



Software Design

Progress Report No. 5

Requirement Analysis

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December 16, 2025

I. Objectives

In this section, the goals in this laboratory are:

- To illustrate the process of determining the requirements for a system
- To enumerate both the requirement definition and requirement specification

II. Methods

Requirement elicitation is one of the critical parts of the process. We must use various techniques to determine what the users need and what the customers really want.

Two Kinds of Requirements:

1. Requirement definition – a documentation that is written in terms that the customer can understand.
2. Requirement specification – a documentation that the definition are written in technical terms appropriate to the development of the entire system

Background

Over the semester you will be developing a “System”. This will be a suite of applications of real options methods to a professional issue of your own choosing. The object of developing this “System” is to provide you with a worked-out application of real options analysis in an area of your interest. The expectation is that, by creating this system, you will achieve an in-depth understanding of how real system analysis could be useful to you professionally.

This “System” might also provide you with a good start on some research project or thesis or be a helpful complement to the work you were doing – that would be an added benefit. In general, you are encouraged to develop this “System” around some research or course project that you might be involved with.

Laboratory Activity

1. Describe your System Application
2. Describe the engineering system that you would like to analyze this semester.
3. Choose something that interests you and that you wish to explore, as you will spend substantial time on it;
4. Choose any ways to gather requirements (survey, questionnaires, Use Case diagram, and the like)

You should place yourself in the position of someone participating in the design of this system. For example, you might want to put yourself in the role of a system designer.

**Be sure to describe the following:

1. What is the system? What does it include, and what does it exclude?
2. What are its principal design levers or variables? What can we manipulate to improve its performance? What kind of model do we have to analyze the effect of these variables?
3. What are the benefits of this system? What models do we have of how the design affects these variables?

III. Results

1. System Application Description

Our project is a Web-Based Inventory Management System developed for Asia Wood International Corporation (AWIC). The purpose of this system is to replace their current Excel-based inventory tracking with a more organized and automated system.

Instead of manually updating spreadsheets, the staff can log in to the system and record stock-in and stock-out transactions. The system automatically updates the inventory levels after every transaction. It also allows users to view inventory summaries and generate reports in Excel and HTML format.

The system is built using C++ with the Drogon framework for the backend, and HTML and CSS for the interface. It uses a MySQL database to store all inventory records. The system runs on a Local Area Network (LAN), so it can still function even without internet access.

The system is focused only on internal inventory management. It does not include online ordering, payment processing, ERP systems, or hardware devices like barcode scanners.

2. Description of the Engineering System

The system is divided into three main parts: the user interface, the system logic, and the database. The user interface is where the staff and admin interact with the system using a web browser. The system logic processes the data, checks inputs, and updates stock quantities. The database stores all product information and transaction records.

The hardware needed is simple. A central computer can host the database, and other office computers can access the system through the LAN. This setup keeps the system simple, affordable, and easy to maintain.

3. Important Design Factors

There are several important factors that affect the performance of the system. The database design must be organized properly to avoid errors and duplicate data. The role-based access control ensures that only authorized users can perform certain actions. The stock calculation logic must be accurate so that inventory levels are always correct. Running the system on a LAN also helps make it stable and usable even without internet.

These factors help improve accuracy, security, and efficiency.

Models Used in the System

We used basic database normalization to keep the data organized. The system also follows ACID properties to make sure transactions are saved correctly and consistently. An audit trail is included to record who made changes and when they were made. We also considered usability, reliability, and security when designing the system.

Benefits of the System

The system reduces errors compared to manual Excel tracking. It updates inventory levels automatically, which saves time and effort. It improves security by requiring users to log in and limiting access based on their role. Reports can be generated quickly, and managers can easily monitor stock levels. Since it runs on a LAN, the company does not need internet or subscription services to use it.

4. Requirement Gathering

We gathered the system requirements by interviewing the company management, observing their current inventory process, and reviewing their existing Excel files. This helped us understand the problems in their current system and identify the features needed in the new system.

System Requirements

From the user's point of view, the system must allow secure login, record stock-in and stock-out transactions, update inventory automatically, generate reports, and show inventory summaries on a dashboard.

From the technical side, the system must use secure authentication, role-based access control, and a MySQL database that is properly structured. It must update stock levels after every

transaction and keep a record of all activities. The system must work smoothly within a Local Area Network and maintain accurate data at all times.

IV. Conclusion

In conclusion, the proposed inventory system helps AWIC improve their inventory process by replacing manual Excel tracking with a more organized and automated system. It reduces errors, updates stock levels automatically, and makes report generation faster and easier.

Overall, the system improves accuracy, security, and efficiency while remaining simple and cost-effective for the company.

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