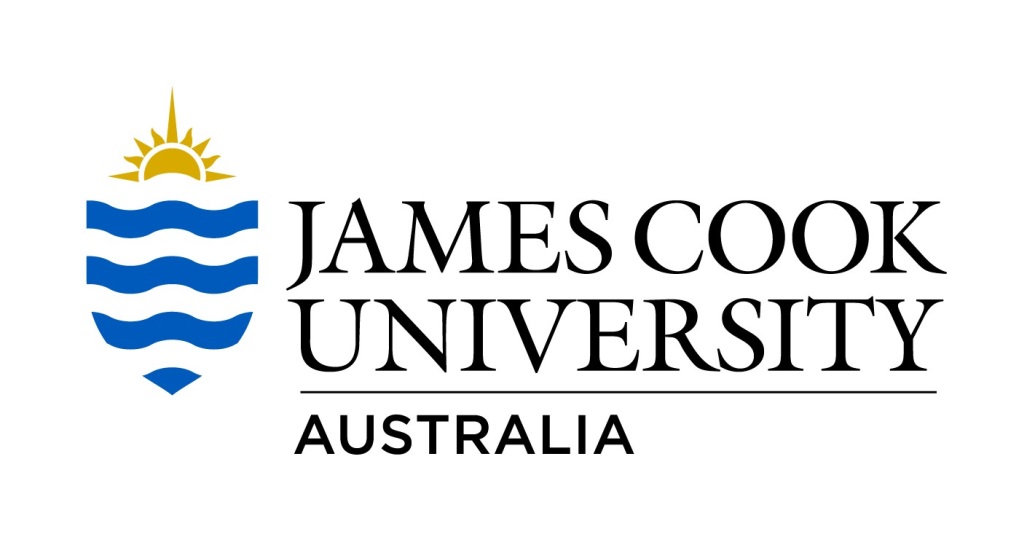
**SIM UNIVERSITY**

**SCHOOL OF SCIENCE AND TECHNOLOGY**



**CP5046 ICT PROJECT 1**

**Ebay Agent Automation System (EAS)  
(version 0.1)**

Team NAME : TEAM AWESOME  
PROJECT TEAM :

**May 2012**

# Abstract

Ebay.com has been an industry leader over the last decade unbeatable in the ecommerce auctions industry.

Over the past few years, EBay has been working on its own application programming interface to enable independent developers to drive their businesses using eBay’s inventory and infrastructure as a backbone. With the EBay API, developers have an easy and clear way of creating stable and complete business solutions fast and at low cost.

The E-Commerce Auctions System for EBay marketplace aims to capitalize on the functionalities and features provided by EBay to provide a risk free and hassle free environment to do transactions in. Users of the system will be able to buy items, sell items, browse for deals, get recommendations for items and leave feedback on items that they have bought.

The software development life cycle, database design and implementation and project management skills have been fused together for the implementation of this project. Each skill set will be used as a guideline during the implementation process. The entire design and implementation process has been documented into this report and can serve as a guideline to manage other projects on developing integrated software systems.

Table of Contents

[Abstract 2](#_Toc342513379)

[1 Introduction 4](#_Toc342513380)

[1.1 Overall Objective 4](#_Toc342513381)

[1.1.1 Academic Objective 4](#_Toc342513382)

[1.1.2 Project Objective 4](#_Toc342513383)

[1.2 Background 5](#_Toc342513384)

[1.3 System Requirements and Objectives 6](#_Toc342513385)

[2 Proposed Method and Approach 8](#_Toc342513386)

[2.1 Identifying Software Development Lifecycle Approach 8](#_Toc342513387)

[2.2 Identifying Database Lifecycle 10](#_Toc342513388)

[2.3 Gathering User Requirements 12](#_Toc342513389)

[2.4 Identifying Hardware and Software Requirements 12](#_Toc342513390)

[2.5 Literature Review 13](#_Toc342513391)

[2.5.1 Software Design 13](#_Toc342513392)

[2.5.2 Software Implementation 13](#_Toc342513393)

[2.5.3 Database Design and Implementation 14](#_Toc342513394)

[2.5.4 EBay Application Development 14](#_Toc342513395)

[2.5.5 Project Management 14](#_Toc342513396)

[2.5.6 Contemporary Products 15](#_Toc342513397)

# 

# Introduction

The detailed objectives analysis of this project can be sub classed into two major categories. Academic Objective is what I would gain from an academic stand point that could be useful for the future from a personal view. The other would be the real world project objective that comprises of tangible gains.

## Overall Objective

### Academic Objective

* To solve real world problems by facilitating solutions for business requirements.
* To understand and practice software system integration of web elements, software design and database design.
* To build software and database from scratch based on the user requirements.
* Enhancement of non-technical skills such as report writing, time and project management and effective communication.
* To experience how to solve problems as the surface during the various phases of the project life cycle.

### Project Objective

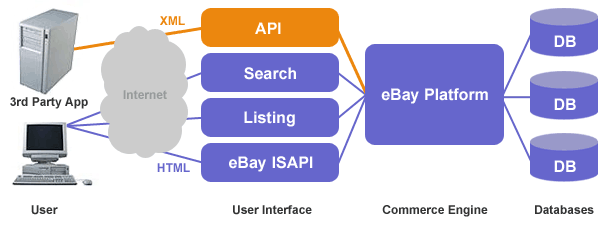
* Successfully launch the prototype with a real business model and generate revenue.
* To understand how to cater to needs of online shoppers and sell what the customers want.
* Tie-ups with other online local startups for brand awareness.
* Extending beyond EBay to include other merchants like Amazon and Yahoo.

## Background

Ebay.com has been has been generating revenue from its auctions, offering a wide range of products worldwide.

The EBay developers program was founded in 2000, and is currently responsible for 25% of EBay listings to date. What the developer program does is allow third party applications to tap into EBay’s database and generate their own revenue.

EBay has released the application programmable interface (API) that can be used to communicate directly with the eBay database in XML format. By using the API, third party application can provide a custom interface, functionality and specialized operations not otherwise afforded by the original eBay interface. The API is not dependent on the eBay user interface, so it allows for a developer to create stable and customized features to suit the market’s business needs.



**Fig 1.1 EBay API operations cycle – courtesy www.ebay.com**

The API takes on the responsibilities of communication with the EBay databases and handles all transactions. Fig 1.1 illustrates the operations cycle of the EBay API. EBay generates unique tokens for each application to identify itself to the EBay platform. This allows for auditing and makes transactions secure.

The API affords us the opportunity to cater to the local market where people are always looking for the cheapest way to buy and the best way to get the best return for selling an item. The following are some of problems that users have with EBay.

P01. Local users are more comfortable buying and selling through a local company to minimize risks.

P02. Users want to buy items from reliable buyers. EBay’s search does not allow users to sort by seller ratings and it can be tedious for users to have to click on each item to know a sellers ratings.

## System Requirements and Objectives

The following system objectives are based on the 2 common problems/issues as stated by local users and also based on requirements needed to make a shopping system safe and viable.

|  |
| --- |
| System Object S01 |
| The system needs to allow users to buy products online without having the need to interact with EBay. No EBay account should be required to use the system buy items. |

|  |
| --- |
| System Object S02 |
| The system needs to allow users to sell products online without having the need to interact with EBay. No EBay account should be required to sell items. |

|  |
| --- |
| System Object S03 |
| The system needs have a search functionality that allows users to search for products by categories. |

|  |
| --- |
| System Object S04 |
| Search functionality should be able to perform searches for items available only within Singapore. |

|  |
| --- |
| System Object S05 |
| The system has to allow a buyer to view the product details before making the purchase. |

|  |
| --- |
| System Object S06 |
| The system needs to be able to notify users via email with appropriate information once a purchase has been made or an item has been put up for sale. |

|  |
| --- |
| System Object S07 |
| The system needs to allow sellers to set their own buying and bidding prices. |

|  |
| --- |
| System Object S08 |
| The system needs to be able to allow buyers to feedback on the transaction and products. |

|  |
| --- |
| System Object S09 |
| The system needs to be able to recommend items to buyers based on search category that they have selected |

|  |
| --- |
| System Object S10 |
| The system needs to be able recommend the top searches that other are using to enhance their purchasing options based on the selected search category. |

|  |
| --- |
| System Object S11 |
| Users should have a summary view of all their transactions e.g. (products sold, products bought, feedbacks made). |

# Proposed Method and Approach

## Identifying Software Development Lifecycle Approach

Various software development process models are available and each has been well documented with advantages and shortcomings.

The model used in this project is the V-Model which is illustrated on Figure 2.1 below.

System Requirement & Requirement Elicitation

Requirements Analysis

Design

Implementation

Unit & Integration Testing

System & Integration testing

Operation & Maintenance

Acceptance Testing

**Validate Requirements**

**Verify Design**

**Figure 2.1 the V-Model**

**(Referencing Page 630 of OOSE: Using UML, Patterns and Java [1])**

The V-model uses a well-balanced method in which each phase can be implemented using the documentation of the phase before it. It also saves time by allowing phases to be done concurrently. The V-model has several phases.

The Verification Phases are on the Left hand side of the V, the implementation Phase is at the bottom of the V and the Validation Phases are on the Right hand side of the V. The left and right side of the V are also linked at several stages implying that when problems are discovered at the validation stages, the verification stages can be reworked. This opens up aspects of the SDLC like iterations and re-workings that are hidden in other models like the water fall model.

The waterfall model was not adopted as iterations and rework aspects are hidden and thus deemed impractical in the real world.

The spiral model is known for its complexity and needs a learning curve to see its real potential. Time is also a factor as steps in spiral model need to be further expanded.

The V-Model can be adapted to our project via the following steps:

**System Requirement Analysis and Elicitation**

* Understanding the purpose of system
* Understanding the background
* Identifying Hardware and Software Requirements
* Literature Review

**Requirement Analysis Phase**

* Understanding Interaction with Ebay
* Gathering User Requirements
* Identify Functional Requirements with Use Cases
* Identify Non-Functional and Implementation Requirements

**Design Phase**

* Transform Use cases from previous phase into classes
* Identify Associations between classes
* Identify Attributes and Methods for classes
* Create sequence diagrams to show interaction between classes

**Implementation Phase**

* Transform Design model into source code

**Testing Phase**

* Test classes
* Test User Interface
* Test class interaction with Database

## Identifying Database Lifecycle

Conceptual Design

Logical Design

Physical Design

Planning

Requirement Analysis

Implementation

Testing

Database Design

DBMS Selection

**Fig. 2.2 Stages of the Database Development Lifecycle**

**(Referencing Page 272 of Database Systems: A Practical Approach to Design [2])**

The database development lifecycle comprises of the following steps:

**Planning Phase**

* Understanding the project background
* System Requirements and Project Objectives

**System Definition Phase**

* Identifying Users
* Identifying system boundaries

**Requirement Analysis Phase**

* Gather User requirements
* Literature Review

**Design Phase**

* Identify DBMS to use
* Identify attributes, data type
* Identify relationship description
* Create an Entity Relationship Diagram
* Normalization

**Implementation Phase**

* Creating Tables
* Populating Tables

**Testing Phase**

* Relationship Integrity Testing

## Gathering User Requirements

An important part of a software development project is the requirements gathering portion. It clearly highlights what is to be achieved. My strategies for effectively gathering user requirements are:

Brainstorming  
Brainstorming can be an effective way to generate lots of ideas on a specific issue by thinking from the user’s perspective. These ideas were then prioritized in the level of importance and implemented accordingly.

Case Study  
By studying similar applications, we can gather information on how feasible the proposed project is, what solution is being used by that system and the good and bad of the system. We can use this knowledge to refine our project goals and implementation targets. A Case study has been done in the following sections.

## Identifying Hardware and Software Requirements

The hardware and software requirements are identified. The costing in respect to the resource needed is also included. Please refer to the Resource Plan at Appendix A1.

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Resource** | **Cost** | **Resource Source** |
| Development | | |  |
| 1 | Visual Studio.Net 2008 Express Edition for development | Free | http://www.microsoft.com/express/downloads/ |
| 2 | MySQL Database Server for development | Free | http://www.mysql.com/ |
| 3 | Microsoft .Net Framework 3.5 | Free | http://www.microsoft.com/downloads/details.aspx?FamilyId=333325FD-AE52-4E35-B531-508D977D32A6&displaylang=en |
| 4 | EBay SDK for .Net / Windows | Free | http://developer.ebay.com/developercenter/windows/sdk/ |
| Production | | |  |
| 5 | Webhosting with MYSQL Database | $10 per mth | http://www.godaddy.com/Hosting/web-hosting.aspx?ci=9009&isc=goazsg300c |

## Literature Review

A literature review is to keep a reader updated on the knowledge that is current to the specific field the report is addressing. This section discusses the collection of books, websites and articles used in the research and implementation of the ICT 499 Capstone Project.

A simple summary of the texts that I have based my research of the report are as follows.

### Software Design

The Book, **Object-Oriented Software Engineering, using UML, Patterns and Java TM**, has allowed me to understand the more granular tasks involved in the steps of a software development lifecycle. The book explains tasks involved from Requirements Elicitation to Analysis to Design to Implementation thru to testing and maintenance.

**Chapter 4: Requirements Elicitation** (Page 122-150)   
Explains gathering user requirements and understanding the background and environment of a project before any form of study is started. It explains gathering of Functional and Non-functional requirements and implementation requirements.

**Chapter 5: Analysis** (Page176-188)   
Explains various steps of converting use cases (functional model) into an analysis model and subsequently into a design model. It also includes the identification of entities, their associations, aggregations, attributes and methods.

**Chapter 6: System Design** (Page 228-254)   
Explains how to make classes and their subsystems can be made more robust and to adhere to proper design standards and goals. It also discusses coupling and cohesiveness.

### Software Implementation

The Book, **Object-Oriented Software Engineering, using UML, Patterns and Java TM**, has allowed me to understand the more granular tasks involved in the steps of a software development lifecycle. The book explains tasks involved from mapping class and sequence diagrams to source code to testing classes and the interaction between classes.

**Chapter 10: Mapping Models to Code** (Page394-422)   
Discusses how to map the design model into source code. The book uses the Java language as a baseline, but the object oriented concept can be used for any Object Oriented language which in our case is VB.Net.

**Chapter 11: Testing** (Page 443-472)   
Explains the testing concepts. It explains Unit testing which is based on the classes themselves and subsequently the system testing which covers the interaction of classes inside the system as a whole.

### Database Design and Implementation

The book **Database Systems: A Practical Approach to Design, Implementation, and Management**, gives a clear and concise view of founding an effective database and also delves into the implementation and management issues that may consequently arise.

**Chapter 3: The Relational Model** (Page 70 - 86)

This chapter explains the concepts of relational modeling and illustrates with suitable diagrams and explanations, the relationships, and referential integrity rules.

**Chapter 9: Database Planning, Design, and Administration** (Page 269 – 301)

This is an overview of the major stages involved in a database development lifecycle and goes further to elaborate the main activities in each stage. Please refer to chapter 2.2 of this report of the overview of a Database Development Lifecycle.

### EBay Application Development

The book, **eBay Application Development,** explains in great detail what EBay offers to developers and how the EBay API can be used in a third party application using VB.Net

**Chapter 3: Introduction to EBay SDK** (Page 40-69)   
This chapter introduces the EBay SDK in simple terms and its capabilities in general.

**Chapter 5: Managing Items with EBay SDK** (Page 103 – 121)  
This chapter explains how items are listed in EBay and how the SDK can be used to buy and List items.

**Chapter 8: Using the EBay API** (Page 172-192)   
Delves into the API and the calls and references that can be used within a software.

**Chapter 9: Using the EBay API within a Web Site** (Page 192 – 278)  
Explains how to interact with EBay and provides a lot of examples with syntax and scenarios.

### Project Management

This article from the **Maxwiderman** site contains useful insights into the phases of a Project Lifecycle and the granular tasks involved in each phase.

The text, **Fundamentals of Project Management**, explains tasks management and work breakdown structures.

**Chapter 5: Using the WBS to plan a project** (Page 56 – 68)

This chapter explains how to break down tasks, combine similar tasks and also about stacking or loading tasks to be done concurrently.

### Contemporary Products

There are contemporary products available online which I can base my design model upon when building the solution.

**Half.com**This site uses EBay’s platform to run their own e-commerce business. It sells any EBay product that is available for buying immediately but most items are only available to customers in the United States.

Some features that are available in my system that is not found in Half.com are as follows:

* Ability to allow users to list their items
* Searching only the highly rated sellers
* Available for use by people outside the US, mainly Singapore