ACTONIT - AN ONLINE BIDDING PLATFORM (IaaS CLOUDS)

*Mohammad Taqi Ahmad Iyaaz [1], * Dr. P.G. Om Prakash [2]*

[1] *Student, Department of Computational Intelligence, SRM Institute of Science and Technology, Chennai, India*

[2] *Assistant Professor, Department of Computational Intelligence, SRM Institute of Science and Technology, Chennai, India*

taqihadinaji@gmail.com, ommail2004@gmail.com

Abstract

There are a lot of prominent online shopping services in the world now, they are used by both the selling and buying parties to sell and buy the respective items.

Although there exists many other websites for the sale of second-hand and third-hand goods, India lacks a proper web-service where the people are able to bid for daily electronics and goods with freedom and within a time interval.

This project focuses on developing a proper platform in IaaS Clouds, for all the people to be able to use as vendors and customers; to be a able to sell a particular product/item. The problems concerning quantity and time (when a particular item was set for auction) can be solved here.

Within a certain time limit which is acceptable by everyone, everyone will have the freedom to compete for it. Furthermore we will be using the IaaS model which is the least dependent on the Cloud Computing services.

This project is a combination of technologies, including HTML, Python, Django etc. It allows the user to freely sell and buy items with ease without the constraints of going to another place for just buying and selling items; thus saving a lot of time and money. It is very optimal even for people in faraway cities as it will have participation all over the country.

In conclusion, the idea of having a website which makes the idea of competitive shopping possible by home and the fact that it is possible to access it within the time interval easily from one place makes things easier for all users.

Keywords

Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS) Graphical User Interface (GUI), Real-Time Bidding (RTB), One of a Kind (OOAK), First-come, First-served (FCFS), Sold Out (S/O), Trademark (TM)

I. Introduction

An online auction is a type of auction that takes place over the internet, allowing buyers and sellers to interact virtually. In an online auction, a seller lists an item or items for sale, and interested buyers can place bids on those items. The bidding process takes place over a set period of time, with the highest bidder at the end of the auction winning the item.

Online Auctions have been adopted by many major cloud providers such as AWS, Azure etc. But there are limitations on how simple those auctions are, and how heavily dependent on the Cloud providers they are. This paper proposes an auction model that is independent of the cloud to an extent as it is maintained in an IaaS model.

This is very cost effective and with proper maintenance both the customers and vendors will find it easy to use with good security for protection and for people all over the world to easily participate for displayed item and be able to bid for it instead of first come first basis. The website will first verify the user and then only allow them to participate in the bidding.

The introduction of an advance crediting system makes any form of scam impossible to take place thus making it so that once bided, the person will automatically pay for the object when he has out bided everyone and won it.

1.1. Innovation Idea of the Project

IaaS as a cloud service model offers a lot of advantages financially, Quality-wise and technical-wise like on-demand infrastructure resources; compute networking and storage

Introduction of a wallet inside the website, through which all payments will take place. The wallet would require the user to add a certain amount of money in the wallet to be eligible to participate in the auction.

It counters a major flaw of the Online bidding system where bidders can overuse their freedom and bid more than what they have, causing the auction to be invalid.

1.2. Problem Statement

The absence of a proper online auction system is of major importance in India, even though there do exist offline, on-site auctions they have a lot of limitations, like how they are not very cost-effective or time-effective. Other advantages that online auction has over offline are Greater convenience, online auctions can be accessed from anywhere, at any time, as long as there is an internet connection. This eliminates the need for physical attendance at an auction house or other location, making it more convenient for both buyers and sellers.

Increased accessibility, online auctions are open to a global audience, meaning that buyers and sellers can access a larger market than with offline auctions. This can result in increased demand for items and potentially higher prices.

Lower costs, online auctions typically have lower overhead costs than offline auctions, as there is no need for physical auction houses, auctioneers, or other associated costs. This can result in lower fees for sellers and potentially lower prices for buyers.

Greater transparency, online auctions provide greater transparency for both buyers and sellers, as all bids and transactions are recorded electronically. This can help to reduce the risk of fraud and ensure that both parties have a clear understanding of the terms of the transaction.

II. Objective

The primary objective of an online auction system is to facilitate the buying and selling of goods and services through a virtual platform. The system aims to connect buyers and sellers from all over the world, providing a convenient and accessible marketplace for both parties. Specifically, the objectives of an online auction system may include:

- To provide a secure and reliable platform for buyers and sellers to conduct transactions. To facilitate competitive bidding, which can result in higher prices for sellers and fair market values for items.
- To increase access to a global market, enabling sellers to reach potential buyers from all over the world. To reduce transaction costs for both buyers and sellers, by eliminating the need for physical auction houses, auctioneers, and other associated costs.
- To provide greater transparency and accountability, by recording all bids and transactions electronically.
- To provide a user-friendly interface, making it easy for buyers and sellers to navigate the system and conduct transactions.

Overall, the objective of an online auction system is to provide a convenient and efficient marketplace that benefits both buyers and sellers, while ensuring a fair and transparent bidding process.

III. Literature Survey

Recent studies have highlighted the different kinds of auction system studies that have been conducted by a number of groups on their utilization of the cloud, one of such studies, Truthful Online Auction Toward Maximized Instance Utilization in the Cloud (2018) [1] has mentioned how the ever increasing demands often leave the users in a high risk low return situation. Thus the study looks for alternate cloud services which can possibly give a better look through for the dynamic supply the market needs.

Another paper, Success Strategies and Web Elements in Online Marketplaces: A Moderated-Mediation Analysis of Seller Types on eBay [2] studies the salient web elements in an online market place which influences the seller success. These types of studies focus on all the different types of strategies the buyer could take after a complete comprehensive understanding. Similar studies which compare different online auctions and bring out the changes regarding different impacting factors are also done [3], [4], [5].

Another theoretical based approach done in A Combinatorial Auction-Based Collaborative Cloud Services Platform [6], uses the Breadth Traversal Algorithm and thee Revised Ant Colony Algorithm. It presents a DCP in which to run effectively a market model of the auction was used.

2015, Data-Driven Auction Mechanism Design in IaaS Cloud Computing [7], published by IEEE Access studies on methods like Markov Decision Process (MDP) and Vickrey-Clarke-Groves (VCG) auction mechanism, although it has limitations like Complexity and simulation models based on standard Markov processes can be computationally impractical if there are a large number of possible embedded decisions.

2017, Online Auction of Cloud Resources in Support of the Internet of Things [8], published by IEEE Internet of things Journal, uses methods such as Online Algorithm (Auction) and NP- Complete is proofed but it too has its limitations like Obtaining prior knowledge is hard is hard thus in order to counter this IOT data was used.

2017, Dynamic VM Scaling: Provisioning and Pricing through an Online Auction [9], published by Journal of IEEE transactions on Cloud Computing Competitive Analysis of Auction Algorithm as a technique but it is heavily dependent on the cloud service they are being used (PaaS) and (SaaS).

2018, Online Auction for IaaS Clouds: towards Elastic User Demands and Weighted Heterogeneous VMs [10],

published by IEEE Access uses the price-based allocation rule, and algorithm of online auction but it is not able to accept elastic user demands and have to allocate different types of VMs independently.

2020, An Effective Budget Management Framework for Real-time Bidding in Online Advertising [11], published by IEEE Access focuses on algorithms like Budget Allocation Algorithm but this too has problems regarding complexity.

2021, EdgeDR: An Online Mechanism Design for Demand Response in Edge Clouds [12] published by IEEE Transactions on Parallel and distributed systems works with Primal Dual Based Algorithm Design and Online Auction Algorithm but it is very unreliable as it has lower utility and is very cost ineffective.

IV. Motivation

Online bidding platforms are a rarity in India, government owned platforms do exist but are only available for bulky products like oil and steel in large quantities and is unavailable for normal day to day items. Thus in order to have an independent website built on IaaS clouds open for public in the form of both as a vending platform and purchasing platform.

Working through HTML in your own domain makes it easier to set up for an IaaS cloud computing, rather than going for the more dependent PaaS and SaaS options. Making an advance crediting system can rein in the possibilities of fraud bidding which can cause problems for other bidders.

An online auction system can provide access to a global market, enabling sellers to reach potential buyers from all over the world. This can increase the visibility of a seller's products and potentially result in higher prices for items.

Online auctions are convenient for both buyers and sellers, as they can be conducted from the comfort of their own homes or offices. Buyers can browse items and place bids at any time of day or night, while sellers can manage their listings and sales from their own computers.

Online auctions can be more cost-effective than traditional auctions, as they eliminate the need for physical auction houses, auctioneers, and other associated costs. This can result in lower fees for sellers and lower prices for buyers.

Online auctions can encourage competitive bidding, as buyers can see the current highest bid and place their own bids accordingly. This can result in higher prices for sellers and a fair market value for items.

V. Methodology

The methodology for an online auction system typically involves several key steps:

System Analysis: This involves identifying the requirements and goals of the system, such as the types of goods or services to be sold, the target audience, and the desired features of the platform.

Design: The design phase involves creating a plan for the online auction system, including the layout, user interface, and features of the platform.

Development: The development phase involves building the actual platform, including the backend infrastructure, database, and user interface. This typically involves using programming languages such as HTML, CSS, Python etc.

Testing: Once the platform is built, it needs to be tested to ensure that it works as intended. This involves both manual testing and automated testing.

Deployment: The platform is then deployed to a web server or cloud platform, making it accessible to users.

Maintenance: Once the platform is live, it requires ongoing maintenance and updates to ensure that it remains secure and functional. This requires fixing of bugs adding new improvements.

In addition to these key steps, there are several best practices that should be followed when developing an online auction system. These include ensuring that the platform is secure, easy to use, and provides clear guidelines for bidding and selling. It is also important to have a clear policy for handling disputes and ensuring that all transactions are conducted fairly and transparently.

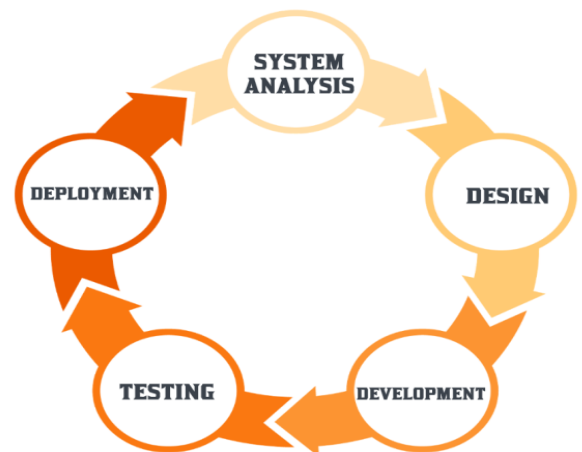Here is a diagram illustrating the methodology for an online auction system

Fig.5.1

VI. STRUCTURE AND ARCHIETECTURE

There has been a number of researches in Online auction systems regardless of what type they are, for example study of strategic steps, study of algorithm, study regarding the security measures of this e-auction [13], [14], [15].

Studying these papers we came up with a way to make an improved version of the various auction websites we have seen. We will be using Python, HTML, CSS, JavaScript and Django (python based web framework)
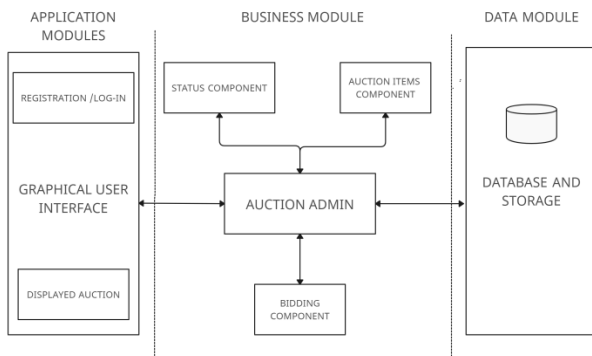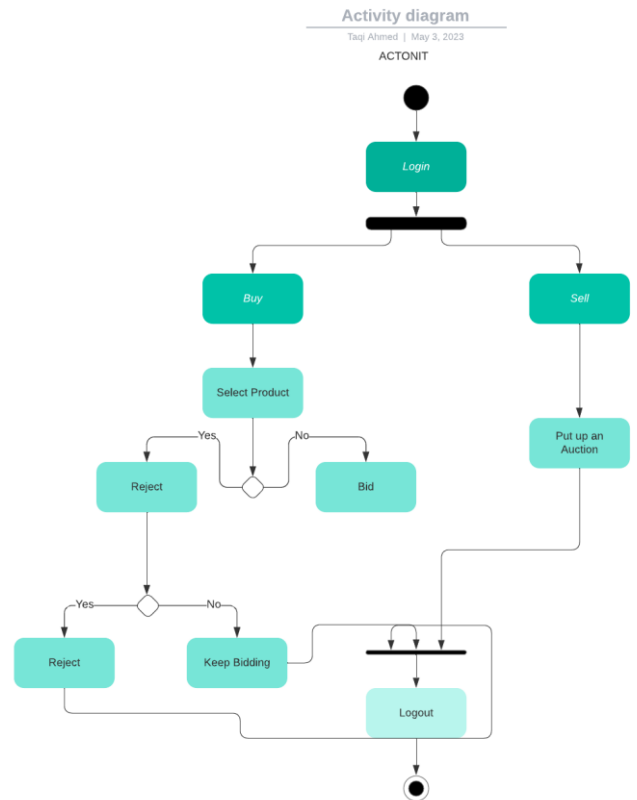

Fig.6.1. Architecture Diagram

Fig.6.2.Usecase

Fig.6.3. Activity Diagram
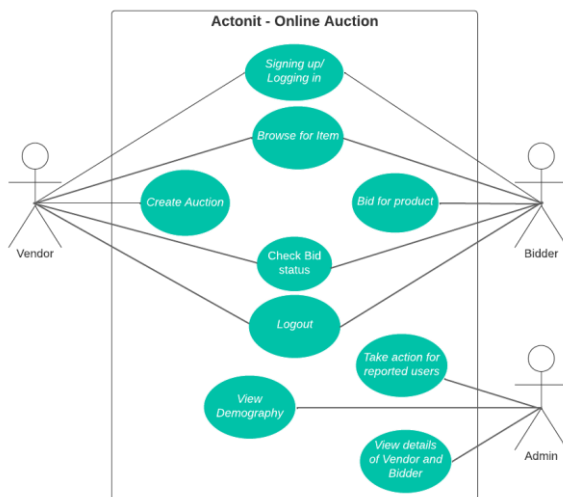
VII. CHALLENGES FACED

There are a number of limitations when it comes to the online auction based on the number of papers we have taken into account, some other studies regarding the limitations of online auction were also done [16], [17], [18], [19].

After further analysing, some of the major flaws faced by online auctions are:

- The existing system is heavily dependent on the cloud service providers and takes a huge toll in finance.
- There are security issues as well when it comes to a system which is involved in a complete online takeover on the internet.
- Prior inspection of the item can cause some problems along with no flexible payment methods but that can be solved by introducing an advance payment method to activate the account, this helps maintaining order from the bidding side as well.
- There can be server problem many times if the traffic is overloaded but that can also be fixed thanks to using an IaaS model.

- Another major challenge could be the creditability from the bidder side, there can be problems if the bidder bids for more than what he can pay for, this can interrupt the whole bidding process and cause problems to other bidders and vendors as well.

VIII. IMPLEMENTATION

Actonit- Online Auction system was developed using a combination of several programming languages, frameworks, and libraries. The system was built using a combination of Python, HTML, CSS, and JavaScript programming languages. Django was used to build the application server, and the Bootstrap front-end framework was used to design the user interface.

MODULES

The Project is mainly divided into three Modules:

- Application Module
- Business Module
- Data Module

Application Module

The Application Module is responsible for the working of the GUI, it helps perform any action in the virtually created environment, one does not need the programming language to use it. It consists of logical tasks like exploring the website, signing up, and logging in etc.

The registration and logging in comes under this Module, The displaying of the Auction and its browsing is all part of this module.

This component takes care of all the interactions in the frontend, with many different aspects in it.

This Module is mainly made with the help of HTML, CSS and other languages to solidify the framework.

Business Module

The Business Module is responsible for the working of the modules, in it all the working components including the category of the auctions, bidding of the auctions and auction items and their status etc.

This module is in charge of the processing part, the auction item list, their categories, their prices, the bids that go for

them etc. Every change that users- sellers and bidders make comes under this module.

All the search components, filter components, edit components that the users makes from the website is part of the business module.

This Module was also made with the help of HTML, CSS, JavaScript etc.

Data Module

The Data Module consists of the backbone of the project. It is the place where all the data is stored, This module consists of all the backend data and storage. The person managing this module will be in control of the whole database and will have the power to edit and change the details which is inputted from the users from the website.

The person in control is usually known as the admin and is able to change things directly through the database, the admin could also have an account on the website which has special administrator privileges and is able to make changes indirectly.

The language which we used for storing and taking care of the data is Sql.

FRONTEND

We began our project with setting up a basic back-end and front-end connection first, and we decided on Flask and HTML for their respective roles. We created a basic left-top-top Wireframe [20] for the front end consisting of a side nav as well as a top nav and having the rest of the page occupy the contents.
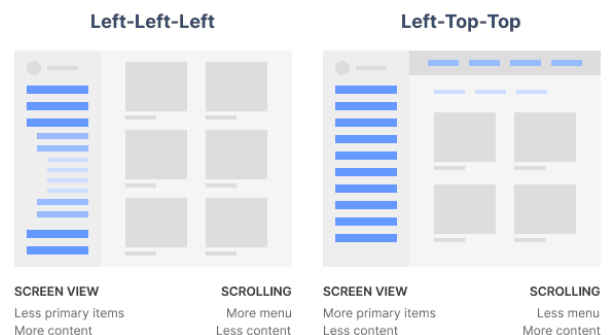

Fig.8.1 Left-top-top and Left-left-left Wireframe

We included features and pages like, landing page login page and registration page, Dashboard, Active Auctions, Watchlist and create Auctions. All these were created into subsequent HTML pages. Following this we enhanced the visuals using Bootstrap and CSS.

results:

BACKEND

The back-end server is accountable for overseeing the exchange of information between the user interface and the database. It consists of various files such as server-side scripts composed in Python, and configuration files that establish the server settings. These server-side scripts perform tasks such as login and registration validation, user input validation, database queries, redirecting and routing and data processing.

This is where the code for all API calls, data queries for user data, database messages, etc is done. Working with Django framework made our work easier, faster and efficient.

We used MySQL workbench as our environment, in which it can be used as a database design tool and it is also able to integrate maintenance, database design, SQL development, administration etc into a single integrated development environment.

It makes the work easier, some of the reasons why it is very popular are :

a. It makes user management very easy, everything from viewing all user information to revoking status can be done through this tool.
b. It has a Visual SQL editor, with this multiple number of queries can be run at a time and they will also be displayed automatically and even the history of queries are saved.
c. It's a great modelling and designing tool, all objects, including tables, views, stored procedures, triggers, etc, are adhered to by MySQL Workbench.

IX. Discussion and results

An Online Bidding platform titled "Actonit" is a web application that is designed to make online auctions fair for everyone, and people regardless where they are from, should be able to take part in it. In this section, we present the results of our study that aimed to make the use of online auctions easier, efficient and safer for the users. The results of our study provides easier accessibility by the users after the application is put up on the cloud in the form IaaS, this is very cost efficient and does not depend on the cloud service entirely.

Thus creating an online auction (IaaS) makes it easier on both the managers and the users to work on the application creating a friendly environment,

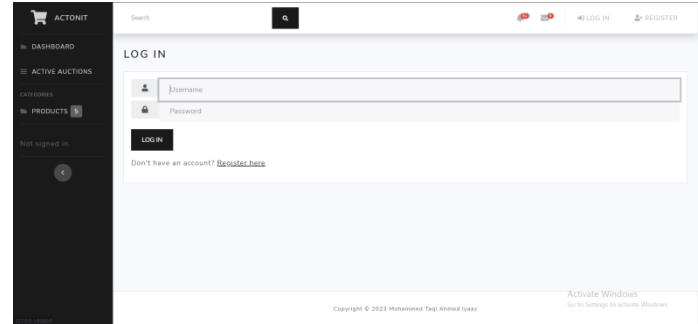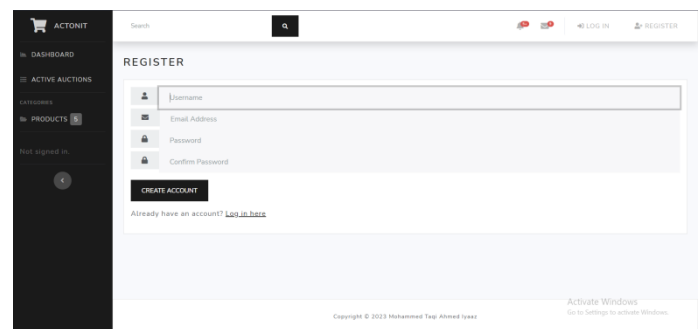Presented below are visual representations to illustrate our
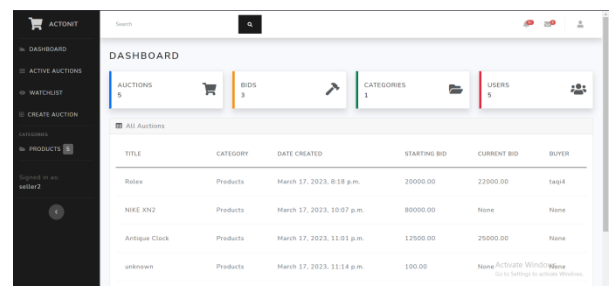

Fig.9.1 Log-in page

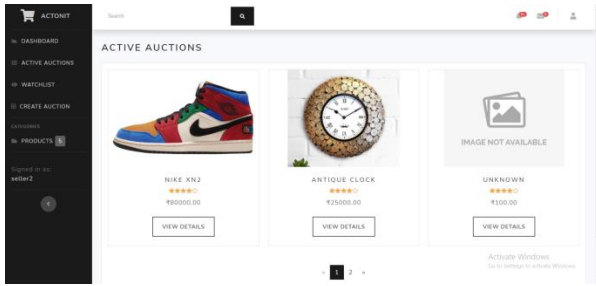Fig.9.2 Sign-up page

Fig.9.3 Dashboard

Fig.9.4 Active Auctions
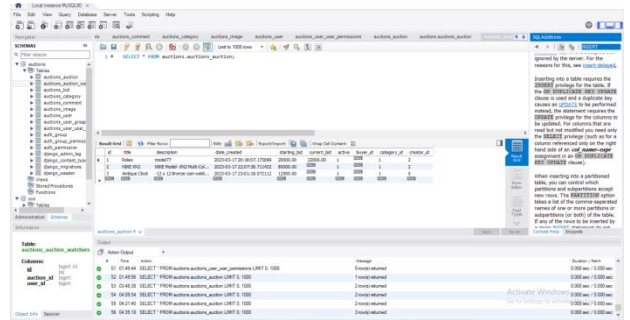

Fig.9.5 Watchlist
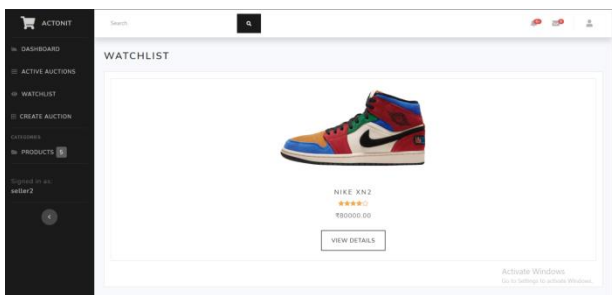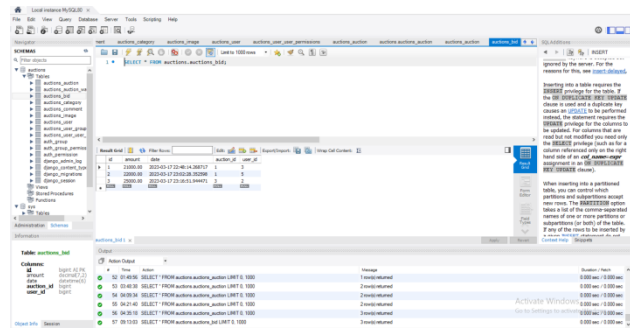

Fig.9.6 Create Auction-1

Fig.9.7 Create Auction-2
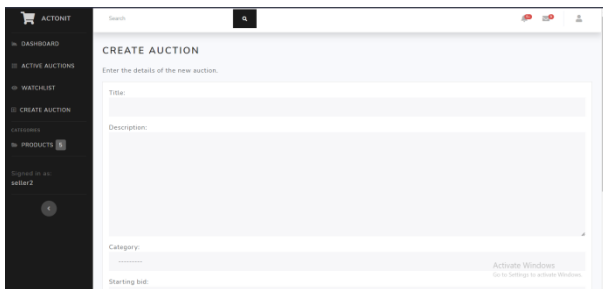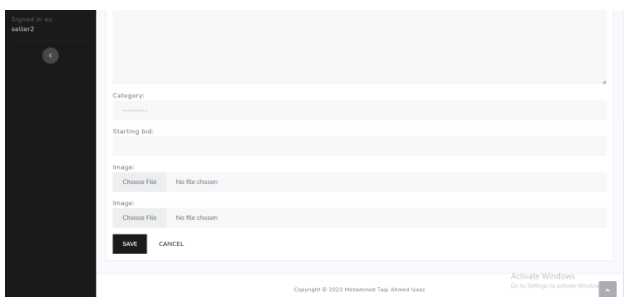

Fig.9.8 Database-1

Fig.9.9 Database-2

X. References

[1] Yifei Zhu, Silvery D. Fu, jiangchuan Liu, and Yong Cui "Truthful Online Auction Toward Maximized Instance Utilization in the Cloud." 2018, IEEE/ACM TRANSACTIONS ON NETWORKING

[2] Nitin Walia and Fatemeh Mariam Zahedi, "Success Strategies and Web Elements in Online Marketplaces: A Moderated-Mediation Analysis of Seller Types on eBay." 2013, IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT

[3] Yang Liu; Yu-qiang Feng; Zhen Shao, Factors that influence a buyer's utility in online auctions: A conceptual model for studying the role of offline experiences, 2009 International Conference on Management Science and Engineering

[4] Jing Huirong, Study on the online reverse auction & the innovation of enterprise management, 2013 6th International Conference on Information

Management, Innovation Management and Industrial Engineering

[5] Sudarshan S. Chawathe, Analyzing Auction Data for Anomalous Bidding, 2020 11th IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON)

[6] Xiaowei Zhang, Bin Li , Junwu, A Combinatorial Auction-Based Collaborative Cloud Services Platform, 2015 IEEE Access

[7] Chunxiao Jiang, Yan Chen, Qi Wang, Ray Liu, Data-Driven Auction Mechanism Design in IaaS Cloud Computing. 2015, IEEE Access

[8] Ammar Gharaibeh, Abdallah Khreishah, Mehdi Mohammadi, Ala Al-Fuqaha, Issa Khalil, Online Auction of Cloud Resources in Support of the Internet of Things, 2017, IEEE Internet of things Journal

[9] Xiaoxi Zhang, Zhiyi Huang , Chuan Wu, Zongpeng Li, Dynamic VM Scaling: Provisioning and Pricing through an Online Auction. 2017, Journal of IEEE transactions on Cloud Computing

[10] Juan Li, Yanmin Zhu, Jiadi Yu, Chengnian Long, Online Auction for IaaS Clouds: towards Elastic User Demands and Weighted Heterogeneous VMs, 2018, IEEE Access

[11] Mengjuan Liu, Wei Yue, Lizhou Qiu, Jiaxing Li, An Effective Budget Management Framework for Real-time Bidding in Online Advertising. 2020, IEEE Access

[12] Shutong Chen, Lei Jiao, Fangming Liu, Lin Wang, EdgeDR: An Online Mechanism Design for Demand Response in Edge Clouds, 2021,IEEE Transactions on Parallel and distributed systems

[13] Rashesh G Chothani, Nainesh A Patel, A Review of Online Auction and It's Pros and Cons, 2015, International Journal of Advance Engineering and Research Development

[14] Megat Shariffudin, Full Thesis Analyzing Factors Influencing eBidding (online Reverse Auctions) Adoption in Malaysian Public Sector, academia/9642047/

[15] Audrey Elizabeth Wen, HoiYat Wong, Bidder and Seller Strategies in Online Auctions: A Review, 2021 3rd International Conference on Economic Management and Cultural Industry (ICEMCI 2021)

[16] Margarita Janeska, Dejan Zdraveski, Suzana Taleska, Trends and Challenges of Electronic Auctions as a New Business Model, 2014, TEM JOURNAL 3

[17] Amitava Bagchi, Atul Saroop, Internet Auctions: Some Issues and Problems, 2003, Distributed Computing - IWDC 2003

[18] Tomáš Hanák, Ivan Marović, Nikša Jajac, Challenges of Electronic Reverse Auctions in Construction Industry—A Review, Economies 2020, 8(1), 13

[19] Jogi Priya P M, Dr. Joe Prathap P, Security Boosted Online Auctions Using Group Cryptography, 2017, International Journal of Applied Engineering Research

[20] Sánchez Ramón, Óscar & Molina, Jesús & Sánchez Cuadrado, Jesús & Vanderdonckt, Jean. (2013). GUI Generation from Wireframes.