Online Auction App

Final Year Project Report

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In partial full fillment of the requirements for the degree of
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Faculty of Engineering Sciences and Technology

Hamdard Institute of Engineering and Technology

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Certificate of Approval

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This project "Online Auction App" is presented by Bismah Imran, M.Umair, Maham Mirza under the supervision of their project advisor and approved by the project examination committee, and acknowledged by the Hamdard Institute of Engineering and Technology, in the fulfillment of the requirements for the Bachelor degree of Computer Science.

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Authors' Declaration

We declare that this project report was carried out in accordance with the rules and regulations of Hamdard University. The work is original except where indicated by special references in the text and no part of the report has been submitted for any other degree. The report has not been presented to any other University for examination.

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Plagiarism Undertaking

We, M.Umair, Bismah Imran, and Maham Mirza solemnly declare that the work presented in the Final Year Project Report titled Online Auction App has been carried out solely by ourselves with no significant help from any other person except few of those which are duly acknowledged. We confirm that no portion of our report has been plagiarized and any material used in the report from other sources is properly referenced.

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Maham Mirza

Acknowledgments

Document Information

Table 1: Document Information

Customer	
Project Title	Online Auction App
Document	Final Year Project Report
Document Version	1.0
Identifier	FYP-026/FL24 Final Report
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Definition of Terms, Acronyms, and Abbreviations

- **Auction**: A process of selling items to the highest bidder through bidding, replicated digitally in the app.
- **Real-time Bidding**: Instant updates and bid placements, enabling a dynamic auction environment.
- **Firebase**: A cloud-based platform for app backend operations, including authentication and real-time data.
- **Flutter**: A UI toolkit used for building responsive and cross-platform applications.

- **Dart**: Programming language used with Flutter for app development.
- **Mobile Compatibility**: The ability of the app to function smoothly on smartphones and tablets.
- **Chat System**: An in-app messaging feature enabling direct communication between buyers and sellers.
- **Encryption**: A security feature converting data into a secure format to prevent unauthorized access.
- **Notifications**: Alerts sent to users about auction updates, bids, or messages.
- **Admin Module**: A backend feature for administrators to manage auctions, users, and disputes.

Abstract

The **Online Auction App** is a modern platform that makes buying and selling items more engaging and flexible. Unlike traditional shopping websites with fixed prices, this app allows users to bid for items in real-time, ensuring competitive deals for buyers and better profits for sellers. Built with mobile users in mind, the app provides a user-friendly experience with features like instant notifications, secure logins, and a chat system for direct communication. Backed by reliable technologies like Firebase and Flutter, it ensures smooth and secure operations. Whether you're looking to buy unique items or sell to a wider audience, the app offers an exciting and interactive auction environment.

Table of Contents

List of Figures

List of Tables

CHAPTER 1

INTRODUCTION

The Online Auction App is a cutting-edge platform designed to make buying and selling items easier and more exciting. Unlike traditional e-commerce websites where items have fixed prices, this app allows users to participate in live auctions, giving buyers the chance to snag great deals and sellers the opportunity to get the best possible price for their items. Whether you're looking to auction off collectibles, electronics, or even vehicles, this app offers a seamless and fun way to connect with potential buyers and sellers from anywhere.

One of the key features of the app is its real-time bidding system. Users can see the current bids and place their own offers in a matter of seconds. This creates a dynamic marketplace where competition drives better prices for everyone. To keep things secure and organized, the app also has user profiles, where buyers and sellers can manage their information, track their bidding history, and communicate directly through a built-in chat system. Notifications keep users updated on the status of their auctions, ensuring they never miss out on important updates.

Designed for mobile devices, the app is accessible and easy to use, even for those who are always on the go. It is built using modern technology to ensure fast and reliable performance, with a focus on keeping user data safe and secure. Whether you're a seasoned bidder or just getting started, the Online Auction App provides a simple, secure, and engaging way to explore the world of online auctions.

1.1 Motivation

The motivation behind developing the Online Auction App stems from the need to create a more interactive and flexible marketplace for buying and selling goods. Traditional e-commerce platforms often lack the dynamic nature of auctions, where buyers can bid for items and potentially get them at a lower price, while sellers can benefit from competitive bidding. The app aims to bridge this gap by providing a platform that offers real-time bidding, enhancing the shopping experience for both buyers and sellers. It encourages a fair marketplace where users can engage more actively and enjoy the thrill of auctions from the comfort of their mobile devices.

1.2 Problem Statement

Current e-commerce applications typically operate on fixed pricing models, which do not allow for price negotiation or bidding. This static pricing approach limits both buyers and sellers, as buyers cannot compete for better deals, and sellers cannot maximize their profits through competitive bidding. The absence of a real-time auction system in most e-commerce apps creates a gap in the market, leaving users seeking more dynamic and flexible options. The Online Auction App addresses this issue by introducing a platform that facilitates real-time bidding, thereby creating a more engaging and profitable environment for all users.

1.3 Goals and Objectives

The primary goal of the Online Auction App is to provide a secure, user-friendly platform for online auctions, where users can buy or sell goods dynamically through bidding. The objectives include:

- Enhancing the buying experience by offering competitive deals through real-time auctions.
- Empowering sellers to maximize their profits by reaching a broader audience and receiving competitive bids.
- Facilitating real-time interactions between buyers and sellers for negotiations and updates.
- Ensuring the app is optimized for mobile devices, providing a seamless user experience on the go.

1.4 Project Scope

The project scope encompasses several key features and functionalities to ensure a comprehensive online auction platform:

- **User Management**: Users can register, log in, and manage their profiles securely.
- **Auction Listings**: Users can list items for auction, including details like start and end times, and minimum bids.
- **Bidding**: The app supports real-time bidding, allowing users to place and track bids dynamically.
- **Chat System**: Buyers and sellers can communicate through a chat system to negotiate and discuss terms.
- **Administration**: An admin module to manage user accounts, auctions, and resolve disputes.
- **Notifications**: Real-time notifications for updates on bids and auction statuses.
- **Mobile Compatibility**: The app is designed to be responsive and accessible on all mobile devices, ensuring a broad user base and ease of use.

CHAPTER 2

RELEVANT BACKGROUND & DEFINITIONS

Relevant Background & Definitions

The Online Auction App represents a significant advancement in the way goods and services are bought and sold in the digital marketplace. To fully understand its importance and functionality, it is essential to delve into the background of online auctions, the technological infrastructure supporting the app, and the definitions of key terms and concepts related to this domain.

Historical Context of Online Auctions

Online auctions have evolved from traditional auction houses, where bidders gather in person to compete for items, to digital platforms that allow participants to engage in the auction process from anywhere in the world. The first significant foray into online auctions began in the mid-1990s with platforms like eBay, which revolutionized the way consumers could buy and sell items. These platforms introduced the concept of bidding on items over the internet, opening up new opportunities for both buyers and sellers. The convenience of participating in auctions from the comfort of one's home, coupled with the potential for finding rare items or getting good deals, led to the rapid growth of online auction platforms.

As technology advanced, so did the features of online auction systems. Today, these platforms support real-time bidding, mobile compatibility, and secure payment systems, making them more accessible and user-friendly than ever before. The development of the Online Auction App builds on this legacy, incorporating modern technological advancements to provide a seamless, interactive, and secure auction experience.

Technological Infrastructure

The Online Auction App is built using Flutter and Dart, a combination that allows for the development of highly responsive, cross-platform mobile applications. Flutter, an open-source UI software development kit by Google, enables the creation of natively compiled applications for mobile, web, and desktop from a single codebase. It provides a rich set of pre-designed widgets and tools, making it easier for developers to build aesthetically pleasing and functional user interfaces.

Dart, the programming language used with Flutter, is designed for client development, such as for web and mobile apps. It is optimized for fast development, offering a smooth and quick development cycle, which is crucial for dynamic applications like the Online Auction App. The use of Flutter and Dart ensures that the app is not only visually appealing but also efficient and fast.

The backend of the app is powered by Google Firebase, a comprehensive platform for app development. Firebase provides various services such as real-time database management, user authentication, and cloud messaging. These features are integral to the functionality of the Online Auction App, allowing it to handle real-time data updates, secure user logins, and instant notifications effectively.

Definitions and Key Concepts

To fully grasp the workings and benefits of the Online Auction App, it is important to understand several key concepts and terms associated with online auctions and the app's features:

1. **Auction**: A public sale in which goods or property are sold to the highest bidder. Online auctions replicate this process digitally, allowing users to bid on items through an internet platform.
2. **Real-time Bidding**: A process in which auction bids are placed, updated, and displayed instantaneously. This feature is crucial for online auctions, as it provides a dynamic and engaging user experience.
3. **User Authentication**: A security process that ensures only authorized users can access certain areas of the app or perform specific actions. The Online Auction App uses Firebase Authentication to manage user sign-ins, sign-ups, and email verification.
4. **Firebase Real-time Database**: A cloud-hosted NoSQL database that allows data to be stored and synchronized in real-time across all connected clients. This is essential for keeping auction listings and bid updates current and consistent for all users.
5. **Mobile Compatibility**: The ability of an app to function seamlessly across various mobile devices, ensuring that users can access and use the app from their smartphones or tablets without any issues.
6. **Chat System**: A built-in messaging platform that enables users to communicate directly with each other. In the context of the Online Auction App, this allows buyers and sellers to discuss items, negotiate prices, and finalize transactions more effectively.
7. **Admin Module**: A part of the app designed for administrators to manage auctions, oversee user accounts, and resolve disputes. This ensures the smooth operation of the platform and maintains the integrity of the auction process.
8. **Notifications**: Alerts sent to users to inform them of important updates, such as being outbid on an item or an auction ending soon. Notifications are crucial for keeping users engaged and informed about their activities on the platform.
9. **Encryption**: The process of converting data into a secure format that cannot be read by unauthorized users. This is an important feature for protecting sensitive user information and ensuring the security of transactions.
10. **User Interface (UI)**: The part of the app that users interact with. A well-designed UI is crucial for providing a positive user experience, making it easy for users to navigate the app and participate in auctions.

The Role of Online Auction Apps in Modern Commerce

Online auction apps like the one described in this document play a pivotal role in modern commerce by offering a flexible and dynamic alternative to traditional e-commerce platforms. They cater to a variety of users, including individual sellers looking to reach a broader audience, collectors seeking rare items, and businesses aiming to maximize their revenue streams.

These apps benefit users by:

- **Providing Competitive Prices**: Buyers can potentially get items at lower prices through competitive bidding, while sellers can achieve higher profits by attracting multiple bidders.
- **Expanding Market Reach**: Sellers can reach a global audience, increasing the chances of finding the right buyer for their items.
- **Enhancing User Engagement**: The interactive nature of auctions, with real-time updates and competitive bidding, creates a more engaging shopping experience compared to fixed-price models.

Challenges and Considerations

While online auction apps offer numerous benefits, they also present certain challenges that need to be addressed:

- **Security Concerns**: Protecting user data and ensuring secure transactions is paramount. Implementing robust authentication methods and data encryption is essential to gaining user trust.
- **User Experience**: The app must be easy to use and navigate, even for those who may not be tech-savvy. A cluttered or confusing interface can deter users from participating in auctions.
- **Real-time Performance**: The app must handle real-time data efficiently to provide a seamless experience. Any delays or lags can frustrate users and impact the overall success of the auctions.

CHAPTER 3

LITERATURE REVIEW & RELATED WORK

Literature Review

Online auctions have been a popular method of buying and selling goods for years, revolutionized by platforms like eBay and similar websites. These platforms introduced the concept of bidding on items online, allowing users to participate in auctions without being physically present. Over time, this model has evolved with advancements in technology, leading to the development of more sophisticated auction systems that are faster, more secure, and accessible through mobile devices.

Several studies and developments have focused on enhancing online auction platforms. Research has been conducted on improving user experience, ensuring data security, and optimizing real-time bidding processes. Various papers have highlighted the importance of user engagement and the role of instant notifications in keeping users informed and involved. There has also been significant work on using mobile technology to make auction platforms more accessible, catering to the growing number of users who prefer conducting transactions via their smart phones

Related Work

1. **eBay and Other Online Platforms**: eBay was one of the first major online auction platforms, setting the standard for online auctions. It allowed users to bid on a wide range of items, from collectibles to electronics, and introduced features like auction timers, feedback systems, and secure payment methods. Other platforms, such as Amazon Auctions and Yahoo! Auctions, followed suit, offering similar services with varying degrees of success.

2. **Mobile Auction Apps**: With the rise of mobile technology, several auction platforms developed apps to cater to mobile users. These apps focused on providing a seamless experience on smaller screens, with features like swipe navigation, push notifications, and mobile payment options. Research in this area has shown that mobile compatibility significantly increases user engagement and bidding activity.

3. **Security Enhancements**: Ensuring the security of user data and transactions has been a critical area of focus. Studies have explored the use of encryption, secure login systems, and fraud detection algorithms to protect users and maintain the integrity of the auction process. Platforms that fail to implement robust security measures often face user distrust and potential legal issues.

4. **User Engagement and Gamification**: Some platforms have experimented with gamification elements to enhance user engagement. Features like reward points for participation, leaderboards, and interactive tutorials have been shown to increase user activity and retention. Research indicates that creating a fun and engaging environment can lead to higher bidding rates and user satisfaction.

Gap Analysis

Despite the progress made in online auction platforms, there are still several gaps and areas for improvement:

1. **Lack of Real-time Interaction**: Many traditional auction platforms, while effective, lack real-time interaction capabilities. This gap is particularly noticeable in mobile apps, where users expect instant feedback and updates. The Online Auction App addresses this gap by integrating real-time bidding and notifications, ensuring users are always up-to-date with the latest auction status.

2. **Limited Mobile Optimization**: While many platforms offer mobile apps, not all are fully optimized for mobile use. Issues like slow loading times, difficult navigation, and limited functionality can deter users from participating in auctions on their mobile devices. The Online Auction App is designed with mobile-first principles, ensuring a smooth and responsive experience on all mobile devices.

3. **Security Concerns**: Despite advances in security technology, some platforms still struggle with protecting user data and ensuring safe transactions. The Online Auction App fills this gap by using secure authentication methods and encryption to safeguard user information, providing a secure environment for both buyers and sellers.

4. **User Experience and Accessibility**: Many existing platforms can be overwhelming or confusing for new users, with complex interfaces and jargon-filled instructions. This limits the platform's reach and user base. The Online Auction App focuses on providing a user-friendly interface with clear instructions and easy navigation, making it accessible to users of all technical abilities.

5. **Limited Communication Features**: Communication between buyers and sellers is often limited to post-sale interactions or external messaging platforms. This can lead to misunderstandings and disputes. The Online Auction App includes an integrated chat system, allowing users to communicate directly within the app, fostering transparency and reducing the likelihood of disputes.

CHAPTER 4
PROJECT DISCUSSION

1. **Software Engineering Methodology**
2. **Project Methodology**
3. **Phases of Project**
4. **Software/Tools that Used in Project**
5. **Hardware that Used in Project**

Chapter 5
IMPLEMENTATION

4.1 Proposed System Architecture/Design

4.2 Functional Specifications

4.3 Non-Functional Specifications

4.4 Testing

4.5 Purpose of Testing

4.6 Test Cases

Chapter 5

EXPERIMENTAL EVALUATIONS & RESULTS

Evaluation Test bed

Results and Discussion

CHAPTER 6

CONCLUSION AND DISCUSSION

7.1 Strength of this Project.

7.2 Limitations and Future Work

7.3 Reasons for Failure – If Any

REFERENCES

APPENDICES

List of Appendices

A0. Copy of Project Registration Form
A1a. Project Proposal and Vision Document
A1b. Copy of Proposal Evaluation Comments by Jury
A2. Requirement Specifications
A3. Design Specifications
A4. Other Technical Details
Test cases
UI/UX Details
Coding Standards
Project Policy
A5. Flyer & Poster Design
A6. Copy of Evaluation Comments
Copy of Evaluation Comments by Supervisor for Project – I Mid Semester Evaluation
Copy of Evaluation Comments by Jury for Project – I End Semester Evaluation
Copy of Evaluation Comments by Supervisor for Project – II Mid Semester Evaluation
Copy of Evaluation Comments by Jury for Project – II Mid Semester Evaluation
Copy of Evaluation Comments by Jury for Project – II End Semester Evaluation
A7. Meetings' Minutes
A8. Research Paper
A10. Any other

A0. COPY OF PROJECT REGISTRATION FORM

A Photostat or scanned copy should be placed when submitting a document to Project Coordinator.(**Note**: Please remove this line when attach copy that is required)

A1A. PROJECT PROPOSAL AND VISION DOCUMENT

Any standard template may be used, as per project need approved by Project Coordinator& Supervisor. Following is a suggestive outline. **Also, the same outline should be used for Project Proposal Presentation.**

1 Introduction
1.1 Problem Statement
1.2 Project Motivation
1.3 Objectives
1.4 Literature Review
2 Project Vision
2.1 Business Case and SWOT Analysis
2.2 Background, Business Opportunity, and Customer Needs
2.3 Business Objectives and Success Criteria
2.4 Project Risks and Risk Mitigation Plan
2.5 Assumptions and Dependencies
3 Project Scope
3.1 In Scope
3.2 Out of Scope
4 Proposed Methodology
4.1 SDLC Approach (Waterfall/Agile/any model)
4.2 Team Role & responsibilities
4.3 Requirement Development
4.4 High-level Architecture / Design
4.6 Application (or Project) Testing
5 Project Planning
5.1 Gantt Chart
6 Project Requirements
6.1 Software tools requirements
6.2 Hardware requirements
7 Budget/Costing
7.1 Mention the budgeting cost of each item - required for this project
7.2 Estimated Budgeted Cost - of the Project
8 Project Deliverables
8.1 Phase I - Alpha Prototype
8.2 Phase II - Beta Prototype
8.3 Phase III - Release Candidate
8.4 Phase IV - Final Product
9 Proposed GUI (Disposable Prototype)
10 Meetings held with supervisor and/or client.
11 Reference

A1B. COPY OF PROPOSAL EVALUATION COMMENTS BY JURY

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A2. REQUIREMENT SPECIFICATIONS

Any standard template may be used, as per project need approved by Project Coordinator& Supervisor. Following is a suggestive outline.

1. Introduction
1.1. Purpose of Document
1.2. Intended Audience
1.3 Abbreviations
2. Overall System Description
2.1. Project Background
2.2. Project Scope
2.3. Not In Scope
2.4. Project Objectives
2.5. Stakeholders
2.6. Operating Environment
2.7. System Constraints
2.8. Assumptions & Dependencies
3. External Interface Requirements
3.1. Hardware Interfaces
3.2. Software Interfaces
3.3. Communications Interfaces
4. Functional Requirements
4.1. Functional Hierarchy
4.2. Use Cases
4.2.1. [use case 1]
4.2.2. [use case 2]
4.2.n. [use case n]
5. Non-functional Requirements
5.1. Performance Requirements
5.2. Safety Requirements
5.3. Security Requirements
5.4. User Documentation
6. References

A3. DESIGN SPECIFICATIONS

Any standard template may be used, as per project need approved by Project Coordinator& Supervisor. Following is a suggestive outline.

1 Introduction
1.1 Purpose of Document
1.2 Intended Audience
1.3 Project Overview
1.4 Scope
2 Design Considerations
2.1 Assumptions and Dependencies
2.2 Risks and Volatile Areas
3 System Architecture
3.1 System Level Architecture
3.2 Software Architecture
4 Design Strategy
5 Detailed System Design
5.1 Database Design
5.1.1 ER Diagram
5.1.2 Data Dictionary
5.1.2.1 Data 1
5.1.2.2 Data 2
5.1.2.3 Data n
5.2 Application Design
5.2.1 Sequence Diagram
5.2.1.1 <Sequence Diagram 1>
5.2.1.2 <Sequence Diagram 2>
5.2.1.3 <Sequence Diagram n>
5.2.2 State Diagram
5.2.2.1 <State Diagram 1>
5.2.2.2 <State Diagram 2>
5.2.2.n <State Diagram n>
6 References

A4. OTHER TECHNICAL DETAIL DOCUMENTS

Test Cases Document

UI/UX Detail Document

Coding Standards Document

Project Policy Document

User Manual Document

A5. FLYER & POSTER DESIGN

A6. COPY OF EVALUATION COMMENTS

COPY OF EVALUATION COMMENTS BY SUPERVISOR FOR PROJECT – I MID SEMESTER EVALUATION

A Photostat or scanned copy should be placed when submitting document to Project Coordinator.(**Note**: Please remove this line when attach copy that is required)

COPY OF EVALUATION COMMENTS BY JURY FOR PROJECT – I END SEMESTER EVALUATION

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COPY OF EVALUATION COMMENTS BY SUPERVISOR FOR PROJECT – II MID SEMESTER EVALUATION

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A7. MEETINGS' MINUTES& Sign-Off Sheet

Original Documents should be placed when submitting document to Project Coordinator. Document should be signed by the supervisor and all other members present in the meeting (wherever possible). (**Note**: Please remove this line when attach copy that is required) Weekly meetings' minutes are required (held with Supervisor and/or with client). Important group discussions can also be included here.

A8. DOCUMENT CHANGE RECORD

Date	Version	Author	Change Details

A9. PROJECT PROGRESS

Photostat of Incremental versions of Requirement Signoff sheet submitted to Project Coordinator. (**Note**: Please remove this line when attach copy that is required)

A10. RESEARCH PAPER