



جامعة  
الأميرة سميرة  
للتكنولوجيا  
Princess Sumaya  
University  
for Technology

## Mostawdaakom

*An analytical application that provides users (retailers, and suppliers) with real-time inventory updates.*

**King Talal School of Business Technology**  
**Department of Business Information Technology**

### Prepared By:

Rachel Raed Samawi	2020109
Bana Ziad Al-Barghouthi	20200080
Ibrahim Khaled Al-ajlouni	20201149
Zaid Jehad Mohammad	20201105

**Supervised By:** Dr. Dalia Al-Eisawi



'Bridging the communication gap between  
Suppliers and Retailers'



“Bridging the Gap between Suppliers and Retailers”



## **Acknowledgment**

First and foremost, we would like to express our sincere gratitude to our supervisor, Dr. Dalia Al-Eisawi, for her continuous patience, understanding, and feedback throughout this project. Her knowledge and expertise in the Analytics System Analysis and Design fields have added tremendous value to our project and, most notably, our professional lives. We are all grateful for her excitement towards our graduation project and support towards giving it an ‘out-of-the-box’ element, positively influencing our efforts from beginning to end.





We owe our family a debt of appreciation for their continuous support and encouragement as we pursued our graduation project. We want to thank our parents, siblings, and extended family for their patience, understanding, and numerous sacrifices that have helped us concentrate on our academic goals. Our family has been the pillar of our journey; they have supported us through good times and bad. Thank you.

Finally, we would like to thank our friends who supported us through their continuous words of encouragement, motivation, and understanding during our time at PSUT and this project.



## Authorization Form

We, “Bana Barghouthi, Zaid Mohammad, Rachel Samawi, and Ibrahem Al-Ajlouni”, authorize Princess Sumaya University, King Talal Faculty of Business Technology to supply copies of our graduation project to libraries, establishments, or individuals upon request.

Name	Signature	Date
Bana Barghouthi		16/5/2024
Zaid Mohammad		16/5/2024
Rachel Samawi		16/5/2024
Ibrahem Al-Ajlouni		16/5/2024



## Committee Decision

This graduation project was defended on the 26th of May 2024.

Examination Committee	Signature
Dr. Dalia Al- Eisawi	



## **Abstract**

The current research-based project, a new innovative mobile application with easy-to-use features that bridge the communication gap between suppliers and supermarkets/hypermarkets, enables effective and efficient order placement and management so that supermarkets' owners can track, manage, and receive their purchases in the demanded quantities and in real-time.

Our project came to solve core challenges such as the adoption of digital technologies by traditional suppliers and retailers. Moreover, the technology involves integration with many types of other Point-of-Sales and inventory systems which may be technically complex. Also, larger data volumes are often very difficult and complex.

Mostawdaakom is a Business Intelligence application that helps in inventory real-time updates, as well as providing the most demanded products, thus the smaller supermarkets are unable to keep up with the market trends and the unexpected demands that normally happen to the products can be always updated with the market trends. What sets our research apart is that we have two sections, one full of local Jordanian companies and another with international companies.

The current research-based project will follow a robust System Development Life Cycle (SDLC) which contains several key phases: requirement analysis, system design, implementation, testing, and maintenance. Our project will utilize Android Studio as a front-end and TinyDB Method and Firebase for the back-end infrastructure; The main reason for using Android Studio as Front-end is that it's user-friendly and it follows our study plan courses, TinyDB has been made to temporarily store chosen products and send heartbeats to Firebase to store the order permanently.

Our research project aims to tackle discounts and enticing offers on local companies' products to encourage people to support local companies for a stronger economy in Jordan and to strengthen our country's self-dependence. Some of the great problems that our project aims to solve are to reduce the stock-outs that supermarkets suffer from with certain products, provide real-time market trends updates to make it easy for all supermarkets to be up to date with the trends, and improve the inventory management process and simplify it for the suppliers and supermarkets' owners.



# 1. Table of Contents

<b>1. Chapter 1: Introduction.....</b>	<b>12</b>
1.1 Aim and objectives:.....	12
1.2 Background Review: .....	13
1.3 Trends in retail technology:.....	14
1.4 Opportunities for Mostawdaakom: .....	14
1.5 Project Structure:.....	15
1.6 Gantt chart: .....	17
<b>2. Chapter 2: Theoretical Background of the Proposed System .....</b>	<b>19</b>
2.1 The Proposed Platform:.....	19
2.2 Competitive analysis: .....	20
2.2.1 Mostawdaakoms' local competitors: .....	21
2.3 PESTLE Analysis:.....	23
2.4 Ethical Aspects:.....	25
<b>3. Chapter 3: Business Requirements .....</b>	<b>27</b>
3.1 Business Model Canvas .....	27
3.2 Human Requirements:.....	29
3.2.1 Employee Categorization:.....	29
3.2.2 Departments and Roles: .....	30
3.3 Marketing Strategy:.....	33
3.4 Use Case Diagram .....	39
3.4.1 Use Case Table .....	39
3.4.2 Use Case Process .....	45
3.4.3 Use Case Scenario.....	47
<b>4. Chapter four: System Requirements Analysis: .....</b>	<b>52</b>
4.1 Functional and Non-Functional System Requirements:.....	52
4.2 Methodologies .....	52
4.3 Quantitative Data Analysis.....	53
4.4 Qualitative Data.....	63
4.4.1 Pre-initiation Data Collection .....	63
4.4.2 Initiation – Data Collection .....	70
4.5 Problem Statement .....	71



4.6	Feasibility Study.....	72
4.6.1	Financial Feasibility .....	72
<b>4.6.1.1</b>	<b>The Ecosystem .....</b>	<b>72</b>
4.6.1.2	Source of Revenue .....	75
4.6.2	Technical Feasibility.....	76
4.6.3	Operational Feasibility .....	76
<b>5.</b>	<b>Chapter five: system analysis and design .....</b>	<b>78</b>
5.1	Entity Relationship Diagram (ER Diagram) .....	78
5.2	ERD description: .....	79
5.3	Data Flow Diagram (DFD) .....	83
5.4	Prototype .....	84
<b>6.</b>	<b>Chapter six: Implementation: .....</b>	<b>94</b>
6.1	Programming Language .....	94
6.2	Mostawdaakom's dashboard: .....	97
6.3	Coded Screens: .....	101
6.3.1	Splash Screen.....	101
6.3.2	Sign-in Page.....	103
6.3.3	Sign-Up Page.....	104
6.3.4	User Type .....	106
6.3.5	Adding Store name .....	108
6.3.6	Home Page.....	110
6.3.7	Local Products Page .....	111
6.3.8	International Products Page .....	113
6.3.9	Local and International Products Page .....	115
6.3.10	Eisberg page .....	116
6.3.11	Product Review Page.....	118
6.3.12	Cart Page.....	120
6.3.13	Order Status .....	122
6.4	CyberSecurity and Threats .....	123
6.5	Screen Testing .....	125
<b>7.</b>	<b>Chapter Seven: limitations and future work: .....</b>	<b>128</b>
7.1	Limitations: .....	128





7.2	Proposed solution: .....	129
7.3	Future work: .....	130
<b>8.</b>	<b>Conclusion: .....</b>	<b>132</b>
<b>9.</b>	<b>References: .....</b>	<b>134</b>
<b>10.</b>	<b>Survey questions: .....</b>	<b>140</b>

## List of figures:

Figure 1: Project Structure .....	16
Figure 2 Gantt chart .....	17
Figure 3 mostawdaakoms' supply chain .....	20
Figure 4 yaseers' logo .....	21
Figure 5 Orderat logo.....	22
Figure 6 BMC for mostawdaakom .....	28
Figure 7 Mostawdaakom Use Case Diagram.....	44
Figure 8 survey Q1.....	54
Figure 9 survey Q2.....	55
Figure 10 survey Q3.....	56
Figure 11 survey Q4.....	57
Figure 12 survey Q5.....	58
Figure 13 survey Q6.....	59
Figure 14 survey q7 .....	60
Figure 15 survey Q8.....	61
Figure 16 survey Q9.....	62
Figure 17 ERD cardinality .....	79
Figure 18 ER diagram .....	82
Figure 19 Mostawdaakom Context level .....	84
Figure 20 Screen 1: Sign-in Page.....	85
Figure 21 Screen 3: Sign up Page .....	86
Figure 22 Screen 2: Choosing Page .....	86
Figure 23 Screen 4: Store name and Location .....	87
Figure 24 Screen 5: Home Page.....	88
Figure 25 Screen 6: Product Description .....	89
Figure 26 mixed products .....	90
Figure 27 international products .....	90



Figure 28 local products.....	90
Figure 29 Screen 10: Cart Page .....	91
Figure 30 Screen11: Successful Order.....	92
Figure 31 Mostawdaakom's dashboard.....	98
Figure 32 Our data set.....	99
Figure 33 Our dashboard's datasheet.....	100
Figure 34 splash screen.....	101
Figure 35 sign-in .....	103
Figure 36 sign-up .....	104
Figure 37 user type.....	106
Figure 38 adding store name and location .....	108
Figure 39 home page.....	110
Figure 40 local products.....	111
Figure 41 international products .....	113
Figure 42 local and international products.....	115
Figure 43 eisberg page .....	116
Figure 44 product review .....	118
Figure 45Cart page.....	120
Figure 46 Order status.....	122

## List of tables:

Table 1 statistics for Jordan's major retail chains .....	14
Table 2 Mostawdaakoms' local competitors.....	21
Table 3 PESTLE analysis table.....	24
Table 4 Target audience categories and purposes.....	35
Table 5 content pillar and activation strategy .....	36
Table 6 Use Case Table .....	43
Table 7 suppliers use case scenario .....	47
Table 8 suppliers steps performed .....	48
Table 9 retailers use case scenario.....	49
Table 10 retailers steps performed.....	50
Table 11 suppliers sample table.....	66
Table 12 retailers Sample Table .....	69
Table 13 Startup Cost Table .....	73
Table 14 Fixed Costs Table .....	75
Table 15 ERD description.....	80
Table 16 reasons for using Android Studio .....	97
Table 17 Limitations and proposed solution.....	129



# {Chapter One: Introduction}



## **1. Chapter 1: Introduction**

While communication and inventory management continue and develop more elaborately in the retail system than ever, the necessity for an innovative system is even clearer now. Whether trading at marketplaces or shopping online in digital stores nowadays, the core of a product/firm is always and still the interconnection and accessibility. As technology awakened, the supply chain & retail business landscape experienced a significant change where companies were not limited to brick and mortar to attract their audience; they started taking active advantage of digital platforms to market their products. Yet, among the convenience of online shopping, a common challenge persisted: the fact that such aspects as inventory management and order placement are not properly put together into one system.

We aim to fill this system's gap by analyzing the results of research that we will conduct and by talking to people who already had or were using this type of solution. Therefore, the current gaps in communication and inventory management between retailers and supermarkets need to be closed. This will be achieved by an application with a mobile-based platform that changes the retail-supply chain industry dynamics.

Mostawdaakom will attempt to resolve the retail and supermarket difficulties with its real-time inventory updates, the order placement process that is seamless, and secure communication channels. By using a consumer-driven mindset and a dedication to perfection, we intend to give the companies an application to place confidence in strategic decisions and improve organizational excellence. The idea of Mostawdaakom emerged from a profound need to remodel communication and inventory management practices.

Mostawdaakom's creative partnerships as well as continuous innovation are the strategy behind that. So, it tries to reshape the traditional landscape of the retail business, making the company a more connected and efficient ecosystem.

### **1.1 Aim and objectives:**

Our project aims to provide a software solution to revolutionize traditional inventory management methods and address several issues facing the retail-supply chain environment by bridging the communication gap between suppliers and retailers in an innovative application that offers real-time inventory updates and analytics to retailers to make well-informed decisions.



The objectives behind our application are as follows:

- Design a user-friendly interface for suppliers and retailers that ensures connectivity across various mobile operating systems (iOS, Android).
- Offer retailers tools for reporting and providing accurate analytics. Also, offering insights about customer trends and demand patterns based on historical data.
- Build a win-win situation where both suppliers and retailers benefit from enhanced collaboration and productivity.
- Simplify order placing procedures to reduce delays and human errors. Moreover, it manages repetitive processes, such as stock reordering based on predefined criteria.

## **1.2 Background Review:**

In today's retail industry, inventory management and supplies will be the key principles of doing business. Old-school procedures of inventory control regularly cause inefficiencies such as a sudden drop or even a rise in inventory levels, along with human errors. On the other hand, communication barriers between retailers and suppliers may cause the slowdown of frequent hassles.

It has been viewed by industry sources that the retail sector is undergoing a momentous digital transformation, where businesses incorporate new technology to enhance operational efficiency and customer experience. Mobile-based applications have grown as mighty tools that help merchants manage inventory, track sales, and also to communicate directly with suppliers in real time.

As in many other industries in Jordan, retail is not an exception. It faces certain challenges. In general, the supermarkets and trading organizations are growing, as we have a total of 638 Grocery stores in Amman as of January 09, 2024. (Digital strategy, (2024, January 9)). So, it is essential to develop viable inventory management systems. Also, it is necessary to make certain that the flow of information between the retailers and the suppliers is seamless as this contributes greatly to making sure that operations are operating very well and the profitability of the company is improved. (International Trade Portal,2020).



The Jordanian distribution network is undergoing a process of transformation, as it is shifting from stalls and traditional markets to shopping centers. Several major shopping centers have opened in Amman recently and factory outlets are being built in the south of the capital. E-commerce is also in full expansion. (CCI France Jordanie, 2020).

Retail Chain	Number of Hypermarkets	Number of Supermarkets
Cozmo	1	5
C-Town	2	5
Safeway	2	14
Carrefour Group	4	36

*Table 1 statistics for Jordan's major retail chains*

### **1.3 Trends in retail technology:**

The last couple of years seem to represent an emerging adoption of technology in the retail business. Mobile apps, especially, have experienced dramatic growth among retailers, consumers, and others alike. Usually, these applications provide retailers with a nice tool to administer the inventory, monitor sales, and communicate with customers.

Also, web social platforms make the mall part of enterprise operations, which provides a platform for retailers to communicate with customers, promote products, and aid in collecting valuable insights about consumer behavior. Through these media retailers will be able to take advantage of their advertising facilities and build strong customer relations.

### **1.4 Opportunities for Mostawdaakom:**

The concept of Mostawdaakom is built on a unique set of functionalities aimed at improving the communication between retailers and supplying companies within the retail-supply chain ecosystem. Similar apps like “Orderat” customized their focus to specific aspects like vendor management and inventory tracking. However, the Mostawdaakom app stands out by offering a fully operating application that provides users with real-time inventory updates, a smooth ordering process, and integration with existing systems. This solution thus achieves personalization through a recommendation engine feature. It helps users to come across appropriate products or suppliers that they are interested in or have dealt with in the past.



Having a platform that's developed in Jordan, such as Mostawdaakom that covers the increasing need for tech-enabled solutions and helps with the difficulties Jordanian retailers face. It has a significant opportunity to positively influence the retail industry. Mostawdaakom may help shops increase operational performance, reduce costs, and boost profitability, through secure communication channels with supermarkets, real-time inventory updates, and easy order placement.

Furthermore, Mostawdaakom can meet the expanding demands of shops in Jordan to satisfy the growing needs of retailers in Jordan and abroad by encouraging cooperation between suppliers and retailers, the software can improve supply chain operations and the customer's overall shopping experience.

Mostawdaakom can revolutionize the store business in Jordan by focusing on key problems in inventory control and communication. Technological advancement and innovation are arguably the main tools that can give retailers a greater competitive edge and growth expansion opportunities in the modern retail sector.

### **1.5 Project Structure:**

The project structure explains a methodical approach to Mostawdaakom's dueting rollout and implementation. The project will include the components; Introduction, Theoretical Background, Requirements, System Analysis, System Design and Implementation, and eventually, a conclusion. The components of this report differ in the sense that they address research objectives, do a feasibility study, design prototypes, and finally give a conclusion with future work included. Such a structured roadmap will enable the team to work clearly and effectively and also will ensure that the project is conducted consistently and economically.

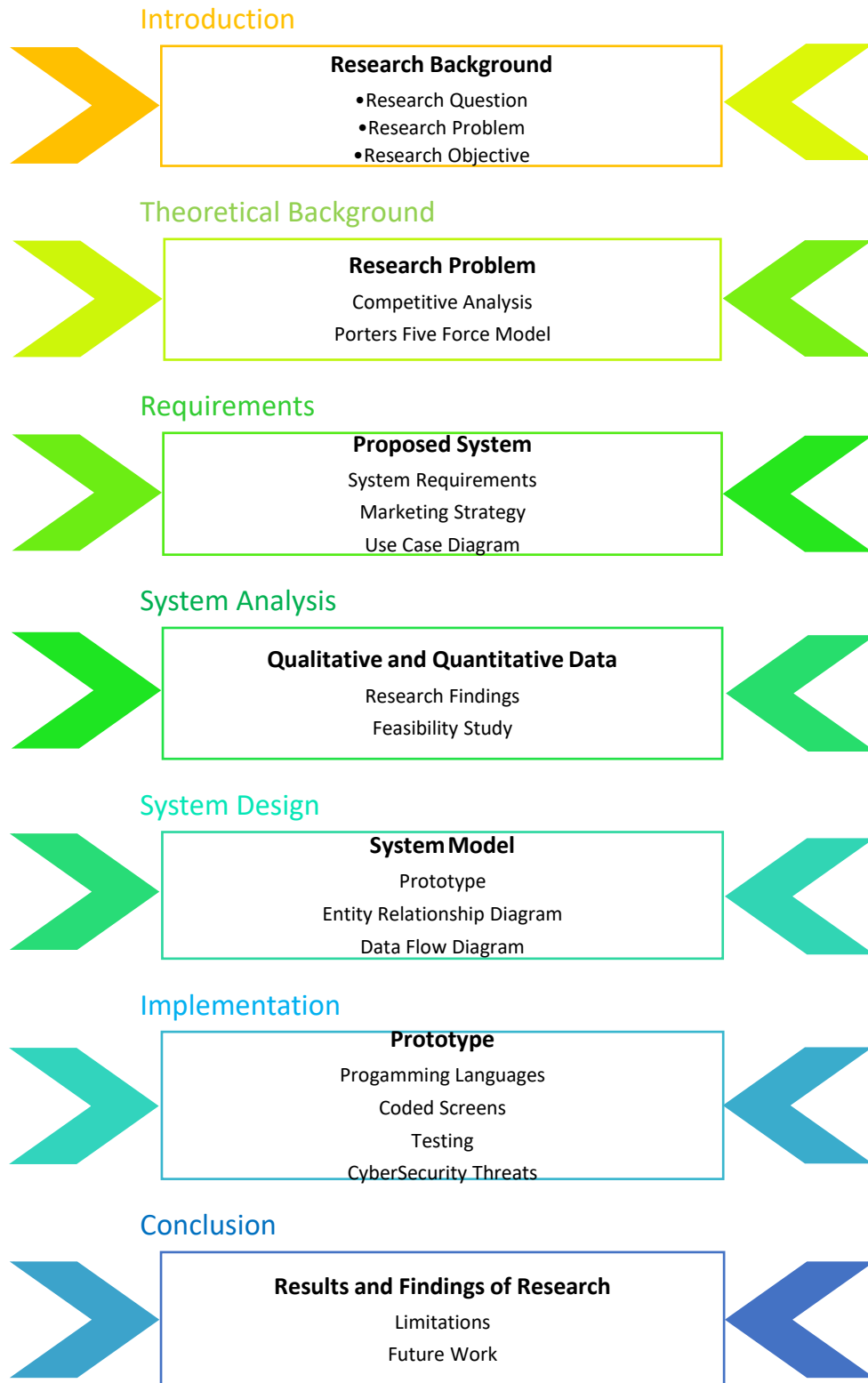


Figure 1: Project Structure





## 1.6 Gantt chart:

Below is the Gantt Chart used by the team throughout the project's lifespan. The Gantt Chart includes details related to each task and which subtask was assigned to whom.

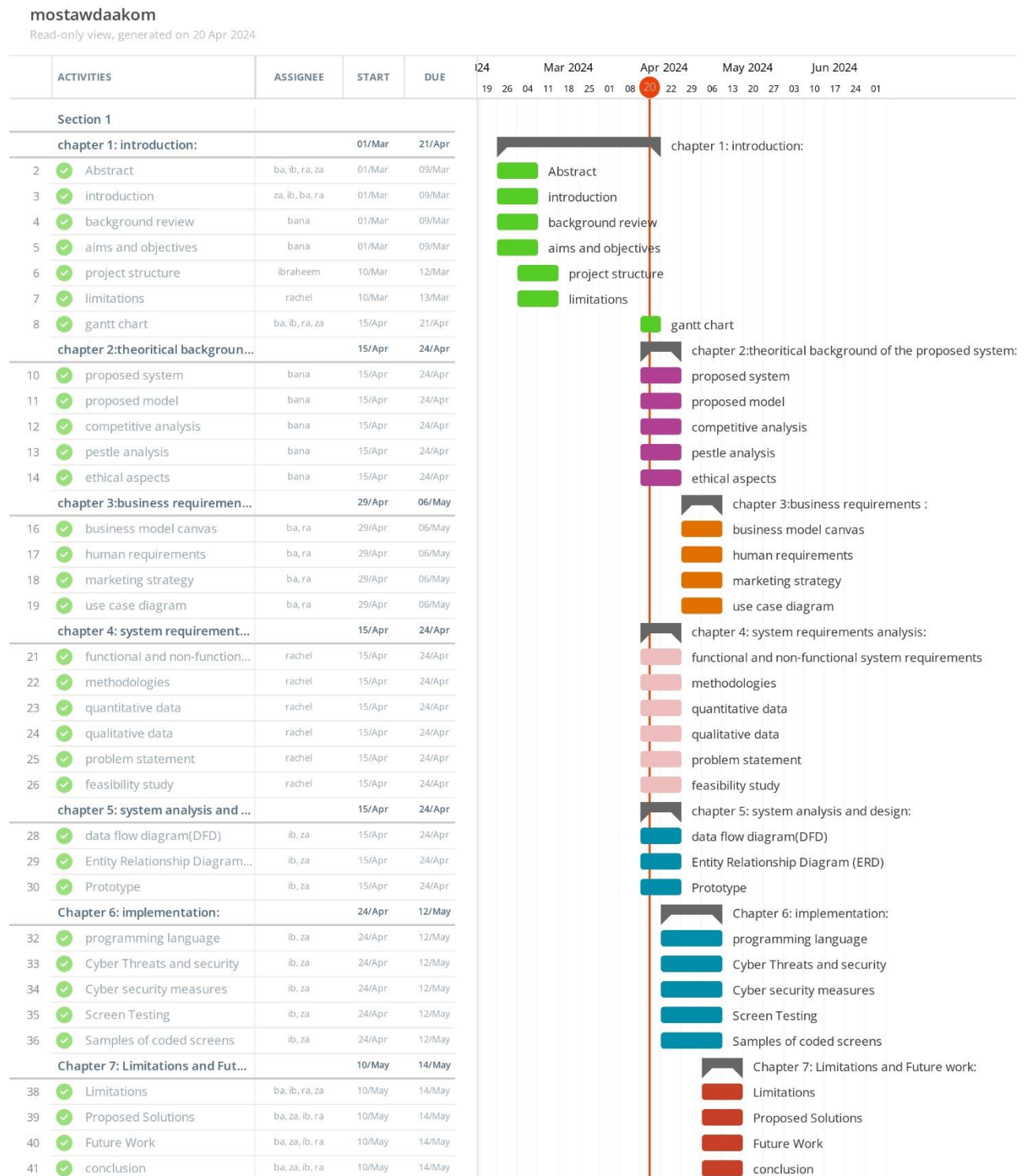


Figure 2 Gantt chart



## **{Chapter Two: Theoretical Background of the Proposed System}**



## **2. Chapter 2: Theoretical Background of the Proposed System**

### **2.1 The Proposed Platform:**

Technology has affected every aspect of our existence in today's fast-paced society, and we are dependent on it for almost everything, including the retail industry.

The suggested application will have a user-friendly interface that addresses several issues facing the retail-supply chain environment by bridging the communication gap between suppliers and retailers in an innovative application that offers real-time inventory updates and analytics to retailers to make well-informed decisions.

The development of mostawdaakom will be using the traditional System Development Life Cycle (SDLC). An SDLC is a conceptual model that describes the stages of an information system development project, from the initial phase of a feasibility study to the continuous maintenance of the finished application (Gillis, 2019). Although there are many various SDLC models and methodologies, they all typically include several clearly defined steps or phases. Information security must be a part of the SDLC for every SDLC model that is used to ensure that the information that the system will send, process, and store is properly protected (Balaji, Murugaiyan, 2012).

Flutter is the language we're going to use to create our application. It is a powerful and flexible framework that emphasizes a single codebase, hot reload, and rich set of widgets which made it our choice for creating a high-quality, performant application. (Mindmill, 2020).

As for our database, Firebase is our preferred option. Google's Firebase is a platform for developing mobile and online applications that provide several tools and services to help developers create and scale apps fast. It has capabilities including hosting, serverless operations, cloud storage, real-time databases, authentication services, and more. Because of its reputation for simplicity and smooth integration, Firebase is a preferred option among developers who want to build feature-rich apps without having to worry about complicated infrastructure management. (Moroney, 2017).

In terms of Mostawdaakom's marketing strategy, our marketing strategy has both digital and offline channels that help us to communicate and connect with our market segment. we will



implement a tactical marketing approach that encompasses various channels like digital marketing, strategic alliances, industry events, customer advocacy, and ongoing optimizations. Using this, Mostawdaakom can efficiently reach customers, build their trust, and get the target market to adopt its innovative solutions in the market-driven retail technology sector.



*Figure 3 mostawdaakoms' supply chain*

As shown in the figure, Mostawdaakom works as a link between the suppliers and retailers. The supply chain management framework starts with the manufacturer producing the goods and selling them to the suppliers, then comes Mostawdaakoms' turn, we connect them with their retailers easily and efficiently so that the customer can have the goods he needs.

## **2.2 Competitive analysis:**

In competitive analysis, firms closely examine competitors' strengths and weaknesses systematically to map out the opportunities in the competitive environment. Knowing the competitor's competitive positions as a strategic landmark is important in the background of a market. Accurate business performance calls for an accurate figure on whether the goods provided



are what the customers desire. products, marketing strategies, and presenting strengths and weaknesses. (Dalrymple, 2018)

We intend to accomplish this through our market analysis, which includes finding the most promising areas for development and refining. In addition to opportunities and possibilities, it is equally important to discuss challenges and risks. It helps society find themselves in their environments, and their role in the chain. this includes competitive setting, methods that other firms are applying to get ahead, and adaptability to shape oneself and the business differently for a vastly divergent population for securing the business dynamic stable successfully.

Analyzing competitors' websites, products, and advertising media, as well as doing surveys and focus group discussions, help to gain insight into the customer's preference for the brand. competitors through social groups and the analysis of customer data are the most common methods of information gathering and analysis.

We couldn't find an international competitor for our app, however, there are two local competitors. Mostawdaakoms' local competitors are as follows:

Local competitors:
Yaseer
Orderat

*Table 2 Mostawdaakoms' local competitors*

### **2.2.1 Mostawdaakoms' local competitors:**

#### **1) Yaseer:**



*Figure 4 yaseers' logo*



Yaseer is a B2B marketplace that signifies the equitability of small FMCG retailers by enabling them to link with their suppliers and simplifying the wholesale purchasing system.

Yaseer B2B app provides better prices at decreased prices, thus profitability and latte margins can be improved. The shift has been made to a delivery system that is not only fast, but it also operates as envisaged, by optimizing the supply chain with the delivery time as required by the two actors. Furthermore, a vast range of products on the site allows businesses to present their inventory to a big pool of customers, differentiated by their needs and desires. So far, the business services are offered to local businesses that are operating in the capital city of Amman. This, in turn, gives them an edge that they would need to face the competition in the market.(Yaseer b2b,2023)

## 2) Orderat:



*Figure 5 Orderat logo*

Orderat is a fintech supply chain solutions platform that employs empowering technologies and services aligned with the requirements of retailers via linking them to the sellers. Orderats' advantages are that it provides consumers with a total solution in minutes, and enables obtaining and maintaining the required stock in times when business diminishes. Also, they offer time-saving features at low costs with convenient payment solutions that let sellers get the widest access.



However, Mustawdaakom distinguishes itself from the Yaseer B2B app and Orderat by offering personal recommendations that align with users' tastes and historical data provided by retailers. With the existing plan for data analysis and machine learning algorithms, Mustawdaakom can suggest related products and manufacturers to retailers and help them reveal more chances to make good purchase decisions. Moreover, mostawdaakom supports local companies by providing them with an application to show their products and reach a broader audience. Through collaborating with local businesses, the growth of the economy and the creation of community is promoted by Mustawdaakom. Also, Mustawdaakom provides discounts as well as special price promotions on the products of the firms that are owned by local companies, this makes customers save cost and supports the community together. These actions not only increase the local businesses' visibility and sales but also reinforce the linkages between such businesses and the local customer base

### 2.3 PESTLE Analysis:

A PESTLE analysis investigates the essential external elements influencing an organization from a Political, Economic, Social, Technological, Legal, and Environmental aspect. It can be used in a variety of settings and can help people professionals and senior managers make strategic decisions (Alanzi, 2018). The authors of this project believed that conducting a PESTLE Analysis on Jordan would be beneficial for having a comprehensive view of the external factors that may impact Mostawdaakom's success and based their decisions on facts rather than assumptions. They have concluded the following:

Political	Economic	Social
The government's policies and regulations can have a significant impact on the retail industry in Jordan. For instance, the compliance of Mostawdaakom with local laws regarding data privacy, consumer rights, and taxation	There are overall economic growth and stability that contribute to the amount of money consumers have in their pockets and the volume of sales a retailer receives. When sales rise, demand for inventory management	The growing trend of consumer understanding, such as the shift to online store buying and demand for more tailored experiences, redefines the requirement of creative business solutions like Mostawdaakom.



may also affect the operations of the company.	solutions like Mostawdaakom naturally increases. besides that, inflationary pressures may often push up the cost of goods and services for retailers, threatening their profits and normally their ability to invest in elaborate technologies.	Moreover, population profiles which factor in age, income, and urbanization, have a tremendous impact on where the retail trade is geared to and consumer demand.
--	---	---

<b>Technology</b>	<b>Legal</b>	<b>Environmental</b>
Recent technology trends like artificial intelligence, data analytics, and mobile connectivity, have the potential to offer Mostawdaakom new additional features with a competitive edge. In addition, the rising technology has digitalized the retail industry businesses, making it necessary for them to adopt technological solutions and efficient inventory management and communication, which caused Mostawdaakom's growing rate.	Mostawdaakom has to follow data protection regulations (for example GDPR(General Data Protection Regulation)) to protect clients' information and to maintain their trust in their customers and intellectual property rights. Complying with copyright and trademark laws ensures the sustainability of the platform.	Awareness of environmental issues and customers preferring eco-friendly products affect retailers' actions and supply inventory which can draw More from Mostawdaakom to implement green supply chain initiatives.

Table 3 PESTLE analysis table





## 2.4 Ethical Aspects:

**Data Privacy and Security:** Mostawdaakom should concentrate on a safety measure so that personal information, transaction history, and business data stay at a secure location through storage and processing. The issues of transparency of the personal data gathering methods, as well as the consent of the users- required for the usage of data, are among the key ethical considerations.

**Fair Treatment of Users:** Fairness and equal crafting of all users, whether they are small or large, and influential powers is a mission of Mostawdaakom. They must have transparent pricing policies, unbiased algorithms, and equal distribution of the supply chain power.

**Transparency and Accountability:** Positivity is an important element that must be kept highly transparent in the course of the work of Mustawdaakom, the platform is expected to give users detailed and correct information on its operations and policies as well as how and when they may change. In addition, the platform should be accountable for any inaccuracy, misbehavior, or deviation of the trust to have some methods of paths to deal with user problems and complaints.

**Environmental Sustainability:** Ethical performances can be achieved by fostering these kinds of acts, such as the adoption of environmentally friendly packaging, waste control throughout the supply chain, and the support of sustainable sourcing and production methods at the level of the users.

**Ethical Marketing and Advertising:** Ethical marketing and advertising will be practiced by Mostawdaakom without any deceptive or misleading tactics being used and it is important to ensure that promotional materials conceptualize offered capabilities and offerings accurately.

**Community Engagement:** Through Mustawdaakoms' activities, Mass Tourism must be socially responsible by taking into consideration executing such behavior by working closely with the local community and supporting small companies of the area as well as participating in different community initiatives or donating to charitable organizations that share such a belief and exist to fulfill such intention.



# {Chapter Three: Business requirements}



## **3. Chapter 3: Business Requirements**

### **3.1 Business Model Canvas**

A Business Model Canvas (BMC) is a visual diagram that helps the organization develop, analyze, and compare business models. Business model canvas includes key partners which refers to the external companies or parties that the company requires to achieve or implement its key activities, Key Activities which is the primary activities that are performed by an organization that delivers goods or services to customers, in addition to this, key resources meaning the resources used by an organization to create a good or service. Furthermore, value proposition means the unique design feature of the product compared to other competing products on the market. Also, Channels describe the communication channels between the organization and its

customer base, Customer Relationships indicate the types of relationships that are established or expected to be built between an organization and its customer base. In addition to the expected

expenses to build these relationships, Customer Segments: describe the organization's target audience(s) and demographic, this field is also used to describe the problems faced by our targets, cost Structures describe the types of costs expected to be faced by an organization

adopting the business model, and lastly revenue Streams describes how an organization will be generating revenue from their offerings.

# Business Model Canvas

Designed via [AltexSoft BMC Tool](#)

<p><b>Key Partnerships</b></p> <ul style="list-style-type: none"> <li>Suppliers of both local and international products</li> <li>Supermarkets, minimarkets and hypermarkets owners</li> <li>QRCE(Queen Rania Center for Entrepreneurship)/ Princess Sumaya University</li> <li>Delivery personnel.</li> <li>Mobile app developers.</li> <li>Marketing and advertising agencies.</li> <li>Technology partners.</li> </ul>	<p><b>Key Activities</b> <b>Provide Suppliers and Retailers with a platform that:</b></p> <ul style="list-style-type: none"> <li>Seamlessly facilitates the communication between suppliers and retailers.</li> <li>Provide real-time Market trends for the small supermarkets that are unable to know the new market trends, ensuring they stay informed about new market trends and demand.</li> <li>Simplify order management by tracking orders from the moment they are placed until they are received.</li> </ul> <p><b>Key Resources</b> <b>Equipment:</b></p> <ul style="list-style-type: none"> <li>Hardware including but not limited to servers and computers.</li> <li>Software and Database Subscriptions.</li> <li>Office Space.</li> <li>Information to populate the platform.</li> <li>Financial Resources from financial institutions and angel investors.</li> </ul> <p><b>Human Resources:</b> Developers, designers, project team members, community manager administrative <u>staff</u>, marketing and financial teams.</p>	<p><b>Value Propositions</b> <b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Seamless communication between retailers and suppliers.</li> <li>A more efficient order and inventory management.</li> <li>offers a real-time updates on inventory and market trends.</li> <li>Reduce stock-outs and shortages.</li> <li>Simplify order management by tracking orders from the moment they are placed until they are received.</li> <li>It promotes supporting local companies by providing discounts and making offers which creates a stronger economy in Jordan and strengthen self-dependence.</li> </ul> <p><b>Features:</b></p> <ul style="list-style-type: none"> <li>Business Intelligence-Based application</li> <li>Cross-Platform Compatibility</li> <li>Real-time Data updates</li> </ul>	<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>Mostawdaakom delivers customer care through a combination of personal assistance and self-service</li> <li>Personal Assistance: by providing personalized customer support through various channels such as: Phone Support, Live Chat.</li> <li>Self-Service Options: by providing a knowledge base with guides, and FAQs to help users troubleshoot issues and learn how to use features.</li> </ul> <p><b>Channels</b> <b>Marketing Channels:</b></p> <ul style="list-style-type: none"> <li>Social media platforms</li> <li>Targeted Advertisements</li> <li>Word-of-Mouth</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>Mostawdaakom's Primary customers are Supermarkets, mini-markets and hypermarkets in Amman Jordan and suppliers of local and international products.</li> <li>The problems faced by suppliers and supermarket in Jordan's retail market is the big communication gap between suppliers and retailers which leads to inefficient order placement, management, and inventory control.</li> <li>Also, the availability of variety products becomes a concern for small supermarkets(mini-markets), it's hard for them to keep up with what customers want as the market changes quickly, they find it tough to stock new items on their shelves and be informed about what is recently demanded and trendy in the market.</li> <li>Another challenge that local suppliers suffer from is the lack of trust people have in local products. Many customers tend to prefer the <u>international</u> products, assuming that they always offer better quality even if they are more expensive.</li> </ul>
<p><b>Cost Structure</b></p> <p>- Mostawdaakom will take a phased approach. by starting with minimal costs in the initial phases, focusing on essential expenses such as software development and basic infrastructure, As Mostawdaakom expands and generates revenue, Mostawdaakom can then increase its spending on areas such as marketing, customer support, and technology upgrades to support continued growth and innovation.</p> <p><b>- Platform Development costs:</b></p> <p>- Hardware, software licensing fees, and developer support during the initial development phase of Mostawdaakom. The project team will utilize personal laptops and facilities until the proof of concept is developed. Subsequently, funding from angel investors and banks will be pursued such as IPARK and QRCE. An estimated JD 14,000 will be required initially to cover expenses such as copyrighting the program, legal fees, company registration, ad hoc expenses, and logo development.</p>		<p><b>Revenue Streams</b> <b>Fees and pricing strategies:</b></p> <ul style="list-style-type: none"> <li>Transaction Fees: Mostawdaakom can charge transaction fees to suppliers for each successful order placed through the platform. This can be a percentage of the order value or a flat fee per transaction.</li> <li>Advertising Revenue: Mostawdaakom can generate revenue by displaying advertisements within the platform. Suppliers or other businesses can pay for sponsored listings or banner ads to promote their products or services to <u>supermarkets/hypermarkets</u> users.</li> </ul> <p><b>Advertising:</b></p> <ul style="list-style-type: none"> <li>Mostawdaakom can be promoted by using online advertising platforms such as Google Ads, social media advertising (Facebook, Instagram, LinkedIn), and display advertising to target</li> </ul> <p><b>Paying Methods:</b></p> <ul style="list-style-type: none"> <li>Mostawdaakom can <u>have</u> payments online via authorized credit and debit cards or by cash.</li> </ul>		

Figure 6 BMC for mostawdaakom



## **3.2 Human Requirements:**

### **3.2.1 Employee Categorization:**

As a startup, once the platform is officially launched, Mostawdaakom plans on employing a total of fifteen full-time employees and will offer part-time and internship vacancies, some of which will work as a team to represent a department, including:

Human Resources, Marketing, Research and Development, Finance, Information Technology Recruiting Interns and part-time staff will aid in ensuring the workforce is capable of meeting deadlines by dividing workloads to maintain a healthy work-life balance, improving productivity at low costs. Upon recruitment, the workforce will be trained to learn more about Mostawdaakom and its operational policies. In addition to a training and development session, to ensure that their performance on tasks meets the quality standards set and KPIs to impact Mostawdaakom's success positively. Staff will be allowed to work remotely or in the office space. Weekly, full-time staff will be expected to work 40 hours, and part-time staff will be expected to work 20 hours. Mostawdaakom will offer their workforce the following incentives and benefits:

- a) Monthly salary based on the pay scale and years of relevant experience.
- b) Healthy Insurance
- c) Enrollment with the Jordanian Social Security in compliance with the Jordanian Ministry of Labor's Regulations and Legislation.
- d) Entitlement to fully paid annual leaves: 14 working days, weekends, and national holidays.

The Human Resource Department (HR) and supervisors are required to conduct performance evaluations on all staff members annually based on the following factors:

- a) Work Ethic
- b) Work Quality and Meeting Deadlines
- c) Teamwork and collaboration
- d) Behavior
- e) Self-Development

Employees who receive a high evaluation are rewarded with valuable incentives and recognition such as raises, bonuses, or increased numbers of days off. However, low-score employees will receive warnings unless drastic measures are necessary.



### **3.2.2 Departments and Roles:**

#### **Human resource (HR) department:**

An organization's most significant asset is its Human Resources (Zahra, Syah, & Indradewa, 2021). Hence, Mostawdaakom's decision to adopt an HR department. The department's role is to comprehensively view individual and group behavior to enhance organizational productivity and create a healthy organizational culture (Nascimento, 2017).

The department will initially employ one experienced person to conduct departmental responsibilities. The HR Specialist will be expected to recruit a hardworking and diverse team that can complete the assigned tasks efficiently and effectively, in addition to facilitating quarterly training and development sessions relevant to the soft and technical skills expected of them at Mostawdaakom. Moreover, they must conduct annual employee evaluations and team-building activities and provide appropriate incentives to keep employees motivated.

#### **Information Technology (IT) Department:**

For the convenient running of Mostawdaakom's application and ongoing evolution, implementing an advanced IT department is vital. This department will consist of four of us, and each member will be placed in charge of specific tasks, all to provide the basis for our company's platform and its improvement.

##### **1. IT Manager:**

IT Officer stands in the position of a leader who is involved daily in planning and classifying tasks for the team, and who defines the overall purposes and goals of the department. Considering the IT Officer's role is centered on the online operations of Mostawdaakom, s/he makes sure the institution's digital networks are secure and scalable aligned with the adoption of technologically adequate goals.

##### **2. Database Administrator (DBA):**

The DBA is called upon to be in charge of database access management as well as updating the software of database and data security protocols; therefore, that individual has a very important role to perform for Mostawdaakom in terms of integrity and availability of data. DBAs' intricate role involves building up solid security infrastructure and maintaining efficient database operations to guarantee uninterrupted platform working and user satisfaction.



### 3. **Server Engineer:**

Server Engineers whose main job is to run performance check-ups of backend servers recognize issues that arise quickly and solve them immediately. Collaboratively working with a wide range of operating systems, the Server Engineer sustains an up-to-date and regular version of Mostawdaakom's servers which would minimize downtime and optimize the system's capability constantly to deliver the service.

### 4. **Full-Stack Developer:**

Developing and coding APIs, building servers and databases, and creating front-end website structures, a Full-Stack Developer is the one to look into the functionality, navigation, and overall user experience of our platform. Working on the optimization of the immediate response and the platform configuring are the central axes of a Full-Stack Developer function that makes sure Our clients have a very comfortable user experience.

## **Research and Development (R&D) Department:**

Aware of the fact that innovation is the key catalyst for organizational development and growth, while actively competing with industry peers, Mostawdaakom has set up an advanced R&D department. Concentrating on a revolutionary R&D department, which consists of two people, is the main goal to set the market requirements and activate the continuing projects to improve the Mostawdaakom platform.

### A) **R&D Manager:**

As the head of the research and development department, the R&D Manager is responsible to spearhead strategic research initiatives and make sure innovation efforts are implemented consistently with Mostawdaakom's long-term goals. The R&D Manager examines new market trends that shape the innovation and stands the company amongst the top players in the retail industry through technology advancements.

### B) **R&D Coordinator:**

With the aid of the R&D Manager, the R&D Coordinator will oversee the ongoing research activities and the development of new projects. Reaching market research to making cooperative activities with external contrive, the R&D Coordinator is the important one along with getting Mostawdaakom innovations worked out.

**Finance Department:**

Being able to successfully manage financial affairs is the key to organizational success. This is why Mostawdaakom has set up a financial department as a focal point of its organization and as a place for financial management and strategic planning.

**a) Finance Manager:**

As Finance Manager, you would be in charge of the Finance department, which takes responsibility for monitoring and carrying out financial operations, including budgeting, forecasting, and financial reporting. The Finance Manager manages the finance plans and risk management processes to achieve sound financial health and long-term sustainability of Mostawdaakom.

**b) Chief Accountant:**

Lending the Finance Manager a hand, the Chief Accountant supervises the performances of daily accounting operations, including the payroll process, invoicing, and record-keeping of finances. Through the lens of scrutiny and the application of Standard Accounting norms the Chief Accountant ensures the accuracy and compliance in accounting operations.

**c) Accountant:**

As the second in command, the accountant utilizes the Accounts Payable and Receivable to ensure that all the dues in and out are reconciled for financial report preparation. Our Accountant carries out diligent financial analysis and reporting, thus the Senior Leadership Team is enabled to make well-founded decisions regarding financial policies and financial transparency.

**Marketing Department:**

Bearing in mind the importance of marketing in creating brand awareness, boosting customer involvement, and augmenting sustainable business growth, Mostawdaakom initiates the Marketing department. As part of five energetic team members, the department of marketing is in charge of implementing strategic marketing activities to publicize Mostawdaakom's platform and to secure more users including new ones and those who use it regularly.

**1) Head of Marketing:**

With the help of the Marketing Manager, the Head of Marketing has a final say on all marketing-





related decisions, including the planning and implementation of strategies that are in line with the business goals of the organization. The Head of Marketing will stimulate the increase of the brand popularity by monitoring the markets and consumer trends, and by setting targeting, imaging, and communication plans.

## **2) Digital Marketing Specialist:**

Channeling digital marketing, the Digital Marketing Specialist will be responsible for coagulating various digital platforms such as social media, search engines, email marketing, etc. to launch and optimize digital marketing campaigns. The Digital Marketing Specialist achieves this specialized goal by using data-driven platforms and analyzing the efficiency of campaigns, to ensure a high rate of return on investment (ROI).

## **3) Marketing Officer:**

Working meridianally with the Marketing Officer, he or she creates marketing campaigns, ensures the content is high quality, and analyzes marketing campaign performance metrics. This marketing professional would be tasked and responsible for pursuing marketing tactics supported by cross-functional promotion to help the company succeed in most of its marketing efforts.

## **4) Moderators (x2):**

The Moderators are the cores of the Mostawdaakom Online community who manage its forums and interact with the users. Get Instant Help Now As moderators, they monitor interactions between users and respond to inquiries and questions. They do all that to ensure that a positive experience creates their brand advocacy and loyalty among Mostawdaakom's community.

### **3.3 Marketing Strategy:**

Mostawdaakom's long-term marketing plan will be based on the Seven Ps to achieve its three main marketing objectives: 1. Awareness 2. Advocacy 3. Affinity

The Seven P's marketing mix is known for the foundational tools that organizations use to satisfy and fulfill the needs of their target audience(s), covering Product, Price, Place, Promotion, People, Process, and Physical Evidence (Jain & Jain, 2022).



## **Product**

‘Product’ refers to the goods and services offered by an organization that is expected to satisfy target needs and wants, adding value to them (Jain & Jain, 2022).

Among Mostawdaakom’s products, there is a trading mobile application developed by the professional team to make it the least complex process for people who need to manage the store's communication and inventory. The platform establishment unifies all these supermarkets and retailers; thus, it ensures the dynamic inventory levels through real-time updates, and it simplifies the supply chain operations within the platform. Through the use of the latest technological solutions that Mostawdaakom provides, supermarket owners gain the opportunity to make better and more accurate purchasing decisions and to execute the best possible optimization of their supply chain activities. Moreover, the intuitive interface and expandable features give shoppers and mini-markets a user-friendly environment that is both simple and scalable. This transfers great business-running value to all of the parties.

## **Price**

Price’ is the term used to describe the monetary value expected to be incurred by users for goods and services offered by an organization (Jain & Jain, 2022).

Thinking about its primary customers and of value it creates, the standalone startup Mostawdaakom implements pricing schemes suitable for the demands of shops and markets. We will provide either monthly subscription packages or packages for a shorter time, with affordable rates, depending on your budget. Furthermore, Mostawdaakom may create for instance discounts whereby customers can be able to buy local productions most importantly at a discounted price, and also offer annual subscriptions or introductory offers to allure new members. Payments can be conveniently processed online through a secure online payment gateway on the platform for simple and hassle-free transactions for the user.

## **Place**

‘Place’ refers to the decisions taken by shareholders on where these services are expected to be delivered to their customers (Jain & Jain, 2022).



Mostawdaakom is becoming available for users through its devoted mobile App, which can be found and downloaded to your handset from known major app distribution landing points including the Google Play Store and Apple App Store. Indeed, apart from the community center, users can also obtain the services that are provided by Mostawdaakom through the website, which will ensure accessibility to all devices and web browsers. The extension to the online platform allows shoppers from regions beyond physical borders to shop directly from any location they want and thus the platform enables retailers and supermarkets to integrate Mostawdaakom into their operations from everywhere there is an internet connection.

## Promotion

‘Promotion’ is the term used to describe the strategy of how an organization will be able to connect with its target audience to inform them of its goods and services and the channels used to develop these connections (Jain & Jain, 2022)

### Target Audience Categories and Purposes:

Category	Purpose
<b>Retailers and supermarket owners</b>	Awareness creation and adoption of the Mostawdaakom for the application inventory management and order placement is the next agenda advised.
<b>Suppliers and Distributors</b>	Incentivize the participants and the collaborators on the platform for the smooth running of the supply chain procedures.
<b>Retail Industry Professionals</b>	Express a location of networking, communication, and continuous professional development between retail partners.

*Table 4 Target audience categories and purposes*



### Social Media Promotion Strategy:

- **Platform Selection:** Channel networks like Facebook, Twitter, and LinkedIn that are most widely used can be utilized to reach the intended audience effectively.
- **Budget Allocation:** Set a sum of money every month for the concentrated advertising campaigns that are broadcast on the social media platforms to market the products sold in Mostawdaakom to the general public.
- **Campaign Duration:** Launch continuous advertising campaigns to keep high PR and interact with the market of customers.
- **Content Posting Frequency:** Regularly post, in the blog, some insider information, and consumer reviews as they are guided along the sales process.
- **Content Themes and Activation Strategies:** Develop a theme strategy that will be consistent with the Mostawdaakom value orientation and already has content elements such as inventory management tips, success stories, platform updates, and industry news.

Content Pillar	Description	Activation Strategy
Inventory Management	Provide effective inventory management using tips and best practices,	Share information about it within social media like articles, infographics, and video tutorials.
Success Stories	Let the businesses using Mostawdaakom speak for themselves; highlight certain case studies and success stories.	Feature testimonials, interviews, and user-generated content.
Platform Updates	Features, versions, and platforms are announced	Post a newsletter, an update, or a sneak preview of the upcoming upgrades.
Industry News	Reveal the retail industry-related facts, trends, and insights	Find and share unique articles, comments, reports, and thoughts.

Table 5 content pillar and activation strategy



### **Annual Event Promotion Strategy:**

- ❖ **Event Types:** Spearhead webinars, workshops, and networking events that unite with the prospective audience and boost Mostawdaakom.
- ❖ **Event Components:** Provide training, product demos, and networking avenues and get discounts for the customers who attend your event.
- ❖ **Incentives:** Implement incentives that include free trials, discounted subscriptions, and souvenirs to the users to encourage them to join the platform as well as adoption of it.

### **People**

‘People’ in the marketing mix refer to the people who play a direct or indirect role in the product or service (Jain & Jain, 2022). This includes the staff involved in marketing and sales. Mostawdaakom's marketing mix encompasses both the internal team responsible for marketing and sales efforts, as well as the broader network of users and stakeholders who interact with the platform.

- **Internal Team:**

Mostawdaakom's marketing department is composed of a dedicated team of professionals, each playing a crucial role in driving the platform's marketing and sales activities:

- 1) **Head of Marketing:**

The Head of Marketing is a magnitude leader of Mostawdaakom's marketing operation involving the design of different marketing initiatives and campaigns. They determine a strategy direction, and budget allocation as well as that the campaign corresponds to the business objectives. Moreover, they are responsible for developing programs and networking with partners to ensure the dissemination of exposure to the brand.

- 2) **Digital Marketing Specialist:**

Part of the responsibilities of the Digital Marketing Specialist is to incorporate digital marketing campaigns to ensure the online presence of Mostawdaakom through multiple channels. They administer PPC ad campaigns, look into the tracking data, and use key metrics, such as CTR, CPC, and CR, to better evaluate the effectiveness



of the campaigns. Besides, they closely with the Marketing Director to share information about the campaign outcomes and return on investment (ROI).

### **3) Marketing Officer:**

The Marketing Officer also takes care of those operations marketing tasks that can contribute to the marketing operations done by Mostawdaakom this can be a mix of content writing, live coverage of events, and also collaborating with the external suppliers to have handouts for the promotional materials. They are an indispensable part of marketing strategy formulation and it is their job to make sure that the branding message is not lost anywhere as all the points are covered.

### **4) Moderators (x2):**

Moderators are the first contact points for Mostawdaakom, they handle queries through social media platforms and phone interactions and give feedback. This category deals with interacting with users, responding to customer inquiries, resolving issues, and keeping up a positive brand image through efficient customer service.

- **User Community:**

The Fighters for Social Justice team, in addition to the user community, is a paramount part of the platform's triumph. This is fulfilled through traders, supermarkets, suppliers, and other players who are involved in the activities of mostawdaakom. What will make Mostawdaakom unique is the creation of a community of people who have similar interests. They will collaborate and support each other to achieve their goals. This way, the users will develop strong relationships and they will be excited to come back frequently.

## **Process**

‘Process’ is the term used to describe the complete buying process a customer experiences (Bowyer, 2017).

The process of using Mostawdaakom should be simple and straightforward for users. This includes the matchmaking process, booking confirmation, and payment.



## Physical Evidence

'Physical Evidence' refers to the environment where the service is delivered and communicated and the tangible cues given to identify a product from another (Rafiq & Pervaiz, 1995).

Mostawdaakom's physical evidence includes the app itself and any promotional materials such as brochures or business cards. The app should also have a professional, attractive design that reflects Mostawdaakom's brand identity.

### 3.4 Use Case Diagram

A Use Case Diagram is a Unified Model Language (UML) used to collect the internal and external influences of a system's design requirements (Waykar, 2015). In the diagram, the functionalities of a system are identified in the form of 'Use Cases' (the oval shape), the activity that triggers the use case; the users are in the form of 'actors' (the stickmen) who initiate an event, and the relationships are identified using the lines and arrows between use cases (Waykar, 2015).

The connecting arrows consist of four types: Communicates, Includes, Extends, and Generalizes. The communication relationship is used to connect the actor to a use case. The includes relationship is a dashed line connecting different use cases with a common behavior with one use case. The extended relationship depicts a use case with an exception. The generalized relationship implies that one actor/use case is more general than the other. (Kendall & Kendall, 2013).

Figure (Number of figures fixed at the end) is the use case diagram that describes the functions Mostawdaakom will be offering to its two primary actors – Suppliers and Retailers, and two secondary actors – Admin and Delivery driver.

#### 3.4.1 Use Case Table

The connecting arrows consist of four types: Communicates, Includes, Extends, and Generalizes. The communication relationship is used to connect the actor to a use case. The includes relationship is a dashed line connecting different use cases with a common behavior with one use case. The extended relationship depicts a use case with an exception. The generalized



relationship implies that one actor/use case is more general than the other. (Kendall & Kendall, 2013).

Figure (Number of figures fixed at the end) is the use case diagram that describes the functions Mostawdaakom will be offering to its two primary actors – Suppliers and Retailors,

And two secondary actors – Admin and Delivery driver.

Use Case	Description
<b>Primary Actors</b>	
Register	Users will enter the information requested of them once the registration page is launched and confirm their registration.
Login	After registration, users will enter their login credentials once they launch the login screen, and then pick if they're suppliers or retailers.
Manage account	The user is required to set up their account; they have the option to set up a profile picture and a short bio about themselves.
Choose local/international products	The user has the option to choose between two product categories local products and international products.
Place order	After choosing the category, retailers can place their orders by adding the demanded products to their basket.





Track Order	The order will be tracked from the second it was placed until the retailer receives the order.
Search product	Retailers will be able to search for any product they desire or seeking.
Filter product	Retailers can filter products according to specific criteria such as type, price, or category.
Access history	Users can view their previously searched products.
Notifications	Retailers receive notifications when orders are about to be delivered and received. Additionally, suppliers receive notifications when their products are running low and when retailers place orders for their products. Also, suppliers and retailers receive a notification if they're accepted or rejected from the admin.
Payment	Retailers can pay with cash or card.
Manage discounts	The ability for suppliers to control and adjust the pricing discounts offered on their products.



Generate Reports	The ability for suppliers to produce detailed summaries or analyses of their operations, such as inventory levels, sales performance, product demand, and financial transactions.
Manage Inventory	The ability for suppliers to restock inventory when needed.
Customer Support	Assistance and service provided by suppliers to retailers to ensure retailers' satisfaction.
<b>Secondary Actors</b>	
Monitor & Report	Admin oversees system activities and generates comprehensive reports to identify issues and make decisions.
Accept/Reject Suppliers	Administrators can evaluate and decide whether to accept or reject a certain supplier.
Accept/Reject Retailers	Administrators can evaluate and decide whether to accept or reject a certain retailer.
Client Service	Support and Assistance from the administrative team which includes resolving technical issues, resolve any conflicts or disagreements.



Delivery Pick up	Collecting packages from suppliers.
Delivery	Transporting packages to retailers.

*Table 6 Use Case Table*

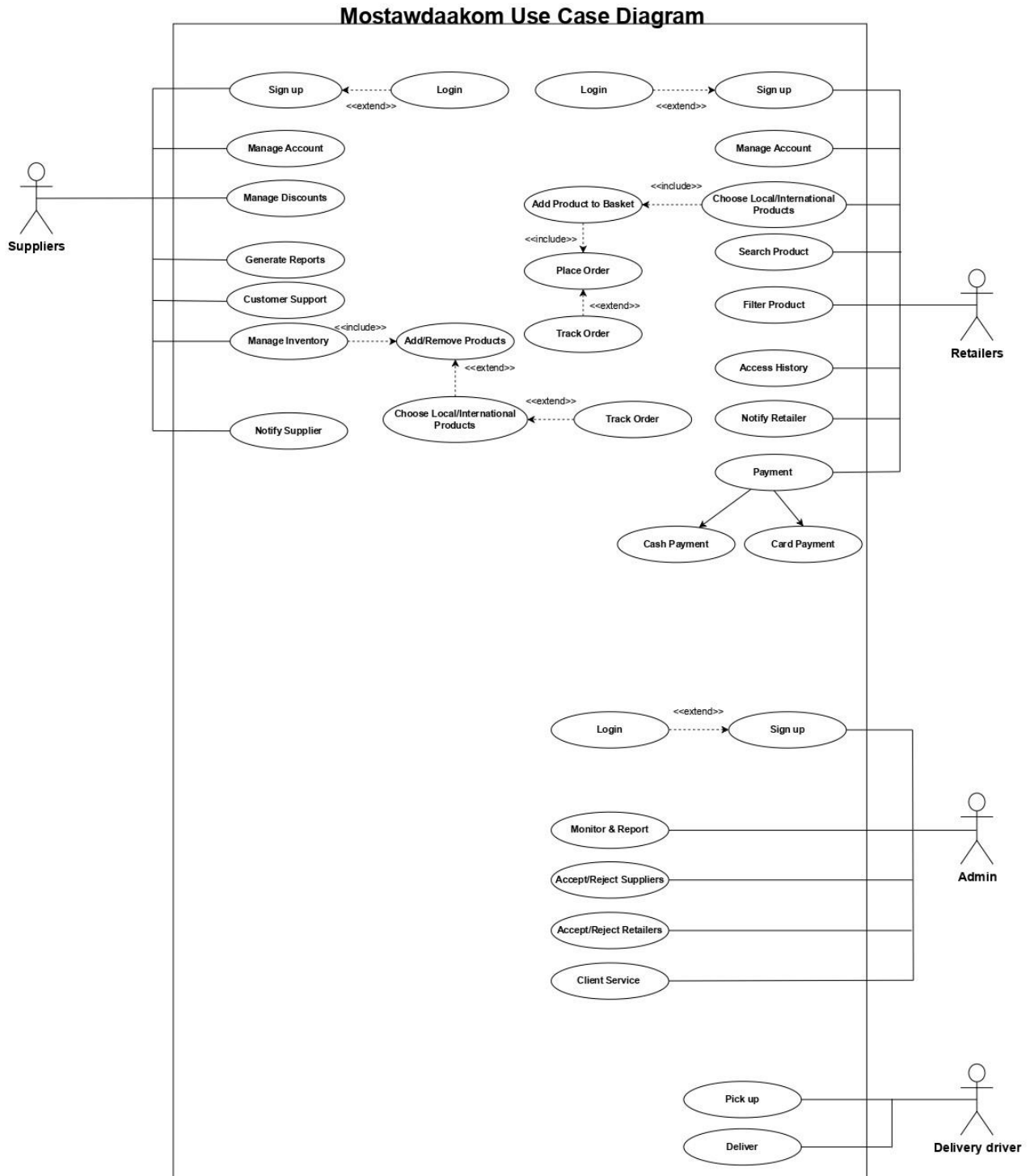


Figure 7 Mostawdaakom Use Case Diagram



### 3.4.2 Use Case Process

Use Case Diagrams typically have actors that are categorized as:

a. **Primary Actors:** the actors on the left side of the diagram. These are the system's direct users. The lines connected by the primary actors represent that this is an activity that this user can logically perform.

b. **Secondary Actors:** The actors that do not directly use the system's functionality;

However, they play a role in how it functions. In Figure 3, the secondary actors are Mostawdaakom's IT Department and delivery drivers.

As a new user, a use case's trigger begins after the user uploads our application through the App Store/Play Store. They trigger the 'Sign Up' event where they enter their details, and Mostawdaakom verifies details such as mobile numbers and emails. When a user logs into their account, Mostawdaakom will verify log in credentials; if correct, the user is directed to the Mostawdaakom home page. Otherwise, their login will be unsuccessful, and they will be redirected to the sign-up page.

Upon logging in, the user must select their role either a supplier or retailer, users can then proceed to manage their accounts by writing a short bio about themselves and adding a profile photo if desired.

If the user chooses to be a retailer, they will have access to two sections: a local products section and an international section. The retailer can select the desired category, add the required products to their basket, and then place the order. The delivery personnel will deliver orders from suppliers to retailers, and vice versa if the retailer needs to return any products. From the moment the order is placed until it is received, the order will be tracked, and the retailer will receive updates at every stage of the process. Retailers have the ability to search for products and filter them based on type, price, and category, they also have access to their search history. Retailers will receive notifications when orders are about to be delivered and after their received.



If the user selects the supplier role, they also gain access to manage their account, where they can write a short bio about themselves, and add a profile photo if desired, and manage discounts. category, add the required products to their basket and then place the order. The delivery personnel will deliver orders from suppliers to retailers, and vice versa if the retailer needs to return any products. From the moment the order is placed until it is received, the order will be tracked, and the retailer will receive updates at every stage of the process. Retailers have the ability to search for products and filter them based on type, price, and category, they also have access to their search history. Retailers will receive notifications when orders are about to be delivered and after their received.

If the user selects the supplier role, they also gain access to manage their account, where they can write a short bio about themselves, and add a profile photo if desired, and manage discounts.

Suppliers can generate daily, weekly, monthly, and yearly reports to stay up to date and monitor their inventory. Suppliers are responsible for providing customer support to retailers to ensure effective communication and gather feedback about the products.

Suppliers will be notified when they are short of products and when retailers place orders for their products. Moreover, suppliers and retailers get their acceptance or rejection status notifications from the company admin.

After the admin has registered and logged in, his responsibilities include system maintenance, monitoring and reporting, managing supplier and retailer accounts (accepting and rejecting), and providing client service.



### 3.4.3 Use Case Scenario

Use Case Scenarios are the possible paths that are taken to reach a specific goal and give extra details on how an activity can be achieved. They help get insight into how a user may interact with the system and predict possible bugs that could disrupt a user's experience. This is done as a precautionary measure to handle issues that may arise prior (Guthrie, 2022).

Header Area	
Use Case Actor	Suppliers
Area	Application
Actors	Retailers, Admin, Delivery drivers
Stakeholders	Princess Sumaya University For Technology
Description	A Supplier that provides either local or international products to retailers.
Triggering Event	The client accesses the platform from the application
Trigger Type:	External

*Table 7 suppliers use case scenario*



Steps Performed (Main path)	Required information
The client will access the platform via AppStore/PlayStore	Application
The client signs up for an account to be able to use the platform	First Name, Last Name, Email, Password, Phone Number, and License Number.
The client can update their profile	Bio, Picture, First Name, Last Name, Email, Phone Number, and Password
Client login if they successfully sign up	Email and Password
The client can generate reports	Daily, weekly, monthly, and yearly
The client can manage discounts	The client can manage discounts by selecting bundles of products to be sold together and applying discounts
The client should provide customer support	Through various channels such as Phone Support and Live Chat on either phone number or email.

*Table 8 suppliers steps performed*





Header Area	
Use Case Actor	Retailer
Area	Application
Actors	Admin, Supplier, and Delivery
Stakeholders	Princess Sumaya University for Technology
Description	A business owner such as a Supermarket or Hypermarket buys from suppliers of local and international products.
Triggering Event	Client access the platform from the Application
Trigger Type	External

Table 9 retailers use case scenario

Steps Performed (Main Path)	Required Information
The client will access the platform via AppStore/PlayStore	Application
The client signs up for an account to be able to use the platform	First Name, Last Name, Email, Password, Phone Number and License



The client can update their profile	Bio, Picture, First Name, Last Name, Email, Phone Number, and Password
Client login if they successfully sign up	Email and Password
The client can search	Show all available products
The client can filter	Show all products that are filtered
The client can place an order after searching or filtering	Give the option to choose local or international products
The client can add products to the basket	The client can add and remove from the basket
The client can track the order	Information about the process progress will be received via both email and notifications

*Table 10 retailers steps performed*



## **{Chapter Four: System Requirements Analysis}**



## **4. Chapter four: System Requirements Analysis:**

### **4.1 Functional and Non-Functional System Requirements:**

Functional System Requirements are a list of actions or functions that the system must perform to satisfy its users. In a platform such as Mostawdaakom functional requirements include user authentication, order placement and management, integration with existing systems, and market analysis.

Non-Functional Requirements define how the application runs and performs its operational characteristics. The non-functional requirements of our project's mobile application should ensure that it is easy to use and functional for the user. Mostawdaakom should be user-friendly, and secure and allow massive numbers of users to access and share huge volumes of data. Additionally, suppliers will be required to have a valid license to be given a registering authority, and it is for regulatory compliance. This core requirement ensures that Mostawdaakom remains free from fraud, and therefore, retailers can be assured that the goods or services Mostawdaakom offers have been verified as genuine and of approved quality.

### **4.2 Methodologies**

The basis of our efforts to strengthen Mostawdaakom's capabilities has been a combination approach involving qualitative and quantitative research methodology, precisely matched to the demands of our target market which falls into the category of suppliers and retailers. It all started with us conducting introductory talks with a group of participants. These included: Suppliers for both local and international products and retailers and supermarket owners in Amman, Jordan. Our research selection focused on knowing the challenges faced by retailers and suppliers, knowing their feedback about Mostawdaakom and what can Mostawdaakom provide to make their inventory process much easier.



### **4.3 Quantitative Data Analysis**

The quantitative data was collected through a survey sent to both suppliers and retailers online. The questionnaire was formatted to tackle four main areas of suppliers' and retailers' acceptance and perceptions of Mostawdaakom. The survey areas were the following:

#### **Inventory management and order placement:**

It mainly inspects if the majority of suppliers and retailers use any technological solutions for handling inventory management, the percentage of experiencing shortages and stock-outs, the importance of real-time inventory updates, and the factors that would influence their decision to adopt new technology to manage inventory.

#### **Communication and Collaboration:**

In this area, it's mostly about the suppliers and retailers' satisfaction with their current way of handling inventory, if they're satisfied with Mostawdaakom features, and if they would recommend it as suppliers and retailers if they would be more inclined to use Mostawdaakom for the fact that it supports local Jordanian companies, and how important is it for them to actively support local companies.

#### **Recommendations and Payment Methods:**

This area is all about studying the preferred methods for payments for both retailers and suppliers.

#### **Security and Privacy:**

This area studies how concerned suppliers and retailers might be about the security and privacy of new technologies like Mostawdaakom.

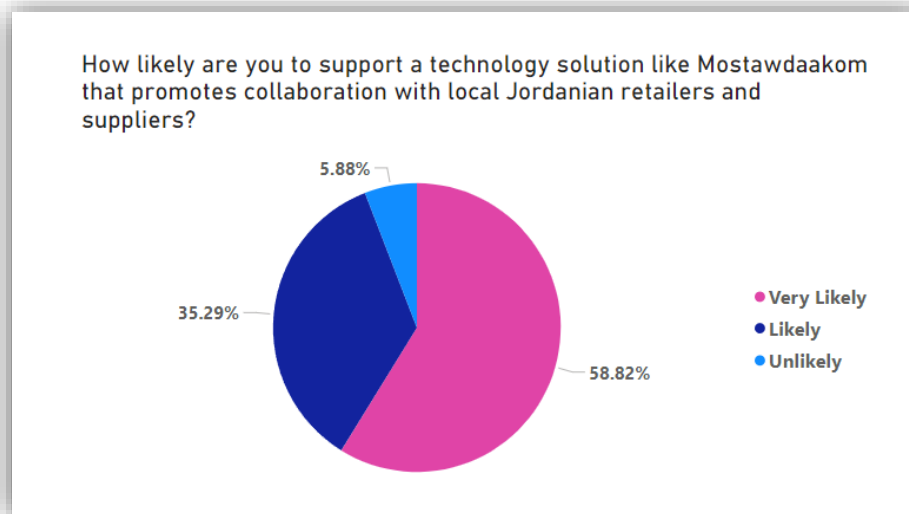


Figure 8 survey Q1

The survey question aimed to find out how likely the respondents are to adopt this kind of technology like Mostawdakom which does collaborative work with Jordanian retailers and suppliers.

The survey results showed that 58.82% of respondents were very likely with Mostawdaakom as a technology solution that promotes collaboration with local Jordanian retailers and suppliers and 5.88% were unlikely and as we tracked their responses for the next question it showed that they were afraid of using technology as we mentioned in Mostawdaakom's Limitations. 35.29% answered likely, this shows us that those people who answered likely are interested in the idea of supporting Mostawdaakom after knowing more about it.

Generally, the results reveal a great deal of support for the technology proposals, thus it is apparent that such proposals will be well received among efforts to associate with local Jordanian businesses.

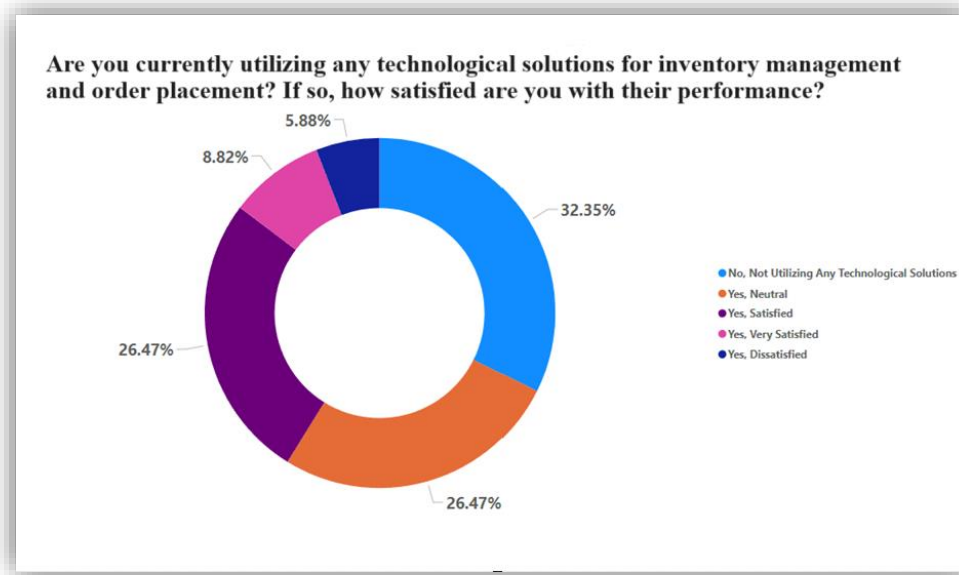


Figure 9 survey Q2

We asked the survey participants to specify the number of technology tools they were using for inventory management and placing order and their degree of satisfaction or dissatisfaction with those.

32.35% responded "No, not utilizing any technological solutions" This targeted group of account respondents said that they were not using any technology currently to manage stock and to place orders. 23.47% responded "Yes, neutral": Their answers showed that a balanced group opinion the group was set at a "neutral" satisfaction level of available technological solutions. Their answers leave one noticing that these individuals do not have incredibly strong positive or negative feelings toward the operation of these technologies.

26.47% responded "Yes, satisfied": About 25% of respondents expressed satisfaction with the technological solutions they had been operating for inventory management and order formatting. This gives an insight into the large number of users who consider these tools beneficial for reaching their objectives and improving their work productivity. 8.82% responded "Yes, very satisfied": However, A handful of respondents gave a relatively high level of satisfaction, which signifies they felt the work of their solutions was outstanding. This group complained about or had issues



to do with the performance of the tools which in turn identify where the technology solutions in the market can be improvised or optimized.

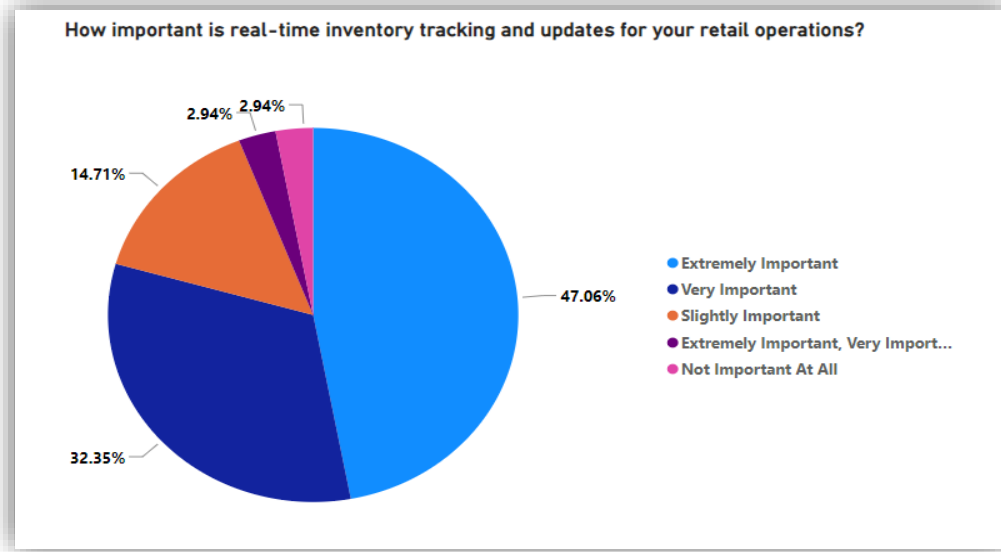


Figure 10 survey Q3

The result of the survey reveals a huge consensus among the respondents on the importance of inventory tracking and updating in everyday usage for retail operations. Almost half of the participants (47.06%) thought it was extremely important, hence a must in the application of the retail processes. On the other hand, 32.35% of them said it was "Very important", which again supported the main point that it was a very crucial thing. The fact that a small percentage (14.71%) of the people thought that it was "Slightly important" proved that many people were aware of its usefulness. Despite this, a small number (2.94% each) of the respondents considered it "Not important at all" or a combination of "Extremely important and very important." "The most common view is because the majority of the respondents saw the necessity of real-time inventory management in the retail business to guarantee the efficiency of the operations and to meet the customer needs.



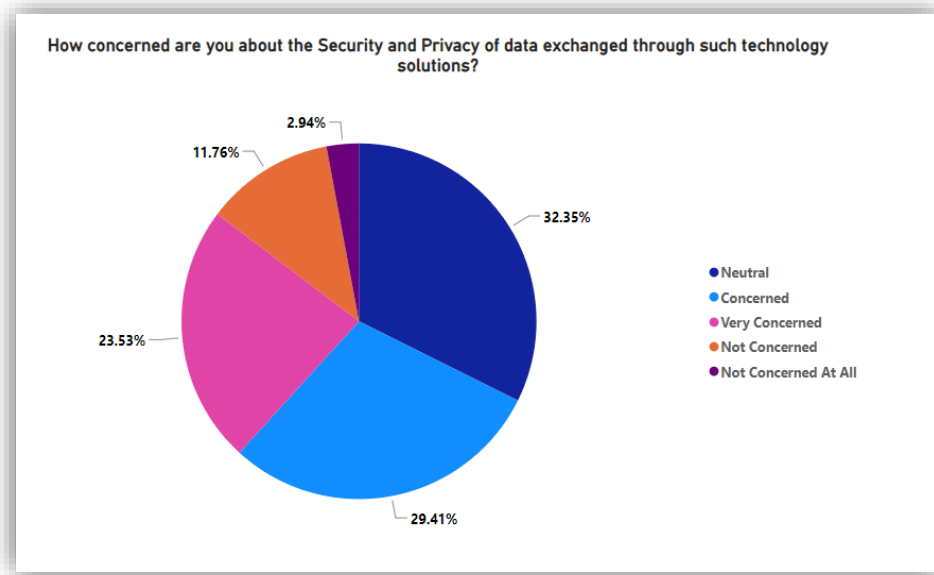


Figure 11 survey Q4

The survey responses give the chance to the researchers to understand the attitudes towards the security and privacy of data that is exchanged by the technology solutions. A large part of the respondents, which is about one-third (32.35%) according to the survey, took a neutral stand, meaning that they had a common view or maybe they didn't have a clear opinion on the issue. On the contrary, almost 30% of the interviewees voiced their worry, thus, showing the noticeable percentage of the people who are concerned about the dangers of the data exchange. Moreover, approximately 23.53% of the respondents were very worried, which shows a drastic increase in the level of data privacy and security concerns. The other way around, a small number (11.76%) said they were not worried, thus they have a high degree of freedom or trust in the security of such technology solutions. Finally, only 2.94% of the respondents said they were not worried at all, hence they are the minority group of people who think that there is no risk in data sharing. The different answers to this question show that people have different knowledge, feelings, and trust about data security and privacy in technology solutions among the respondents.

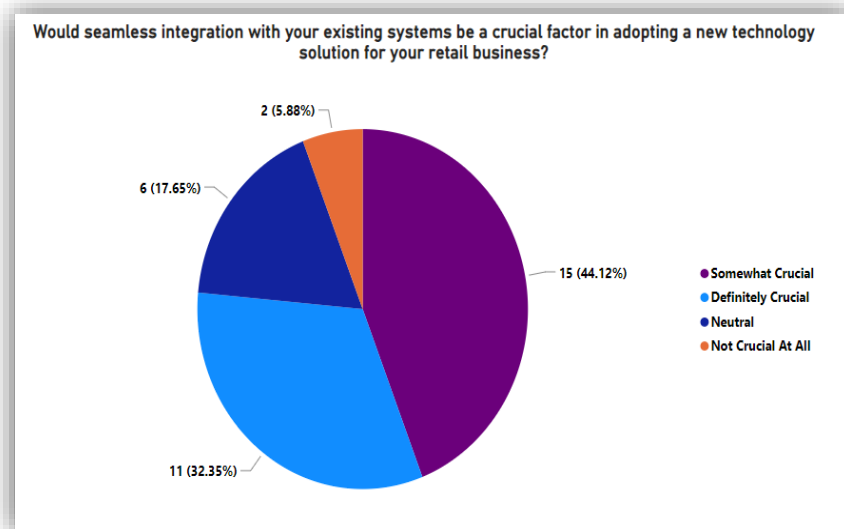


Figure 12 survey Q5

The replies to this survey question showed that a minority, making up about 5%, are the ones who suffer from financial harassment. 88% of the people surveyed said that "Seamless integration is "Not crucial at all," indicating that they do not see it as a priority to replace the existing systems. On the other hand, a big part, about 44, of the people are participating in a project that doesn't have anything to achieve. 12%, considered it "Somewhat crucial," which meant that they acknowledged the importance of it but at the same time, they gave it some room for flexibility. Additionally, roughly 17. 65% of the people have not expressed any opinion and remained on the neutral side, this implies the lack of strong feelings or the uncertainty of integration compatibility. On the other hand, a vast number, around 32, of the students achieved more than the expected grades. 35%, labeled as fitting integration "Very important," showing high stress on the fact that the provision of the new Internet system needs to be compatible with the already existing ones. These different points of view show that not all of the respondents regard integration compatibility as an essential part of the new technology solutions implementation in their retail businesses.

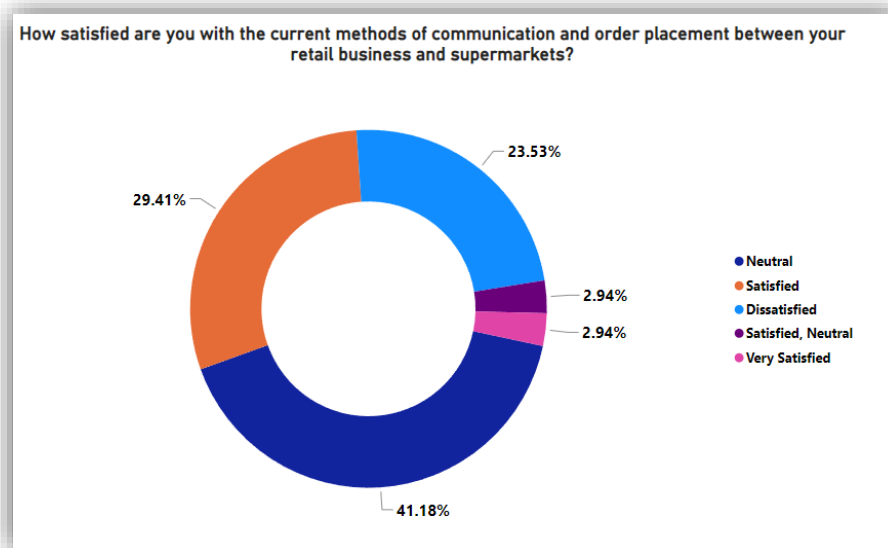


Figure 13 survey Q6

The responses to the question about satisfaction with current methods of communication and order placement between retail businesses and supermarkets: the responses to the question about satisfaction with current methods of communication and order placement between retail businesses and supermarkets around 41. 18% of the participants said that they were "Neutral" to the present methods, thus, it can be concluded that they did not have a very strong feeling about the methods, either positive or negative. On the other hand, around 30% said they were "Satisfied," thus displaying a moderate level of their contentment with the current communication and order placement procedures. Conversely, about 23. 53% of the respondents expressed their discontent with the current methods and pointed out the obvious flaws, hence, the fact that a significant percentage of people are not satisfied shows that the system is not working in their favor. Additionally, 2. 94% of the respondents each said that they were "Satisfied, Neutral" or "Very satisfied", which means that the various degrees of positive sentiment to the current communication and order placement processes were indicated them. These responses show the diversity of attitudes towards the effectiveness and satisfaction with the existing

methods, the most notable part of which is neutral or dissatisfaction along with the satisfaction or the feeling of high levels of satisfaction.

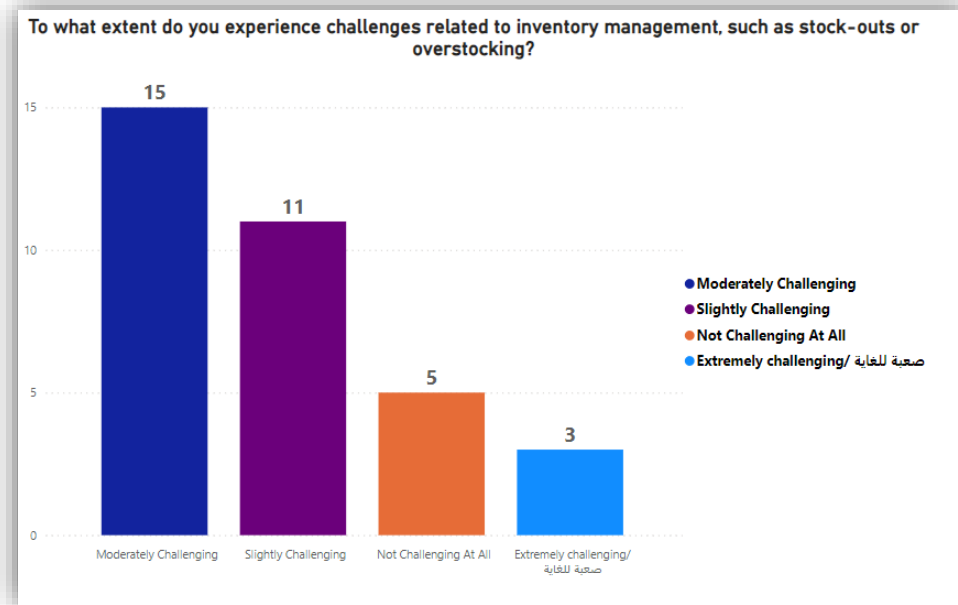


Figure 14 survey q7

The replies to the question that addresses the difficulties related to inventory management show a broad range of experiences among the respondents. Out of the total responses, 15 respondents mentioned that inventory management was moderately challenging, which means that the level of difficulty was significant yet manageable, it could be the situation where the inventory was not enough or it was overstocked. Moreover, 11 respondents said that they had slightly difficult experiences, hence, the difficulties were not too high, which could be because they were not avoiding the minor issues in inventory management. On the other hand, 5 people stated that they do not find inventory management challenging at all, which shows that the existing systems are very effective in the management of inventory. Another two respondents pointed out these



problems as the most challenging ones that they face, which means that these problems are either very frequent or they are the most persistent ones, and therefore, they affect their business a lot. The interviews, on the whole, demonstrate the variety of experiences and perceptions of the inventory management challenges that the respondents go through.

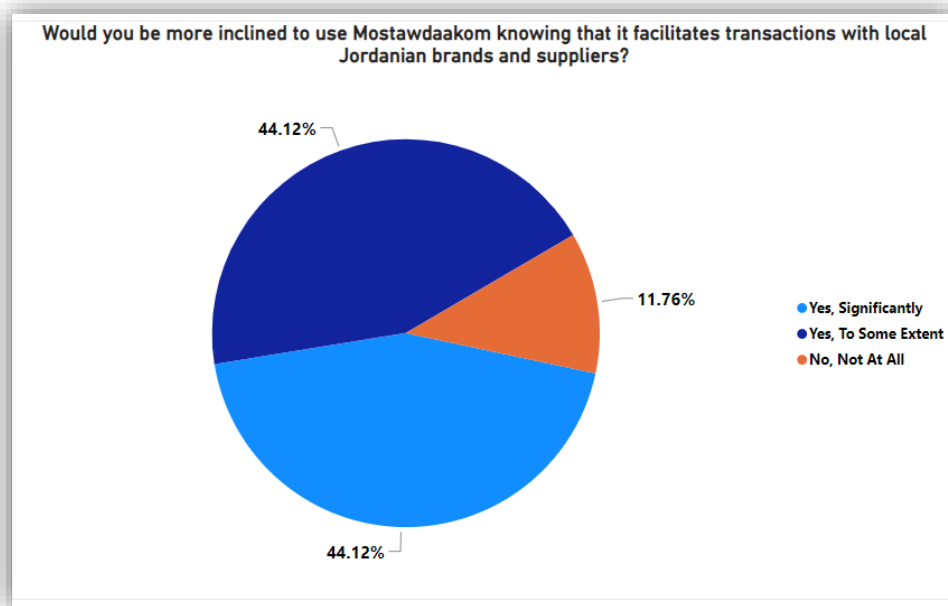


Figure 15 survey Q8

The replies to the question which is about the tendency to use Mostawdaakom, taking into consideration the easy transactions with the local Jordanian brands and suppliers, show a strong positive attitude to such participation. Equally, 44.12% of the respondents stated their willingness to use it in a significant way, pointing out the major interest in backing local businesses. Additionally, 44.12% said that they had a somewhat less preference for the usage of Mostawdaakom which indicates that their attitude towards this technology was positive but not as



strong as other parts of the population. On the other side of the opinion, a small group of people (11.76%) said that they would not use it at all for this purpose, thus, the main group with minority opinions and the one with other preferences are the ones with reservations. These replies are the result of a clear preference for the Mostawdaakom platform as it helps in the transactions with local Jordanian brands and suppliers, hence, there is a big chance of the platform being used by these people.

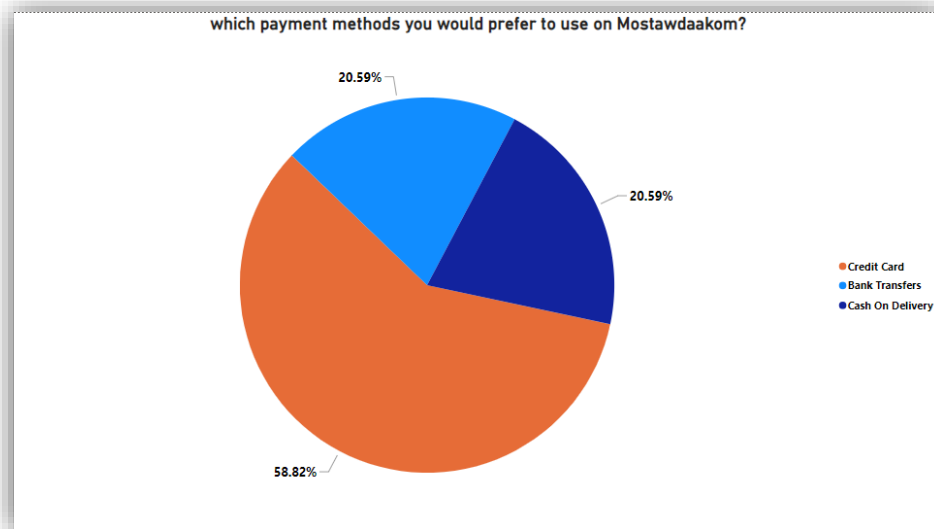


Figure 16 survey Q9

The answers to the question about the chosen payment methods on Mostawdaakom show that the respondents have a clear opinion. A vast majority, which makes up 58%, are in favor of the adoption. 82%, stated that they were in favor of using credit cards, thus, it showed a high tendency towards digital payment options, which were convenient and also secure. Additionally, 20. 59% of the participants were in favor of bank transfers, hence the high percentage of respondents who prefer direct and electronic fund transfers. Similarly, another 20. 59% of the respondents chose the



cash-on-delivery method, which shows that there are still people who prefer the old way of payment for the reason that it is simple and they are used to it. These responses altogether show the need to provide multiple payment options on Mostawdaakom to fit the different needs and preferences of the customers and to make their experience easy for everyone.

## 4.4 Qualitative Data

### 4.4.1 Pre-initiation Data Collection

Before conducting the survey, we established the groundwork or foundation for our research project by interviewing a random sample of suppliers and retailers that are located in Amman, to structure the survey optimally to ensure obtaining the right information from the right people to make the right decisions.

Our preinitiation interviews led us to the following:

Questions	Sample Response Conclusion
Retailers Sample number:5	
<b>How often do you face shortages and delays in receiving products from suppliers?</b> كم نسبة مواجهتك لنقص او تأخير باستلام المنتجات؟	Most respondents mentioned that they do not experience shortages and delays from suppliers frequently it's about from 1—15%.
<b>What are the challenges you face when getting products for your supermarket?</b> ما هي التحديات التي تواجهها عادةً عند حصولك على المنتجات؟	<b>Seven Eleven Grand Stores/7 stores (in Shmesani):</b> Nowadays our challenge is mainly inflation, it's causing the prices of the products to go up while people's power of purchase is low.  <b>Habiba stores:</b> Coordinating orders with multiple suppliers and ensuring timely deliveries  <b>Fouad supermarket (in Sweifieh):</b> one of the challenges we face is losing our suppliers due to parking limitations.  <b>My market (in Dahiyat Al-Rasheed):</b>

	<p>In the last few years, we haven't experienced any shortages but recently because of what's happening in Yemen and the Red Sea we have been facing some shortages and delays because of the transportation issues, this has been a challenge for us lately.</p> <p><b>H&amp;H Supermarket(5<sup>th</sup> circle):</b> The challenge we normally face is that it's hard to keep up with the new product trends and if we do it's hard to get the products.</p>
<p><b>How do you find new products and suppliers for your supermarket?</b> كيف تجد موردين و منتجات جديدة عاداتاً؟</p>	<p><b>7 stores (in Shmesani):</b> We normally look on social media platforms and online websites for new suppliers and products.</p> <p><b>Fouad supermarket (in Sweifih):</b> Most of the time companies send their sales people and come to our shop.</p> <p><b>My market (in Dahiyat Al-Rasheed):</b> We rely on our supplier's network and connections to provide us with new products.</p> <p><b>Habiba Stores:</b> Word-of-mouth recommendations from my other retailer friends play a significant role in discovering new products and suppliers.</p> <p><b>H&amp;H Supermarket(5<sup>th</sup> circle):</b> We searched the company on Google to find their contact number.</p>
<p><b>Have you ever used any applications or websites to order products for your supermarket?</b> هل سبق ان استخدمت تطبيقات او مواقع الكترونية لشراء منتجات للسوبرماركت؟</p>	<p><b>Seven Eleven Grand Stores/7 stores (in Shmesani):</b> We've experimented with online sales channels but found them less effective than traditional methods.</p> <p><b>Fouad supermarket (in Sweifih):</b> No, we never tried getting our products from applications.</p> <p><b>My market (in Dahiyat Al-Rasheed):</b></p>



	<p>Yes, but not consistently only when we need specific products for a limited time at good prices.</p> <p><b>Habiba Stores:</b> No not really.</p> <p><b>H&amp;H Supermarket (5<sup>th</sup> circle):</b> yes, we did we normally use the Orderat application to order our products.</p>
<p><b>Do you think mostawdaakom can help with solving the challenges you face as a supermarket owner?</b> هل تعتقد ان مستودعكم سيساعد بحل العديد من التحديات التي يواجهها اصحاب السوبرماركت؟</p>	<p><b>Seven Eleven Grand Stores/7 stores (in Shmesani):</b> Yes, if it can fix the problems we faced the last time we tried getting supplies from online applications.</p> <p><b>Fouad supermarket (in Sweifieh):</b> I would like to try.</p> <p><b>My market (in Dahiyat Al-Rasheed):</b> Yes, I support the adoption of new technologies that could enhance our inventory management.</p> <p><b>Habiba Stores:</b> We believe that Mostawdaakom has the potential to solve many challenges we face as supermarket owners, such as reaching new suppliers that we don't know about.</p> <p><b>H&amp;H Supermarket(5<sup>th</sup> circle):</b> Yes, I believe that mostawdaakom has the potential to solve many problems.</p>
<p><b>Do you think that having local and international brands sections within the application with more discounts on local brands' products could influence your purchase decisions?</b> هل برائيك فصل المنتجات المحلية و العالمية و توفر خصومات اكثر على المنتجات المحلية سيؤثر على قرارك بالشراء؟</p>	<p><b>Seven Eleven Grand Stores/7 stores (in Shmesani):</b> In today's market, there is a growing demand for local products that are unfamiliar to us. By leveraging real-time market data and separating products, we can effectively address this demand.</p> <p><b>Fouad supermarket (in Sweifieh):</b></p>

	<p>Yes, making good discounts will probably influence my purchasing decision.</p> <p><b>My market (in Dahiyat Al-Rasheed):</b> Yes, we like supporting local companies it is great to have all the alternatives in one section.</p> <p><b>Habiba Stores:</b> Yes, getting local products at good prices would change my purchasing decisions.</p> <p><b>H&amp;H Supermarket (5<sup>th</sup> circle):</b> I never thought of that, normally it's not hard for me to separate the suppliers that bring me international and local products. But providing discounts may help my decisions to purchase.</p>
<p><b>As a supermarket owner would you recommend using mostawdaakom?</b> كونك صاحب سوبرماركت هل تنصح باستخدام مستودعكم؟</p>	<p><b>Seven Eleven Grand Stores/7 stores (in Shmesani):</b> Yes, I feel like it connects us to many suppliers that we may not know about.</p> <p><b>Fouad supermarket (in Sweifieh):</b> Yes, seems like Mostawdaakom provides good solutions to many problems.</p> <p><b>My market (in Dahiyat Al-Rasheed):</b> I wouldn't recommend anything I didn't try, but I look forward to trying Mostawdaakom.</p> <p><b>Habiba Stores:</b> I would like to try it first.</p> <p><b>H&amp;H Supermarket (5<sup>th</sup> circle):</b> Yes, of course.</p>

Table 11 suppliers sample table

Questions	Sample Response Conclusion
<p>Suppliers Sample number:5</p>	
<p><b>What are the challenges you mainly face while reaching retailers?</b> ما هي التحديات التي تواجهها عند توزيعك للمنتجات لاصحاب السوبرماركت؟</p>	<p><b>Habiba Supplies:</b> The primary challenge we face is ensuring that our imported goods and locally manufactured align with the demands of the local Jordanian market.</p> <p><b>Zanbaka:</b></p>



	<p>one of the main challenges we face is convincing retailers to stock our new, unconventional, and unique local products.</p> <p><b>Sama Jordan:</b> Our biggest challenge is making our top-quality products stand over competitors and convincing retailers to choose us over others.</p> <p><b>Al-Juneidi:</b> one of the challenges we face is the distribution of so many products to so many supermarkets.</p> <p><b>Baladna:</b> The constant growth and consistency in quality ensure that both retailers and customers always demand our products over competitors.</p>
<p><b>How do you currently distribute your products to retailers?</b> ما هي طريقته الحالية لتوزيع المنتجات لأصحاب السوبر ماركت؟</p>	<p><b>Habiba Supplies:</b> we have a contract with a logistics service provider company in Jordan.</p> <p><b>Zanbaka:</b> We have our employees that provide logistic service to our products.</p> <p><b>Sama Jordan:</b> Our products are shipped directly from our manufacturing facilities/ warehouse to malls and supermarkets in different locations us.</p> <p><b>Al-Juneidi:</b> We partner with a third-party logistic provider to handle our product distribution.</p> <p><b>Baladna:</b> We ship our products.</p>
<p><b>Have you ever used any online applications or websites to sell your products?</b> هل سبق أن استخدمت تطبيقات أو مواقع الكترونية لبيع المنتجات التي توردها؟</p>	<p><b>Habiba Supplies:</b> No, we did not try using online applications or websites.</p> <p><b>Zanbaka:</b> Yes, we support using new technologies to expand our business.</p> <p><b>Sama Jordan:</b></p>



	<p>Yes, the pandemic was a huge reason for us to try selling online which worked perfectly for us.</p> <p><b>Al-Juneidi:</b> Yes, but it didn't work successfully with all the applications we tried selling on.</p> <p><b>Baladna:</b> Yes, we sell our products using applications and websites.</p>
<p><b>Do you believe that mostawdaakom will make the distribution process more efficient and easier?</b></p> <p>هل تعتقد ان مستودعكم سيسهل عملية التوزيع و يجعلها اكثر كفاءة؟</p>	<p><b>Habiba Supplies:</b> Yes, it seems like mostawdaakom has the potential to simplify the distribution process for us and provide them in real-time.</p> <p><b>Zanbaka:</b> Yes, we believe that our new local products can gain more recognition with the feature that Mostawdaakom has, which separates local and international products</p> <p><b>Sama Jordan:</b> We already have our distribution method and established contracts with a good number of supermarkets. While I'm not sure if Mostawdaakom will add significant value, there's no harm in giving it a try.</p> <p><b>Al-Juneidi:</b> Yes, we believe that Mostawdaakom is a seamless platform for retailers to discover and procure our products efficiently.</p> <p><b>Baladna:</b> Yes, I feel like the fact that Mostawdaakom is business intelligence-based makes it much easier for retailers to know the market trends.</p>

<p><b>If you supply a local brand product are there any challenges you face when selling your products to retailers?</b>  إذا كنت مورد لمنتجات محلية، هل تواجه صعوبة بتوريدها للمحلات التجارية؟</p>	<p><b>Habiba Supplies:</b>  Selling local products can be challenging due to the hard competition the international products have set.</p> <p><b>Zanbaka:</b>  In the Jordanian market in general, we face a significant problem which is the lack of trust from customers in locally manufactured products, assuming that international companies are always superior therefore it influences customers buying decisions.</p> <p><b>Sama Jordan:</b>  Yes, the new generations assume that using international companies instead of local is 'cooler' even if the local product is an exact copy and at lower prices.</p> <p><b>Al-Juneidi:</b>  I don't face many challenges in that area.</p>
<p><b>As a supplier would you recommend using mostawdaakom?</b>  كمورد هل تنصح باستخدام مستودعكم؟</p>	<p><b>Habiba Supplies:</b>  Yes.</p> <p><b>Zanbaka:</b>  Yes, we always support using new technologies that can benefit the inventory process.</p> <p><b>Sama Jordan:</b>  I can't recommend something I didn't try, but mostawdaakom seems to have the potential to provide easier inventory management.</p> <p><b>Al-Juneidi:</b>  Yes, mostawdaakom will hopefully be a successful application.</p> <p><b>Baladna:</b>  Yes, I believe that mostawdaakom will be a known application one day.</p>

Table 12 retailers Sample Table



#### **4.4.2 Initiation – Data Collection**

Mostawdaakom has conducted a sample of 5 different retailers and suppliers in Amman, Jordan, who responded to our survey to gain a clearer understanding of the process. The interviews contained a mix of open-ended and closed-ended questions. Suppliers and retailers were asked the following:

##### **Questions for Suppliers:**

- What are the challenges you mainly face while reaching retailers?
- How do you currently distribute your products to retailers?
- Have you ever used any online applications or websites to sell your products?
- Do you believe that Mostawdaakom will make the distribution process more efficient and easier?
- If you supply a local brand product are there any challenges you face when selling your products to retailers?
- As a supplier would you recommend using Mostawdaakom?

##### **Questions for Retailers:**

- How often do you face shortages and delays in receiving products from suppliers?
- What are the challenges you face when getting products for your supermarket?
- How do you find new products and suppliers for your supermarket?
- Have you ever used any applications or websites to order products for your supermarket?
- Do you think Mostawdaakom can help with solving the challenges you face as a supermarket owner?
- Do you think that having local and international brands sections within the application with more discounts on local brands' products could influence your purchase decisions?
- As a supermarket owner would you recommend using Mostawdaakom?



Based on our interviews with 5 retailers in Amman, including Seven-Eleven Grand Stores/7 stores (in Shmesani), Habiba stores, Fouad Supermarket (in Sweifieh), My Market (in Dahiyat Al-Rasheed), and H&H Supermarket (5th circle), as well as 5 suppliers, Habiba Supplies, Zambaka, Sama Jordan, Al-Juneidi, and Baladna, we gained valuable information about the common challenges they face in the inventory management practices. The interview answers highlighted the issues for Mostawdaakom to solve effectively. One of the challenges observed in the market is consumers' lack of trust in the products that are locally manufactured, preferring international brands and imports instead of assuming it's superior. Additionally, retailers struggle to keep up with changes in demand whether it's driven by trends and social media, or the sudden growing preference for local alternatives among consumers.

#### **4.5 Problem Statement**

In Jordan's retail market, there is still a big gap between suppliers and retailers which leads to inefficient order placement, management, and inventory control. The traditional ways of handling retail management often result in stock-outs, inability to track real-time market trends, and poorly performed inventory management processes. Also, the availability of a variety of products becomes a concern for small supermarkets, it's hard for them to keep up with what customers want as the market changes quickly, and they find it tough to stock new items on their shelves and be informed about what is recently demanded and trendy in the market. This is why they need a new innovative, up-to-date way like Mostawdaakom to get new different products and stay updated with the new customer demands.

Digital technologies adoption by suppliers and retailers that are used to the traditional way of managing inventory can be challenging, they can be resistant to the change of tried and true approaches that are replaced by new technologies, making them doubt the smoothness of the process or their ability to keep up with the new trend.

Another significant challenge in Jordan's market identified by one of the supplier's interviews is the poor image and doubt many people have towards the locally manufactured products, instead of buying local product lines, consumers increasingly prefer imported products to those produced nearby or within their region, due to the lack of trust in local company's quality and the assumption that international companies are always superior to us.



## **4.6 Feasibility Study**

A feasibility study is a detailed study that takes into account all critical aspects associated with a proposed project to determine the project's chances of success (Amy Drury, 2023).

Success in business may be primarily defined by return on investment, On the plus or minus side, however, several other significant factors, like community reaction and environmental impact. Project managers can use feasibility studies to assess the risk and return of a proposed course of action, but before proceeding, a few things need to be taken into consideration (Amy Drury, 2023).

### **4.6.1 Financial Feasibility**

#### **4.6.1.1 The Ecosystem**

Over the past two decades, Jordan has developed a supportive ecosystem for sustainable investments in general. The Government has implemented significant regulatory reforms to establish a business environment conducive to investment (Pallez, 2018).

In recent years, there has been an enhancement of investment law, and investment promotion agencies have been a cornerstone for mitigating economic and political risks for investors (Pallez, 2018).

The Information Communications and Technology (ICT) sector is at the center of Jordan's economic strategy. With good infrastructure, political stability, affordable talent, and government support, the sector generates over JD1.6 billion in revenues annually, accounting for 3.8% of GDP. In 2020 while the Jordanian economy struggled due to the COVID-19 pandemic, the ICT sector witnessed a 6% growth.

According to the Ministry of Digital Economy and Entrepreneurship, Jordan seeks to serve as a leading regional center on digital transformation and cutting-edge innovation, with 27% of the region's tech entrepreneurs being of Jordanian origin. With 25 business incubators and accelerators in Jordan, it now ranks 49th on the Global Entrepreneurship Index (GEI). Jordan is also advancing





in Cybersecurity; it enacted the Cybersecurity Law in 2019 and currently ranks 71 out of 193 countries participating in the Global Cybersecurity Index (GCI).

This provides Mostawdaakom a fertile ground to grow and flourish through the support system available for tech startups. For example, QRCE (Queen Rania Center for Entrepreneurship), as well as IPARK create opportunities for entrepreneurs and startups to grow successful technology and innovation businesses, and develop systems that contribute to the economic and social growth of Jordan.

We approached QRCE to validate our project in the Jordanian market, they expressed their interest in offering us an opportunity for a project Pitch as we will be seeking a full sponsor and fund to cover our expenses as entrepreneurs from the venture lab offered by PSUT.

Startup Costs	
Item	Cost
Registration And Governmental Fees	Unknown until the deployment of the project
Application Deployment (IOS + Android)	AppStore \$99 yearly PlayStore \$26 one-time fee
Devices Laptops and Mobile Phones	\$1000
Google Maps Integration	\$17 for every 100,000 search
Vehicles	4 vehicles \$17,000 per vehicle
Total	Onetime payment total \$69,026 Yearly fees \$99 \$17 after every 100,000 completed searches

Table 13 Startup Cost Table



<b>Fixed Costs</b>		
<b>Operating Expenses</b>	<b>Cost per month</b>	<b>Cost per year</b>
Project Manager	\$2,800	\$33,600
IT Team	\$11,250	\$135,000
Business Intelligence Expert	\$4000	\$48,000
Rent	\$1000	\$12,000
Database Administrator	\$2000	\$24,000
Customer service	\$500	\$6,000
Marketing Team	\$560	\$6,720
Financial Accountant	\$840	\$10,080



Delivery Drivers	\$500	\$6000
Total	\$23,450	\$281,400

*Table 14 Fixed Costs Table*

#### **4.6.1.2 Source of Revenue**

Our revenue is conducted from the order transactions facilitated between the suppliers and retailers. This revenue stream could be diversified as follows:

We take from suppliers 5%, from retailers 5%, and the delivery revenue which means in total for every transaction 10% including delivery fees.

#### **4.6.1.3 Break Even Point**

A break-even point refers to the number of sales or income that a company must achieve to cover all of its costs, both fixed and running costs. The break-even point is a very important financial as it helps companies to find out how much revenue they need to generate to cover costs and be able to start making a profit. Businesses can increase profitability by studying the break-even point and using the information to influence decisions regarding price, variety of products, and cost control (Sinambela & Darmawan & Gardi & Malaihollo, 2022).

To summarize, the estimated annual cost is 281,400.

By taking 10% of each order transaction between suppliers and retailers, within approximately 10 months we expect to reach the break-even point and after that, the real profits start to be generated.

Accordingly, the proposed project might be unfeasible, but we are confident that later on we can make adjustments to problem-solving that will make it feasible.



### **4.6.2 Technical Feasibility**

The main subject of this evaluation focuses on the organization's technical resources, including the team's ability to translate concepts into functional systems and the overall capacity of its technical resources. Additionally, it involves evaluating the suggested system's hardware, software, and other technical requirements is another aspect of technical viability (Martins,2023).

The technical requirements needed from Mostawdaakom to function properly and in sync:

- ❖ Firebase backed by Google. (cloud-hosted database)
- ❖ Smartphones with different operating systems. (to test the prototype for different mobile devices)
- ❖ Laptops (social media and e-marketing)
- ❖ Google services (Google Docs, Google Maps, Google Drive)

### **4.6.3 Operational Feasibility**

The operational feasibility study is the tool that helps to determine the possibility of the project or system being successfully implemented and integrated into the organization's operations. This type of feasibility study examines the viability of a project or plan according to the organization's operational protocols, resources, and capabilities. The plan is considering the impact of the project on the organization's procedures and workflow.

Operational feasibility is a critical factor to take into consideration because the ease of use and adoption by suppliers and retailers determines its success. However, not all Mostawdaakom users whether they are retailers or suppliers can use the application proficiently for reasons like being unfamiliar with using new technologies, or they're not holding a university degree. Accordingly, Mostawdaakom will provide them with regular training to improve their understanding and expertise in application usage.



# **{Chapter Five: System Analysis and Design}**



## 5. Chapter five: system analysis and design

### 5.1 Entity Relationship Diagram (ER Diagram)

The Entity - Relationship Diagram (ERD) is a simplified representation extensively used in database architecture to characterize the relationships between entities such as Individuals, Items, and Ideas within a framework.

1) **Entities:** can be suppliers, retailers, products, orders, or Mostawdaakom as a main part among them

2) **Attributes:** characteristics which specifically describe the entities drawn on the Entity Relationship Diagram

3) **Relationships:** refer to the links between one item and another in a database. They are shown lines to connect entities. The more entities lying between connection points determines three types of relationships:

- **One-to-one relationship (1: 1):** In a one-to-one relationship, an entity may be split into two to clarify more information. [Rouces, J., de Melo, G., Hose, K. (2015)]
- **One-to-many relationship (1: N):** One-to-many connections are when one singular entity (X) may be linked to several instances of another entity (Y) however, each instance of (Y) is linked only to one instance of (X). [Rouces, J., de Melo, G., Hose, K. (2015)]
- **Many-to-many relationship (M: N):** A many-to-many connection presents X and Y entities that each can be connected to various cases of the other. These may display as one-to-many relationships in a physical ERD. [Rouces, J., de Melo, G., Hose, K. (2015)]

4) **Cardinalities:** Cardinality: describes the number of associations that are allowed to be explicitly called between instances of an entity and the instances of another one. An ERD consists of an arrow line showing the relationship between the entities.

Cardinality is a term used to demonstrate the possibility of assignments of one entity value to many entity instances in an ERD. There are two types of cardinalities:



- **Mandatory:** This implies that it should at least be identified or specified already which is associated with a particular specific entity. Cardinality that is compulsory is pointed legs with an ERD.
- **Optional:** This implies that one logical instance in an entity can exist even without getting involved in another entity's relationship. It's represented by a line absent of any sign at the end.

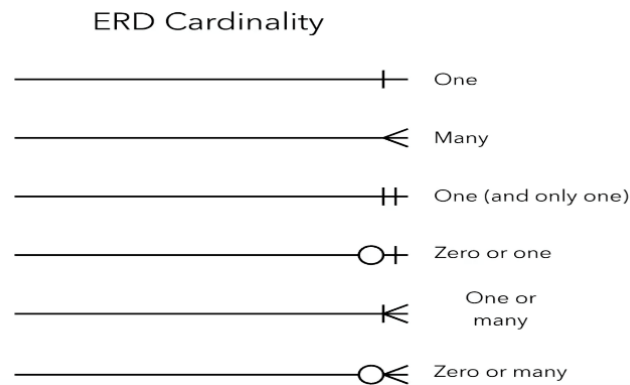


Figure 17 ERD cardinality

## 5.2 ERD description:

In the table below we define the core entities with their attributes and identifiers used in our module. This fixed structure is the backbone of our database design, providing a well-organized system for data management and outcomes evaluation.

Entity	Attributes	Key Attributes
Mostawdaakom	Merchant_ID Supplier_ID Retailer_ID Order_ID Product_ID Delivery_ID	Primary Key • Merchant_ID  Foreign Key • Supplier_ID • Retailer_ID • Order_ID • Product_ID • Delivery_ID



<b>Supplier</b>	Supplier_ID Supplier Name Supplier Address Contact Phone Contact Email	Primary Key <ul style="list-style-type: none"><li>• Supplier_ID</li></ul>
<b>Retailer</b>	Retailer_ID Retailer Name Retailer Address Contact Phone Contact Email	Primary Key <ul style="list-style-type: none"><li>• Retailer_ID</li></ul>
<b>Product</b>	Product_ID Supplier_ID Product Name Description Price Quantity	Primary Key <ul style="list-style-type: none"><li>• Product_ID</li></ul> Foreign Key <ul style="list-style-type: none"><li>• Supplier_ID</li></ul>
<b>Order</b>	Order_ID Retailer_ID Order Date Total Amount Status	Primary Key <ul style="list-style-type: none"><li>• Order_ID</li></ul> Foreign Key <ul style="list-style-type: none"><li>• Retailer_ID</li></ul>
<b>Delivery</b>	Delivery_ID Order_ID Delivery Date Shipping Address Tracking Number	Primary Key <ul style="list-style-type: none"><li>• Delivery_ID</li></ul> Foreign Key <ul style="list-style-type: none"><li>• Order_ID</li></ul>

Table 15 ERD description



**Relationships:**

- Mostawdaakom can have many suppliers (One-To-Many)
- Mostawdaakom can have many retailers (One-To-Many)
- Mostawdaakom can handle many deliveries (One-To-Many)
- A Product can be included in many Orders (Many-To-Many)
- Many orders may have many products (Many-To-Many)
- An Order is placed by one Retailer and each retailer may have many orders (one-to-many).
- An Order might have one Delivery but each delivery may have many orders (one-to-many).
- A Product is supplied by one Supplier but each supplier has many products (one-to-many).

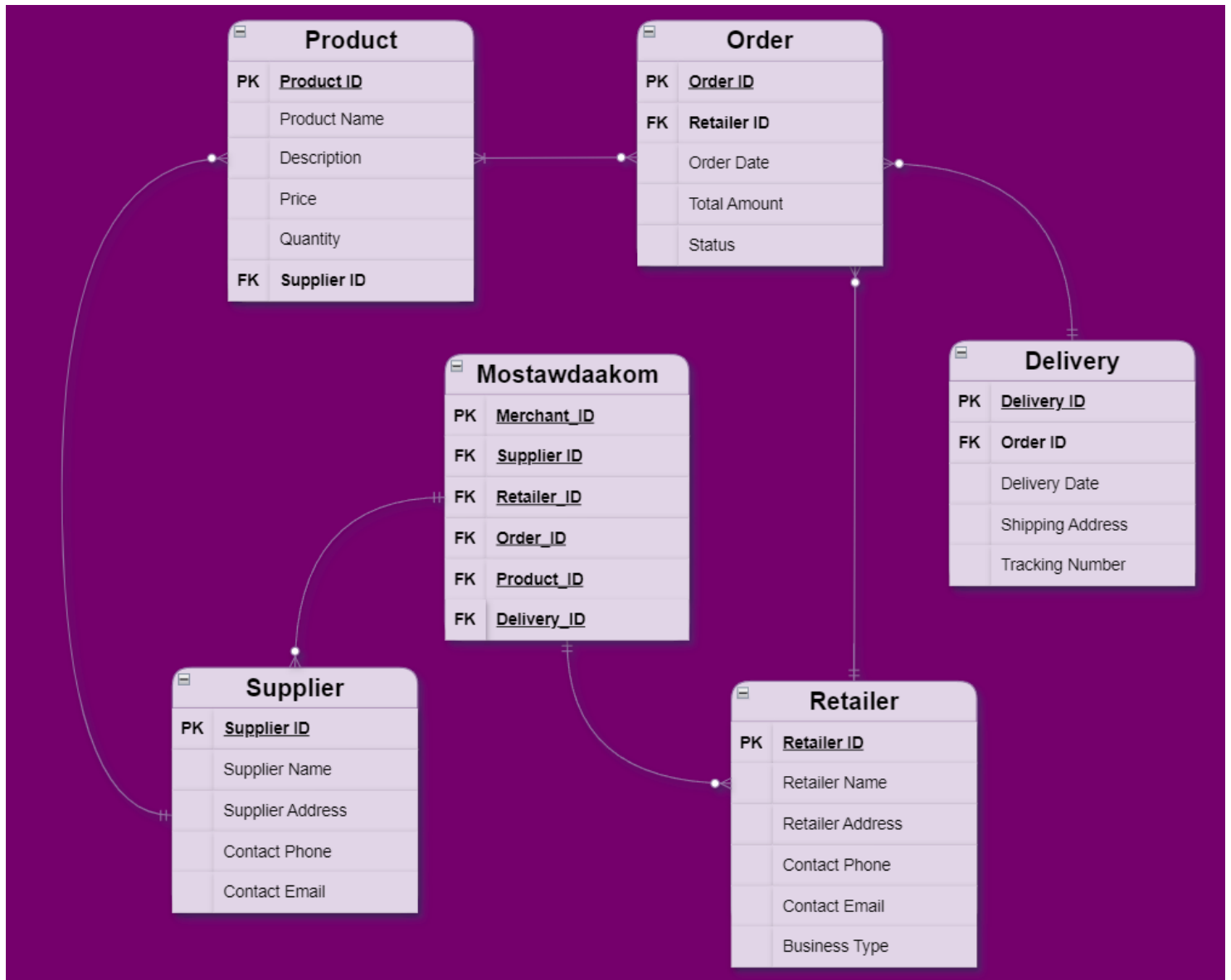


Figure 18 ER diagram



### 5.3 Data Flow Diagram (DFD)

A data flow diagram (DFD) is a model which illustrates the information flow in any process or system, hence, it is a tool that shows the flow of information in any process or system. This goes through the rectangles, circles, arrows, and short text labels with the data inputs, data outputs, data storage, and the pathway between them. Data flow charts are the diagrammatic, hands-drawn process pictures of the multi-level, detailed DFDs that are step by step the way data is managed. They are the people who are in charge of the research of the already existing system or the one that is to be created. A DFD is like other top diagrams and charts, it can "tell" things that are difficult to express in words, and it is suitable for both technical and non-technical audiences, from developers to CEOs. Therefore, the reason why DFDs are still so popular and widely used many years after their invention is that they are very useful. Contrariwise, these pictures are the best for the systems that are involved with the data flow like the software and systems. Nevertheless, they are not that useful today in the case of virtual or real-time systems that are based on databases.

Figuring out the data flow diagram (DFD) is a tool to depict the way data flows in the information system graphically. The DFD consists of four symbols that represent:

- a) **Processes:** set forth to accomplish a task which is to gain an objective.
- b) **Data Flows:** These are identified by arrows as directions of data flow electronically or physically.
- c) **Data stores:** a repetitive improvement of the stored accumulation of data.
- d) **Entities:** can be noted as a human being, organization, or mechanism that affects the systems and outcomes.

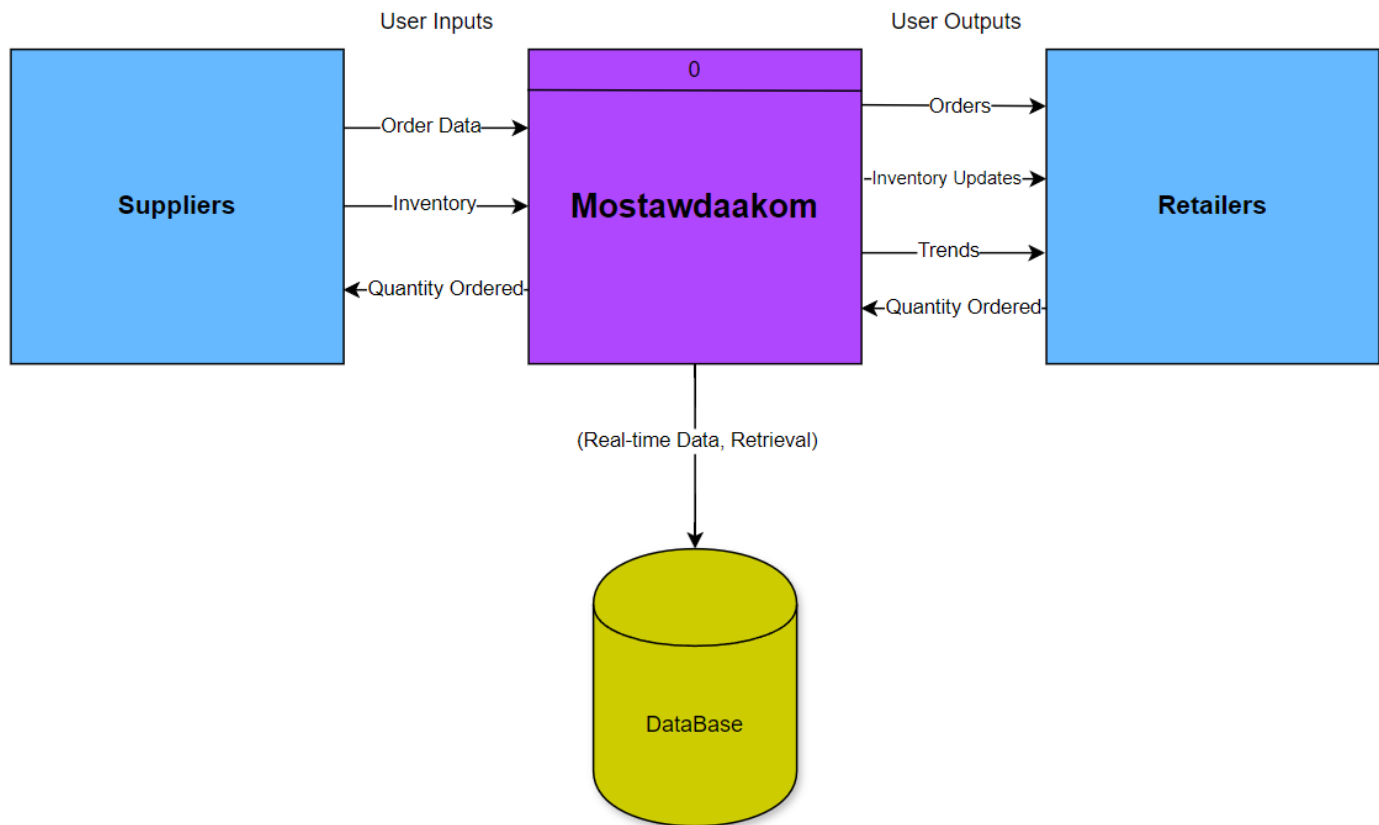


Figure 19 Mostawdaakom Context level

## 5.4 Prototype

Mostawdaakom's prototype is the first afterimage to see how the concept works and study its functionalities (Dam & Siang, 2020). The app design is expected to include all its core functions, which are needed to run the application effectively.

Mostawdaakom started its prototype using Javascript as its frontend language and followed the same path as its previous project templates to ensure the functionality of its fundamental features.



*Figure 20 Screen 1: Sign-in Page*

Once you enter the Mostawdaakom Mobile application it will bring you to the login page where the magic starts, if you're a new user you will have the button that says "Don't have an account? Register Now".



Figure 22 Screen 2: Choosing Page

Figure 21 Screen 3: Sign up Page



Once you click on Register Now it will take you to a page which you choose whether you are a supplier or retailer, assuming you are a retailer it will direct you to a page where you can enter your Email Address, Password, Re-Enter Password to double check if both passwords match, last thing you will add your mobile phone number so we can reach you whenever there's an order for you.

مستودع س

Store Name

Store Location

Next

*Figure 23 Screen 4: Store name and Location*



By then you will be directed to a page to enter your store name & store location, and now I can tell you “Welcome to Mostawdaakom you are all set!”.

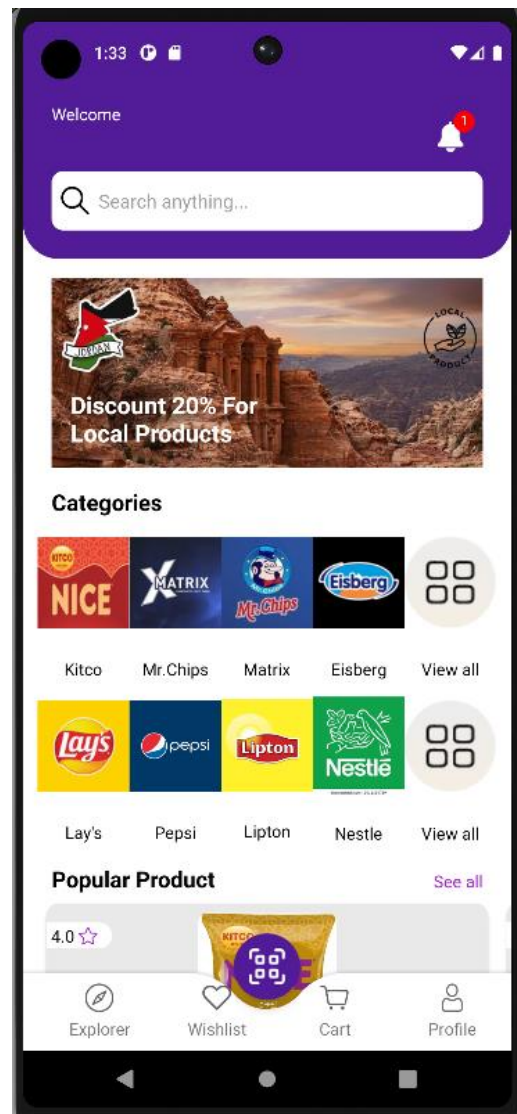


Figure 24 Screen 5: Home Page

Now you can explore all of the uploaded products by suppliers, on the header of this page we will first welcome you by your name, also you have a search bar you can check for products that you want in specific, in the middle of this page you will have 2 categories (Local, Global) Products which you can explore separately. The top 4 ordered products per company for each category will





be on the explore tab of Mostawdaakom and it will be changed daily this would make it easier for retailers to know what the most ordered products this method works based on Business Intelligence on the back end of the application

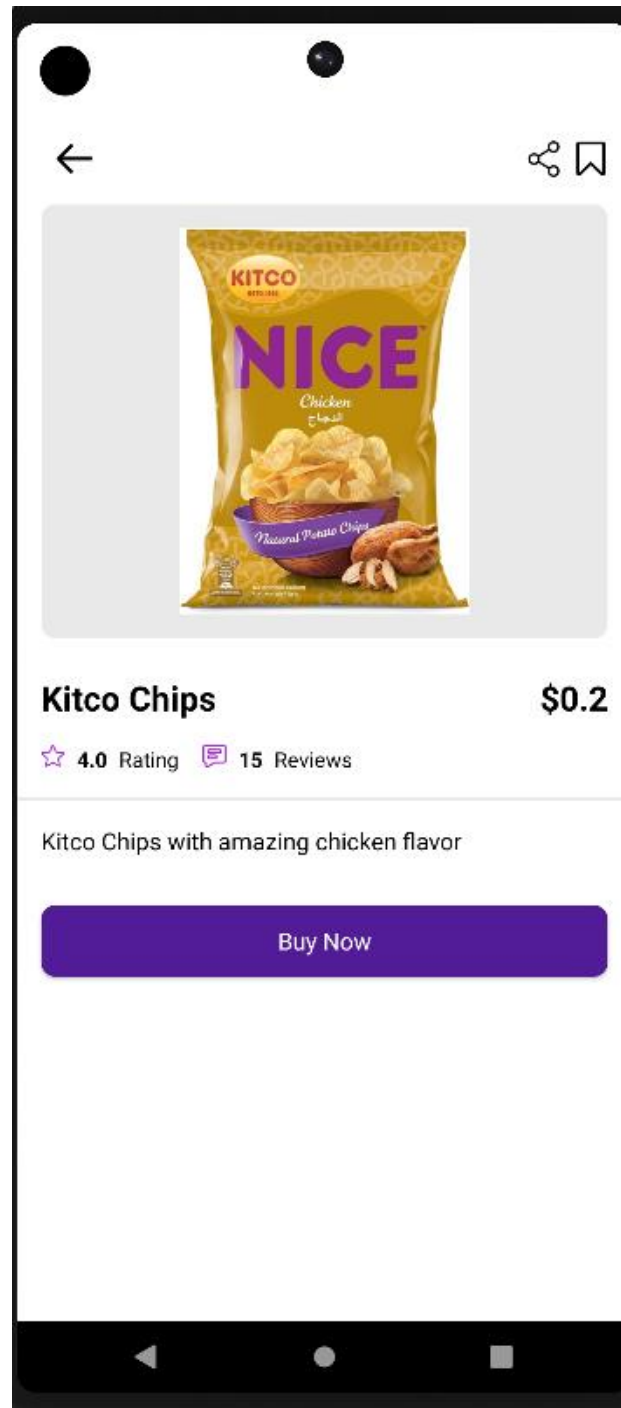


Figure 25 Screen 6: Product Description



After choosing the product you will be directed to see the product description and you will click on buy now for one time.



Figure 28 local products



Figure 27 international products



Figure 26 mixed products

In Mostawdaakom Mobile Application users have 3 categories to choose their products from; Users' 1<sup>st</sup> choice is to explore whether international products or local ones, 3<sup>rd</sup> their choice is to check all products as shown in the pictures this is the product sorting based on the users' choice, first figure shows the local products sorted by their type; also user might explore new products;



this applies to the 3 choices that user might click on, and last thing the last is that user can press on the button in the middle of footer and scan the QR code of any product to check its availability.

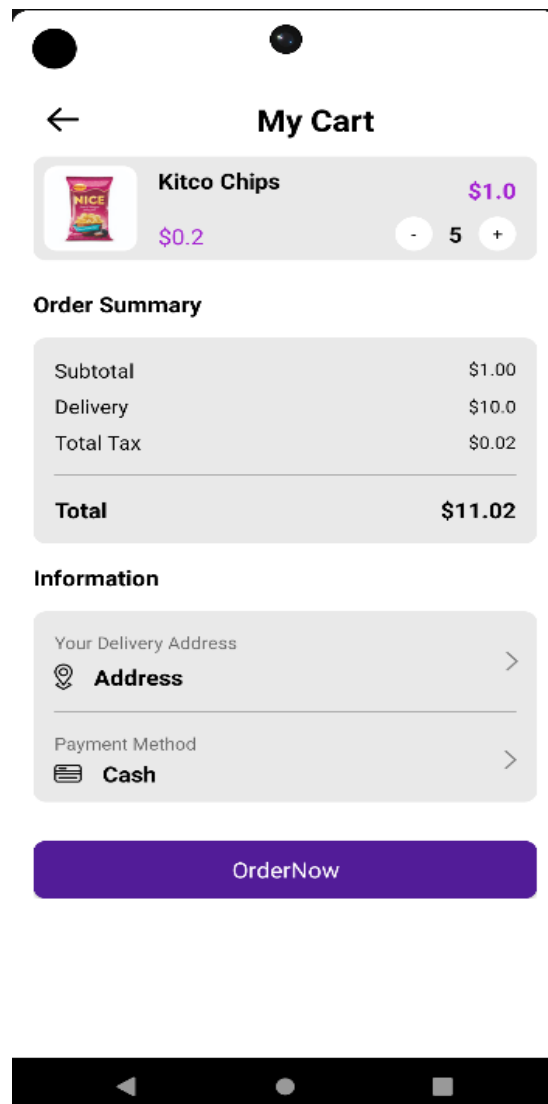
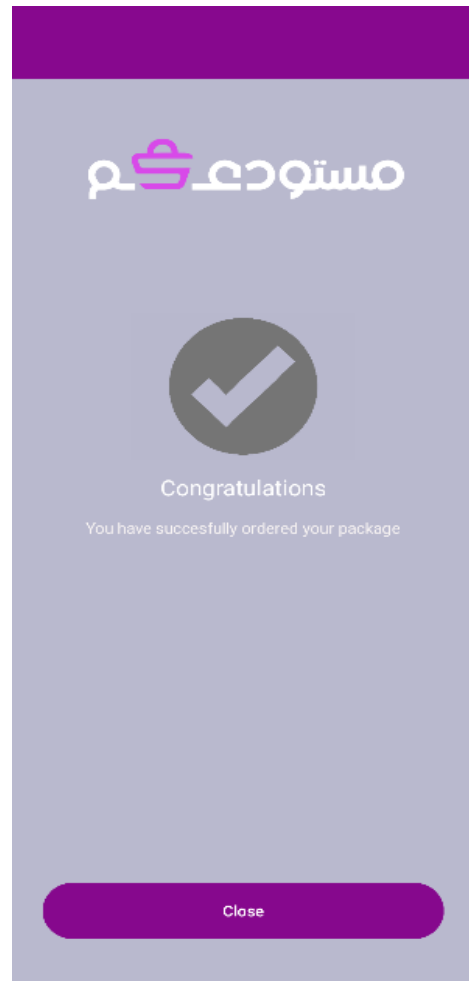


Figure 29 Screen 10: Cart Page



Once you add all the products you can check your shopping cart and add the quantity needed for each product, and by then you can check out and choose the payment method you prefer; (Cash on Delivery, Visa Card, Debit Card, and Credit Card).



*Figure 30 Screen11: Successful Order*

After coming to check out and choosing your convenient payment method, the application will mark a specific page where you will instantly see the 100% success confirmation of your package order. This guarantees that the procedure goes on with a smooth operation speed, thereby making you well-informed all through the process.



# {Chapter Six: Implementation}



## 6. Chapter six: Implementation:

### 6.1 Programming Language

Java has been chosen as the programming language for our new Mostawdaakom mobile application. Java, a language that is highly adaptable and can be used for Android development, will thus allow us to create a strong and feature-rich application. Through the utilization of Java's extensive libraries, tools, and strong community support, we can guarantee compatibility among a variety of Android devices, thus providing all Mostawdaakom users with the same experience without any difficulties. Our highly competent development team, which is experienced in Java, will develop an app that not only fits but also goes beyond your expectations. Be prepared for an awesome Mostawdaakom experience, cut and pasted with Java's features.

Selecting the optimal programming language for mobile app development involves considering several crucial factors: Selecting the optimal programming language for mobile app development involves considering several crucial factors:

1. **Platform:** Decide whether we are going to target Android, iOS, or both platforms. Some languages are device-specific, for instance, Java and Kotlin are for Android, while Swift is for iOS. Cross-platform solutions such as React Native, Flutter, and Xamarin which enable the development of applications for different platforms using one codebase are available.
2. **Developer Skills and Experience:** Evaluate the talents and the acquired skills and the level of proficiency of the members of our development team and their competence. The team's previous knowledge of the language can be an advantage to heighten the work efficiency. It is very important to consider their level of knowledge in different languages and frameworks, and also their willingness to learn new ones because it will affect their career development.
3. **Ecosystem and Community Support:** Scrutinize the impact on the ecosystem and the advantages of the community service of the programming language. A language with a well-developed ecosystem of libraries, frameworks, and tools, together with a lively community, can provide the required resources, documentation, and support, which in turn, can make it easier to solve the development problems.
4. **Long-Term Maintenance and Scalability:** Picture the lengthy servicing and the scalability of the application. The fact that language stability, forward compatibility,



community support, and the availability of the resources and developers for the maintenance and update of the platform are among the factors that are the key to determining the compatibility of the platform with something new is also proof that.

5. **User Experience and Design:** Consider the user experience and the design requirements of the application when crafting a solution. Some languages and frameworks have extensive libraries and tools that help developers create user interfaces that are not only visually pleasant but also interactive. The reason for using a language is to introduce our design objectives.

By the examination of these aspects, we are confident that Java is the best answer for the creation of Mostawdaakom, thus a strong and flexible application will be developed which will give a perfect user experience.

Reason	Description
<b>Comprehensive Toolset</b>	Android Studio possesses a rich toolset of the development for Android apps which is specifically carried out by the tool itself. Powerful code editor is coupled with layout editor, debugger, profiler, and emulator, which are all inside one IDE and serve all at once.
<b>Official IDE</b>	Google assures and provides the required personnel to maintain Android Studio which is the official Android development IDE. It guarantees that it is compatible with different Android SDK versions, APIs, and features, by the latest Android SDK Platform(s). It keeps getting feedback, to eliminate all bugs and introduce new features, hence a stable and always latest development environment.



<b>Layout Editor</b>	Android Studio offers a Layout Editor feature that one can utilize in building a UI for your app and eliminate any prop that is not needed. This package offers a superb and well-equipped UI which includes the FYSG (Very Greatly Significant) editor that enables one the create components as well as style, design of layouts, and themes.
<b>Code Editor</b>	Android Studio building block is the strong code editor that has embedded features (like code completion, syntax highlighting, refactoring, linting, etc.) This platform supports both Java and Kotlin, i.e. it lets developers opt for either of these languages for their app development purposes.
<b>Seamless Gradle Integration</b>	Android Studio compiler provides a beneficial built-in development tool with many incorporated highlights, for example just referring and code coloring, refactoring, linting, etc. This platform supports all the developers to apply either Java or Kotlin to develop the necessary app.
<b>Advanced Debugging and Profiling</b>	Android Studio comes with several useful debugging and profiling tools which are necessary to take admit when locating errors and resolving them in your applications. You can use some efficient features like debugging tools using breakpoints, visualization of variables,





	step-by-step your code, and finding bottlenecks in a snap. This profiler in the optimizer provides information on the number of each resource used by the CPU, memory, and network.
<b>Emulator and Device Support</b>	When you need to test your app, Android Studio gives you virtual devices (emulators) with various types of screens, resolutions, and Android versions, as they may vary. Furthermore, it is the way to plug in various Android devices to continue testing those being developed and to debug them directly.

*Table 16 reasons for using Android Studio*

## **6.2 Mostawdaakom's dashboard:**

Mostawdaakom dashboard is a critical tool that reflects real-time inventory updates in Amman, Jordan, a dashboard gives Mostawdaakom's retailers and suppliers a huge advantage for so many reasons, having access to real-time inventory data allows retailers and suppliers to make efficient and effective decision-making, promptly identify trends, reveal inventory inaccuracies and they can agree on the appropriate tactic to use leading to better decision-making. Through real-time updates, a business can regularly check its inventory levels and maintain them at optimal levels. Also, it could give a real-time view of stock levels and thus prevent stock-outs, minimize excess inventory, and optimize reorder points, which lead to carrying costs and cash flow improvement reduction.

In the following Mosdawdaakom dashboard, we can see a collection of visuals about the inventory. The area chart shows the total sales (5% tax) by order day observing sales patterns over time, and identifying peaks and troughs for strategic decision-making. The stacked bar chart offers a comprehensive view of total sales (5% tax) by city (specifically in Amman, Jordan) and customer type (normal or member), enabling users to analyze sales performance across different areas.

The line and clustered column chart combines orders and total sales (5% tax) by product line.



Lastly, the pie chart offers a brief overview of total sales (5% tax) distribution by payment methods.

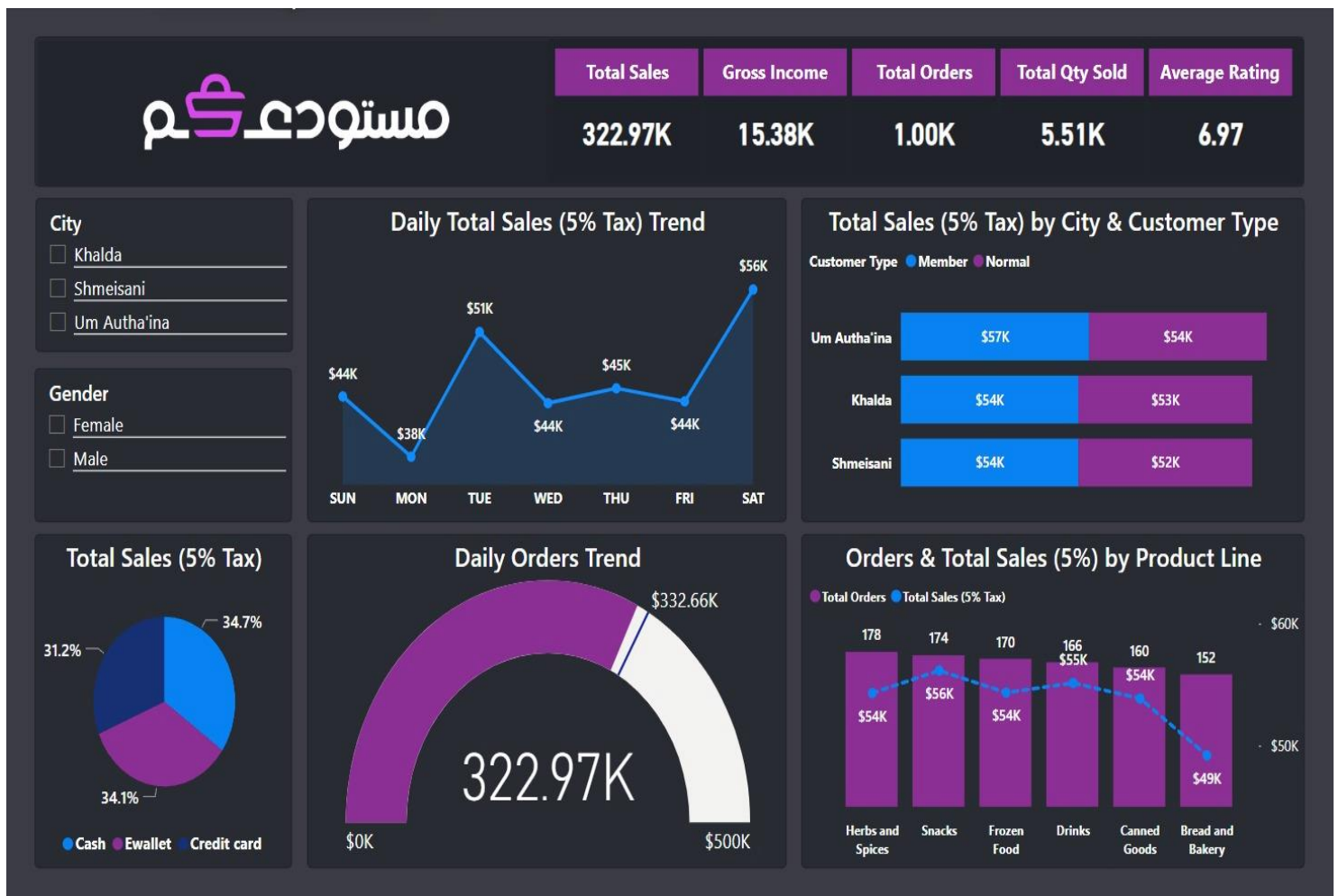


Figure 31 Mostawdaakom's dashboard

The area chart shows the trend line of total sales day by day. As we can see in the following dashboard, Saturday is the top trending day because it's a weekend, and customers tend to buy more on weekends. Moreover, the gauge chart is a visual KPI that is a textbook example of a speedometer-looking chart. It indicates the given value to a span of values to quickly find if the performance is good, bad, or needs to be considered. For our gauge visual, we used the formula  $(\text{total sales} \times 0.05) \times 1.03$  to predict our target based on our previous total sales. Normally, depending on the results the gauge should be colored green, yellow, and red for good, okay, and poor to enable you to see the information with a quick sight. But, we picked the purple color because it matches our dashboard's theme. Also, The line and clustered column chart combines the total sales of the



following categories: herbs and spices, snacks, frozen food, drinks, canned food, and bread and bakery. As we can see, the most popular category is snacks, indicated by the trend line. This information is useful for understanding demand and stocking more of what is popular to avoid stockouts and shortages. Furthermore, The stacked bar chart displays the total sales in each area, categorized by customer type. Members are regular customers, while normal customers are new or infrequent shoppers. This information helps with inventory distribution by highlighting which areas have more consistent demand from regular customers. Lastly, the pie chart illustrates the most preferred payment methods among customers, providing insights into their preferred ways to pay.

## Our dashboard's data set and datasheet:

Invoice ID	Branch	City	Customer Type	Gender	Product Line	Unit Price	Quantity	Tax 5%	Total Sales (5%)	Date	Time	Payment	Gross Income	Rating	Day Name	Day Number	Order Day	Sales Target
123-19-1176	A	Khalda	Member	Male	Bread and Bakery	\$58.22	8	\$23.288	\$489.048	Sunday, January 27, 2019	8:33:00 PM	Ewallet	\$23.288	8.4	Sunday	1	SUN	\$503.72
373-73-7910	A	Khalda	Normal	Male	Drinks	\$86.31	7	\$30.2085	\$634.3785	Friday, February 8, 2019	10:37:00 AM	Ewallet	\$30.2085	5.3	Friday	6	FRI	\$653.41
252-56-2699	A	Khalda	Normal	Male	Snacks	\$43.19	10	\$21.595	\$453.495	Thursday, February 7, 2019	4:48:00 PM	Ewallet	\$21.595	8.2	Thursday	5	THU	\$467.10
636-48-8204	A	Khalda	Normal	Male	Frozen Food	\$34.56	5	\$8.64	\$181.44	Sunday, February 17, 2019	11:15:00 AM	Ewallet	\$8.64	9.9	Sunday	1	SUN	\$186.88
549-59-1358	A	Khalda	Member	Male	Drinks	\$88.63	3	\$13.2945	\$279.1845	Saturday, March 2, 2019	5:36:00 PM	Ewallet	\$13.2945	6	Saturday	7	SAT	\$287.56
129-29-8530	A	Khalda	Member	Male	Drinks	\$62.62	5	\$15.655	\$328.755	Sunday, March 10, 2019	7:15:00 PM	Ewallet	\$15.655	7	Sunday	1	SUN	\$338.62
635-40-6220	A	Khalda	Normal	Male	Bread and Bakery	\$88.6	8	\$35.84	\$752.64	Thursday, February 7, 2019	11:28:00 AM	Ewallet	\$35.84	6.6	Thursday	5	THU	\$775.22
287-21-9091	A	Khalda	Normal	Male	Canned Goods	\$74.67	9	\$33.6015	\$705.6315	Tuesday, January 22, 2019	10:55:00 AM	Ewallet	\$33.6015	9.4	Tuesday	3	TUE	\$726.80
594-34-4444	A	Khalda	Normal	Male	Frozen Food	\$97.16	1	\$4.858	\$102.018	Friday, March 8, 2019	8:38:00 PM	Ewallet	\$4.858	7.2	Friday	6	FRI	\$105.08
865-92-6136	A	Khalda	Normal	Male	Snacks	\$52.75	3	\$7.9125	\$166.1625	Saturday, March 23, 2019	10:16:00 AM	Ewallet	\$7.9125	9.3	Saturday	7	SAT	\$171.15
704-48-3927	A	Khalda	Member	Male	Frozen Food	\$88.67	10	\$44.335	\$931.035	Saturday, January 12, 2019	2:50:00 PM	Ewallet	\$44.335	7.3	Saturday	7	SAT	\$958.97
645-44-1170	A	Khalda	Member	Male	Canned Goods	\$58.07	9	\$26.1315	\$548.7615	Saturday, January 19, 2019	8:07:00 PM	Ewallet	\$26.1315	4.3	Saturday	7	SAT	\$565.22
575-30-8091	A	Khalda	Normal	Male	Drinks	\$72.5	8	\$29	\$609	Saturday, March 16, 2019	7:25:00 PM	Ewallet	\$29	9.2	Saturday	7	SAT	\$627.27
249-42-3782	A	Khalda	Normal	Male	Bread and Bakery	\$70.01	5	\$17.5025	\$367.5525	Thursday, January 3, 2019	11:36:00 AM	Ewallet	\$17.5025	5.5	Thursday	5	THU	\$378.58
827-26-2100	A	Khalda	Member	Male	Canned Goods	\$33.84	9	\$15.228	\$319.788	Thursday, March 21, 2019	4:21:00 PM	Ewallet	\$15.228	8.8	Thursday	5	THU	\$329.38
407-63-8975	A	Khalda	Normal	Male	Snacks	\$73.88	6	\$22.164	\$465.444	Saturday, March 23, 2019	7:16:00 PM	Ewallet	\$22.164	4.4	Saturday	7	SAT	\$479.41
851-28-6367	A	Khalda	Member	Male	Drinks	\$15.5	10	\$7.75	\$162.75	Saturday, March 23, 2019	10:55:00 AM	Ewallet	\$7.75	8	Saturday	7	SAT	\$167.63
400-60-7251	A	Khalda	Normal	Male	Canned Goods	\$74.07	1	\$3.7035	\$77.7735	Sunday, February 10, 2019	12:50:00 PM	Ewallet	\$3.7035	9.9	Sunday	1	SUN	\$80.11
888-02-0338	A	Khalda	Normal	Male	Frozen Food	\$26.23	9	\$11.8035	\$247.8735	Friday, January 25, 2019	8:24:00 PM	Ewallet	\$11.8035	5.9	Friday	6	FRI	\$255.31
157-13-5295	A	Khalda	Member	Male	Bread and Bakery	\$51.94	10	\$25.97	\$545.37	Saturday, March 9, 2019	6:24:00 PM	Ewallet	\$25.97	6.5	Saturday	7	SAT	\$561.73
478-06-7835	A	Khalda	Normal	Male	Herbs and Spices	\$89.69	1	\$4.4845	\$94.1745	Friday, January 11, 2019	11:20:00 AM	Ewallet	\$4.4845	4.9	Friday	6	FRI	\$97.00
604-70-6476	A	Khalda	Member	Male	Herbs and Spices	\$17.94	5	\$4.485	\$94.185	Wednesday, January 23, 2019	2:04:00 PM	Ewallet	\$4.485	6.8	Wednesday	4	WED	\$97.01
729-09-9681	A	Khalda	Member	Male	Canned Goods	\$25.91	6	\$7.773	\$163.233	Tuesday, February 5, 2019	10:16:00 AM	Ewallet	\$7.773	8.7	Tuesday	3	TUE	\$168.13
151-16-1484	A	Khalda	Member	Male	Frozen Food	\$32.25	4	\$6.45	\$135.45	Wednesday, February 13, 2019	12:38:00 PM	Ewallet	\$6.45	6.5	Wednesday	4	WED	\$139.51
667-92-0055	A	Khalda	Member	Male	Bread and Bakery	\$99.83	6	\$29.949	\$628.929	Monday, March 4, 2019	3:02:00 PM	Ewallet	\$29.949	8.5	Monday	2	MON	\$647.80
744-02-5987	A	Khalda	Member	Male	Canned Goods	\$78.38	6	\$23.514	\$493.794	Thursday, January 10, 2019	2:16:00 PM	Ewallet	\$23.514	5.8	Thursday	5	THU	\$508.61
411-77-0180	A	Khalda	Member	Male	Frozen Food	\$72.2	7	\$25.27	\$530.67	Tuesday, March 26, 2019	8:14:00 PM	Ewallet	\$25.27	4.3	Tuesday	3	TUE	\$546.59
372-94-8041	A	Khalda	Normal	Male	Bread and Bakery	\$15.26	6	\$4.578	\$96.138	Friday, February 15, 2019	6:03:00 PM	Ewallet	\$4.578	9.8	Friday	6	FRI	\$99.02
898-04-2717	A	Khalda	Normal	Male	Herbs and Spices	\$76.4	9	\$34.38	\$721.98	Tuesday, March 19, 2019	3:49:00 PM	Ewallet	\$34.38	7.5	Tuesday	3	TUE	\$743.64
563-36-9814	A	Khalda	Member	Male	Frozen Food	\$76.82	1	\$3.841	\$80.661	Wednesday, February 13, 2019	6:27:00 PM	Ewallet	\$3.841	7.2	Wednesday	4	WED	\$83.08
996-90-2548	A	Khalda	Normal	Male	Drinks	\$25.84	3	\$3.876	\$81.396	Sunday, March 10, 2019	6:55:00 PM	Ewallet	\$3.876	6.6	Sunday	1	SUN	\$83.84
472-15-9636	A	Khalda	Normal	Male	Canned Goods	\$50.93	8	\$20.372	\$427.812	Friday, March 22, 2019	7:36:00 PM	Ewallet	\$20.372	9.2	Friday	6	FRI	\$440.65
568-88-3448	A	Khalda	Normal	Male	Bread and Bakery	\$25	1	\$1.25	\$26.25	Sunday, March 3, 2019	3:09:00 PM	Ewallet	\$1.25	5.5	Sunday	1	SUN	\$27.04
575-67-1508	A	Khalda	Normal	Male	Frozen Food	\$38.6	1	\$1.93	\$40.53	Tuesday, January 29, 2019	11:26:00 AM	Ewallet	\$1.93	6.7	Tuesday	3	TUE	\$41.75
674-15-9296	A	Khalda	Normal	Male	Drinks	\$37.14	5	\$9.285	\$194.985	Tuesday, January 8, 2019	1:05:00 PM	Ewallet	\$9.285	5	Tuesday	3	TUE	\$200.83
795-49-7276	A	Khalda	Normal	Male	Herbs and Spices	\$37.15	4	\$7.43	\$156.03	Saturday, March 23, 2019	6:59:00 PM	Ewallet	\$7.43	8.3	Saturday	7	SAT	\$160.71
726-29-6793	A	Khalda	Member	Male	Frozen Food	\$24.18	8	\$9.672	\$203.112	Monday, January 28, 2019	8:54:00 PM	Ewallet	\$9.672	9.8	Monday	2	MON	\$209.21
220-28-1851	A	Khalda	Normal	Male	Canned Goods	\$34.73	2	\$3.473	\$72.933	Friday, March 1, 2019	6:14:00 PM	Ewallet	\$3.473	9.7	Friday	6	FRI	\$75.12

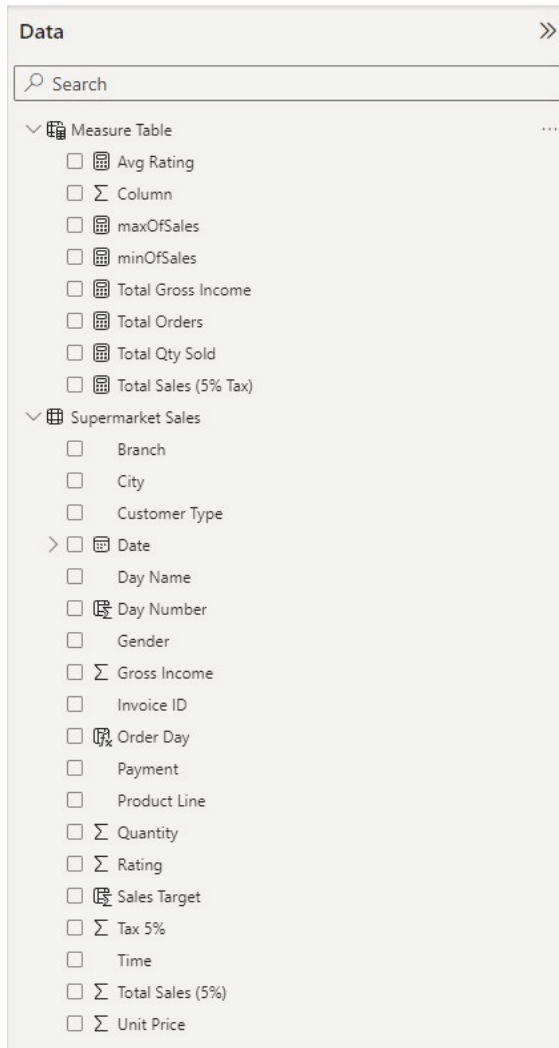
Table: Supermarket Sales (1,000 rows)

Figure 32 Our data set

The data presented in the figure is by Mostawdaakom's BI Dashboard. This data has been cleaned before including only the important column for the data visualization used in dashboard visuals. After the process of data management, these duplicates and missing entries have been removed



from the dataset. With data ready, we now move to design clear and effective visuals to guide our analysis from here on out.



This figure provides an overview of both the "Measure Table" and "Supermarket Sales" sheets.

We've created the Measure Table to incorporate the formulas that are essential for our dashboard, aligning them with the data from the "Supermarket Sales" sheet.

This ensures that our dashboard functions effectively by deriving insights from the sales data.

*Figure 33 Our dashboard's datasheet*

### 6.3 Coded Screens:

The XML Code for the Screens are as shown below:

#### 6.3.1 Splash Screen



Figure 34 splash screen

```
<?xml version="1.0" encoding="utf-8"?>  
  
<androidx.constraintlayout.widget.ConstraintLayout  
xmlns:android="http://schemas.android.com/apk/res/android"  
  
xmlns:app="http://schemas.android.com/apk/res-auto"
```



```
xmlns:tools="http://schemas.android.com/tools"

android:layout_width="match_parent"

android:layout_height="match_parent"

tools:context=".Activity.splashScreen">

<VideoView

    android:id="@+id/videoView2"

    android:layout_width="0dp"

    android:layout_height="0dp"

    app:layout_constraintBottom_toBottomOf="parent"

    app:layout_constraintEnd_toEndOf="parent"

    app:layout_constraintHorizontal_bias="0.0"

    app:layout_constraintStart_toStartOf="parent"

    app:layout_constraintTop_toTopOf="parent"

    app:layout_constraintVertical_bias="1.0" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

### 6.3.2 Sign-in Page



Figure 35 sign-in

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".Activity.login3">
    <androidx.constraintlayout.widget.ConstraintLayout
```



```
android:layout_width="421dp"
android:layout_height="914dp"
android:background="#B9B9CE"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="1.0"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.6">
```

### 6.3.3 Sign-Up Page



Figure 36 sign-up

```
<?xml version="1.0" encoding="utf-8"?>
```





```
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#C81919"
    android:backgroundTint="#F0EAF1"
    android:backgroundTintMode="add"
    tools:context=".Activity.RetailerActivity">
<androidx.constraintlayout.widget.ConstraintLayout
    android:layout_width="411dp"
    android:layout_height="920dp"
    android:background="#B9B9CE"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.0"
    app:layout_constraintStart_toStartOf="parent">
```



### 6.3.4 User Type

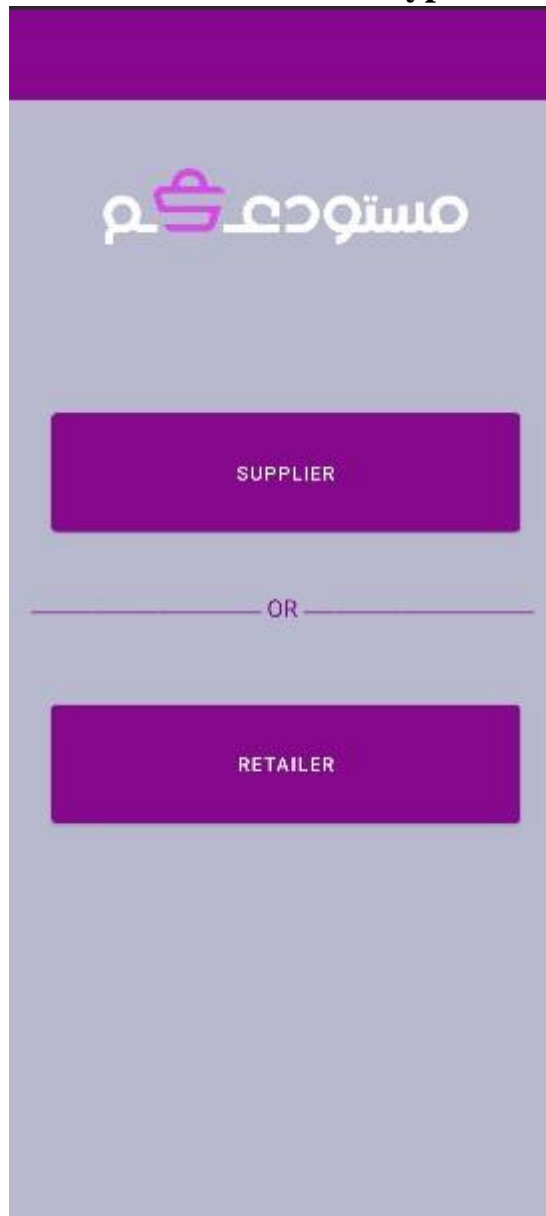


Figure 37 user type

```
<?xml version="1.0" encoding="utf-8"?>
```

```
<androidx.constraintlayout.widget.ConstraintLayout  
xmlns:android="http://schemas.android.com/apk/res/android"
```



```
xmlns:app="http://schemas.android.com/apk/res-auto"  
xmlns:tools="http://schemas.android.com/tools"  
android:layout_width="match_parent"  
android:layout_height="match_parent"  
android:background="#27F6EAEA"  
tools:context=".MainActivity">
```

```
<androidx.constraintlayout.widget.ConstraintLayout  
    android:layout_width="414dp"  
    android:layout_height="916dp"  
    android:background="#B9B9CE"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.0"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toTopOf="parent">
```



### 6.3.5 Adding Store name

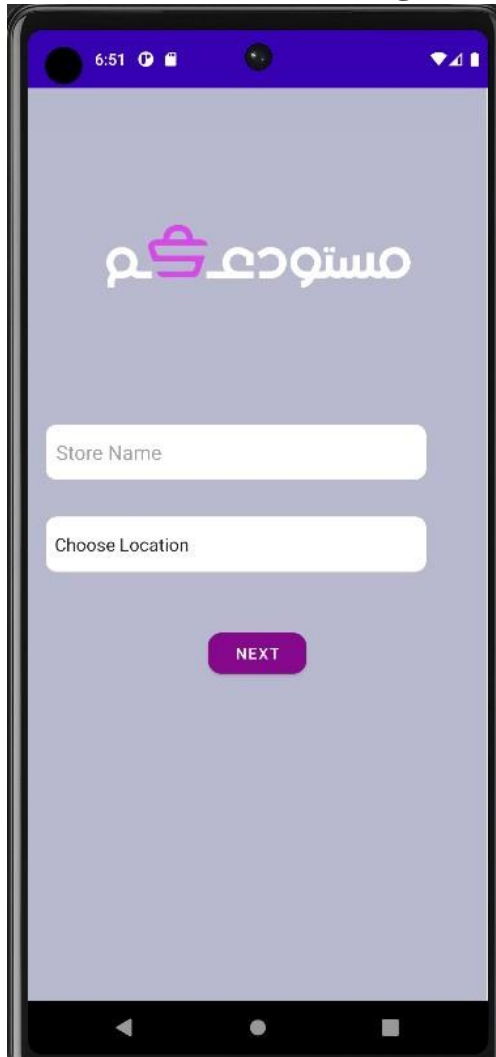


Figure 38 adding store name and location

```
<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout  
xmlns:android="http://schemas.android.com/apk/res/android"  
    xmlns:app="http://schemas.android.com/apk/res-auto"  
    xmlns:tools="http://schemas.android.com/tools"  
    android:layout_width="match_parent"
```



```
android:layout_height="match_parent"
tools:context=".StoreLocation">
<androidx.constraintlayout.widget.ConstraintLayout
    android:id="@+id/constraintLayout5"
    android:layout_width="410dp"
    android:layout_height="917dp"
    android:background="#B9B9CE"
    android:backgroundTint="#B9B9CE"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.0"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.333">
```

### 6.3.6 Home Page

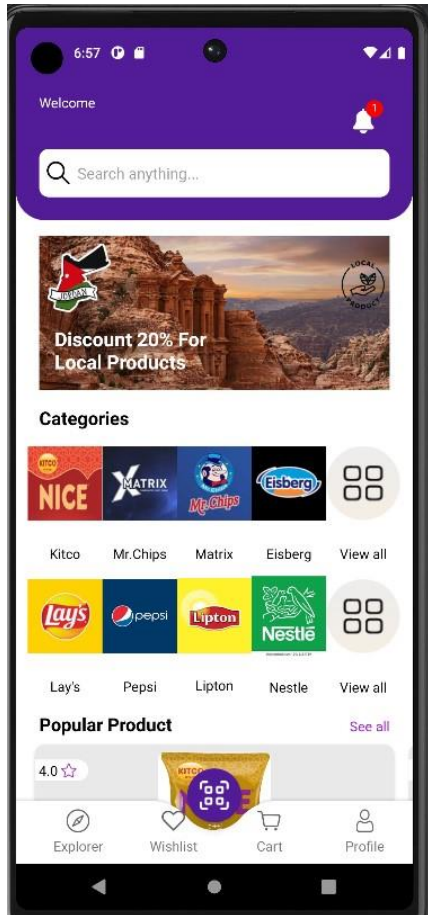


Figure 39 home page

```
<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:onClick="btn"
    tools:context=".Activity.MainActivity">
    <ScrollView
```

```

android:id="@+id/scrollView2"
android:layout_width="match_parent"
android:layout_height="match_parent"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent">

```

### 6.3.7 Local Products Page



Figure 40 local products

```
<?xml version="1.0" encoding="utf-8"?>
```



```
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"

    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:onClick="kitcoLocal1"
    tools:context=".Activity.viewLocal">
<ScrollView
    android:id="@+id/scrollView2"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent">
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:paddingBottom="30dp">
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:background="@drawable/top_background"
    android:orientation="vertical">
```



### 6.3.8 International Products Page



Figure 41 international products

```
<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
        xmlns:app="http://schemas.android.com/apk/res-auto"
        xmlns:tools="http://schemas.android.com/tools"
        android:layout_width="match_parent"
```



```
android:layout_height="match_parent"
tools:context=".Activity.viewGlobal">
<ScrollView
    android:id="@+id/scrollView2"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        android:paddingBottom="30dp">
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:background="@drawable/top_background"
            android:orientation="vertical">
```

### 6.3.9 Local and International Products Page



Figure 42 local and international products

```
<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"

    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".Activity.seeAllProducts">

    <ScrollView

        android:id="@+id/scrollView2"
```



```
android:layout_width="match_parent"
android:layout_height="match_parent"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent">
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:paddingBottom="30dp">
```

### 6.3.10 Eisberg page

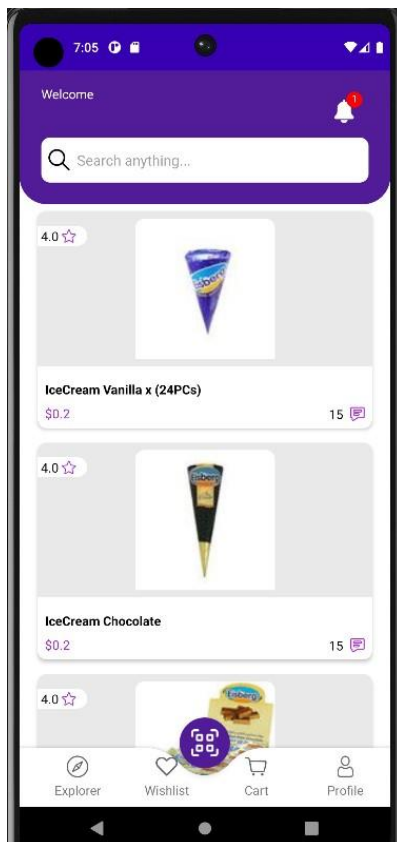


Figure 43 eisberg page



```
<?xml version="1.0" encoding="utf-8"?>  
  
<androidx.constraintlayout.widget.ConstraintLayout  
xmlns:android="http://schemas.android.com/apk/res/android"  
    xmlns:app="http://schemas.android.com/apk/res-auto"  
    xmlns:tools="http://schemas.android.com/tools"  
    android:layout_width="match_parent"  
    android:layout_height="match_parent"  
    tools:context=".Activity.eisberg">
```

```
<androidx.constraintlayout.widget.ConstraintLayout  
    android:layout_width="match_parent"  
    android:layout_height="match_parent"  
    tools:context=".Activity.MainActivity">  
    <ScrollView  
        android:id="@+id/scrollView2"  
        android:layout_width="match_parent"  
        android:layout_height="match_parent"  
        app:layout_constraintBottom_toBottomOf="parent"  
        app:layout_constraintEnd_toEndOf="parent"  
        app:layout_constraintStart_toStartOf="parent"  
        app:layout_constraintTop_toTopOf="parent">  
        <LinearLayout  
            android:layout_width="match_parent"  
            android:layout_height="wrap_content"  
            android:orientation="vertical"  
            android:paddingBottom="30dp">
```

### 6.3.11 Product Review Page

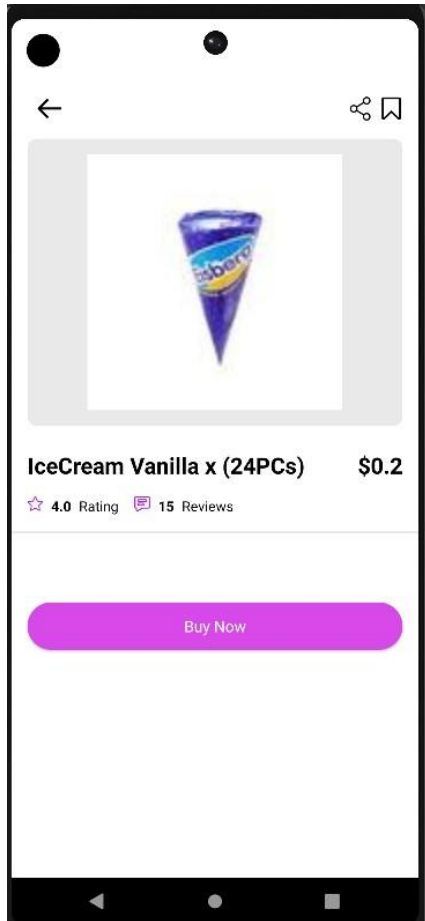


Figure 44 product review

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".Activity.DetailActivity">
    <ScrollView
```



```
android:layout_width="match_parent"  
android:layout_height="match_parent">
```

```
<LinearLayout
```

```
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:orientation="vertical">
```

```
<androidx.constraintlayout.widget.ConstraintLayout
```

```
    android:layout_width="match_parent"  
    android:layout_height="match_parent">
```

```
<ImageView
```

```
    android:id="@+id/backBtn"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_marginStart="16dp"  
    android:layout_marginTop="16dp"  
    android:padding="8dp"  
    android:src="@drawable/arrow"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toTopOf="parent" />
```



### 6.3.12 Cart Page

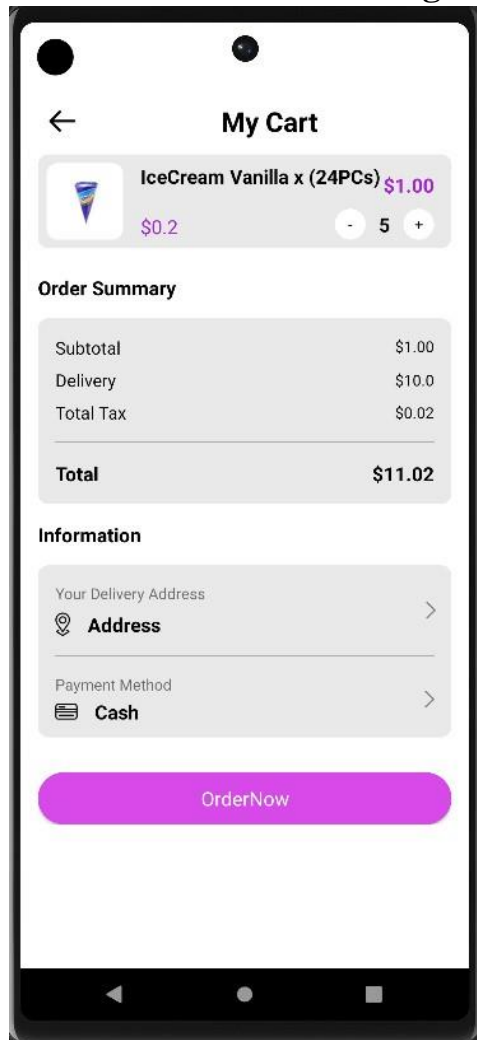


Figure 45 Cart page

```
<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
        xmlns:app="http://schemas.android.com/apk/res-auto"
        xmlns:tools="http://schemas.android.com/tools"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:context=".Activity.CartActivity">
    <TextView
```





```
    android:id="@+id/emptyTxt"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Your Cart Is empty"
    android:visibility="gone"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
<ScrollView
    android:id="@+id/scroll"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        android:padding="16dp">
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="horizontal">
            <ImageView
                android:id="@+id/backBtn"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:padding="8dp"
                app:srcCompat="@drawable/arrow" />
```

### 6.3.13 Order Status

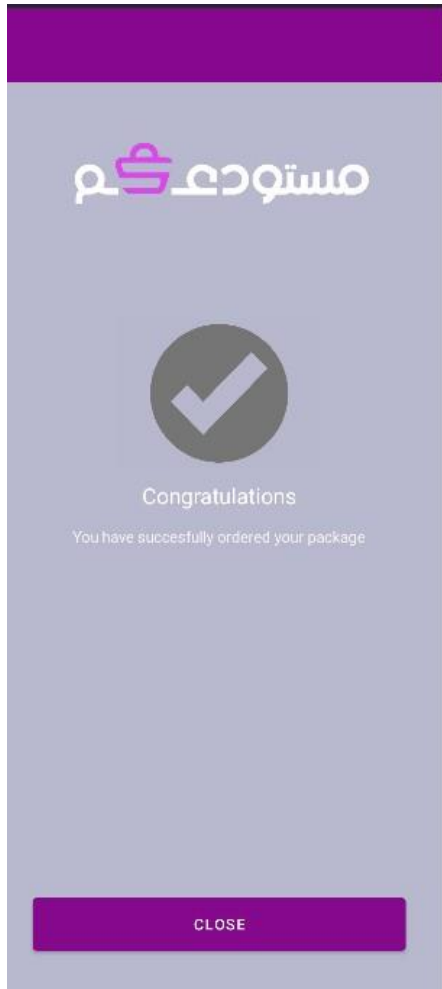


Figure 46 Order status

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".SuccessfulOrder">
<androidx.constraintlayout.widget.ConstraintLayout
```



```
android:layout_width="421dp"
android:layout_height="914dp"
android:background="#B9B9CE"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="1.0"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.6">
<Button
    android:id="@+id/button"
    android:layout_width="345dp"
    android:layout_height="60dp"
    android:layout_marginBottom="40dp"
    android:backgroundTint="#86088D"
    android:text="Close"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/textView6"
    app:layout_constraintVertical_bias="0.866" />
```

## 6.4 CyberSecurity and Threats

Cybersecurity is a key point to be reckoned with in the execution and operation of all mobile applications, including Mostawdaakom, our revolutionary tool that increases the efficiency of communication between suppliers and supermarkets/hypermarkets. While Mostawdaakom aims not only to increase real-time feedback during order placement and other operations but also to



disseminate information on market trends, we will also need to take into account cybersecurity practices and their education mechanism.

The users of Mostawdaakom will most likely be asked to share confidential data: business details, contact information, and financial data. The security of this data from unauthorized access or accessing attempts has to be on our priority list. To achieve this, we must employ encryption protocols that are robust and can be authenticated securely to give access only to authorized individuals. Regular in-depth security audits will be carried out alongside vulnerability testing to pinpoint areas in need of improvement.

Phishing types of attacks, users of Mostawdaakom may face considerable risk. Scammers can try to make imitation log-in pages or send fake emails that seem to be from Mostawdaakom to persuade the users to provide them with their passwords and other personal data. To overcome such an issue, we will have an educational program for users about the lure of the authenticity of emails, messages, and links before you provide such information. We will set up the email authentication standard letters such as SPF, DKIM, and DMARC to discard email spoofs.

Since Mostawdaakom not only creates connections between retailers and their suppliers but also as a platform makes transactions possible, users need to be mindful of the emergence of such possible scams. Users should be very careful about sharing tons of personal details and credentials with their new friends after conducting due diligence when they are looking out for new acquaintances. The 'Mostawdaakom' app will extend its capabilities by introducing mechanisms that identify and prevent fraud as well as any other type of malpractice, paving the way to a safe space for everyone with the use of technology.

Involving application developers in ensuring that apps are not vulnerable to malware attacks offers an effective avenue for finding answers to application security concerns.

The mobile app security is paramount to avoid the appalling and the son of a bitch software from lurking on the device. This should be done by encouraging customers to install a reliable security software development kit, update their operating systems, and ensure the most up-to-date security patches for the application. Plenty Nimbus will in return to such regular patches and updates that will include addressing vulnerabilities facing issues and new security menaces.



Coming up with passcodes strong and unique and investing in 2FA are vital factors to consider for the sake of the security of the account. Mostawdaakom will establish rigorous password rules and train users with tips on ways to manage digital passwords. By giving and promoting 2FA we have a chance to add one more security layer, it provides a serious issue to unwelcome users in their accounts because of the complexity of accessibility.

We will provide safety information and publications on the best practices concerning the susceptibility on our website. In addition, we will build a platform for reporting potential vulnerabilities. By way of raising public consciousness, users will have the ability to make informed decisions and to take relevant safety to mitigate risks related to online communication.

It is an essential means of achieving that whereby the measures for thwarting cyber threats and prioritizing user data will be given a strong footing. Developing robust security features and providing users with relevant security education will help build a robust, safe, and trustworthy platform where participants will be able to conveniently keep abreast of the market trends while maintaining their stock grid.

## **6.5 Screen Testing**

During a session of testing the veers off the Mostawdaakom (an application aimed at improving communication exchange between suppliers and supermarkets/hypermarkets), ten people responded to our feedback request. Conclusions demonstrated the large majority of respondents loved the product and pointed out the application's screens which they found outstanding for their friendly interface, adjustability, and user-friendliness.

Meanwhile, it is undoubtedly that Mostawdaakom was very clear in design and screens showed very explicitly the features and functionalities of the product through which the user interacts. Users have highly commended the app's practical structure as it was easy to navigate and thus got the information quickly. Consumers were able to see the information on the screens which was presented in a definite and concise manner. This helped them to understand features and make the right choices fast.

Testers were delighted not only with how easy the screens were to use but also with the fact that they could be used in different environments. The optional functions that helped them to



personalize their profile, adjust the site settings as they pleased, and tailor the search for suppliers and products had a great impact on them. With screens, users had a tool to exercise control and power artificially. This effect made them both able to perform the commands individually and enjoy something exactly tailored to their interests and needs.

In addition to that, the testers appreciated the ease of use of the website in the context of connecting to other lingual websites through the use of referral links and a comprehensible presentation of results in the form of graphs. This was made possible by the screens that were appealing optically and their icons that were intuitive, as well as the menus that were quite organized and led the user through the system in an orderly manner. This template set the UI thus, boosting the general feel and the curiosity among the product testers to adopt it frequently.

The fact that these ten people have been taking part in the Mostawdaakom comprehension testing process adds to the proof of the latter's immeasurable user-friendliness. The clear design and comfort of the screens amazed the testers, and they finally understood that Mostawdaakom will germinate in the future as it aims to develop the communication process between suppliers and hypermarkets/ supermarkets and as well facilitate orders and real market trends.



# **{Chapter Seven: limitations and future work}**



## **7. Chapter Seven: limitations and future work:**

### **7.1 Limitations:**

Our current research-based project has simplified the inventory management process for both retailers and suppliers. However, the proposed mobile application faces integration challenges, to convincing retailers and suppliers to adopt Mostawdaakom and integrate it into their daily operations may be challenging, especially if they are used to the traditional ways of managing inventory.

Additionally, the effectiveness of the application may be influenced by factors like the availability of internet connection and smartphone accessibility. Also, our proposed application may encounter some limitations in handling a huge amount of data due to the need to integrate a great number of databases to provide as many demanded products as possible.

Furthermore, Mostawdaakom competes with other players in this field, which have developed systems offering similar or different inventory management and order placement options. As several top competitors operate and have a commanding influence in the market, the key is to find ways of penetrating through these competitive forces and differentiating Mostawdaakom, before we try to get a good portion of the market share. This can be achieved by strategically positioning and communicating value propositions to potential users.

Customized and multi-purposed solutions are central in Mostawdaakom to support positive, unique interactions among retailers as well as suppliers, on the one hand, and the retail industry as a whole, on the other. Enabling the software to be highly customizable while having scalability and usability running effectively is the extraordinary difficulty of our situation. Finding an appropriate equilibrium between standardization and customization is an important task, as Mostawdaakom plans to create an interface that is optimized to cater to the specific needs of every user without sacrificing the robustness and functionality of the project. The solution to this challenge should include the concept of spacious architecture and the provision of options clearly to enable the varying models of businesses and workflows to match the needs of numerous users. This will ultimately ease the process of adapting the platform successfully.





## 7.2 Proposed solution:

Nothing in life comes without its challenges. As mostawdaakom comes to life, it has and will face different challenges at different stages. Table 17 lists the challenges mostawdaakom has and will overcome in the future.

Limitations	Proposed solutions
1. Integration challenges like convincing retailers and suppliers to adopt Mostawdaakom and integrate it into their daily operations.	Create a learning culture of change and innovation within organizations by delivering training courses and workshops to users on relevant awareness, communication, and engagement methods to allow them to adapt with ease and make a seamless transition into computerization.
2. The effectiveness of the application may be influenced by factors like the availability of internet connection and smartphone accessibility.	Build a scalable and modular architecture for Mostawdaakom that can accommodate growth, expansion, and adjustment to business needs in the future.
3. Limitations in handling a huge amount of data due to the need to integrate a great number of databases to provide as many demanded products as possible.	Use standardized data formats, protocols, and APIs for providing seamless data exchange, transformation, and synchronization with the Mostawdaakom and with the external systems.
4. Competitors developing systems offering similar or different inventory management and order placement options.	Position Mostawdaakom as a value-driven solution with exclusive benefits, features, and capabilities against its competitors.
5. Enabling the software to be highly customizable while having scalability and usability running effectively.	Design Mostawdaakom to be a configurable and extendable platform that permits users to custom-make workflows, user interfaces, and business rules to their particular needs and preferences.

Table 17 Limitations and proposed solution



### **7.3Future work:**

In the future, Mostawdaakom plans to grow in several ways by expanding operations and opportunities. As a first step, we are building a complete website in addition to the mobile app, where users can be transferred in a seamless multichannel model, which will enable them more convenience.

Additionally, we are in the process of developing a warehouse that will enable us to improve the management of the stores besides putting into consideration proper storing and distribution of the items.

Moreover, we want to expand our user base by including libraries and pharmacies in our services. Such means enable us to go beyond suppliers and retailers to reach a wider industrial and consumer-based market.

In addition to that, in the future we aim to deploy Mostawdaakom on both IOS and Android, using Firebase as the backend and Flutter as the front end.

Furthermore, we're seeking to integrate our proposed mobile application with GoCanvas, a centralized order management system that helps with better inventory management.

Finally, we aim to release the Pro version of our app, which is Mostawdaakom Pro, equipped with more advanced features and facilities for a residual need of the users. With these programs being firmly part of our innovation strategy, we strive to generate new ideas, improve the customer experience, and finally cement Mostawdaakom as the best retail and stock control system out there.



# {Conclusion}



## **8. Conclusion:**

Mostawdaakom will be an application that facilitates communication between retailers and suppliers and provides a real-time market study to update retailers with the market trends and the most demanded products. Many parties will benefit from Mostawdaakom including retailers, suppliers, supermarket customers, and Jordanian local companies. Mostawdaakom not only will make the inventory process much easier, faster, and more efficient but also will encourage retailers to sell local products which will enhance self-reliance and reduce the need for imports from abroad.

Mostawdaakom is a B2B application that will support both Android and IOS, that was proposed to offer a unique range of innovative and tailored supply chain and logistics services.

Mostawdaakom is the key for suppliers and retailers to work in a better, more efficient, and more effective way. Providing a real-time update and easy-to-understand dashboard this serves retailers and suppliers a business that has the right amount of stocks, saves time, saves money, reduces loss, and provides a faster and more efficient service to the retail customers.

Overall, Mostawdaakom makes the inventory management process smoother and more successful for everyone involved.



# {References}



## 9. References:

- Karandin, M. (2023, November 30). The Future of Retail: Technology Trends transforming the shopping experience. N. <https://www.n-ix.com/retail-technology-trends/>
- M. A. Mokar, S. O. Fageeri and S. E. Fattoh, "Using Firebase Cloud Messaging to Control Mobile Applications," 2019 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE), Khartoum, Sudan, 2019
- Tyagi P. Pragmatic Flutter: Building Cross-Platform Mobile Apps for Android, iOS, Web, & Desktop. 1st ed. Boca Raton: CRC Press; 13 August 2021.
- Mamoun R, Nasor M, Abulikailik SH. Design and Development of Mobile Healthcare Application Prototype Using Flutter. 2020 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE) 2021 Feb (pp. 1-6). IEEE.
- Doi:10.1109/ICCCEEE49695.2021.9429595. Ghimire, D. (2020). Comparative study on Python web frameworks: Flask and Django.
- Saundariya, K., Abirami, M., Senthil, K. R., Prabakaran, D., Srimathi, B., & Nagarajan, G. (2021, May). Webapp service for booking handyman using MongoDB, express JS, React JS, node JS. In 2021 3rd International Conference on Signal Processing and Communication (ICPSC) (pp. 180-183). IEEE
- Author links (2019, November 25). Integrated product development process and Green Supply Chain Management: Contributions, limitations, and applications. Journal of Cleaner Production. <https://www.sciencedirect.com/science/article/abs/pii/S0959652619342994#preview-section-introduction>



- (PDF) Big data: Challenges and solutions. (n.d.-b).  
[https://www.researchgate.net/publication/321488240\\_Big\\_Data\\_Challenges\\_and\\_Solutions](https://www.researchgate.net/publication/321488240_Big_Data_Challenges_and_Solutions)
- Author links (2016, March 28). The effect of mobile retailing on consumers' purchasing experiences: A dynamic perspective. Computers in Human Behavior.  
<https://www.sciencedirect.com/science/article/pii/S0747563216302448>
- Gillis, A. S. (2019, June 21). What is the systems development life cycle? - definition from whatis.com. SearchSoftwareQuality. Retrieved November 23, 2022, from  
<https://www.techtarget.com/searchsoftwarequality/definition/systems-development-lifecycle>
- Mindmill. (2020). Flutter in Action. Google Books. Retrieved January 14, 2024, from  
[https://books.google.com/books/about/Flutter\\_in\\_Action.html?id=EzgzEAAAQBAJ](https://books.google.com/books/about/Flutter_in_Action.html?id=EzgzEAAAQBAJ)
- Moroney, L. (2017, January 1). An Introduction to Firebase. Apress eBooks.  
[https://doi.org/10.1007/978-1-4842-2943-9\\_1](https://doi.org/10.1007/978-1-4842-2943-9_1)
- *Yaseer App landing page*. YaseerB2B. (2023). <https://www.yaseerb2b.com/en>
- *LinkedIn*. LinkedIn. (2023). <https://www.linkedin.com/company/orderatmarket/about/>
- Zahra, Syah, & Indradewa. (2021, August). Human Resource Management Implementation at Startup Arena Corner. Retrieved December 2, 2022, from  
[https://www.researchgate.net/publication/353986107\\_Human\\_Resource\\_Management\\_Implementation\\_at\\_Startup\\_Arena\\_Corner](https://www.researchgate.net/publication/353986107_Human_Resource_Management_Implementation_at_Startup_Arena_Corner)



- Nascimento. (2017). What is the role of Human Resource Management in growing startups? Core. Retrieved December 2, 2022, from <https://core.ac.uk/display/84689400>
- Dr. Riddhisha Jain & Ms. Sanjeev Jain. (2022). Analyzing and Exploring the Effectiveness of Each Element of the 7Ps of Marketing Mix (No. 2455–6211). International Journal of All Research Education and Scientific Methods (IJARESM). [https://www.researchgate.net/publication/357657009\\_Analyzing\\_and\\_Exploring\\_the\\_Effectiveness\\_of\\_Each\\_Element\\_of\\_7Ps\\_of\\_Marketing\\_Mix](https://www.researchgate.net/publication/357657009_Analyzing_and_Exploring_the_Effectiveness_of_Each_Element_of_7Ps_of_Marketing_Mix)
- Bowyer, R. (2017, March 20). Marketing Mix 7Ps Example – Marketing Mix 7Ps pdf. How to Make Money Online Blogging with WordPress. Retrieved December 2, 2022, from <https://www.in-business.org.uk/marketing-mix-7ps-example-marketing-mix-7ps-pdf/>
- Rafiq, & Ahmed. (1995). Using the 7Ps as a generic marketing mix: An exploratory survey of UK and European marketing academics. In ResearchGate. Retrieved December 2, 2022, from [https://www.researchgate.net/publication/247624673\\_Using\\_the\\_7Ps\\_as\\_a\\_generic\\_marketing\\_mix\\_An\\_exploratory\\_survey\\_of\\_UK\\_and\\_European\\_marketing\\_academics](https://www.researchgate.net/publication/247624673_Using_the_7Ps_as_a_generic_marketing_mix_An_exploratory_survey_of_UK_and_European_marketing_academics)
- BMC: <https://www.hindawi.com/journals/complexity/2022/1649160/>
- Use case documentation:
- [https://www.researchgate.net/publication/322991847\\_role\\_of\\_use\\_case\\_diagram\\_in\\_software\\_development/link/5a7b38b9aca27233575a83ae/download?\\_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InB1YmxpY2F0aW9uIiwicGFnZSI6InB1YmxpY2F0aW9uIn19](https://www.researchgate.net/publication/322991847_role_of_use_case_diagram_in_software_development/link/5a7b38b9aca27233575a83ae/download?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InB1YmxpY2F0aW9uIiwicGFnZSI6InB1YmxpY2F0aW9uIn19)
- <https://ieeexplore.ieee.org/abstract/document/805405>





- <https://nulab.com/learn/design-and-ux/how-to-create-a-use-case-scenario-to-improve-products/>
- Avital, N. (2023, December 20). Cybersecurity Threats | Types & Sources | Imperva. Learning Center. <https://www.imperva.com/learn/application-security/cyber-security-threats/#:~:text=Cybersecurity%20threats%20are%20acts%20performed,to%20or%20disrupt%20computing%20systems.>
- What is an Entity Relationship Diagram (ERD)? (n.d.). Lucidchart. <https://www.lucidchart.com/pages/er-diagrams>
- What is a Data Flow Diagram. (n.d.). Lucidchart. <https://www.lucidchart.com/pages/data-flow-diagram>
- Test different screen and window sizes. (n.d.). Android Developers. <https://developer.android.com/training/testing/different-screens>
- Bhatt, T. (2024, May 9). 7 Security Measures In Android App Development. Intelivita. <https://www.intelivita.com/blog/android-application-security-best-practices/>
- Role of Java in Android App Development - ADMEC Multimedia Institute. (2020, October 27). ADMEC Multimedia Institute. <https://www.admecindia.co.in/web-development/role-java-android-app-development/>
- Yurdakul, F. (2024, March 28). Advanced debugging in Android (part 2) - Appcent - Medium. Medium. <https://medium.com/appcent/advanced-debugging-in-android-part-2-39ba7f7895ef>
- Android emulator vs. real device testing - Tricentis. (2024, January 5). Tricentis. <https://www.tricentis.com/learn/android-emulator-vs-real-device-testing-key-differences>



- George, J. K. (2023, August 22). Unveiling the Symbiotic Dance of Android Gradle Plugin Versions and Gradle Versions: A Comprehensive Exploration. Medium. <https://medium.com/@jobykorahgeorge/unveiling-the-symbiotic-dance-of-android-gradle-plugin-versions-and-gradle-versions-a-84b95b06865c>
- Sinambela, E. A., Darmawan, D., & Gardi, B. (2022, April 29). Production Cost Calculation Analysis Using Variable Costing Method. <https://ejournalisse.com/index.php/isse/article/view/10>
- Software engineering tenth edition global edition. (n.d.-c). [https://api.pageplace.de/preview/DT0400.9781292096148\\_A26661611/preview-9781292096148\\_A26661611.pdf](https://api.pageplace.de/preview/DT0400.9781292096148_A26661611/preview-9781292096148_A26661611.pdf)
- Digital, S. | R. (2024, January 9). List of grocery stores in Amman: SmartScrapers. SmartScraper. <https://rentechdigital.com/smartscraper/business-report-details/jordan/amman-governorate/amman/grocery-stores>
- <sup>1</sup> The distribution network in Jordan. The distribution network in Jordan - International Trade Portal. (n.d.). <https://www.lloydsbanktrade.com/en/market-potential/jordan/distribution>



# {Appendencies}



## 10. Survey questions:



### Mostawdaakom

"We're creating a mobile app to improve communication between suppliers and retailers. It will offer real-time inventory updates and simplify the ordering process. Our goal is to solve inventory issues and make the app easy to use and secure. Your input will help us make it better."

Are you currently utilizing any technological solutions for inventory management and order placement? If so, how satisfied are you with their performance?

- ☐ Yes, very satisfied
- ☐ Yes, satisfied
- ☐ Yes, neutral
- ☐ Yes, dissatisfied
- ☐ No, not utilizing any technological solutions
- ☐ Other: \_\_\_\_\_



How satisfied are you with the current methods of communication and order placement between your retail business and supermarkets?

- ☐ very satisfied
- ☐ Satisfied
- ☐ Neutral
- ☐ Dissatisfied
- ☐ Very dissatisfied
- ☐ Other: \_\_\_\_\_

To what extent do you experience challenges related to inventory management, such as stock-outs or overstocking?

- ☐ Extremely challenging
- ☐ Moderately challenging
- ☐ Slightly challenging
- ☐ Not challenging at all
- ☐ Other: \_\_\_\_\_



How important is real-time inventory tracking and updates for your retail operations?

☐ Extremely important

☐ Very important

☐ Slightly important

☐ Not important at all

☐ Other: \_\_\_\_\_

How concerned are you about the security and privacy of data exchanged through such technology solutions?

☐ Very concerned

☐ Concerned

☐ Neutral

☐ Not concerned

☐ Not concerned at all

☐ Other: \_\_\_\_\_



What factors would influence your decision to adopt a new technology solution for inventory management and order placement?

- ☐ Ease of use
- ☐ Real-time updates
- ☐ Scalability
- ☐ Security and privacy
- ☐ Integration capabilities
- ☐ Cost-effectiveness
- ☐ Other: \_\_\_\_\_

Would seamless integration with your existing systems be a crucial factor in adopting a new technology solution for your retail business?

- ☐ Definitely crucial
- ☐ Somewhat crucial
- ☐ Neutral
- ☐ Not crucial at all
- ☐ Other: \_\_\_\_\_



How likely are you to recommend a mobile app that facilitates communication and order placement between retailers and supermarkets to your peers in the industry?

☐ Very likely

☐ Likely

☐ Unlikely

☐ Other: \_\_\_\_\_

How likely are you to support a technology solution like Mostawdaakom that promotes collaboration with local Jordanian retailers and suppliers?

☐ Very likely

☐ Likely

☐ Unlikely

Would you be more inclined to use Mostawdaakom knowing that it facilitates transactions with local Jordanian brands and suppliers?

☐ Yes, significantly

☐ Yes, to some extent

☐ No, not at all

☐ Other: \_\_\_\_\_





How important is it for you to actively support local Jordanian businesses through the adoption of technological solutions like Mostawdaakom?

- ☐ Extremely important
- ☐ Very important
- ☐ Slightly important
- ☐ Not important at all
- ☐ Other: \_\_\_\_\_

which payment methods you would prefer to use on Mostawdaakom?

- ☐ Credit card
- ☐ Bank transfers
- ☐ Cash on delivery
- ☐ Apple Pay
- ☐ Other: \_\_\_\_\_



Why would you recommend Mostawdaakom to other sellers or distributors?

- ☐ It's reliable
- ☐ It has lots of useful features
- ☐ It's easy and enjoyable to use
- ☐ The price is competitive
- ☐ Other: \_\_\_\_\_