

Chapter 3

METHODOLOGY RESULTS AND DISCUSSION

Materials and Methods is the chronological listing of steps and procedure/s used by the proponent/s. Methods used for gathering of data, laboratory and field experiment, theoretical and/or conceptual frameworks, as well as techniques employed in the analyses of data must be specifically listed.

Software Design, Products and/or Processes

The proponent(s) shall describe in detail how he will design the proposed system in accordance with standards.

This section can be represented by Hierarchical Input-Process-Output (HIPO). Provide an explanation about the diagram.

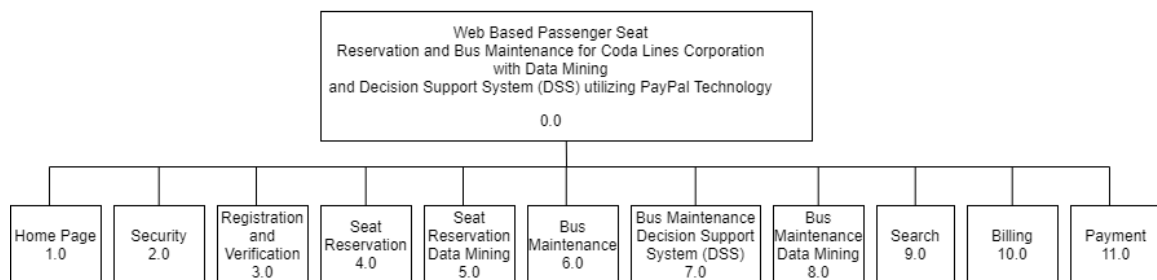


Figure 3.1 Sample of HIPO

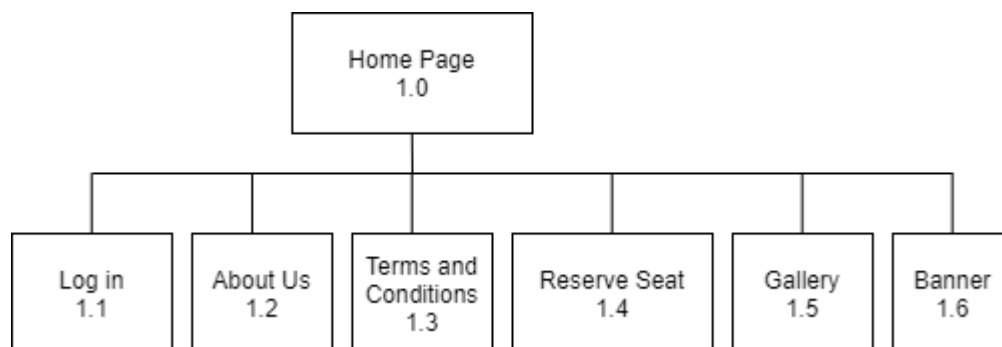


Figure 3.2 Homepage

System Architecture

This will show that the students have an idea on how to identify, formulate and solve computing problems.

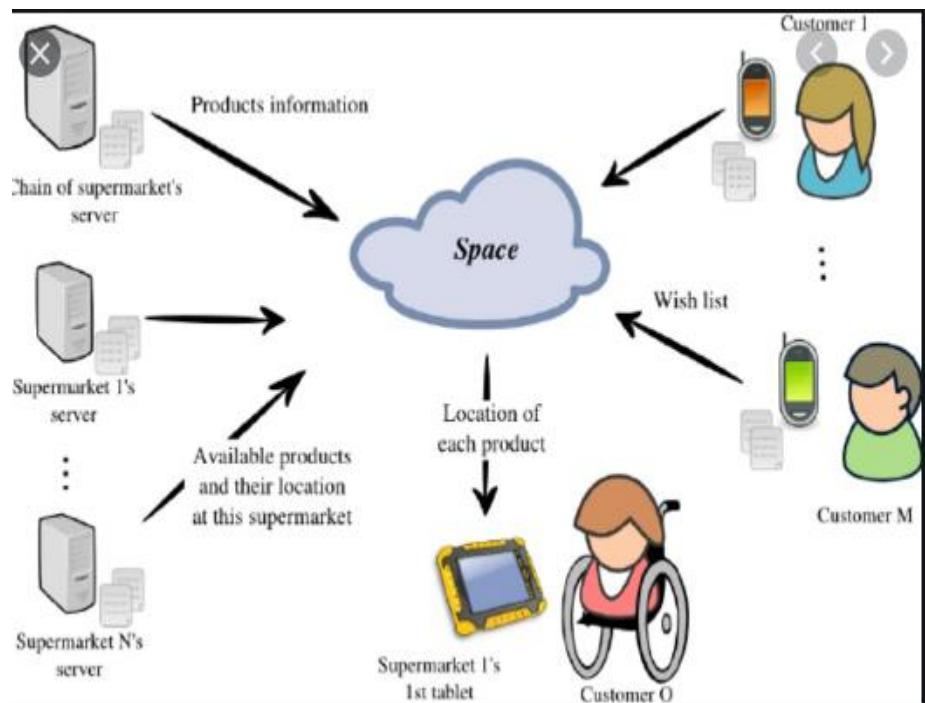


Figure 3.3 System Architecture of the Title of the System

Discuss the System Architecture diagram

Conceptual Design

This section represents the application as a conceptual entity-relationship model. Verification of the conceptual design is required (usually included in the Results and Discussion chapter) to ensure that all needed data has been acquired and that it supports all processes identified in the requirement specifications.

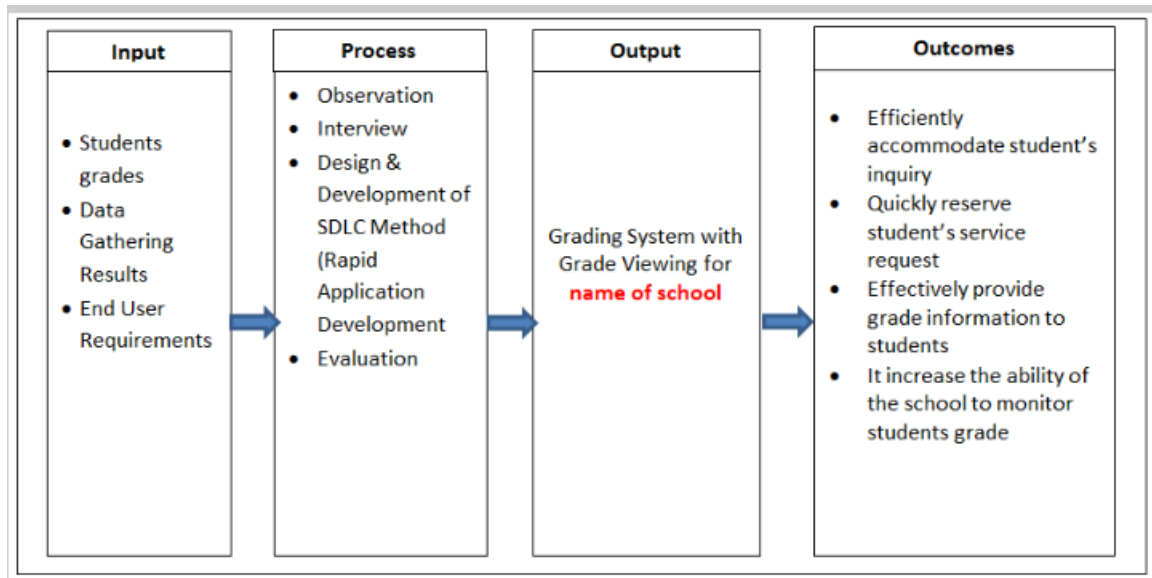


Figure 3.4 Conceptual Framework of the Proposed Study

Discussion of the Conceptual Framework

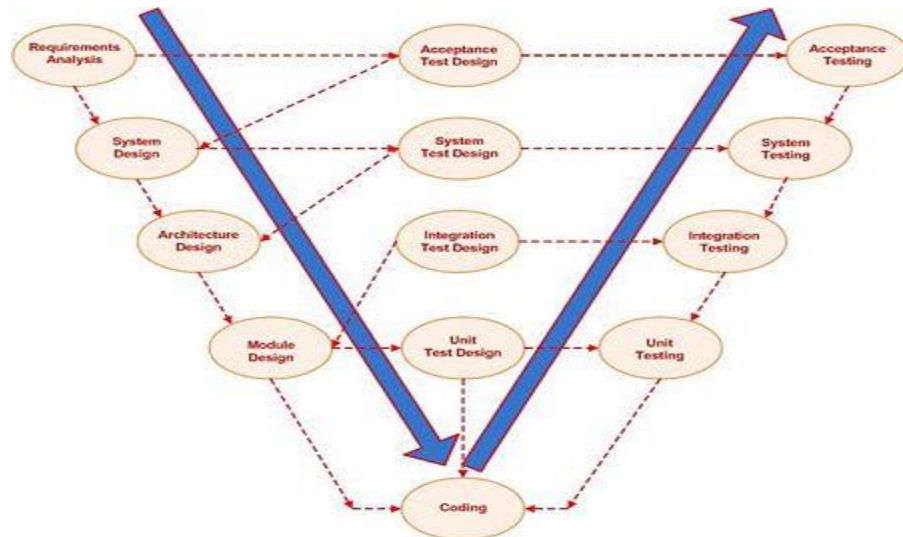


Figure 3.5 V-Model

Explain the various phases of the diagram and how each phase will be used/implemented in the proposed study.



Cost Benefit Analysis

This section estimates the cost of software, hardware and labor required by the application of the project. It should compare the cost to implement such an application with the benefits delivered by the application. It should also demonstrate the values added to a given institution by the application of the project.

I. Hardware Cost

Recommended Requirements	Specifications	Quantity	Unit Price	Cost
Processor	Ryzen 3 2200g 3.5Ghz Quad Core	2	4,750.00	9,500.00
Motherboard	AS-Rock A320M- DVS R4.0	2	2,735.00	5,470.00
RAM	4GB DDR4-2400 Zeppelin	2	1,260.00	2,520.00
Hard Drive	Seagate 500gb SATA	2	1,700.00	3,400.00
Keyboard	A4TECH KRS-85	2	400.00	800.00
Monitor	<u>Acer EB162Q LED</u> <u>15.6" Monitor</u>	2	3,290.00	6,580.00
Mouse	A4Tech G3-200N	2	250.00	500.00
Printer	Epson L120	1	4,995.00	4,995.00

Total: ₱33,765.00

Table 3.1 Hardware Cost

Source: www.openpinoy.com, www.pcgilmore.com.ph



II. Software Development Cost

Personnel	No. of Personnel	Salary
Programmer	1	20,000.00
System Analyst	1	35,000.00

Total: **₱55,000.00**

Table 3.2 Software Development Cost

Source ph.indeed.com

Personnel Salary for 60 Days:

Programmer: $20,000 / 60 = ₱333.33$

System Analyst: $35,000 / 60 = ₱583.33$

III. Operational Cost

A. System Cost

Items	Specification	Costs
Operating System	Windows 10 Home	7,300.00
Front End	Notepad++ 7.2.2	Free
Back End	XAMPP 7.2.7	Free
Web Hosting	Hostinger Premium Web Hosting	1,788.00

Total: **₱9,088.00**

Table 3.3 System Cost

Source: www.ebay.com, www.hostinger.ph



B. Stationaries and Supplies

Items	Quantity	Price	Total
Bond Paper	5 Reams	240.00	1,200.00
Ink Refill	2	250.00	500.00
Ballpen	3	10.00	30.00
Folder	6	7.00	42.00
Envelope	5	4.00	20.00

Total: **₱1,792.00**

Table 3.4 Stationaries and Supplies

Source: www.nationalbookstore.com

C. Utility Expenses

Particulars	Cost
Electricity	2,000.00

Total: **₱2,000.00**

Table 3.5 Utility Expenses

Computer Usage 100.00/day for 10 hours in 20 days

Source: www.meralco.com.ph

D. Training Cost

Personnel	Amount per day	Days	Hours	Total
Administrator	300.00	3	5	900.00
Employee	300.00	3	5	900.00

Total: **₱1,800.00**

Table 3.6 Training Cost

(60.00 / hour * 5 Hours) * 3 Days = **₱900.00**



IV. Summary Cost

Costs	Amount
Hardware Cost	33,765.00
Software Development Cost	55,000.00
System Cost	9,088.00
Stationaries and Supplies	1,792.00
Utility Expense	2,000.00
Training Cost	1,800.00

Total Costs: ₱103,445.00

Table 3.7 Summary Cost

Estimated Benefits:

Accuracy and efficiency of the software at approximately 85%

Total estimated Benefits = $103,445.00 \times 85\%$

Total = ₱87,928.25

Payback Period

Payback Period = $(\text{Total Cost} / \text{Total Estimated Benefits}) \times 12$

$= (103,445.00 / 87,928.25) \times 12$

Total = 14 months or 1 year and 2 months

Return of Investment

Return of Investment = $(\text{Total Estimated Benefits} / \text{Total Cost}) \times 100$

$= (87,928.25 / 103,445.00) \times 100$

Total = 85%

Requirement Analysis

In this section, the proponent(s) must first determine information requirements with regard to the specific organization under study. At this phase, the proponent(s) needs to know the details of the current system function: who (the people who are involved), what (the business activity), where (the environment in which the work takes), when (the timing), and how (how the current procedures are performed) of the business or organization under study. The proponent(s) must know and analyze why the business uses the current system. There may be good reasons why the organization is using the current methods, and these should be considered when designing the proposed system.

You may provide an organization's operational framework and Data Flow Diagram (DFD).

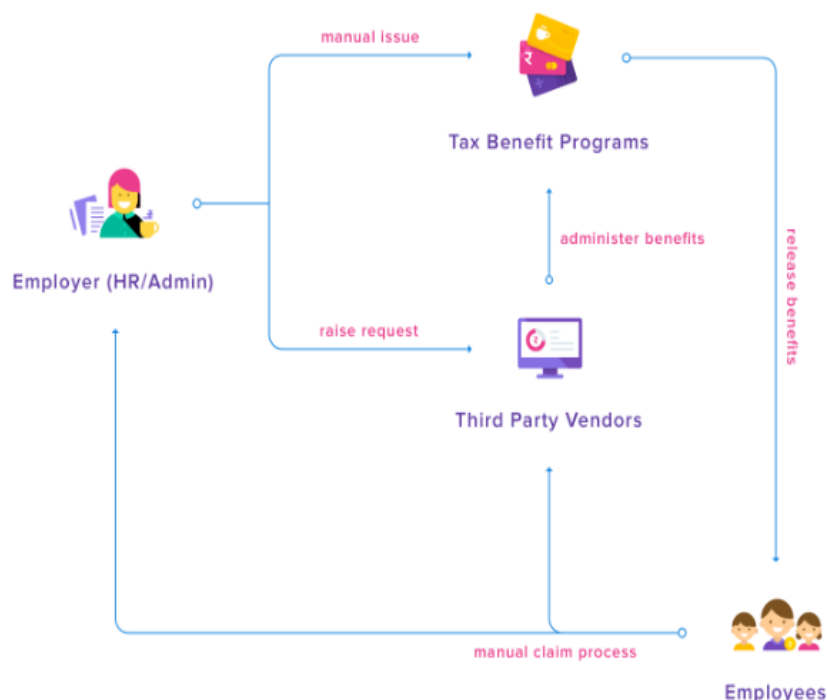


Figure 3.6 Current Technical Situation/Procedure

Provide a discussion of the manual procedures used by the organization. Identify also the problems encountered by the end users.

Discuss the requirements needed to build and develop the proposed system like the recommended hardware and software requirements.

Data-flow diagrams (DFD) are a way of representing function-oriented systems where each round-edged rectangle in the data flow represents a function that implements some data transformation, and each arrow represents a data item that is processed by the function. Files or data stores are represented as rectangles. The advantage of data-flow diagrams is that they show end-to-end processing. That is, you can see all of the functions that act on data as it moves through the stages of the system. The fundamental data-flow structure consists of an input function that passes data to a processing function and then to an output function.

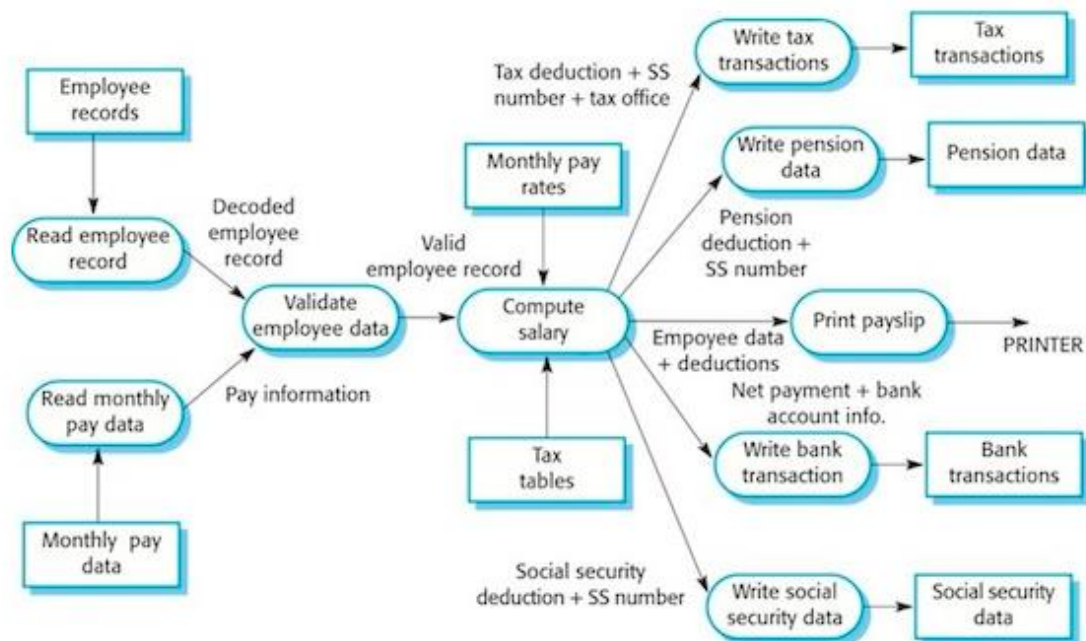


Figure 3.7 Data Flow Diagram of the Proposed System

Example:

It illustrates how data-flow diagrams can be used to show a more detailed view of the architecture of a data processing system. This figure shows the design of a salary payment system. In this system, information about employees in the organization is read into the system, monthly salary and deductions are computed, and payments are made. You can see how this system follows the basic input-process-output structure:

1. The functions on the left of the diagram 'Read employee record', 'Read monthly pay data' and 'Validate employee data' input the data for each employee and check that data.

2. The Compute salary function works out the total gross salary for each employee and the various deductions that are made from that salary. The net monthly salary is then computed.
3. The output functions write a series of files that hold details of the deductions made and the salary to be paid. These files are processed by other programs once details for all employees have been computed. A payslip for the employee, recording the net pay and the deductions made, is printed by the system.

System Architecture/System Flow

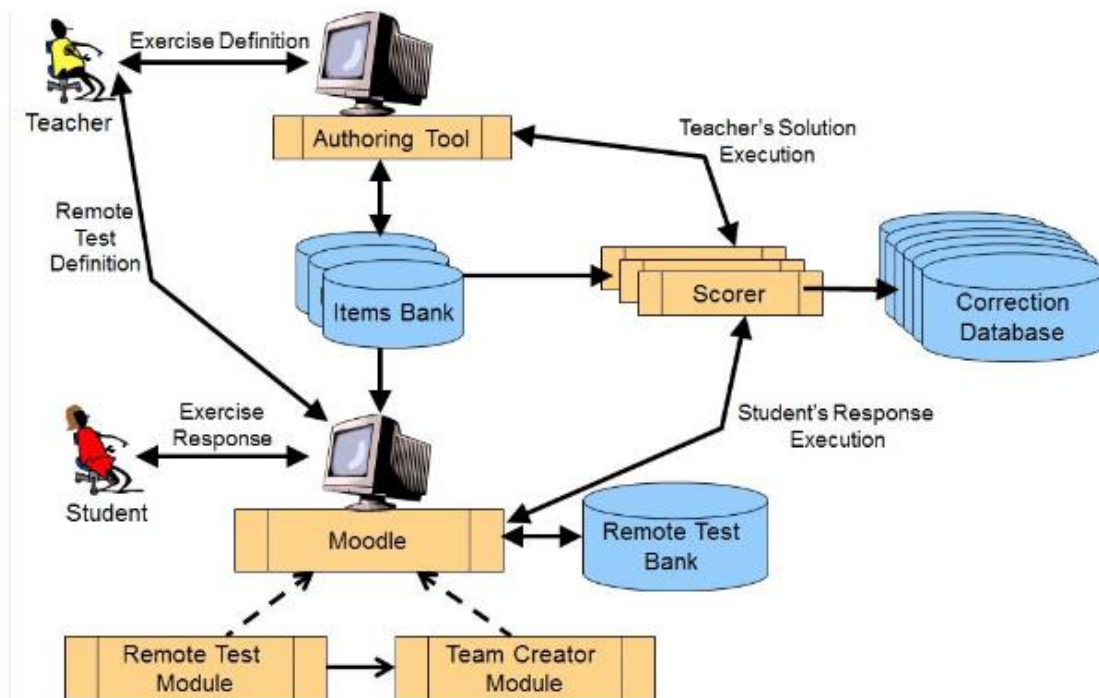


Figure 3.8 System Architecture of the Proposed Study

Explain the diagram

System Flow

System Flows are systems models that show the activities and decisions that systems execute. They are useful for understanding complex system interactions because they visually show the back-and-forth interactions between systems and complex branching.

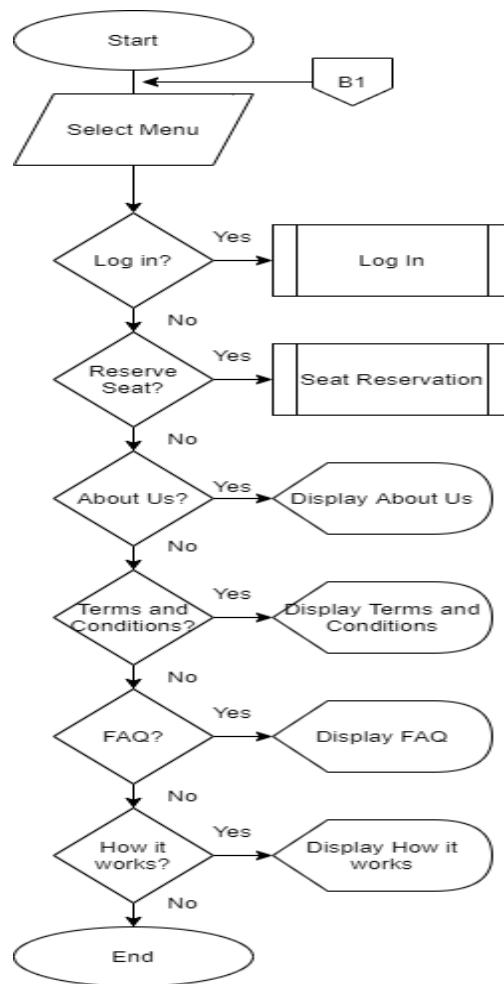


Figure 3.9 Procedural Flowchart – Home Page

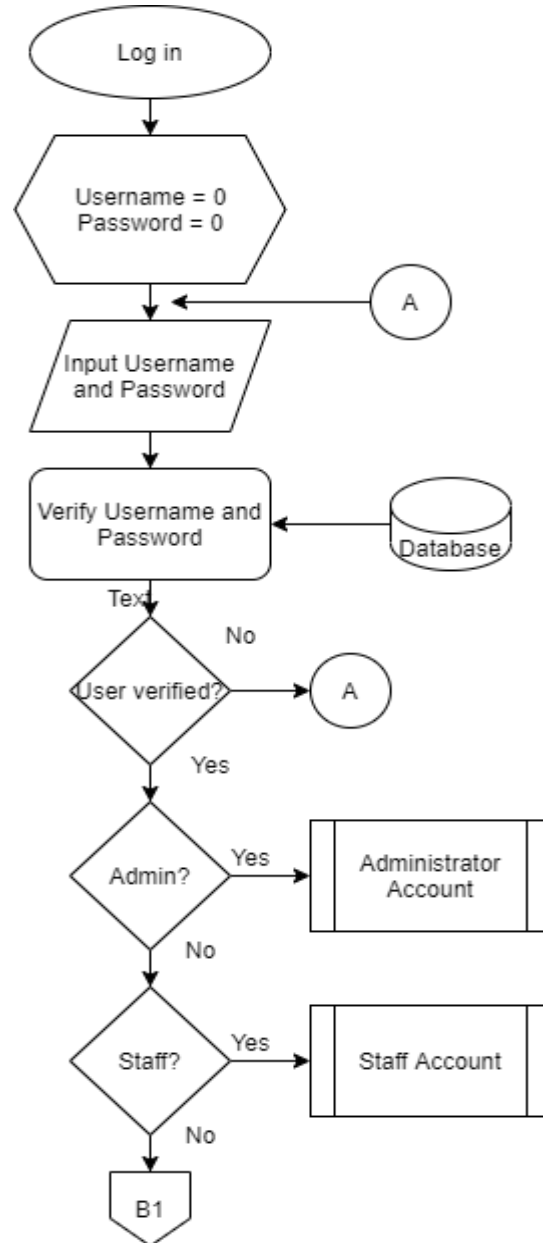


Figure 3.10 Procedural Flowchart – Security Module

In this section, the proponents will design the complete procedural flow of the proposed system using Flowchart. Use the important symbols in flowcharting like predefined process symbol to depict sub-modules/components, the on and off page connector for direction of the system flow within the same page or another page, the database as the storage of all the transactions, etc.

Block Diagrams

A block diagram is a diagram of a system in which the principal parts or functions are represented by blocks connected by lines that show the relationships of the blocks. They are heavily used in engineering in hardware design, electronic design, software design, and process flow diagrams.

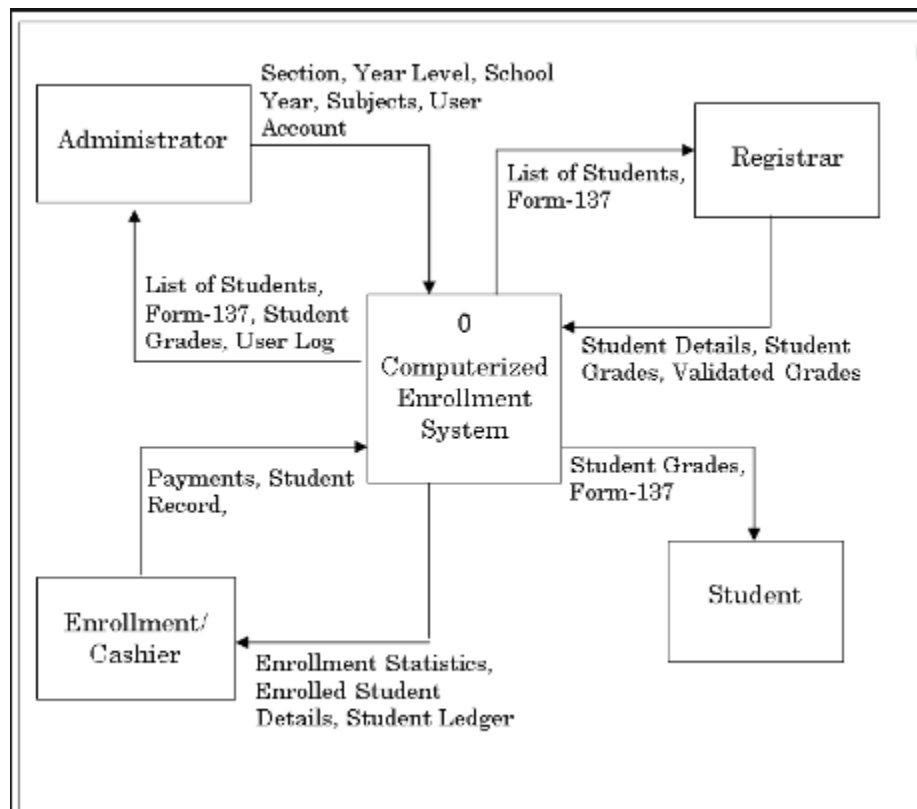


Figure 3.11 Block Diagram of the Proposed System

Explain the diagram

Development and Testing

To design a computer-based systems, processes, components, or programs to meet desired needs and requirements under various constraints. The standards to be used in software development as well as how it will be tested should be included in this subsection.

The various types of testing may also be mention in this section. Define each and how it will be implemented. Example, *Unit testing, module testing, integration testing, performance testing, etc.*



Like for example, *“In developing, designing and evaluating the proposed Scheduling System, the proponent(s) shall be using the ISO 9126-1 or 25010 for the evaluation of the software. It identifies the main quality characteristics of a software, namely: (1) Functionality, (2) Reliability, (3) Efficiency, (4) Maintainability, and (5) Usability.*

Thus, in order to ensure that the software conforms with the standard, it should be evaluated by IT Experts as well as the target users and beneficiaries.

Input and Output Reports and Analysis

This section will be represented by Input-Process-Output (IPO) diagrams. Identify all the modules based on your Hierarchical Input-Process-Output (HIPO). The reference number will be based on the label number indicated in your HIPO. Input are data, Process is an action word and Output will be the result of the action performed.

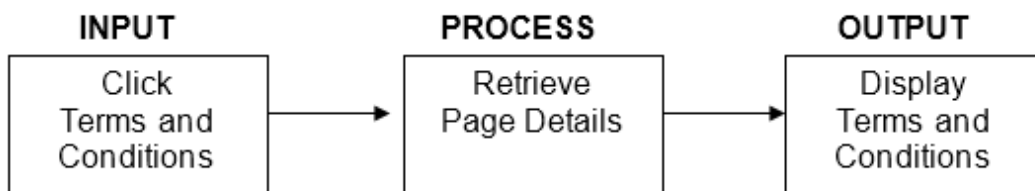
Reference Number: 1.1

Module Name: Log In



Reference Number: 2.1

Module Name: Terms and Conditions





Description of the Prototype

This section must discuss in details how the proposed system/software works. Start by describing the most important components down to the least. Example, *the proposed system will implement a strong security measure for all the users, various transactions and its databases. The system will be opened by two (2) levels of access, one is the Administrator which will have full access in the system and the second level is for the Employees. Each level of access will be requiring to input unique username and strong password. Password must be eight to twelve (8-12) alphanumeric and case sensitive. There will be a password counter for each user and if ever the user forgot his/her password, a forgot password module will be available wherein they will be answering a secret question that matches a secret answer. An audit trail report will also be available which will monitor who logged in and out of the system as well as their activities inside the system.*

Implementation Plan

It describes 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.

Example:

*The developed system will be sent to the **Name of the Company** right away after the revision to present it once more to the end users. If the company wants to adopt the proposed system, the proponents will hand over the system together with its documentation which will serve as a guide to the Administrator who will be assigned for the system's update and maintenance. There will be a letter of agreement that the system will be handed over to the company freely and the researchers is no longer responsible for the updates and maintenance. If the system will be implemented, the researchers will conduct several strategies as presented below:*



Strategy	Activities	Persons Involved	Duration
Approval from the Name of the Company Administrator	Send letter to the Administrator	Researchers Administrator	1 Day
System's Installation	Installation of the system and required software and hardware	Researchers Administrator	8 Hours
Information distribution	Provide technical documentation and user's manual	Researchers Administrator	1 Day
3 Days training	Hands on training for the end users of the system	Researchers Administrator Employees	3 Days

Table 3.8 implementation Plan

Implementation Results (optional)

This section is optional. Explain and discuss if the implementation plan for the proposed system is doable of feasible and provide a report/documentation or feedback with regards to the mentioned strategies.

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Multiple Constraints

Please refer to this reference:

<https://masterofproject.com/blog/7390/project-constraints-definition-7-common-project-constraints>

Algorithm Use

Define and discuss the algorithm to be used in the proposed study and how you will be implementing the chosen algorithm. You may also provide diagrams to better explain your point or discussion.