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ABSTRACT

This project revolves around the development of e-commerce websites by focusing on improving customer experience. In light of the intense competition in the digital market, customer comfort and satisfaction have become fundamental factors for the success of any online store.

The project aims to study and analyze the problems faced by customers while using electronic platforms, such as delayed responses, difficulty in accessing information, or a complex user interface. Then, it proposes practical technical solutions.

We aimed to conduct a platform performance analysis experiment on an e-commerce store built on **Bagisto** with an Arabic interface linked to the **HubSpot** system, by injecting dummy data into two different scenarios: poor performance and good performance, and then displaying a comparison between them on the dashboard.

Tools:

- **Bagisto:** An open-source e-commerce platform built on Laravel
- **HubSpot:** A CRM and marketing management system

The goal of the integration is to display the store's performance through statistics, by creating dummy data reflecting both scenarios inside HubSpot, saving the statistics as files, and displaying the comparison between both cases inside the HubSpot interface.

Defined Scenarios:

- Scenario 1: Poor performance — many views but few sales
- Scenario 2: Improved performance — after enhancing prices and descriptions, sales increased

Keywords: E-commerce – Bagisto platform – HubSpot system

الملخص

يدور هذا المشروع حول تطوير مواقع التجارة الإلكترونية من خلال التركيز على تحسين تجربة العملاء. وفي ظل المنافسة الشديدة في السوق الرقمية، أصبحت راحة العميل ورضاه من العوامل الأساسية لنجاح أي متجر إلكتروني. يهدف المشروع إلى دراسة وتحليل المشكلات التي يواجهها العملاء أثناء استخدام المنصات الإلكترونية، مثل التأخر في الرد، صعوبة الوصول إلى المعلومات، أو تعقيد واجهة المستخدم. ثم يقترح حلولاً تقنية عملية. سعيًا إلى تنفيذ تجربة تحليل لأداء منصة متجر إلكتروني مبني على **Bagisto** بواجهة عربية ومربوط بنظام **HubSpot**، من خلال حقن بيانات وهمية في سيناريوهين مختلفين: أداء ضعيف وأداء جيد، ثم عرض مقارنة بينهما داخل لوحة التحكم.

الأدوات المستخدمة:

- **Bagisto**: منصة متجر إلكتروني مفتوحة المصدر مبنية على **Laravel**
 - **HubSpot**: نظام لإدارة علاقات العملاء (CRM) وإدارة التسويق
- الهدف من هذا الربط هو عرض أداء المتجر من خلال الإحصائيات، عبر إنشاء بيانات وهمية تعكس كلا السيناريوهين داخل **HubSpot** ، وحفظ الإحصائيات كملفات، ثم عرض المقارنة بين الحالتين في واجهة **HubSpot**.
- ### السيناريوهات المحددة:

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LIST OF VOCABULARY

E-commerce : Refers to the buying and selling of goods and services over the internet.

E-marketing: online platforms, social media, search engines, email, and other digital channels to promote products or services. It includes strategies like SEO

Selling: In e-commerce, selling happens online through an online store or platforms or even social media.

Buying: In e-commerce, the customer buys products online instead of going to physical store.

Shipping: Delivering the product from the seller to the buyer after a purchase is made on an online store.

Delivery: Bringing the product to the customer's chosen location, and it's the final step after the product has been shipped.

Operating costs : This includes expenses like rent, employee salaries, and inventory management.

Competitive Prices: This means businesses offer good prices to attract more customers compared to their competitors.

Variety of Products: This means that online stores offer a large selection of items for customers to choose from.

Cyber security: This refers to keeping personal information, financial details, and online activities safe from hackers or cybercriminals.

Competition: When there are too many companies selling the same thing, it can be hard for one company to get noticed.

COD : Cash on Delivery .. Paying when the product arrives

Fraudulent Websites: These are websites that pretend to sell products but actually steal money or personal information from customers.

Privacy Policies: These explain how websites collect, store, and protect personal information like names, emails, and payment details.

Counterfeit Products: These are items that look like the original but are made cheaply and dishonestly.

Revolutionizing: Making something completely different or new in a big way

Widespread use: Something that a lot of people use everywhere

Sophisticated services: Smart and high-level features that help users

Brand's reputation: How good or trustworthy your business looks to others

Digital wallets: Apps or services that let you pay online without using cash or physical cards

Promotions: Special deals, discounts, or sales

Engagement: How people interact with content or a brand, especially on social media

Customized: Made especially for someone.

Feature : A special tool or option in a website or app.

Automated : Done by a computer without human help Guest Checkout Buying something without signing up or logging in.

Dishonest : Not truthful

Live chat : Real-time messaging with customers.

CRM : Customer Relationship Management System

GENERAL INTRODUCTION

GENERAL INTRODUCTION

Between the hidden poetry of code and the visible art of user experience, developers stand out as technical artists, perpetually striving for digital perfection. In an era where success is measured by clicks and conversion rates, improving customer service is not merely an option, but a strategic imperative dictated by the rapidly evolving digital marketplace.

This introduction paves the way for a deeper exploration of how modern technologies and advanced systems can be leveraged to transform e-commerce from a transaction platform into an exceptional, human-centered experience. For the joy of shopping.

So that the project objectives are:

Improve customer relationships by building a central database for all interactions (communications, purchases, inquiries).

Enhance technical support with HubSpot services. Increase the efficiency of marketing and sales operations.

Provide a simple and fast interface for collecting customer information and their interaction with the website.

We will divide our study into three chapters to carry out this project:

Chapter one: Theoretical Foundations of e-commerce and Customer Relationship Management.

Chapter two: Case Study and Solution Design.

Chapter three: System Implementation.

Chapter one

*Theoretical Foundations of e-commerce and
Customer Relationship Management.*

Part one I: E-Commerce

Introduction:

This chapter introduces the domain of e-commerce and how to improve customer service from a technical perspective for commercial websites.

I.1.1 An overview of e-commerce:

E-commerce refers to the buying and selling of goods and services over the internet. It has evolved significantly since its inception in the 1990s and has become an essential part of the global economy. Here are some key points about e-commerce.

I.1.2 Types of E-commerce:

B2C (Business to Consumer): Where businesses sell products directly to consumers, such as Amazon[1] and Zara.

B2B (Business to Business): Where companies exchange goods and services with each other, like platforms such as Alibaba and Fiverr.

C2C (Consumer to Consumer): Where individuals trade goods and services, such as eBay and Etsy.

C2B (Consumer to Business): Where individuals offer their services or products to businesses, such as platforms like Upwork

I.1.3 Benefits of E-commerce:

Ease of Access: Consumers can shop from anywhere at any time, increasing the likelihood of purchases.

Variety of Products: A wide range of goods and services is available for consumers to choose from.

Cost Reduction: Operating costs are typically lower compared to traditional stores, allowing companies to offer competitive prices. [1]

I.1.4 Challenges:

Cybersecurity: Protecting data and financial transactions from online threats.

Trust: Some consumers may be hesitant to purchase products online due to a lack of knowledge or past negative experiences.

Competition: The abundance of available options can make it difficult for companies to stand out.[2]

I.1.5 E-commerce trends:

Social Commerce: Using platforms like Facebook and Instagram for promoting and selling products.

Artificial Intelligence: Analyzing data to enhance the shopping experience and improve marketing strategies.

Logistics Technology: Improving shipping and distribution networks using technology to enhance efficiency.

I.1.6 Ways to Use E-commerce:

E-commerce strategies and applications:

There are various ways to use e-commerce, allowing individuals and companies to benefit from available opportunities. Here are some key methods:

I.1.6.1 Strategies:

Digital Marketing: Using social media, email, and search engines to attract buyers.

SEO (Search Engine Optimization): Making the website appear higher in Google search results.

Personalization: Showing products based on the customer's interests or past purchases.

Customer Service: Using chatbots, live chat, or FAQs to help customers quickly.

Mobile Optimization: Making sure the website works

I.1.6.2 Applications:

- Online Retail Stores (like Amazon[4], Noon) Digital Products (e-books, software)
- Online Services (courses, bookings) Marketplaces (Etsy, eBay [5]) Mobile Shopping Apps

I.1.6.3 Tools:

- Store Builders : WooCommerce Payment Tools : PayPal Marketing Tools : Google Ads Analytics Tools : Google Analytics
- Shipping & Delivery Tools : Shippo
- Shipping & Delivery Tools : Shippo
- Customer Support Tools : LiveChat

I.1.7 The problems faced by e-commerce with the client from a technical perspective:

From a technical standpoint, e-commerce has faced several issues with customers, including:

Cybersecurity Issues:

Exposure of e-commerce sites to hacks or phishing attacks can lead to data breaches, raising concerns about security.

System Downtime: Technical failures during peak periods (such as website or app outages) can frustrate customers and disrupt purchasing processes.

Payment Issues: Errors or failures in payment transactions due to infrastructure problems or compatibility of payment systems can prevent customers from completing purchases.

User Experience: If user interfaces are complicated or websites are slow to load, it negatively impacts the customer experience and decreases their willingness to shop.

Technical Support Response: Lack of immediate technical support or slow responses to customer inquiries can lead to frustration.

System Integration: Incompatibility between e-commerce systems and inventory management or logistics systems can lead to errors in order management and inventory control.

Software Updates: Failing to regularly update software may result in security vulnerabilities or loss of important functionalities that affect customer satisfaction.

Data Management: Difficulty in analyzing large volumes of data related to customer behavior and revenue can limit companies' ability to enhance customer experience. Addressing these technical issues can improve customer relationships and enhance trust in e-commerce platforms

I.1.8 E-commerce in Algeria (Case study):

I.1.8.1 Problems of local Algerian e-commerce stores that deal with sellers and buyers, specifically (Jumia [7]Algeria, Ouedkniss, Let-Shoup DZ, and Souq DZ):

Shipping and Delivery Issues:

Delivery Delays: Customers may experience delays in receiving orders due to weak infrastructure or a lack of transportation options.

Lack of Reliable Shipping Services: Some sellers may lack effective shipping services, impacting the speed of product delivery.

Quality and Credibility:

Variation in Product Quality: The products sold may not match the description or displayed images, leading to customer dissatisfaction. Issues with Seller Reliability: Some sellers may not have a good reputation may offer counterfeit products.

Lack of Product Variety:

Limited Available Options: The range of products may be limited compared to global platforms, making it difficult for customers to find what they are looking for.

User Experience:

Uncomfortable User Interface: The design and structure of websites or apps may be ineffective, negatively impacting the shopping experience.

Difficulty in Navigation: Customers may struggle to find the information or products they need.

Payment Issues:

Lack of Payment Options: Some stores may not offer a variety of payment options, limiting customers' ability to complete transactions.

Concerns about Security: Worries about the protection of financial data and transactions may affect customers' purchasing decisions.

Customer Service:

Weak Customer Support: There may be a lack of effective technical support, making it difficult for customers to resolve their issues.

Delayed Responses: A delay in customer service responses may lead to a loss of trust from buyers.

I.1.8.2 the advantages of local Algerian e-commerce stores:

Ease of Access: Buyers can access a wide range of products and services through these stores without leaving their homes.

Product Variety: E-commerce stores like Jumia [7] Algeria and Ouedkniss offer a diverse array of products, from electronics and clothing to household items.

Competitive Prices: Online stores often offer competitive prices and special deals, making online shopping an economical option.

Easy Payment: These stores provide multiple payment options, including cash on delivery, making the purchase process easier for users.

Customer Service: E-commerce stores offer excellent customer support and technical assistance, helping to resolve any issues users may face.

Fast Delivery: Some stores provide fast and efficient delivery services, ensuring products reach customers in a short time.

Reviews and Ratings: Buyers can read product reviews and ratings from other users, helping them make informed purchase decisions.

I.1.9 E-Commerce Law in Algeria :

E-commerce in Algeria is regulated by Law No. 18-05 of May 10, 2018, which pertains to e-commerce and establishes the general rules for conducting this activity within the country. Below are the key points of this law:

I.1.9.1 Definition of E-Commerce :

E-commerce in Algeria includes any sale or provision of services remotely via electronic means, including the internet.

I.1.9.2 Legal Requirements for E-Commerce :

The seller or service provider must be legally registered, meaning they must have a commercial register if they are a legal entity or a tax identification number if they are an individual.

The website or platform used for sales must be registered in Algeria and have a dz domain extension.

Clear information about the company or seller must be provided, including name, address, phone number, email, and commercial register or tax identification number.

Complete details about the product or service must be displayed, including price, characteristics, and payment and delivery methods.

I.1.9.3 Approved Payment Methods :

The law allows electronic payments through digital payment methods approved by the Bank of Algeria, such as the CIB electronic payment card or mobile payment services.

Cash on delivery (COD) remains common but is not explicitly mentioned in the law.

I.1.9.4 Consumer Protection :

Consumers have the right to cancel a purchase within seven (7) days of receiving the product and receive a refund.

After-sales service and product warranties must comply with Algerian laws. Advertisements or offers that may mislead consumers are prohibited.

I.1.9.5 Penalties for Violations :

Unregistered e-commerce traders may face fines and even closure of non-compliant platforms.

Illegal transactions (such as selling prohibited goods or failing to meet warranty conditions) may result in criminal penalties.

I.1.9.6 Regulatory Framework and Oversight :

The Algerian Ministry of Commerce is responsible for monitoring and regulating e-commerce activities.

The Central Bank sets regulations for electronic payments in cooperation with local payment service providers.

I.1.9.7 Faced by Customers in E-Commerce:

Despite the convenience and accessibility of online shopping, customers often encounter various challenges, including:

I.1.9.8 Product Quality and Misleading Listings:

Items received may be different from the product images displayed online. Receiving defective, used, or counterfeit products instead of genuine ones. Difficulty in getting refunds or replacements for incorrect or damaged items.

I.1.9.9 Poor Customer Service:

Slow response from customer service teams in addressing complaints.

Lack of clear return and refund policies, making it hard for buyers to recover their money.

Inadequate support, especially in smaller online stores without dedicated customer service teams.

I.1.9.10 Fraud and Fake Websites

Some customers fall victim to scam websites that take payments but never deliver products. Counterfeit goods being sold as originals.

Deceptive promotions offering extremely low prices but resulting in poor customer experiences.

I.1.9.11 Technical Issues on Websites

Difficult navigation on some e-commerce sites, making shopping frustrating.

Errors during checkout or payment, leading to duplicated orders or failed transactions.

Websites not being optimized for mobile devices, causing inconvenience.

I.1.9.12 Privacy Concerns

Some platforms collect customer data and sell it to third parties without consent. Excessive targeted advertising based on past searches and purchases.

Weak data protection measures, leading to potential breaches.

I.1.9.13 Legal and Regulatory Issues

Lack of strict consumer protection laws in some countries. Difficulty in taking legal action against fraudulent sellers. Unexpected customs duties or taxes when ordering internationally

I.10 Customer Relationship Management System (CRM) :

I.10.1 Definition CRM System:

Customer Relationship Management (CRM) is a strategic approach aimed at enhancing interactions with customers and increasing their satisfaction through advanced techniques and tools. A CRM system plays a crucial role in this strategy, comprising a set of systems and tools that enable businesses to manage and develop relationships with both current and potential customers. This system collects and analyzes essential customer data, such as contact information, purchasing behaviors, and previous interactions, which ultimately enhances the services provided and boosts long-term business success. [10]

I.10.2 Objectives of CRM System:

Enhancing Customer Experience: The system provides all the necessary information to understand customer needs and offer appropriate solutions.

Increasing Sales: By following up with potential customers, analyzing sales data, and maintaining effective communication

Achieving Loyalty: By providing outstanding service, which increases the likelihood of repeat business from customers.

Improving Operational Efficiency: Facilitates communication between different departments within the company, such as sales, marketing, and customer service.

Providing Accurate Data: Collecting and analyzing customer data in an organized way helps in making informed strategic decisions.

I.10.3 Types of CRM Systems:

Operational CRM: Focuses on automating business processes such as sales, marketing, and customer service, contributing to improved operational efficiency.

Analytical CRM: Relies on analyzing data derived from customer interactions to provide valuable insights that help in making strategic decisions.

Collaborative CRM: Aims to enhance collaboration between various departments such as sales, customer service, and marketing to ensure the best service for customers.

Strategic CRM: Focuses on deeply understanding customer needs and aligning all operations and services to achieve long-term customer satisfaction.

I.10.4 Benefits of Using a CRM System:

Improved Customer Communication: Helps in building strong relationships with customers through continuous and effective communication.

Increased Productivity: Enhances efficiency by automating many administrative tasks.

Task Management: Assists in organizing daily tasks, such as following up with customers and responding to inquiries.

Customer Behavior Analysis: Allows businesses to understand customer preferences and behaviors, helping in offering better services.

Cost Reduction: Reduces the need for manual interactions and minimizes human errors.

I.10.5 Applications of CRM System in Businesses:

Marketing: CRM can be used to analyze customer behavior and direct marketing campaigns accordingly. **Sales:** Helps sales teams track leads, provide appropriate offers, and increase the likelihood of closing deals.

Customer Service: Allows employees to access customer interaction records and provide optimal support based on this information.

I.10.6 Challenges Businesses May Face When Implementing a CRM System:

High Cost: Implementing the system may require significant upfront investments.

Resistance to Change: Some employees may be resistant to adopting new systems.

Employee Training: The system requires ongoing training for employees to ensure effective use.

Data Protection: It is essential to ensure that customer data is well-protected from cyber threats.

I.10.7 Through our study of the obstacles faced by customers in e-commerce, we addressed two important points:

- the issue of trust and credibility,
- customer service and response to inquiries.

This was achieved by linking the website to CRM system, specifically "**HubSpot**" [11]. HubSpot is a CRM that offers integrated tools for customer service, including:

Sales Tools (Sales Hub)

- Lead tracking.
- Sending and following up on personalized emails.
- Automatically scheduling meetings with clients.
- Organizing and managing sales deals.
- Notification system for email opens and interactions.

Customer Service Tools (Service Hub)

- Technical support ticketing system.
- Knowledge base to help customers solve issues on their own.
- Tools for sending customer satisfaction surveys.
- Live chat and automated support bots.

I.11 Bagisto :

Bagisto is an open-source eCommerce platform built on Laravel (PHP framework) and Vue.js. It provides:

- Product management
- Cart and checkout
- Customer accounts
- Order management

It's suitable for developers who want to customize or self-host an online store.

I.12 HubSpot :

HubSpot is a leading CRM platform that provides tools for marketing, sales, customer service, and content management. It helps businesses attract leads, convert them into customers, and build strong long-term relationships by automating processes and centralizing communication.

I.13 HubSpot Events :

HubSpot Events refer to tracked interactions or actions taken by a user that are recorded inside the HubSpot CRM system. These can be things like:

- Visiting a page
- Clicking a button
- Submitting a form
- Making a purchase (if tracked via API or integration)

These events help businesses understand user behavior and automate marketing/sales workflows.

I.14 HubSpot integration via API :

Integrating HubSpot via API allows your application (like a Laravel-based Bagisto e-commerce store) to communicate directly with HubSpot's CRM system. This is useful for syncing customers, orders, product events, or marketing actions.

Main Goal:

To automate and synchronize data between your e-commerce store and HubSpot CRM in order to enhance customer experience, streamline marketing/sales efforts, and improve business insights.

Detailed Objectives:**Customer Data Synchronization :**

Automatically send customer data (name, email, etc.) from Bagisto to HubSpot when a user registers or makes a purchase.

Enables unified customer profiles and contact tracking in HubSpot.

Order and Deal Tracking :

When a customer places an order, it can be pushed to HubSpot as a “Deal.” Helps you track revenue, purchase history, and customer lifecycle.

Marketing Automation : Based on customer behavior (e.g., abandoned cart, viewed product), you can trigger automated actions from HubSpot:

- Send personalized emails or WhatsApp messages Run loyalty or win-back campaigns
- Nurture inactive users

Performance Analytics : Use HubSpot’s powerful dashboards to analyze:

- Customer segments and behavior Conversion rates
- ROI on marketing efforts

Unified Customer Journey :

All customer interactions email, website visits, chat, purchases are logged in one place. Helps support, marketing, and sales teams see the full picture.

Smart CRM & AI Use :

- HubSpot’s AI tools can help predict Who is most likely to purchase
- What offers work best for different customer groups When to re-engage a customer

Practical Example:

- A customer visits your store and views a product but doesn't buy.
- HubSpot logs a "product_view" event.
- After 24 hours, it sends them a personalized email with a discount. If the customer buys, HubSpot logs it as a successful deal.

This integration transforms your store into a smart, data-driven sales and marketing machine.

- Automatically send customer data (e.g., new user registrations) Sync orders and product interactions
- Track behavior (cart abandonments, purchases)
- Run automated marketing campaigns via workflows
- Display CRM metrics (leads, revenue) inside your dashboard

Part two II: Main user service

E-commerce has witnessed rapid growth, transforming shopping habits and traditional business models. Thanks to technological advancement and the widespread use of the Internet, e-commerce platforms offer advanced services to enhance user experience and attract customers. These services play a vital role in the success of online stores by building trust and strengthening brand reputation in the competitive digital market.

Below is a review of the most essential services provided by e-commerce platforms to users, with explanations of each service and references to the most prominent platforms that implement them:

II.1 The most prominent services of e-commerce platforms:**II.1.1 Product Browsing and Search:**

Definition: Tools that allow users to browse products and filter them by category, price, brand, and other features, plus search functionality to quickly find specific products.

II.1.2 Shopping Cart Functionality:

Definition: A virtual tool for collecting products the user intends to purchase before proceeding to checkout.

II.1.3 Secure Payment Processing:

Definition: Systems that enable secure financial transactions using credit cards, digital wallets, or alternative payment methods

II.1.4 Order Tracking and History:

Definition: Allows users to track their shipments in real-time and access their previous purchase history.

II.1.5 User Account Management:

Definition: Interface enabling users to manage their personal information, preferences, passwords, shipping addresses, and payment details. Sources: Standard feature on most e-commerce websites.

II.1.6 Product Reviews and Ratings:

Definition: Platform allowing users to share their opinions and experiences with products, helping others make purchase decisions

II.1.7 Personalized Recommendations:

Definition: Customized product suggestions based on the user's previous browsing and purchasing behavior using AI and machine learning.

II.1.8 Customer Support Channels:

Definition: Services such as live chat, email, and phone to assist users with their inquiries and issues. Wishlist Creation:

Definition: Feature allowing users to save products they're interested in for future purchase.

II.1.9 Loyalty Programs and Rewards:

Definition: System for rewarding regular customers through points, discounts, and special offers to encourage brand loyalty.

II.1.10 Mobile Shopping Apps:

Definition: Dedicated mobile applications providing a seamless shopping experience

on smartphones and tablets.

II.1.11 Email Notifications for Orders and Promotions:

Definition: Automated messages keeping users informed about their order status, promotions, and new products.

II.1.12 Easy Returns and Refunds:

Definition: Clear and simple processes for users to return unsatisfactory products and get their money back. .

II.1.13 Guest Checkout Options:

Definition: The ability to complete a purchase without needing to create an account, saving time and simplifying the process.

II.1.14 Social Media Integration:

Definition: Connecting the e-commerce store with social media platforms for engagement, marketing, and sometimes direct purchasing through those platforms

II.2 E-commerce services comparison:

The following table () represents a comparison between several e-commerce platforms in Algeria and over the world

	Services Website	Product Browsing & Search	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Algerian	Jumia	*	*	*	*	*	*	*	*	*		*	*	*	*	*
	foorshop	*	*	*	*	*			*				*	*	*	*
	Ouedkniss	*			*				*			*	*			*
	foorshop	*	*	*	*	*			*				*	*	*	*
	zedingo	*	*	*	*	*			*	*		*	*	*	*	*
international	Amazon	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	eBay	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Aliexpress	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Walmart	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Etsy	*	*	*	*	*	*	*	*	*		*	*	*	*	*
	Shopify (Platform)	*	*	*	*	*	*	*	*	*	Depe nds*	*	*	Depe nds*	*	*

	Services Website	Product Browsing & Search	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Noon	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 1: Quality of Service Comparison Table between Electronic Platforms

***Depends: Available as an add-on or depends on store configuration by the business owner**

Part three III: Field study[12]

In our study of the ecommerce challenges in Algeria, we used a questionnaire Where the results analytics and findings are discussed in the next sections.

Questionnaire data analytics:

Q01: "Do you use online shops?"	YES	NO
The rates of answers were:	56%	44%

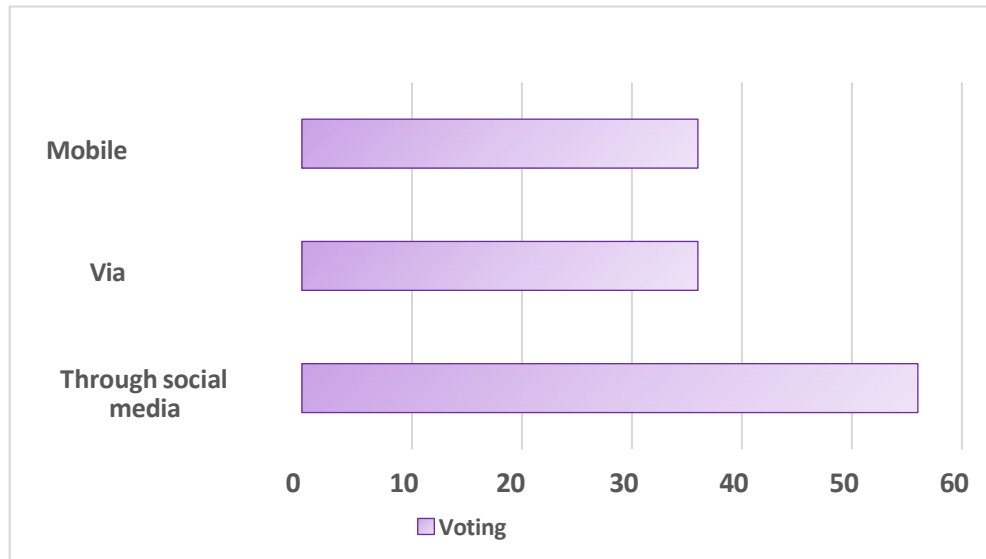
Q02: What kind of challenges did you face in e-commerce, either as a buyer or a seller ?

Customers often face a mismatch between the actual product and its photos, as well as issues with poor quality or counterfeit goods.

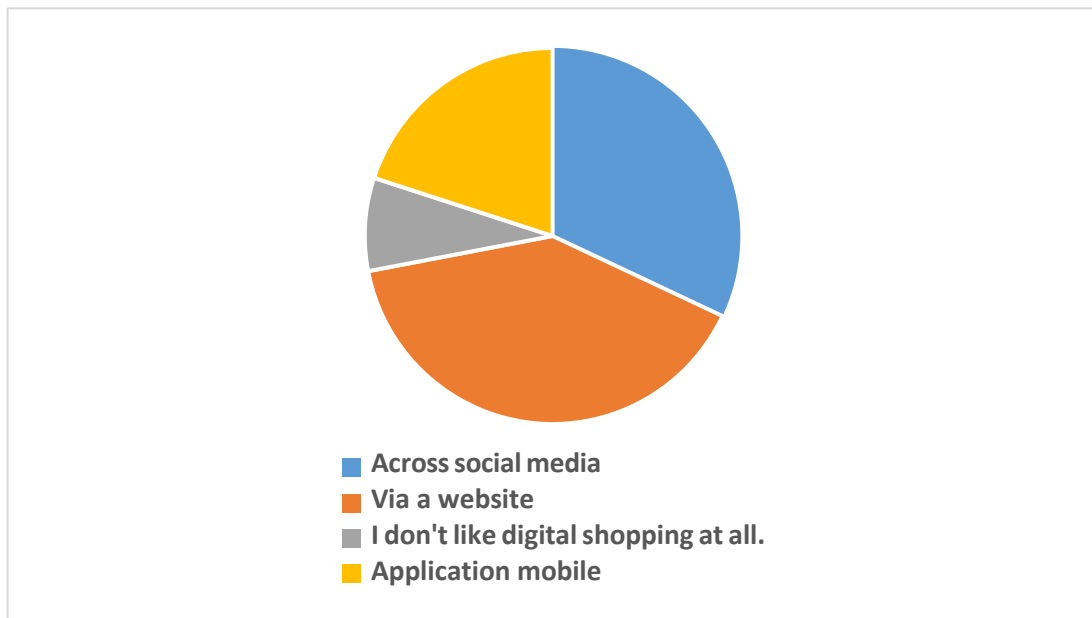
Many complain about delayed deliveries, failure to meet deadlines, or poor communication from sellers.

As for sellers, they encounter challenges such as fake orders, product returns, and lack of trust from customers due to market-related issues.

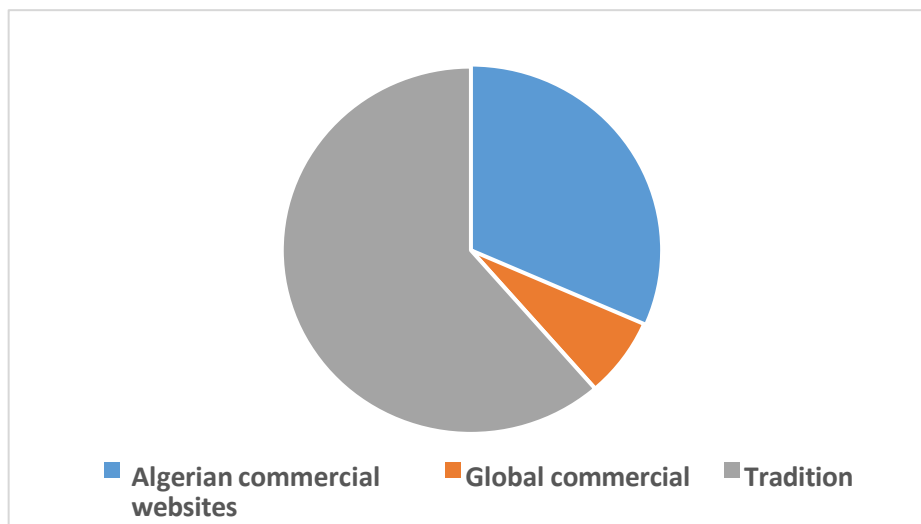
Q03: (Figure 1.III.1: What do you prefer in digital shopping, as a seller?)



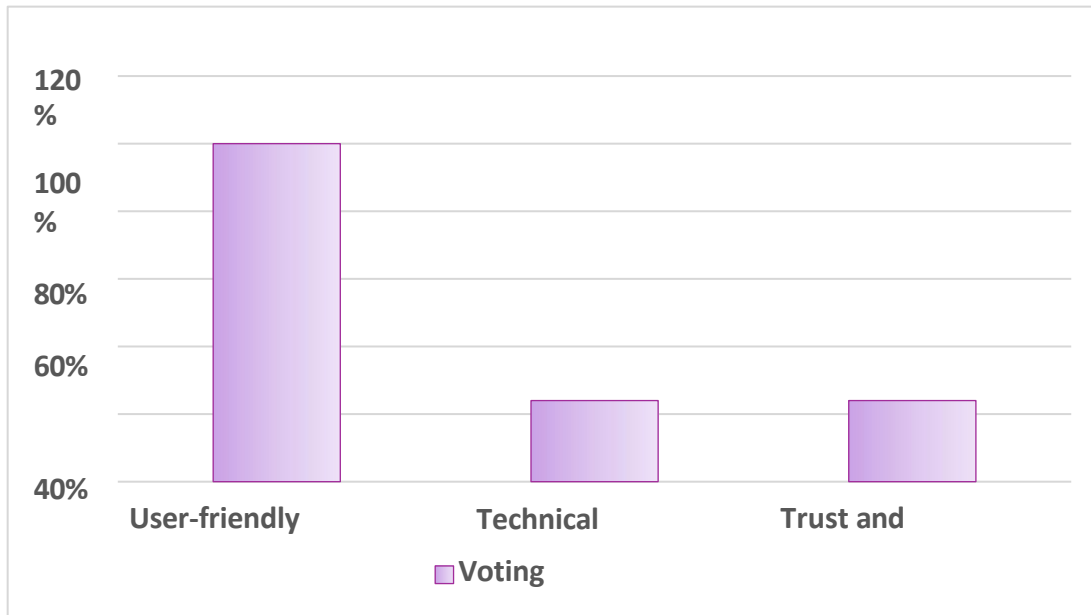
Q04: Figure 1.III.2: What do you prefer in digital shopping, as a buyer?



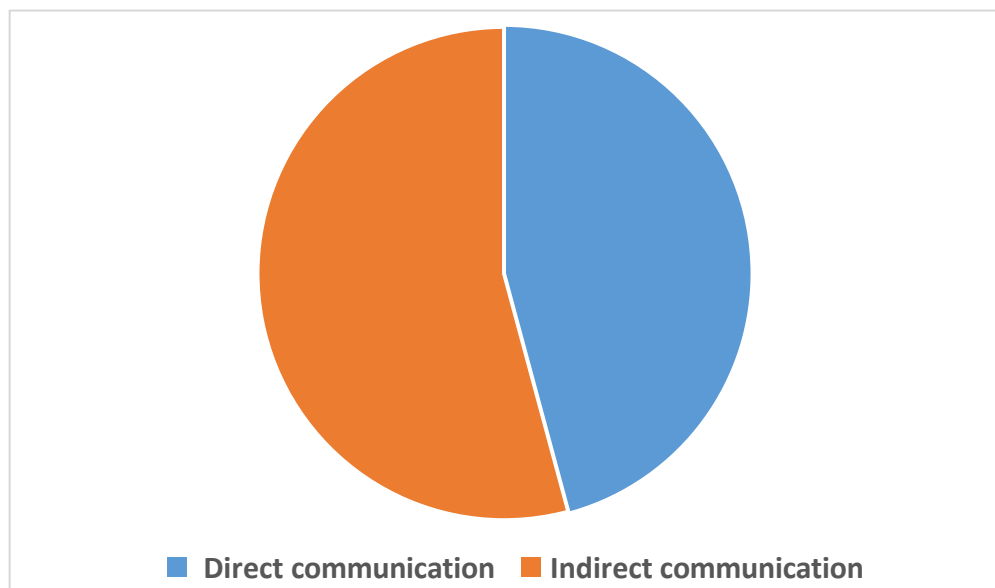
Q05: (Figure 1.III.2: Which online store do you prefer to shop at?)



Q06: (Figure 1.III.3: What features did you like about it?)



Q07: (Figure 1.III.4: What is your preferred method of communication with customer service?)



Q08: Have you encountered any problems while using this website?

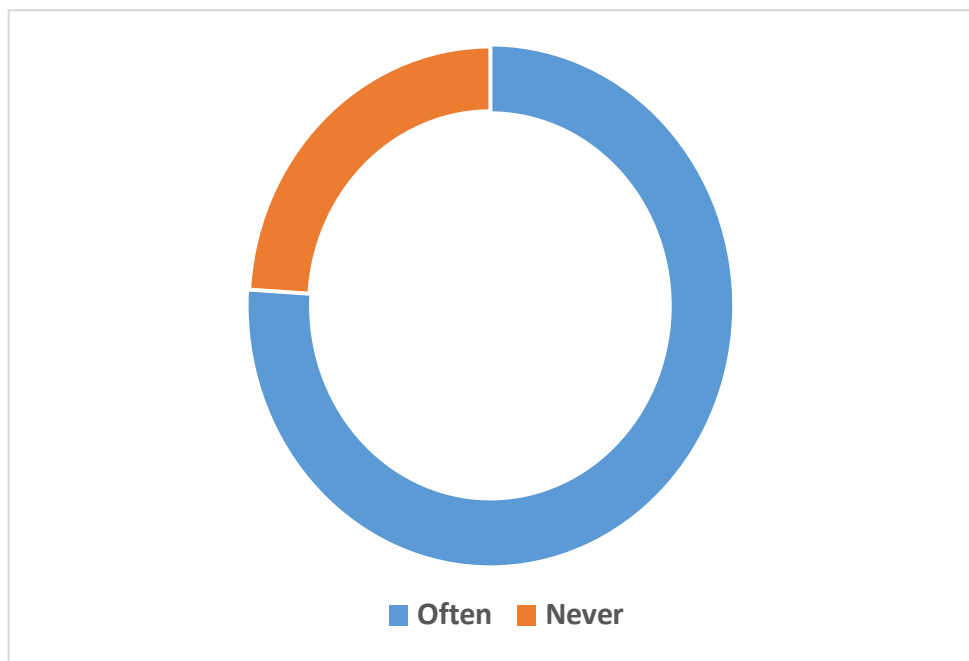
- Products do not match the ones shown in the listings. Some users reported no current issues.
- The website is slow at times.
- Risk of dealing with scammers when communicating outside the Ali Baba app
Lack of secure transaction protection when dealing off-platform.
- Weak reporting or rating systems for fraudulent sellers. No immediate technical support during urgent situations.
- Difficulty in refunding money or returning products in case of disputes.

Q09: Are there any improvements you would like to see on this website?

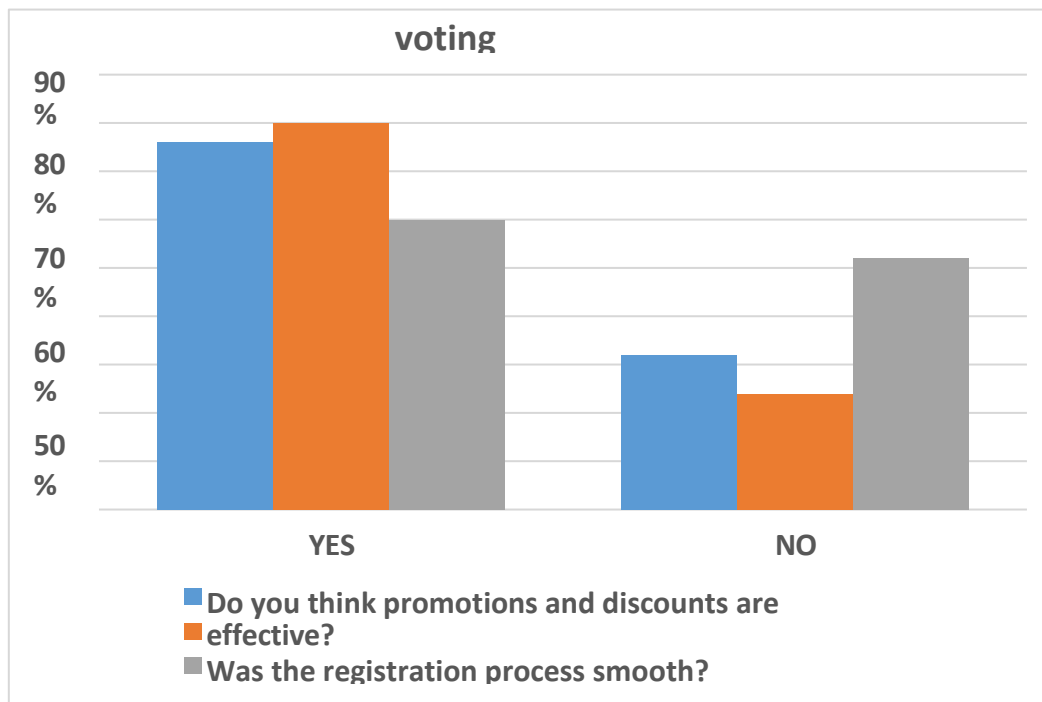
- Offer cash on delivery.
- Improve customer service and technical support.
- Clearly display product prices and ensure realistic images. Enhance search functionality and browsing speed.
- Use AI to personalize user experience based on input. Keep the store open 24/7.
- Diversify product offerings and include store ratings

Q10: Can you rate the products after purchasing them?	YES	NO
The rates of answers were:	84%	16%

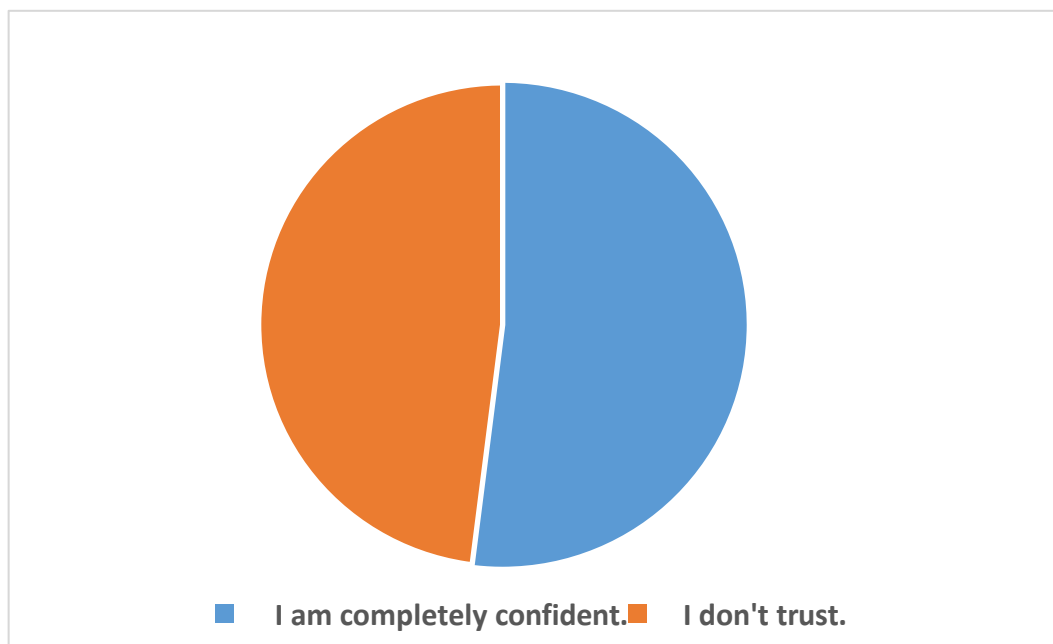
Q11: (Figure 1.III.5: Have you experienced issues with the quality of products received compared to the description?)contact the seller after purchase?)



Q12: (Figure 1.III.6: How was your experience with registration, promotions, and the ability to contact the seller after purchase?)



Q13: (Figure 1.III.7: Do you feel safe when paying online on Algerian e-commerce websites in general?)



Q14: (Figure 1.III.8: What aspects of Algerian e-commerce websites would you most like to see improved?)



Q15: Have you ever been scammed or experienced a data breach while shopping online?	YES	NO
The rates of answers were:	25%	75%

Q16: Would you like to receive notifications about new offers and added products?

Most participants prefer to receive notifications about new offers and products. While a minority do not prefer notifications, this is understood as a desire not to be bothered.

Questionnaire findings

Obstacles Customers Faced with E-commerce:

Trust and Credibility Issues:

- Use reliable platforms that protect both buyers and sellers.
- Create a professional business page with customer reviews and ratings. Share real product videos, not just pictures.
- Implement a post-purchase rating system for transparency.

Product Quality and Difference from Pictures:

- Take clear, real photos of the actual product from multiple angles. Avoid using generic or downloaded photos from other sources.

- Provide detailed product descriptions (size, color, material, etc.). Include real customer reviews with pictures.

Customer Service and Delayed Responses

- Set fixed times during the day to respond to customers. Use chatbots for instant replies to common questions.
- Create a FAQ (Frequently Asked Questions) section to save time. Set up automated messages when unavailable temporarily.

Delivery Issues and Delays

- Partner with trusted and well-reviewed delivery companies. Set realistic delivery timeframes.
- Send tracking numbers to customers.
- Notify clients in advance if delays occur and apologize.

Return Concerns and Seller Fears

- Clearly state a return policy that is fair and transparent.
- Take photos of the product before shipping as proof of condition. Accept returns in case of defects or mismatch with description.
- Use digital sales agreements to protect both sides.

Price Competition

- Focus on **added value** (great service + quality + trust). Offer seasonal promotions or bulk discounts.
- Build long-term customer relationships to gain loyalty. Develop a strong brand identity that sets you apart.

Chapter Two

System Design

II .1 Introduction:

After completing the study of the existing system and understanding the set of tasks it provides to users, this chapter employs UML (Unified Modeling Language) as a crucial step to demonstrate the project's progress by incorporating new insights gained from a thorough and realistic analysis. This will enhance our comprehensive and detailed understanding of the system's nature and requirements by presenting various diagrams used in modeling and designing the system.

In this chapter, we will focus on three main UML diagrams:

- **(Use Case Diagram):** This diagram describes the activities and tasks performed by users or external systems, along with their various interactions with the system under development.
- **(Activity Diagram):** This diagram outlines the sequence of activities and interactions executed within the system, as well as the flow of data and control during these activities.
- **(sequence Diagram):** this Diagram is a type of diagram in UML , that shows how objects interact with each other in a particular sequence over time.
- **(Class Diagram):** This diagram defines the different objects within the system and the relationships between them, including their attributes, operations, and how they interact with one another.

II.1.1 Definition of UML:

UML is a standardized modeling language used to visualize, design, and document software systems. It provides a set of graphical diagrams that help clarify a system's structure, behavior, and interactions between its components. UML is widely used in software engineering to facilitate the understanding and development of complex software systems

II.1.2 System actors :

During our study of the topic, we focus our study on two main actors in the system. including the customer, on whom the store revolves; the admin who displays products for sale; responsible for everything related to the store's software; The following table illustrates the actors, use cases, and description by each actor in the system:

actors	Use cases	Description
customer	1. Browse products 2. Add to cart 3. checkout 4. View orders 5. View cart 6. Receive-notice abandon	1) Allows users to view the list of available products with filtering and sorting options. 1) Allows users to view the list of available products with filtering and sorting options. 2) Allows the user to add a selected product to their shopping cart. 3) Enables a customer to review their cart, enter payment details, and confirm the purchase 4) Allows the customer to view details of current or past orders including status, items information. 5) Allows the user to view the contents of their shopping cart, including products, quantities, and total price 6) Sends a notification (email) to a customer who added items to the cart but did not complete the checkout.
admin	1-Onlineshop management 2-Manage CRM rules 3-Manage dashbord	1 - Enables the admin to manage products, categories, orders, users, and system settings of the online shop. 2- Enables the admin to define, update, or delete customer relationship management (CRM) rules such as CRM events, and manage notifications. 3- Allows the admin to configure and monitor the dashboard with key metrics, system alerts, sales data, user activity, and other real- time information.

Table 2 : Table of actors and use cases

USE CASES DIAGRAMS :

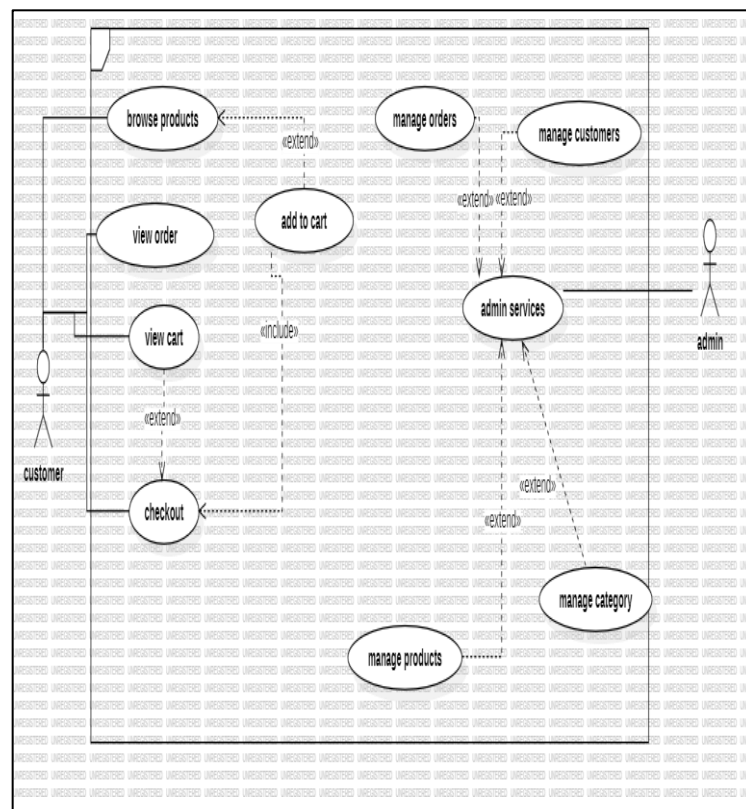


Figure 1: use case diagram without CRM integration

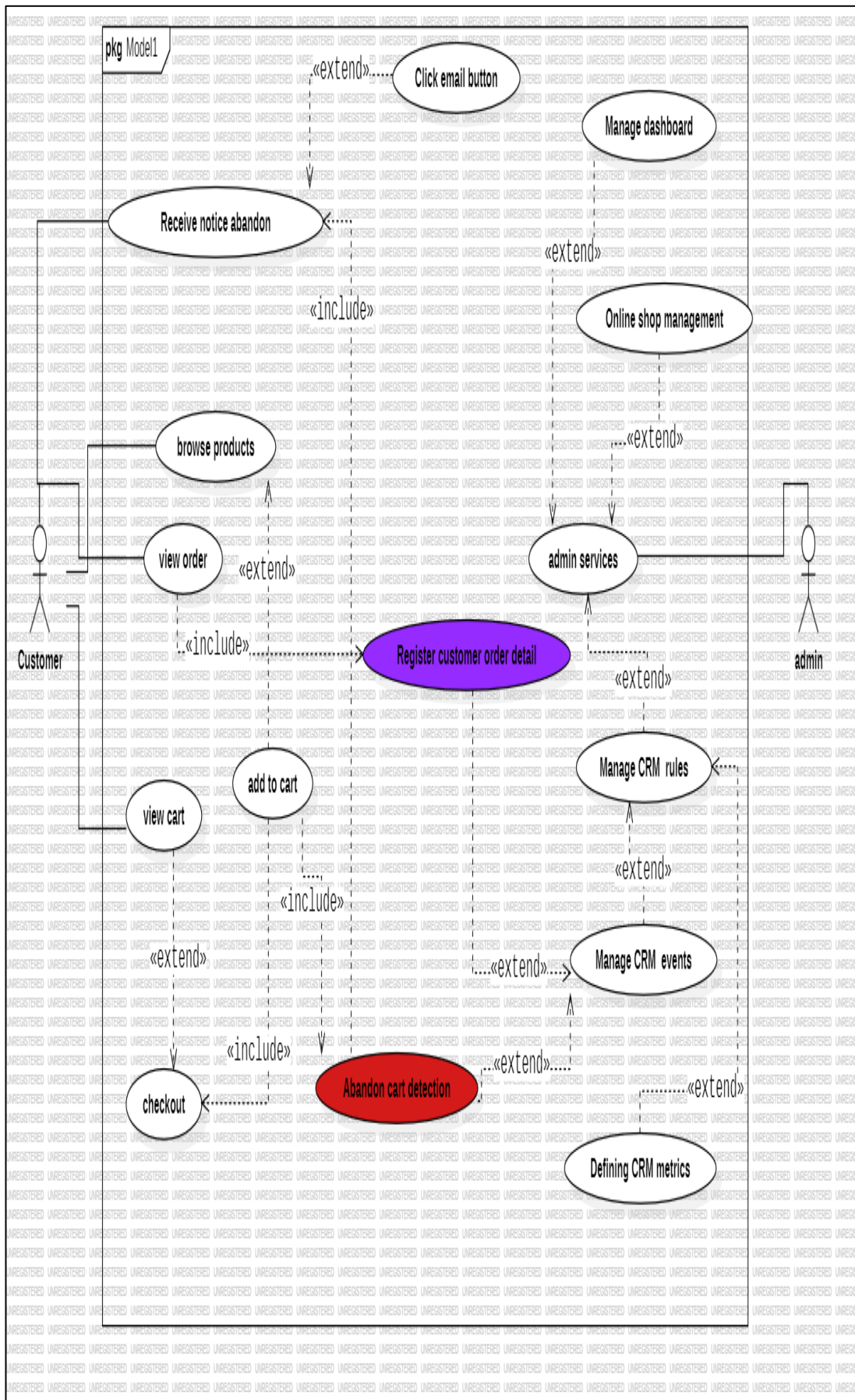


Figure 2: use case diagram with CRM integration

Activity Diagram : in UML(Unified Modeling Language) is a behavioral diagram that models the flow of activities, actions, and processes within a system. It visually represents the step-by-step workflow, decision points, parallel processes, and the sequence of operations, similar to a flowchart but with more advanced features for complex systems.

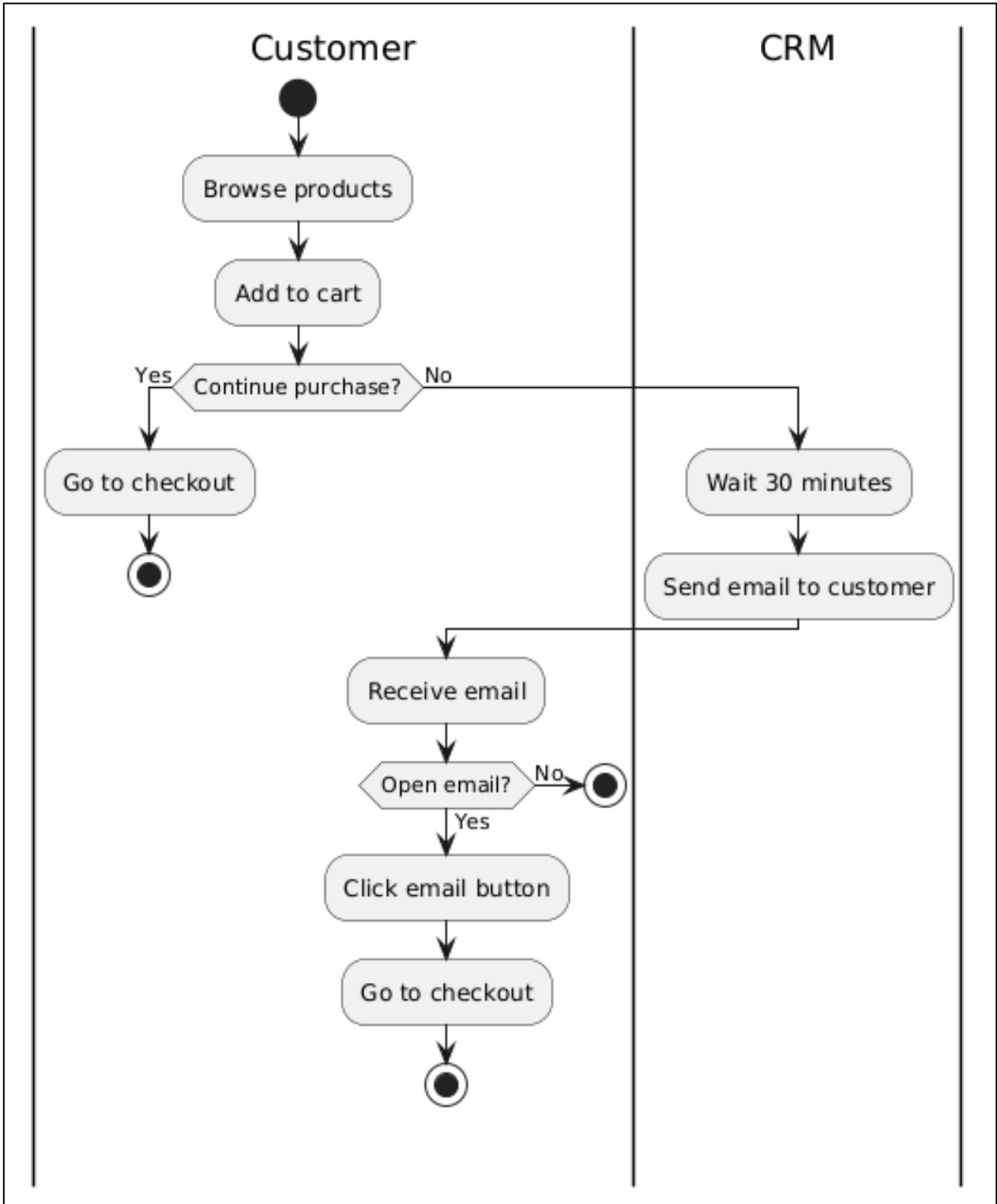


Figure 3: detection cart abandon event process activity diagram

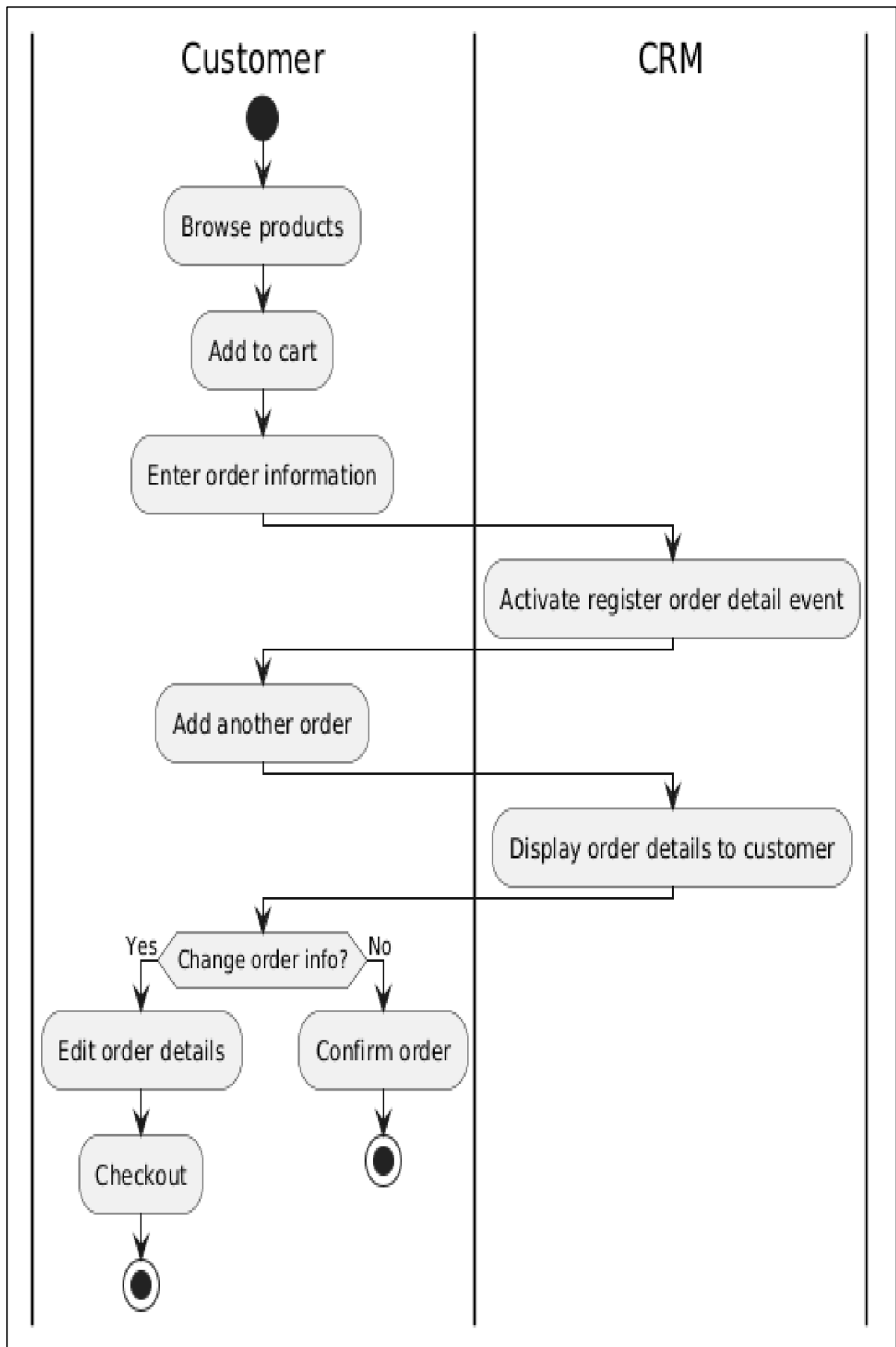


Figure 4: Registre ordre détail activity diagram

Sequence Diagram: is a type of UML interaction diagram that illustrates how objects interact in a system over time. It shows the order of messages exchanged between objects to achieve a specific functionality.

We have Designed a diagram for add new event (admin-CRM system)and the purchasing process between the customer, the online shop,and system A series of information and document exchanges take place between them, as outlined in the UML :

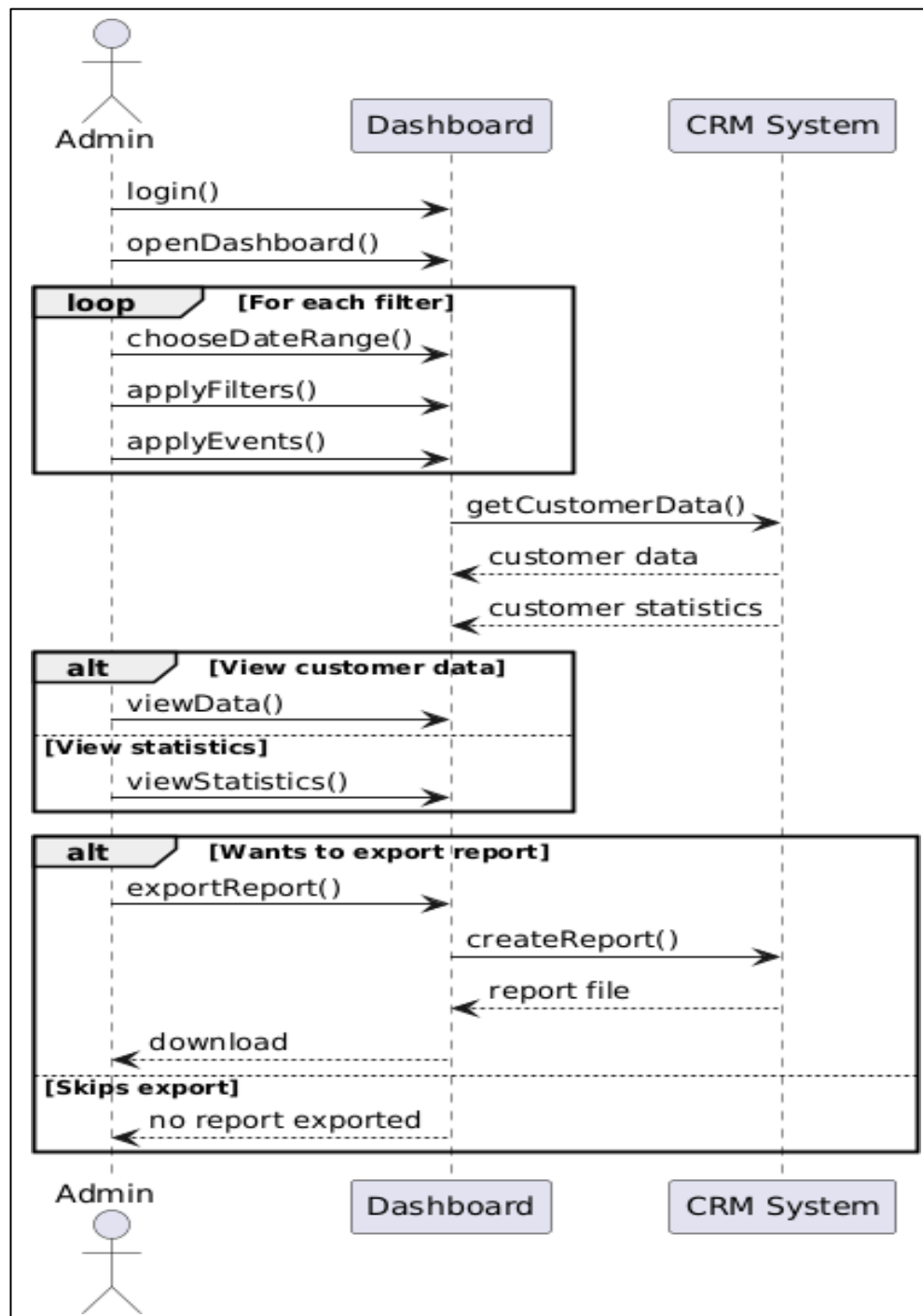


Figure 5: admin-dashbord-system sequence diagram

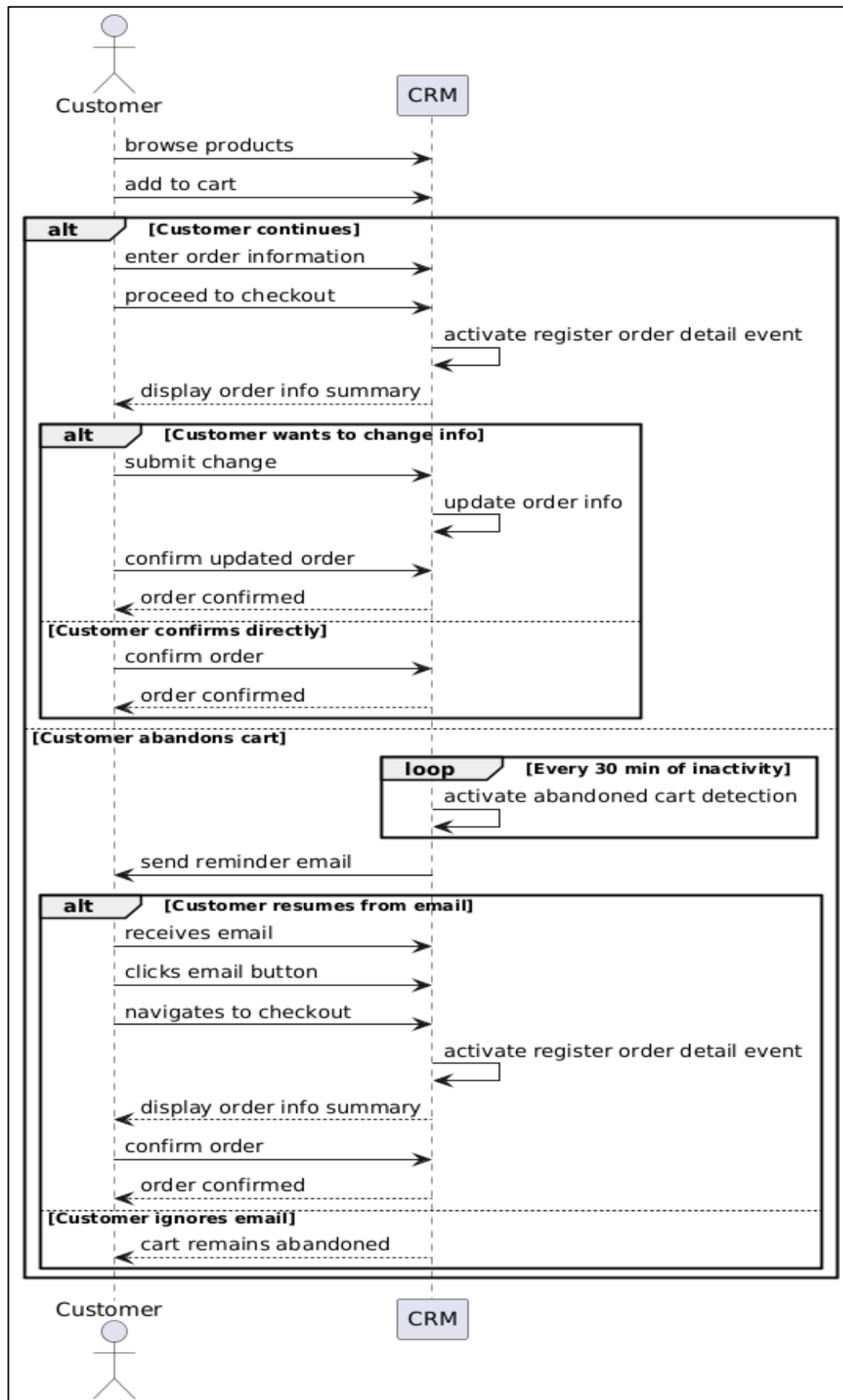


Figure 6: customer-system sequence diagram

Class Diagram :

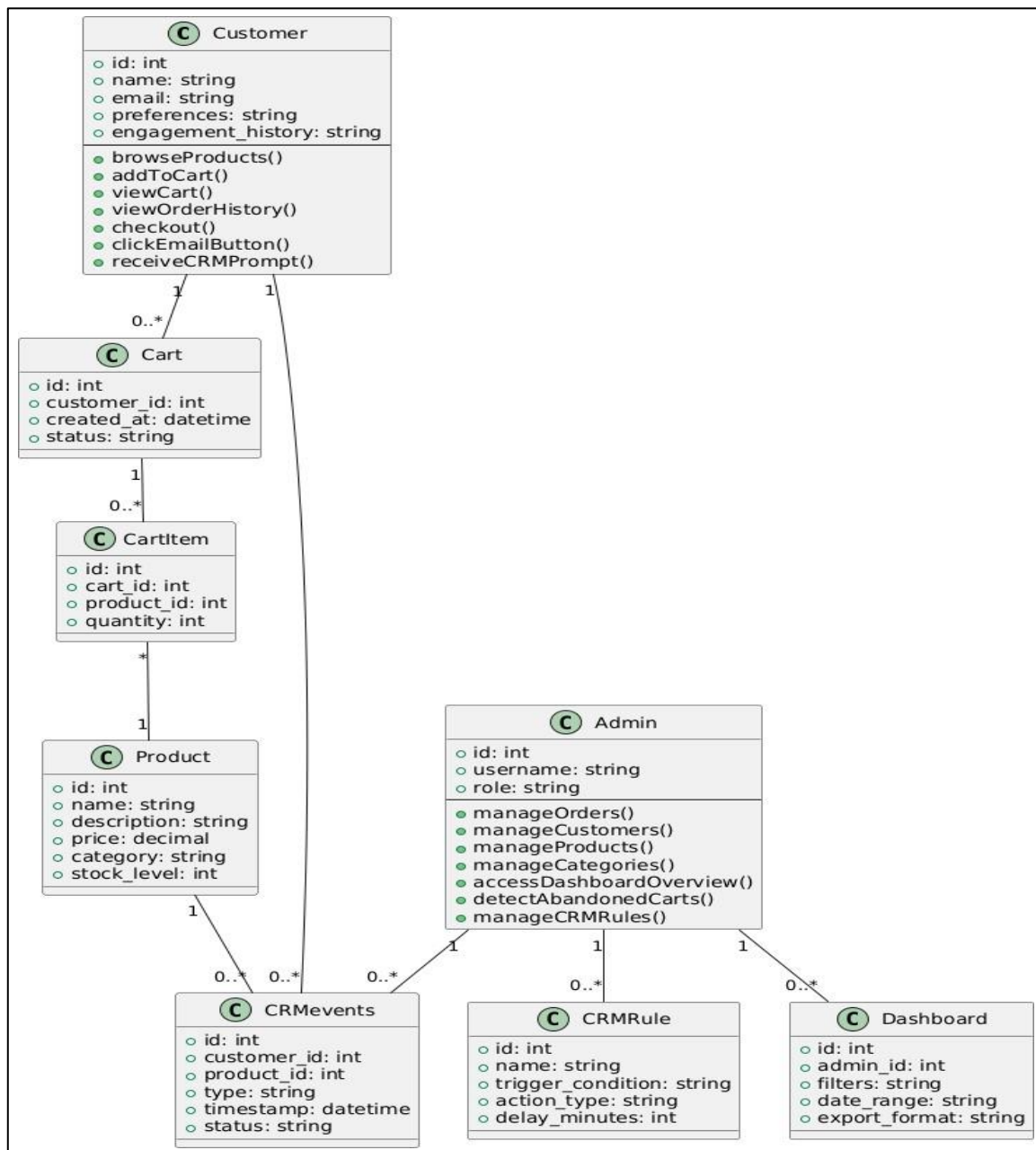


Figure 7:Class Diagram of our system)

Relational Schema :

Customer(id, name, email, preferences, engagement_history)

Cart(id, customer_id, created_at, status)

CartItem(id, cart_id, product_id, quantity)

Product(id, name, description, price, category, stock_level) **CRMevents**(id, customer_id, product_id, type, timestamp, status)

Admin(id, username, role)

CRMRule(id, name, trigger_condition, action_type, delay_minutes)

Dashboard(id, admin_id, filters, date_range, export_format).

II.1 Conclusion:

In conclusion, in this chapter, we conducted a comprehensive analysis and accurate modeling of our project to develop the application. We provided comprehensive answers to questions related to visualization and modeling, using the UML language as the primary tool in designing a variety of diagrams, including use case diagrams, activity diagrams, and class diagrams. These models are an important step toward achieving development goals efficiently and accurately

Chapter three

System Implementation

III.1 Introduction:

After completing the design and model of the program using the Unified Modeling Language (UML), this chapter reviews the details of the website development process, with a brief overview of the programming languages and tools used, in addition to explaining the integration of our website with the Hub Spot system.

III.2. Components of the work environment:

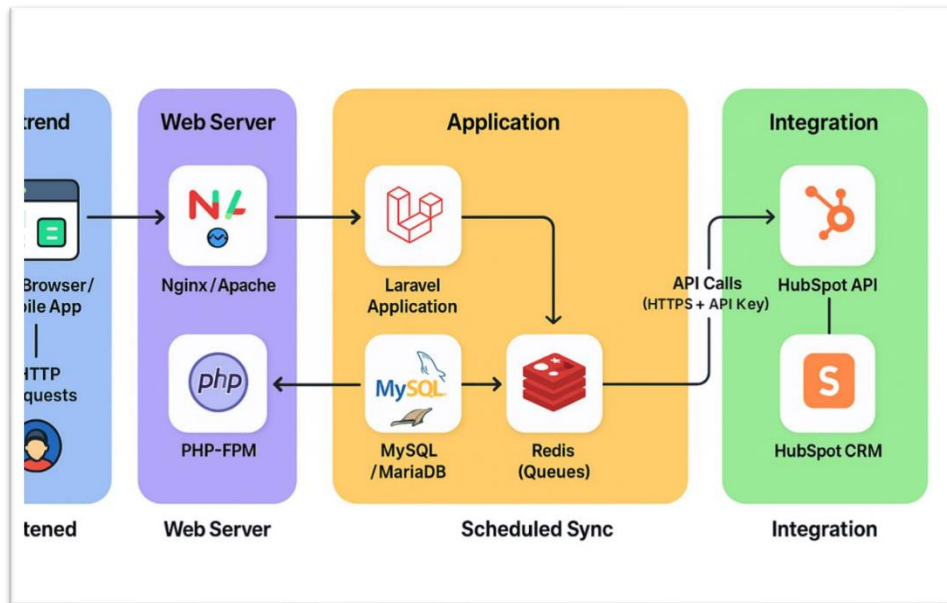


Figure 8: System architecture diagram

Frontend (User – Browser / Mobile App)

Represents the end users who browse the website or app via a browser or mobile application. They send HTTP requests (e.g., viewing a product, logging in, etc.) to the server.

Web Server

Uses two common servers—Nginx or Apache—to route incoming requests from users to the application. Also includes PHP-FPM (FastCGI Process Manager) to process Laravel’s PHP scripts.

This layer serves as the gateway through which all requests pass.

Application (Laravel App)

The heart of the system, where requests and data are handled. Depends on:

- **Laravel Application:** The framework responsible for business logic, such as

authentication, product display, payment processing, etc.

- **MySQL / MariaDB:** The database storing information (users, orders, products, etc.).
- **Redis (Queues):** Used for background tasks like sending emails or data synchronization—handled in a scheduled, efficient manner.

Scheduled Sync

Here, automatic synchronization of data (e.g., customers or transactions) with external platforms is configured.

Laravel pushes jobs into Redis queues, which process them later in an orderly fashion without slowing down the site.

Integration (HubSpot)

Data is sent from Laravel to the HubSpot API over a secure HTTPS connection using an API key. The HubSpot API enables the application to interact with HubSpot.

HubSpot CRM receives this data for storage and analysis and can later use it for marketing automation or customer support.

Process Flow Summary:

User submits a request via browser → Request arrives at the Web Server → Routed to the Laravel

application → Laravel interacts with the database and Redis → Redis queues trigger scheduled API calls to HubSpot → Data is stored and utilized in HubSpot CRM.

III.3 Used languages and frameworks:

1.3 For the website:

PHP:

The main server-side language; Bagisto is built on Laravel, which is a PHP framework.

JavaScript: Used for front-end interactivity and dynamic behavior.

Blade (HTML templating): Laravel's templating engine used to dynamically render HTML pages.

HTML/CSS: For building and styling the website's structure and design.

SQL (usually MySQL): For managing the database that stores products, users, orders, etc.

Laravel: It is a framework for developing web applications in the PHP language. Laravel is considered among the latest frameworks that are characterized by ease of use, flexibility, and power.

Vue.js: Used in some interactive parts of the front-end (e.g., admin panel).

Bootstrap: Used to design responsive and styled UI components.

Composer: PHP dependency/package manager.

MySQL / MariaDB: Default relational database for the project.

RESTful APIs: Bagisto provides ready-to-use APIs for mobile apps or third-party integrations.

XAMPP: It is an open source software package used to set up and run a local website.

Bagisto:

Bagisto is an open-source framework built on Laravel and Vue.js, designed for developing flexible and scalable e-commerce platforms. It supports multiple product types and advanced product attribute management via an intuitive admin panel. With omni-channel capabilities, it ensures a consistent shopping experience across websites, mobile apps, and POS systems.

Bagisto also enables multi-vendor marketplaces with centralized control over inventory, commissions, and reviews. It supports multiple languages and currencies, making it ideal for global markets. The platform offers headless commerce via robust APIs, allowing integration with any frontend like Vue.js or React. Additionally, it provides a rich ecosystem of extensions, including mobile apps, POS systems, B2B solutions, PWA, AR experiences, SaaS multi-tenant setups, and integration with generative AI tools.

2.3 Integration Tools:

HubSpot CRM: To manage customers and track their behavior.

JavaScript Tracking Code: To embed HubSpot tools into the website interface.

Laravel HTTP Client: To send data from the server to HubSpot.

HubSpot APIs: To interact directly with the system via APIs.

III.3 Explanation of Bagisto Integration with HubSpot:

In the context of integrating the Bagisto platform with the HubSpot CRM system, this integration aims to connect the e-commerce site built on Bagisto with HubSpot CRM in order to automate marketing, track customer behavior, and unify data between the two systems to deliver the best possible shopping experience. We have taken into account a number of key technical aspects to ensure a successful link and to make the most of both platforms. Below we present these aspects in detail.

III.4 Authentication Mechanism:

The integration between Bagisto and HubSpot in this project relies on using an **API Key** as the authentication method when calling HubSpot's APIs. This key is generated from the HubSpot account settings and is passed in every HTTP request header when sending data.

This method is straightforward and easy to use: the API key's privileges apply to all operations and grant access to core resources such as Contacts and Deals.

III.5 Data Sent from Bagisto to HubSpot:

Data is sent from the site according to the type of the configured events in the integration code

```
try {
    $hubspot = Factory::createWithAccessToken($apiKey);
    // Log::info('HubSpot Integration: Client created successfully for customer registration.');
```



```
    $contactProperties = [
        'email' => $customer->email,
        'firstname' => $customer->first_name,
        'lastname' => $customer->last_name,
        // 'phone' => $customer->phone, // Example
    ];
}
```

-Registering a new user after completing an order:

- Full Name
- Email Address
- Phone Number (optional)
- Registration Date

-Registering a new user after manually registering on the website

- Order Number
- Total Amount
- Payment Method
- Order Status
- Associated Customer Details

III.4 Event Triggering:

Sending events is a central part of the Bagisto–HubSpot integration, enabling the conversion of on-site user interactions into analyzable data within HubSpot.

This integration uses Laravel’s built-in **Events & Listeners** system to tie specific business logic to each event. When an event occurs in Bagisto (such as “User Registered” or “Order Completed”), the corresponding event object is fired, and its listener issues an API call to HubSpot to transmit the relevant data.

1.7 Workflow Example:

Through the scenario:

Registering a new user after completing an order: Scenario: A customer visits the store, registers, places an order, and after completing the purchase, an account is automatically created for them with the purchase details saved.

Registering a new user after manually registering on the website Scenario: The user creates an account manually from the registration page, and their account is automatically registered.

Code:

```
class EventServiceProvider extends ServiceProvider
{
    protected $listen = [
        'checkout.order.save.after' => [
            'Webkul\HubspotIntegration\Listeners\OrderPlacedListener',
        ],
        // Listen for customer registration event
        'customer.registration.after' => [
            'Webkul\HubspotIntegration\Listeners\CustomerRegisteredListener', // Point to the new listener
        ],
    ];
}
```

2.7.a Experiment Plan:

Among the services provided by the CRM system is the service of evaluating the performance of the online store in terms of the percentage of profits and sales and providing essential evaluations in order to improve this performance. Our goal of this experiment is to demonstrate the extent of the impact and effectiveness of this system in low-income online stores.

2.7.a Experiment data:

2.7.b A:Scenario 1 (Month 1 Before)):

Action	Quantity	Notes
Product Views	300	Mostly from social media, but poorly described products
Cart Additions	50	Customers like items, but unsure due to unclear info
Abandoned Carts	45	Price too high, lack of trust
Completed Purchases	5	Extremely low conversion
Email Opens	40	Campaigns not engaging
Email Clicks	5	Weak CTA
Revenue	5000dz	Weak month

B:Scenario 2: (Month 2 (After)):

Action	Quantity	Notes
Product Views	350	Better product descriptions and photos
Cart Additions	120	Users more confident
Abandoned Carts	20	Pricing improved, trust gained
Completed Purchases	70	Excellent result
Email Opens	150	Engaging subject lines
Email Clicks	100	Targeted CTA
Revenue	7000dz	Strong growth

2.7.b Experiment statistics:

- Poor user interaction performance (Before):
- Optimal user interaction performance (After):

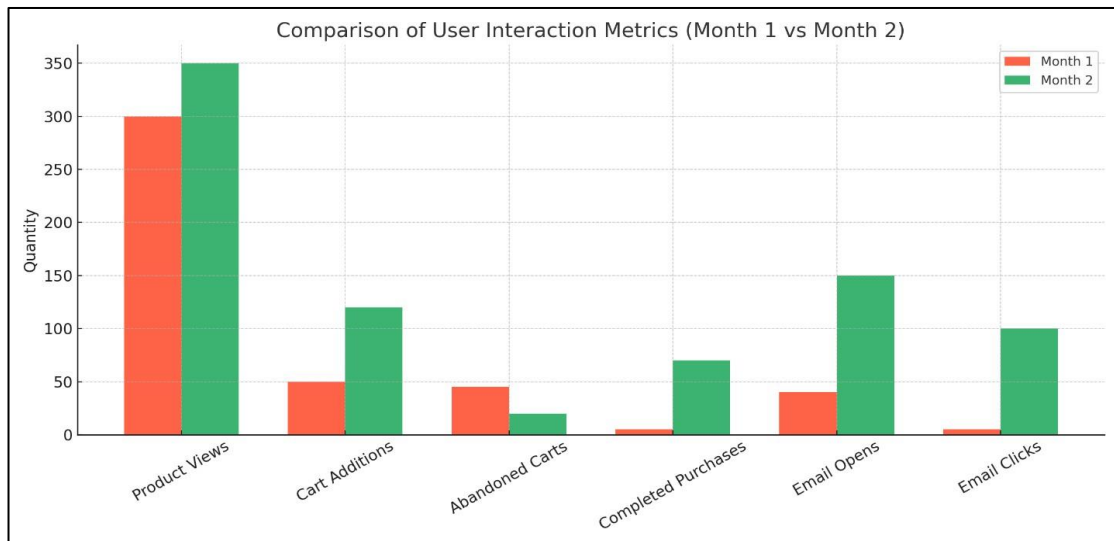


Figure 9: shows statistics comparing two different cases

Results: Significant improvements were recorded across all KPIs, including increased purchase conversion rates, reduced shopping cart abandonment rates, increased email open and click-through rates, and improved conversion rates from different traffic channels.

III.5 Entity Association:

To maintain accurate relationships between data, we use HubSpot's **Associations API** to link Deals (orders) with Contacts (customers). Whenever a new deal is sent to HubSpot, it is immediately associated with the correct contact ID, ensuring the data remains properly connected.

III.6 Integration Goals:

- Enable comprehensive tracking of visitor and customer behavior.
- Automate email marketing.
- Support targeted campaigns based on in-store user behavior.
- Customize registration and purchase events.

III.7 Why this integration?

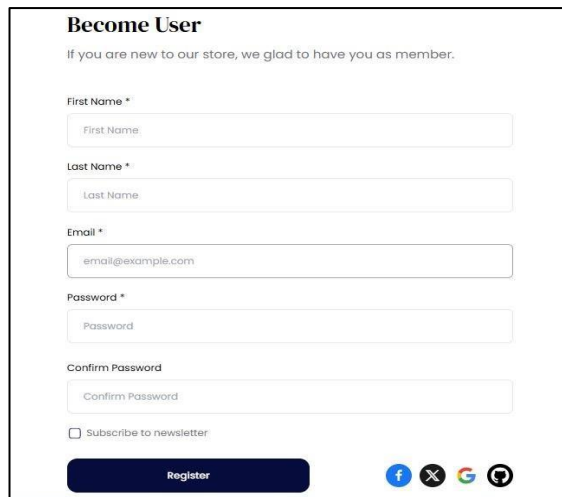
Improve customer experience: By accurately tracking customer behavior and delivering personalized content.

Increase sales: Through marketing automation based on different touchpoints.

Performance analysis: Correlating purchases and registrations with HubSpot reports provides a deeper understanding of your audience.

Audience segmentation: Post-purchase registrants can be targeted with different personalized campaigns than pre-purchase registrants.

III.8 Main interfaces of the site:



The registration form is titled "Become User" and includes a welcome message: "If you are new to our store, we glad to have you as member." It contains five input fields: "First Name *", "Last Name *", "Email *", "Password *", and "Confirm Password". Below these fields is a checkbox for "Subscribe to newsletter". A dark blue "Register" button is at the bottom left, and social media icons for Facebook, Twitter, Google, and YouTube are at the bottom right.

Figure 10: New customer registration interface

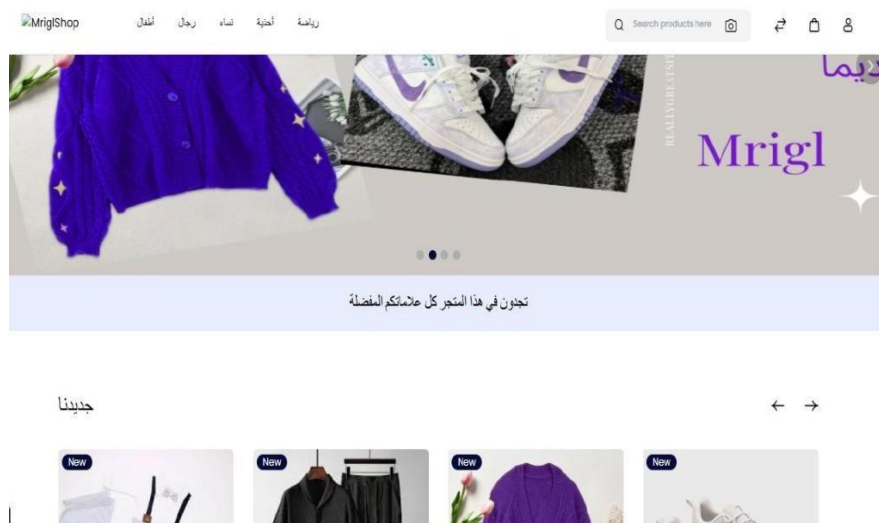


Figure 11: Front-end of the online store

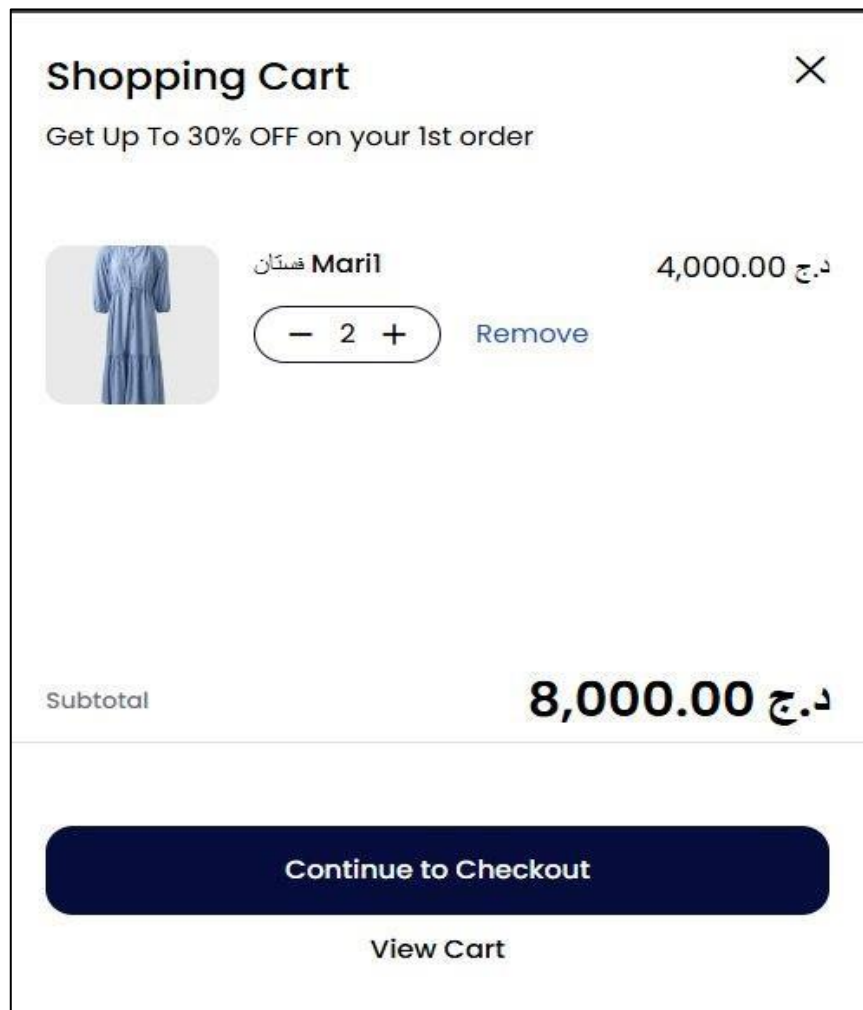


Figure 12: Order Details and Discount Offers)

☒ Use same address for shipping?
 Proceed

Shipping Method



20.00 ج.د

Flat Rate - Flat Rate Shipping



0.00 ج.د

Free Shipping - Free Shipping

Payment Method



Cash On Delivery

Cash On Delivery



Money Transfer

Money Transfer



PayPal Standard

PayPal Standard



PayPal Smart Button

PayPal

Cart Summary



فستان Maril

2 × 4,000.00 ج.د

Subtotal	8,000.00 ج.د
Coupon Discount	Apply Coupon
Delivery Charges	20.00 ج.د
Tax	0.00 ج.د
Grand Total	8,020.00 ج.د

Place Order

Figure 13: Order summary and payment and shipping method selection

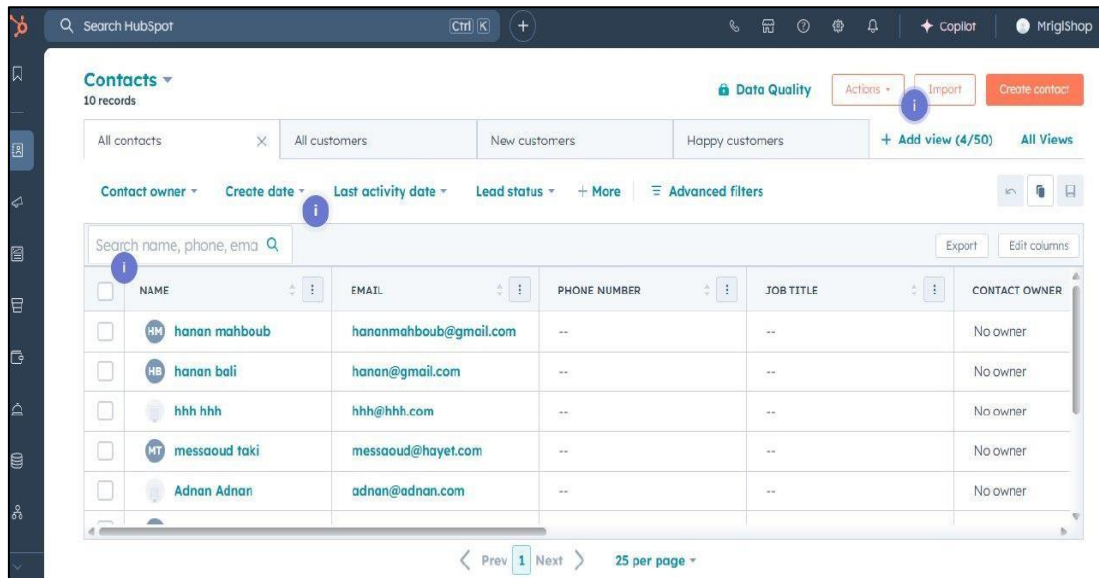


Figure 14: HubSpot Contact Management Interface: Overview of All Registered Customers

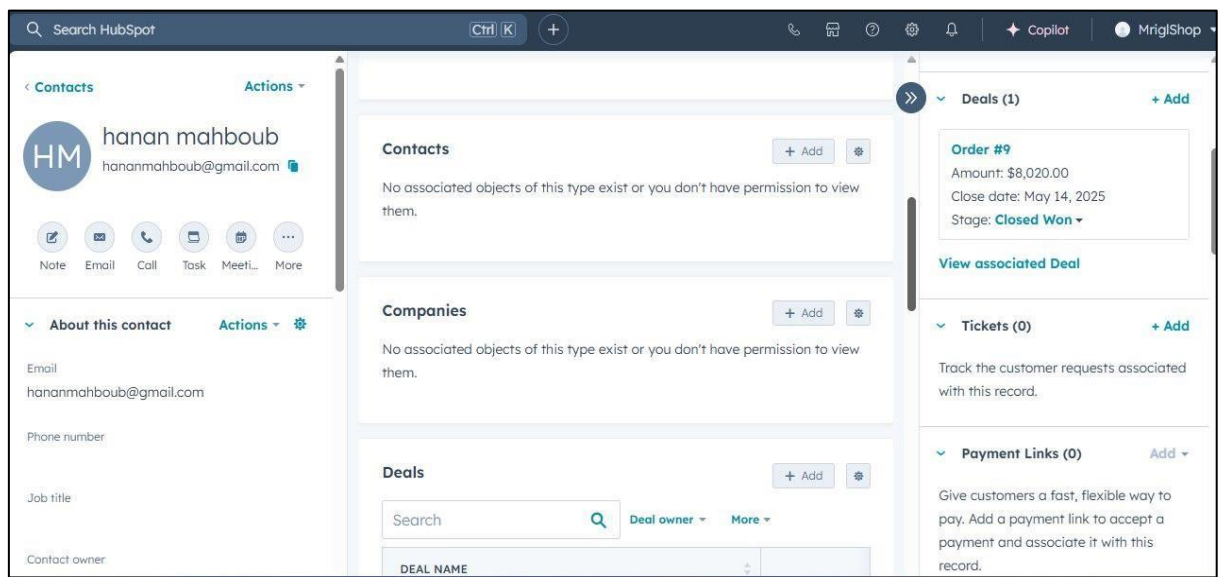


Figure 15 Detailed Contact Profile in HubSpot: Customer Information and Closed Deals

GENERAL CONCLUSION

GENERAL CONCLUSION

This study aims to highlight the role of Customer Relationship Management (CRM) systems in supporting and enhancing e-commerce platforms, especially in the face of intense competition and rising customer expectations in the digital era. On the theoretical side, the study clarified CRM concepts and their importance in understanding user behavior, personalizing services, and building long-term relationships.

On the practical side, we conducted a case study of an e-commerce website, analyzing its needs and proposing a suitable CRM system. UML models were used to design the functional structure of the system. The system was then implemented and evaluated based on several criteria related to improving user experience, tracking customer orders, and retrieving data.

The results showed that integrating a CRM system within an e-commerce environment effectively enhances customer interaction, increases satisfaction, and boosts customer retention. Moreover, the system provides a strong foundation for improving digital marketing campaigns and making data-driven decisions.

Based on these findings, it can be concluded that adopting CRM in e-commerce platforms is no longer optional but a strategic necessity for achieving excellence and sustained success. This work could be further expanded in the future to incorporate artificial intelligence and big data analytics, aiming for a smarter and more interactive customer experience.

THE REVIEWER

THE REVIEWER

- Survey Link : <https://forms.gle/rbu2ftNqKxT55U8V6>

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[16] site PHP : <https://www.php.net>

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EXTENSION

Extension

Graduation thesis questionnaire :

	
استبيان خاص بمذكرة تخرج karouimaria39@gmail.com Changer de compte  * Indique une question obligatoire	* ما رأيك في التجارة الإلكترونية  ☐ جيدة ☐ سيئة
Adresse e-mail * Votre adresse e-mail	* هل تفضل الشراء عبر الانترنت؟ ☐ نعم ☐ لا ☐ نادرا
* ما رأيك في التجارة الإلكترونية 	ماهي التحديات التي واجهتك في التجارة الإلكترونية بصفتك تاجر او زبون Votre réponse  docs.google.com

أي الميزات التي أعجبتك فيه؟

☐ واجهته سهلة الاستخدام

☐ الدعم الفني

☐ الثقة والمصداقية

☐ البحث على المنتج بسرعة

☐ Autre : _____

تحدث عن الميزات التي لم نضعها في خانات الاختيار

Votre réponse

ما هي وسيلة التواصل التي تفضلها مع خدمة العملاء؟

☐ الدردشة المباشرة

☐ البريد الإلكتروني

☐ المكالمات الهاتفية

☐ وسائل التواصل الاجتماعي

* ماذا تفضل في التسوق الرقمي *كونك بائع*

☐ عبر صفحات التواصل الاجتماعي

☐ عبر موقع الكتروني

☐ تطبيقات الجوال

☐ Autre : _____

* ماذا تفضل في التسوق الرقمي *كونك مشتري*

☐ عبر صفحات التواصل الاجتماعي

☐ عبر موقع الكتروني

☐ تطبيقات الجوال

☐ Autre : _____

أي موقع تجاري تفضل التعامل معه

☐ واد كنيس

☐ jumia algerie

☐ hanooty

☐ Autre : _____

* كيف تقيم جودة خدمة العملاء فيه

رديئة

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

6 ☐

7 ☐

8 ☐

9 ☐

10 ☐

جيدة جدا

* هل هناك أي تحسينات ترغب في رؤيتها في هذا الموقع

Votre réponse



docs.google.com

* اختر مايناسب

هل تعتقد ان

العروض

الترويجية

والخصومات

فعالة؟

هل كانت

عملية

التسجيل

سلسة؟

هل يمكنك

التواصل مع

البائع بعد

الشراء

نعم

☐☐☐

لا

☐☐☐

هل تشعر بالأمان عند الدفع عبر الأنترنت في مواقع التجارة الإلكترونية الجزائرية بصفة عامة؟

☐ نعم , تماما

☐ نعم , الى حد ما

☐ لا, لدي بعض المخاوف

☐ لا, لا اثق في الدفع الالكتروني



هل هناك مشاكل واجهتك من خلال تعاملك مع هذا ..
الموقع يمكنك سردها

Votre réponse

* هل يمكنك تقييم المنتجات بعد شرائها ؟

Votre réponse

هل واجهت مشكلات تتعلق بجودة المنتجات المستلمة
مقارنة بالوصف؟

- ☐ نعم، غالباً
- ☐ أحياناً
- ☐ نادراً
- ☐ أبداً

عموماً، ما هي أكثر الجوانب التي ترغب في تحسينها
في مواقع التجارة الإلكترونية الجزائرية؟

- ☐ تحسين خدمة العملاء
- ☐ تقليل وقت التوصيل
- ☐ توفير خيارات دفع أكثر أماناً
- ☐ تحسين جودة المنتجات ومطابقتها للوصف
- ☐ توفير مراجعات موثوقة للمنتجات
- ☐ Autre : _____

* هل سبق أن تعرضت لعملية احتيال أو اختراق بيانات
أثناء الشراء عبر الإنترنت؟

- ☐ نعم
- ☐ لا

* هل ترغب في تلقي اشعارات حول العروض الجديدة
والمنتجات المضافة؟

Votre réponse

Envoyer

Effacer le formulaire