
**TRIBHUWAN UNIVERSITY**

INSTITUTE OF

ENGINEERING PULCHOWK

CAMPUS

**A MINOR PROJECT Report**

**ON**

**e-Auction**

**Submitted By :**

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# Abstract

An e-Auction is a web based application that takes place on the internet, where a property that has been seized by Department of Customs Nepal is sold to the highest bidder. In a e-Auction, interested bidders register on the auction platform and place their bids on the property The seller is the Customs Department of Nepal, which is responsible for the management of the auctions. The bidding process typically starts at a price that is equal to the outstanding price of the item plus any fees and costs associated with the items. The auction continues until the highest bidder wins the property or until the reserve price is met. This application enables seller to post their items for auction; bidders can create an account and are able to bid for any available items.

This project investigates the effectiveness of online auctions as a method for selling seized items i.e. vehicles, home appliance, grocery etc. that the borrower had been seized during import or export process. The study analyses data from online auction platforms that specialize in online auctions, examining factors such as bidding patterns, auction duration, and seller reputation. The results indicate that longer auctions tend to attract more bidders, and that items with higher ratings tend to receive higher final prices. The findings suggest that online auctions can be an effective way for customs department to sell the seized items which is more fair and transparent than traditional channels. However, the study also highlights potential risks and challenges associated with purchasing seized properties online, such as legal and financial issues that may need to be addressed. Overall, this study contributes to our understanding of the online auction industry and highlights areas for further research and development in the field of online auctions.



**Keywords:** Customs, bid, confiscated, auction, industry, analysis

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We would also like to express our appreciation to the Samsung Innovations Campus for providing us with the necessary resources and facilities to carry out this project. The Learning Program organized by Samsung Company was instrumental in providing us with valuable insights into the Python programming language and various tools, which were crucial in the development of our online auction system.

Our thanks and appreciations also go to the authors of various papers that helped us gain the in-depth knowledge of various aspects. Finally, we would like to thank all the people who are directly or indirectly related for the successful completion of this project.

Sincerely,
Sailesh Shiwakoti
Suraj Niroula
Surya Narayan Chaudhary

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# 1 Introduction

## 1.1 Background

When a person or company exports goods from Nepal to other countries, or imports goods from abroad into Nepal, they are required to pay customs duty on those goods. Customs duty is a tax imposed on the import and export of goods by the government of a country, which is typically calculated as a percentage of the value of the goods being imported or exported.

The customs department in Nepal is responsible for enforcing customs regulations and ensuring that all goods being imported or exported comply with the relevant regulations and standards. If someone is found to be taking goods out of Nepal or bringing them into Nepal without paying customs duty, concealing it or evading customs duty, or bringing it into Nepal without declaring it according to the law, the said goods will be confiscated by the customs office and often have a significant amount of confiscated goods or unclaimed items that need to be sold. In the past, these items were sold through traditional methods, such as live auctions or direct sales, which were often time-consuming and inefficient.

However, with the advent of e-auctions, customs offices can now sell their goods through online platforms, which are not only faster and more efficient but also offer greater transparency and accessibility to a larger pool of potential buyers.

In this project, we aim to design and develop an e-auction platform for customs offices that will allow them to sell their goods online, efficiently and transparently. The platform will be designed to cater to the unique needs of customs offices, with features such as real-time bidding, and automated inventory management.

## 1.2 Problem Statement

The Department of Customs in Nepal faces several challenges in the auction of confiscated goods. The current manual process of conducting auctions is time-consuming, cumbersome, and not very transparent, leading to a limited pool of potential buyers and low revenue generation for the government. The traditional process of auctioning confiscated goods requires the physical presence of buyers and involves long wait times and complex bidding processes. This makes it difficult for potential buyers who may be located in different parts of the country or even abroad to participate in the auctions.

Moreover, the manual auction process may be prone to errors and irregularities, such as mismanagement of bids and incomplete records. The lack of transparency in the manual process may also give rise to allegations of corruption and unfair practices, affecting the credibility of the Department of Customs.

To address these challenges, the Department of Customs requires a modern and efficient online auction system to facilitate the auction of confiscated goods. The system should be designed to be user-friendly, accessible, and secure while complying with all relevant regulations and standards. It should provide a transparent and efficient platform for bidders to participate in the auctions from anywhere in the world. The online auction system should also allow the Department of Customs to maintain accurate and complete records of the auction proceedings, thereby reducing the possibility of errors and irregularities.

The development of an online auction system for the Department of Customs in Nepal is crucial in overcoming the challenges of the current manual auction process. Such a system will make the auction process more efficient, transparent, and accessible to a wider range of potential buyers. It will also generate better revenue for the government, providing a fair and efficient platform for the auction of confiscated goods. Additionally, the online auction system will enhance the credibility of the Department of Customs and increase public trust in the auction process.

## 1.3 Objectives

Our objective is to create a user-friendly platform that will benefit both the customs offices and the buyers, by streamlining the auction process and ensuring fair and transparent transactions. By doing so, we hope to contribute to the growing trend of e-auctions and promote the adoption of this technology in various industries

- To develop a modern, efficient, and secure online auction system for the Department of Customs in Nepal to facilitate the auction of confiscated goods.
- To provide a user-friendly and accessible platform for bidders to participate in the auction process from anywhere in Nepal.
- To reduce errors and irregularities in the auction process through the online system's accurate and complete record-keeping.
- To enhance the credibility of the Department of Customs by providing a transparent and fair platform for the auction of confiscated goods.
- To ensure the security and confidentiality of bidder and auction-related information.
- To provide effective and responsive customer support for bidders and other users of the online auction system.
- To train and provide technical support to the staff of the Department of Customs in using the online auction system effectively.
- To continuously monitor and evaluate the online auction system's performance and make necessary improvements to ensure its efficiency and effectiveness in facilitating the auction of confiscated goods.

## 1.4 Project Scope

The online auction system for the Department of Customs in Nepal covers all aspects of the system's development, implementation, and maintenance. The system's design and implementation will be guided by the need to provide a secure, reliable, and user-friendly platform for the auctioning of confiscated goods, which complies with all relevant regulations and standards. This project is critical for the Department of Customs in Nepal to improve efficiency, transparency, and effectiveness in the auctioning of confiscated goods.

# 2 Literature Review

Electronic auctions, also known as e-auctions, have gained significant popularity in recent years due to their ability to provide a transparent, fair, and efficient mechanism for buying and selling goods and services online. E-auctions are widely used in various industries, including government, finance, and retail, to name a few. In the context of customs offices, the e-Auction of confiscated goods is a critical function of customs departments worldwide, as it generates revenue and deters criminal activity. There is a growing trend towards the use of online auction systems, which offer several benefits over traditional auction methods, including increased transparency, accessibility, and cost-effectiveness.

Several studies have examined the use of online auction systems in customs departments, including a study by Li and Liang (2016), which examined the adoption of online auction systems in Chinese customs. The study found that online auction systems were associated with improved efficiency and effectiveness in the auctioning of confiscated goods, as well as increased revenue for the government.

Similarly, a study by Yang and Hu (2018) explored the use of online auction systems in the Taiwanese customs department. The study found that online auction systems were associated with reduced costs, improved transparency, and increased participation in the auctioning process.

A study by Chawla et al. (2019) examined the use of blockchain technology in customs departments, which could potentially enhance the security and transparency of online auction systems. The study found that blockchain-based systems could offer several benefits, including enhanced security, reduced fraud, and increased transparency.

The customs department of Nepal is responsible for the regulation and control of the import and export of goods, as well as the collection of revenue for the government. However, the department faces several challenges, including corruption, outdated technology, and inadequate infrastructure (Acharya, 2016).

Efforts have been made to modernize the customs department of Nepal, including the development of the Nepal Electronic Cargo Tracking System (NECTS) in 2015 (ADB, 2015). However, there is a need for further improvements, including the use of online auction systems to enhance efficiency and transparency in the auctioning of confiscated goods.

In terms of existing online auction systems in Nepal, there are a few examples, including the introduction of an e-procurement system in 2017 (NRB, 2017). However, there is a need for a dedicated online auction system for the auctioning of confiscated goods by the customs department.

Several e-auction platforms are available in the market that can be used by customs offices to conduct auctions online. These platforms provide various features and functionalities, such as bid validation, secure payment gateways, and auction management tools. Some of the popular e-auction platforms include GovDeals, AuctionZip, PublicSurplus, ProxiBid, BVA Auction,Copart,Iron Planet etc.

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Overall, the literature suggests that online auction systems can offer several benefits to customs departments, including increased efficiency, effectiveness, transparency, and revenue generation. Furthermore, the use of blockchain technology could enhance the security and transparency of these systems. These findings support the development of an online auction system for the Department of Customs in Nepal to improve the auctioning of confiscated goods.

# 3 Methodology

## 3.1 Requirement Gathering

The first step in the development process is to gather requirements from the customs office regarding the features and functionalities they require in the e-auction system. This was done by conducting interviews with customs officers and stakeholders to understand their needs and expectations.

## 3.2 System Design

Based on the requirements gathered in the previous step, a system design was created that outlines the architecture, user interface design, and other technical details.

## 3.3 System Development

The actual development of the e-auction system was carried out using appropriate programming languages and development tools. The system was built using an iterative and incremental development approach, with regular feedback and testing cycles to ensure that it meets the requirements and specifications.

## 3.4 System Testing

The e-auction system would be subjected to various testing methodologies to ensure that it is functioning as expected. This will involve unit testing, integration testing, system testing, and user acceptance testing.

## 3.5 Development and Maintenance

Once the system has been fully tested and approved, it would be deployed to the customs office for use. Ongoing maintenance and support will be provided to ensure that the system remains operational and up-to-date with changing requirements.

## 3.6 Evaluation

Finally, an evaluation of the e-auction system would be carried out to assess its effectiveness and impact. This involves collecting feedback from customs officers, bidders, and other stakeholders to identify areas for improvement and further development.

# 4 Implementation

## 4.1 Application

### 4.1.1 Frontend and UI

The development of an e-auction system for the Customs Department of Nepal involves several steps, including selecting appropriate front-end technologies, designing user interfaces, and developing the platform. To create a user-friendly and intuitive interface for the online auction system, we have used HTML, CSS, jQuery, and Bootstrap. These technologies help in creating a responsive website that can adjust to various screen sizes and devices, providing a seamless user experience for the bidders.

### 4.1.2 Backend and Database

The e-auction project uses Django REST framework as the backend technology and SQLite as the database. Django Channels is used to handle WebSockets, while Celery is used for asynchronous task processing. The use of these technologies allows for the creation of a scalable and efficient web application that can handle real-time bidding and auction systems.

### 4.1.3 User category Management

The eAuction project was designed to manage different categories of users such as anonymous bidders, registered bidders, inventory incharge, and super admins. To manage the access of these users, the system implemented Bell-LaPadula models and access control lists (ACLs) to structure the front-end and back-end of the website.

### 4.1.4 Auction Management

The website's structure included several buckets to manage auctions, such as live auction, not settled auction, settled auction, admin waiting auction, and rescheduled auction. Each auction was in one of several states, such as live, waiting, settled, not settled, and rescheduled. Auctions were also placed in different buckets based on their state and type. If an auction's type was open, it would expire and be moved to the not settled bucket. However, if the type was closed, it would move to the admin waiting bucket until a super admin entered an OTP to confirm the auction winner. If the bidder paid the remaining amount within seven days, the auction would move to the settled bucket. If not, the auction would move to the not settled bucket, and the next highest bidder would be awarded the auction.

### 4.1.5 Bid Management

The system implemented bid states to manage whether the bidder paid the initial 10% amount or not, whether they bid, and whether they could edit, delete or fill the remaining 90% amount. Inventory Management The inventory incharge was responsible for adding items and rescheduling auctions, making them live again. This helped in achieving the auction lifecycle. Data Structures and Scheduling to manage these interactions and data structures, the system used a scheduler process that ran every ten minutes to query the database and move auctions between the different buckets as needed. Additionally, a constantly running event loop monitored auctions that were about to expire or had elapsed seven days since the auction winner was awarded but not paid.

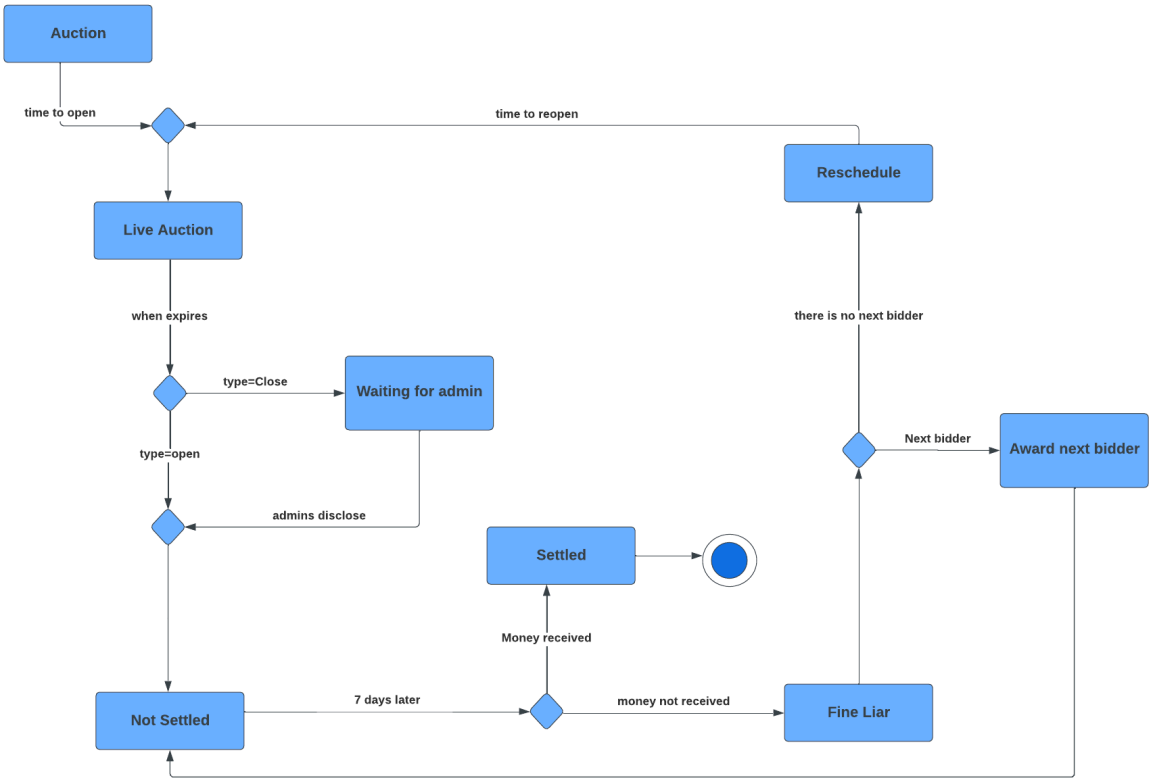


Figure 9: System Workflow of e-Auction

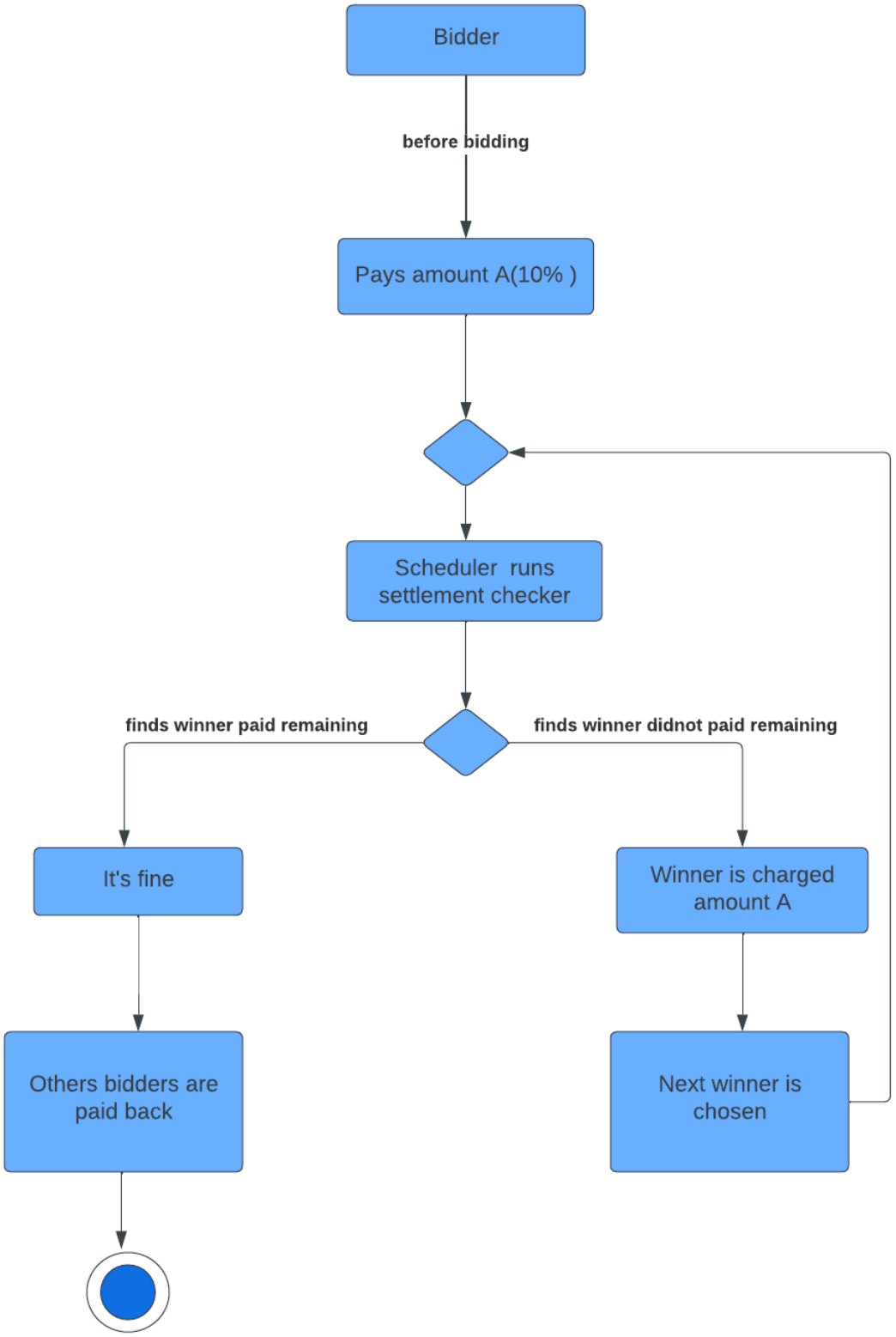


Figure 9: System Workflow of e-Auction

## 4.2 Diagram

### 4.2.1 Use Case Diagram

The portal is a web application which has following use cases.

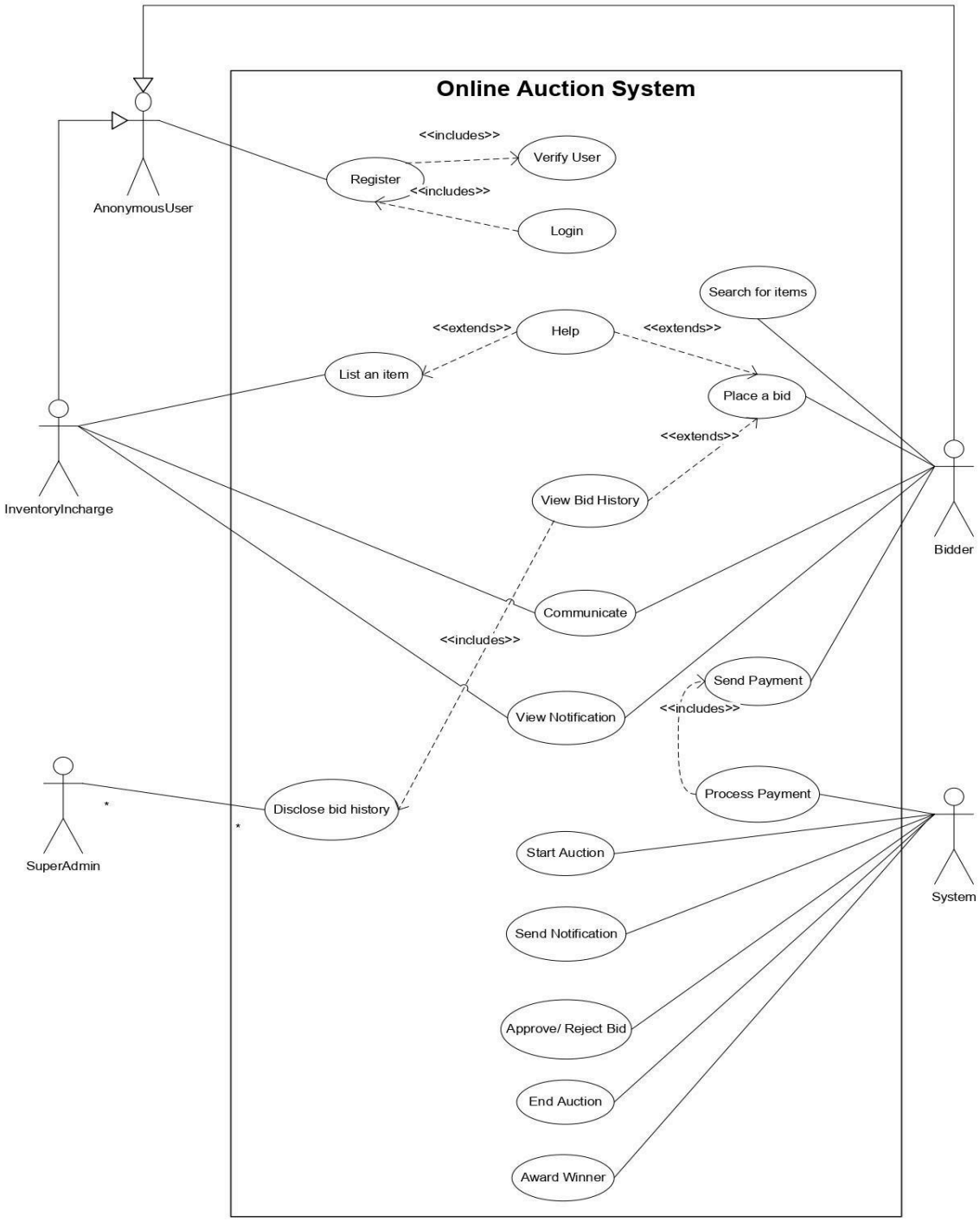


Figure 10: Use Case Diagram for the portal

### 4.2.2 Schema Diagram

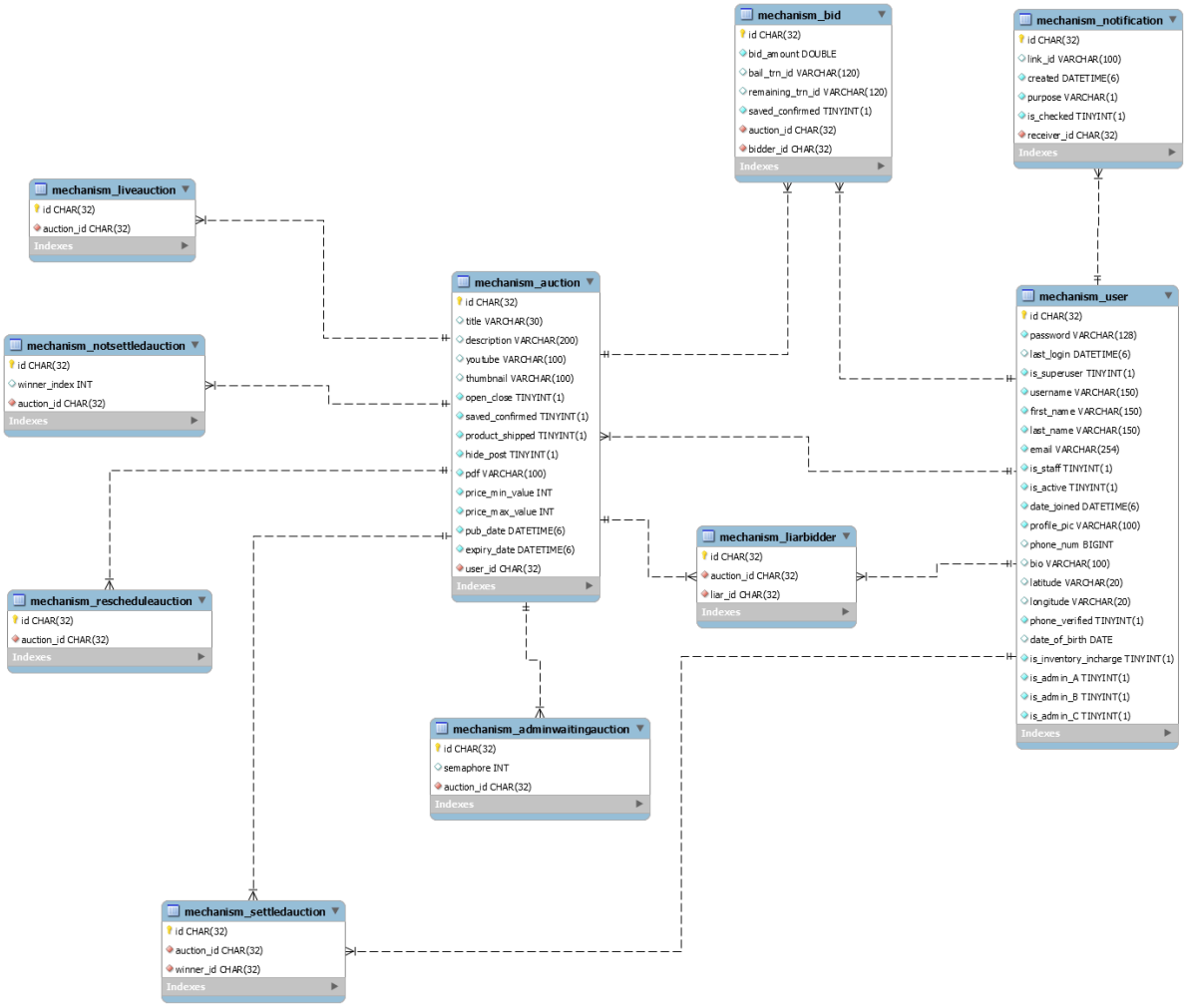


Figure 11: Schema Diagram

### 4.2.3 Sequence Diagram

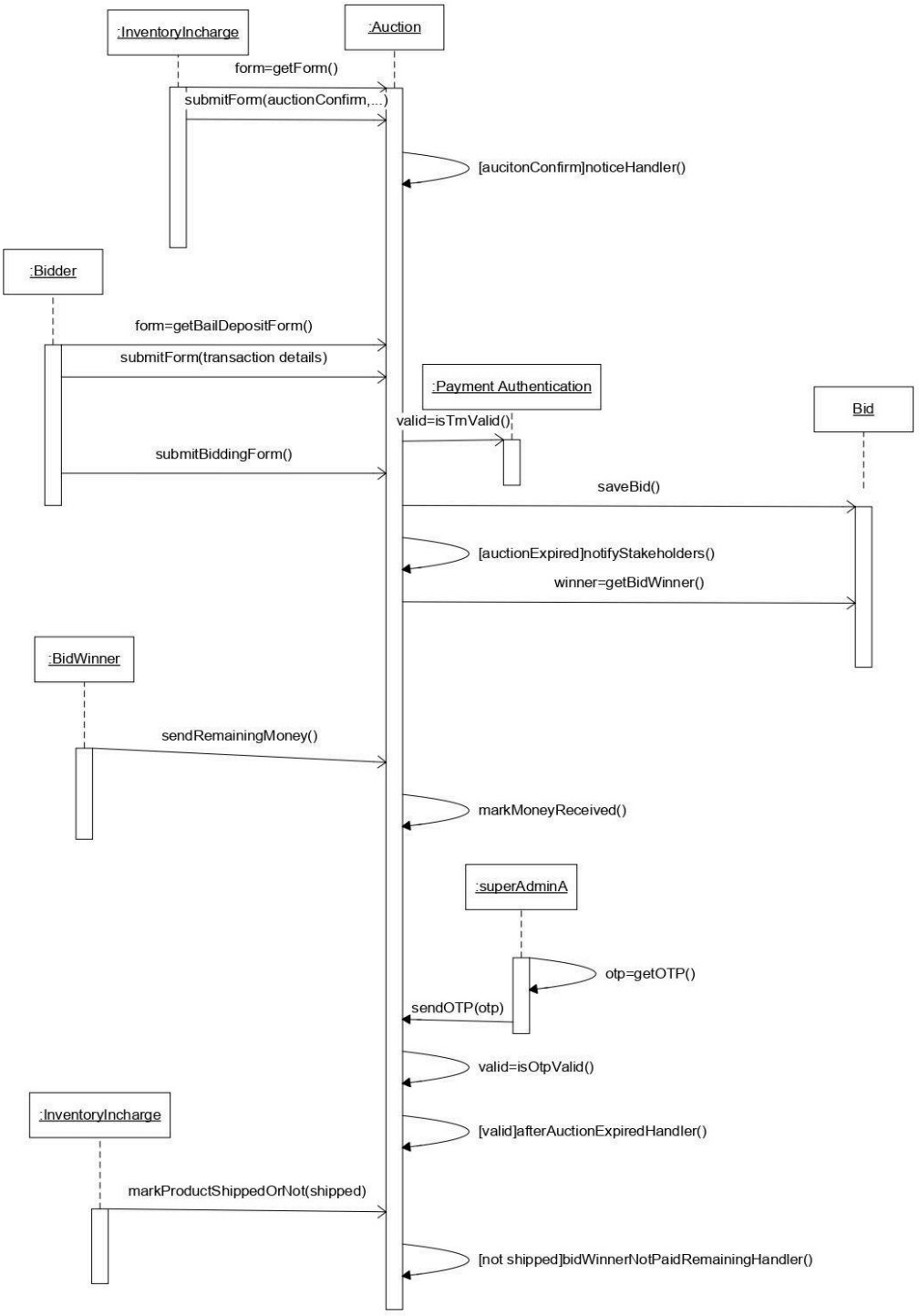


Figure 12: Sequence Diagram of e-Auction

### 4.2.4 Class Diagram

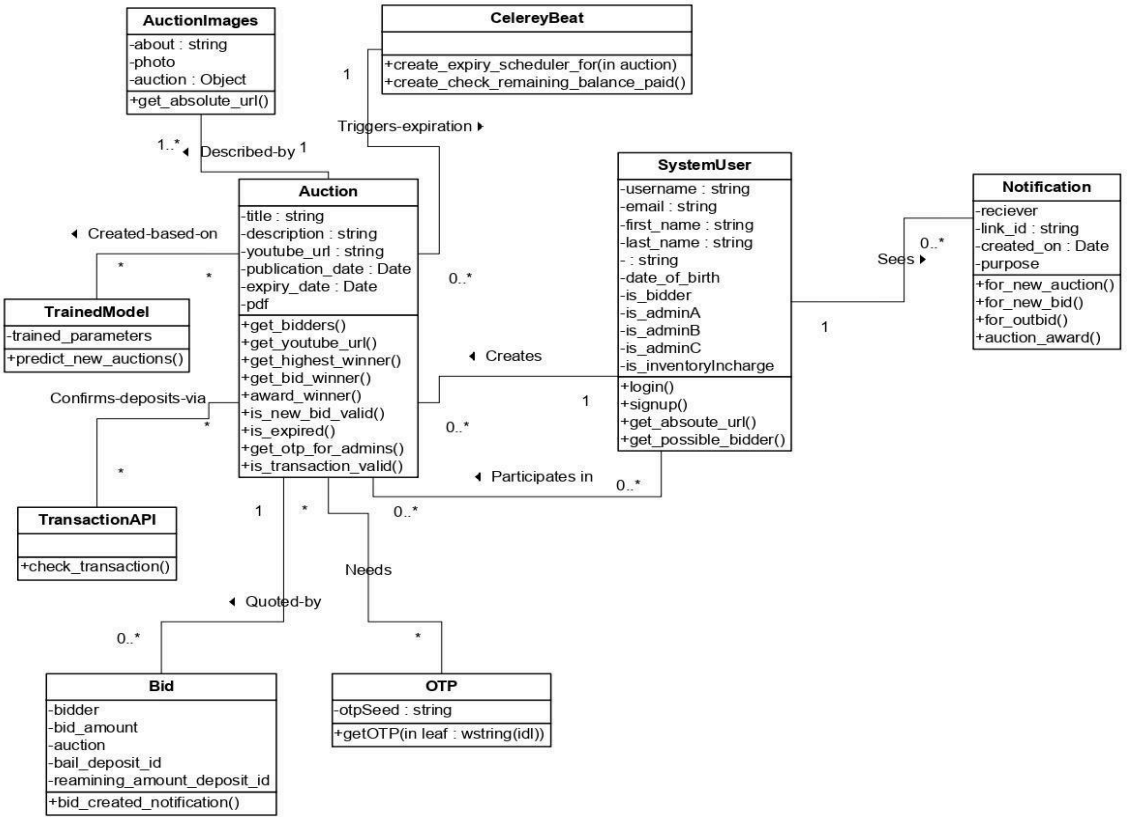


Figure 12: Class Diagram of the Portal

## 4.3 Tools and Technologies Used

For the development of the system various technologies as follows were used:

- Programming Languages
  - Python
  - Javascript, HTML, CSS, jQuery (For Frontend)
- Frameworks
  - Django Rest Framework (For Backend)
- Database
  - SQLite (Database)

# 5 Result

The implementation of the eAuction system was successful in achieving the project objectives of allowing the government to sell items online and enabling bidders to participate The system provides a secure and efficient platform for online auctions, with different levels of access and permissions for different types of users The use of the Bell-La Padula model and access control lists ensures that the system is secure and protects the confidentiality and integrity of the data

The system's structure and design enable the auction lifecycle to be managed effectively and efficiently, ensuring that auctions are created, managed, and settled in a timely and effective manner. The system once developed as single page application for frontend and provided with the real time bidding details in case of open auction, is ready to be used. The architecture is such that it is pluggable to any domains, where domain being the government agencies such as traffic police offices, campuses, courts etc. The crucial part of system is to design database for handling all these government agencies. And most economic advantage is that no any item will be wasted because of various reasons and bidders can get benefit by purchasing at low costs, even branded items.

# 6 Future Development

Although the e-Auction project has achieved significant success in improving the auction process for the Customs Department of Nepal, there are still areas for improvement. In the future, the following areas can be considered for further development:

**User Interface (UI) Design:** One of the key areas for improvement in the r-Auction platform is its UI design. The current design is not visually appealing, which can discourage potential bidders from using the platform. Improving the UI design can enhance the user experience and make the platform more attractive to potential bidders.

**Payment Integration:** Currently, bidders are unable to make payments through the r-Auction platform. Introducing a payment integration feature into the platform can make it more convenient for bidders to complete their transactions, which can enhance the appeal of the platform.

# 7 Conclusion

This project has investigated the effectiveness of online auctions as a method for selling seized items by the Department of Customs, Nepal. The study analyzed data from online auction platforms and found that longer auctions tend to attract more bidders, and higher rated items tend to receive higher final prices. The findings suggest that online auctions can be an effective and fair way for the department to sell confiscated items. However, the study also highlights potential risks and challenges associated with purchasing seized properties online, such as legal and financial issues. This project contributes to the understanding of the online auction industry and highlights areas for further research and development. Overall, the project provides insights into the potential benefits and challenges of using online auctions as a method of selling seized items and helps to inform future decision-making by the Department of Customs Nepal.

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