**A Web-Based Product and Service Discount Tracker for Students**

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**135230**

**An Information System Project 2 proposal submitted to the School of Computing and Engineering Sciences in partial fulfilment of the requirements for the award of the bachelor’s degree in business information technology of   
Strathmore University**

**School of Computing and Engineering Sciences**

**Strathmore University**

**Nairobi, Kenya.**

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# Declaration

I declare that this work has not been previously submitted and approved for the award of a bachelor’s degree by this or any other University. To the best of my knowledge and belief, the proposal contains no material previously published or written by another person except where due reference is made in the proposal itself.

Student’s signature:

………………………………….………….. [*Signature*]

………………………………….………….. [*Date*]

**Approval**

The Information System Project 2 proposal of ***Peter David Aringo*** was reviewed and approved *(for examination)* by:

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# Abstract

Personal financial management is crucial for effective financial planning and control. Many individuals, including students, struggle with managing their finances, which can lead to financial distress and impact academic success. To address this, a web-based product and service discount tracker tailored to students' needs will be developed. This comprehensive application will combine budgeting, price comparison, and discount tracking features to help students manage their finances and save money. Objectives include evaluating students' financial challenges, reviewing existing systems, designing, and developing the tracker, and conducting testing. Previous research supports the importance of discounts and financial skills, justifying the development of this application. The project scope includes a login system, budget preparation, and displaying discounts from various retailers. Time management and skill limitations are potential study constraints.

This proposal examines the challenges students encounter in managing personal finances and assesses existing systems for budgeting and discounts. The impact of frequent spending habits, financial illiteracy, and financial attitudes on students' financial behaviour is explored. The study identifies commonly purchased items by students and analyses the limitations of existing systems. Based on these findings, a conceptual framework is proposed for a student-oriented web-based product and discount tracker system. Although existing systems like Goodbudget offer useful features, they do not adequately address the unique needs of students.

The project adopts the Structured Systems and Analysis Design Approach (SSADM) as the development methodology, providing a well-defined framework for information system analysis and design. The iterative waterfall model is chosen as the system development methodology, combining the traditional waterfall model with an iterative approach for flexibility and continuous improvement. Stakeholder engagement, interviews, surveys, and system reviews will be conducted to gather functional and non-functional requirements. The design phase will involve various diagrams, including use case diagrams, context diagrams, data flow diagrams (DFDs), entity-relationship diagrams (ERDs), and a database schema. Development tools include Visual Studio Code, MySQL, HTML, CSS, JavaScript, and PHP. Testing will focus on functional testing through system testing. The proposed web-based solution offers cost savings, centralized updates, compatibility, and accessibility. The system architecture includes modules for user management, product and service management, discount tracking, merchant management, student profiles, and reporting and analytics.

Keywords: Students, Finance, Budgeting, Development Methodology, Development Tools.

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# Introduction

## Background

Personal financial management is the process of planning and managing personal financial activities, according to (Team, 2023). The primary areas of personal finance are income, spending, saving, investing and protection according to (Team, 2023). Many people often struggle with managing their personal finances all around the globe, in Kenya for example, a report by a global auditing firm Deloitte found that most Kenyan adults still face challenges that limit their ability to manage present and future needs (Oluwole, 2022). In critical areas of personal finances like savings and investments 54.6% of Kenyans did not have enough money to save. The report also added that 34.9% of Kenyans stated that they do not have enough money to invest.

However, poor financial management affects university students to a larger extent than it does other adults. A report by (Mette Ranta, 2022) notes that young adults are a major risk group who are especially financially vulnerable to the effects of economic downturns such as in the current time and age where the world is currently amidst a cost-of-living crisis (Comitee, 2022). According to (Bexley, Daroesman, Arkoudis, & James, 2013), approximately two-thirds of students report incomes below the poverty line, leading to significant financial distress. This distress is even more pronounced among students from low socioeconomic backgrounds, with four out of five of them having incomes below the poverty line. A study by (Mutiso, et al., 2023) found that financial concerns, including money and finances, are among the most important stressors for students.

This situation is concerning because financial stress often leads to anxiety, which is a prevalent mental health issue among students, as noted by (Jones, Park, & Lefevor, 2018). Furthermore, effective financial management is crucial not only for personal success but also for academic success. (Cummins, Haskell, & Jenkins, 2005) concluded that students who possess good personal finance management skills are more likely to organize their lives and manage their time effectively, resulting in better academic progress.

Addressing this problem and encouraging good personal finance management among students is imperative. While several applications have been developed to assist with budgeting, such as Good Budget, utilizing the envelope method for savings, and Acorn’s investment assistance, these apps do not fully address the needs of students. Additionally, Digit, which helps individuals save based on spending habits, does not specifically cater to students. To provide a comprehensive solution, it is necessary to develop a web-based product and service discount tracker tailored specifically to students' needs and preferences.

## Problem Statement

Good knowledge on how to deal with personal finances is always an advantage to all members of society the positive effects of good personal finance management permeate throughout families and extends into society (Council, 2022). Despite this, a large number of people often struggle with management of their personal finances, and this is especially difficult for students because, according to (Bexley, Daroesman, Arkoudis, & James, 2013), nearly two thirds of students have incomes below the poverty line which causes great financial distress. Financial hardship is one of the major things that is stressing out students in higher education learning today (Mutiso, et al., 2023). It is one of the leading causes of anxiety, which is the most common mental health disease among students according to (Jones, Park, & Lefevor, 2018).

Apart from that, good financial management capabilities not only contribute to the personal success of the student but also to the academic success of the student. Students who can better manage their finances are more likely to better manage their time in a way that is conducive to learning. One of the solutions to this problem suggested by (Gachango, 2014), was increasing financial literacy. However, knowledge on financial literacy will not help deal with the prevailing cost of living crisis. Failure to solve this problem will only allow room for mental health challenges and below average performance to continue to grow among university students.

## Aim

The aim is to develop a web-based product and service discount tracker that helps students save money.

## Specific Objectives

I. To evaluate challenges faced by students zin handling their personal finances.

ii. To identify the most common stress points for students when purchasing.

iii. To review existing systems.

iv. To design a web-based product and service discount tracker.

v. To develop a web-based product and service discount tracker.

vi. To test the developed system.

## Research Questions

1. What challenges do students face in managing their personal finances?
2. What are the most purchased items by students?
3. How far do the existing systems go to solve the problem?
4. What are the key design considerations and user-requirements for a web-based product and service discount tracker?
5. How can a web-based product and service discount tracker be effectively developed and implemented?
6. What are the usability and functionality issues of the developed web-based product and service discount tracker?

## Justification

The journal of marketing research found that discounts do indeed help people save money while at the same time providing a marketing platform for businesses. Apart from that, a study by (Zhong, et al., 2022) demonstrated that only price discounts had a significant relationship with purchase intentions. Research by (Zulfaris, Mustafa, Mahussin, Alam, & Daud, 2020)show that most experts agree that financial skills such as preparation of a budget are advantageous to people. Therefore, an app that gives people both a platform to prepare a budget as well as performing price comparisons on different discounts would go a long way in solving the issue of poor financial skills among students and the general public at large.

## Scope and Limitations

At its completion this application should allow for users to both login to and logout of the application. The application should allow for users to prepare a budget under which they wish to spend their money on. The application should be able to display discounts from different retailers and suggest the best possible discount to the users after price comparison. During this project expected challenges include issues with time management due to running other concurrent projects. A solution to this would be having a timetable and planning well. Also, another challenge anticipated is that at a certain point the skills required to implement certain aspects of this project will be insufficient and the solution to this is to keep in close consultation with supervisors and carry out exhaustive research.

# Literature Review

## Introduction

This chapter addresses the concept of students' challenges in managing personal finances, exploring the impact of frequent spending habits, the lack of financial literacy, and the influence of financial attitudes on their financial behaviour. To address these issues, existing systems like Goodbudget, Honey, and RetailMeNot were reviewed to identify their limitations and gaps. Based on these findings, a proposed web-based product and discount tracker system is introduced, aiming to bridge the gaps by connecting shoppers and merchants, providing administrative functionalities, integrating secure payment gateways, and ensuring performance optimization and security measures. The conceptual framework of the system is developed considering data flow through DFD diagrams, and extensive testing is conducted to validate functionality, usability, integration, and performance.

## Challenges faced by Students in Managing Personal Finances

(Prihartono & Asandimitra, 2018) carried out research on a preliminary survey, conducted using a questionnaire, that was distributed to 30 students from three universities to investigate financial behaviour. The survey included indicators such as bill payment, budget planning, expense recording, savings, and price comparison. The sample size was determined based on previous recommendations. The study provided initial insights into the phenomenon of financial behaviour among students.

Table 2.1: Result of Preliminary Study

|  |  |  |
| --- | --- | --- |
| No. | University Name | Result (Mean) |
|  | State University of Surabaya | 2.46 |
|  | Air Langaa University | 2.38 |
|  | National Development University | 2.74 |

Source: (Prihartono & Asandimitra, 2018)

The researchers suggested that students who engage in frequent spending habits, exceedingly once or twice a month, are more likely to encounter financial management problems. This is because their monthly income from parents is quickly depleted, leading to the need for additional remittances. Such poor financial behaviour significantly impacts students' ability to manage their finances effectively.

Research by (Alshebami & Aldhyani, 2022) observed that the younger generation places less emphasis on saving habits and money management which negatively impacts their life and makes them far more reliant on their families and government financial support. The authors also cite the lack of financial literacy in their society being one of the biggest drivers of poor financial management.

(Nazah, Ningsih, Irwansyah, Pakpahan, & Nabella, 2022) also suggest that having a strong level of financial literacy enables students to effectively handle their finances. This capability is not solely determined by income, but also by the avoidance of financial mistakes and the presence of a sound financial plan. To be considered financially literate, a student should possess at least five key indicators, which include knowledge of basic financial management, budgeting, interest rates and credit, the ability to evaluate financial service offerings, and effective communication regarding financial concepts. According to the researchers, previous studies affirm that financial literacy positively influences students' attitudes towards financial management. However, lack of it could have a negative influence on student’s attitudes towards financial management.

Authors (Nazah, Ningsih, Irwansyah, Pakpahan, & Nabella, 2022) in their research stated that financial attitudes play a significant role in shaping financial literacy. According to (Nazah, Ningsih, Irwansyah, Pakpahan, & Nabella, 2022) students' financial attitudes can be observed through their perspectives on monthly expenses, saving, and future financial outlook. These attitudes are influenced by family education. (Alshebami & Aldhyani, 2022) also believe that parents and peers play a crucial role in shaping student’s financial behaviour. Additionally, the financial attitudes of students are shaped by the necessity of managing financial challenges independently from their families. In response, students strive to adopt frugal lifestyles and allocate a portion of their income for future expenses. The strong desire of students to meet their life's needs based on their income level serves as a catalyst for the development of financial management behaviours.

Income is defined by (Adiputra & Patricia, 2019) as the total earnings obtained from various sources such as salary, interest, and gross profit over a specific period. Authors (Mashud, Mediaty, & Pontoh, 2021), state that generally parents give money to their children to use as pocket money, but students must be able to manage the money they get from their parents so that your needs can be fulfilled and parents don't need to add the pocket money for them. According to research from (Adiputra & Patricia, 2019) income does not have a significant impact on financial management behaviour.

Income alone cannot guarantee the development of positive financial behaviour because even individuals with high income levels can still face financial difficulties. However, research by (Mashud, Mediaty, & Pontoh, 2021) suggested that higher parental income corresponds to better financial understanding and management skills. Similarly, proposed that students with affluent parents would possess higher knowledge, attitudes, and behaviours in financial management. Similarly, if the income of parents is low, the understanding and ability to manage finances will also be low.

## Commonly Purchased Items by Students

A survey carried out in 2022 among 1,049 customers by (Kunst, 2023) found that 49% of Kenyans shop online for consumer electronics, 47% shop for bags and accessories, 41% for clothing items, 39% shop for shoes, 36% for accessories and 25% for household appliances among others. According to research by (Ali & Anika, 2017) that the average income of male students was Ksh 5538.50 while that of female students was Kshs 6678.60. The authors found that male students spend an average of 1,027.30 shillings on entertainment, 303.00 shillings on transport, 179.80 shillings on stationary, 2,153.60 shillings on rent, 736.10 shillings on clothing, and 98.80 shillings on hair. Among these categories, there is a significant difference observed in transport expenses, with males spending less compared to females. Additionally, male students allocate a larger portion of their budget to rent and clothing.

On the other hand, female students spend an average of 770.00 shillings on entertainment, 1,132.10 shillings on transport, 318.90 shillings on stationary, 1,442.40 shillings on rent, 1,491.10 shillings on clothing, and 1,046.10 shillings on hair. Females tend to spend more on transport, rent, clothing, and hair compared to their male counterparts. These gender disparities in expenditure patterns suggest differing priorities and preferences between male and female students.

Based on the research by (Ali & Anika, 2017), it is evident that students spend the most money on rent and clothing. Male students allocate a significant portion of their budget to rent, with an average expenditure of 2,153.60 shillings, while female students spend an average of 1,442.40 shillings on rent. In terms of clothing expenses, male students spend an average of 736.10 shillings, whereas female students spend a higher average of 1,491.10 shillings. These findings suggest that rent and clothing are the primary expenditure categories for students, with variations observed between male and female spending patterns.

Also, based on the research findings of (Kunst, 2023), the most commonly purchased items by students can be inferred from the survey conducted in 2022. The survey revealed that among the respondents, the top categories of items purchased by Kenyan students online were consumer electronics, bags and accessories, clothing items, shoes, accessories, and household appliances. These findings indicate that these categories are popular among students when it comes to their purchasing preferences.

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## Review of Existing Systems

### Good Budget

Goodbudget according to (Holzhauer, 2022), is a budgeting app based on the envelope system known as *“Kaikebo”* in Japanese which means household accounting book. This system is designed to let an individual know how much money is allocated to each expense, along with how much they save each month. This allows individuals or households to effectively manage their finances. With Goodbudget, according to (Goodbudget, 2023), users can create virtual envelopes for different spending categories and allocate funds based on their budget. The app offers manual or automatic transaction tracking, enabling users to categorize expenses and gain insights into their financial habits. Goodbudget supports syncing and sharing, making it easy for family members or partners to collaborate on budgeting. The app provides budget reports and visualizations to track progress and identify areas of overspending. Additionally, users can track debt repayment and set financial goals within the app. Goodbudget offers a free version with basic functionality and a premium version, Goodbudget Plus, with additional features. Overall, Goodbudget is a user-friendly app that helps individuals and households practice envelope budgeting and stay on top of their finances.

A picture containing cartoon, screenshot, design, art

Description automatically generated

Figure 2.1: Goodbudget envelope system (Goodbudget, 2023)

### Honey

According to (Bundrick, 2022), the Honey Chrome extension is a browser add-on that helps users save money while shopping online by offering real-time price discounts and alerting them to price drops. Owned by PayPal, Honey is available as an extension for various browsers, including Chrome, Edge, Firefox, Safari, and Opera. When shopping online, the Honey extension works in the background, searching for valid discount codes and coupons that can be applied to the purchase. It suggests the deal with the highest savings available before the checkout process. Additionally, Honey can save items in a drop list and track their prices over time, sending email alerts when there are price reductions. The extension also compares Amazon sellers, analyses total prices including shipping and Prime deals, and provides price history. Honey offers a rewards feature where users can earn points redeemable for cash back through PayPal or gift cards. To use Honey, users can easily install the extension from the Chrome Web Store and sign up with their preferred method of authentication. While using browser extensions like Honey may require granting permissions to access data on websites, it is important to install extensions from trusted sources and maintain security measures on devices.

### RetailMeNot

According to (Owens, 2018), RetailMeNot Genie is a free browser extension offered by RetailMeNot that simplifies the process of finding and applying promo codes while shopping online. Once installed on your computer, the extension automatically searches for available discounts and applies them at checkout, saving you the hassle of searching for deals yourself. Additionally, RetailMeNot Genie offers cash back on purchases, providing an extra incentive to shop through the platform. The extension combines and applies multiple offers to maximize your savings, covering a wide range of categories including clothing, beauty, travel, and food. To use RetailMeNot Genie, simply download the extension and follow the instructions. When shopping online, a small 'R' logo in your browser will indicate available deals, and you can click it to view the offers. Alternatively, Genie will automatically prompt you to apply the savings at checkout. RetailMeNot offers thousands of coupons, deals, and cash-back offers that are constantly updated, allowing you to enjoy discounts and savings from various retailers.

## Gaps in the existing system

The existing systems have certain gaps that need to be addressed. Goodbudget, although a comprehensive budgeting app based on the envelope system, has limitations. The reliance on manual or automatic transaction tracking may lead to inaccuracies, and the app may lack advanced collaboration features for effective budgeting among multiple users. Honey, the browser extension for online shopping savings, focuses on discount codes but may not cover all retailers and could lack comprehensive pricing data for accurate comparisons. RetailMeNot Genie, the promo code browser extension, depends on the availability and accuracy of codes, potentially resulting in missed savings. It's important for users to be aware of these limitations and consider alternative tools or approaches to supplement their financial management strategies. By addressing these gaps, users can enhance their budgeting, shopping, and savings experiences.

## Conceptual Framework

The web-based product and discount tracker is a standalone system designed to connect shoppers and merchants for deal transactions. Shoppers can set a budget, browse, search, and avail deals offered by registered merchants, while merchants can create, manage, and track their deals, process orders, and communicate with customers. The platform includes administrative functionalities for user management, deal moderation, support, and analytics. It integrates with secure external payment gateways for payment processing, ensures performance optimization, implements security measures, enhances usability, and ensures reliability and scalability. The system is compatible with various web browsers, operating systems, and devices.

The system architecture follows a three-tier model, utilizing technologies such as HTML5, CSS3, JavaScript, React.js, Node.js, Express.js, MySQL, Stripe, PayPal, JWT, and HTTPS. The user interfaces are designed to be intuitive and user-friendly, supporting seamless navigation and accessibility. The system's data flow is illustrated through context level DFD, level 0 DFD, and level 1 DFD diagrams, showcasing processes such as user registration, authentication, deal management, order processing, support, and reporting. The system's test requirements encompass shopper, merchant, administrator, and system-level tests, ensuring functionality, usability, integration, and performance are thoroughly validated.

A diagram of a system

Description automatically generated with medium confidence

Figure 2.2: Conceptual Framework for this system

# System Development Methodology

## Introduction

This project will apply the Structured Systems and Analysis Design Approach. This is because it provides a well-defined and structured framework for analysing and designing information systems, which ensures that all aspects of the system are considered and addressed properly. Also, the SSADM emphasizes the creation of detailed and accurate documentation throughout the development process. This documentation helps in understanding the system requirements, design, and implementation, making it easier for future maintenance and upgrades. Additionally, SSADM defines clear deliverables for each phase of the development process. This helps in monitoring progress and ensures that the project stays on track. The System Development Methodology used in this project will be the iterative waterfall model. This is because according to (Pal, 2021), the iterative models provide feedback from every phase to the preceding phases. Thus, the reason for the iterative waterfall model is because the feedback path will allow for correction of errors committed in previous phases and these changes will reflect in later phases as well as the clear structure, risk mitigation and quality assurance that come with using an iterative waterfall model.

## Iterative Waterfall Model

The project will apply the iterative waterfall model as its system development methodology. According to (Pal, 2021), the iterative waterfall model provides feedback paths from every phase to its preceding phases, which is the main difference from the classical waterfall model. The project will progress through sequential phases, including requirements gathering, analysis, design, implementation, testing, deployment, and maintenance. However, unlike the traditional waterfall model, each phase will include multiple iterations, where feedback from stakeholders and users will be incorporated to refine the deliverables. This iterative process allows for flexibility, adaptation, and continuous improvement, ensuring that the project evolves and aligns with changing requirements and stakeholders' needs. Documentation will still play a crucial role in capturing and managing project artifacts, providing a solid foundation for each iteration.

### Requirements Gathering

For gathering requirements for the project, a comprehensive and collaborative approach will be needed to ensure a thorough understanding of stakeholder needs. The process will begin by engaging key stakeholders, such as students and service providers, through interviews and surveys. These interactions will allow the identification of their specific requirements, preferences, and pain points related to a web-based product and service discount tracker. Additionally, existing systems will be reviewed to understand the gaps in those systems and opportunities for improvement. By adopting this inclusive and iterative approach, the goal is to gather comprehensive and accurate requirements, aligning the project with the stakeholders' expectations and maximizing its value.

### Design

The system design phase of a software development project aids in the specification of hardware, system requirements, and the definition of overall system architecture. It will help provide an overall view of how the system will function, this will end up easing our development process. One of the diagrams that will be used include the use case diagrams because they provide a visual representation of the players in a system, the many functions they require, and how these functions interact. Sequence diagrams were also used because they show how items interact with one another and in what sequence they interact. One of the tools used to design these diagrams will be draw.io, which is a software used to create high quality designs.

### Development

A web-based solution will be built. This is because both the end-user and the developer will save money with a web application. Also, updates will be handled centrally, thus web applications will be constantly up to date. Additionally, all users will have access to the same version, there will be no compatibility difficulties. With a web browser, web apps can be accessed from anywhere. For the front-end development, CSS and HTML will be used. CSS will bring a website's front-end to life and enhance the user experience. HTML coding will guarantee that text and pictures in the browser are formatted correctly. A browser would not be able to display text as elements or load pictures or other components without HTML.

For the backend development, PHP and MYSQL will be used. One of the most significant advantages of PHP is that it is platform agnostic, meaning it can run on Mac OS, Windows, Linux, and most web browsers. It also works with all major web servers, making it simple to install on a variety of systems and platforms at a low cost. MySQL will be used for the database because it is open source, dependable, and easy to maintain. It is also compatible with all major hosting providers. Many businesses use MySQL's data security and transactional support to safeguard online transactions and improve consumer interactions. The XAMPP server will be used for the MySQL database, and Visual Studio Code will be used for the coding. Visual Studio Code has impressive features such as multi-line editing, build systems for dozens of programming languages, regex search and replace, and a Python API for constructing plugins.

### Testing

After development, the solution will be tested to ensure it works as intended. A system test will be carried out. System testing, which falls under the black box testing method, will be performed to validate the fully integrated system. Black box testing focuses on the functionalities of the system. Several types of system tests exist, and for this system, functional testing will be conducted. Functional testing validates the software system against its functional requirements. The purpose of the system test will be to ensure that the system meets the end-to-end system requirements. Also, integration testing will be carried out on this system. Integration testing is the type of testing that ensures that individual software components are properly integrated and work together as a cohesive system.

## Method to be used to Gather the Functional and Non-Functional Requirements

To gather the functional and non-functional requirements for the project, a systematic approach will be followed, ensuring clarity, comprehensiveness, and alignment with stakeholder needs. The process of gathering functional requirements will involve engaging with key stakeholders through various techniques such as interviews and surveys. These interactions will provide insights into the specific functionalities, features, and behaviours expected from the web-based product and service discount tracker. Additionally, existing documentation, such as user manuals or system specifications, will be reviewed to identify any existing functional requirements that need to be considered.

For gathering non-functional requirements, an analysis of both technical and user-centric aspects will be conducted. Technical requirements, such as performance, security, scalability, and interoperability, will be identified through thorough system analysis, consultation with technical experts, and industry best practices. User-centric non-functional requirements, including usability, accessibility, and responsiveness, will be assessed by incorporating user feedback and conducting usability testing sessions.

## Design Diagrams

In the design phase of the project, several design diagrams will be drawn using the SSADM (Structured Systems Analysis and Design Method) approach. These diagrams will help visualize and communicate the system's structure, behavior, and interactions. The following is a list and description of the design diagrams that will be created:

1. Use Case Diagram: The use case diagram illustrates the system's functionality from a user's perspective. It shows the actors (users or external systems) and the various use cases (specific actions or interactions) they can perform within the system. Use case diagrams help identify the system's features and the interactions between users and the system.
2. Context Diagram: This diagram provides an overview of the system and its external entities. It depicts the interactions between the system and its external environment, highlighting the boundaries and interfaces of the system.
3. Data Flow Diagrams (DFDs): DFDs represent the flow of data within the system. They consist of interconnected processes, data stores, data flows, and external entities. DFDs help understand how data moves through the system, showing inputs, outputs, and transformations.
4. Entity-Relationship Diagrams (ERDs): ERDs illustrate the data entities, their attributes, and the relationships between them. This diagram helps in designing the system's database structure, ensuring data integrity and efficient data management.
5. Database schema: A schema shows the table that will be used in the system. It also shows how the tables will interact with each other to make the system work optimally. The tables will be used to store data and records that will be used to generate reports and help operations such as logging in and farmer registrations.

These design diagrams will provide a comprehensive and structured representation of the system, facilitating effective communication between stakeholders, designers, and developers. They serve as visual aids to ensure a clear understanding of the system's architecture, data flow, functionality, and user interface.

## Development Tools

The proposed project will utilize Visual Studio Code as the Integrated Development Environment (IDE), enabling efficient and streamlined coding processes. MySQL has been chosen as the Database Management System (DBMS) due to its open-source nature, reliability, and compatibility. The project will leverage HTML, CSS, JavaScript, and PHP as the primary programming languages, offering a robust foundation for developing the web-based solution. These development tools have been carefully selected based on their proven effectiveness, industry acceptance, and ability to meet the project's requirements for efficient development, data management, and web application functionality.

## Testing Method

After the development phase, thorough testing of the solution will be conducted to ensure its proper functionality. A system test will be carried out to validate the fully integrated system. This system test will employ the black box testing method, which focuses on examining the system's functionalities. Specifically, functional testing will be performed to verify that the software system aligns with its functional requirements. The primary objective of the system test is to ensure that the end-to-end system requirements are met, guaranteeing that the solution performs as intended and satisfies the needs of its users.

## Domain of Execution

A web-based solution will be built, benefiting both end-users and developers. It offers cost savings for users and developers alike, as no specialized hardware or software is required. The centralized update management ensures constant updates, eliminating the need for manual user updates. With a single web application accessible by all users, there will be no compatibility difficulties. Web apps can be accessed from anywhere using a web browser, providing convenience and flexibility. This web-based approach saves money, keeps the application up to date, ensures compatibility, and allows easy access from any location, making it an ideal choice for the project.

## Proposed Modules and System Architecture

The proposed Computer-Based Information System (CBIS) for this project will include several modules to enhance its functionality. The User Management Module will handle user registration, login, and authentication processes, ensuring secure access to the system. The Product and Service Management Module will enable users to add, update, and delete products and services, providing features for categorization and organization. The Discount Tracking Module will allow users to track and manage discounts, saving favourites and receiving notifications. The Merchant module that will enable product and service vendors to create and manage their profiles as well as add the discounted products to the system. The Student Profile Module will enable students to create and manage their profiles, capturing relevant information and offering personalized recommendations. The Reporting and Analytics Module will provide data analysis and reporting capabilities, generating insightful reports and visualizations. Together, these modules will create a comprehensive and efficient CBIS, empowering users with seamless product tracking, personalized discounts, and robust data analysis.

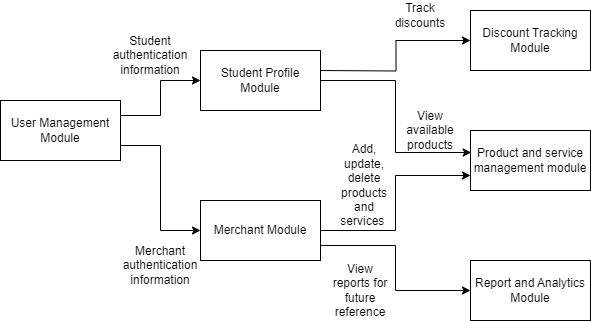


Figure 3.1: System Architecture

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# Appendix A: Timeline of Activities

Figure 4.1: Gantt Chart

# Appendix B: Turnitin Similarity Index

A screenshot of a cell phone

Description generated with very high confidence

# Appendix D: Marking Guide

**Strathmore University**

**School of Computing and Engineering Sciences**

**Information Systems Project Proposal Assessment Guide**

|  |  |
| --- | --- |
| **Student Number(s)** |  |
| **Working Title:** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Evaluation Points** | **Weight** | **Score** | **Notes** |
| **Title page:**  Informative, concise and appropriate | **2 pts** |  |  |
| **Abstract**  To have background, problem, solution, methodology (approach data and tools) outcomes and expectations  *Check on Completeness and correctness* | **3 pts** |  |  |
| **Introduction**  Background **(2)**  *A clear illustration of issue, context and audience*  Problem Statement **(2)**  *Pain points, audience, who is affected and how solution comes in to fix the pain. What facts support this*  Objectives (S.M.A.R.T and Linked to Problem Statement) **(3)**  Research questions **(3)**  *Alignment of questions with objectives*  Justification **(2)**  *Should be research supported.*   Scope of Project **(2)**  *Specify boundaries of people process, HW/SW, data etc*  Limitations **(1.5)**  *Challenges Expected*  Delimitation **(1.5)**  *To do to counter anticipated challenges*  *Check for correctness, completeness and citation of work* | **(17 pts)** |  |  |
| Literature Review/Related Work Literature objectives mapping as aligned with research questions **(2)**  Critique of content adequacy of  What it is, how it presents, its implications,  Citations of content align with work **(4)**  Review of at least 3 systems comprehensively the working behind it **(2)**  Gaps identification, analysis relative to the proposed solution **(3)**  Conceptual Framework clear to communicate how it works, data flows, processing, actors **(2)**  Describe input process output storage boundaries.  Emerging technologies contextualization **(5)** | **(18 pts)** |  |  |
| Intended Approach/ Methodology Research Design **(2)**  *experimental, casual etc to determine type of data to be used, Variables etc*  Research Methodology **(5)**  *Methodology (1), Correct process (1), Design and Development tools (1), Research Paradigm (2)*  Deliverables and milestones **(2)**  *Examinable bits from ideation*  *Proposal, design, test cases documentation doc*  *Proof of concept- modules* | **(9 pts)** |  |  |
| Proposal Presentation Table of Contents and List of Figures **(2)**  Are relevant references provided and formatted correctly? **(1)**  Is there a clear and proper use of language? **(1)**  Effective report structure (chapters and sections) and layout **(2)** | **(6 pts)** |  |  |
| Total Marks | **55** |  |  |

|  |  |  |
| --- | --- | --- |
| Verdict (Please tick) | Accepted | Reject |

Comments (**Especially if verdict is rejected**)