

**INSTITUTE OF TECHNOLOGY**

**SCHOOL OF COMPUTING DEPARTMENT OF SOFTWARE ENGINEERING**

Web based software project managements for Student Cafeteria Meal Card (SCMC)

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# Chapter one

## Introduction

## Background of the organization

**Woldia University**

Woldia University is located in North Wollo,Amhara, Ethiopian far from 521 Kilometer in the capital city of Ethiopia, Addis Abeba .

Woldia university was established through the council of ministers Regulation No 223/2011 issued on may 26,2011.

Corner stone for construction activities of the university was laid on Oct ,26,2008 by his Excellency Ato Ayalew Gobezy , former president of the Amhara Regional state , and his excellency Dr. Adhana Haile , former deputy state minister of education

Currently, the total area of the university is 196 hectares of land. Woldia university has two campuses, namely ,the main compus called Woldia university and the other one is Mersa campus of Agriculture. It is 25 kms far from the main campus .

The first batch of students, numbering 599, has been admitted to the university on Dec 10/2011 in fabulous reception ceremony involving invited guests city residents, representatives of different zone & Woreda administrative offices and university’s community . students have been placed in to four faculties and 12 departments.

In its second year of operation ,the university admitted over 1457 New students . The number of faculties grew in to six ,the two newly added being the faculty of Agriculture and pedagogic al and behavioral science faculty . Like wise , the number of departments doubled in to 24. Currently, the university has a student population of over 10,000.

The university is anticipated to contain a student population of 15,000 over a period of five years. More than 200 blocks are planned to be erected in different phases with in the specified period.

## Statement of the problem

## Existing system

The existing system of WDU student cafe management system perform different task. Major function of Woldiya campus student café management system is preparing meal card every year. Ticking meal card of students during Meal time. woldiya university has their own meal time schedule of food.

The existing system that is working manually, all activity performing in the system like ticking meal card, generating report, recording information, diagnosis information and many other works are being working manually.

Many practical works in existing system that are in manual working are

* Ticking meal card: it is the ticker activity of existing café management system, it is every meal card have to be ticked by ticker manually for each student.
* Generating report: an activity of generating report in café management system in server office, it has to be recorded by worker of service office manually

## Major problems of existing system

The major problem of using student meal cards manually is the potential for errors, inefficiencies, and inconvenience. Some specific issues include:

**1. Human Error:** Manual handling of meal cards increases the likelihood of human errors in recording transactions, tracking balances, and managing accounts. This can lead to discrepancies in billing, inaccurate reporting, and confusion for both students and staff.

**2. Time-Consuming Processes:** Managing meal cards manually can be labor-intensive, requiring staff members to manually input data, calculate balances, and update records. This can result in delays in service, long wait times for students, and frustration for both employees and cardholders.

**3. Limited Convenience and Flexibility:** Manual systems may offer limited options for reloading cards, checking balances, or managing accounts remotely. This lack of convenience can inconvenience students and may deter them from using the meal card system.**4. Difficulty in Tracking and Reporting:** Manual systems make it challenging to efficiently track and report on meal card usage, trends, and patterns. This can hinder the university's ability to make data-driven decisions and optimize their dining services.

* Students eat more than once by cheating.
* The food amount needed is not known well therefore there will be extravagancy of food.
* Now everything is done using paper which leads to extra wastage.
* Students have to make a line to get in and cause the ticker has to find their meal number to tick if they are present.

## Proposed system

To overcome the problems that exist in the current mechanism of cafeteria system, the proposed system will add here the following function. Create efficient, effective, easy and accurate web based cafeteria system with a professional design and new application with latest approach.

Design interactive web application that can be managed easily to serve and support the current internal and external users of the café system.

The proposed system aims to save time spent on manual record searches, reduce physical storage space, provide easy access and control for administrators, ensure reliable information sharing among café community members, facilitate efficient registration, searching, updating, and secure file storage, and generate reports and enable online feedback.

## Advantage of the proposed system

* Saves time which is spent on searching the records by hand,
* Reduce space that occupied by manual document,
* Helps, admin to have an easy access and control over the system,
* Helps to reliable information among the community of the café,
* Helps to searching, updating and to keep all the file in safe way,
* Easy to generate a report daily, weekly or monthly
* Easy to search students profile or information.
* Each student uses their budget properly.
* The system will be available 24 hours for 365 days

## Motivation

The motivation behind the proposed system is to address the existing challenges and inefficiencies in the current cafeteria system. By implementing a new, efficient, and effective web-based system with a professional design and innovative approach, the goal is to improve the overall operations of the cafeteria and enhance user experience.

The motivation stems from the desire to save time spent on manual processes, reduce physical storage space occupied by documents, and provide easy access and control for administrators. Additionally, the system aims to ensure reliable information sharing among café community members, streamline registration and updating processes, and securely store files.

The motivation also includes the objective of generating reports for decision-making and enabling online feedback to promote communication and engagement within the café community. Overall, the motivation behind the proposed system is to modernize the cafeteria system, enhance operational efficiency, and provide a user-friendly and interactive platform for both internal and external users.

## Scope and limitation of the project

The scope of our project to make a system, a system that record the time and attendance of the users and ticking the meal card of student automatically. Our projects aim is to develop the system that makes the students of this university much more served on their Cafe and gives the coordinator of the cafeteria assistance on easy task which makes them do their daily activities in a much more efficient manner. And also our project is limited to the management of cafeteria management system of Woldiya University. The limitation of It is accessed only by English language, We cannot get food without restricted time, The system only works with the university local area network.

## Project Goal and Object

## Goals

The goal of the proposed system is to streamline and automate the process of managing and tracking work orders for a maintenance team. By consolidating all work orders into a centralized system, the team can efficiently prioritize, assign, and track the progress of tasks, ultimately increasing productivity and enhancing overall maintenance operations and build web-based application.

## General objective

The general objective of this project is to develop web based student cafeteria Meal card system.

## Specific objective

To accomplish the general objective, we could be follow our specific objectives in order to success the system. Our specific objectives are

## To identify and document both functional and non-functional requirements to ensure a clear understanding of the system.

## To generate simple and informative reports for easy analysis of cafeteria operations.

## To streamline the scheduling process and minimize time and energy expenditure.

## To enable easy data updates for accurate and timely information.

## To automate the ticketing system for faster issue resolution.

## To provide quick and easy access to all relevant information within the system.

## To improve data availability and enhance data management.

## To enhance the overall efficiency and effectiveness of the cafeteria system.

## To reduce time wastage and increase productivity.

## To generate efficient and insightful reports for decision-making.

## To design an attractive and user-friendly interface for easy navigation.

## To provide visibility on the menu preparation for breakfast, lunch, and dinner.

## To streamline communication and collaboration among cafeteria staff.

## To track inventory levels and improve supply chain management.

## To enhance customer satisfaction and experience through improved service delivery.

## Methodology

## Data collection method

To collect the information, we use the requirement gathering system

* **Interview the cafe coordinator:** by preparing the question and ask the question to the cafe Coordinator he give us the full information clearly.

During interview we use

* Record sound using mobile phone
* **Observation:** since we are student we observe the way of managing the student, so we document some idea by observation. Assessing and analyzing the overall system has been carried out by observing the current working systemize we have gone to WDU cafeteria office and search (seen) how their system works.
* **Document analysis:** Browse some information about the background of cafe system in Ethiopia university especially in the Woldiya university

## System design and analysis tools

* **Design and analaysis tools and purpose**
* **Microsoft Word:** The purpose of Microsoft Word in the proposed system is to create and edit documents related to maintenance schedules, work orders, reports, and other documentation. Word can be used to draft maintenance procedures, service schedules, and user manuals for the cafeteria maintenance management system. It can also be used to generate reports on maintenance activities, track progress, and communicate important information to the cafeteria staff.
* **Figma:** Figma's purpose in the proposed system is to assist in designing the user interface and user experience for the maintenance management system. It can be used to create wireframes, prototypes, and mockups of the system interface, allowing designers to visualize and iterate on the design before development. Figma enables collaboration among team members, version control, and real-time feedback, making it an essential tool for creating an attractive and user-friendly interface for the cafeteria maintenance system.

## System development tools

* **HTML5:** can be used to build the layout and content of the maintenance management system, ensuring proper structuring of documents, forms, and elements for easy navigation and interaction.
* **CSS (Cascading Style Sheets):** can be utilized to customize the appearance, layout, and formatting of the maintenance management system, providing a visually appealing and cohesive design for users.
* **jQuery:** can be used to enhance interactivity, handle user events, and manipulate the DOM dynamically, improving the user experience of the maintenance management system.
* **JavaScript:** t can be utilized to create dynamic elements, validate user input, and enhance the overall user experience of the maintenance management system.
* **PHP:** can be employed to handle backend logic, process form submissions, interact with databases, and generate dynamic content for the maintenance management system.
* **Visual Studio Code (VSCode):** can be used as the primary development environment to write, edit, debug, and manage code for the maintenance management system efficiently.
* **MySQL:** can be utilized to create and manage the database for storing information related to work orders, maintenance schedules, user accounts, and other relevant data for the cafeteria maintenance system.
* **Ajax:** can be used real-time update,dynamic content loading,form submissions and validation and interactive features.

# Chapter two

## System requirement specification

## Background

Student cafeteria is one of the services given in woldia university that has been started its service in 2004E.C. In 2006E.C the university has established second campus in mersa and agricultural students were taken to there. This leads the cafeteria system to have two café. I.e. main campus and Mersa campus. Now at the time the WDU main campus has giving its service for around 9000 students and on the other side Merssa campus gives service for 800 students. Many Campuses are using one card system such as ASTU, JMU and other technology Universities in our country that have got successful result or benefit from the system. Taking those campuses as an example the system will give more benefit for the users’ especially after it will be advanced to one card system.

## Functional requirement

Functional requirements describe the specific actions and tasks that a system must perform to meet the needs of its users. They detail the functionalities, features, and behavior that the system should have to fulfill its intended purpose.

* **Login for Authentication:** This functional requirement refers to the feature that allows authorized users, such as cafeteria staff and administrators, to securely log in to the maintenance management system using their credentials to access and update information.
* **Login Registration for Adding New Users:** This requirement involves the capability to register and add new users to the system, including cafeteria staff, administrators, and other relevant personnel, with appropriate access permissions.
* **Student Registration Fetch New Registered from Registrar:** This requirement pertains to the functionality that allows fetching and importing newly registered students' information from the registrar's database into the cafeteria management system for tracking and meal planning purposes.
* **Food Program Registration:** This feature enables the scheduling of food programs, including specifying the time and day for different meal offerings, such as breakfast, lunch, and dinner.
* **View Program Update and Delete from the Package:** This requirement involves the ability to view, update, and delete food program schedules and packages within the system, allowing for modifications as needed based on changing requirements or preferences.
* **View Student Update and Delete:** This feature allows users to view, update, and delete student information stored in the system, such as dietary restrictions, meal preferences, and attendance records.
* **Register Non-Café Usage Students:** This functionality enables registering students who are not regular cafeteria users but may require occasional meal services or special accommodations.
* **Check Students Eaten/Not:** This requirement involves tracking and monitoring students' meal attendance and determining whether they have eaten or not for record-keeping and planning purposes.
* **View Daily Menus:** This feature provides access to daily menus for cafeteria meals, displaying information on available dishes, ingredients, nutritional content, and preparation instructions for staff and students to make informed choices.
* **Reporting and Analytics:** This functionality involves generating reports and analytics on various aspects of cafeteria operations, such as meal consumption patterns, inventory usage, student attendance, and financial performance, to support data-driven decision-making and performance evaluation.

## Non-functional requirement

Non-functional requirements, also known as quality attributes or qualitative requirements, define the attributes or qualities that a system must possess rather than specific behaviors or functions it must perform. In the context of the proposed cafeteria management system for Woldia University, non-functional requirements encompass various aspects related to performance, security, portability, and product attributes.

## Performance requirement

* **Response Time:** The system should respond to user interactions, such as placing orders or updating menus, within acceptable time limits to ensure a seamless user experience.
* **Throughput:** The system should be capable of handling a high volume of transactions during peak hours without significant degradation in performance.
* **Scalability:** The system should be able to scale efficiently to accommodate an increasing number of users, transactions, and data volumes over time.

## Security requirement

* **Authentication and Authorization:** The system should implement robust authentication mechanisms to verify the identity of users and ensure that only authorized personnel can access sensitive information.
* **Data Encryption:** Sensitive data, such as student personal details and payment information, should be encrypted during transmission and storage to prevent unauthorized access or tampering.
* **Access Control:** The system should enforce access control policies to restrict user privileges based on roles and responsibilities, minimizing the risk of data breaches or unauthorized actions.

## Portability requirements

* **Platform Independence:** The system should be designed to run on different platforms, including desktop computers, laptops, and mobile devices, without requiring significant modifications or adaptations.
* **Operating System Compatibility:** The system should be compatible with common operating systems, such as Windows, macOS, and Linux, to ensure widespread usability.

## 2.3.4. Product requirements

* **Reliability Requirement:**

- The system should be reliable, with minimal downtime and high availability, to ensure continuous service during operating hours.

- It should be capable of handling unexpected errors gracefully and recovering from failures quickly to minimize disruptions to cafeteria operations.

* **Efficiency Requirement:**

- The system should be designed to optimize resource utilization, including server resources and network bandwidth, to ensure efficient operation and scalability as the number of users and transactions grows over time.

* **Speed Requirement:**

- The system should provide fast response times for user interactions, such as placing orders, updating menus, and processing payments, to enhance the user experience and streamline cafeteria operations.

* **Maintainability Requirement:**

- The system should be designed with modular and well-documented code to facilitate ease of maintenance and future enhancements by cafeteria staff or IT personnel.

- Regular updates and patches should be applied to address security vulnerabilities and improve system performance and reliability.

* **Availability Requirement:**

- The system should be highly available, with redundant components and failover mechanisms in place to minimize downtime and ensure continuous service availability, even in the event of hardware or software failures.

## Feasibility study

## Operational feasibility

Operational feasibility assesses whether the proposed system will be viable and beneficial within the current operational environment. In the case of the Woldia University cafeteria management system, operational feasibility examines whether the system will streamline existing processes, enhance efficiency, and meet the needs of cafeteria staff and students.

* **Streamlining Processes:** The proposed system aims to automate manual tasks such as meal card ticking, generating reports, and tracking student attendance. By eliminating manual errors and reducing time-consuming processes, the system can streamline cafeteria operations.
* **Enhancing Efficiency:** With features like automatic meal card ticking, real-time reporting, and user-friendly interfaces, the system can improve the overall efficiency of cafeteria management. This can lead to faster service, reduced waiting times for students, and better resource utilization.
* **Meeting User Needs:** Through interviews with cafeteria coordinators and observations of current processes, the system's requirements have been tailored to meet the specific needs of Woldia University's cafeteria. This ensures that the system is aligned with user expectations and can effectively support their daily activities.

## Technical feasibility

Technical feasibility evaluates whether the proposed system can be implemented using available technology and resources. It examines factors such as software compatibility, infrastructure requirements, and development capabilities.

* **Software Compatibility:** The proposed web-based cafeteria management system will utilize technologies such as HTML5, CSS, JavaScript, PHP, and MySQL, which are widely supported and compatible with modern web browsers. This ensures that the system can be accessed by users across different devices and platforms.
* **Infrastructure Requirements:** The system will be hosted on the university's local area network (LAN), leveraging existing infrastructure and minimizing additional hardware costs. It will also require a reliable internet connection for remote access and data synchronization.
* **Development Capabilities:** The development tools chosen for the project, such as Visual Studio Code for coding and Figma for design, are commonly used by developers and designers. Additionally, the project team has access to necessary skills and expertise for system development, including programming languages and database management.

## Economic feasibility

Economic feasibility assesses whether the proposed system is financially viable and offers a positive return on investment (ROI). It considers factors such as development costs, potential savings, and long-term benefits.

* **Development Costs:** The initial investment required for system development includes expenses related to software licenses, development tools, and personnel. However, these costs are offset by potential long-term savings and efficiency gains.
* **Potential Savings:** By automating manual processes and reducing errors, the proposed system can lead to cost savings in terms of labor, paper usage, and resource management. Additionally, the system may help minimize food wastage and optimize inventory management, further reducing operational costs.
* **Long-Term Benefits:** The proposed system offers long-term benefits such as improved service quality, enhanced data analysis capabilities, and increased customer satisfaction. These benefits contribute to the overall value proposition of the system and justify the initial investment.

## Intangible cost-benefits associated with the project:

* **Improved User Experience:** One intangible benefit of the proposed cafeteria management system is the enhancement of the user experience for both cafeteria staff and students. By streamlining processes, reducing wait times, and offering user-friendly interfaces, the system can contribute to a more positive and efficient dining experience.
* **Enhanced Data Accuracy and Reliability:** With the automation of manual tasks and the implementation of real-time reporting, the system can improve the accuracy and reliability of data related to meal transactions, student attendance, and inventory management. This enhanced data quality can lead to better decision-making and improved operational efficiency over time.
* **Increased Transparency and Accountability:** By providing visibility into meal card transactions, student attendance records, and cafeteria operations, the system promotes transparency and accountability among cafeteria staff and administrators. This can help foster trust and confidence in the management of cafeteria services and ensure fairness in resource allocation.
* **Empowered Decision-Making:** Through the generation of insightful reports and analytics, the system enables cafeteria managers to make data-driven decisions regarding menu planning, inventory management, and resource allocation. This empowers decision-makers to optimize cafeteria operations and adapt to changing student preferences and dietary requirements.

## Tangible cost-benefits associated with the project:

* **Labor Cost Savings:** One tangible benefit of the proposed system is the reduction of labor costs associated with manual meal card ticking, data entry, and report generation. By automating these tasks, the system frees up staff time for more value-added activities, ultimately reducing labor expenses for the university.
* **Paper and Printing Cost Reduction:** With the transition from manual, paper-based processes to digital record-keeping and reporting, the system can significantly reduce costs related to paper usage, printing, and document storage. This tangible benefit contributes to overall cost savings and promotes environmental sustainability.
* **Efficiency Gains and Productivity Improvement:** By streamlining processes, minimizing errors, and enhancing operational efficiency, the system can improve productivity among cafeteria staff. This leads to tangible benefits in terms of faster service, shorter wait times for students, and increased throughput in the cafeteria, ultimately maximizing revenue potential.
* **Optimized Inventory Management:** Through better tracking of inventory levels, consumption patterns, and food wastage, the system enables more efficient inventory management practices. This tangible benefit helps reduce food waste, minimize overstocking, and optimize procurement, resulting in cost savings for the university.