality Suitability | Degree to which a product or system provides functions that meet stated and implied needs when used under specified conditions. |
| Performance Efficiency | Performance relative to the amount of resources used under stated conditions |
| Compatibility | Degree to which a product, system or component can exchange information with other products, systems or components and/or perform its required functions, while sharing the same hardware or software environment |
| Usability | Degree to which a product or system can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use |
| Reliability | Degree to which a system, product or component performs specified functions under specified conditions for a specified period of time |
| Security | Degree to which a product or system protects information and data so that persons or other products or systems have the degree of data access appropriate to their types and levels of authorization |
| Maintainability | Degree of effectiveness and efficiency with which a product or system can be modified by the intended maintainers |
| Portability | Degree of effectiveness and efficiency with which a system, product or component can be transferred from one hardware, software or other operational or usage environment to another |

The statistical tool were used in the interpretation of data is weighted arithmetic mean as shown at table 3. Arithmetic mean is used to determine the average responses of the five option in each item, namely, 5(excellent), 4(very good), 3(good), 2(fair) and 1(poor). The arithmetic means for each software characteristics were computed. These were used to derive the overall evaluation mean.

Table 3
Likert Scale

| Scale | Range of Mean Value | Interpretation |
|-------|---------------------|----------------|
| 5 | 4.51 – 5.00 | Excellent |
| 4 | 3.51 – 4.50 | Very Good |
| 3 | 2.51 – 3.50 | Good |
| 2 | 1.51 – 2.50 | Fair |
| 1 | 1.00 – 1.51 | Poor |

A. 6: Implementation Plan

Describe how the information system will be deployed, installed and transitioned into an operational system. The plan contains an overview of the system, a brief description of the major tasks involved in the implementation, the overall resources needed to support the implementation effort (such as hardware, software, facilities, materials, and personnel), and any site- specific implementation requirements.

For practical reason, although an implementation plan is relevant in real applications, it would be impractical for the students to include on the scope of your capstone project, the implementation of the software product which they have developed, unless, the implementation is the main objective of the capstone project.

This is possible if the software had been developed and the main objective is to effectively integrate IT-based solutions into the user environment and/or to deploy and use tools and techniques necessary for IS practice.

Sample:

The developed system will be presented to the Barangay Poblacion Health Center after the revisions and finalizations are made. If the barangay office proceeds to the adaptation of the system, the proponents will submit the complete version of the system together with its documentation. Table 4 shows the implementation plan of the proponents as guide for this study.

This sample na ginawa ko pwd nyo i-Apply and gamitin sa term paper nyo same content no need to change including table 4 sample.

Table 4
Implementation Table

| Strategy | Activities | Persons Involved | Duration |
|---------------------------|--|---|------------|
| Approval from the company | Send letters for the approval of Administrators | Researchers, Administrator | 1 – 2 Days |
| System Installation | Installation of the system and checking of the facility that needs an upgrade (software and hardware). | Researchers, Administrator | 2 - 3 Days |
| Information Distribution | Send Flyers, Brochures, Posters, and User Manual | Researchers, Administrator | 1 Day |
| 3- Day Training | Hands-on Training and System Demo/ Lectures | Researchers, Adviser, Officer and Administrator | 3 Days |

Proposed Design of the System

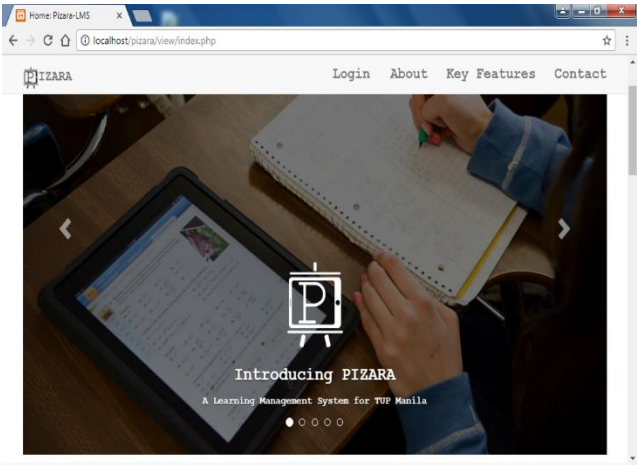


Figure 1. Main page of the proposed system

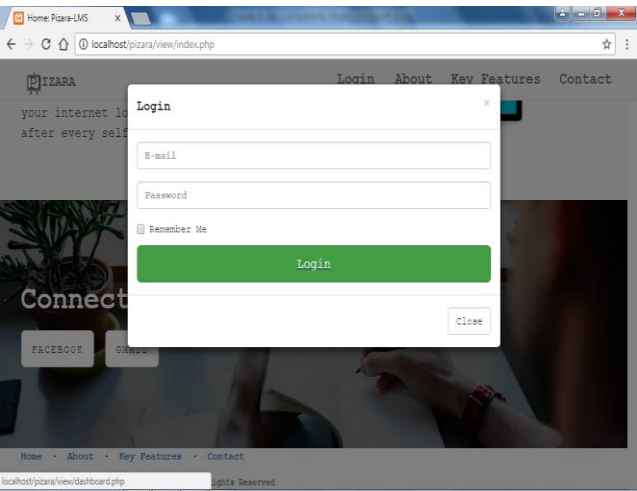


Figure 2. Log in/out screen page for user of the proposed system

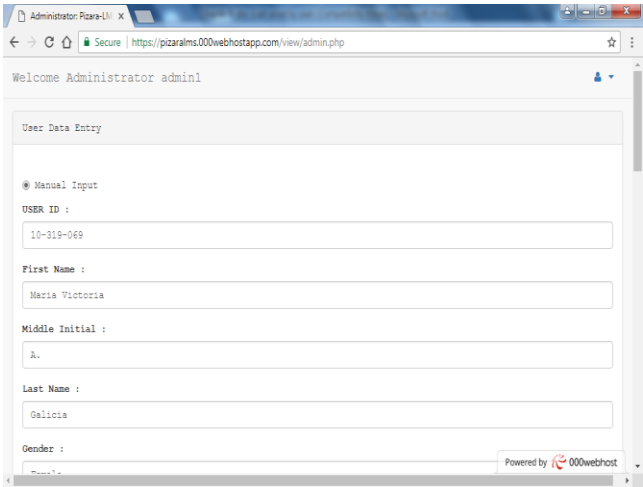


Figure 3. User account registration screen page to access the proposed system

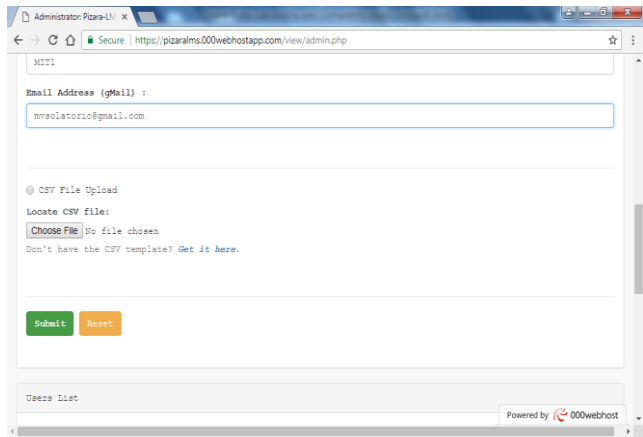


Figure 4. An import class list using CSV file screen page of the proposed system

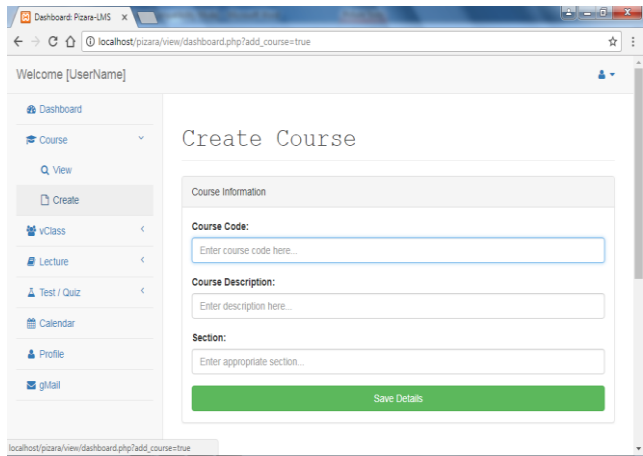


Figure 5. Course creation module screen page of the proposed system

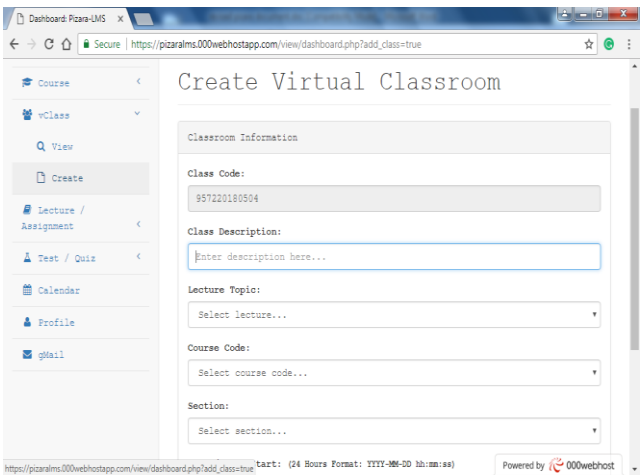


Figure 6. Virtual classroom creation module screen page of the proposed system

B. FOR GAME DEVELOPMENT

Here's the content:

- ✓ Requirement Analysis
 - ✓ Requirement Documentation
 - ✓ Game Design Document
 - Game Name
 - Game Concept
 - Genre
 - Target Audience
 - Game Play and Mechanics
 - Game Progression,
 - Level Structure,
 - Objectives,
 - and Mechanics
 - Game Options
 - Target Design Document
 - ✓ Technical Design Document
 - Project Overview
 - Out of Scope
 - Technical Specification
 - ✓ [Design of Software, Systems, Product and/ or Processes](#)
 - ✓ [System Architectural Diagram](#)
 - ✓ [Development and Testing](#)
 - ✓ Implementation Plan
- GDD & TDD
Eto yung additional na content kapag GAME Development yung proposed system nyo.. The rest of the content is same lang then refer to the above sample.
- Sa part ng Implementation Plan magkaiba dn sa pure system development. Pls. refer on the given sample below.

B. 1: Requirement Analysis

In the beginning, the student-proponent should bear in mind that the proposed game system must upgrade/ innovate the existing game application to address the needs of the end users.

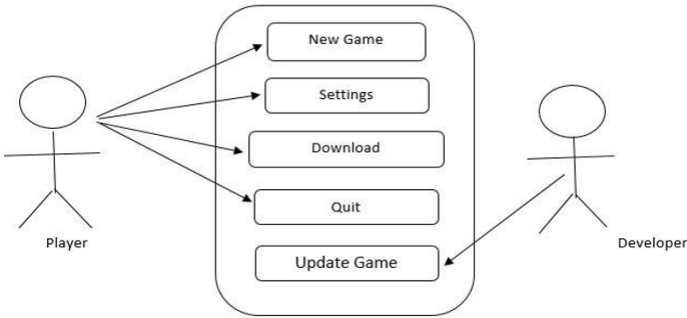
Content Diagram (Existing diagram will use the following)

- Unified Modelling Language (UML)
 - Use Case Diagram
 - Sequence Diagram

NOTE: On this section, magPresent ka ng existing related GAME na gagamitin mo. Ang objective naten dto is ma compare kung ano dapat magiging additional or innovation ng game na wala sa existing game related to your proposed system.

Sample Use Case Diagram

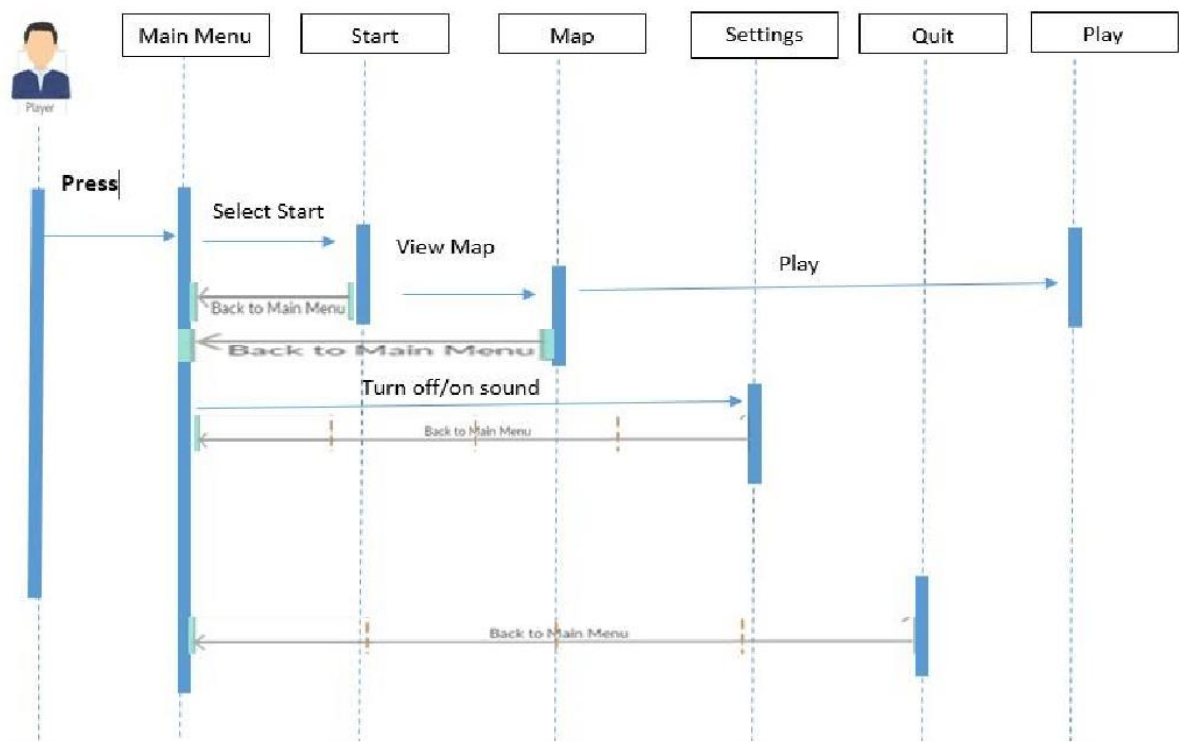
*Sample Use Case of La Heroes Venganza Game Diagram



Discussion:

Figure 1, shows the interaction of existing related game called “La Heroes Venganza” to its player and developer. It also shows how the changes in the diagram will flow over the game. This figure can help the future readers to understand and to familiarize in overall function of the game.

Sample Sequence Diagram
*Sample Sequence Case of La Heroes Venganza Game Diagram



Discussion:
Figure 2, Sequence Diagram of Pinoy Legend shows the sequence on how the player can control the game. This game consists of the following modules such as main menu, character, game map, story, settings and quit button. Where the users can know how to access and working with the game.

B. 2: Requirement Documentation

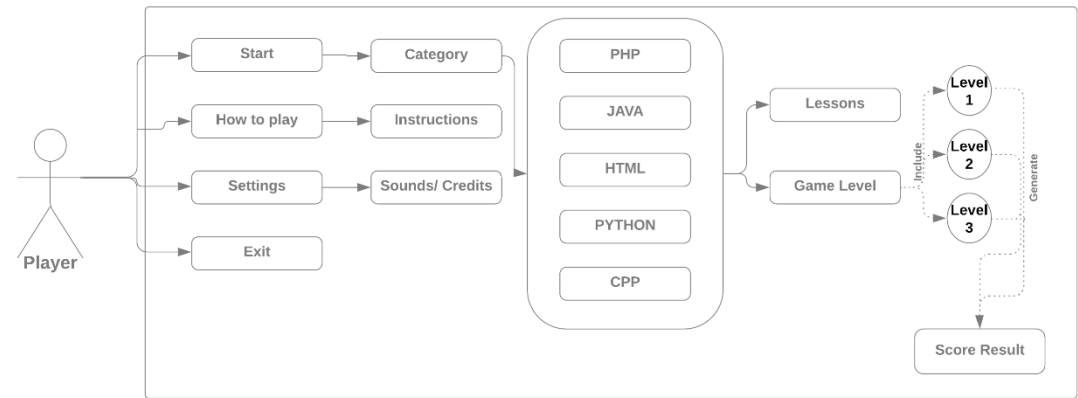
Establishes the basis for agreement between the client and the developers on what the game software product is to do. All software features are enumerated in details. “How the game software will do”.

NOTE: Presentation na to ng proposed game system nyo.

Content Diagram (Proposed diagram will use the following)

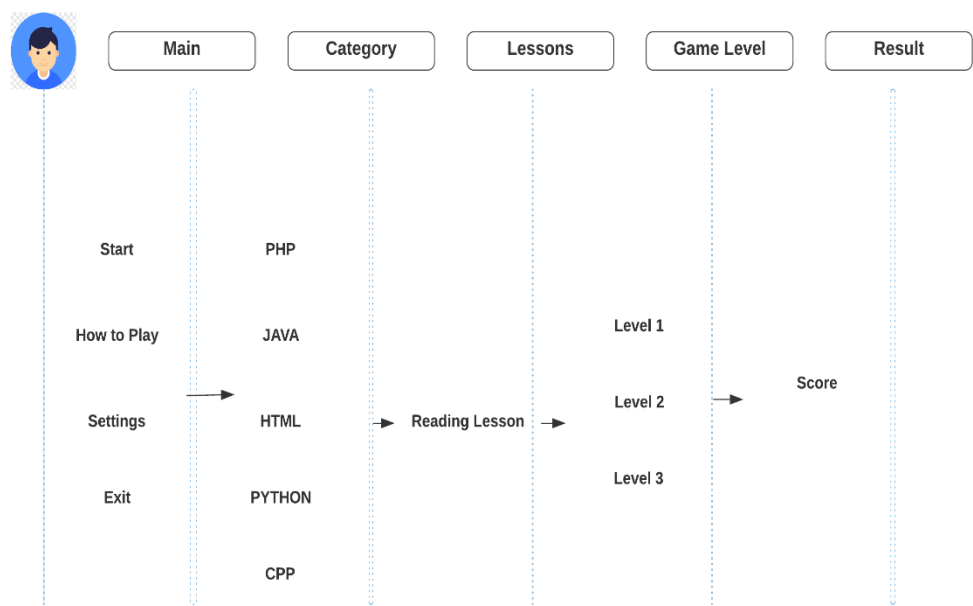
- Unified Modelling Language (UML)
 - Use Case Diagram
 - Sequence Diagram

Sample Use Case Diagram of the Proposed Game



Sample Discussion:
Figure 3, shows the use case diagram of the proposed game Tap To Learn Game Quiz to its player and developer.

Sample Sequence Diagram of the Proposed Game



Sample Discussion:

The above figure shows the sequence diagram of the game entitled Tap To Learn Game to its player and developer. The main flow of the game shows. That perform different sequence include: Main, Category, Lessons, Game Level, Result.

- A. Main: Contains the following buttons:
 - Start – Introduce the categories.
 - How to play – Instructions about the game flow.
 - Settings – Shows the credits, and sounds setting.
 - Exit – This button is to close/ exit the application.
- B. Category: Contains the 5 computer programming language:
 - PHP, JAVA, HTML, PYTHON and CPP
- C. Lessons – Instructions about the computer programming language.
- D. Game Level – Have 3 level
 - Level 1 – Tackles about the programming fundamentals and data types, constant and variable.
 - Level 2 – Tackles about the, sequential control structure and iterative structure.
 - Level 3 – Tackles about the functions and conditional structure.
- E. Result – Show the score of the player.

B. 2: Game Design Document Outline

- A. *Game Name:* Tap To Learn: An Android Based For IT Related Students
- B. *Game Concept:* A Programming Language Quiz Game with different levels.
- C. *Genre:* An Educational Game
- D. *Target Audience:* The users who have interest in this kind of game, especially for the incoming first year students in computer course.
- E. Game play and Mechanics
 - *Game Progression:* Tap to Learn contains of different levels that follows the computer languages.
 - *Level Structure:* The player should at least complete the required score needed from certain game level in order to move to the next level.
 - *Objectives:* The objective of this game is to support the students what is computer language is all about, to improve their skills and knowledge related to specific programming language.
 - *Mechanics*
 - i. Physics- The user can used android phone to play game.
 - ii. This game has a different level.
 - iii. When the player completed the level of the game he/she will unlocked other level

F. Game Options

- Restart: The existing level which the restart button pressed will be restart.
- Quit: Able to quit/exit the game.

G. Target Design Document

Target Hardware- Minimum API Level Android 4.1 “Jelly Bean” Development Hardware and Software. The proposed game is developed using Android Studio version 4.1.0 also installed SDK project game engine written in Java.

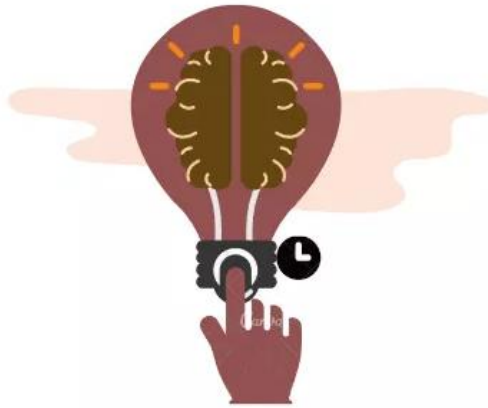


Figure 5. Proposed Design of the Game App Logo

B. 3: Technical Development Design

Project Overview

Android is a mobile operating system developed by Google. It based on a modified version of the Linux kernel and other open source software and it is designed primarily for touch screen mobile devices such as smart phones and tablets. In addition, Google has further developed Android TV for television, Android Auto for cars, and Wear OS for wrist watches, each with specialized user interface. Variants of Android are also used on game consoles, digital cameras, PCs and other electronics. The objective of this game is to enhance their knowledge about the computer languages in educational way.

A. Out of scope

- i. Tap To Learn has a Level 1, Level 2 and Level 3
- ii. It is an application created only for touch screen.

B. Technical Specification

- i. Device RAM usage requirements at least 2GB RAM
- ii. Android phone

Testing Procedures (Sample Format)

This part of the report examines about the framework documentation. Investigation to get ready for future utilization of the application to the Android Smart telephones and tablets in which a cautious learn about the framework are finished by separating the things that is expected to make the framework viable.

Table 1
Testing Procedure undertaken by the Proponents

| Component / Module | Test Conducted |
|---|---|
| Tap the game icon and install the application | a. The application is expected to download and install from the Play store to mobile devices. |
| Game Levels Game Sounds | a. Displays the different levels and work functionally. b. The sounds of the game is expected to send audio effects and sound to the user. |
| Game Environment | a. The game is expected to interact with the users; easy to load, accessible button, friendly- environment and entertaining. |
| Game Sounds, Effects and Background Music | a. The game is expected to work the sounds properly, clear and interesting according to its themes and effects. |
| Music Game Instructions and Values | a. The game is expected to give users understanding on the themes and gain users knowledge. |

B. 8: Implementation Plan

Describe how the game system will be deployed and installed in Google Play Store. The plan contains an overview of the system, a brief description of the major tasks involved in the implementation, the overall resources needed to support the implementation effort (such as hardware, software, facilities, materials, and personnel), and any site-specific implementation requirements.

For practical reason, although an implementation plan is relevant in real applications, it would be impractical for the students to include on the scope of your capstone project, the implementation of the software product which they have developed, unless, the implementation is the main objective of the capstone project.

This is possible if the software had been developed and the main objective is to effectively integrate IT-based solutions into the user environment and/or to deploy and use tools and techniques necessary for IS practice.

Sample:

After the development and finalization of the proposed game system will be upload to Google Play Store. The proponents will submit the complete version of the system together with its documentation to the Adviser and the Research Panel members. Table 1 shows the implementation plan of the proponents as guide for this study.

This sample na ginawa ko pwd nyo i-Apply and gamitin sa term paper nyo same content no need to change including table 4 sample.

Table 1
Implementation Table

| Strategy | Activities | Persons Involved | Duration |
|--|--|-------------------------------------|----------|
| Opened an account on Google play store | Opened an account on Google Play Store | Researchers, Advisers, Thesis panel | 1 Day |
| Game publication | Uploaded the game application in Google Play store | Researchers | 1 Day |
| Information Distribution | Social Media Sites | Users, Researchers | 1 Day |
| | Manual (ShareIt, Bluetooth) | Users, Researchers | 1 Day |