

**University of Bahrain**

**College of Information Technology**

**Department of Computer Science**

**ITCS 389: Software Engineering I**

**Online Shopping System**

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Table of Contents

[**1.1 Introduction** 1](#_Toc180008539)

[**1.2 Background** 2](#_Toc180008540)

[**1.3 Identify the Problem** 3](#_Toc180008541)

[**1.4 Project Objectives** 4](#_Toc180008542)

[**1.5 Process Model** 5](#_Toc180008543)

## **1.1 Introduction**

The purpose of this project is to design a modern and intuitive system that handles online shopping for a regional supermarket company called “Al-Helli”. Currently this company doesn’t have a good enough online shopping system, and most people just chose 3rd party platforms to do this task, which is quite a drawback for the overall business. The specified system that we want to build will embrace customer product browsing, ability a shopping cart, checkout procedures as well as order tracking. The scope captures the end-user interface which helps in customer interaction, database management system for product ordering and inventory as well as the integration of secure payment systems. The main goals are to make interactions with the system be simple, reliable and flexible while allowing the users to have a good experience when using the system. The scope that we are most interested in is the local supermarket sector and the strong competition that it’s having and will continue to have to far future.

When it comes to the stakeholders of this project, the Business CEO, Major Software development companies, Customers purchasing products from the online shop are all possible stakeholders for this project. In addition to that, Online shop administrative staff managing the system, Software developers, database administrators, and testers responsible for the system's development and maintenance all hold an interest in the success of this software project.

## **1.2 Background**

“Al-Helli” is a well-known supermarket here in Bahrain. It was found back in 1975. It serves as a common choice for numerous families to do their shopping for goods and daily needs. Its popularity has increased significantly in recent years. This was due to so many factors, but the main ones are their competitive/affordable prices and the frequent offers that they advertise. Which makes customers prefer them over other alternatives. Additionally, their employees and staff are majority Bahraini citizens. That made customers trust “Al-Helli” and made them want to support a local business and staff over foreign companies that offer similar or exact services. Al-Helli currently has 11 branches all around Bahrain and the number will just keep increasing rapidly. The current set of procedures and processes the company is following, from advertisements to their relationship with customers, are all executed to perfection. And it’s clearly seen by the success and result they have been gaining from it. But the system has a clear vulnerability. Which is the digital and technological aspect of things. Since everything right now is becoming online. Keeping a traditional shopping style with an inferior online shopping experience is not sustainable in the long term. No matter what you have, it’s impossible to keep up with others if you are not following this trend and your company will just become outdated. So, to prevent this and maintain the upward growth that the the company is experiencing. A brand new online shopping system must be implemented for the company. This will help “Al-Helli” hold or even increase their strong influence over this industry. And it will give them more exposure to a variety of customers. Which are all desirable milestones the firm wants to achieve soon.

**1.3 Identify the Problem**

**The online system has several issues mentioned by the users. Some of the mentioned issues:**

* The selection of product categories is limited: The system does not have the ability to filter product categories effectively. Hence some users find it difficult to look for the needed item, which makes it challenging.
* Limited users’ orders per day: Customers are unable to place orders for delivery beyond a certain number of days.
* Complicated refund process: Refunds as credits frustrate customers who are expecting a simple process.
* Limited ability to update personal information: Users are unable to change their personal information, such as their email address, which is important for account verification and for tracking orders.
* Grouping items: All the items purchased by the user will be grouped together for delivery, and this will lead to restricting flexibility for receiving items separately.

**Impact Analysis:**

**These issues can lead to significant negative consequence such as:**

* Reduce customer satisfaction: Users may get frustrated since it is difficult to navigate product categories and complications regarding the refund process will lead the users to find other platforms.
* Increasing operational costs: Higher workloads faced by customer service teams due to the system limitations
* Possible profit loss: Limited ordering options and a bad shopping experience can result in missed sales and opportunities because a client might decide to use other user-friendly systems.

**Desired Outcomes:**

**The new online shopping system aims to achieve the following outcomes:**

* Enhancing user experience by improving functionality and navigation.
* Simplified order placement and refund process.
* Flexibility of delivery choices to meet user preferences.

**1.4 Project Objectives**

**To improve the user experience, the project will focus on the following objectives:**

* Finding solutions to technical problems related to the site, to ensure a smooth user experience.
* Reduce waiting time and user effort.
* Improve site reliability and inclusion advantages.
* Reduce the workload of customer service.
* Improve the system functionality by adding more useful features.

**Alignment with Business Goals:**

**These project objectives align with the overall business goal by:**

* Improving customer satisfaction and loyalty, which are important for maintaining sales growth.
* Simplifying processes to cut expenses and boost profitability.
* Supporting the goal of being a top online retailer.

# **1.5 Process Model**

**Model Selection:**

A lot can go into choosing a process model, It depends on many factors like:-

* Clear/unclear requirements.
* Fixed/flexible deadlines
* Large/small project
* Experienced/Inexperienced developers/managers

For our shopping, after careful consideration and evaluation, we decided To adopt the Waterfall process model

**Model Description:**

The waterfall process model is a linear sequential model used in software development. This model is one of the oldest process models ever. It has stood the test of time and is widely used in software development and business applications.

In the waterfall process model, software development is split into different phases, said phases must be completed in order before moving on to the next one. (hence why it is a “linear”).

The Phases that the waterfall process model is split into are:

* **Requirement Definitions**.
  + Requirements from stakeholders are collected thoroughly using various methods like surveys, forms and in-person questioning. It is important to be thorough because this is the last time we collect stakeholder requirements and specifications.
* **System and software design**
  + User requirements are examined to specify the system and software design. Here we make the important design decisions like:
    - What programming language will be used?
    - What database implementation will be used?
    - What is the layout and design of the different interfaces present.
    - And so much more….
* **Implementation and unit testing**
  + Here is where the source code will start to take shape. All the different agreed upon designs will be converted into modules/units. Said units will be rigorously tested to ensure expected behavior and a “bugless” code base.
* **Integration and system testing**
  + All the different units worked on previously are all assembled to finally make the software product. Said integration must be tested to ensure viable and working products that fulfill stakeholder requirements.
* **Operation and maintenance**
  + The software system is deployed and monitored continuously. This may involve bug fixes, Functional enchantments and/or performance improvements.

Advantages of the waterfall lay in its simplicity, well defined millstones, and ease of which is to manage and monitor software development. And the disadvantages are its rigidity, Extensive documentation requirements, inflexibility, and that it pushes out a working product late in development.

**Visual Representation:**



Figure 1:Visual representation of the waterfall process model

Different visual representation of Waterfall process model may have different labels or even more labels. But the ideas are all the same. (In our explanation of the process model, we differentiated between unit testing and system testing, and we had Deployment and Maintenance be in the same phase).

**Justification:**

Some may criticize our decision to use the waterfall model. But we believe it is the better suited process model for our software product because

* Online shopping is not a new thing, previous software giants like amazon, E-bay and Temu have already braved much of the Online shopping frontier. And because online shopping has been around for such a long time, it’s far-fetched that the software requirements would become outdated by the time the software is deployed.
* The rigidity given by the waterfall process model can be a blessing in disguise. Said rigidity insures clear and focused software development. other flexible SDLC can become a nightmare to manage and maintain if not monitored carefully.
* Waterfall model encourages thoughtful planning and decision making, with disciplined and accountable software engineering. Which are sometimes missing in a fast moving “sprintful” environment.
* Waterfall model is simple and has been well understood for decades. Sometimes in business applications, simplicity is king.