

Advanced and Secure Online Web-Based Auction System

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Abstract

The advance and secure online auctioning system is a versatile approach for facilitating lot-based online auctioning system. In this paper, we will describe how to build a safe and online advance auction website. The system has been built to be extremely scalable and capable of serving huge groups of bidders in a promotional event. You may browse deals and put bids on a secure server using the online auction system. The service provider is responsible for all shipping costs. The goal is to create a user-friendly auctioning platform where any goods may be auctioned and where bidders and sellers can receive value-added services. The items will be verified, and the site will provide a secure and safe experience for online users. Auction system is further divide into two different easy platforms in which one is special designed for only the developers to maintain and update the system according the current requirements and demands while another is specific for user-end platform. It is very efficient, secure and reliable for all types of bidders, buyer and sellers. Because of its reliability, efficiency and secure platform, it is not wrong to say that this auction system is unique and can differs from all other system which are also developed and designed for the purpose of auctioning.

Keywords: Auction; Online Platform; Efficiency; Security; Flexible auction; Bidding; Web-based.

1. Introduction

Auction is a Latin word meaning increase. An auction is a bidding and selling procedure in which goods and services are offered for sale. There are several sorts of auctions, and each auction has its own set of regulations. An auction can have several variants, such as a minimum price limit, a maximum price limit, and time constraints. Bidders can participate remotely or in person, depending on the auction type. Participation in remote auctions is possible by phone, mail, and the Internet [1-5]. The popularity of internet shopping has skyrocketed, as has the popularity of online auctions. Because online auctions are becoming increasingly popular in e-commerce, the system's quality and security should be improved. The online auction system is a paradigm in which we participate in goods and service bidding. This auction is facilitated by the use of online software that can regulate the processes involved. There are several auction techniques or varieties, with the English auction system being one of the most prevalent.

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This system is built to be scalable and can handle a large number of bids in a live auction. Online auctions have become a common technique of procuring goods and services. Users' data can be kept secret to protect the legitimacy and integrity of contract papers, and bidders can be maintained in a single database if required [6-10]. Clear reporting saves time and money by reducing paperwork, postage, and photocopying. It is quite simple to communicate with numerous bids. Individual users can submit numerous bids using this technique.

2. Literature Survey

According to Herodotus, the auction has a history dating back to 500 BC. Women were auctioned off every year in Babylon and wedded to whoever purchased them. Women who were less attractive were sold in exchange for the bidder's money. There was no mention of whether the bids were rising or falling in these auctions. Auctions were used by the Roman Empire to settle debts. Marcus Aurelius, for example, sold his own house's furniture to pay off debts. In 193 AD, the whole Roman Empire was auctioned off when it was dismissed, making it the most important historical auction. Buddhist monks in China also utilized auctions to collect funds for temple construction [11-15]. It became regular practice after that to sell the assets of deceased monks for this reason. Auctions were held in England as well; in the late 17th century, London newspapers often advertised auctions in coffee shops and taverns around the city. In the early eighteenth century, the big auction houses arose. The auction houses Christies and Sothebys were founded in 1776 and 1744, respectively, and auctions first appeared in America in the South when slaves were auctioned. Because societal conventions were not sympathetic to the auction, the owner of the items was frequently not permitted to expose himself, which had a detrimental impact on the sale. Auctions were also held in the Netherlands and Germany, with fruit and vegetable auctions beginning in 1887 in the Netherlands and fish auctions beginning in 1887 in Germany. Less attractive women were sold in exchange for the bidder's money. The order of the bids in these auctions was not specified. People may now auction on the internet because the internet has extended over the globe. We built a website with an auction mechanism based on this concept [16-20]. An online auction is one that occurs via the internet. The online auction system is a web-based auction system that is fully automated. An auctioneer may quickly auction an item on our system, and other users can easily bid on and purchase it. He will need a PC with an internet connection for this. In our nation, internet access is now relatively affordable, which is a critical component of our initiative. To auction an item, the auctioneer must first log in and upload a photo of the item as well as information about it. The auctioneer must establish a beginning price or base price from which consumers can bid. No one can bid less than the auctioneer's starting price [21-24]. The product's picture is then shown in the browser window, where other people may view it and bid. By paying, the highest bidder receives the item. He can pay cash or use an online payment mechanism such as Bcash, Mcash, or Ucash. The items can be delivered to your house or by hand. The user must pay the vehicle costs if he wants his order delivered to his residence.

3. Proposed Application Design and Model

The system was found to have the following modules after a thorough examination:

A. Administration Model

This module provides all of the information on the items that are for sale, as well as the ability for customers to bid on and purchase them. Because the whole auction process is kept under supervision until the product sale is confirmed, the administrator must furnish and manage all of this.

B. Auction Model

Sellers are looking for a place where they may offer their things for a better price and profit the most. This is where the merchant may show off and sell all of his wares.

C. Offer Model

Consumers always want to buy diverse items, but they can only buy local products in the local market. In this program, however, the consumer may purchase any goods from any region of the world at a very low price and own it.

D. Bidding Model

Consumers always want to acquire diverse items, but they can only buy local merchandise. In this program, however, the consumer may purchase any goods from any region of the world at a very low price and own it.

E. Security and Authentication

The following is the security and authentication:

- Create an account as a bidder, a seller, or an administrator.
- Make a new password.
- If you have forgotten your password.
- Create an account as a bidder or vendor.

F. Reports

Depending on their access, various actors can create different sorts of reports in this module.

G. Spiral Model

The spiral model is a software development approach that blends top-down and bottom-up principles by combining parts of design and prototype in stages. It is a system development methodology (SDM) used in information technology and is also known as spiral life cycle model (spiral development) (IT). The elements of the prototyping model and the waterfall model are combined in this development paradigm. The spiral model is designed for big, costly, and time-consuming undertakings.

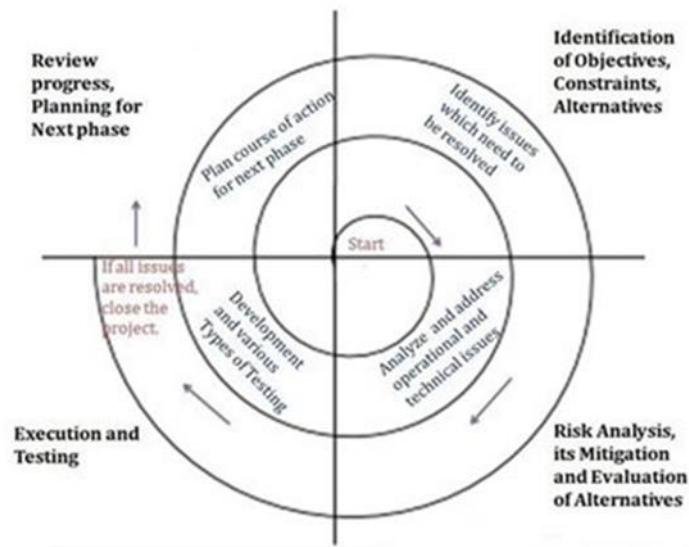


Figure 1: Spiral Model Diagram.

4. Implementation

i. Architecture of an Online Auction System

When looking at existing internet online auctions, it is easy to see how many different themes or sectors are relevant to their design. These subjects encompass both information technology and auction mechanism expertise. Corollary. The method is to break down the online auction's architecture into discrete components or layers and describe each one. Online auctions, like any other information system, are made up of a variety of hardware and software technologies. The author has identified four layers that make up an online auction system. The Internet infrastructure, database, user interface, and market model are the four levels discussed in this thesis. Each of these levels will be examined in the following sections, with their relevance and usefulness outlined.

ii. Internet infrastructure

This layer may be describe as the underlying technology foundation upon which an on-line auction would rest. The infrastructure technology utilized by on-line auctions may include a proprietary network however; this thesis assumes that the on-line auction would held on the Internet. More specifically, using the World Wide Web, which is a hypermedia environment that represents a combination of different Information Technologies such as, advanced client-server Architectures, low cost communications, platform independent software etc. This assumption means that this internet Infrastructure layer would be composed, in some way or another, of a centralized on-line auction server connected by the internet and user operated browser to multiple clients worldwide.

iii. User interface

This layer may be thought of as the underpinning technological foundation for an online auction. On-line auction infrastructure technologies may incorporate a proprietary network; nonetheless, this thesis presupposes that the on-line auction will take place on the Internet. Specifically, using the World Wide Web, which is a hypermedia environment that combines several Information Technologies such as powerful client-server architectures, low-cost communications, platform-independent software, and so on. This assumption implies that the internet Infrastructure layer would be made up of a centralized on-line auction server connected to various customers globally through the internet and a user-operated browser.

iv. Market Model

The online auction system is defined at this level. In other words, it comprises the numerous restrictions imposed on the online auction by the service provider or market administrator. Various price discovery methods, trade execution procedures, commission structures, trade settlements, and so on are examples of such rules. The market model is crucial in defining trader behavior as well as the market mechanism itself. The market model level of the online auction system might be referred to as the "economic engine." It is, in some ways, a technology in and of itself, because it supplies the market with the tools and mechanisms employed in online auctions. For example, a market model may be set up as an English auction with a fixed charge. A sealed-bid auction, in which there is no commission but a cost for placing bids, is another type of online auction. A high-level procedural or object-oriented language, such as FORTRAN, C, C++, or JAVA, is used to develop this layer. On the online auction server, the software code is generally run centrally. The layer, on the other hand, may be made more decentralized, with certain software components installed on client PCs and some on the server.

5. System Design

Any software's fundamental building block is design. The design is based on a thorough examination and knowledge of the current system, as well as the software developer's vision and approach to the proposed system.

a) Creating a Logical Model

This is probably the most important part of the design phase. An entity-relationship diagram should be constructed using a tool like Designer/2000's Entity Relationship Diagram or Erwin from Logic Work, regardless of how small the project is. These tools aid in the creation of the database's logical model as well as the documentation of the data held inside it.

b) ER (Entity-Relationship) diagram

A diagram depicting the database's logical model. It depicts the various database entities and their relationships.

c) Choosing a development tool

Typically, the system will be employed in consideration of the numerous client devices and platforms.

d) Implementing the functionality in stages

Different "versions" of the product are necessary so that users may sample it and provide feedback on whether it has the features they expected. Consider this sequential evolution during the design phase and determine the primary objectives.

e) Using a configuration management tool

You should execute different version controls and implement a backup/restore plan with a configuration management tool:

- Identifying and categorizing users
- Choosing a unified user interface
- Make a test strategy.
- To debug the application, create a diagnostic plan.

f) Database management System (DBMS)

The phrases database and database management system are frequently interchanged, but a database management system is a software product that maintains databases. Accesses, a relational database management system, was utilized in the construction of "Virtual Tour." A DBMS should have many critical qualities, and most current databases include some method for these features:

- Data storage and retrieval should be simple.
- It must ensure the safety of the data saved.
- It should have a way for controlling concurrency and concurrent access to the database.
- In the event of a database crash, there should be a way to recover the database.
- It must preserve the data's consistency and integrity.

6. Data Flow Diagram

Data flow is a relationship between the user and management team of online auction system whether user firstly created an account to get access on auction online system and then communicate or dealing for the required product.

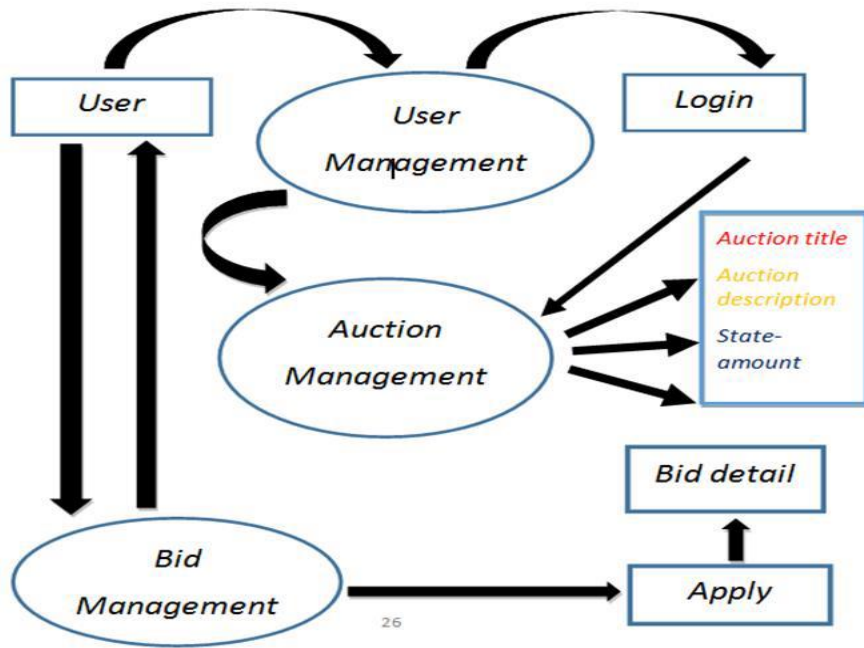


Figure 2: Data Flow Diagram.

7. Entity Relationship Diagram

The data model's cornerstone is the object-relationship pair. The entity-relationship diagram may be used to visualize these pairings (ERD). The entity-relationship diagram depicted in the image depicts the whole process flow.

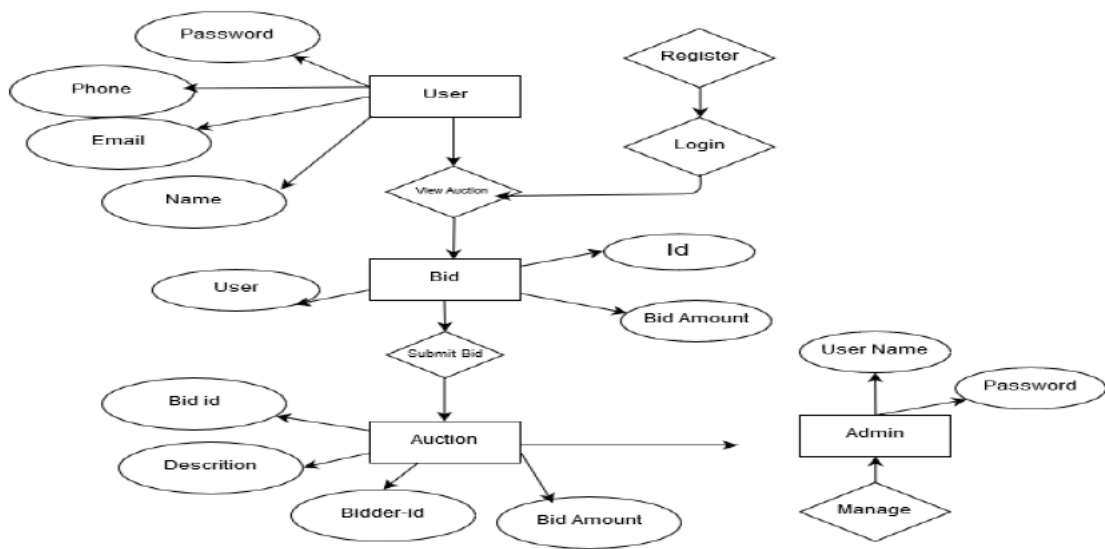


Figure 3: Entity Relationship Diagram.

8. User Case Diagram

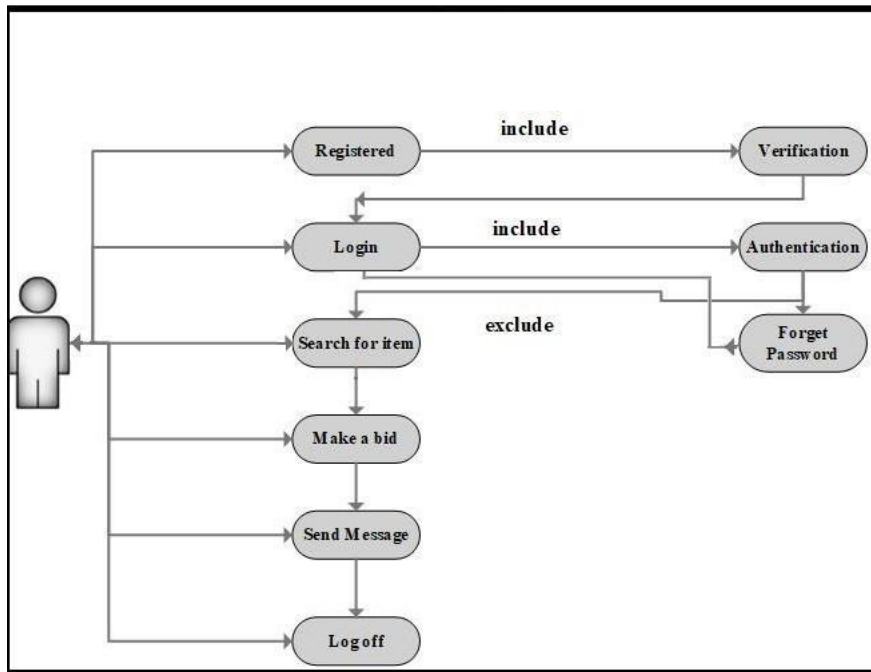


Figure 4: User Case Diagram

Table 1: User Use-Cases.

| Use case name | Use case ID | Scope | Priority | Primary actor |
|---------------------------|-------------|-----------|----------|---------------------------|
| Register | 1 | In | 1 | User |
| Verification | 2 | In | 1 | User |
| Login | 3 | In | 1 | User |
| Authentication | 4 | In | 1 | The system |
| Forgot password | 5 | In | 2 | User |
| Search for an item | 6 | In | 1 | User (as a bidder) |
| Make a bid | 7 | In | 1 | User (As a bidder) |
| Send a message | 8 | In | 2 | User |
| Logoff | 9 | In | 1 | User |

Table 2: Administrative Use Cases.

| Use case ID | Use case name | Primary actor | Scope | Priority |
|-------------|-------------------------------------|---------------|------------|----------|
| 1 | Login | Admin | in | 1 |
| 2 | Manage category | Admin | in | 1 |
| 3 | Manage users | Admin | in | 1 |
| 4 | Manage items | Admin | in | 1 |
| 5 | Send email to the winner and losers | Admin | in | 2 |
| 6 | Logoff | Admin | out | 1 |

9. Administrative Use Cases

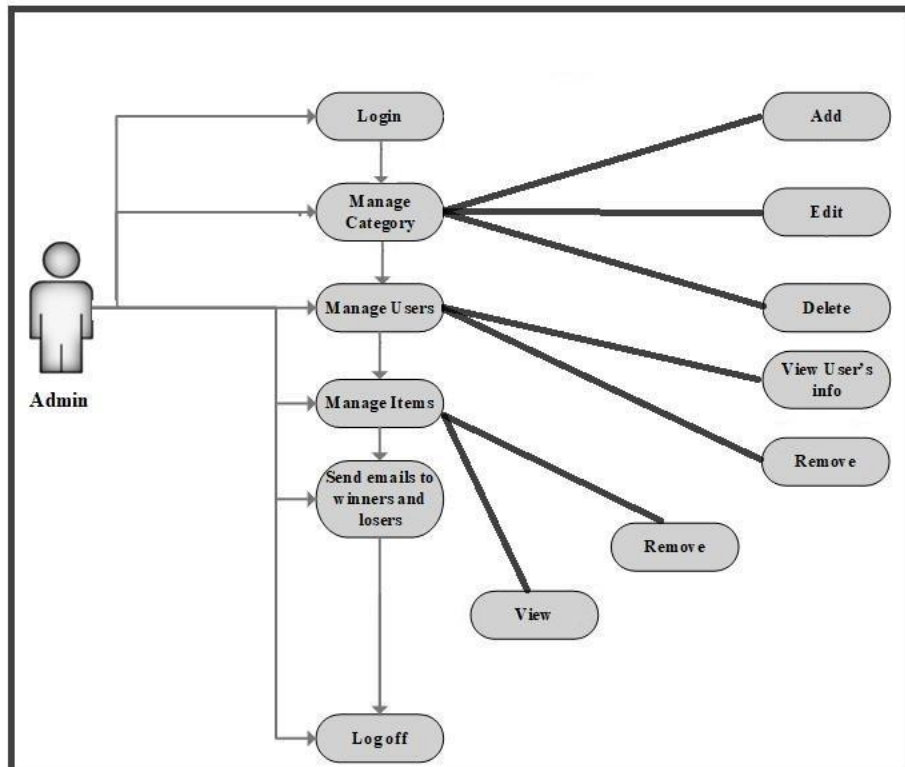


Figure 5: Administrative Use Cases.

10. System testing

When it comes to software development, there is a strong desire to "get the product out the door" as soon as feasible. The majority of the time, software projects are under-estimated and fall behind schedule. When it comes to achieving deadlines, individuals appear to overlook a critical stage of the process: testing. However, we extensively test our project. System testing is a crucial stage in creating a bug-free and dependable system. Testing is the act of executing a software with the goal of identifying bugs. This, however, does not imply humiliating the programmer or forcing the product to fail, but rather the good intention of removing as many issues as possible from the system. A test case is a collection of data items that the system handles normally. There is much more to a good test than just running the program a few times to see if it works. A successful test is one that finds a bug. During the test, the system will continue to be acquired data, and display data, display data into text suspension window display, and the line graph shows [25].

a) *Stepwise Testing or Verification Testing*

Systematic testing ensured that the system was error-free by testing the modules with both fake and real data at the time of their construction. Putting the Computer Program to the Test Following the completion of the program, each module was resumed from the main menu and tested again using dummy data. To this end, a large amount of data was input to verify that the system continued to work correctly. The project received a

considerable amount of data, which was then tested. The project was proven to be bug-free, therefore the new system has been thoroughly tested and debugged and can now be implemented.

b) Unit Testing

Individual components of the program, such as a single class, are tested separately. The smallest unit of software design, the module, is the subject of unit testing. To find flaws within the module's bounds, key control pathways are checked. To readily detect defects within the span of a single slide, all of Child Educator's slides are tested independently. Each slide is thoroughly tested to guarantee that it performs as expected.

c) Project Testing Report

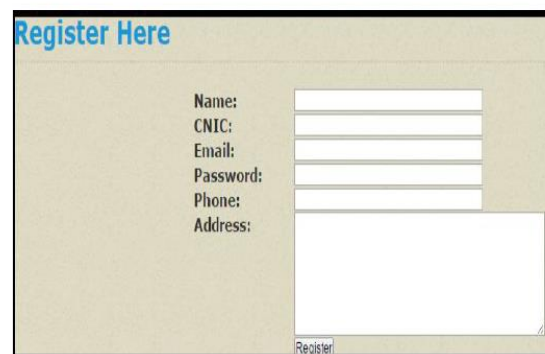
The "online information system" is tested in all phases of black box and white box testing. The system is evaluated in the assessment phase to see if the system's objectives have been met or not. After all, the user is the one who utilizes the system, thus it is necessary to evaluate it from his perspective. The "online information system" is put to the test in the following manner.

- Traceability test matrix
- Test case description
- GUI test plan
- Traceability matrix for this project.

11. Results of Proposed Design:



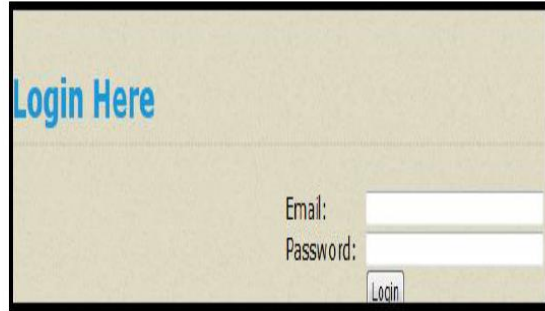
(1) Main online-auction Web Page



(2) Registration Page



(3) User Login Page



(4) Admin Login Page

| List of All Pages | | | |
|-------------------|----------------------------------|------|--------|
| Sr# | Title | Edit | Delete |
| 1 | About Us | | |
| 2 | Privacy Policy | | |
| 3 | Our Services | | |
| 4 | Contact us | | |
| 5 | Terms & Conditions | | |
| 6 | Welcome To Online Auction System | | |

(5) List of Pages

| List of All Bidders | | | | | | |
|---------------------|--------------|-----------------|-------------|--------|------|--------|
| Sr# | Name | Email | Phone | Status | Edit | Delete |
| 1 | Amjad Ali | amjad@gmail.com | 03245687451 | Enable | | |
| 2 | Muhammad Ali | ali@gmail.com | 03214578965 | Enable | | |

(6) List of All Bidders

| List of All Messages | | | | |
|----------------------|--------------|------------------|------|--------|
| Sr# | Name | Email | View | Delete |
| 1 | ayesha | ayesha@gmail.com | | |
| 2 | Muhammad Ali | ali@gmail.com | | |
| 3 | Asad Khan | asad@gmail.com | | |

(7) List of All Messages

| List of All Auctions | | | | |
|----------------------|---------------------|--------------|------------------|--------|
| Sr# | Title | Start Amount | Last_date | Status |
| 1 | Two Laptops | 20000 | 31th April, 2021 | Enable |
| 2 | One Color Printer | 2000 | 31th April, 2021 | Enable |
| 3 | One Samsung Mobile | 2500 | 31th April, 2021 | Enable |
| 4 | One Table Lamp | 300 | 31th April, 2021 | Enable |
| 5 | One Jeep Model 1990 | 180000 | 15th April, 2021 | Enable |
| 6 | One Computer | 20000 | 15th April, 2021 | Enable |
| 7 | One Honda Car | 400000 | 31th April, 2021 | Enable |

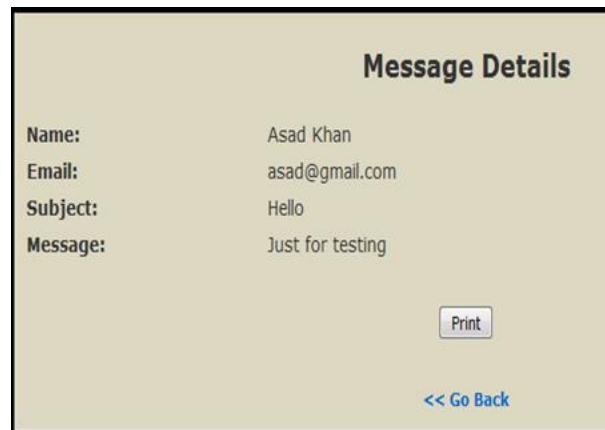
(8) List of Auctions

| View Auction & Bid Details | |
|----------------------------|-------------------------------------|
| Auction Title: | One Color Printer |
| Start Amount: | 2000 USD |
| Bidder Name: | Muhammad Ali |
| Bid Amount: | 2500 USD |
| Description: | I am ayesha and testing this system |

(9) View or Details Usager page

| View Auction & Bid Details | |
|----------------------------|---------------------|
| Auction Title: | One Jeep Model 1990 |
| Start Amount: | 180000 USD |
| Bidder Name: | Muhammad Ali |
| Bid Amount: | 3000 USD |
| Description: | Just Testing |

(10) View or Details Admin Page



(11) Message Deatails or Printing Page

Figure 6

12. Conclusion

The program that has been built is a hypothetical concept that can, of course, be implemented. As a result, the program is adaptable and adaptable to new requirements. This program will be used as part of a data management system. As a result, anytime the policy is changed, it will be updated. The program is trustworthy since it produces accurate results and ensures that no data is lost. Because it was created with the diversity of users in mind, the program is user-friendly. The ease of use, performance speed, and mistake rate are all measurable human aspects that play a part in the evaluation. Not all of the aforementioned elements guarantee a distinct user interface and any program, no matter how well designed and executed, has its own set of benefits and drawbacks. The software has all of the beneficial features that were considered throughout its development, as well as a comprehensive help manual. To aid users, the program also creates relevant error messages. Users will find it easier to work with this program as a result of this. To avoid difficulties caused by software failure, a regular routine for backing up the database should be maintained. The system is reliable, secure, and efficient.

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