Chapter 2 – Analysis

2.1 - Chapter Introduction

The process of identifying the underlying problem and comprehending the problem domain from a jumble of facts and figures is known as analysis. The purpose of analysis is to provide a complete, consistent, and unambiguous image of the system. Also, what should the system supply to meet all user requirements. Requirements Engineering is another name for this procedure. The system can be designed with the help of analysis.

2.2 - Fact Finding Techniques

Fact-gathering procedures are information-gathering strategies used in system analysis to properly define and comprehend system requirements. The following strategies were primarily employed:

1. Interviews
2. Observation
3. Existing Documents Analyzing

2.2.1 – Interviews

The initial technique utilized to collect and establish system requirements, as well as clarify and confirm those needs, was an interview. In order to effectively address and weigh the inputs of each interviewee, the interviewer must first comprehend the perspective of each interviewee.

The following is the interview schedule that was used.

Date	Interviewee	Position	Interview Duration
23/10/2021	Mr. Samudu Kannangara	Owner	40 minutes
23/10/2021	Mr. Upali Kannangara	Stock Keeper	30 minutes
23/10/2021	Mr. Thamara Kannangara	Technician	40 minutes
25/10/2021	Mr. Susith Sewikrama	Delivery Manager	20 minutes
25/10/2021	Mr. Chamara Perera	Technician	30 minutes
27/10/2021	Miss. Kalpani Dinusha	Customer	20 minutes

Table 2.1

2.2.2 – Observation

Observation is a fact-finding technique in which system analysts observe how individuals perform tasks and activities during site visits. This is an excellent approach to learn what end users go through in their day-to-day processes, and it gives you a lot of insight into the business process.

2.2.3 – Existing Documents Analyzing

Analyzing existing papers is a key strategy for acquiring requirements. When building a user-friendly system, evaluating the papers and reports of an existing system can help. Solid information and facts are usually collected by studying existing papers, which helps to corroborate and validate the requirements gathered through other methods.

2.3 - Existing System

Customers used to come into the store and convey their needs to the technician who built their computer under the old system. Customers arrived at the shop, handed over the defective item or computer to the hardware professionals, and then waited in their restroom until the job was completed. To take online orders, they currently utilize a phone-based and WhatsApp-based order system. There are no other options than bank transfers, and the customer must send a legal transaction paperwork to confirm the order. Customers are not given accurate delivery information due to a lack of appropriate delivery information.
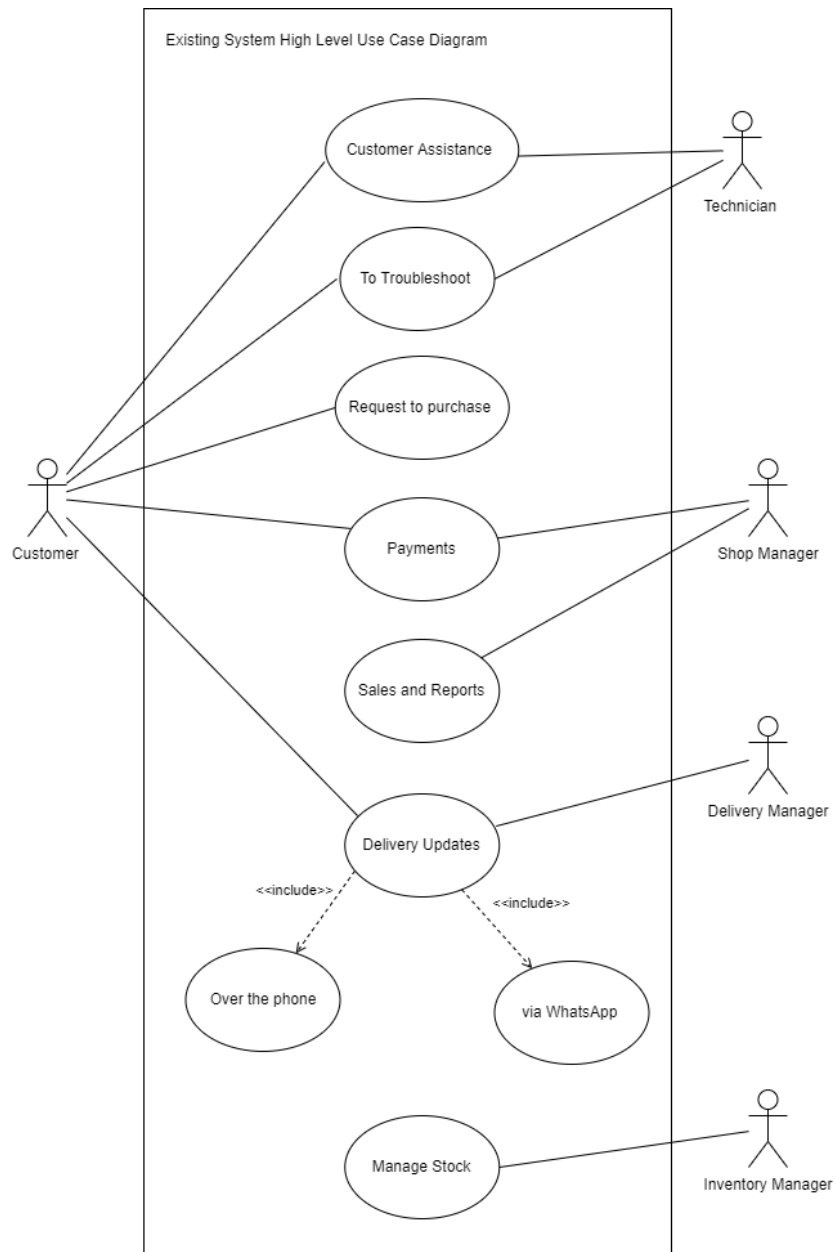
2.4 - Existing System Use Case Diagrams

There were numerous downsides to the paper-based technique.

- It was discovered that data was repeating.
- Data that is unidentifiable owing to illegible handwriting.
- Data was lost because of misplacing the recording materials.
- It takes a long time.
- Manual computations are required.
- Data security is lacking.
- More manpower is required.

The following are the existing system's High-Level Use Case Diagrams for the modules listed.

2.4.1 - Existing Documents Analyzing

Existing System High Level Use Case Diagram

- Customer Assistance — Technician
- To Troubleshoot
- Request to purchase
- Payments — Shop Manager
- Sales and Reports
- Delivery Updates — Delivery Manager
  - <<include>> Over the phone
  - <<include>> via WhatsApp
- Manage Stock — Inventory Manager

Customer

2.5 - Requirements Analysis

2.5.1 - Functional Requirements

Calculations, data insertion, manipulation, and processing, as well as data presentation, are all defined by functional requirements. The system's required features are listed below.

- **Computer Hardware Assistant**
  - This module assists customers who are unfamiliar with computer hardware. It takes all the details of individual items and matches them with the next most appropriate piece, completing the assembly of an entire computer. After completing, customers have an option to check out the selected parts and make a payment to complete the assistant process.

- **Troubleshooting Assistant**
  - **With the help of this virtual assistant, consumers may troubleshoot their hardware failures without having to visit a computer repair shop, and they can order the right parts that the fault has accurately recognized. Customers can schedule an appointment with one of the computer hardware technicians if the problem is not resolved.**

- **Appointment Booking**
  - **This module aids in the scheduling of appointments for clients who wish to troubleshoot with in-house computer hardware professionals.**

- **Shopping Cart**
  - **This module allows users to find the entire store for items and create customer orders using a shopping cart.**

- **Payment**
  - **This module provides up-to-date information on all payments made by customers, as well as advanced payment filtering options and having bank transfers, and cash on delivery options.**

- **Inventory Management**
  - **Has the ability to handle the complete inventory. Individual items and corresponding categories, brands, and models can be added, deleted, and updated.**

- **Warranty Management**
  - This module aids in the generation of warranty alerts. It shows the status of the warranties of the goods and how much time is left on each item's warranty.

- **Delivery Management**
  - This module contains all of the customer-created delivery records in the system. It displays the order tracking number as well as information about the courier company.

- **Invoice GenaCrationg**
  - In the system, this module generates a variety of invoices. It's compatible with the payment, computer hardware assistant, and troubleshooting modules.

- **Backup and System Log**
  - This Module enables the backup of system data and extracts the system log such that the system may be audited for any additional issues.

- **User Management**
  - This module helps to manage all of the users of the system. It aids in the selection of the right individual for the right position.

- **Report Management**
  - This module will make it possible to generate, preview, and print a variety of reports in order to continue with the success of the business.

2.5.1 - Non-Functional Requirements

Non-functional requirements had to be met in order for a system to be valuable and successful.

- Usability
- Maintainability

  It's simple to correct a bug, add new features, make changes to support new operating systems, and make the software easier to maintain for others. It also improves the contentment of members.

- Performance

  The system should be quick and finish the task in the shortest time possible. Data should be retrieved as soon as feasible, and the response time should be minimal.

- Security
- Reliability and accuracy

  The system's major features include the generation of progress reports and workout programs. As a result, the system's accuracy and dependability are critical.

2.6 - Similar Systems and Literature Reviews

It was required to examine the existing system before designing the web-based Computer Hardware Purchasing and Troubleshooting Assistant management system. Because the current system is semi-paper-based, a literature review and related system analysis were also decided. The systems listed below were evaluated in order to have a thorough understanding of the situation.

2.6.1 – Microcenter

2.6.2 – Amazon

2.6.3 - Comparison of the Proposed System to a Comparable System

The results of the comparison as below (table 2.2)

2.7 - Model of the Proposed System's Process

The Software Development Process, also known as the Software Development Lifecycle, is the division of software development activity into phases in order to better design, project management, and product management.

2.7.1 – Scrum

"The Scrum process organizes development into a sequence of sprints, each of which

results in a potentially usable product with an added increment of function. The tasks

for each sprint are set, in consultation with a stakeholder representative, during a sprint

planning meeting and cannot be added to during the sprint. Each task is typically

expressed as a user story. Each sprint is time boxed: the end date of the sprint does not

change. Tasks that cannot be accomplished in time are returned by the team to the

backlog for future consideration." [3]

2.7.1 – Extreme Programming (XP)

"Extreme programming (XP) is a software development methodology which is

intended to improve software quality and responsiveness to changing customer

requirements. As a type of agile software development, it advocates frequent "releases"

in short development cycles, which is intended to improve productivity and introduce

checkpoints at which new customer requirements can be adopted." [4]

2.7.1 – Extreme Programming (XP)

"Rational Unified Process" is what it stands for. RUP is a software development technique developed by IBM's Rational group. It splits the development process into four stages: business modeling, analysis and design, implementation, testing, and deployment. The four phases are as follows: