CHAPTER 3

OBJECT AND METHODOLOGY

3.1 Object Research

The object of research undertaken is to create an online E-auction for small and medium enterprise services information system to provide business advantage for both the end users and the business management in Waigani which is a suburb town in Port Moresby, the capital city of Papua New Guinea.

3.1.1 A Brief History of Waigani

Waigani is s district suburb in itself. It is located at the most central heart of the city of Port Moresby. It is one of the oldest urban town in Port Moresby. It has both suburb and residential areas for government workers and for private sectors. Waigani also is the main central location in Port Moresby which contains small to medium and large business enterprises, governmental offices and private commercial business.

In 1975 after gaining Independence from Australia, Papua New Guinea (PNG) government decided to make Waigani the central hotspot location for conducting government and private businesses. Waigani is now one of the leading urban town and residential place suitable to conduct small to medium business enterprises.

In around 2010, PNG government created a vision 2050 from village level to the National government level to help PNG grow and prosper, to create wealth and economic benefits to all walks of life. Waigani support the active participation of the community. With the creation of the target service that is easy, fast and precise, the realization of the human resource quality, the realization of people's incomes increase, the realization community care in the development and establishment of good coordination with department to all sector of societies.

Waigani is one of the suburbs and town in PNG which put into use the creation of small to medium business which are intended to help small businesses grow and to prosper into medium to large enterprise .It is both a suburb and a urban town in itself and as professional services location in the city of Port Moresby with the aim of realizing a society that developed and prosperous through the empowerment of professional personnel with exploit to the potential of human resources and financial resources that exist and are available to provide a prosperous climate in small, medium and large business enterprises. Waigani is one of the oldest urban town in the Capital city of Port Moresby

3.1.2 Business Vision and Mission

Vision

The Online Auction Website's mission is to become the recognized leader in its targeted market as a platform where people can post products for sale online.

Mission

1. Improve the performance of small to medium business Enterprise providing an E-commerce opportunity.

2. Increasing role in improving information technology to support sales and purchase of products and services to support the growth of small to medium enterprises.

3. Establishing an orderly environment suitable to conduct E-business to individuals, businesses and clients.

3.1.3 E-Auction Company Organizational Structure

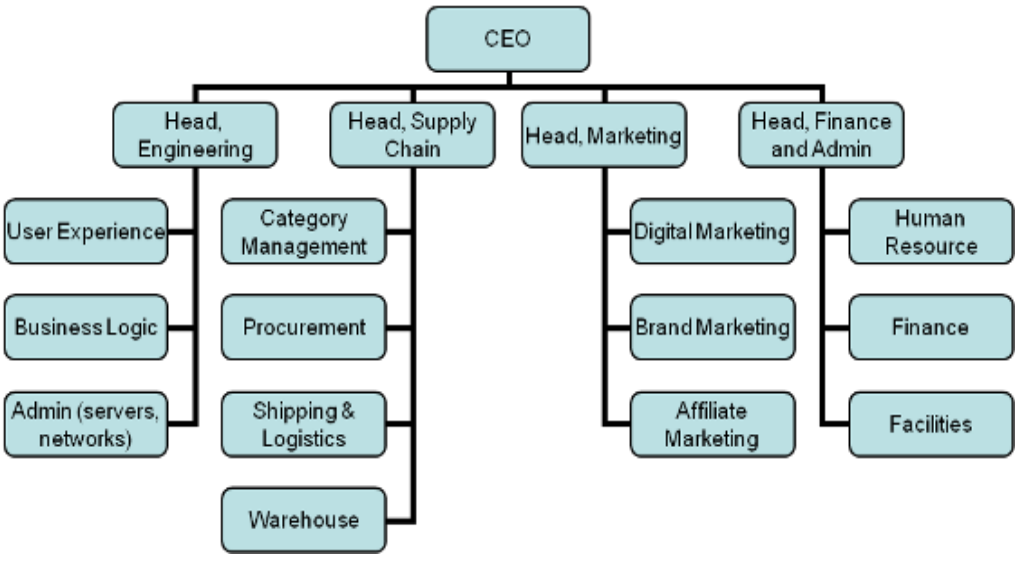


Figure 3.1 Company Organizational Structure

3.1.4 Description of Duties

Details of the main tasks and functions of organizational structure is as follows:

1. Chief Executive officer (CEO)

   The General manager of the company that Oversees design, marketing, promotion, delivery and quality of programs, products and services. He oversee all the operations, implement plans and manages financial and physical resources from the respective heads.

2. Engineering Head

   Technical IT head with emphasis on business that reports directly to the CEO. The technical engineering head is responsible for the main task of administrating, implementing and maintaining the computer server networks and to ensure user experience is satisfied and maintain to the maximum use. The head also oversee business logic and to relay reports and information to the CEO.

3. Head Supply Chain

   Departmental head overseeing the roles and responsibilities in E-auctioning by administrating category management, procurement, shipment and logistics from the e-business point of view.

4. Head of Marketing.

   The task and roles mainly in E business to consumer, to businesses and clients by ensuring that digital, brand and affiliate marketing are advertise online. The task also correspond with the head of engineering to ensure maximum output is place on online marketing.

5. Head of Finance and Admin

   The head of the finance and admin in the role of E-commerce is to work collaboratively with all respective heads and CEO and to manage, oversee the finance and admin with its resources and facilities, do financial transaction and to report directly to the CEO to implement, administer financial outcome of the company organization.

3.2 Research Methods

Research is an activity to obtain facts - facts or principles -
principle (both activities for the discovery, testing or development) with

how to collect, record and analyze the data which must be in bedasarkan systematic science (scientific method).

3.2.1 Research Design

In doing research one of the important things is to make design research, design research is like a roadmap for researchers to lead and determine the direction of the ongoing research process correctly and appropriately to their intended purpose. Without proper design a researcher would not be able to do research well as the concerned does not have a clear direction guidance.
The study design according to Mc Millan in Ibn Hajar (1999: 102) is a plan and structure investigation used to obtain evidence - empirical evidence in answering the research questions.

3.2.2 Types and Data Collection Methods

A method that is used as a means of collecting data - the data. Therefore in this research paper the authors use the method -
methods such as:

3.2.2.1 Primary Data Sources

In this research paper the authors use the method data collection by means of direct observation to social media groups such as facebook and conducting interviews with informants.

a. Observation

The researcher conducted independent observations mainly in social media marketing group for observing the activities that are directly related to data required for system development.

b. Interview

The author conducted interviews with mainly social media marketers, buyers and sellers by discussing about the strength, weakness, opportunities and threats (SWOT analysis) with the problems occurred and how best to come up with the new system.

3.2.2.2 Secondary Data Sources

In this research paper the authors are not only using the method observation data collection and interviews. But using collecting data obtained directly from the problem. In this writer gets the data from the files stored directly in social media groups as in Facebook mainly. Secondary data also get the vision and mission, organizational structure and a description of the task from the marketers.

3.2.3 Method and System Development Approach

Method and system development approach illustrates the stages - stages in the research process in order to solve the problem of the initial research planning to achieve the objectives of research and development system.

3.2.3.1 Systems Approach Method

The method of system approach used by the author is the object-oriented systems .The author uses the object oriented approach because it is easy to understand and easy to use, meaning that this method is easily understandable. Object-oriented approach is a programming paradigm that oriented to the object. All data and functions within the paradigm wrapped in a class - a class or object - the object.
Programming oriented objects made to facilitate development programs that follow the existing model in the life real which the object will interact and form a system.

3.2.3.2 Systems Development Method

System development method we use is the development of a prototype model system because of frequent customer *(customer)* imagine a set of demands but not specified in detail in terms of inputs (input), process, and output (output). In the other side of a software development must specify a needs in detail from a technical point where customers often do not understand regarding this technical stuff. Prototype model can be used to connect to confuse customers regarding technical matters and clarify the requirements specification customers want. Prototype model starts from gathering customer requirements about the software that will be created. Then the created prototype program in order to be imagined with what customers really want for display. Program prototype is usually a program that is not yet finished. The program is usually provide a display with the flow simulation software so that it looks such as ready-made software. The prototype program is evaluated by customer or user to find the specifications in accordance with the wishes customer or user. Here is a picture of the prototype models:

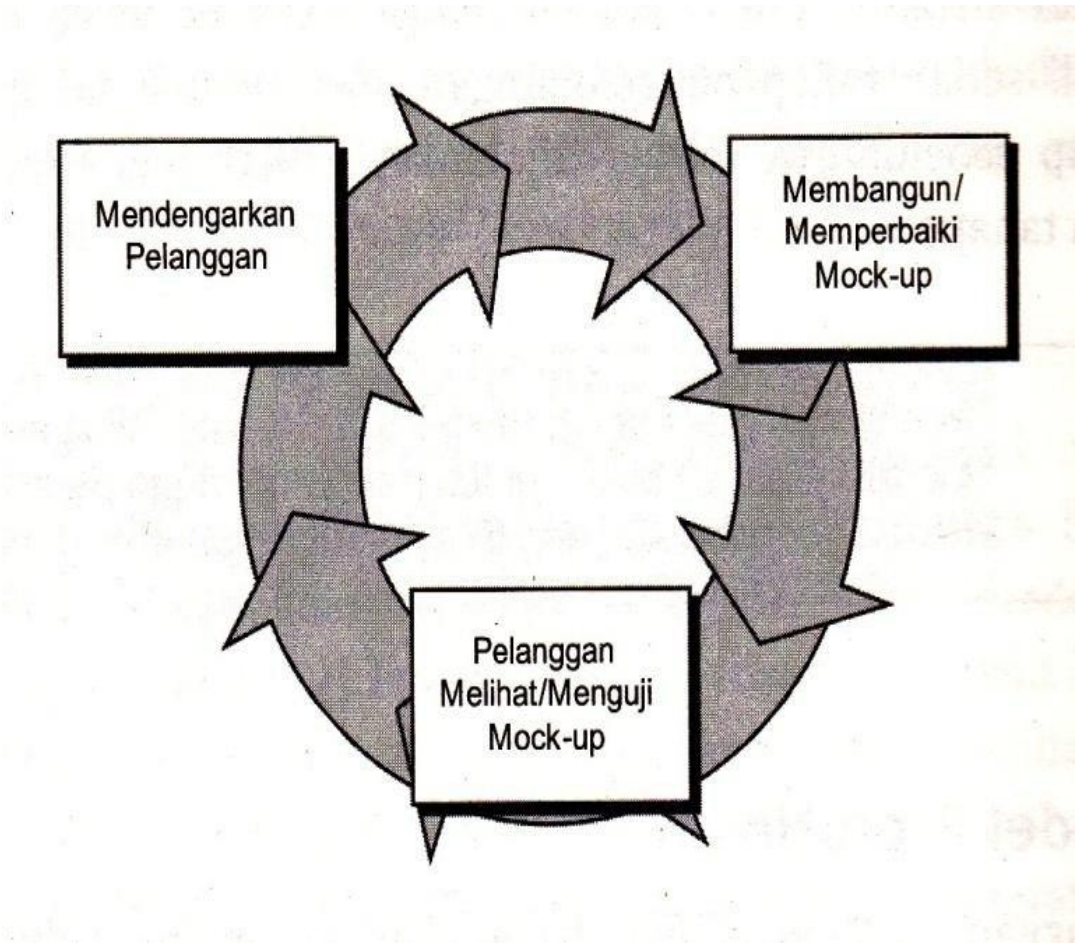


Figure 3.2. A model prototype

Source: US Rosa and M. Saladin. 2011. Learning Module Engineering Software (Structured and Object Oriented). Modula.

Duo *Mock-up* is something that is used as a model design used for teaching, demonstration, evaluation design, promotion or purposes other. A *mock-up* is referred to as a prototype software if supplier is able to demonstrate most of the functionality of software systems and allows testing of software systems design. Iteration occurs in prototyping up in accordance with the wishes of the customer (customer) or user. On the above figure the mendergarkan pelangann (or listening to customers) is a mock up prototype where the system developer listens to the supplier or the clients specifically on what the client wants. The arrow flows to membangun memperbaiki (build repair) where the information system developer build or customized the requirement design based on the client evaluation or want. Pelanggan melihat/menguji or customer test is the prototype outcome of the system where the developer test the system and shows it to the client as a testing prototype. If the customer or the client wants further specification and redesign based on the need of the business then the prototype cycle continues till the both parties are satisfied of the outcome.

Prototype model has the following disadvantages:

a) Customers can often change - change or add - add specification requirements because it considers the application is quickly developed, because of this iteration may cause developers are succumbing to the customers due to the change or additional software requirements specification.

b) Developers often take a compromise with the customer to get a prototype in a short time so that the developer more often do everything they can (without idealistic) in order to produce prototype to be demonstrated. This can lead to quality software that is not good or even cause iterative without end.

3.2.3.3 Analysis and Design Tools

In accordance with the method used by the author system approach that is object-oriented modeling, the authors will describe the modeling namely object-oriented *Unified Modeling Language* (UML). UML appears because of the visual modeling needs to specify, describe, construct, and documentation of software systems. UML is a visual language for modeling and communication regarding a system using diagrams and text - text support.

Things - things done in object-oriented analysis and design include:
1. *Use Case* Diagram
2. Class diagram
3. Diagram Object
4. Sequence Diagram
5. Diagram Activity
6. Diagram Component
7. Diagram Deployment

Here's an explanation challenged each - each diagram:

1. *Use Case* Diagram

   Use case diagrams or *use case* is modeling for behavior *(behavior)* information systems will be made. *Use Case* describe an interaction between one or more actors with information system that will be created. Roughly speaking, *the use case* is used for know what function is in an information system and anyone who is entitled to use the function - the function. Terms naming the *use case* is defined name as simple as possible and can be understood. There are two main things on the *use case* namely the definition of what is called the actor and *use case*. They are:

1.1. Actors are people, processes, or other systems that interact the information system that will be created outside the information system which will be made itself, so even though the symbol of an actor are pictures of people, but the actor is not necessarily the person.

1.2 *Use case* is the functionality provided by the system as units - units that exchange messages between units or actor.

Below is an example of a use case diagram for Library Management System not to be used for the development of the online auction system but relevant to the understanding of use case diagrams.

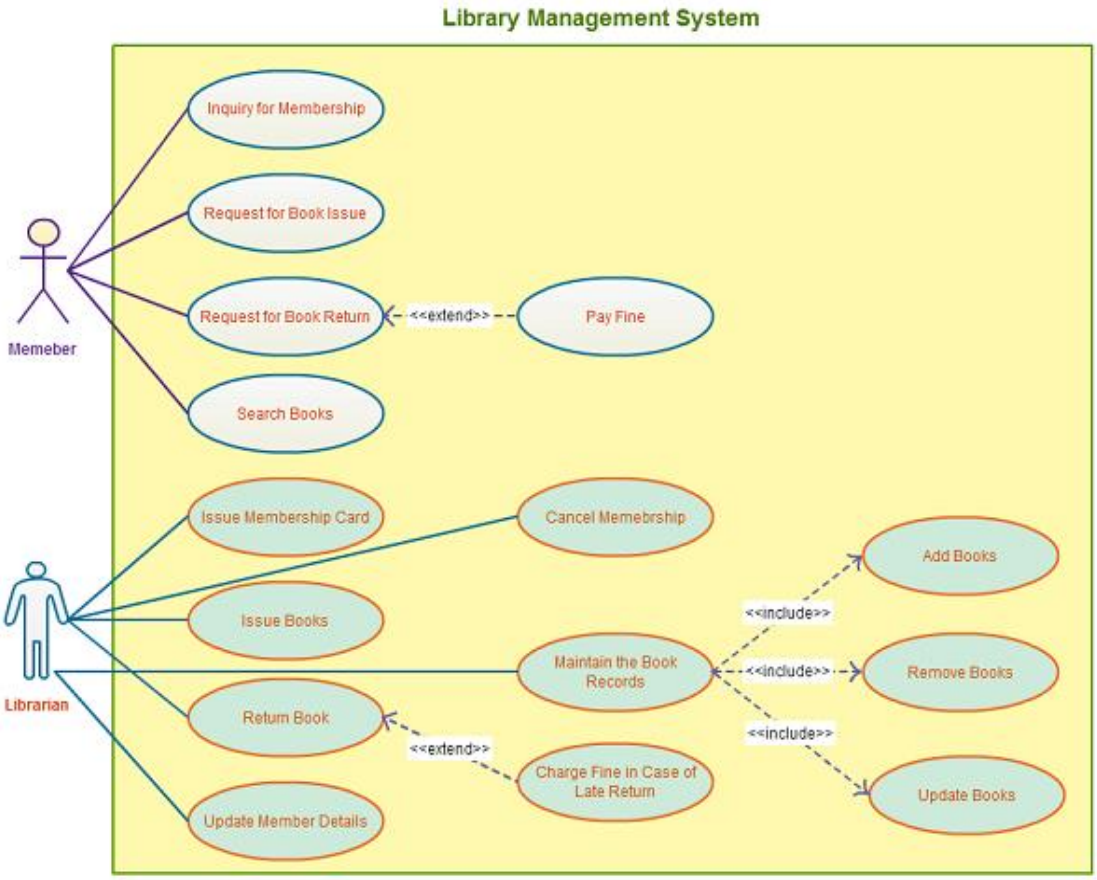


Figure 2: Use Case diagram Example.

2. Class Diagram

The class diagram or *class diagram* illustrates the structure of the system In terms of the definition of the class - a class that will be created to build the system. Class have what are called attributes and methods or operations.

2.1. Attributes are variables
- variables that are owned by a class.

2.2 Operation or method is a function:

- the function of which is owned by a class.

Class - a class that exist in the structure of the system must be able to perform the function -function in accordance with the needs of the system. The composition of the class structure is good at class diagram should have the type - the type of the following classes:

2.2.1 Class play
Classes that have the initial function is executed when the system starts.

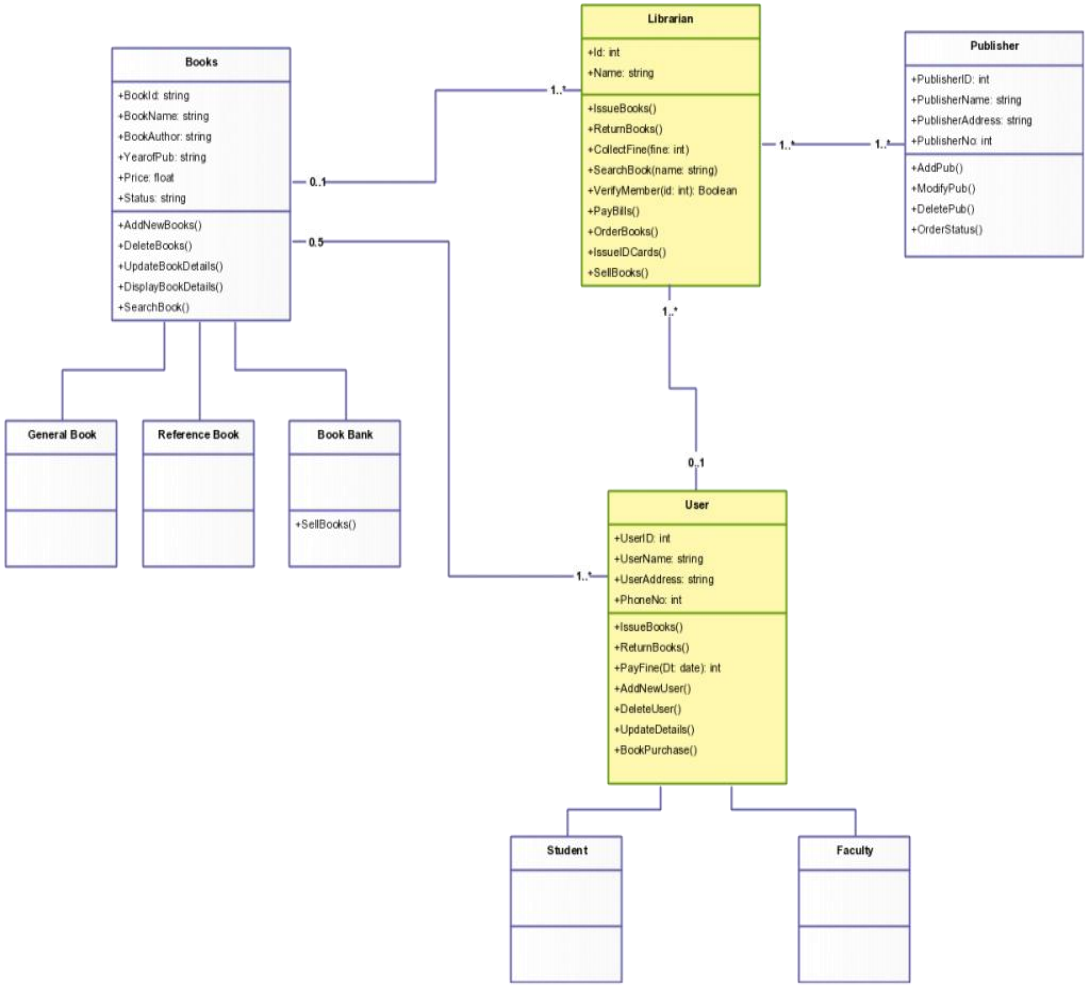
2.2.2 Class that handles the display system.
Classes that define and set the display to user.

2.2.3 Classes are taken from defining *use cases*

2.2.4 Classes are taken from the data defining.

Classes are used to hold or wrap the data into a unity that is taken and saved to the database.

Here below is a Class Diagram for Library Management System as an example. From that the author can gain a solid foundation to build the class diagram for online auction system.



3. Diagram Object

   Object diagram illustrates the structure of the system in terms of naming objects and objects in the system path. In the object diagram should be ensured all classes are already defined in the class diagram object must be used, because if not, the class definition cannot be accounted for Relations *link* on the object diagram is a relationship of wear and used in which the two objects will be connected by *a link* if there is an object that used by other objects.

4. Sequence Diagrams

   Sequence diagrams describe the behavior of objects in *use case* with describe the life time of the object and the *message* is sent and received between objects. Therefore, to describe the sequence diagram should known objects - objects involved in a *use case* and its method - owned Kela method that instantiate become the object.

The number of sequence diagrams to be drawn is as much defining *a use case* that has its own process or that all important *use case* which has been defined interaction message has been covered in the course sequence diagrams so that more and more *use cases* are defined then sequence diagram that should be made is also growing.

5. Activity Diagram

   Activity diagram or *activity diagram* illustrates the *workflow* (flow work) or the activity of a system or business process. Noteworthy here is that the activity diagram illustrates the activity of the system is not what done actors, so activities can be carried out by the system.

6. Component Diagram

   Diagram components or *component diagram* is made to show organization and dependencies among a collection of components in a system. Component diagrams focus on the required system components and exist in the system.

7. Deployment Diagram

   Deployment diagrams or *deployment diagram* shows component configuration in the process of execution. *Deployment* diagram can also be used to model it - the following:

7.1 Additional system describes the design devices, nodes and hardware.
7.2 Client / server system
7.3 Pure distributed systems
7.4 Re-engineering applications

3.2.4 Testing Software

Black-Box Testing focused on the functional requirements of the device software. Thus, the black-box testing allows system software engineers to get a set of input conditions are fully use all the functional requirements for the program. Black-box testing trying to find fault in category as follows:

3.2.4.1. Function - a function that is incorrect or missing
3.2.4.2 Errors interface
3.2.4.3 Errors in data structures or external database access
3.2.4.4 Error performance and fault termination

3.3 Analysis of Existing on line E-auction system

Before starting with the project, we have considered some already existing on line auction systems and their functionality. Then we have decided what kind of system architecture and software technology to use.

The first part of the project is an investigation of already existing on-line auction systems around the net. We considered three of the most famous auction web sites: eBay.com, asteinrete.com and onsale.com.
The table below describes the functionality offered to the users by this three big auction systems:

Existing auction sites with functionalities

User stories	Ebay.com	Asteinrete.com	Onsale.com
Homepage	x	x	x
Registration	x	x	x
Login	x	x	x
Personal page	x	x	x
Search	x	x	x
• Excluding a word	x		
• In a given category	x	x	x
• In a given city	x		
• Having a price from Euro to Euro	x		x
Browse	x	x	x
Item page	x	x	x
Bid	x	x	x
Post an auction	x	x	x
Help	x	x	x
Change Language			
Chat	x		
Administration	?	?	?

Table 1: Existing functionalities of three studied E-auction system.

As shown in the table, all the three systems give the possibility to register, to login to the website and have a home page with a general description of the portal. They offer also a personal page, where each user can check the status of their auctions or of their offers. Another characteristic of this portals is to have an item page, a page that describes each item on auction (with a textual description, a photo etc.). The search functionality is also very important: in addiction to a normal keyword search, eBay offers also the possibility to search excluding a given word, search in a given category, and search for auctions regarding a given city and to make price range (from € to €) search. All the three systems give also the possibility to place

a bid, to post an auction and have also some help pages that explains the aims of the portals and the functionality. None of the portals has the possibility to change language (onsale.com is in English, asteinrete.com is in Italian while eBay.com is in English but there is also the Italian version at eBay.it) and only eBay.com has a chat room for the users.

3.3.1 Existing Types of E-auction

Based on E-commerce we have studied and categorized the existing types of Auctioning given below as summary.

Auction Types

Type	Description	Favoringing
English (eBay)	Public: single item: ascending prices: highest bid wins	Seller: many buyers bid against each other
Dutch (Dutch flower market)	Public: single item: descending prices: seller lowers price till some purchaser is willing to buy.	Seller: many buyers bid against each other
Dutch Internet (Pricefalls)	Public: multiple items: descending price: as Dutch but buyers can purchase at a set price or when price falls to their submitted bid.	Seller: several sellers but many buyers who bid against each other
Japanese (private auctions)	Public: single item: ascending price: highest bidder wins at price just above second highest: no new bidders can join once bidding starts.	Seller: many buyers bid against each other
Yankee (private auctions)	Public: multiple items: ascending price: as Japanese but winners pay their actual bid prices.	Seller: many buyers bid against each other
Reverse (Construction projects etc.)	Public: single item: descending price: sellers bid on price: winner is the lowest price.	Buyer: many sellers bid against each other
Name Your Own Price (Priceline)	Public: single item: descending price: sellers bid on price: as reverse but price is not made public.	Buyer: many sellers bid against each other
Double (Nasdaq and stock markets)	Public: multiple items: sale when buyers and seller agree on price.	No one: both buyers and seller bid against each other
Vickrey auction (Elance)	Sealed bid: highest bidder wins at second-highest price: rarely used.	Seller: many buyers bid against each other
Sealed bid market (Construction projects etc.)	Sealed bid: winner chosen by reputation or quality from lowest bidders.	Buyer: buyer makes final selection

Figure 3: Type and description of Auctioning systems.

Sources: http://www.ecommerce-digest.com/auctions.html

As for the undergraduate thesis project to create and online E-auction information system for electronic commerce we will be mainly using the English and some forms of Dutch auctioning system whereby necessary.