ISSN XXXX XXXX © 2018 IJESC

Research Article Volume 8 Issue No.4

Developing a Web Based Android Application for Auction Based E-Commerce System

Jurjees Ahamed.S[1], Santhosh Kumar.V[2], Satish Kumar.S[3], Shaik Anwar.U[4], Manikandan.B[5]
Student[1, 2, 3, 4], Assistant Professor[5]
Department of Computer Science and Engineering
DACE, India

Abstract:
DealDaddy presents an online service based platform for selling and buying their name and their products(used and brand new products). This platform provides an account for every user where they could customize their products. It works on the basis of product auction (Bidding). Every product will be assigned a base price for bidding. Then the individual users of the DealDaddy has to bid for the product at their own price. The user with the highest bid price will buy the product. The above prescribed bidding mechanism applies to both old and new products(also apply for antiques). DealDaddy has a facility for categorizing for user to categorize the product needs. Every user has to register or have to create their own account on DealDaddy to begin their transaction. DealDaddy assigns a unique user code to every user. Every product transaction take place based on the user id. The seller and buyer details are only concealed with one another. Highest bidder will be contacted through email notifications.

Keywords: Auction; products; Bidding; email; seller

I. INTRODUCTION

The global reach of online auction market places allows for the buyers and sellers to overcome geographical constraints and purchase products anytime from anywhere over the internet. The online auction market provides the consumers with great advantages of low prices, greater product selection and greater efficiency compared to the usual traditional offline markets (Ghose et al, 2006). The use of online auction system makes use of the decision making assistance tool that results in greater buyer's certainty towards their choice of the seller's and product that they make. The decision making assistance tool consists of three parts that is the product information signals, seller's rating scores and seller's shilling activities. The product information signals seek to fully describe the product through the use of textual and visuals, the use of third party product certifications, description of the product characteristics, the product usage and book value. This strives to ensure the buyer's product certainty. The decision making assistance tool also provides for seller's ratings by making use of the feedback scores. These feedbacks are given by previous winning bidders and they evaluate the online auction product sellers. These bidders give detailed seller ratings of all aspects of the seller and giving scores for example giving scores of how accurate was the items description, how satisfied they were with the seller's communication and how quickly were the products transported to them by the seller. The other important aspect of the decision making tool involves the process of coming up with seller's shill ratings. Shilling is the act of introducing fake bids into an auction on the behalf of the seller to artificially inflate the price of an item (Weinberg, 2003). To come up with shill rating the system monitors the shill activity characteristics which include those bidders who make a lot of repeated failed bids on the same seller. Shills usually have higher number of failed bids per seller ratio. The auction house maintains records of the number of bids a bidder has placed for every seller that the bidder has interacted with. This information is used to come up with a shill score. Detailed evaluation of the product and seller and the use of the decision making assistance tool ensures consumer's certainty on the choice of the sellers and the products that they make.

Background: A few decades down the line, auctions were carried in auction houses and the bids were made with the auctioneer delegating the bids and this method required the physical presence of the bidders, thus it resulted in a number of limitations. This led to the use of online auctioning which allow for the auctions to be carried out over the internet from anywhere in the world. The advent of online auctions presents on its own, different downsides due to the lack of proper evaluation techniques of the products and the sellers. The current systems do not allow for proper description of the of the kind of sellers and the kind of products that they sell. These systems do not provide enough detailed information to evaluate the type of sellers and their products. This result in the buyers uncertainty thus resulting in the reduced effectiveness of the online auctions making people opt for offline auction markets. Most available current auction systems do not fully provide product descriptions as well as fully evaluate the different type of sellers that participate in the auctioning process. Online systems come from a background where there is no full evaluation of the shilling activities that take place in different auction systems. The evaluation of shilling activities goes a long way in providing for certainty in the different type of seller. This can be achieved through the provision of the shill scores or shill ratings for each seller in an auction system. By providing the sellers shill rating the different bidders can easily make choices for the different sellers they decide to bid for their products.

Problem Statement: The problem that usually arises in online auction is that of the buyer's uncertainty towards the sellers and their products due to the lack of physical evaluation of the

products (Pavlou, 2008). Despite the increased numerous advantages of online auction there are problems that are still present, unlike in offline markets where buyers can physically evaluate the product quality and interact directly with the sellers, in online markets the buyers do not have such opportunity as the buyers only get to evaluate the product quality via the internet interface that cannot perfectly describe the products (Melnik et al, 2005). The problem of product and the seller's uncertainty negatively affects the key success of the outcomes of the online auctions. The implementation of an online auction system that provides detailed seller and product descriptions results in the increased certainty of the bidders towards the choice of the products and sellers that they make.

Aim

To implement an online auction system for the buyers and sellers.

OBJECTIVES

i. To design and develop an online auction system that ensures the buyer's on the sellers and the products that are being auctioned
ii. To computes the seller's ratings using the feedback scores from the bid winners
iii. To generate reports for each completed bid in the auction system
iv. To notify the bidders of new bids made in the bids that they participate in.
v. To computes the seller's shill scores for each seller that se products on the online auction system.

Justification

The use of online auction systems that do not allow for full effective product description and failure to provide decision making assistance tools to online bidders results in increased product and sellers uncertainty. The buyer's uncertainty towards product and seller makes it difficult for the buyers to differentiate between the good and bad sellers, the lack of differentiation may force higher quality sellers to leave the market since their quality products do not signal and reward with fair prices thus reducing transaction activity (Dimoka, 2008). What this new system is trying to accomplish is to create a higher level of buyer's certainty on the type seller and products that they choose to make bids for. Through the use effective information like the use of visual and textual product description, third party product certification, product book value and product usage. The successful implementation of this project results in an online auction system that allows evaluation of the product that is far much effective and that come close or equal the physical evaluation of the product.

Scope

This online auction system only allows for the auctioning of house hold furniture, computer accessories, and mobile phones. This system only accommodates the buyers and sellers that are located within Zimbabwe. Only registered potential buyers and sellers participate in any of the auctioning process.

Expected Results

The successful development of this system results in the development an auction system that fully signals the products that are to be sold during the auction process. This auction system makes use decision making assistance tool that enables the auction bidders to properly evaluate the sellers and their products to enable them to make choice of the bids to participate in and be confident with the their decision.

II. RELATED WORK AND PROBLEM MOTIVATION

This section describes some existing online auction systems and the motivation for designing and implementing *DealDaddy*.

A.Existing Auction Systems

Wurmann et al. [13] provide a software design for on-line English auctions that supports both software and human agents. Their proposed auction server named the Michigan Internet Auction Bot provides for flexible specification of auctions considering different parameters so that agent researchers can explore the design space of auction mechanisms. However, the authors do not show how they developed their auction sys-tem. Furthermore, the AuctionBot has been decommissioned since the early 2000s. use case diagrams, activity diagrams, sequence diagrams, class diagrams, and deployment diagrams for designing their proposed online auction scheme. But the UML diagrams are incomplete and do not strictly adhere to UML standards. Furthermore, this paper is not research-oriented.

B.Problem Motivation

Considering the limitations of the existing literature, we have designed *DealDaddy*. Our main target research is to detect shill bidding in real-time. To do this, we need to develop our own auction system as it is illegal/unethical to engage in shill bidding using commercial auction sites (e.g., eBay, TradeMe, etc.) for testing purposes. This paper's aim is to describe our knowledge and experiences with developing a web-based auction model.

The reasons for developing this auction system are as follows:

- To fully understand online auction system requirements;
- To gain experience with administering an auction server and participating in online auctions;
- To enable testing of fraud detection/prevention techniques; and
- To educate auction users about fraud/auctioning behaviours.

III. PARTICIPANTS AND THE ONLINE AUCTION FORMAT

A. Online Auction Participants/Stakeholders

There are three main stakeholders in an online auction:

- Seller – A seller lists an item (or collection of items) for sale. The seller is typically after the highest price possible for the item(s).
- Bidder – A bidder submits a bid for an item listed by the seller. The amount the bidder bids is an indication of what the bidder is willing to pay for the item being auctioned. The bidder is typically after the lowest price possible in order to win.
- Auctioneer – The auctioneer is responsible for hosting the auction, providing the resources required for the auction, and conducting the auction proceedings according to the auction

rules. The auctioneer is usually paid a listing fee by the seller. In some cases, the auctioneer may receive a commission based on the winning price. In this case, the auctioneer will typically want the item to sell for the highest price possible.

IV. SYSTEMS ANALYSIS

This section analyses the requirements for DealDaddy.

A. Software Subsystems

Software subsystems provide an intuitive way of visualizing, understanding and analysing the major functional requirements. Table II shows the *DealDaddy*'s subsystems.

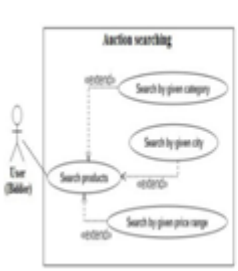
B. Use Cases

The use case consists of a set of possible sequences of inter-actions between systems and users in a particular environment for achieving a particular goal. The use cases for *DealDaddy*'s subsystems are as follows:

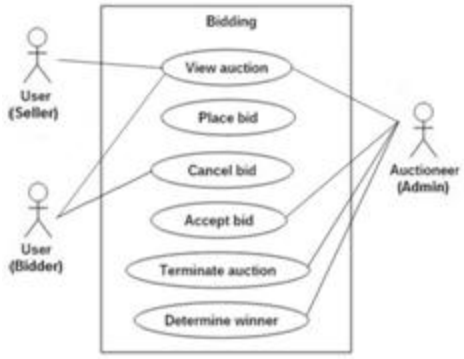
• User account management: Fig. 1 presents the use case diagram that deals with the issues relating to the authentication of trading companies or users (sellers/bid-ders), creation of a profile for each user that reflects his interest in different kinds of products, location details, and membership information. A seller/bidder can also update or view his details. The auctioneer can view the details of any user and delete any user account.

• Auction management: A seller sets up the auction listing of products. This step deals with describing parameters such as price, reserve value, delivery dates, shipping details, payment type, starting and ending date and time of the auction, auction status, etc. The auctioneer ap-proves the auction listing. After getting approval, the corresponding seller will be able to process his auction. Moreover, the auctioneer sets up the auction rules and guidelines.

• Auction Searching: Registered bidders are able to search for specific products being auctioned Auction management use case



The auctioneer terminates an auction and then determines the winner according to the auction rules.



Payment: This subsystem handles the payment of auction listing fees to the auctioneer. A bidder who wins an auction sends payment to the corresponding seller. At the same time, the seller transfers the auctioned products to the bidder (see Fig. 5). Fraud detection: This subsystem monitors an auction for signs of fraudulent bidding behaviour. Bidders or sellers can provide information or are notified if fraud is suspected.

B. Domain Modeling

The domain model class diagram represents the types of objects that exist in the system and shows the associations among them. It also shows the attributes of a class and the constraints that apply to the way the objects are connected. Fig. 7 shows *DealDaddy*'s domain model class diagram. There are three classes: *Bidder*, *Auction* and *Bid*.

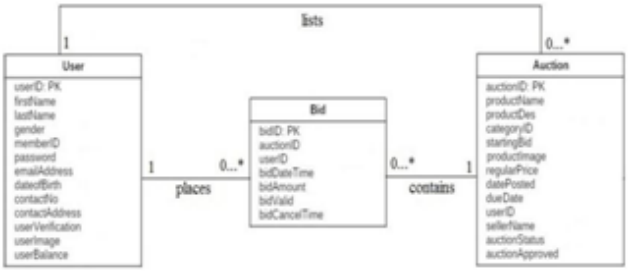


Figure.7. Domain model of an online auction system

The *User* class contains the attributes related to the user. A user becomes a valid user after completing a registration process by providing user details. A valid user can list products for auction through the association with the *Auction* class and also can make a bid through the association with the *Bid* class. The *Bid* class describes the bid amount, bid time and the user making the bid. There are some variations available in online auctions such as the ability to cancel a submitted bid. This is typically allowed when a bidder has accidently entered the wrong bid amount. In the case of cancelling a bid, the bid could simply be deleted from the database. Nonetheless, a cancelled bid should be recorded into the database due to security issues. This can be done by including *bidValid* and *bidCancelTime* attributes to the *Bid* class of the class diagram.

D. Activity Diagram

An activity diagram is graphical representation of work flows to describe the dynamic aspects of a system. While there are many such diagrams related to *DealDaddy*, for space constraints will only provide the most significant activity diagram. When a bidder submits a bid for a particular auction, his placed bid is compared to the current highest bid or last bid of the auction. If

the bidding amount does not meet the minimal required amount to outbid the existing highest bid, then it is discarded and the bidder is asked to resubmit a new bid. On the other hand, the bid value meets the required amount it is time stamped by the auctioneer and entered into the database. In case of first bidding in an auction, the bid is compared to the starting price of the auction. If the bid is higher than the starting price, then the bid value is recorded by the auctioneer and stored in to the database. Otherwise, the auctioneer rejects the submitted bid and notifies the bidder to place a new bid again.

E. System Sequence Diagram

A sequence diagram depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Fig. 9 represents the sequence diagram of bid submission in our proposed auction system.

V. SYSTEM DESIGN

The design of *DealDaddy* is discussed in this section. De-sign class diagram and *DealDaddy* design interfaces are also discussed in details.

A. Software Model

Fig. 10 presents a high level software model for performing online auctions in *DealDaddy*. There are two main parties: a user (bidder or seller), and an auctioneer. A communication link is used to join the two parties.

The participants of an online auction system are described as follows:

1) User: A user can be either a bidder or a seller. A bidder interacts with an auctioneer using an HTML browser. A two-way communication link is used for communicating with the auctioneer to place a bid or get information such as auction status from the auctioneer.
A seller interacts with an auctioneer using an HTML browser. Using a two-way communication, the seller can post one or more items with the details of the items to the auctioneer for auctioning, as well as, can get notification from the auctioneer about the winner of the auction item after the end of the auction.

2) Auctioneer: The auctioneer runs a web server (e.g., MySQL server) and a scripting language like PHP. The auctioneer is responsible for taking information from the bidders and the sellers. The auctioneer provides registration service, log service, access control service, data persistence service, etc. The entire auction is database driven. All state information (e.g., bids, timing, bidding amount, cancellation of bids, etc). about the auction is stored into the database. The transaction of the database starts when a bidder submits a bid or requests a price quote. Using the scripting language, the database generates dynamic web pages according to the bidder activity.

B. Interface Design

In this section we first discuss the usability issues in auction software from the auctioneers perspective. As the software becomes more flexible, allowing a wide variety of auction styles to be used, the auctioneers task of specifying the complete set of rules for an auction becomes more arduous.

1) *The User Interface:* There are two types of user interface available in *DealDaddy*. Both users have to register into *DealDaddy* for performing selling and bidding activities. Our auction site, *DealDaddy*puts a user(seller/bidder) on the Welcome page from where a registered user can authenticate him to the site and initiate a secure session (login). An unregistered user will get the opportunity to fill in a registration form that may be processed online or off-line. Other additional features of these two user interfaces are discussed in this section.

- The Seller Interface: A seller lists auction products by providing details of the product (e.g., the name of the product, starting price, regular price, product category, product description, image of the product, etc). After listing an auction, a seller waits for approval from the auctioneer. The listing products will be ready for auctioning when the seller gets the notification of approval. Fig. 11 shows a seller interface of *DealDaddy*.
- The Bidder Interface: Fig. 12 shows how the bidders navigate the auction web site in the auction implementation. Each bubble shows a web page and arcs from one page to another indicate that a hot link is available from the first page to the second. The two-way communication link indicates that it is possible to browse the first page to the second and also possible to go back to the first page from the second.

After registration, a bidder can browse through or search the products in the auction site, which will possibly result in a product being selected, and its description presented to the bidder (see Fig. 13). If the product is on auction, the rules of auction and bid history can be viewed, and bids can be submitted for that product. From the home page the bidder can also see a list of all auctions at *DealDaddy* or a subset of these that are in his personal auction *watchlist*. An auction gets added to a bidder's auction *watch list* when the bidder explicitly takes an action to do so from certain auction pages, or implicitly when the bidder places his first bid. From lists, all auctions or auction *watch list*, the bidder can select an auction and access the description of the product being auctioned, see the rules of the auction, or bid on the product.

2) ***The Auctioneer Interface****:*

The auctioneer interface consists of five component

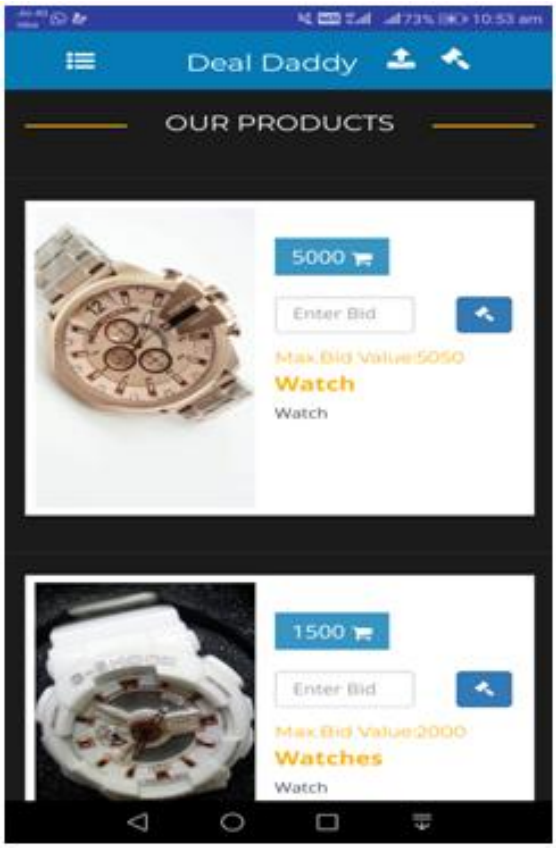
(i) Provide approval to auction listings requested by a par-ticular seller after which the product will be ready for auctioning process;

(ii) Allow the auctioneer to view the details of the products and monitor the progress of the various running auction;

(iii) Add new categories of product;

(iv) Notify the seller if his product is not satisfied the auction rules or the bidder if he wins an auction;

(v) Cancel any auction if any violation or fraud activity takes place.



VI. TESTING APPROACHES FOR FRAUD

DETECTION/PREVENTION METHODS

As outlined in Section IIB, the motivation for creating Auction was to have a platform capable of testing our in-auction fraud detection/prevention proposals. Table III shows four types of in-auction fraud [9]. Each type of fraud is aimed at disadvantaging different (or multiple auction) participants. Currently we are focussing on developing mechanisms to detect the presence of shill bidding. Shill bidding is a very difficult type of in-auction fraud to detect as there are many strategies a shill bidder can engage in. There is also some confusion over what constitutes shill bidding behaviour. Some proposals for shill bidding exist [5]. However, these proposals tend to take a static approach. That is, wait until the auction has terminated and then look for evidence of shill bidding. This means that no recourse can be taken against a shill bidder until an innocent bidder has become a victim. Our current research (being facilitated using DealDaddy) is to develop a real-time shill detection algorithm. The algorithm looks for signs of shill bidding while an auction is in progress. This means that actions can be taken against a suspected shill bidder prior to an innocent bidder becoming adversely affected. Penalties could range from warning a suspicious user, suspending/terminating an auction, suspending a users account, or enforcing economic restrictions on a users future activities. As previously mentioned, it is not possible to test our real-time shill detection algorithm using a commercial online auction, nor is there sufficient reliable commercial auction data available. DealDaddy allows use to conduct various types of tests in order to determine the effectiveness of our shill bidding detection proposal. Table IV describes possible approaches for detecting/pre-venting fraud mechanisms.

VII. CONCLUSION

This paper discussed our experiences in designing an on-line auction system. Much of the existing auction software literature is dated and is of limited usefulness to researchers. Furthermore, most existing proposals do not adhere to sound UML standards. We provided a simple and elegant design for an online auction system based on UML. We presented an analysis and design for the auction system illustrating key system components using UML diagrams. DealDaddy is being used to facilitate our research into real-time shill bidding detection. DealDaddy provides us the ability to conduct various.

VIII. REFERENCES

[1]. B. Rumpe and G. Wimmel, *A framework for realtime online auctions*, in Proceedings of Information Resources Management Association (IRMA) International Conference, pp. 208912, 2001.

[2]. BestAuctionsoftware.Available:http://www.capterra.com/

[3]. auction-software/. [Accessed: 22-Jan-2016]

[4]. C. Ren, *Research and design of online auction system based on thecampus network using uml*, in Proceedings of the 2nd Pacific-AsiaConference on Web Mining and Web-based Application(WMWA09), pp. 129–133, 2009.

[5]. F. T. Sheldon, K. Jerath, Y. J. Kwon, and Y. W. Baik, *Case study: Im-plementing a web based auction system using uml and component-based programming*, in Proceedings of the 26th Annual Internationa Conferenceon Computer Software and Applications Conference (COMPSAC 2002), Vol. l, pp. 211–216, 2002.

[6]. F. Dong, S. M. Shatz, and H. Xu, *Combating online in-auction fraud:Clues, techniques and challenges*, Computer Science Review, Vol. 3(4), 245–258, 2009.

[7]. H. Gomaa, *Object oriented analysis and modeling for families of systemswith uml*, In Software Reuse: Advances in Software Reusability, pp.89–99, 2000.

[8]. H. Gomaa, *Designing concurrent, distributed, and real-time applications with uml*, in Proceedings of the 23rd International Conference on Software Engineering, pp. 737–738, 2001.

[9]. Internet Crime Complaint Center, *2014 internet crime report*. Available: https://www.fbi.gov/news/news blog/2014-ic3-annual-report. [Accessed: 22-Jan-2016]

[10]. J. Trevathan and W. Read, *Undesirable and fraudulent behaviour in online auctions*, in Proceedings of International Conference on Security and Cryptograpghy, pp. 450–458, 2006.