**DEVELOPMENT AND IMPLEMENTATION OF A WINDOWS**

**DESKTOP APPLICATION FOR REAL-TIME GAZE TRACKING ON A**

**LAPTOP SCREEN AS AN ADDITIONAL METHOD OF PROCTORING**

**ONLINE TESTS AND EXAMINATIONS**



By

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In partial fulfillment of the requirement for the degree Bachelor of Science in Computer Science

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**DECLARATION BY AUTHOR**

I certify that this work has not been accepted in substance for any degree and is not concurrently being submitted for any degree other than that of Bachelor of Science in Computer Science being studied at the Department of Computer Science, School of Arts & Science, University of Central Asia, Kyrgyz Republic. I also declare that this work is the result of my own findings and investigations except where otherwise identified by references and that I have not plagiarized another’s work.

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**DECLARATION BY SUPERVISORS**

I, the undersigned hereby certify that I have read this project report and finally approve it with recommendation that this report may be submitted by the authors above to the final year project evaluation committee for final evaluation and presentation, in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science at the Department of Computer Science, School of Arts & Sciences, University of Central Asia, Kyrgyz Republic.

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# ABSTRACT

ABSTRACT

This paper introduces a pioneering final year project focused on developing an e-commerce platform tailored for Central Asia, starting with Tajikistan. The primary aim is to revolutionize the local online shopping landscape by introducing an Amazon-like platform that offers an array of high-quality products, particularly branded clothing, at more affordable prices than existing international e-commerce giants. This initiative stems from the noticeable absence of premium brand apparel in Tajikistan, where consumers often face exorbitant prices due to high import costs from countries like Russia.

In addition to fashion, the platform will revolutionize grocery shopping in Tajikistan, starting in Suchan, Gorno-Badakhshan Autonomous Region, by offering a convenient online ordering and delivery service. This service aims to cater to the busy lifestyle of modern consumers, with free delivery for orders over 1000 somoni, setting a precedent for online grocery shopping in the region.

The project's objectives encompass thorough market research, platform development, efficient logistics and supply chain management, quality assurance, enhancing customer experience, ensuring robust security, and aggressive marketing and outreach. The methodology includes the Agile approach for software development, responsive web design, quality assurance, DevOps, and security best practices.

The ultimate goal of this project is not only to provide a convenient and efficient shopping experience but also to stimulate economic growth in Tajikistan by boosting the local fashion industry and offering a platform for both local and international brands. This paper will delve into the challenges and successes encountered during the development process, providing insights and valuable resources for future contributors and researchers in the burgeoning field of e-commerce platform development.

*Keywords:* E-Commerce, Machine Learning, Online Shopping, Top-brand Clothing, Tajikistan Online Shopping, Fast Shipping, Online Grocery Shopping, Delivery, Discounts, Promotions, Software Development, Problem Solving, Innovation, New Business Model.

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# CHAPTER 1. INTRODUCTION

As we delve into the digital era, the landscape of commerce and consumer behavior is undergoing a profound transformation. E-commerce, a once-nascent field, has rapidly evolved into a cornerstone of retail and trade, particularly evident in the global context. However, in regions like Central Asia, and more specifically Tajikistan, the growth of e-commerce has been markedly slower. This disparity presents both a challenge and an opportunity, especially considering the evolving consumer needs and the potential for digital platforms to reshape the shopping experience.

## 1.1 Background

The global surge in e-commerce has revolutionized how consumers interact with markets, offering unprecedented access to a wide range of products. Despite this, Tajikistan's entry into this digital marketplace has been sluggish. This is particularly notable in the context of high-quality, branded clothing - a sector that is underserved and often prohibitively expensive due to import complexities. This gap signifies a significant opportunity to bring a more inclusive and efficient online shopping experience to the region.

## 1.2 Problem Statement

In Tajikistan, the hurdles faced by online shoppers are manifold. Exorbitant import costs lead to inflated prices for desirable goods. For example, a customer in Dushanbe purchasing a top-brand garment from Russia might incur costs up to three times the original price, including import duties and shipping expenses. Additionally, the lack of local options forces consumers, particularly in regions like Khorog, to settle for less desirable alternatives. The challenge extends beyond fashion, as the busy lifestyles of many, such as those in Suchan, GBAO, limit their capacity to shop for daily necessities.

## 1.3 Objectives

The main goal of this project is to establish a comprehensive online shopping platform, specifically for Central Asian consumers, starting with Tajikistan. This platform aims to:

- Facilitate access to high-quality, branded clothing, addressing the issues of high import costs and limited availability.

- Provide an efficient online solution for the delivery of groceries and daily essentials, tailored to the needs of consumers with busy lifestyles.

- Contribute to Tajikistan's economic development by enhancing the fashion industry and creating opportunities for both local and international brands.

## 1.4 Scope of the Project

Initially, the focus will be on launching a robust online platform in Tajikistan, offering a varied selection of products including branded clothing and groceries. The project will consider:

- Tackling the challenges of import taxes and shipping to ensure competitive pricing.

- Tailoring the product range to reflect local preferences and tastes.

- Developing a delivery system that caters to both urban and rural areas, with incentives like free delivery for orders exceeding 1000 somoni.

## 1.5 Methodology

To meet these objectives, the project will adopt a multi-faceted approach, including:

- Conducting market research to understand the specific demands and preferences of Tajik consumers.

- Building partnerships with both local and international suppliers to ensure a broad product selection.

- Implementing technology solutions to create a user-friendly online platform, efficient payment processing, and a reliable delivery network.

This project aspires to bridge the e-commerce gap in Central Asia, offering a shopping experience uniquely tailored to the region's specific needs and preferences, and in doing so, reshaping the consumer landscape in Tajikistan.

# CHAPTER 2.Literature Survey:

**Note**: Literature survey must be used as an introduction to the subject area and provide current research status in the field. Explain the context of the problem-solution to be implemented and how it going to be used. The depth and quality of your literature survey is going to affect your grade for Midterm exam.

Electronic commerce (e-commerce) has fundamentally changed consumer behavior worldwide, offering unprecedented convenience in online shopping (Amin, Kansana, & Majid, 2016, *A Review Paper on E-Commerce*. Despite being very famous, Central Asia—and particularly Tajikistan—remains largely unexplored in this part. Major players like Alibaba and Tencent are eyeing this market gap (Xiao et al., 2018), emphasizing the importance of user-interface and customer interaction (Kalaskar et al., 2023) and integration with local financial systems (Yaqoob et al., 2019). These insights form the foundation for our Final Year Project (FYP), which aims to address the following research question: "How can a tailored e-commerce platform serve the specific needs of the Central Asian market, starting with Tajikistan?" Our methodology includes a market survey, interface design testing, and partnerships with local financial institutions. We aim to contribute to the field by offering a localized e-commerce solution.

First of all, in 2018 paper, Xiao et al. explores the opportunities for Chinese online retail businesses to branch out into Central Asia. These discussions often encompass the readiness of the market, local cultural aspects, and strategic geopolitics such as the Belt and Road Initiative. However, these investigations often make broad assumptions about Central Asia, neglecting unique situations in individual countries like Tajikistan. Our venture seeks to address this oversight by crafting a specialized approach for the Tajikistan market, initially concentrating on the strong consumer interest in name-brand apparel.

Additionally, the economic landscape of Central Asia presents distinct hurdles for the adoption of online shopping. Elevated import duties and shipping costs can often inflate the final price of goods by threefold, placing financial strain on the customer base. This problem is more pronounced in Tajikistan, where the availability of high-quality, brand-name clothing is both scarce and costly. “According to data from 2018, Tajikistan has shown significant progress in the field of digital governance compared to 2016, including an 8-point improvement in its rankings” (Қурбонов & Исматуллои, 2020).SO we can be sure that our website will be successfully operating as more and ore people are now making purchase online Our project will explore partnerships with local suppliers as well to provide our customers with local goods as well as branded.

Next, Kalaskar et al. (2023) underscore the significance of customer engagement and appealing aesthetics in shaping the success of online retail platforms. In line with this, our FYP aspires to construct an intuitive and user-friendly interface specifically designed for Central Asian, and particularly Tajik, consumers.

Furthermore, Yaqoob et al. (2019) stress the critical role of partnerships with domestic financial infrastructures for secure financial transactions. Expanding on this understanding, our initiative intends to incorporate prevalent payment solutions in Tajikistan, such as the Dushanbe City card, to offer an uninterrupted shopping journey for our patrons.

Another obstacle to the adoption of e-commerce in Central Asia is the gap in digital know-how. Investigations by Chib et al. (2018) imply that educational materials and approachable platforms are crucial for closing this knowledge gap. Our interface plans to feature educational content to assist newcomers in understanding the nuances of the e-commerce environment.

My project aims to fill existing research gaps by adopting a localized approach to e-commerce in Central Asia, initially focusing on the Tajik market's specific needs for quality branded clothing and convenient food delivery. We challenge prevailing China-centric models and aim to catalyze digital and economic development in Tajikistan, rather than merely serving its retail needs. Guided by this integrated review of existing literature, we are well-positioned to make significant contributions to both the e-commerce landscape and Tajikistan's broader developmental goals.

## 2.1 Overview of Related Work

In Xiao et al.'s 2018 study, I discovered the potential for Chinese online retail businesses in Central Asia, focusing on the market's readiness, local cultural aspects, and strategic geopolitics.

Kalaskar et al.'s 2023 research highlighted the critical importance of customer engagement and appealing aesthetics in online retail platforms, a concept I plan to integrate into my project.

Yaqoob et al., in their 2019 publication, emphasized the vital role of integrating domestic financial structures for secure transactions, guiding my approach towards financial integration.

Through Қурбонов & Исматуллои's 2020 findings, I understood the significant digital governance advancements in Tajikistan, indicating a ripe market for my e-commerce venture.

Chib et al.'s 2018 investigation into the digital knowledge gap influenced my decision to include educational content on my platform.

## 2.2 Key Concepts and Definitions

E-Commerce: I define this as the practice of online buying and selling, a central concept of my project.

Digital Governance: This term, crucial in my research, refers to the government's role in digital infrastructure, particularly relevant to my focus on Tajikistan.

Consumer Engagement: My project will employ strategies to involve customers actively, a concept I learned is key for online retail success.

Financial Integration: Integrating local payment methods into my e-commerce platform is vital, ensuring ease of transaction for Tajik users.

## 2.3 Existing Solutions and Limitations

I observed a market dominance by large players like Alibaba, which often overlooks specific local needs, a gap I intend to fill.

My research highlighted economic challenges in Tajikistan, such as elevated import duties, influencing my approach to local supplier partnerships.

The digital knowledge gap in Tajikistan, evident in existing literature, prompted me to consider incorporating educational elements into my platform.

## 2.4 Gap Analysis

I aim to cater to localized needs in Tajikistan, focusing on quality branded clothing and food delivery, areas neglected by existing e-commerce models.

My project involves developing a user interface tailored to Tajik consumer preferences, a niche yet unexplored by current e-commerce giants.

Addressing the educational aspect, I plan to include content that helps users navigate and understand the e-commerce environment, bridging the identified knowledge gap.

Through this literature review, I've gained a comprehensive understanding of the e-commerce landscape and identified specific challenges and opportunities in the Tajik market. This research underpins my project's goal to develop a localized e-commerce solution for Tajikistan, catering to its unique market needs and consumer preferences.

# CHAPTER 2. LITERATURE REVIEW

The burgeoning field of e-commerce has seen significant advancements globally, yet its penetration into Central Asia, especially in Tajikistan, remains limited. This review explores the current research status in e-commerce, focusing on the challenges and opportunities specific to the Central Asian market, with a particular emphasis on Tajikistan.

## 2.1 Current State of E-commerce in Central Asia

E-commerce has revolutionized retail globally, offering unparalleled convenience and access to a vast array of products. However, in Central Asia, and Tajikistan in particular, the progress has been slow, marked by unique challenges and untapped potential (Amin, Kansana, & Majid, 2016). The significant gap in the market, especially in areas like branded clothing and local product availability, presents a unique opportunity for localized e-commerce solutions.

## 2.2 Challenges in the Tajik Market

The Tajik consumer faces several barriers in the e-commerce landscape. High import costs, compounded by shipping fees and taxes, significantly inflate the prices of desired goods (Қурбонов & Исматуллои, 2020). Additionally, the limited availability of quality products and the lack of a tailored online shopping experience further exacerbate these issues. These challenges underscore the need for an e-commerce platform that caters specifically to the Tajik market.

## 2.3 Proposed Solutions and Innovations

Research suggests that successful e-commerce platforms in similar markets focus on user-friendly interfaces, integration with local financial systems, and a strong understanding of local consumer preferences (Kalaskar et al., 2023; Xiao et al., 2018; Yaqoob et al., 2019). These insights guide our approach in developing an e-commerce platform tailored for Tajikistan, encompassing easy access to top-brand clothing, efficient grocery delivery, and catering to local tastes and financial practices.

## 2.4 The Role of Digital Governance in E-commerce Adoption

Tajikistan's progress in digital governance, including improvements in online services and digital infrastructure, indicates a growing readiness for e-commerce adoption (Қурбонов & Исматуллои, 2020). This progress provides a solid foundation for our project, suggesting a favorable environment for the introduction of a localized e-commerce platform.

## 2.5 Comparative Analysis of Existing Solutions

Existing e-commerce platforms, while offering a range of services and products, often fail to address the specific needs of the Tajik market. Our project aims to fill this gap by providing a platform that focuses on local preferences, offers competitive pricing, and includes features tailored to the Tajik consumer, such as integration with local payment systems and a user-friendly interface designed for the Tajik market.

## 2.6 Potential Impact and Future Directions

The implementation of a localized e-commerce solution in Tajikistan has the potential to significantly impact the retail landscape. By addressing the specific needs of Tajik consumers, our project aims to provide a seamless online shopping experience, stimulate the local economy, and pave the way for further digital advancements in the region.

## 2.7 Summary of Literature Review

This review highlights the unique challenges and opportunities in developing an e-commerce platform for Tajikistan. By analyzing current research and market trends, we have identified key areas of focus for our project, including user experience, local integration, and market-specific features. Our approach aims to bridge the gap in the e-commerce market in Tajikistan, catering to its unique needs and setting a precedent for future digital development in the region.

# CHAPTER 3. PROJECT IMPLEMENTATION

Here's a detailed breakdown of its functionalities that are working as of now:

1. User Registration and Login

- Sign-Up Process Users can create an account by providing basic information such as name, email, and a secure password. An optional phone number field is available for order updates.

- Login Registered users can log in using their email and password. The platform will also support login through social media accounts for convenience.

- Account Management Users can update their profile, change passwords, and manage addresses for delivery.

2. Homepage and Navigation

- The homepage features a clean, user-friendly design with a focus on easy navigation.

- Search Bar At the top, a prominent search bar allows users to quickly find products.

- Dropdown Menus Dropdown menus categorize products into various segments like clothing, electronics, groceries, etc., for easy browsing.

- Featured Products and Deals The homepage highlights featured products, ongoing deals, and recommended items based on user browsing history.

3. Product Searching and Categories

- Users can search for products using keywords. The search functionality includes filters such as price range, brand, and customer ratings.

- Each category (e.g., electronics, fashion, home essentials) has its dedicated section with further subcategories for refined searching.

4. Product Pages

- Each product has its own page featuring detailed descriptions, high-quality images, customer reviews, and rating scores.

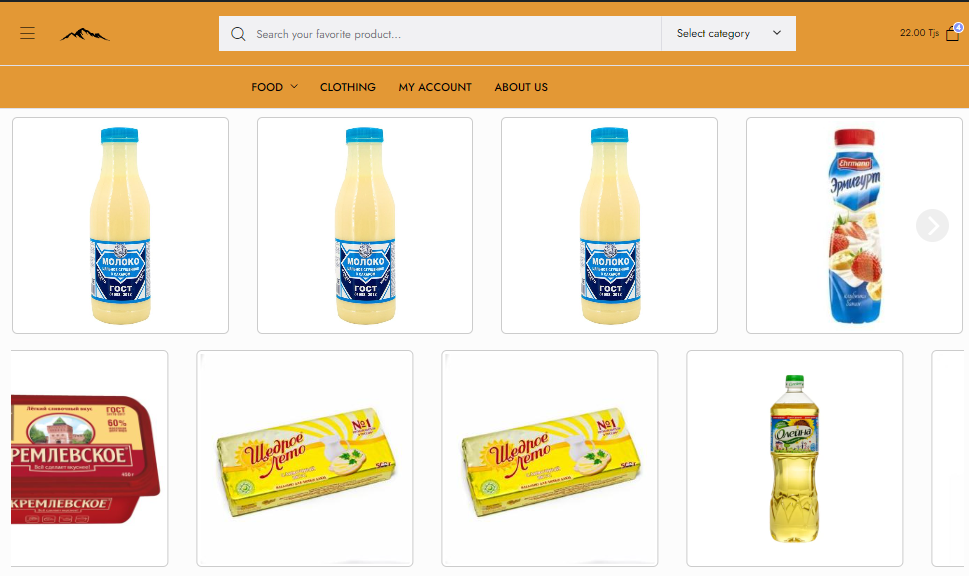
- Product pages provide information on availability, shipping options, and estimated delivery times.

5. Adding to Cart and Checkout

- Users can add products to their cart with a single click. The cart icon is accessible from any page for easy review of selected items.

- During checkout, users can choose their delivery address, select payment options, and review their order before final confirmation.

This e-commerce platform is designed to offer a comprehensive, convenient, and secure online shopping experience, catering specifically to the needs and preferences of consumers in Tajikistan. The focus on localizing content, integrating regional payment methods, and providing a user-friendly interface positions this platform as a significant player in the Tajik e-commerce market.



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A screenshot of a food store

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A screenshot of a shopping cart

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# CHAPTER 4. Conclusion and Future Work

## 4.1 Summary of Findings

In this project, I developed an online shopping platform specifically for the Central Asian market, with an initial focus on Tajikistan. Key findings include:

There is a significant demand for top-brand clothing and convenient online grocery shopping in Tajikistan.

High import costs and limited local options have been major barriers to the adoption of e-commerce in the region.

A localized e-commerce platform can effectively address these issues and cater to the unique needs of the Tajik market.

## 4.2 Contributions and Achievements

My contributions through this project include:

Creating a tailored e-commerce solution that mitigates high import costs and offers a wide variety of products.

Establishing partnerships with both local and international suppliers to enhance product availability.

Implementing a user-friendly interface and efficient delivery system, making online shopping accessible and convenient.

## 4.3 Limitations and Constraints

The project faced several limitations:

Geographical challenges in reaching remote areas of Tajikistan.

Limited access to advanced technological resources in some regions.

Navigating the complexities of international trade and customs regulations.

## 4.4 Recommendations for Future Work

For future expansion and improvement, I recommend:

Exploring more advanced technological solutions, such as AI and machine learning, for personalized shopping experiences.

Expanding the platform's reach to other Central Asian countries, adapting to their specific market needs.

Developing a more robust logistics network to ensure efficient and timely deliveries across all regions.

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