

Design of an Improved E-Auction System

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ABSTRACT: Online auction is an emerging technology and is enjoying popularity mainly because of its capability to overcome drawbacks due to geographical distances, time of auctions and small target bidders, affecting traditional offline mode. A number of online auction sites are available on the internet. However the designers of these auction sites face challenges when it comes to a large bidding population and are mostly commodity-specific. This work is based on the study of some design issues of e-auction sites. Based on this study, architectural software has been designed and implemented. This architecture is used to bid on any commodity available on the site, anytime, and thus is different from a commodity - specific auction sites. The asynchrony and robustness of the site has also been channelised as the timing of events is the major essence of such real-time systems.

KEYWORDS: online auctions, asynchrony, E-R diagram

I. INTRODUCTION

Auction is the means of collecting items, ranging from antiques to handmade crafts, which one can't get from market. The bidders have to be present physically for traditional offline auctions, which may not be feasible for some interested bidders situated far from the place of bidding due to time constraints. Online auctions are designed to attract more number of bidders situated geographically far apart from the place of auction by providing everyone equal opportunity to participate in the auction, by clicking mouse buttons only [1]. Also, it provides a user friendly platform to choose and select the item of interest by providing different views of the object of interest to the bidders. Diversity in the community of bidders brings more authenticity in the decision of cost of particular items.

In spite of highly increasing popularity, e-auction systems have suffered some potential threats. For example, it is almost impossible to check whether items that are put into such systems for auctions are stolen items or not. If happen so, then, there may be chances that the bidder or the auctioneer has to pay some penalty in terms of money or even punishments as per law and order. Another problem may arise when the question of delivery of the item to the owner situated at long distance, arise. How and who will be responsible for paying the delivery or any damage cost, occurred during carriage, need to be well settled. Various new laws has been introduced and proposed to handle such situations to provide the e-auction systems protections under such malicious events and present systems are designed by maintaining some standards and norms.

The problems that are present in existing online auction websites are that they use complex or confusing auction schemes. By focusing on different category of goods, and by adopting the most common type of auction scheme like English auction, more trust-worthy service can be given to the users. Another problem that is present in existing systems is fraud and security. Measures can be taken to combat these threats and vulnerabilities.

The primary aims of the project are:

- To provide users with a unique e-marketplace which allows them to browse, and bid products.
- To implement three levels of access: Administrative user access, registered user access and unregistered user access.

The current work is basically trying to prevent the internet auction site to be commodity-specific. To achieve this goal all the commodities has been given a identity number which is unique and also the relationship of the commodity with its particular category has been established. This can help both the bidder and seller in the bidding process as well as provides more choices to the visitors of the website as compared to commodity-specific auction sites which ponder upon a single commodity.

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The organization of this research paper is as follows. After this introduction, some concepts on e-auction system and its background has been discussed in the Section II. Problems with present e-auction systems are discussed in Section III. Design of an e-auction system addressing the problems mentioned is described in Section IV. Section V consists of some simulation runs of the proposed solution followed by concluding remarks and future directions which is presented in Section VI.

II. BACKGROUND

Auction is a process in which the seller of the commodity tries to sell the product to the bidder who bids the highest amount to purchase the same. The e-auction system tries to establish this relationship on internet and combats the various difficulties related with traditional auction system. Basically there are five types of online auctions which are described in brief below.

II.I Auction types

i) English auctions: - English auctions have an ascending bid auction system. It enables the bid to be viewed by everyone. In this type of auction system, bids are declared by either a bidder or auctioneer and the highest bidder of the auction is expected to pay what he/she bid to purchase the commodity. The popularity of English auction solely depends on the fact that it uses a design that people find known and familiar [3].

ii) Dutch auctions:- Dutch auctions are the opposite of English auctions where the price begins high and is methodically lowered until a buyer admits the price Internet [3].

iii) Vickrey Auction:- A Vickrey auction, is known as a Second-price sealed-bid auction. Though, the highest bidder will merely pay what the second highest bidder had bid [4]. It is advised to check the incentive for buyers to bid tactically [5, 6].

iv) Reverse auction:- In Reverse auctions , multiple sellers compete with each other to get the buyer's business and prices normally decrease with time as new offers are presented[7].

v) Bidding fee auction:- A Bidding fee auction entails customers to pay for bids, which he can increase an auction value one unit of currency at one time [7].

All the E- Auction sites are based on one of the above mentioned type and are developed with a vision to wipe out the inherent problems of offline auctions. The salient features of such sites are as follows:

1. Paperless Auction System.
2. It is accessible to everyone, at any time no matter where they are.
3. Reliable user validation & checking.
4. Easy online settlement

E-auction system is an emerging technique which has been introduced and started getting popularity during last decade. All such systems provide user friendly interface to millions of bidders, spread across the world. All the bidding related documents are kept in a central server with high degree of security. Various laws has been introduced in order to protect buyers right over items bought from such online auctions, as, online auction system can be a potential source of fraud, if manipulated by deceptive people. Thus, use of such e-auction systems secure and safe.

However, most of the existing internet auction sites are related to the buying and selling of a single commodity which acts as a hindrance to the users of the website and also does not provide choice and alternatives to their purchasing power. Another problem may arise when two people geographically far away, bid for the same item, at the same time. Due to their geographical distances, bidding time may differ which may alter the auction result. Following section discusses these issues in detail, associated with existing e-auction systems.

III. PROBLEM PRESENTATION

The problems associated with the present e-auction systems which has been addressed in the design of the current work are as follows:

- Mostly internet auction sites are commodity specific. It discourages the power of users to purchase and does not provide them with alternative choices. However, this work provides the users with an alternative purchasing channel previously unavailable to them. The user or the visitor of the website can view the details of any desired

commodity belonging to a particular category and bid to purchase any product of his choice. Therefore, it provides a variety of products to be auctioned.

- There exists a lot of asynchrony in the ability to collect auction data in the present e-auction systems. Many auction sites do not display revised data which leads to confusion and chaos on the part of customers. It wastes the user's valuable time and gives an impression of fraudulence to the users. Thus, in this work the timing of events has been dealt with and thus, management of time element can be recognized.

IV. PROPOSED SOLUTION

Solutions to the above mentioned problem are addressed in the design of the proposed system which is based on English Auction type. For the purpose of better understanding of the entire work, E-R diagram is presented as follows.

A. E-R Diagram of proposed e-auction system

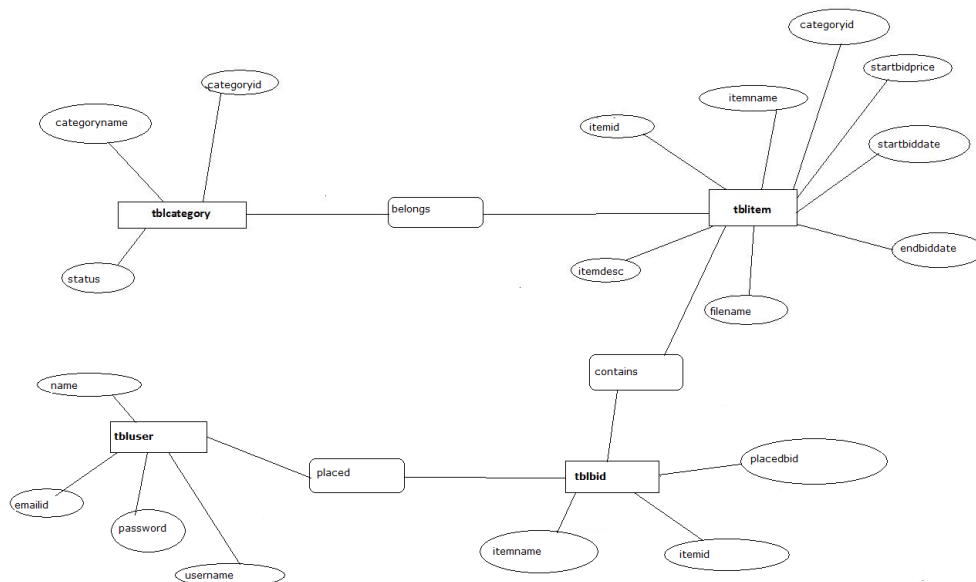


Fig.1 E-R diagram of the proposed design

B. Description of the proposed design

The table 'tbladmin' is not included in the above erd, since the admin works wholly as a different entity. It has access to all the other entities and is at the top-most level of the entire procedure.

The words like 'belongs', 'contains', 'placed' is used in the above diagram to show the one to many relationship which is the main target while making a web application. Here all the commodities/items belongs to a category. One category can have many items. The table 'tblbid' contains the information from the table 'tblitem', thus there relationship has been established on one single item, multiple bids are possible. Moreover, the user places the bid on his desired commodity, thus the linkage between 'tbluser' and 'tblbid' has been shown by the word 'placed'.

The category id is used to give a particular unique identification to each category. This category id will be used by the seller when some particular commodity/item will be added, deleted or updated in the website. The registered user of the website will have a unique username and password which will be used by him or her whenever he visits the site. The last highest bidding price for the particular commodity is displayed when a bidder comes to bid that particular item and the column field 'current time' also store his or her current bidding time in the database. In this manner every time a new bid that takes place on the commodity will show the till date recent highest bid and also when the last bid was placed. Since

we have used fields like ‘startbiddate’ and ‘endbiddate’ for each commodity, the problem of asynchrony can be solved easily as there is a starting and ending time of bidding for each item.

V. IMPLEMENTATION DETAILS

A. Requirement specification

For the purpose of implementation, 32 bit and 64 bit, Intel(R) Core(TM) i3 processors has been used for client and server machines, accordingly. A 16 GB Ram is used in the server machine, whereas, 2 GB is used for that of the client. Both client and server use Windows OS where with the scope of utilization of dot net framework. Both the client and server machine should have an internet connection.

B. Database design

The descriptions of the tables that are used in the present work are given below:

Table 1: - Description of the tables used in the design

Table Name: tblcategory			Table Name: tbladmin		
Column Name	Data type	Allow Null	Column Name	Data type	Allow Null
Categoryid	Int	No	Adminuserid	varchar(50)	No
Categoryname	varchar(50)	Yes	Password	varchar(50)	No
Status	Int	Yes	Table Name: tblusers		
Table Name: tblitem			Column Name	Data type	Allow Null
Categoryid	Int	Yes	Name	varchar(50)	No
Filename	Varchar(50)	No	Emailid	varchar(50)	No
Itemid	varchar(50)	No	Username	varchar(50)	Yes
Itemname	varchar(50)	Yes	Password	varchar(50)	No
Itemdesc	varchar(50)	Yes	Table Name: tblbid		
Startbiddate	Datetime	Yes	Column Name	Data type	Allow Null
endbiddate	Datetime	Yes	Username	varchar(50)	No
startbidprice	Float	Yes	Currenttime	Datetime	No
Status	Int	Yes	Placedbid	Float	No
			Itemid	Int	No
			Itemname	varchar(50)	No

Table: tblcategory – This table is designed to store the details of the categories of each item to be auctioned. In this table, the *category id* has been made the primary key and is an auto-generated field. The status field tells us whether a particular page is active or non-active. The field category name stores the various categories included by the seller.

Table: tblitem – This table is used to store details of items, such as, starting and ending price of bidding, status of bidding of that items etc., to be auctioned. In this table, item id is the primary key and also an auto-generated one. Here, category id acts as a foreign key. The filename has been included to give the look and feel of the commodity to the user or visitor that is to include the picture of the commodity.

Table: tbladmin – Holds the details of administrative login. In the above table, admin user id and password is required by the admin of the website to log in to the website.

Table: tblusers - In the above table, the details of the users are stored i.e. the frequent user of the website or basically the registered user of the website.

Table: tblbid - In the above table, the username is required for keeping the track of the current bidder. The current time stores that particular bidder’s time of bidding. The placed bid stores his bid for the commodity. The item id and item name acts as foreign keys here to keep the track of the item/product for which the bid has been placed. This gives a different outlook from the previous commodity-specific websites.

Since we have used a relational database management system (RDBMS), all the tables are related to one another. The navigation from one web form to the other is done using the property ‘hyperlink’. With the help of this, we can easily

navigate from one form to the other. Thus, it is user-friendly. The linking of database tables has been implemented using the constraints of the column fields. Database management system, has many advantages over the previous traditional ways of saving the data in files because it is more secured and the user can view only the front end and not the work and codes in the back end. It makes data independence more clear and efficient.

C. Execution

The current work consists of 16 forms, descriptions of all of them is not feasible in this paper. Screenshots of some of those which found to be important due to special functionalities, are as follows:

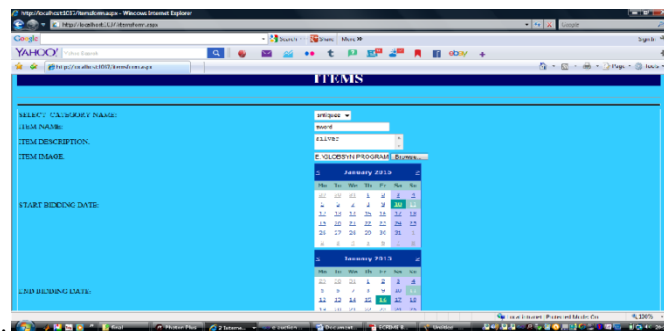


Fig. 2 Screen shot showing item choosing interface

- The above screenshot explains how the details about the different commodities are stored in the database and also the link with its respective category is established. This is basically preventing the auction site from being commodity-specific.

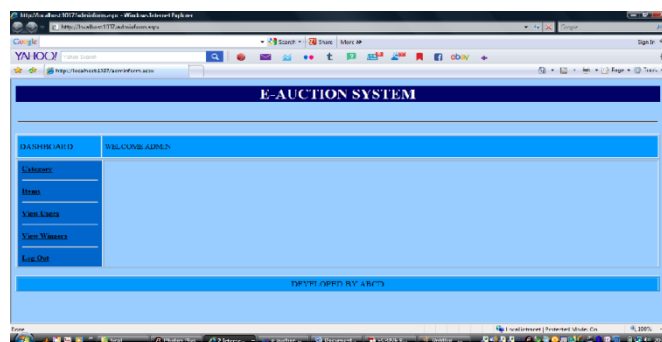


Fig. 3 Screen shot showing admin interface

- The admin of the website has the authority and details of the users of his website. It is his responsibility to notify his customers about the results of the bidding event on a tentative date after the completion of the whole process. He has the authority to add, delete or update any category or any related commodity. This helps wider range of products to be auctioned.

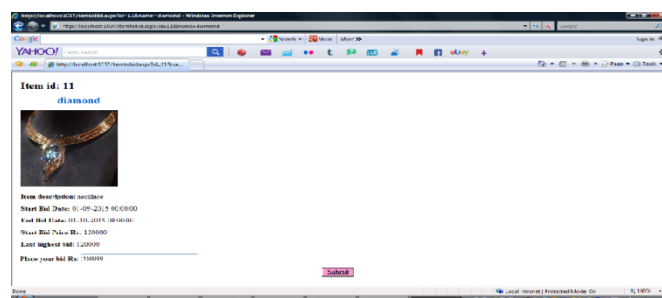


Fig. 4 Screen shot showing interface through which buyers can view item details

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- Present work tries to show the available commodity on the website and the details of each commodity can be viewed by the user. He has the option to view the details and also to place the bid. When he wishes to place the bid, then the last highest bidding price of the commodity will be displayed on the screen. After he places his bid, the event will be stored in a database and the same sequence of events will take place when another bidder comes to place a bid on that particular commodity.

VI. CONCLUSION & FUTURE SCOPE

Present work describes design of one e-auction system which is an improved version of some of the existing system of that type. Unlike commodity specific existing systems, proposed system is capable of handling e-auction of a variety of products, which is essential real world. Also, time management is an important issue in such type of online auction system, which has been managed in the proposed design with care. Also, the system is developed with an aim to make the necessary modifications in the existing systems, and also, that may be required in the future. Hence the system can be maintained successfully without much rework. To summarize, a flexible and robust e-auction system with the ability of handling diversified range of objects simultaneously and time related factor complicating job of bidders as well as auctioneer, is presented in this work. The proposed system is expected to fulfil online auction requirements from all aspects.

As a result of the limitations, there remain some important open research questions of management interest. One of the main future enhancements of the system is to enhance the security by adding the option of Blacklisting defaulting bidders. There also can be option for rating the auctioneers. Such topics may enhance the acceptability of such a system and may be topics of future researches.

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