CUSTOMIZED UTAR E-TRADING MANAGEMENT SYSTEM

BY

FOONG PUI KIM

Supervisor: Mr. Mobashar Rehman

A REPORT

SUBMITTED TO

Universiti Tunku Abdul Rahman

in partial fulfilment of the requirements

for the degree of

BACHELOR OF INFORMATION SYSTEMS (HONS)

INFORMATION SYSTEMS ENGINEERING

Faculty of Information and Communication Technology

(Perak Campus)

JAN 2013

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DECLARATION OF ORIGINALITY

I declare that this report entitled **"CUSTOMIZED UTAR E-TRADING MANAGEMENT SYSTEM"** is my own work except as cited in the references. The report has not been accepted for any degree and is not being submitted concurrently in candidature for any degree or other award.

Signature　　　：　＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Name　　　　　：　＿＿FOONG PUI KIM＿＿＿

Date　　　　　：　＿＿＿8th April 2013＿＿＿＿

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Abstract

The purpose of this project to develop a system is for all the UTAR student and UTAR staff to buy and sell things. As a students, always facing problems such as where to sell their used text book or used furniture or where to buy the second hand books or furniture. Students do not know where they go, so that they problems will be solved.

A group of UTAR students realize the problems they are facing. And trying to solve these problems by create few of the Facebook pages such as UTAR Kampar page, UTAR Kampar Free Market page, UTAR second hand goods and accommodation page to let UTAR students buy and sell things. Besides, Utarian.com forum is created by UTAR student to discuss all the problems facing by the students. A few categories such as Fashion, Second hand goods are provided for UTAR students to buy and sell thing.

The problems of UTAR student buy and sell thing is temporary solved but students are not satisfied. Students not satisfy with the Facebook page lack of product categorization and the old post is soon to be replace by new post.

The Facebook page and utarian.com forum are not suitable for students to buy and sell thing. But, students is force to use the existing system because no others better system to be use.

Thus, we develop this system to solve the problems facing by all the UTAR students and staff. We develop a system that all the UTAR student and staff are authorized to log in and use our system. All the users are able to buy and sell things in our system.

The functionality of upload photo, add to watch list, product categorization, product recommendation, selling report are provided to satisfy the needs of user selling and buying items.

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List of Abbreviations

ICT   Information & Communication Technology

IDE   Integrated Development Environment

MCMC   Malaysian Communications and Multimedia Commission

UTAR   Universiti Tunku Abdul Rahman

Chapter 1 Introduction

1.1 Project Background

The trend of online shopping worldwide is increasing.

According to the MasterCard Worldwide Online Shopping Survey (MasterCard Worldwide, 2012), it show that the online shopping spending of Asia Pacific nations is increasing and in Malaysia alone, the analysis there will be another 79% growth in purchase over the next six months.

Nielsen Company, which is a leading global information and measurement company, commissioned by PayPal to conduct a survey in 2011 (Ho, 2011) shown that Malaysians spent RM1.8bil shopping via the internet. And the payment gateway provider estimates that the market will grow to RM5 billion in 2014.

According to 2011 Global Consumer Shopping Habits Survey (ChannelAdvisor, 2011) conducted by ChannelAdvisor, it was indicated that user prefers do business or shopping through online rather than brick and mortal shop. Amazon is the number one online marketplace for US and UK consumer with eBay followed as second. This survey shown that online classifieds web site has gained most shopping popularity in the world. But what makes classified web site so attractive to online user? Some of the benefits include unlimited number of products to choose from, have a number of sellers to do business with, easy to use, provide feedback function given to buyers and sellers and so on.

Various type of survey conducted and the entire statistic show that online shopping is increasing dramatically. Associated Chinese Chambers of Commerce and Industry of Malaysia (ACCCIM) president Tan Sri William Cheng noticed online user is increasing and pointed out to the Small-and-Medium Enterprises (SMEs) would lose

the online shopping crowd if they failed to adapt the online shopping trend (Lee, 2012).

UTAR student is currently using Facebook group page and UTARIAN forum to buy and sell things because of UTAR do not provided a good communication platform for students to buy and sell things.

Facebook pages are not suitable for students to buy and sell thing, it is open for public. Besides, Facebook is not designed with functionalities that support classified activities. Old posts will eventually being replaced by new posts and then lost in sights within few hours.

UTARIAN.com forum is created by UTAR students as a communication and sharing tool. The main weakness of this forum is that it runs only in Chinese language. Students who do not understand Chinese will not be able to use this forum to communicate with other students. Besides, a forum is more suitable to be used in discussion, but not suitable to be used as an e-commerce site.

In this project, I will be developing the Customized UTAR E-trading Management System for UTAR student to sell and buy things.

1.2 Problem Statement and Motivation

University students frequently face these problems such as where to sell their used text book or used furniture or where to buy the second hand books or furniture.

A group of UTAR students realized the problems they are facing, thus they try to solve these problems by creating Facebook pages for the students to get together and communicate. For example, "UTAR Kampar" page, "UTAR Kampar Free Market" page, "UTAR second hand goods and accommodation" page to let UTAR students to buy and sell things. Besides, Utarian.com forum is created by UTAR student to discuss all the problems faced by the students. A few sub-forums are created such as "Fashion" sub-forum and "Second hand goods" sub-forum to allow UTAR students to buy and sell thing.

The problems are temporary solved but due to the mentioned limitations of the Facebook page and Utarian.com forum, there are students not satisfied. With the Facebook page lack of product categorization and the old post is soon to be replaced by new post. Besides, the Utarian.com forum restricts it users to those who understands Chinese only. Therefore the solution is not effective.

Hence, I'm developing this system to let all the UTAR staff and students to have a better e-trading and communication portal. The most important functions that an e-commerce website should have are product categorization. Most of the e-commerce site basic features will be included in the system. In this system, we focus on providing a communication tool where different online users can sell or purchase products. The system will also recommend products based on the user's preference and personality. This will be done through: Categorization of products on various criteria and Customization of product through analyzing the personality of individual.

1.3 Project Objectives

This UTAR Customize E-Trading Classified system is being built for UTAR student to buy and sell products. All the UTAR students will benefit from the system when we complete the following objectives.

1.3.1 To create an e-trading website for UTAR Perak Campus

Only UTAR students and UTAR staff who register under UTAR are authorized to use this system. Whoever authorizes to use this system will be having their account to buy and sell their preference product. When seller wants to sell products, seller needs to choose the product category. Therefore, all the products are well categorized. Buyer is able to search their preference product by select related product category or search through keyword. Buyer can contact the seller for more detail of the preference product.

1.3.2 To create product recommendation functionality

The approach I used in this system is falls within the "personalization by category" level. This system will be able to provide product recommendation to all the users based on the personality test. Once there is some latest user preference product, this system will be able to notify user through email and notify user once user log in into this system.

1.3.3 To Generate System and Sales Report

This system will be able to record which category of the products is hot seller and display it on the main page to let all users know the current trend of e-commerce. This sales report will be generated every end of the month.

1.4 Project Scope

This system is built for UTAR staff and UTAR student to buy and sell their preference product. Only UTAR staff and UTAR student are authorized to register this system. Personality test is used to test what is the user preference and provide user the information of the related product that user may be interested. Besides, a selling report will be generated every end of the month.

1.4.1 Account Authentication

There are 2 account authentications in this system, which is admin and user. Admin account is able to control all the user activity such as delete the spam post. All the UTAR staff and UTAR student is register under user account. The user is able to post photo to sell product. They are able to buy products from other users as well.

1.4.2 Product Recommendation

A personality test will be given to all of the students to test out what is their category of personality. The category of personality is based on "Big 5 personality traits". This system will provide the product information based on which category of personality user fall in. Once there is new updates of the products, this system will automatically email user or notify user once user log in into this system.

1.4.3 Sales Report

System will automatically record down which category of the product is having high selling rate. This report will be generating every end of the month and display for all users to view the current trend of e-commerce. This report is very useful for users who are selling products.

Chapter 2 Literature Review

2.1 Papers

2.1.1 What is E-commerce?

Electronic Commerce essentially means the undertaking of normal commercial, government and personal activities by means of computers and telecommunications networks and includes a wide variety of activities involving the exchange of information, data or value-based exchanges between two or more parties. (Poon, 1998), (Swatman, 1996), (Wigand., 1997), (Kao & Decou, 2001) and (Zwass, 1996) have all provided definitions of E-Commerce.

People always confuse e-commerce with e-business. In e-commerce, Information and Communications Technology (ICT) is used in inter-business or inter-organizational transactions, or better known as transactions between and among firms/organizations. Same goes for business-to-consumer transactions, it is transactions between firms/organizations and individuals. In e-business, on the other hand, ICT is used to enhance one's business. It includes any process that a business organization, either a for-profit, governmental or non-profit entity, and it is conducted over a computer-mediated network (Andam, 2003). The diagram below well defines the difference between e-commerce and e-business (St. Xavier's College, n.d.).
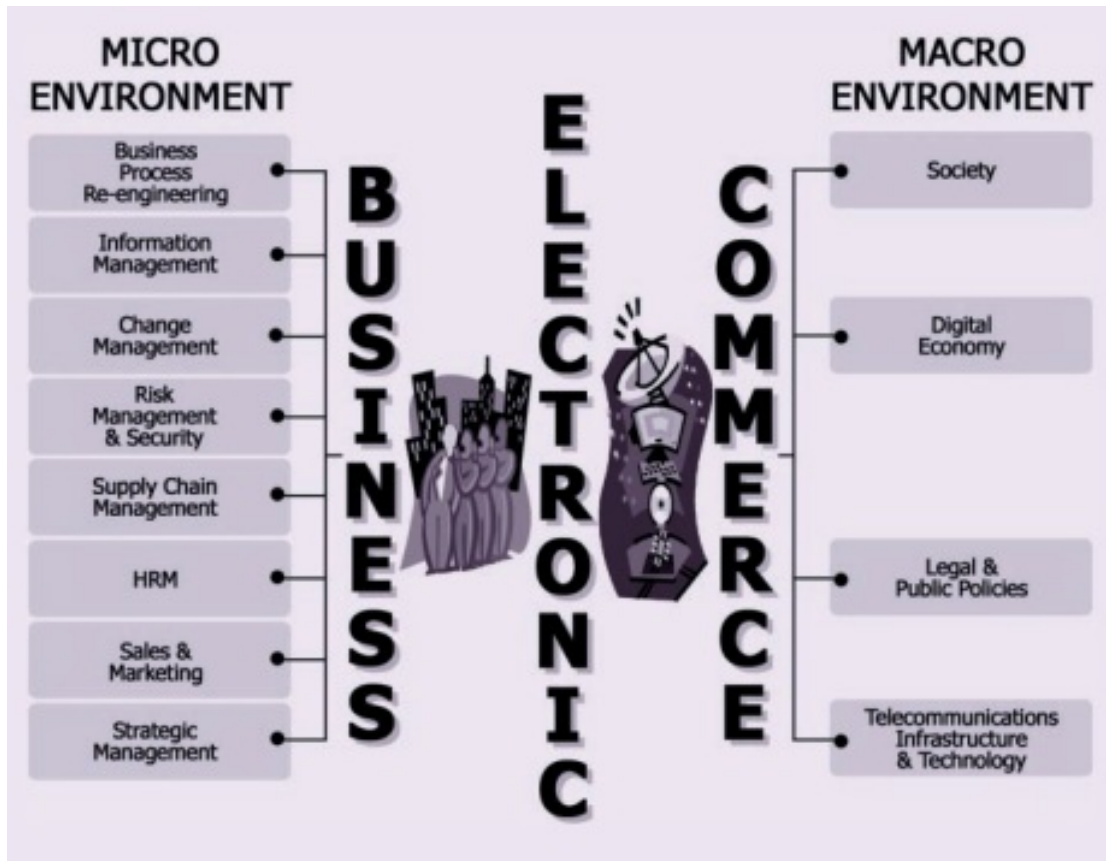
Figure 2.1-1 E-commerce and E-business

There are few e-commerce frameworks describe in this journal (Chan & Swatman, 1999) such as Zwass's Hierarchical Framework, Kalakota and Whinston's "Pillars" Framework, Riggins and Rhee's Domain Matrix, Clarke's Five-Phase Process Model and Wigand's Typology.
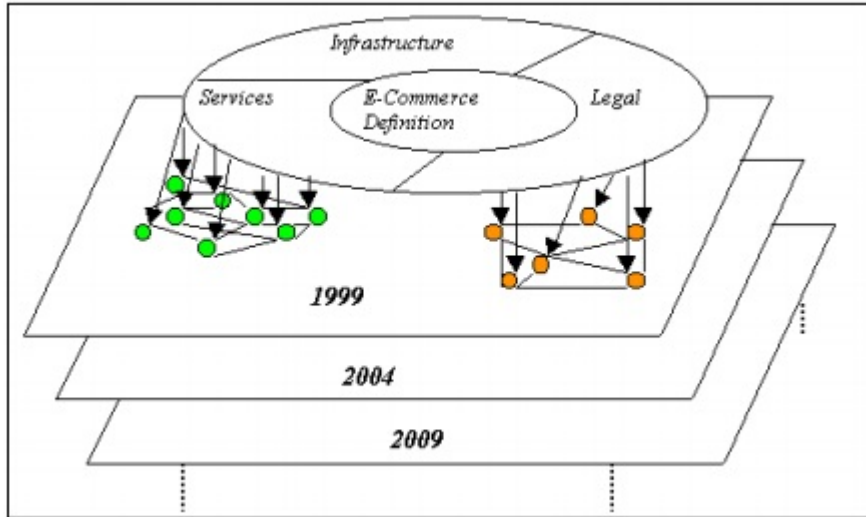
Figure 2.1-2 Electronic Commerce Component Model

Besides, there are 3 e-commerce models which consist of Business to Customer E-commerce, Customer to Customer E-commerce and Business to Business E-commerce (Rajaraman, 2000).

2.1.2 Online Classified Websites Increasing

Age is the significant factor in online classifieds use. Pew Research Centre's Internet & American Life Project survey 2009 (Jones, 2009) showed the internet user who always use classified site are 62% of 25-34 year olds, 57% of 35-44 year olds, 49% of online 18-24 year olds, 48% of online 45-54 year olds, 35% of 55-64 year olds , and 26% of 65 years old .
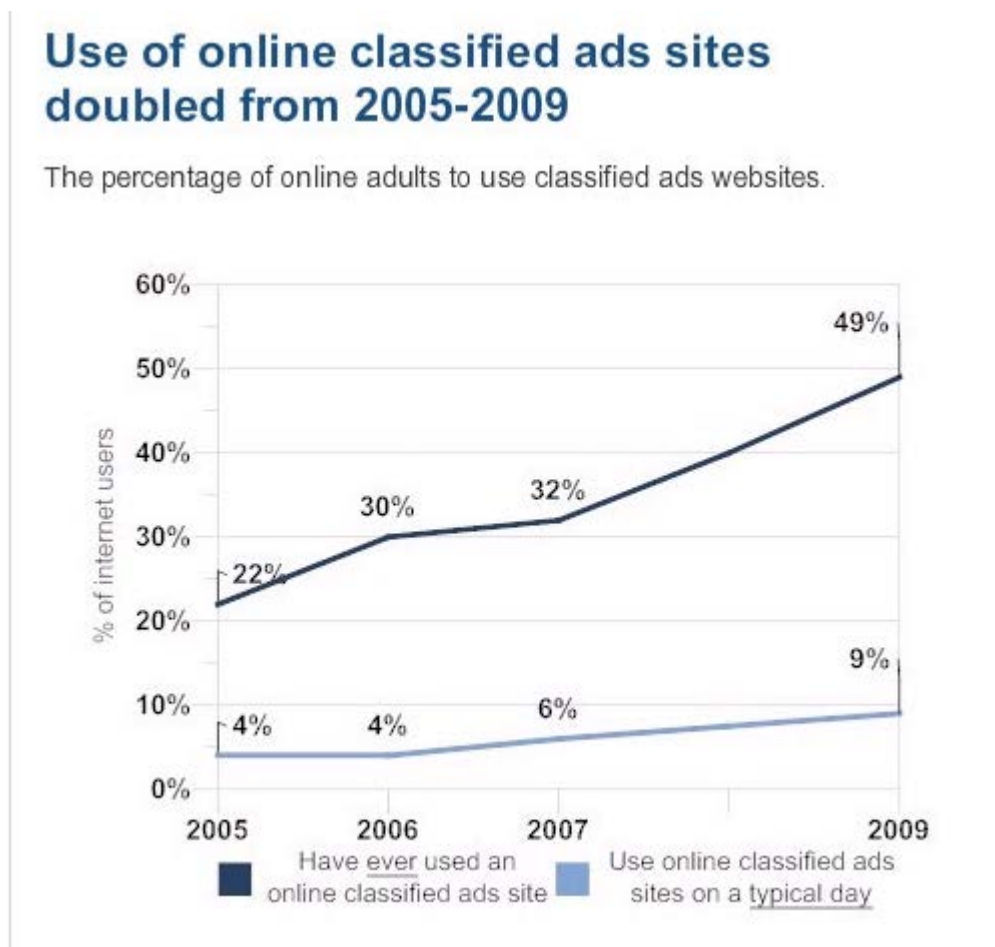
Figure 2.1-3 Use of online classified ads sites

There are 3 main findings in this survey which is salary, education status and residence area. Online adults living in households with incomes of $50,000 or more a year are significantly more likely than lower earners to visit and use classified ads sites. College graduates are significantly more likely than online adults with no college education to use online classified site. Urban and suburban residents are also significantly more likely than rural internet users to use online classified site.

According to Pew Research Center's Internet & American Life Project survey 2009 (Jones, 2009), online classified websites are soaring in popularity with consumers - doubling their usage since 2005. As it stands, nearly half (49 per cent) of all global online adults have used online classifieds at some point. The age between 25-34 years old is the highest percentage of online user to use classify site. Because, in this range of age is most likely after graduate from college and involve in working environment, having the purchasing ability. Between, the teenager around this range of age is most likely open minded and has the ability to judge which seller to trust. Besides, urban resident is more likely to use online classified site is because of they are more explore to sociality and internet than the rural resident.

Use of online classified ads by age

The percentage of internet users in each age group to use online classified ads sites in 2009.

	% who have ever used classified ads sites	% who use these sites on a typical day
All internet users	**49%**	**9%**
Ages 18-24	49^	11^
Ages 25-34	62^^	16^
Ages 35-44	57^^	10^
Ages 45-54	48^	7
Ages 55-64	35	4
Age 65+	26	3

Source: Pew Internet & American Life Project survey conducted March 26 to April 29, 2009. For all adult internet users n=1,687, and margin of error is +/-3%. Sample sizes and margins of error vary by age group.

^^ Internet users in these age groups are significantly more likely than all other age groups to use classified sites.
^ Internet users in these age groups are significantly more likely than internet users ages 55-64 and age 65+ to use classified sites.

Pew **Internet**
Pew Internet & American Life Project

Figure 2.1-4 Use of online classified ads by age

2.1.3 Current Trend of E- retail / E-commerce / Online Shopping Increasing Worldwide

According to the Forrester Research Inc. (Rueter, 2012) and comScore Inc. (Davis, 2012) the online shoppers in United States are increasing dramatically. And it will continue increasing in the future. The factor that lead to the increasing online shoppers are improvement of the feature of the online retailer web site and services, increasing popularity of Smartphone and online retailer offer 'Free Shipping' and daily deal to attract buyers.

Retail E-Commerce (Non-Travel) Growth Rates
Excludes Auctions, Autos and Large Corporate Purchases
Total U.S. – Home & Work Locations
Source: comScore, Inc.

Quarter	E-Commerce Spending ($ Millions)	Y/Y Percent Change
Q1 2007	$27,970	17%
Q2 2007	$27,176	23%
Q3 2007	$28,441	23%
Q4 2007	$39,132	19%
Q1 2008	$31,178	11%
Q2 2008	$30,581	13%
Q3 2008	$30,274	6%
Q4 2008	$38,071	-3%
Q1 2009	$31,031	0%
Q2 2009	$30,169	-1%
Q3 2009	$29,552	-2%
Q4 2009	$39,045	3%
Q1 2010	$33,984	10%
Q2 2010	$32,942	9%
Q3 2010	$32,133	9%
Q4 2010	$43,432	11%
Q1 2011	$38,002	12%
Q2 2011	$37,501	14%
Q3 2011	$36,308	13%
Q4 2011	$49,698	14%

Figure 2.1-5 United States retail e-commerce growth rate

Percentage of e-Commerce Transactions with Free Shipping
Source: comScore e-Commerce Measurement

69%	66%	65%	62%	63%	57%	58%	56%	61%	60%	59%
31%	34%	35%	38%	37%	43%	42%	44%	39%	40%	41%
Q1 08	Q2 08	Q3 08	Q4 08	Q1 09	Q2 09	Q3 09	Q4 09	Q1 '10	Q2 '10	Q3 '10

■ % Transactions with Free Shipping ■ % Transactions with Paid Shipping
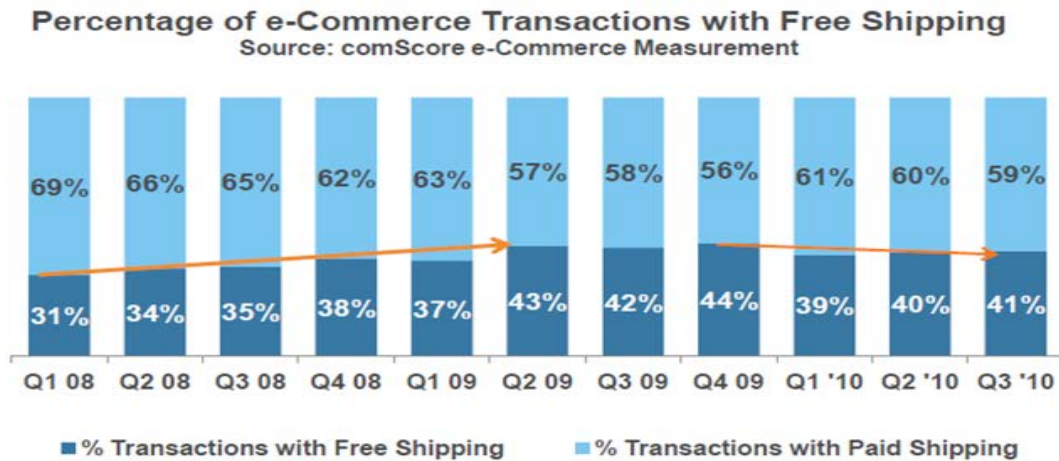
Figure 2.1-6 Percentage of retail e-commerce transactions with free shipping

Importance and Usage of Coupons/Discounts This Holiday Season

Q. When making a purchase this holiday season, how important are discounts and coupons?
Q. At what point in your holiday shopping do you search for discounts or coupons?
Source: comScore Survey – October 2010

12%
3%
84%

- Somewhat/very important
- Somewhat/very unimportant
- Neither important nor unimportant

I decide what gift to purchase and/or where to purchase it based on available discounts or coupons — 31%

I search for discounts/coupons when I am comparing possible gift options and stores — 42%

I decide the gift I want to purchase and the store I want to purchase it from first, then search for discounts/coupons — 18%

I never search for discounts or coupons — 9%

■ % of All Respondents

Figure 2.1-7 Percentage of important usage with coupons/discounts

According to the press release of MasterCard Worldwide Survey-Online Shopping & Ethical Spending 2012 (MasterCard Worldwide, 2012), most of the Asia Pacific nation evolve to "mature" market and 79% of Malaysian show high intent to do online shopping over the next six months. This survey has been published by The Star newspaper (The Star, 2012).

According to Nielsen Company survey 2012, Malaysian spent RM1.8 billion on online shopping (Ho, 2011). And this study shown that Malaysian prefers to spend more on local websites compared to foreign websites.

The current trend of online shopping increasing too fast, Associated Chinese Chambers of Commerce and Industry of Malaysia (ACCCIM) president Tan Sri William Cheng want Small-and-medium enterprises (SMEs) to catch up the trend to avoid being outdate (Lee, 2012).

All of the survey, statistic or studies show that the trend of online shopping is increasing worldwide throughout the years. And it most likely spend on digital content and subscriptions, pay bill, retailers for clothing and accessories, consumer electronics, toys and hobbies, and computer software.

One of the factors that lead the increased in online shopping is payment method which is becoming more and more secure. Such as Paypal, offer 'dispute a case' service to the entire Paypal user to solve the problem of not receiving correct items, damage of the items received and so on. This secured transaction, makes online user feel secured to do online shopping (PayPal, n.d.).

2.1.4 Big 5 Personality Test

Personalization is difference with customization (Treiblmaier et al., 2004). Customization is you explicitly specify what you want. It gives explicit user control (Braynov, 2004). You are what you say you are. Whereas, personalization uses implicit interests and learns what you like from your actions. You are what you click on what you buy (Drogan & Hsu, n.d.) (Sundar & Marathe, 2010) .

In this study (Woo et al., n.d.) presented how the personality test can be used in e-commerce to gain more customer loyalty and increasing user experience. There are 'Big 5' personality types to represent the product personality categories which are Agreeableness (altruism, affection), Extraversion (energy, enthusiasm), Neuroticism (negative affectivity or nervousness), Conscientiousness (control, constrain), Openness to Experience (originality, open mindedness). The person who is in Agreeableness category is a Colorful, cheerful, high energy person. The person who is in Extraversion category is an Imaginative, spirited person. The person who is in Neuroticism category is Mysterious, tough, dark person. . The person who is in Conscientiousness category is Intellectual, factual, down to earth person. The person who is in Openness to Experience category is sophisticated, beautiful, affectionate person.

Personality test is very useful in e-commerce. It lets seller know whok the buyers are. And know what the buyer wants. Example, if the buyer is fall under Agreeableness category is a Colorful, cheerful, high energy person. The seller can recommend the sport product for the buyer.

2.1.5 Linking Product Category with Big 5 Personality

Openness to experience person interested in art, music, and beauty (Ronnie L. McGhee1, 2012) , thus art, crafts and sewing category is directly link to Openness to experiences person. Besides, Openness is often presented as healthier (Anon., n.d.),

thus directly linking to health and personal care category. Moreover, Openness to experience person enjoy films and books (Kalat, 2010, p.517) , will directly link to books category and movie and TV category. Other than these, openness to experience people would like outdoor exercise such as running, cycling, or walking (Nixon, 2010), thus it is directly linking to sport and outdoor category.

Extroversion person and agreeableness person are most likely to enjoy team sports (Nixon, 2010), thus linking to team sport category. Extraverts enjoy music, and reading and writing (Jordan, 2011), thus linking extraversion people to music category and books category.

Conscientious people like having a regular exercise routine and, as a result, may prefer solo activities such as weightlifting (Nixon, 2010), thus linking conscientious people to exercise and fitness category. Conscientious people are most likely to say they exercise for health reasons (Nixon, 2010), thus it is directly linking to health and personal care category.

2.2 Existing Systems

2.2.1 Utarian.com

Background

A forum developed for UTAR students to communicate and discuss about their problem facing with UTAR. It is a forum that connects students from all UTAR campuses and share information.

Strength

All of the forum topics are well categorize.

Weaknesses

The forum is only available in Mandarin Chinese language. Forum is not suitable for buying and selling. It is difficult to upload the photo and write the description.

Figure 2.2-1 Main page of utarian.com

2.2.2 UTAR Facebook group page

<u>Background</u>

Both UTAR Kampar Free Market page and UTAR Kampar second hand goods and accommodation page is created by UTAR students to let students buy and sell product freely.

<u>Strength</u>

Facebook is one of the most popular tools for social communication. It is a 2-way communication channel with the seller and buyer. It has easy-to-manage photo albums – a picture speaks a thousand words. It is easy to use.

<u>Weaknesses</u>

Facebook page lacks categorization. The old posts will be replaced by new posts in a few hours. The seller need to keep posting new post in order to avoid old post to go missing.

Figure 2.2-2 UTAR Kampar Free Market Facebook page

2.2.3 AliExpress.com

Background

AliExpress is a part of Alibaba.com and offers minimum orders as low as 1 item, buyer protection and express delivery. AliExpress currently hosts more than 5,900 different types of products from over 44 different industries.

Strength

Well categorization, good search functions

Weaknesses

Besides, online user who does not own a credit card is not able to use this website to purchase product since AliExpress only offer credit card payment method or using their own payment method.

Besides, the communication tool for buyer communicate with seller is not good. AliExpress need user to install their software in order to let buyer interact with seller. Such as: Trade Manager Client.
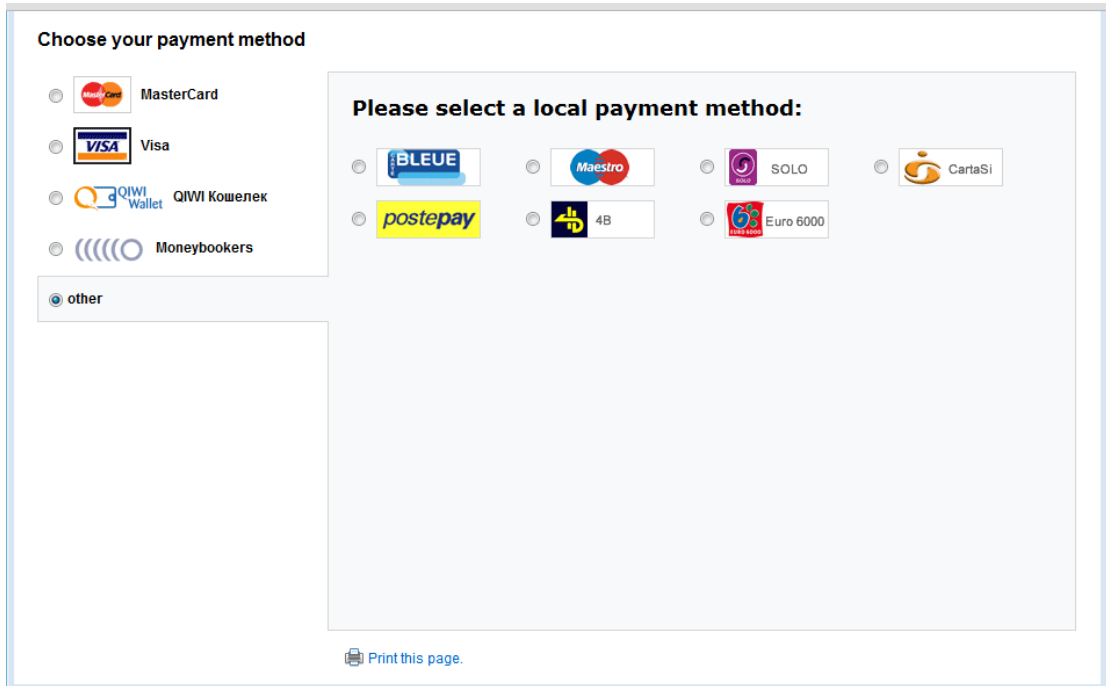
Figure 2.2-3 Payment page of AliExpress.com

2.2.4 eBay.com

<u>Background</u>

eBay is The World's Online Marketplace® with a global customer base of 233 million. Founded by Pierre Omidyar in 1995, eBay has created a powerful marketplace for the sale of goods and services by a passionate community of individuals and small businesses.

<u>Strength</u>

eBay is the leading global brand for online auctions. The company is a giant marketplace used by more than 100 million people to buy and sell all manner of things to each other.

<u>Weaknesses</u>

Shipping cost on eBay has been a big issue while shopping for products. Sellers will make their products on top of the search list by lowering the price of the product while increasing the cost of shipping by as much as twice the price of the product.

Besides, the email and eBay private message is not well synchronization. User read the email but private message is marked unread.

2.2.5 Mudah.com

Background

Mudah.my is a brainchild of Mudah.my Sdn Bhd (formerly known as 701Search Sdn Bhd), a joint venture between Singapore Press Holdings Limited and Schibsted ASA. With more than 5.2 Million unique visitors a month, Mudah.my is one of the most visited internet sites in Malaysia.

Strength

It is one of the famous classified websites in Malaysia. Well product categorization.

Weaknesses

The search function is limited to most recent and cheaper. Besides, the website layout is not particle, all the information will only display on the left hand side, right hand side will be blank.

Figure 2.2-4 Layout problem of Mudah.com

Chapter 3 System Requirement and Specification

3.1 Target User

3.1.1 System Administrator

System administrators are in charge with tasks and responsibilities such as system maintenance, user account management, system performance monitor, and failure handling. They have unrestricted access to the system, thus they require problem solving skill in order to make sure the system is out of trouble.

3.1.2 Users

All of the UTAR academic staff and students are the user of the system. They are given the freedom to buy and sell things. They are required to log into the system in order to sell their product or look for their wanted items. If they want to purchase an item, they will be directly communicated with seller through our messages system to make a deal. Seller may close the deal after the item is sold.

3.2 Functional Requirement

3.2.1 User Authentication

- Administrator Account
    - There will be only one administrator will full system access.
    - Sub-administrator accounts can be created by the main administrator to moderate the system and users.
- Manage User Account
    - Administrators can create and delete user accounts.
- Manage Products
    - Administrators able to dis-activate illegal product.
- User Login & Logout
    - Usage of the full functionality of system is limited to authorized users.
    - User ID and password is required for login.
    - Any user may logout from the system.
- User Profile
    - User can edit their own profile, for instance, personal information and preferences.

3.2.2 E-Shopping

- Sell Item / Product
    - Users can create a new item for sale.
    - Administrators have the right to dis-activate the illegal product.

- Search Item / Product
    - Users can use the search feature to look for an item using product keywords, category, product condition or the system's personalized recommendation system.

- Add to Watch List
    - Users can add the product of their interest to a watch list, so that they can contact the seller to purchase the product.

- Product Recommendation
    - Suggesting products based on user preference and personality.

3.3 Non-Functional Requirement

3.3.1 Performance

- The system must respond to search query in less than 3 seconds.

3.3.2 Security

- Only authorized users have access to the system.
- System database is protected from unauthorized access.
- Both seller and buyer's contact information is protected from users other than their trade partner.

3.3.3 Reliability

- Downtime of the system should be not more than 10 minutes on normal occasion and not more than 3 hours for maintenance.
- The system will respond according to user's request.
- Data are stored correctly in the database.

3.3.4 Availability

- Maximum 3 hours of system maintenance per week.

3.3.5 Usability

- Standard and easy to understand user interface.
- Non-steep learning curve to start using the system.

3.4 Hardware and Software Requirement

3.4.1 Internet

- Internet Connection is required to access the web based system.
  - o Dial-up connection
  - o 3G connection
  - o DSL connection
  - o WIMAX connection
  - o Fiber connection

3.4.2 Computer

- Any computer installed with web browser.
  - o Desktop PC
  - o Laptop PC
  - o Tablet
  - o Smartphones

3.4.3 Web Browser

- Google Chrome
- Mozilla Firefox
- Internet Explorer
- Safari

Chapter 4 Methodology & Technology

4.1 Methodology

4.1.1 Agile Software Development

Agile software development methodology is chosen for development of this project. The project will be break into small parts and completed in an iterative and incremental software development method.

Phase 1: Planning

First phase, the field of research and project title is discussed to determine the best system to develop. Afterwards, we perform a simple study on the title. Deliverables and tasks are discussed among team members and supervisor to recognize the possible innovations and contributions. Work break down structure is used to regulate the tasks and time required.

Phase 2: Analysis

Journal articles and papers are studied in analysis phase. After we have better understanding in the field of research, we move on to analyse existing systems and find out their strengths and weaknesses. To collect more information, a survey is conducted to study on users' requirement.

Phase 3: Design

Before this phase, we already identified the problems. In order to solve them, several mock-up architecture design and interface design of the system is created. The sketches are reviewed and the finalized design will be used to develop the system.

Phase 4: Implementation

In phase 4, functionalities and previous structural designs are being coded and implemented into the system. We expect there will be a lot of uncertainty and problems in this phase.

Phase 5: Testing

The system will have to undergo several different tests to make sure it performs well. For example, unit testing to make sure the functions are working well, while system testing to make sure the whole system is consistent and robust.

Phase 6: Deployment & Documentation

The final phase of the project will be the deployment of the completed system. Documentation of the system such as user manual and maintenance manual will be created for the ease of future maintenance. Future upgrades and improvements are also reviewed.
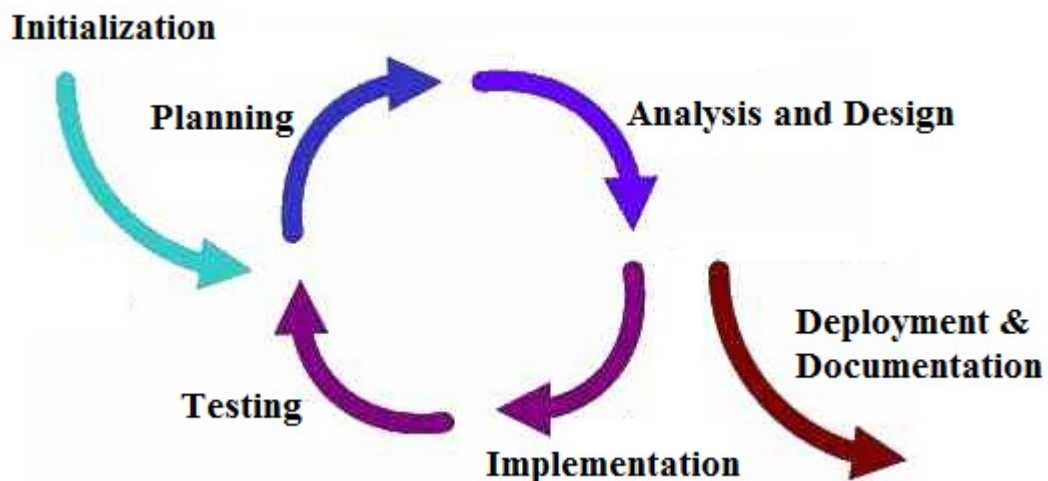
Figure 4.1-1 Agile Software Development Method

Agile software development methodology is an iterative and incremental software development method where project is break into small series. Requirements and solutions are able to evolve through adaptive planning, progressive development and delivery (Cockburn, 2007).

This methodology is chosen over the waterfall because in waterfall method, once a stage is completed there is no going back to its previous stage (Sommerville, 2007). Most of the software designed and implemented under the waterfall method is hard to change. Fixing the problem usually require redesigning an entirely new system where it is costly and inefficient. Agile method is more to adapting changes. New changes can be applied without the need of rewriting the entire programme.

Another reason we choose agile method is because one has usable product at the end of each tested stage (Pressman, 2010). This guarantees bugs are caught and eliminated in the development life cycle. The end product is undergone another test at the very end once again. This is rarely possible for waterfall method, since the product will only be tested at the end of the life cycle. This means the entire process has to restart again.

Since agile methodology is in iterative form, hence it tends to have regular feedback from the end user (Sommerville, 2007). The modularity of the development life cycle is also enhancing the communication not just between the developer and end user, but among the developer as well. With quicker development, testing and constant feedbacks, the agile methodology also indirectly saves the development cost and time.

4.2 GANTT chart

Task Name	Duration	Start	Finish	Predecesso
Project	163 days	Wed 13/06/12	Fri 05/04/13	
Planning	33 days	Wed 13/06/12	Fri 27/07/12	
Questionnaire Design	11 days	Wed 13/06/12	Wed 27/06/12	
Completion of Questionnaire	0 days	Wed 27/06/12	Wed 27/06/12	3
Distribution of Questionnaire	9 days	Thu 28/06/12	Tue 10/07/12	4
First Analysis of Questionnaire	2 days	Wed 11/07/12	Thu 12/07/12	5
Define Problem Statement	4 days	Fri 13/07/12	Wed 18/07/12	6
Define Project Scope and Objective	4 days	Thu 19/07/12	Tue 24/07/12	7
Literature Review	19 days	Thu 28/06/12	Tue 24/07/12	4
Preliminary Report Compilation	3 days	Wed 25/07/12	Fri 27/07/12	9,8
Completion of Preliminary Report	0 days	Fri 27/07/12	Fri 27/07/12	10

Figure 4.2-1 Planning Stage

Task Name	Duration	Start	Finish	Predecesso
Project	163 days	Wed 13/06/12	Fri 05/04/13	
Planning	33 days	Wed 13/06/12	Fri 27/07/12	
Analysis	21 days	Wed 25/07/12	Wed 22/08/12	9
Literature Review on Methodology and Technology	7 days	Wed 25/07/12	Thu 02/08/12	9
Functional Requirement Analysis	3 days	Fri 03/08/12	Tue 07/08/12	13
Non-Functional Requirement Analysis	3 days	Wed 08/08/12	Fri 10/08/12	14
System Requirement Development	3 days	Mon 13/08/12	Wed 15/08/12	15
Final Report Compilation	5 days	Thu 16/08/12	Wed 22/08/12	16
Completion of Final Report	0 days	Wed 22/08/12	Wed 22/08/12	17

Figure 4.2-2 Analysis Stage

Task Name	Duration	Start	Finish	Predecesso
Project	163 days	Wed 13/06/12	Fri 05/04/13	
Planning	33 days	Wed 13/06/12	Fri 27/07/12	
Analysis	21 days	Wed 25/07/12	Wed 22/08/12	9
Design	19 days	Thu 23/08/12	Tue 30/10/12	18
Design Planning	2 days	Thu 23/08/12	Fri 24/08/12	18
Interface Mockup	4 days	Mon 08/10/12	Thu 11/10/12	20
System Mockup	8 days	Fri 12/10/12	Tue 23/10/12	21
Design Review	5 days	Wed 24/10/12	Tue 30/10/12	22
Design Completion	0 days	Tue 30/10/12	Tue 30/10/12	23

Figure 4.2-3 Design Stage

Task Name	Duration	Start	Finish	Predecesso
Project	163 days	Wed 13/06/12	Fri 05/04/13	
Planning	33 days	Wed 13/06/12	Fri 27/07/12	
Analysis	21 days	Wed 25/07/12	Wed 22/08/12	9
Design	19 days	Thu 23/08/12	Tue 30/10/12	18
Implementation	43 days	Wed 31/10/12	Fri 25/01/13	24
System Interface Development	10 days	Wed 31/10/12	Tue 13/11/12	24
System Development	30 days	Wed 14/11/12	Tue 22/01/13	26
System Evaluation	3 days	Wed 23/01/13	Fri 25/01/13	27
Completion of System	0 days	Fri 25/01/13	Fri 25/01/13	28

Figure 4.2-4 Implementation Stage

Task Name	Duration	Start	Finish	Predecesso
Project	163 days	Wed 13/06/12	Fri 05/04/13	
Planning	33 days	Wed 13/06/12	Fri 27/07/12	
Analysis	21 days	Wed 25/07/12	Wed 22/08/12	9
Design	19 days	Thu 23/08/12	Tue 30/10/12	18
Implementation	43 days	Wed 31/10/12	Fri 25/01/13	24
Testing	27 days	Mon 28/01/13	Tue 05/03/13	29
Unit Testing	5 days	Mon 28/01/13	Fri 01/02/13	29
Integration Testing	5 days	Mon 04/02/13	Fri 08/02/13	31
System Testing	5 days	Mon 11/02/13	Fri 15/02/13	32
System Integration Testing	5 days	Mon 18/02/13	Fri 22/02/13	33
User Testing	7 days	Mon 25/02/13	Tue 05/03/13	34
Software Testing Passed	0 days	Tue 05/03/13	Tue 05/03/13	35

Figure 4.2-5 Testing Stage

Task Name	Duration	Start	Finish	Predecesso
⊟ Project	163 days	Wed 13/06/12	Fri 05/04/13	
⊞ Planning	33 days	Wed 13/06/12	Fri 27/07/12	
⊞ Analysis	21 days	Wed 25/07/12	Wed 22/08/12	9
⊞ Design	19 days	Thu 23/08/12	Tue 30/10/12	18
⊞ Implementation	43 days	Wed 31/10/12	Fri 25/01/13	24
⊞ Testing	27 days	Mon 28/01/13	Tue 05/03/13	29
⊟ Deployment and Documentation	13 days	Wed 06/03/13	Fri 22/03/13	36
Deployment	3 days	Wed 06/03/13	Fri 08/03/13	36
Documentation	10 days	Mon 11/03/13	Fri 22/03/13	38
Deployment Completion	0 days	Fri 22/03/13	Fri 22/03/13	39

Figure 4.2-6 Deployment & Documentation Stage

4.3 Technology

Microsoft technologies are chosen for this project because .NET environment supports different languages such as C#, C++, and VB.NET, hence its interoperability is the main reason we choose this technology. Same runtime library is used and it guarantees its unification. Besides, it also offers a vast and powerful class library where lessen the required codes. Other than that, Microsoft also offers different useful controls and tools such as web server control and deployment tool (Microsoft, n.d.).

4.3.1 Microsoft .NET Framework – ASP.NET & Visual Basic .NET

The Microsoft .NET framework is developed by Microsoft as a software framework. It provides a large library of language interoperability across several programming languages in user interface, database connectivity, algorithms, network communications and web application development.

ASP.NET is a web application framework under Microsoft .NET framework. Web developers use it to build dynamic websites, web applications and services. This will be used to develop the control forms of the E-trading management system. Meanwhile, Visual Basic .NET will be used with ASP.NET as the code behind of the web application.

4.3.2 Microsoft SQL Server

Microsoft SQL Server is a relational database management system developed by Microsoft. Its primary function is to store and retrieve data as requested by other application. Microsoft SQL Server is chosen because the stability and integrity between Microsoft components.

Chapter 5 Design

5.1 General User Interface Design

5.1.1 Main Homepage

This is the main homepage of UTAR E-Trading and Job Portal System, where users are greeted with latest information from both systems. Basic and important links are easily located at the header and footer navigation bars.
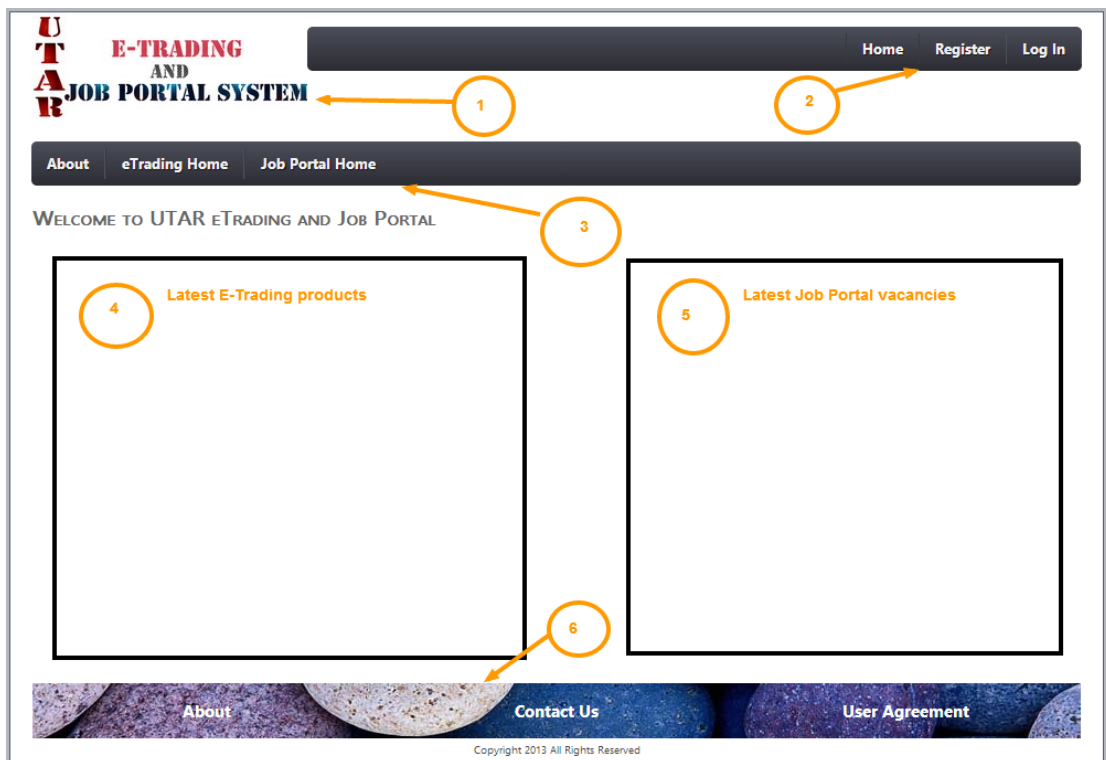
Figure 5.1-1 Main Homepage

1. Logo with hyperlink to homepage.
2. User navigation bar for anonymous user. Once the user is logged in, depends on the user's role, the user navigation bar will have different links.

3. Site navigation bar:

    a. About page.

    b. E-Trading Homepage.

    c. Job Portal Homepage.

4. Latest product advertisements.

5. Latest job vacancies.

6. Footer navigation bar.

5.1.2 User Navigation Bar – Administrator

This navigation bar will appear if the logged in user is in administrator role.
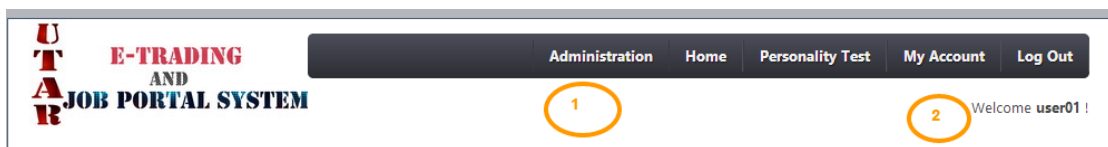
Figure 5.1-2 Administrator User Navigation Bar

1. Basic links to:

    a. Administration page.

    b. Homepage.

    c. Personality Test page.

    d. My Account page.

    e. Log Out.

2. Welcome message.

5.1.3 User Navigation Bar – User

This navigation bar will appear if the logged in user is in normal user role.

Figure 5.1-3 User Navigation Bar

1. Basic links to:

   a. Homepage.

   b. Personality Test page.

   c. My Account page.

   d. Log Out.

2. Welcome message.

5.1.4 Personality Test

User can take our personality test questions in order to find out their very own personality trait. The result will be used to recommend products and jobs to them.

Figure 5.1-4 Personality Test-1

1. Instructions.
2. Personality test questions.

Figure 5.1-5 Personality Test-2

3. Submit button to submit the response. The responses will be validated if each of them is answered.
4. Reset button to reset the radio button to default state.

5.1.5 My Account – View / Edit Profile

User can edit their profile in this page.

Figure 5.1-6 Edit Profile

1. User information fields
2. Save Changes button to save the updated information.
3. Reset button to return the page to default state.

5.1.6 My Account – My Personality

This page shows the user's latest personality test result.

PERSONALITY TEST RESULT

This report will provide you a brief information about your personality.

INTERPRETING YOUR RESULTS

In this report we provide a description of the Low and High scores for each of the personality factors. The higher your score the more likely the high description applies.

Score Range	0 - 33 Low	34 - 66 Middle	67 - 100 High

Describing a low range scoring person		Describing a high range scoring person
Reserved ■ Formal ■ Serious ■ Quiet ■ Prefers working alone ■ Avoids direct leadership roles	Your score for Extraversion: 70	Outgoing ■ friendly ■ assertive ■ likes working with others ■ enjoys direct leadership roles
Hard-headed ■ sceptical ■ competitive ■ proud ■ prefers competition over co-operation	Your score for Agreeableness: 64	Compassionate ■ eager to please ■ good natured ■ prefers co-operation over competition and conflict
Spontaneous ■ disorganised ■ prefers flexible plans ■ dislikes precise details	Your score for Conscientiousness: 64	Conscientious ■ disciplined ■ efficient ■ well organised ■ likes precise detail ■ strong sense of duty
Not easily upset in stressful situations ■ relaxed ■ resilient ■ calm	Your score for Neuroticism: 70	Experiences negative emotional reactions and feelings of anxiety ■ prone to worry ■ easily upset
Traditionalist ■ down-to-earth ■ practical ■ conservative ■ prefers traditional outlooks and technical problem-solving	Your score for Openness: 84	Imaginative ■ open-minded ■ experimental ■ prefers creative conceptual problem-solving

Personality Traits	In other words...
Extraversion Extraversion describes how energetic and enthusiastic a person is - especially when dealing with people.	Are you an outgoing, socially active extravert or do you prefer working and being alone?
Agreeableness Describes a person's attitudes towards other people.	Do you show compassion or are you tough and guarded?
Conscientiousness Describes how organised, motivated and thorough an individual is in life and in pursuing goals.	Are you industrious, thorough and well organised?
Neuroticism Measures the different ways people have of reacting emotionally to pressure and stressful circumstances.	Are your reactions overly emotional? Do you tend to be apprehensive and anxious - or - are you cool, calm and collected?
Openness to Experience Describes an individual's pro-active seeking and appreciation of experience for its own sake.	Do you like to experience new and varied activities or do you prefer routine and familiarity?

Figure 5.1-7 Personality Test Result

5.2 E-trading User Interface Design

5.2.1 E-trading Homepage

E-trading homepage is display a list of latest products and recommended products based on the user personality and specialization.
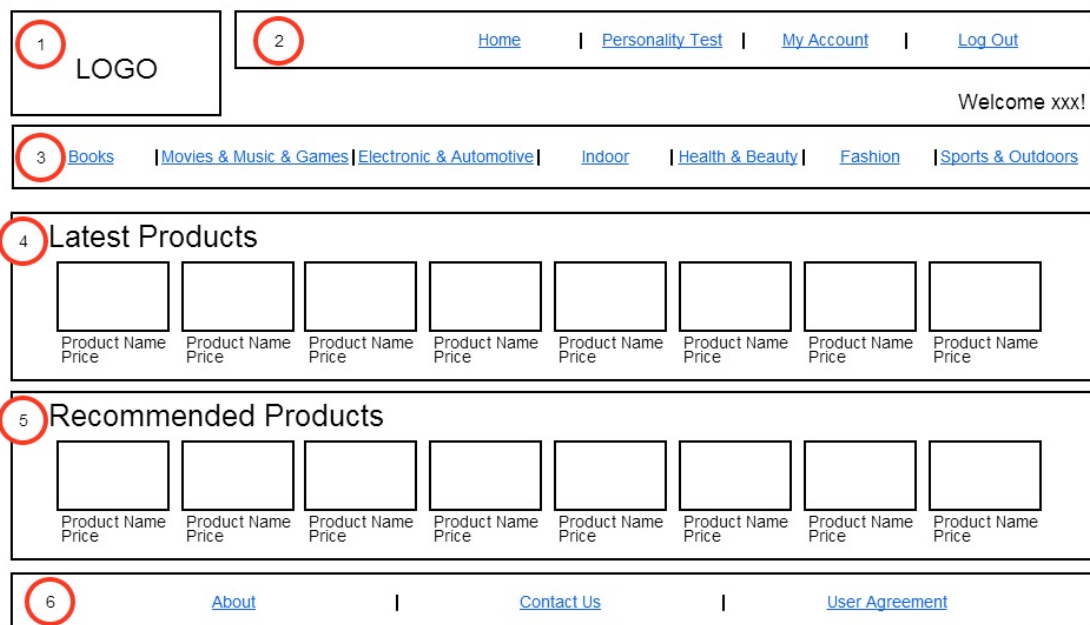
Figure 5.2-1 E-trading Home page

1. E-trading logo that links to the E-trading's homepage.
2. Horizontal site navigation bar that display 7 main product categories:
   a. Books category.
   b. Movie, Movie and Games category.
   c. Electronics and Automotive category.
   d. Indoor category.
   e. Health and Beauty category.
   f. Fashion category.

   g. Sports and Outdoors category.

3. Display latest products.

4. Display recommended products based on the user personality.

5.2.3 Product Category page

Product category page display all the products that under particular category. It display simple product information.

Figure 5.2-2 E-trading Category Page

1. Side navigation bar that display all the main categories and sub categories.
2. Search panel which allow user to search product through:
   a. Sub category.
   b. Product condition which is new or used.
   c. Product name.
3. Display product once user:
   a. Selected particular category from horizontal site navigation bar
   b. Selected particular category from the side navigation bar
   c. User search through search panel.

For complete product information, user able to click on the photo or product name, it will link to product page.

5.2.4 Add Product

User able to sell product by upload product's photo and fill in the product information.

Figure 5.2-3 E-trading Add Product Page

Steps to add products:

1. Fill in product important basic information.
2. Select product category.
3. Fill in more product information.
4. Upload photos.

5. Submit this product by select "Start Selling" button or select "reset" button to reset all the information entered.

5.2.5 Product Page

Product page is to display product with complete product information, include seller name.
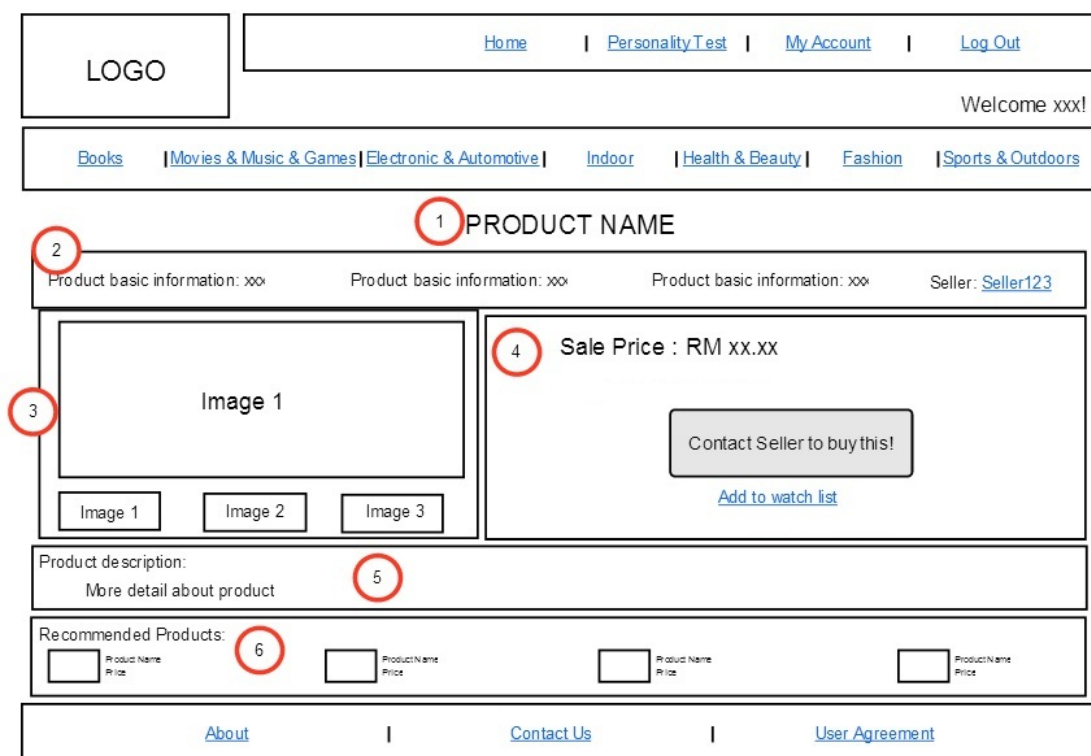
Figure 5.2-4 E-trading Product Page

1. Product name is display as the big title.
2. Product information
3. Product images

4. Product Price. "Contact seller to buy this!" button for buyer to contact seller for more information. "Add to watch list" link to allow user collect their interested products.

5. Product description.

6. Recommended products based on the user personality

5.2.6 Edit Product page

User able to edit product's information.

Figure 5.2-5 E-trading Edit Product page

Steps to edit products:

1. Edit product information.

2. Select "Save Changes" button to save edited product information. Or select "Reset" button to reset all edit information.

5.2.7 View Transaction Page

User able to view transaction made information.

Figure 5.2-6 View Transaction Page

1. User able to search transaction by product name.
2. Transaction information.

5.2.9 View Buying List Page

Users are able to view all the products that was brought.

Figure 5.2-7 View Buying List Page

1. User able to search transaction by product name.

2. The information about brought products.

5.2.11 View Selling List Page

Sellers are able to view a list of products selling. Users are able to edit product information by select "Edit".

Figure 5.2-8 View Selling List Page

1. User able to search transaction by product name.
2. The information about selling products.

5.2.13 Contact Seller Page

User able to communicate with seller if user interested to buy that particular product.

Figure 5.2-9 Contact Seller Page

1. The enquiry product information.
2. Messages information.
3. User reply messages.
4. Close transaction when the conversation or negotiation ends.

5.2.15 View User Profile Page

User, who would like to know about buyer information, is able to select the link of seller name at product category page or product page to view user profile.

Figure 5.2-10 User Profile Page

1. User's general information.
2. User's selling item(s).

5.3 Use Case Diagram
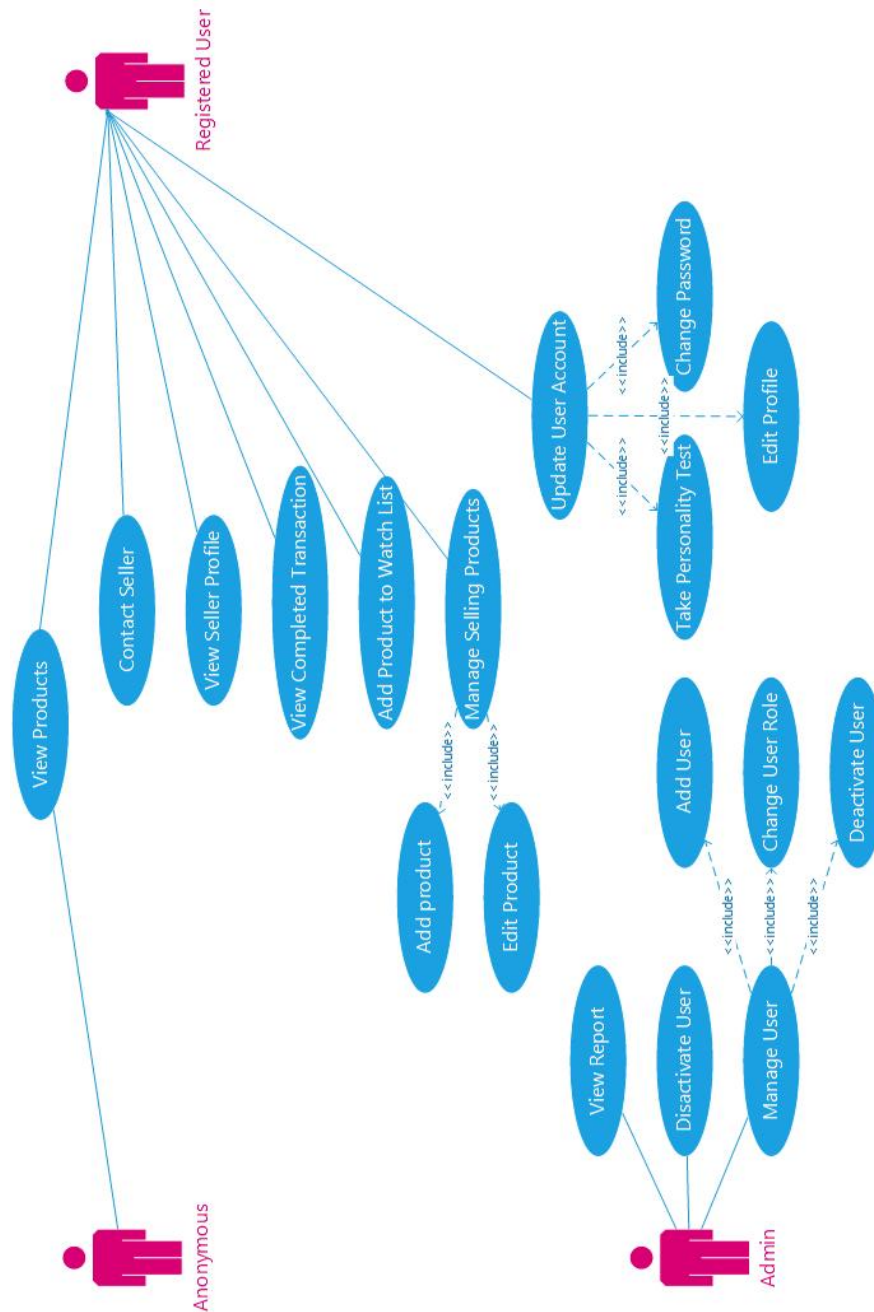
Figure 5.3-1 E-trading Use Case Diagram

5.4 Database Design
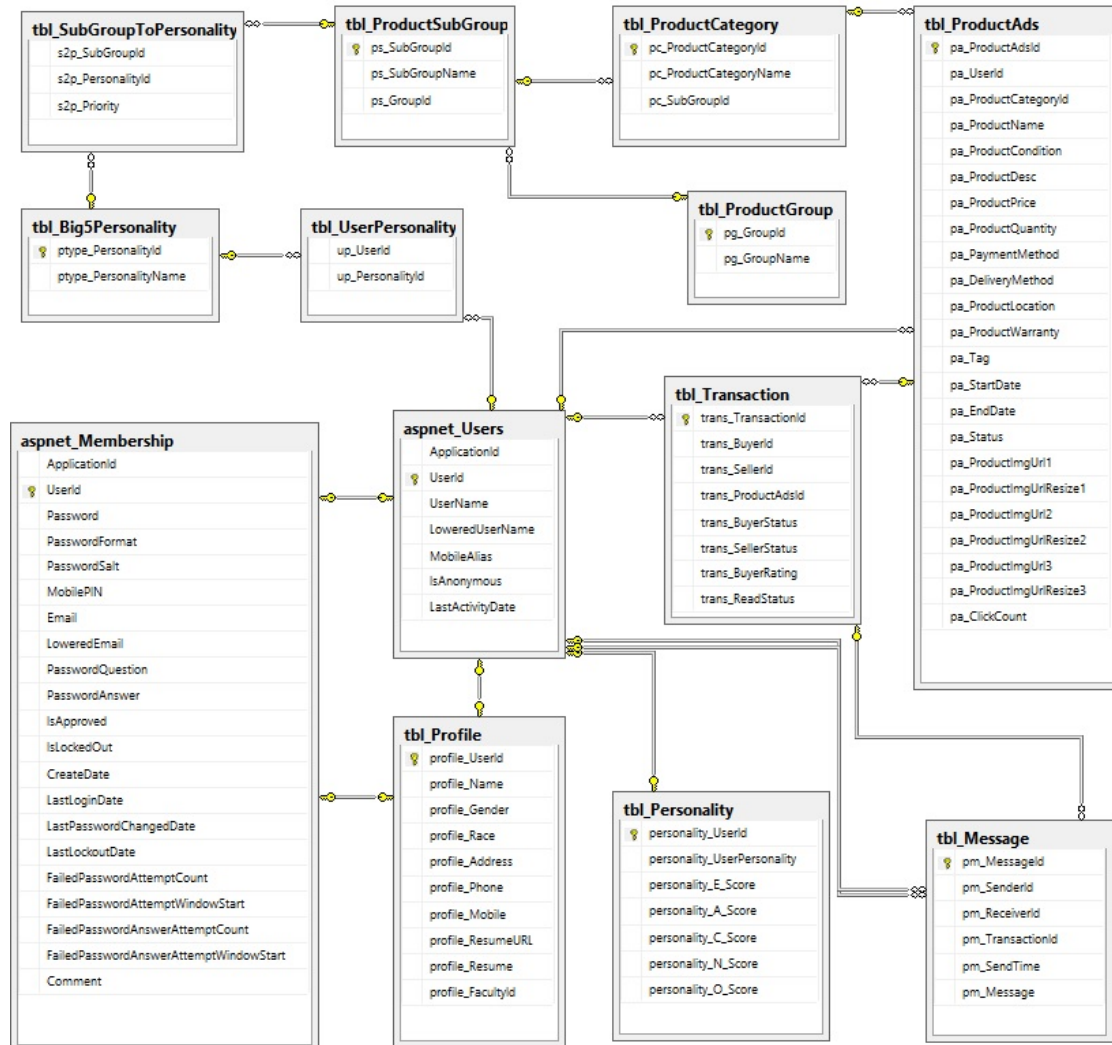
Figure 5.4-1 Entity Relationship Diagram

5.5 Database Table

Figure 5.5-1tbl_ProductGroup

This table stores each of the product group names with unique group id.

Figure 5.5-2 tbl_ProductSubGroup

This table stores each of the product sub group name with unique sub group id.

Figure 5.5-3 tbl_Product Category

This table stores each of the product category names with unique product category id.

tbl_ProductAds

	Column Name	Data Type	Allow Nulls
🔑	pa_ProductAdsId	int	☐
	pa_UserId	uniqueidentifier	☐
	pa_ProductCategoryId	nvarchar(5)	☐
	pa_ProductName	nvarchar(300)	☑
	pa_ProductCondition	nvarchar(5)	☑
	pa_ProductDesc	nvarchar(MAX)	☑
	pa_ProductPrice	decimal(8, 2)	☑
	pa_ProductQuantity	int	☑
	pa_PaymentMethod	nvarchar(300)	☑
	pa_DeliveryMethod	nvarchar(300)	☑
	pa_ProductLocation	nvarchar(300)	☑
	pa_ProductWarranty	nvarchar(300)	☑
	pa_Tag	nvarchar(500)	☑
	pa_StartDate	date	☑
	pa_EndDate	date	☑
	pa_Status	nvarchar(10)	☑
	pa_ProductImgUrl1	nvarchar(MAX)	☑
	pa_ProductImgUrlResize1	nvarchar(MAX)	☑
	pa_ProductImgUrl2	nvarchar(MAX)	☑
	pa_ProductImgUrlResize2	nvarchar(MAX)	☑
	pa_ProductImgUrl3	nvarchar(MAX)	☑
	pa_ProductImgUrlResize3	nvarchar(MAX)	☑
	pa_ClickCount	int	☑
			☐

Figure 5.5-4 tbl_ProductAds

This table stores all the product information.

Figure 5.5-5 tbl_UserPersonality

This table will store a user's personality based on the personality test.

Figure 5.5-6 tbl_Big5Personality

This table will store the five personality traits.

Figure 5.5-7 tbl_SubGroupToPersonality

This table store information about which personality related to which product sub group.

Figure 5.5-8 aspnet_Users

This table stores the user's information.

Figure 5.5-9 tbl_Profile

This table stores a user's personal information. This information can be edited in the user's profile page.

Figure 5.5-10 aspnet_Membership

This table stores a user's registration information.

Figure 5.5-11tbl_Personality

This table stores a user's personality test score. Each personality trait's score is recorded so that the information can be retrieved for review.

Figure 5.5-12 tbl_Transaction

This table is to store the transaction information.

Figure 5.5-13 tbl_Message

This table is to store the message information.

Chapter 6 Implementation and Outcome

6.1 General User Interface

Figure 6.1-1Homepage

CREATE A NEW ACCOUNT

Use the form below to create a new account.

Passwords are required to be a minimum of 6 characters in length.

Security Question and Answer is used for password reset.

Account Information

User Name:

E-mail:

Password:

Confirm Password:

Security Question:

Security Answer:

Register

Figure 6.1-2 Register Account Page

Figure 6.1-3 Login Page
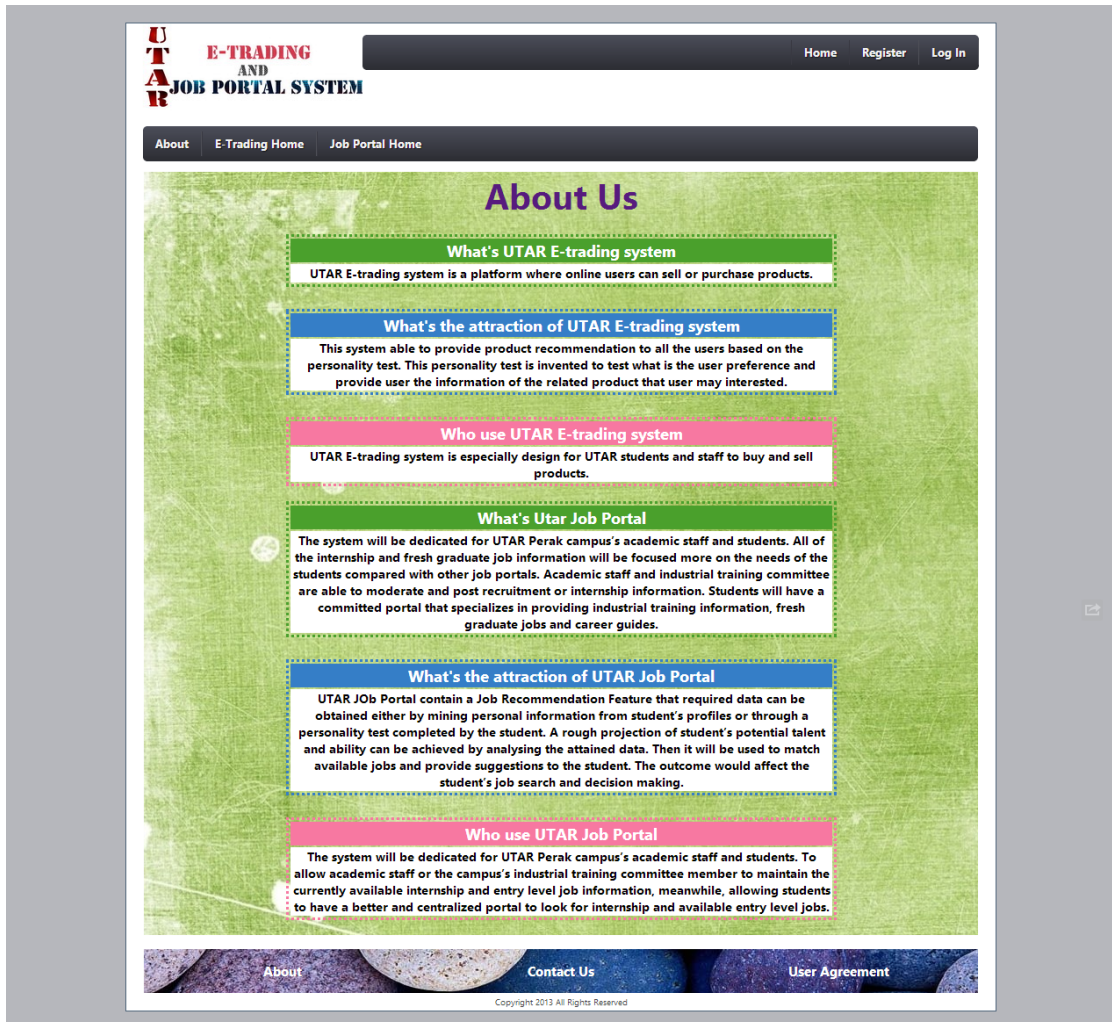
Figure 6.1-4 About Us Page
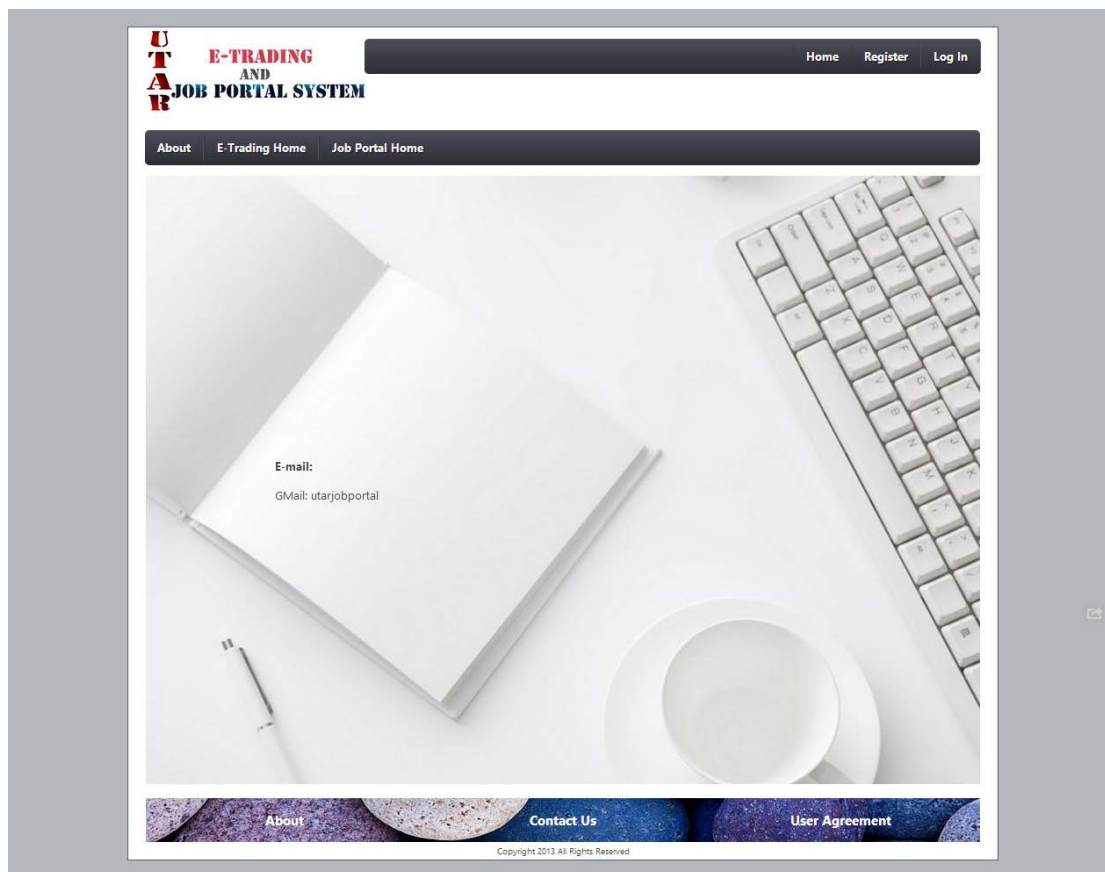
Figure 6.1-5 Contact Us Page
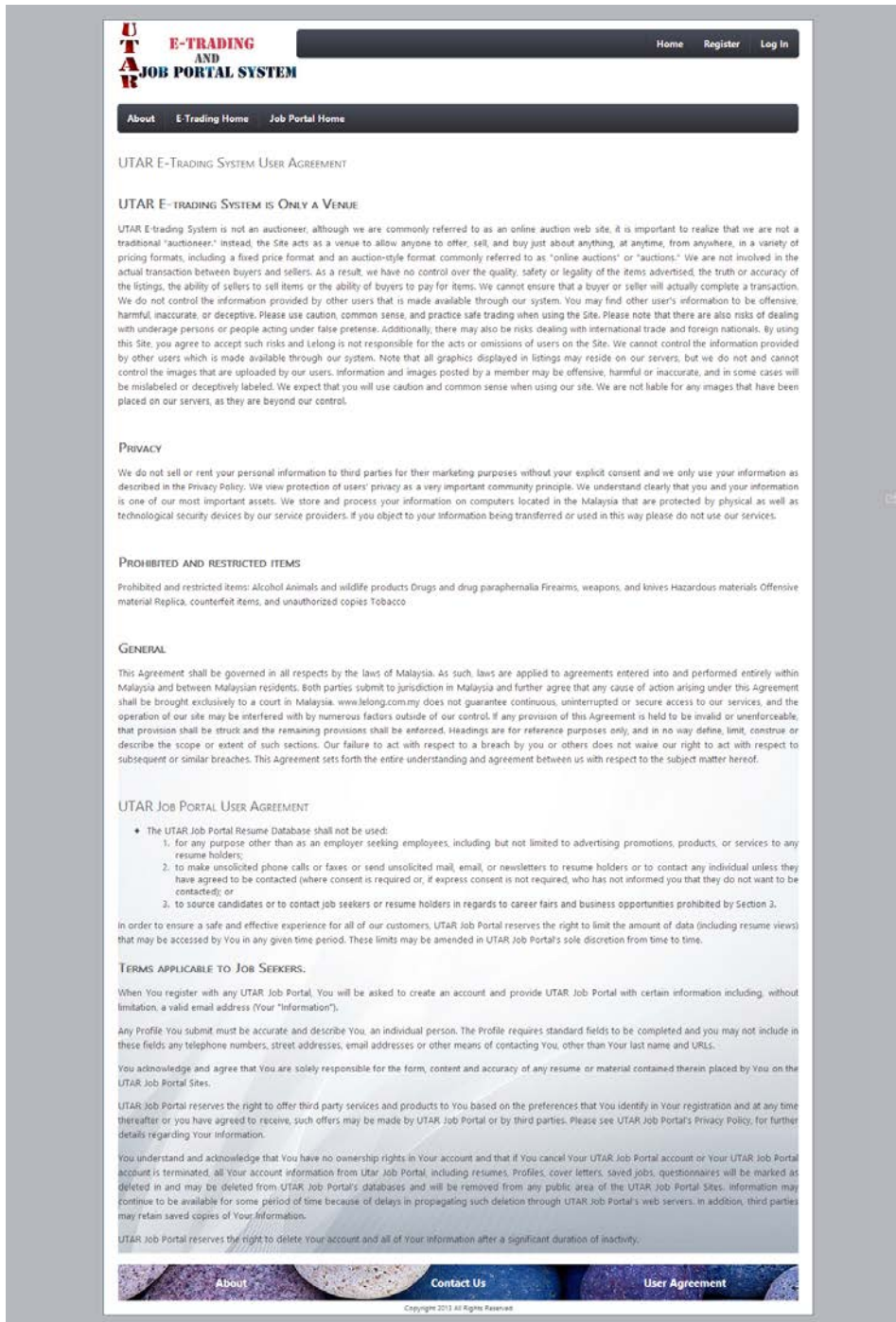
Figure 6.1-6 User Agreement Page

Figure 6.1-7 Personality Test Page

Figure 6.1-8 My Account Page

Figure 6.1-9 My Result Personality Page

Figure 6.1-10 Change Password Page

Figure 6.1-11 Product Page

Figure 6.1-12 Product Category Page

Figure 6.1-13 Add Product Page
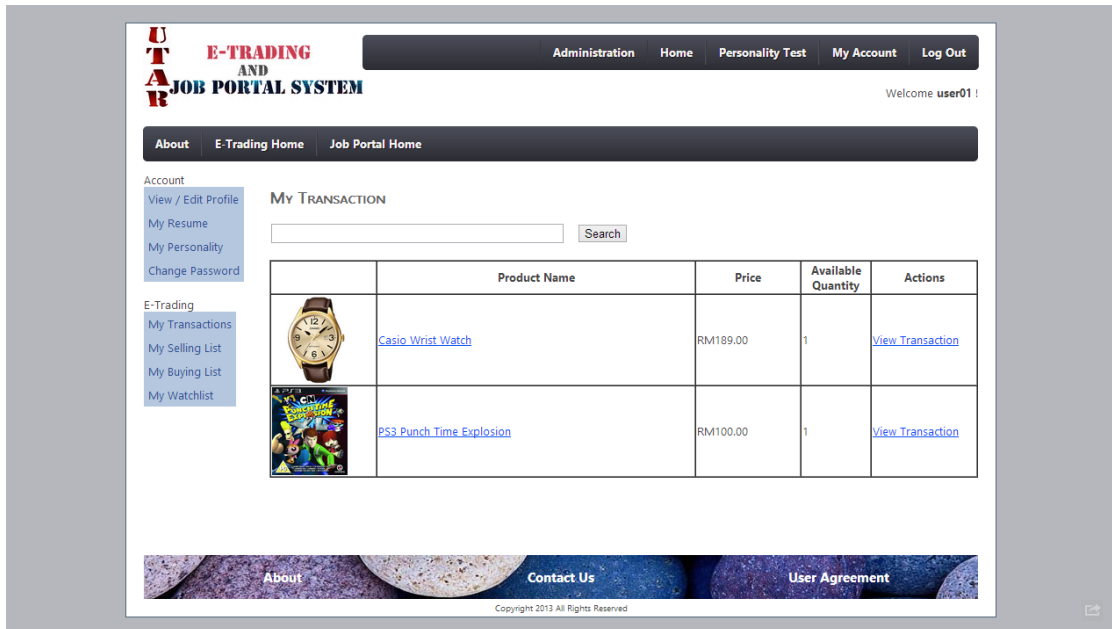
Figure 6.1-14 View Transaction Page
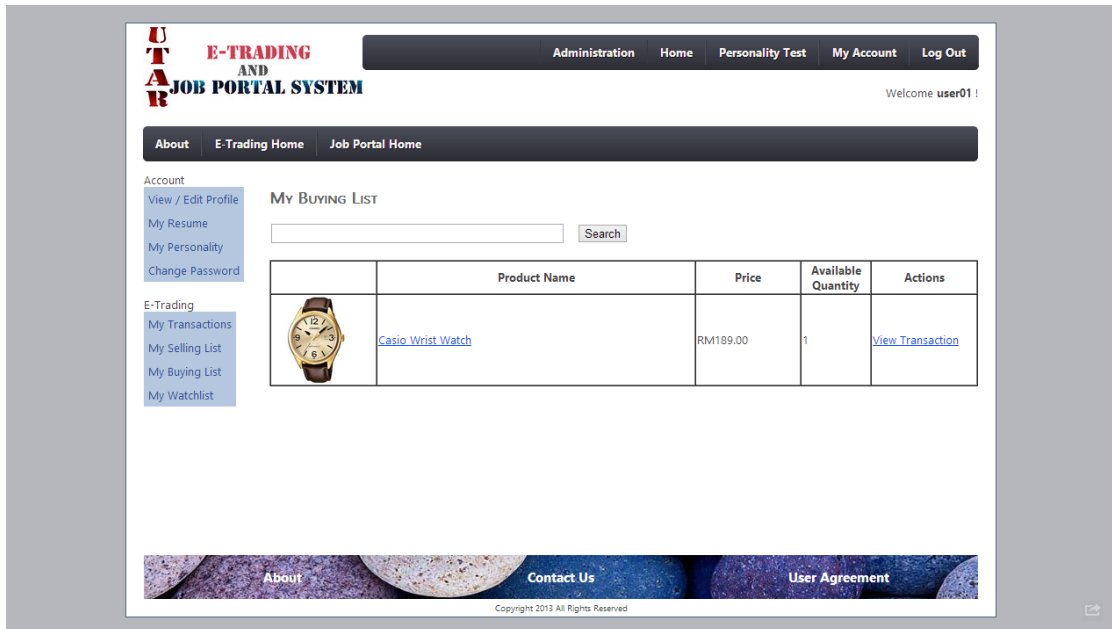
Figure 6.1-15 View Buying List Page
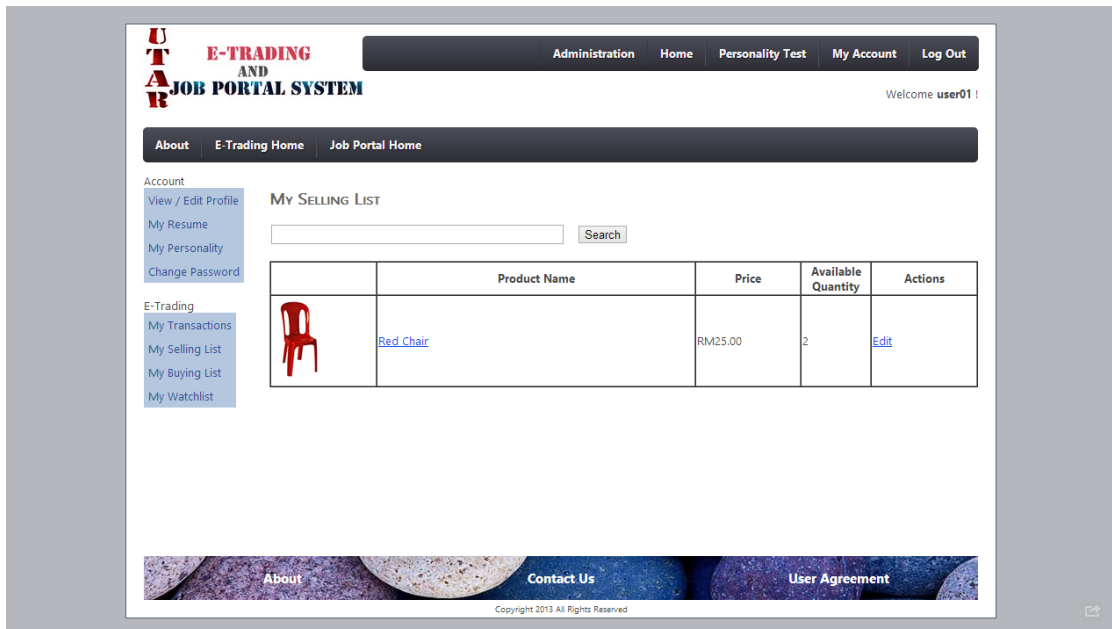
Figure 6.1-16 View Selling List Page
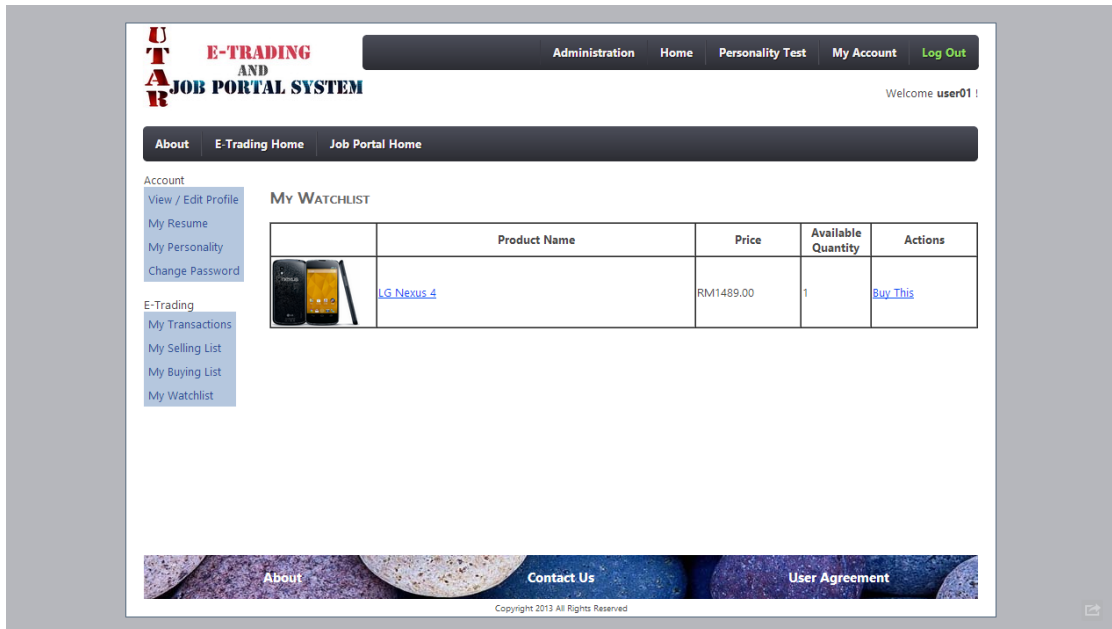
Figure 6.1-17 Watch list Page
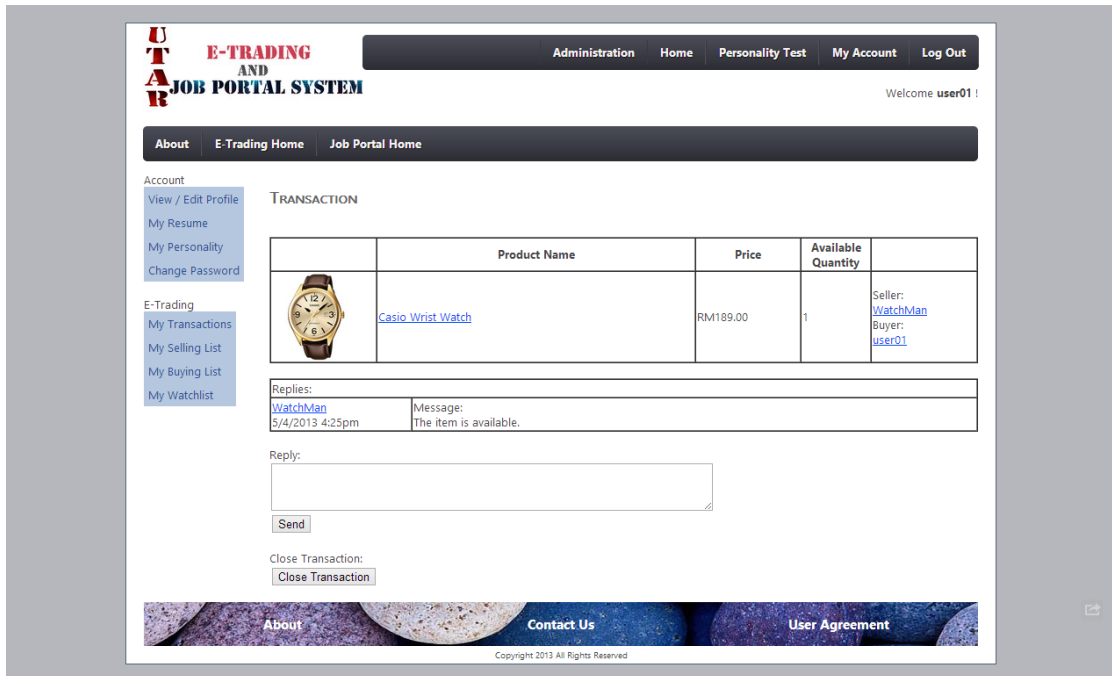
Figure 6.1-18 Contact Seller Page

Figure 6.1-19 User Profile Page

Chapter 7 System Test Plan

7.1 Customized UTAR E-trading Management System Test Plan

This chapter will explain the test plan for Customized UTAR E-trading Management System, a web-based internet job portal that advertises recorded vacancy information to registered users and guest users. The system will be consists of two user interfaces, one for administration purposes, while another for general usage. The administration user interface can only be accessed by the system administrators, whereas the general user interface can be accessed by registered users and anonymous users with certain restrictions.

This test plan will address the test coverage for for Customized UTAR E-trading Management System functionality and usability with the inclusive of job recommendation based on user's personality.

List of general features

- User registration
- Personality test
- Product recommendation based of personality
- Product search
- Add Product

List of administrative features

- User creation
- Manage user
- View report

7.2 Functionality Testing

This section will elaborate the functionality testing of the system.

Modules	Task	Check	Comment
User registration	Validate required input	✓	
	Validate unique username	✓	
	Validate password length	✓	
	Successful registration	✓	Only with unique username
User Login	Validate required input	✓	
	Correct login information	✓	
	Wrong login information	✓	Login denied
	"keep me logged in" is working	✓	
	Successful login	✓	Only with correct login information
Password retrieval	Validate required username	✓	
	Available username	✓	

	Unavailable username	✓	
	Validate required security answer	✓	
	Correct security answer	✓	
	Wrong security answer	✓	
	Successful password retrieval	✓	Function available if system were to deploy on a server with SMTP service
E-trading Administrative	Manage user	✓	
	Manage product	✓	
	View report	✓	
E-trading Administrative: Add User	Validate required inputs	✓	
	Assign user role	✓	
	Reset fields button returns the fields to default state	✓	
E-trading Administrative: Edit user	Change user role	✓	
	Validate required inputs	✓	

	Reset Fields button reset the page to default state	✓	
	Successful edit company	✓	
E-trading Administrative: Manage Product	Change product status	✓	
	Validate required inputs	✓	
	Reset Fields button reset the page to default state	✓	
	Successful edit product	✓	
E-trading: Product Category	Main Category links	✓	Top Site Navigation
	Drop down menu	✓	Top Site Navigation
	Sub category links	✓	Top Site Navigation
	Side navigation link	✓	
Personality Test	Validated required inputs	✓	
	Radio buttons are working	✓	
	Reset button refreshes the page	✓	

	Successful submit personality test response	✓	
My Account: View/Edit Profile	Validate required input	✓	Applicable for email field only
	Save changes button is working	✓	
	Successful edit profile	✓	Only if the requirements are met
	Reset button return the fields to default state	✓	
My Account: Add product	Validate required input	✓	
	Validate file type	✓	Only accept jpeg and PNG files
	Successful upload products	✓	

Table 7.2-1 Functionality Testing Table

7.3 Usability Testing

This section will further elaborate the usability test of the system.

Modules	Task	Check	Comment
Browser friendliness	Website working in different browsers. Recommended resolution is 1024 * 768.	✓	Strongly suggest to view the website using PC devices
Font size/spacing and contrast	Content texts are easy to read.	✓	
Prominent logo	Website logo is well placed	✓	
About us	Learn who are us	✓	
Navigation	Easy to understand navigation with reasonable links	✓	
Content	Clear and concise content, with different headings and organized	✓	
Consistent page design	Navigation, styling, links are consistent	✓	

Table 7.3-1 Usability Testing Table

Chapter 8 Project Review

8.1 Discussion

"Add to Cart" function is not apply in this system, since it is not e-commerce website that involving real transaction. We use "Contact Seller to buy this" function to let seller and buyer communicate about more detail of the product and how to make the transaction deal. In the product page, buyers are able to see all the information about the product, buyer able to contact seller for more detail information.

8.2 Conclusion

A survey is conducted on 150 UTAR students and UTAR staff, the problems facing by seller are difficult to find suitable buyer, inefficient website layout for promoting product, limited information could be provided and lack of product exposure to potential buyer. Besides, the problems facing by buyer are difficult to find suitable seller, inefficient website layout for product searching, lack of product information and lack of product categorization.

This web site is built to solve the problem facing by UTAR student, the difficulty to buy and sell product in a good communication platform. In this study, we use classification to classify the products. So that users are able to search for their required products easily.

Besides, this website is built with personality test, helping user to know which product to buy. This website will be easy to use, simple user interface, well categorization of the product and provide custom service for the user.

In conclusion, this system will be widely used by UTAR staff and UTAR students.
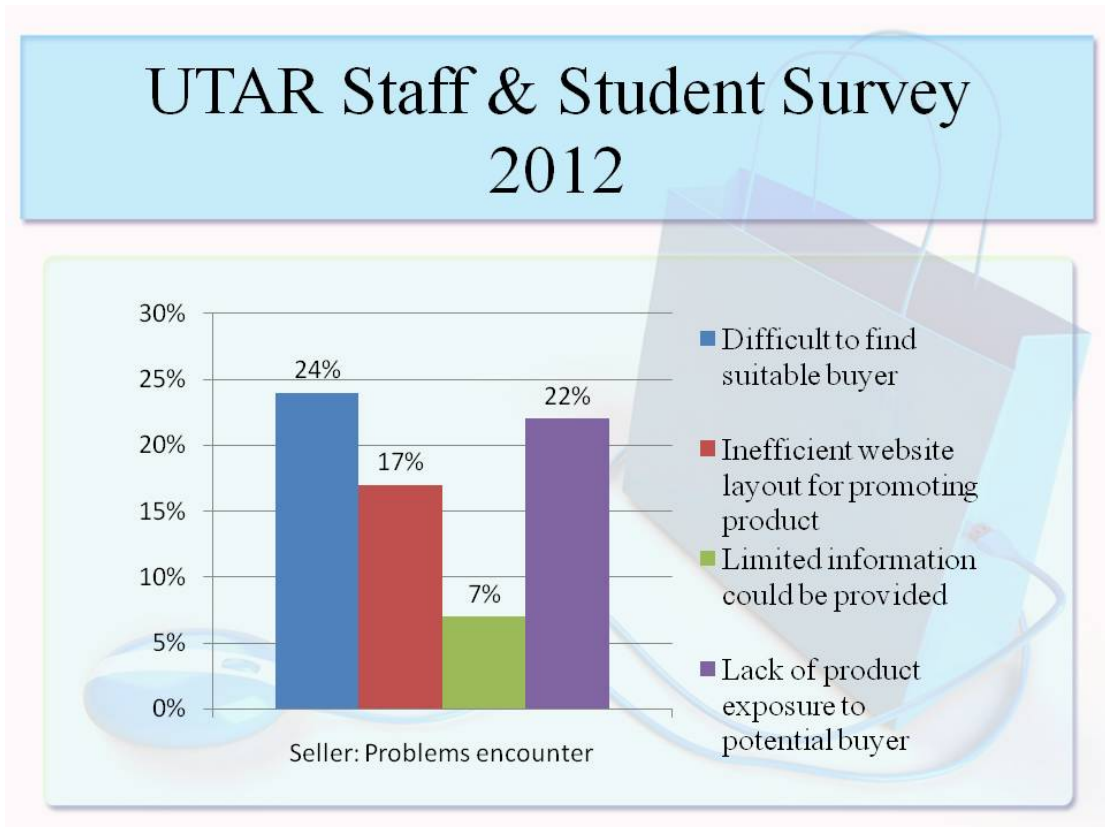
Figure 8.2-1 Problems encountered by sellers
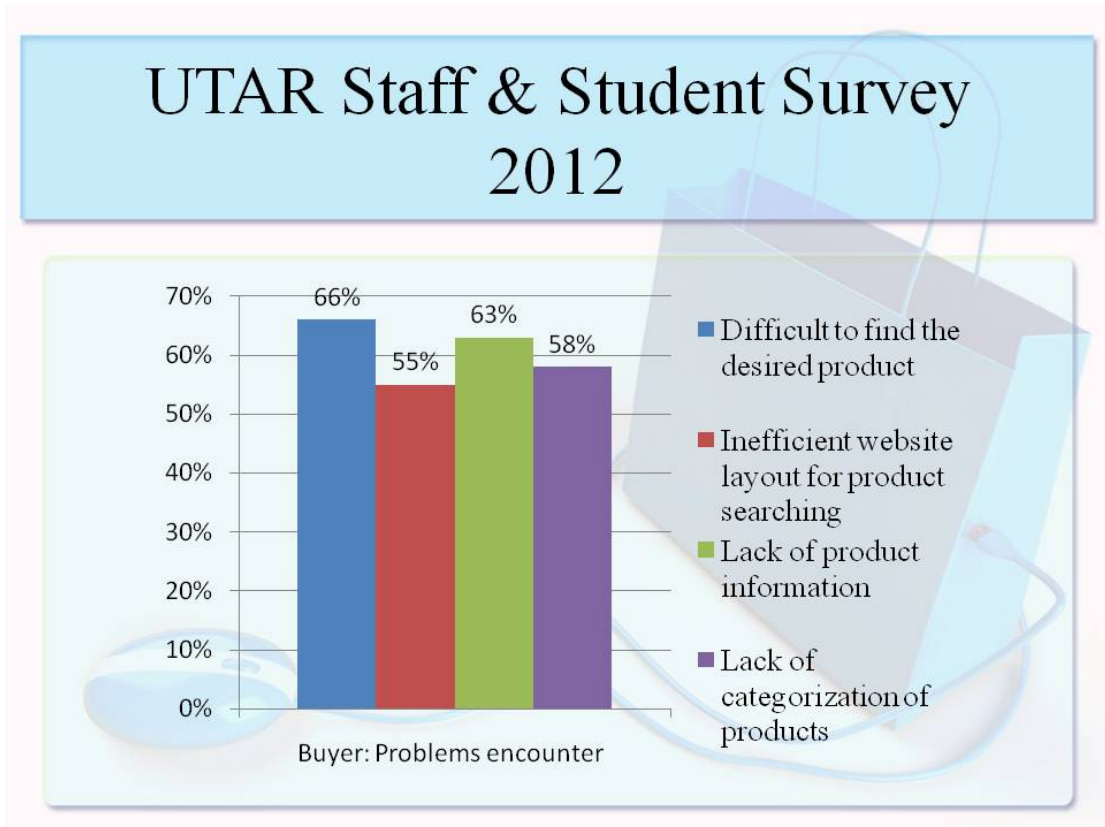
Figure 8.2-2 Problems encountered by buyers

References

Amalana, 2010. *The Advantages of Internet Job Search*. [Online] Available at: http://amalana.hubpages.com/hub/Amalana-job-search [Accessed 19 July 2012].

Andam, Z.R., 2003. E-Commerce and E-Business. *UNDP Asia-Pacific Development Information Programme (UNDP-APDIP)*, p.47.

Anon., n.d. *The "Big 5" Aspects of Personality*. [Online] Available at: http://www.psychometric-success.com/personality-tests/personality-tests-big-5-aspects.htm [Accessed 2 April 2013].

Bernama, 2012. *Bernama.com*. [Online] Available at: http://www.bernama.com/bernama/v6/newsbusiness.php?id=681328 [Accessed 22 July 2012].

Braynov, S., 2004. Personalization and Customization Technologies.

CareerJet, n.d. *About Us*. [Online] Available at: http://www.careerjet.com.my/about/ [Accessed 19 July 2012].

ChannelAdvisor, 2011. *2011 Consumer Survey - Global Consumer Shopping Habits*. [Online].

Chan, E. & Swatman, P.M.C., 1999. Model, Electronic Commerce: A Component.

Cockburn, A., 2007. *Agile Software Development: The Cooperative Game*. Addison-Wesley.

consumersearch, 2010. *Job Sites: Reviews*. [Online] Available at: http://www.consumersearch.com/job-sites [Accessed 20 July 2012].

CrunchBase, 2012. *CareerJet*. [Online] Available at: http://www.crunchbase.com/company/careerjet [Accessed 19 July 2012].

Davis, D., 2012. *E-retail sales jump 14% in Q4*. [Online] Available at: http://www.internetretailer.com/2012/02/06/e-retail-sales-jump-14-q4 [Accessed 24 July 2012].

Drogan, M. & Hsu, J., n.d. Personalization and Customization. *Enhancing The Web Customer's Experience: Techniques and Business Impacts of Web*.

Dube, R., 2009. *Top 10 Most Effective Job Search Websites*. [Online] Available at: http://www.makeuseof.com/tag/top-10-most-effective-job-search-websites/ [Accessed 20 July 2012].

Engler, B., 2008. *Personality Theories: An Introduction*. 8th ed. Cengage Learning.

Ho, S., 2011. *Malaysians spent RM1.8bil shopping online in 2010*. Petaling Jaya: The Star.

Ho, N.W., Shen, X. & Shirmohammadi, S., 2007. Personalization through Personality Categorization of Products. In *Electrical and Computer Engineering*. Vancouver, 2007.

JobStreet.com, 2010. *JOBSTREET.COM HR NETWORKING EVENT HIGHLIGHTS SHIFT IN EMPLOYMENT MARKET*. [Online] Available at: http://mrem.bernama.com/viewsm.php?idm=15691 [Accessed 20 July 2012].

Jones, S., 2009. *Online Classifieds*. Washington: Pew Internet & American Life Project.

Jordan, G., 2011. Introverts and Extraverts: They Aren't What You Think. *Introverts and Extraverts: They Aren't What You Think*.

Kalat, J.W., 2010. *Introduction to Psychology*. United State: Wadsworth.

Kao, D. & Decou, J., 2001. Applicability of selected e-commerce models to an e-commerce planning process model. *Journal of Computer Information Systems (JCIS)*, 2, pp.172-78.

Lee, L., 2012. *SME told to go for online shopping market*. Kuala Lumpur: The Star.

MasterCard Worldwide, 2012. *MasterCard Worldwide Survey-Online Shopping & Ethical Spending 2012*. [Online] Available at: http://www.masterintelligence.com/ViewRegionReport.jsp?hidReportTypeId= 9&hidRegionId=1&hidUserId=null [Accessed 24 July 2012].

Microsoft, n.d.. *NET Framework Conceptual Overview*. [Online] Available at: http://msdn.microsoft.com/library/zw4w595w.aspx [Accessed 21 July 2012].

Monster, n.d. *About Monster*. [Online] Available at: http://www.monster.com.my/about_us.html [Accessed 12 July 2012].

Nixon, R., 2010. Best Fitness Routines Fit Your Personality, Studies Show. *Best Fitness Routines Fit Your Personality, Studies Show*, Available at: http://www.livescience.com/10931-fitness-routines-fit-personality-studies-show.html.

PayPal, n.d. *Buyer Protection off eBay*. [Online] Available at: https://www.paypal-marketing.co.uk/safetyadvice/BuyerProtectionOffEbay.htm [Accessed 24 July 2012].

Peck, G., 2008. *Crystal Reports 2008: The Complete Reference*. McGraw-Hill.

Poon, S., 1998. *Small Business Internet Commerce: A Study of the Australian Experience*. PhD Thesis. Monash University.

Poropat, A.E., 2009. A Meta-Analysis of the Five-Factor Model of Personality and Academic Performance. In *Psychological Bulletin*., 2009.

Pressman, R.S., 2010. *Software engineering: a practitioner's approach*. 7th ed. McGraw-Hill Higher Education.

Rajaraman, V., 2000. Electronic Commerce. pp.13-23.

Revelle, W. & Scherer, K.R., 2009. *Personality and Emotion*. Oxford University Press.

Ronnie L. McGhee1, D.J.E.J.A.B.C.P., 2012. The Relation between Five-Factor Personality Traits and Risk-Taking Behavior in Preadolescents. *The Relation between Five-Factor Personality Traits and Risk-Taking Behavior in Preadolescents*, 3(8), pp.558-661.

Rueter, T., 2012. *E-retail spending to increase 62% by 2016*. [Online] Available at: http://www.internetretailer.com/2012/02/27/e-retail-spending-increase-45-2016 [Accessed 24 July 2012].

Sommerville, I., 2007. *Software Engineering*. 8th ed. Addison-Wesley.

St. Xavier's College, n.d. *Introduction to e-commerce*. Kolkata: St. Xavier's College.

StatCounter, n.d. *Top 5 Browsers in Malaysia from Aug 2011 to Jul 2012*. [Online] Available at: http://gs.statcounter.com/#browser-MY-monthly-201108-201207-bar [Accessed 12 August 2012].

Stevenson, B., 2009. The Internet and Job Search. In D.H. Romer, ed. *Studies of Labor Market Intermediation*. University of Chigago Press. Ch. 2. pp.67-86.

Storm, P. & deVries, S., 2006. Personality Psychology and the Workplace. *MLA forum*, V(2).

Sundar, S.S. & Marathe, S.S., 2010. *Personalization versus Customization: The Importance of Agency, Privacy, and Power Usage*. International Communication Association.

Suvankulov, F., 2010. CA 90407-2138 *Job Search on the Internet, E-Recruitment, and Labor Market Outcomes*. Dissertation. Santa Monica: RAND Corporation Pardee RAND Graduate School.

Swatman, P.M.C., 1996. *Electronic Commerce: Origins and Future Directions*. Victoria: 1st Australian DAMA Conference.

Temmel, M., Theuermann, M., Ukowitz, E. & Vogrin, T., n.d. *The Impact of The Internet On Our Daily Life*. [Online] Available at: http://www.tru.ca/cpj/essay.html [Accessed 19 July 2012].

The Star, 2011. *National broadband penetration rate reaches 81%*. Kuala Lumpur: The Star.

The Star, 2012. *More Malaysians shopping online*. The Star.

Treiblmaier, H., Madlberger, M., Knotzer, N. & Pollach, I., 2004. Evaluating Personalization and Customization from an Ethical Point of View. In *Proceedings of the 37th Hawaii International Conference on System Sciences*. Austria, 2004. Vienna University of Economics and Business Administration Austria.

Universiti Tunku Abdul Rahman, n.d. *Participating Companies*. [Online] Available at: https://indtrng.utar.edu.my/companies.aspx [Accessed 3 July 2012].

Wigand., R.T., 1997. Electronic Commerce: Definition, Theory, and Context. *Inf. Soc.*.

Woo, N.H., Shen, X. & Shirmohammadi, S., n.d. *Personalization through Personality Categorization of Products*. Ottawa.

References

Wulf, B., n.d. *Personality Type & Job Search*. [Online] Available at: http://www.jobdig.com/articles/770/Personality_Type_%26_Job_Search.html [Accessed 21 July 2012].

Younger, J., 2007. *Online Job Recruitment - Trends, Benefits, Outcomes And Implications*. [Online] Available at: http://ezinearticles.com/?Online-Job-Recruitment---Trends,-Benefits,-Outcomes-And-Implications&id=750692 [Accessed 19 July 2012].

Zwass, V., 1996. Electronic commerce: structures and issues. *International Journal of Electronic Commerce*, 1(1), pp.3-23.

Appendix A:

Questionnaire

UNIVERSITI TUNKU ABDUL RAHMAN (UTAR)

Faculty of Information and Communication Technology

Bachelor of Information Systems (HONS) Information Systems Engineering

Final Year Project

Customized UTAR e-Trading & Job Portal Management System

Project Questionnaire:

UTAR e-Trading & Job Portal Survey

Disclaimer

Dear respondents:

We are final year undergraduate students of Bachelor of Information Systems (HONS) Information Systems Engineering from Universiti Tunku Abdul Rahman (UTAR). The purpose of this project is to develop a personalized e-trading & job portal management system for students and academic staff of UTAR Perak Campus.

We are truly appreciating your participation in this survey. Your feedback will assist and support us in obtaining better statistics on UTAR students' requirement on e-trading and job hunt. Your identity will remain anonymous. Results of this survey will only be used for academic purpose and will not be shared with any third party under any circumstances.

Section 1 – Demographic Information

The following questions concern your personal information. Completion of this section is voluntary and confidentially assured.

Please tick in the appropriate check box.

1. Gender:

   ☐ Male   ☐ Female

2. Age:

   ☐ 16 – 20 years old   ☐ 21 – 30 years old

   ☐ 31 – 40 years old   ☐ 41 – 50 years old

   ☐ 51 years and over

3. Which faculty you're from?

   ☐ Centre for Foundation Studies
   ☐ Faculty of Arts and Social Science
   ☐ Faculty of Business and Finance
   ☐ Faculty of Engineering and Green Technology
   ☐ Faculty of Information and Communication Technology
   ☐ Faculty of Science
   ☐ Faculty of Medicine and Health Sciences
   ☐ Institute of Chinese Studies

4. What is your year of study?

   ☐ Foundation   ☐ Year 1

   ☐ Year 2   ☐ Year 3

   ☐ Year 4   ☐ Year 5 and above

5. Daily, on average how many hours you spend surfing the internet?

   ☐ Less than 1 hour   ☐ 1 – 3 hours

   ☐ 4 – 6 hours   ☐ More than 6 hours

Section 2 – E-trading Questionnaire

Please tick in the appropriate check box.

1. Have you ever purchased new or used items from the internet?

☐ Yes   ☐   No   (Why?

_____)

2. On monthly basis, how often do you purchase through the internet?

☐ Never   ☐ Less than 3 times

☐ 3 – 5 times   ☐ 6 – 8 times

☐ More than 8 times

3. On average, how much do you spend for each purchase?

☐ Never   ☐ Less than or RM25

☐ RM26 – RM50   ☐ RM51 – RM75

☐ RM76 – RM100   ☐ More than RM100

4. What category(s) of product you usually purchase through the internet? (you can tick more than one options)

	Music and Videos		Clothing & Accessories
	Entertainment		Food/ Drink
	Books		Computer & Gadgets
	Consumer Electronics		Gifts
	Hobbies/ Collectibles		Furniture
	Health & Beauty		Sport Goods
	Travel & Vacations		Safety & Security
	Others (Please state): _____		
	Not applicable		

5. What is/are your preferred payment method(s)? (you can tick more than one options)

	Credit Card		Cash On Delivery
	Bank Transfer		Money Transfer (such as Western Union)
	Paypal		
	Others (Please state): _____		
	Not applicable		

6. Are you aware of UTAR's (Perak Campus) Facebook page and a forum for UTARians to trade?

☐ Yes   ☐ No [Proceed to Question 9]

7. Do you use the UTAR's (Perak Campus) Facebook page and UTARians forum to buy or sell goods?

☐ Yes   ☐   No   (Why?
_____)

8. As a buyer, what are the problems you encounter on UTAR Facebook trading page or UTARian Forum? (more than one option can be selected)

	Difficult to find the desired product.		Inefficient website layout for product searching.
	Lack of product information.		Lack of categorization of products.
	Others (Please state): _____		
	Not applicable		

9. As a seller, what are the problems you encountered on UTAR Facebook trading page or UTARian Forum? (more than one option can be selected)

	Difficult to find suitable buyer		Inefficient website layout for promoting product
	Limited information could be provided		Lack of product exposure to potential buyer
	Others (Please state): _____		
	Not applicable		

10. If there is a UTAR shopping portal for UTAR students and academic staff, will you support the system? What features you will want in that system?

_____

_____

_____

_____

11. Any other comments or suggestions you wish to add:

Section 3 – Job Portal Questionnaire

Please tick in the appropriate check box.

1. Have you ever tried looking for a job/internship on an employment website?

   ☐ Yes   ☐   No   (Why?

   _____)

2. What are the other sources you use for job/internship hunting? (you can select more than one options)

	Newspapers/Magazines		Faculty Website
	Faculty Notice Board		Lecturers
	Friends		Social Network
	Job Fairs		
	Others (Please state): _____		
	Not applicable		

3. What types of employers or employment sector do you tend to choose? (you can select more than one options)

	Education		Government
	Military		For-Profit
	Non-Profit		
	Others (Please state): _____		

4. As a student, what are the common problems you face during job/internship hunting? (you can select more than one options)

	Difficult to look for the desired job		Range of job offered is too wide
	Job offered does not fit available skills		The job portal interface/layout is not user friendly
	Lack of job information		Time consuming
	Others (Please state): _____		
	Not applicable		

5. If there is a UTAR job portal for UTAR students and academic staff, will you support the system? What features you will want in that system?

_____
_____

_____
_____

6. Any other comments or suggestion you wish to add:

Thank You for Your Cooperation

Section 1 – Demographic Information

The following questions concern your personal information. Completion of this section is voluntary and confidentially assured.

Please tick in the appropriate check box.

1. Gender:

    ☐ Male   ☐ Female

2. Age:

    ☐ 21 – 30 years old   ☐ 31 – 40 years old

    ☐ 41 – 50 years old   ☐ 51 years and over

3. Which faculty you're from?

    ☐ Centre for Foundation Studies
    ☐ Faculty of Arts and Social Science
    ☐ Faculty of Business and Finance
    ☐ Faculty of Engineering and Green Technology
    ☐ Faculty of Information and Communication Technology
    ☐ Faculty of Science
    ☐ Faculty of Medicine and Health Sciences
    ☐ Institute of Chinese Studies

4. Designation:

    ☐ Tutor   ☐ Lecturer

    ☐ Senior Lecturer   ☐ Assistant Professor

    ☐ Associate Professor

5. Experience:

    ☐ 1 – 5 years   ☐ 6 – 10 years

    ☐ 10 years and above

Academic Staff Interview

1. How do you normally disseminate job/internship recruitment information to students?

2. What difficulties you faced to disseminate the news to the students?

3. Do you think faculty notice board or faculty website is an efficient method to disseminate job news for UTAR students? (Faculty Board, Faculty web site). If not why?

4. If there is a UTAR e-trading system that allows students and academic staff to buy and sell goods, how do you think of the system? What features you will want in that system?

5. If there is a UTAR job portal that allows academic staff to post up job information to the students, will you support the system? What features you will want in that system?

Appendix B:
Turn It In

Appendix B:

Turn It In

Customized UTAR E-Trading Management System

ORIGINALITY REPORT

17 %	**14** %	**3** %	**11** %
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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3	Submitted to The International College *Student Paper*	1%
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