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UNIVERSITI MALAYSIA SABAH

**SKTM ONLINE AUCTION  
(ENGLISH AUCTION MODULE)**

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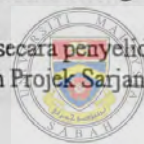
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## DECLARATION

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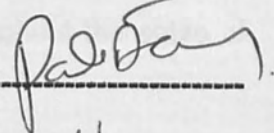


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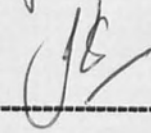
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## ABSTRACT

The introduction of the online auction concept has opened up a new dimension of possibilities to virtual trading and e-Commerce. The implementation of the auction concept into the World Wide Web has seen a lot of success, judging from the growth in the number of users and trade volume. This thesis discusses the implementation of UMS SKTM Online Auction System modules which includes the registration and login for new member and administrator, search item that is on auction and the English Auction bidding protocols. The English auction bidding protocols is not the same as the traditional English auction because as an online auction, it will include another module which is the proxy bidding which will be describe in this report. It explains all the natural workings of the software system, which covers all areas including the system's components and modules, characteristics and functions, the development approaches taken, the development tools used, and also the logical sequences involved in every process of the system. It also explains the objective and motivation involved in building this system, within the limitations of the scope to build the system specifically for the UMS SKTM community. The fundamental nature of existing systems and the implications it will have on this system are also covered. As a whole, this thesis will break down and explain the overall complexity of every part of the system development process.



## ABSTRAK

Pengenalan konsep *online auction* kepada internet telah membuka satu dimensi kemungkinan yang baru bagi perdagangan siber. Implimentasi *online auction* di dalam jaringan global telah sedikit sebanyak mencapai kejayaan, jika dilihat dari peningkatan bilangan pengguna dan nilai perdagangan. Tesis ini akan membincangkan pembangunan sebuah system iaitu *UMS SKTM Online Auction System* terutama sekali kepada module-module seperti pendaftaran dan log masuk pengguna dan pentadbir, pencarian barang-barang yang dilelong, dan akhir sekali adalah lelongan menggunakan protokol Enggeris. Lelongan menggunakan protocol ini adalah berbeza dengan lelongan enggeris tradisional dimana sebagai satu lelongan secara online, protokol ini juga mempunyai satu lagi modul iaitu tawaran menggunakan proxy yang juga akan dibangunkan didalam projek ini. Ia akan menerangkan kesemua komponen dalaman perisian tersebut, termasuklah modul-modul, ciri-ciri, kefungisian, pendekatan pembangunan yang digunapakai, alat-alat pembangunan dan juga aliran logikal setiap proses yang berlaku. Selain itu, ia juga menerangkan objektif dan motivasi yang mendorong pembangunan sistem ini, yang tertakluk kepada had skop yang memfokus kepada pembangunan sistem khas untuk komuniti UMS SKTM. Liputan tesis juga akan menerangkan ciri-ciri asas yang wujud pada sistem-sistem yang sudah wujud. Secara keseluruhannya, tesis ini akan membahagi dan menjelaskan kekompleksan bahagian-bahagian yang terlibat dalam proses pembangunan sistem ini.



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## Chapter 1

### Introduction

#### 1.1 Introduction

IT usage has increased over the years and it plays a major role in most of the activities that we do such as online banking, online bill payment, online shopping, and many more. Electronic business has become very popular over the years and it generates huge revenues for the internet industry. Electronic business or e-Business is any business process that is empowered by an information system. Today, this is mostly done with Web-based technologies. E-business is important because the methods that it uses can enable companies to link their internal and external processes more efficiently and flexibly, work more closely with suppliers and partners to better satisfy the needs and expectations of their customers. In practice, this involves the introduction of new revenue streams through the use of e-commerce, the enhancement of relationships between clients and partners and improving efficiency from using knowledge management systems. E-business can be conducted over the public Internet, through internal intranets and over secure private extranet.

E-Commerce is the term for e-business transactions, commerce or Internet trade. E-commerce, therefore, refers to the business transactions between companies (B2B) or between companies and their customers (B2C) that are wholly or partially conducted over the Internet or similar public or private computer networks (Subir Bandyopadhyay, Julie Wolfe, 2004). E-commerce, however, not only refers to the electronic commerce of goods and services but all electronic business transactions such as for example from trade to financial transactions (monetary transactions).

One of the most widely used e-commerce today is online auction. Online auction is a virtual auction on the Internet where, its popularity has exploded over the past few years. It is an extremely popular way to buy and sell just about



anything from books, collector's item and even cars. One of the main reasons for the popularity of online auctions is because of the larger availability of markets. Due to the rapid increase in ownership and access to computers and the Internet in the past few years, the online auctions have reached a global level in which we can practically participate anywhere and anytime (Peter R. Wurman, 2003).

In Malaysia, online auction is not very popular. There are only a small number of online auction users (<http://bbs.buysell.net.my/bbs/memberlist.php>). As of today, there are three popular online auctions in Malaysia namely Lelong.com (<http://www.lelong.com.my/>), EBay Malaysia (wholly own by EBay which is a foreign based) (<http://www.ebay.com>), and Auction-IT ([www.webportal.com.my/auction](http://www.webportal.com.my/auction)). Based on Lelong.com forum, there are only about 2,240 participants. This number is quiet small compared with to those from western based online auction. For example, EBay.com has approximately 85 million registered users, 12 million items in over 18,000 categories listed on any given day. It transacted thousands of item ranging from books, toys to service.

One possible reason for the unpopularity of auctions in Malaysia is people here don't like to purchase second hand goods, where they would rather just go to a shop and buy first hand goods. Security is also one issue that contributed to the unpopularity on online auction in Malaysia.

We conducted a survey to study the students' perception towards online auction in SKTM. The questionnaires were distributed to 50 students (37 computer science students and the rest is from engineering student) selected randomly.

Based on the survey we found out that most SKTM students, even those who are taking IT courses are unfamiliar with online auction. This problem exists because there is no environment that allows them to use online auction. They don't have the opportunity to play with the real online auctions. Our study also shows that many students are not interested in online auction because they don't own a credit card to buy an item in an online auction.

By creating one and starting here at SKTM, it can indirectly create awareness to the student on the importance and advantages of online auction. Random survey in SKTM shows that, the 29 out of 50 students say that they know what online auction is. But 45 out of 50 of them never actually used it before. This is very poor in terms of the participation or usage of online auction.



Figure 1.1 and Figure 1.2 shows the proportion of students that are aware of online auction and that had used it before.

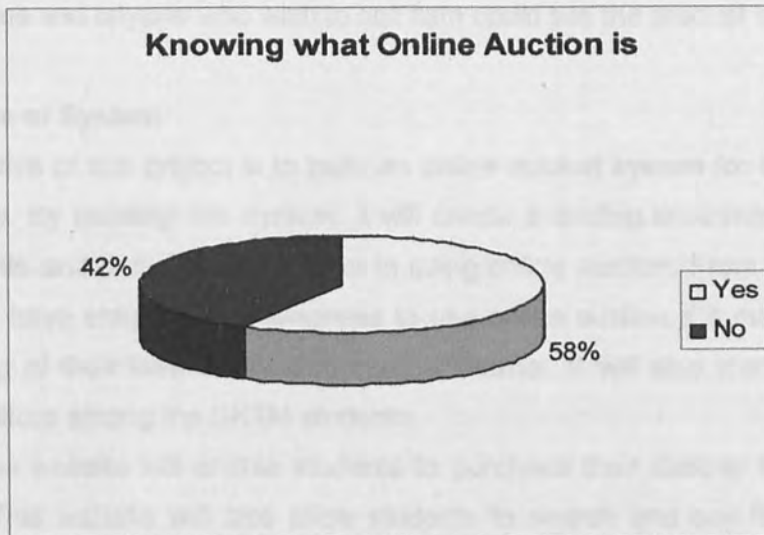


Figure 1.1 Knowing what Online Auction is.

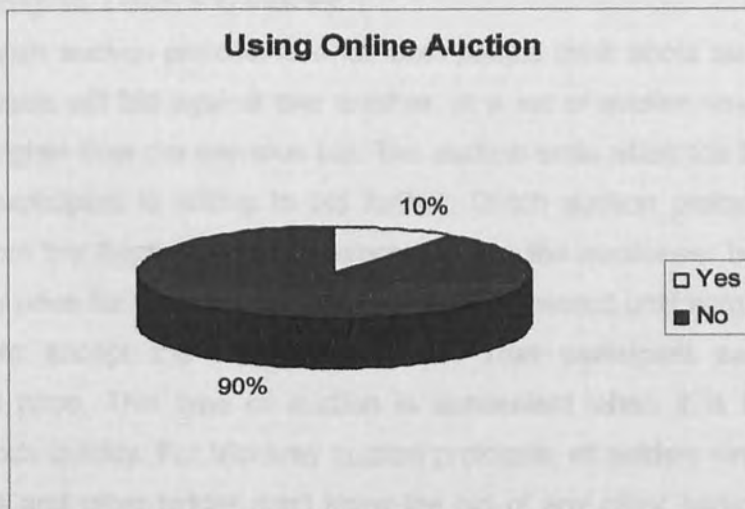


Figure 1.2 Using Online Auctions

Another problem is buyer usually could not search for suitable seller and seller could not find a suitable buyer. Students at SKTM might be interested in buying second hand books from their senior. The price offered by the seller and the price that the buyer desire may not match, and usually bargaining will happen before a transaction can be finalized. With an online auction these process can



be automated and the item would be purchased by the one who value it most and the seller will also get to sell the item at the desired price. It is also a convenient way to sell and buy item since students can just check from the auction sites and anyone who wish to sell item could sell the product online.

## 1.2 Objectives of System

The objective of this project is to build an online auction system for UMS SKTM community. By building this system, it will create a trading environment among the students and can develop interest in using online auction. From our survey, 32 people have stated their willingness to use online auction if it makes buying and selling of their item easier through the internet. It will also start the online auction culture among the SKTM students.

This website will enable students to purchase their desired item via the Internet. This website will also allow students to search and buy first hand or second hand items that is in the categories of textbooks, computers and computer parts, motorcycles and T-Shirts. This auction is based on three auction protocols, English, Dutch and Vickrey.

English auction protocol is what most people think about auction where, the participants will bid against one another, at a set of auction time, with each bid being higher than the previous bid. The auction ends when the time is up or when no participant is willing to bid further. Dutch auction protocols is a bit different from the English auction protocols where the auctioneer begins with a high asking price for their items in which it will be lowered until some participant is willing to accept the auctioneer's price. That participant pays the last announced price. This type of auction is convenient when it is important to auction goods quickly. For Vickerey auction protocols, all bidders simultaneously submit bids and other bidder don't know the bid of any other participant during the auction time until it ends and the winning bidder pays the second highest bid rather than their own. All of this three auction protocols will have a reserve price where if the auctioneer fails to raise a bid higher than this reserve the sale may not go ahead (Rafaeli, 2002).

Students wanting to buy items from the online auction need to be registered with the system. Once they are registered, they will be free to sell and bid in the auction. Student will have the facility to search for a given item and



view the current price. If they want to participate in the auction, they simply have to place their bids. At the end of the auction the winner will be declared and the winning bidder will be declared. The winning bidder will get his item and the seller will get his money.

### 1.3 Project Scope

There are four types of item that are to be auctioned, namely, textbooks, computers and computer parts, motorcycles and T-Shirts in our online auction. From our survey, the second most preferred item by SKTM student is Electronics, but these categories are to be included on Computer categories to minimize the scope of the system. The decision to include T-Shirts on the SKTM online auction is because T-Shirts that have a description about its University, for instance, a description like "Proud 2B UMS Student", is a popular item in any campus in Malaysia. These T-Shirt categories will also be included as used clothing.

All of these four categories of item will be auctioned based on three different auction protocol types, namely English, Dutch and Vickrey. Each item that is being auctioned is given a reservation price in which a seller can choose not to sell the item if the reservation price is not reached. A reservation price is the minimum price that the seller is willing to accept for the item.

The project has been jointly developed by three students consisting of myself, Nigel Ongkili and Hafizam. I have been responsible to develop the registration module, access rights or log-in, search method and English auction bidding protocols. These modules will be elaborated in Chapter 4.



## 1.4 Organization of the Report

The report is organized in the following manner.

### **Chapter 1: Introduction**

This chapter will give a brief introduction about online auction, describing the current situation on why it is popular and what motivates us to create one for UMS community. It also describes the objectives of the online auction system.

### **Chapter 2: Literature review on existing auction websites**

This chapter will describe all characteristic, methods and function normally provided by those existing auction websites and the interface design of those existing auction websites. Comparison will be made between the existing online auctions.

### **Chapter 3: Methodology**

This chapter reports on the approaches and overall framework taken in building the web application. It contained the Software Development Life Cycle (SDLC) approaches that will be applied in the implementation of the project such as the analysis, design and implementation.

### **Chapter 4: System analysis and design.**

This chapter explains some of the functions that is developed in the proposed system and will include some flowcharts to explain the logic sequence of each function and the transaction involved in online auction.

### **Chapter 5: Implementation.**

This chapter describes all the implementation of the module that I had developed and how the implementation is done.

### **Chapter 6: Testing.**

This chapter describes the testing phase of the system.



## Chapter 7: Conclusion.

This chapter will summarize the work that has been done and also future work.

### Literature Review

#### 2.1 Introduction

Auction is a process of buying and selling things by offering them up for bid, taking bids, and then selling the item to the highest bidder. In economic theory an auction is a method for determining the value of a commodity that has an undetermined or variable price. A minimum or reserved price is used, whereas if the bidding does not reach the minimum, there is no sale (but the person who puts the item up for auction still owes a fee to the auctioneer). In the context of auctions, a bid is an offered price (Ricky-Ruby Duff, Kevin James, Shyam Sunder, 2000).

The definition of auction is one pattern of market for selling product. It is an organized market with clear-cut rules. This means that the auctioneer who sells the products or services determines the base price for the products (a reserved price) and that all the potential buyers will bid for the product, the bidder who offers the highest prices will be the winner for the bid (Falsok, 2002).

The term e-auction stands for electronic auction. Sometimes e-auction is also called the internet auction. It is a combination of two words, the auction market and direct sales. An electronic auction operates based the same principle as the regular auction market. However, the e-auction is done online and modified slightly to take into account of online constraints. Traditional auction usually has a few hundreds whereas online auction can go for several thousand. Internet auction services rely on a central auction server (<http://www.auction.com/wholesale/auctions.html>).

An online auction is a virtual auction on the internet. The system of the processes are still the same with the auction, as it will be done online. An example of online auction is eBay, UMS and Amazon.com.

The difference of online auction with the traditional one is that the traditional auction will usually had a low limit but for online auction it might



## Chapter 2

### Literature Review

#### 2.1 Introduction

Auction is a process of buying and selling things by offering them up for bid, taking bids, and then selling the item to the highest bidder. In economic theory an auction is a method for determining the value of a commodity that has an undetermined or variable price. A minimum or reserved price is used, whereas if the bidding does not reach the minimum, there is no sale (but the person who puts the item up for auction still owes a fee to the auctioneer). In the context of auctions, a bid is an offered price (Rong-Ruey Duh, Karim Jamal, Shyam Sunder, 2002).

The definition of auction is one pattern of market for selling product. It is an organized market with clear-cut rules. This means that the auctioneer who sells the products or services determines the base price for the products (a reserved price) and then all the potential buyers will bid for the product, the bidder who offers the highest prices will be the winner for the bid (Rafaeli, 2002).

The term e-auction stands for electronic auction. Sometimes e-auction is also called the Internet auction. It is a combination of two ideas, the auction market and direct sales. An electronic auction operates based the same principle as the regular auction market. However, the e-auction is done online and modified slightly to take into account of timing constraints. Traditional auction usually last for a few minutes whereas online auction can go for weeks. Most of the Internet auction services rely on a central auction server (<http://www.agorics.com/Library/auctions.html>).

An online auction is a virtual auction on the Internet. The system or the processes are still the same with the auction but it will be done online. An example of online auction is EBay, uBid, and Amazon.com.

The difference of online auction with the traditional one is that the traditional auction will usually last for few hours but for online auction it might



take days or even weeks depending the time that was set by the seller of a particular item for it to announce a winner of the auction.

Online auction is better than the traditional auction because it is conducted virtually which means anyone can join in the auction as opposed to the traditional auction where it is conducted in a room that is meant to be an auction room (Rong-Ruey Duh, Karim Jamal, Shyam Sunder, 2002). This means that if someone were to conduct an auction, he/she must prepare a space for the auction to take place. Although the traditional auction can be considered as an entertainment, by some, it is also tiring for the participant when an auction for a particular item takes hour to decide a winner.

## **2.2 Chapter Review.**

This chapter will review a few existing online auctions. The main things that are going to be reviewed are the main issues that is needed to be met in developing SKTM Online Auction system such as is the registration and log-in, search item, payment, the use of proxy bidding and the auction protocols (English, Dutch and Vickrey). The EBay, amazon.com, Ubid.com, Yahoo Auction, are the most popular online auction websites on the Internet and two Malaysian based online auctions Auction-IT, Lelong.com will be reviewed in this chapter. This chapter will also review all the advantages and disadvantages of these online auctions, where the advantages will be featured on the SKTM Online Auction. At the end of this chapter, there will be a table that will show the functionality features of each online auction website.

### **2.2.1 Auction Protocols.**

Except for Auction-IT which only uses English Auction protocols, all of these online auctions, EBay, amazon.com, Ubid.com, Yahoo Auction, and Lelong.com, use the three major types of auctions, English, Dutch and Vickrey. There are other auction protocols that are used such as American but it will not be described here since it is outside the scope of this work. English auction is also called open-outcry or ascending-bid auction. This is the most common type of auction. The auctioneer begins the bidding process with a minimum price for the item and then increases the price until a single highest bidder remains. The highest bidder will win the bid and buy the item. This is a fair and open process



and is an effective approach to obtaining a high winning bid price (Rong-Ruey Duh, Karim Jamal, Shyam Sunder, 2002).

Dutch auction is also called descending-bid auction. It is normally used for selling items that tend to perish rapidly such as fruits, vegetables and fish. The auctioneer begins the bidding process with a highest price and keeps decreasing the price until a bidder presses the stop-bidding button to stop the falling price. The winner is the first one who is willing to pay which means the winner is not necessarily the one with the highest valuation of the item (Rafaeli, 2002).

Second price sealed-bid auction also called Vickrey auction or uniform second price auction. The bidder submits only one bid, without the knowledge of the other bidders. The highest bidder wins but he pays the second highest bid price and not his own offer. Disadvantage of this type of auction is that it creates a perception that the buyer is taking advantage of the seller by paying the second highest price (Rong-Ruey Duh, Karim Jamal, Shyam Sunder, 2002).

In all of these three auction protocols type, each item that is being auctioned is given a reserved price in which a seller can choose not to sell the item if the reserved price is not reached.

Potential buyers or bidders can visit a particular auction website that offers the items the bidders interested. All the auction websites are available 24 hours access and they keep track of the status of active auction. The bidders can place their bid on the items by keying in the bid amount and the quantity of the items themselves. The auction website will ask for the member userID so that the website can track the member information from the database. The bidder must make sure that his bid is higher than the current highest bid and complies with the given bid increment. When bidder Click on the "Bid Now" button the bidder will receive a confirmation that notices his bid was accepted. The website will send an alert to the member that have been placed a bid on whether they won the bid or they have been out-bided. Most of the auction websites will post the current leading bid for each items or services so that the members know what they need to bid to get the running (Wurman, 2003).



### 2.2.2 Registration and logins.

All the sellers and bidders must register at the selected auction website. All of these auction websites provide register function because they want to record all the data about the user such as e-mail address, home address, and home telephone numbers for delivery the items to the buyer home according to the home address or contact the buyer for their own purposes. The e-mail address is needed to send information about their bid result. To guard against fraud, most of the websites require auctioneer or buyer to set up an account by submit their names, address, credit card numbers, userID and passwords and sometimes even paying a fee up front during the registration process (<http://en.wikipedia.org/wiki/Auction>).

After they have registered as a member of that particular auction website, all the sellers can list, schedule and price their items on the site. The bidders can place their bid after the registration process. The credit card information is required for verification. The seller or auctioneer must decide a minimum bid amount or a reserve price for their items when they post their items for bidders to bid (Rong-Ruey Duh, Karim Jamal, Shyam Sunder, 2002)..

A log in page is a function or feature which gives the members to purchase items easily without refilling their personal particular again, when they buy some of the items from the existing websites. Just like registration, all six of the online auction websites that was reviewed provide this login function in their websites. This enable their customers to purchase items easily, and at the same time the company that sells can delivers the items to the customer immediately after the customer enter their credit card number, according to the address filled-in by the user during the registration process.

### 2.2.3 Search function.

Search function is also a feature that exists in all of the six auction websites that we reviewed. With this function, users can key in keyword or word. All the information that matched the key word will be retrieved from the database and displayed on the website. It is very useful because it helps user to search the item straight away and this can save a lot of time for the user compared to the user who browse for the item one by one.





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