Pharmacy Medical Network

by

Sharon Sharmini Leo

Dissertation submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
(Information System)

JANUARY 2006

Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

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Information System Programme
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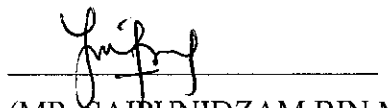
Approved by,

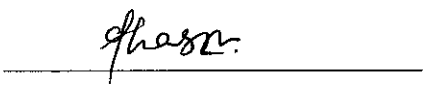


(MR. SAIPUNIDZAM BIN MAHAMAD)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
JAN 2006

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in the project, that the originality work is my own expect as specified in the references and acknowledgements, and that the original work contain herein have not been undertaken or done by unspecified sources or persons.



SHARON SHARMINI LEO

ABSTRACT

The project focuses on the uprising of the health industry as the consumers seek for an advance development. Looking into many aspects, the technology savvy is been used an intranet pharmacy system which is ease of use and has flexibility to clients, Integrated the "in house intranet" Internet, with pharmacies to adapt to the changes of development. The project main objectives are to review on integrated pharmacies and hospitals network and understand characteristics of intranet network, to develop a pharmacy network system and to study and implement a database for storing data of the patients online. This project work scope was based on developing a functional and a better pharmacy approach according to current changes. Being able to use the enhance services provided on this intranet health care network is feasible and specific guidance has been given to the society, new standards for the profusions. The methodology used is the waterfall model where each phase is completed in order to meet the requirement of the system. The concept of the Pharmacy Medical Network also stores and reuses health knowledge on the site serving as a central repository of knowledge in our integrated health system, implementation of a pharmacy network improved our ability to manage knowledge and communicate information within pharmacy to other health care network.

ACKNOWLEDGEMENT

With the mercy of God, I have successfully completed the final report of my Final Year Project to fulfill the requirement for my Bachelor of Technology (Hons) in Information System. I was lucky to have the opportunity to study at University Technology PETRONAS that are highly putting effort to produce well rounded graduates by offering the Final Year Project to final year students. Each development process in the project may enhance the skills of the students in applying knowledge and theories, expanding thought and solving problems independently. I would like to express my appreciation to these people who have lent their helping hands and conduct me during the accomplishment of this project.

First of all, I would like to give my special thanks to my respective supervisor Mr. Saipunidzam Mahamad, who has always guided me and supervised me from the beginning till the end of the project. Thanks to all the valuable knowledge that was conveyed. This acknowledgement is also dedicated to the FYP coordinator, Mr. Nordin for his concern and support and to all UTP lecturers who always gave some advise, support and encouragement.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The project focuses on the uprising of the health industry as the consumers seek for an advance development. Integrated the "in house intranet" Internet, with pharmacies to adapt to the changes of development. The rapid adoption of computerization in pharmacies recently caught this concept, which is smart choice for the clients using the services in pharmacy. Looking at the wide range of fraud these day's especially using credit card concept is much more safer as it carries information a about client and identification and password is required on top of it. The intranet pharmacy system provides a large scale of information. The project aims to offer a convenient and cashless means of purchasing medicines and health product using the intranet pharmacy itself. In the other scope the "digital wallet" carries value of money, which also more secured compared to the credit card usage. The system would be able to facilitate consumers to search through products an easy ordering process without the need of queuing up in pharmacies.

This project is based on developing an intranet pharmacy system using the "digital wallet" technology, which is looking forward for a safer way of purchasing products in the pharmacy on accessing to other services available.

1.2 Problem Statement

Pharmacy is being pushed forward into a period of change, but how can information technology (IT) help and adapt to the changes of development. Specializing in the development of pharmacy system products and services for the health care market are growing fast these days. Looking into the intranet pharmacy system to be a functional portal in current trends with future enhancement with new technologies. As the matter of fact a real time implementation of the intranet pharmacy system should have authentication from the local banks and the available devices for the digital wallet usage. As we know that the usage of this technology savvy us an advantage for clients and it's more secured, as it's an in house Internet. Other limitations of the project would be based on keeping up to new trends of pharmacies should be up to date. Acknowledging the proper usage of user identification and user password. Computerized database may require more developments of human computer interface before they will be used widely.

1.3 Objectives

The project objectives are: -

- To review on integrated pharmacies and hospitals network and understand characteristics of intranet network.
- To develop a pharmacy network system where the digital wallet plays a role.
- Study and implement a database for storing data of the patient online.

1.4 Project Scope

The project scopes of my research are to: -

- To learn and explore the usage of technology in reduces the increasing credit fraud cases theses are prepaid digital wallet, which transfer the electronic equivalent of cash to a vendor's digital cash register transactions are done directly to bank account theses are smart choice of shopping for clients.
- To learn the method of clients to purchase products faster and consult doctors in order to make appointments and gain health issues.
- To implement the usage of digital wallet concept in the intranet pharmacy site and allow clients to use the services on the site in a practical manner or functional approach.

CHAPTER 2

LITERATURE REVIEW

2.1 Computerization of Pharmacy

Looking at the modern technology has come to a rapid computerization concept. At this angle taking pharmacy services to a higher level with the intranet would gain momentum. As the matter of fact most online pharmacy websites are not consistent and practical with the technology. Looking into the technology in pharmacy is widely needed to provide pharmacist with more readily and accessible health care system about their patient's information [1]. Along with this technology looking at most modern pharmacies are providing service on online websites, going through most of the services on internet/intranet pharmacy system is not feasible. Most sites are rather, information based sites than a functional pharmacy website providing a good service to clients. Practically being an online system, we looking into many other factors which will also apply, people have to know about the particular pharmacy system before using it [1]. In the most on-line pharmacy application it is similar with the same options and non-functioning system. In other aspects we are also looking whether it is approachable in daily life. Basically most online pharmacy websites do not provide good functional websites, which can really convince the clients into using them. It's more into an information World Wide Web information site rather than usability for the clients. It rather provides the client basic health information and more details about the particular retail pharmacy itself.

In fact the number fraud cases which client uses the credit card is a wider range then it self. A recent study has concluded that addition of a pharmacist and computerized patient profile system improved prescribing practices of doctors and pharmacist. As the matter of fact, suing it to strategic and innovative manner to support health related decision-making represents a serious challenge to the pharmacies [3]. Health care system consumers need and want as much as information as possible concerning their consultation and treatment options and therefore increasingly demand access to relevant and personal health information. As today consumers believes in getting immediate and looks into the benefits into the services before signing up for any particular health care membership.

The intranet plays the crucial role in bridging the gap between healthcare providers and consumers by providing good quality and making available required information on the services site. In other ways understanding and developing the technology is critical, especially from the perspective of pharmacy care as multi provider system to provide integrated delivery of health services along the entire care. The idea of this system is to build an integrated delivery network a form of one stop shopping for all types of health service in response to its consumers needs as well changes of technology. Perhaps this generation would adapt to this new concept, which brings out opportunities for web "business". This includes formal and informal education for providers and health professionals. The discussion on focusing and improving pharmacy services through electronically enabling routine of pharmacy prescription capabilities, patient appointment and preparing the clients access to centralized information storage based on all health information have been proposed long time ago.

Once a beneficiary requests an appointment in the web service, business rules are used tightly to guarantee a client will receive an appointment and the follow up notification itself. The rapid acceptance of the intranet by consumers throughout the global has come to a positive side of view. The Healthcare industry increasingly views Information Technology as a fundamental asset in providing health-related information web services and decision support on demand as well as improving

quality of Health care and patient care. Specializing in the development of software products for the Health care has partnered with Intranets to offer hospital pharmacies an easy way to implement maintenance free hosted intranet solution [5]. This fully integrated service will allow pharmacies to organize information, share files, coordinate schedules and enable efficient collaboration.

2.2 Digital Wallet Evolution

The technology savvy and their related technologies are an emerging component of electronic commerce worldwide. In some countries, they are revolutionizing aspects of health care. Digital wallet can be identified as a high technology wallet. A plastic card is meld into one universal multifunction card can be used to store personal information, hold digital cash or prove identify has benefit the community [2].Using the digital wallet technology into intranet pharmacy application would create an enhance way of providing service to the clients with trust. The digital wallet is potentially secured than the credit card as use of the digital wallet concept is done user identification and password is required .In this case the it carries the information of a client is able to purchase item, consult a pharmacist or doctor, make appointments, take part in forums, gain knowledge from the health info, purchase item and gain vouchers monthly and doctors payment done all using one digital cash card. This is advisedly much safer and convenience the public community on trying it. But even in their current incarnation, digital wallet supports an impressive variety of intranet pharmacy application and they are small, and powerful. Getting to know the types of this concept as a current and merging with the intranet pharmacy application. Looking at it we label as digital wallet as credit card sized card with more memory than the traditional magnetize strip (the common used in the credit card) .The usage of digital wallet has reflected the national effort to modernize its technology infrastructure. Its investment proved profitable for most organization.

The intranet pharmacies are being developed to increase the clinical and the other general pharmacy activities to provide a more efficient way of service. Looking into many aspects in this modern world many clients rather pay more for a better customer satisfaction with good service indeed The intranet pharmacy system would enhance and facilitate the functions of a busy pharmacy, which applies these days [3]. At this purpose having a glance at making appointments with doctors or consulting the pharmacist through the pharmacy using the pharmacy portal is great deal. In many years the pharmacy practice has benefited the community globally and greatly from the introduction of computers. In most cases pharmacist task are time consuming and often error prove task has been successfully automated reducing both preparation time and error. Now we are looking into something which will benefit the most pharmacies and hospital with a enhance service to the global community. In many cases the job function of a pharmacist allocates a lot of time especially consulting a client through an accurate prescription of drug or medicine.

CHAPTER 3

METHODOLOGY

3.1 The Waterfall Life Cycle Model

The word 'process' is sometimes used to emphasize the idea of a system in action. In order achieve an outcome; the system will have to execute one or more activities. This is not process this idea can be applied to the development of computer based system where a number of interrelated activities have to be undertaken to create a final product. I have chosen the waterfall model for the intranet pharmacy network. This is the 'classical' model of system development. Alternative names for this model are one shot or one through. As we can see the figure 1, there is a sequence of activities working from top to bottom. The diagram shows some arrow pointing upwards and backwards. This indicates that a letter stage may reveal the need for some extra work at an earlier stage, but this could definitely be the exception rather than the rule. After all, the flow of a waterfall should be downwards with the possibility of just a little water splashing back. The limited scope for interaction is in fact one of the strengths of this project you want to avoid reworking tasks previously thought to be completed. Having to reopen completed activities play complication with promised completion dates. The waterfall life cycle was the attempt at the definition of a software development life cycle.

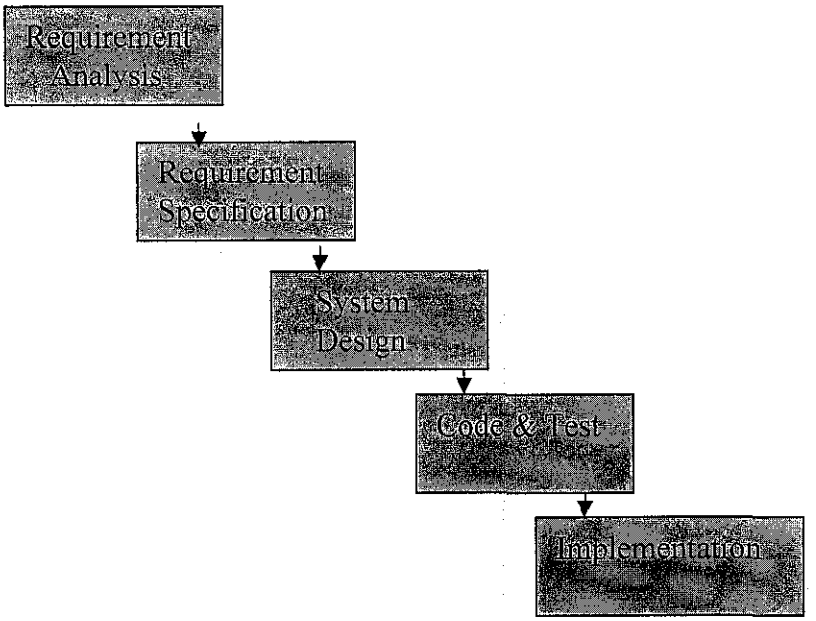

Figure 1: Waterfall Life Cycle Model

Requirements Analysis: At this Stage, the requirements are established. The problem is determined and the solutions are setback and decided. Then the specification of the system such as services and the aims are achieved. Analysis are done and set to achieve target of requirements successfully. Initially, the author had done through reading about pharmacy information system from books, articles and journals. This literature review on the project and research paper was done to help the author understand the process and importance step to be followed in completing the system.

The first step taken by the author was analyzing the current pharmacy system that has existed in overseas. This analysis involves the method of getting to know electronically how this system functions and how it can benefit the user from every angle.

Requirement specification: At this stage the user is required to follow the specification to follow up with the next stage before designing the system. In this phase, frequent visit was done to have meeting with the supervisor in order to get the right specification for the system. This Pharmacy Medical Network requires a lot of attention as it is a wide scope and requires special specification to complete this system. The most important specification is the cashless shopping where the other benefit of the software includes cashless shopping. Clients do not have to carry a large amount of cash to spend in the pharmacy providing the intranet services. The clients can now just purchase all the product the want using their digital wallet and the amount spend is deducted from their bank account. In other means it is like a secured debit card, which allows clients to enjoy the functionality of the pharmacy medical network. Questionnaire was done by the author and was distributed to 14 lecturers and 24 students to know the right system functionality and user's point of view on the system.

System Design: At this Stage, planning work is done to meet the specification. The program structure modules design and do things more in detail. The main activity of this phase is to design a programmed system. This means there is a lot of structured of coding. This is a very essential stage as what is analyzed is put into action. The designing part is tedious as ASP web application has to be learned and applied. In this design phase follows storyboarding; the concept and the story ideas can be turned into reality. Data flow diagram and UML was also prepared to know the flow of the system and to understand the functionality. It depends on the availability of the existing resources or need to create new materials, might include: -

- Obtaining right to existing materials whenever necessary.
- Digitizing of source images for the web portal.
- Identification of new resources to be created or selected from the existing resources of text and images.
- Production of original materials and other materials.

The designing phase is divided into few areas:-

- Text

All of the text content used in the intranet pharmacy system is taken from a few scrape ideas and going through reference materials. The text is formatted into many different sizes, fonts, effects, and color. There is no original text created for this prototype.

- Images

As image plays an important tool to capture the user, creative and graphic images were downloaded from Internet in order to use it in this project.

- Other graphics

Other graphics include animated background wallpaper; window frame, icons and buttons are downloaded from the Internet.

Implementation: At this stage the implementation starts off with the implementation of the system. The implementation of the system has gradually has consume time as this stage requires a good time management. After completing the design, the system is implemented by module. One module was implemented after another according to their functionality. This is to ensure that the author can provide the evaluation testing based on the module. The changes to the system design were also done in this stage.

3.2 Tools

3.2.1 Software Requirement

The run on the Pharmacy Medical Network, the computer system must meet the following minimum requirements: -

- Windows XP -client specification / any windows based 1998 onwards (Operating System).
- Windows 2000 server- for the server configuration with integrated Internet Information Services.
- Microsoft Access-database specification
- Internet Explorer- Internet Explorer 5 and above. (Clients requirement)
- Screen resolution-color digital monitor capable of displaying screen resolution of 800 * 600 pixels.
- Graphics display setting required to view the pharmacy medical network site for clients. The most accurate view of viewing the intranet pharmacy site for clients 800*600

3.2.2 Hardware requirements

- Pentium 3 onwards above 1GHz processor- (for clients)
- At least 256 MB of Random Access Memory (RAM).
- Hard Disk space of 40GB
- 100% Windows compatible mouse.
- 100% Windows compatible keyboard

CHAPTER 4

RESULTS AND DISCUSSION

4.1 System Design and Architecture

4.1.1 Unified Modeling Language (UML)

The use case explains the system functionality of Pharmacy Medical Network. There are three actors involved which is the customer, the guest and the administrator who also plays the role of the pharmacist. The customer are the actor with the user ID and password who has registered with the bank account and does transaction when it needed to purchase products and make appointments with the doctor. The administrator on the other hand gets to see on the E- Cart on the purchase and set appointments for the doctors. They are the main role in the system and the guests are the one who newly visits this system and does the registration and views product.

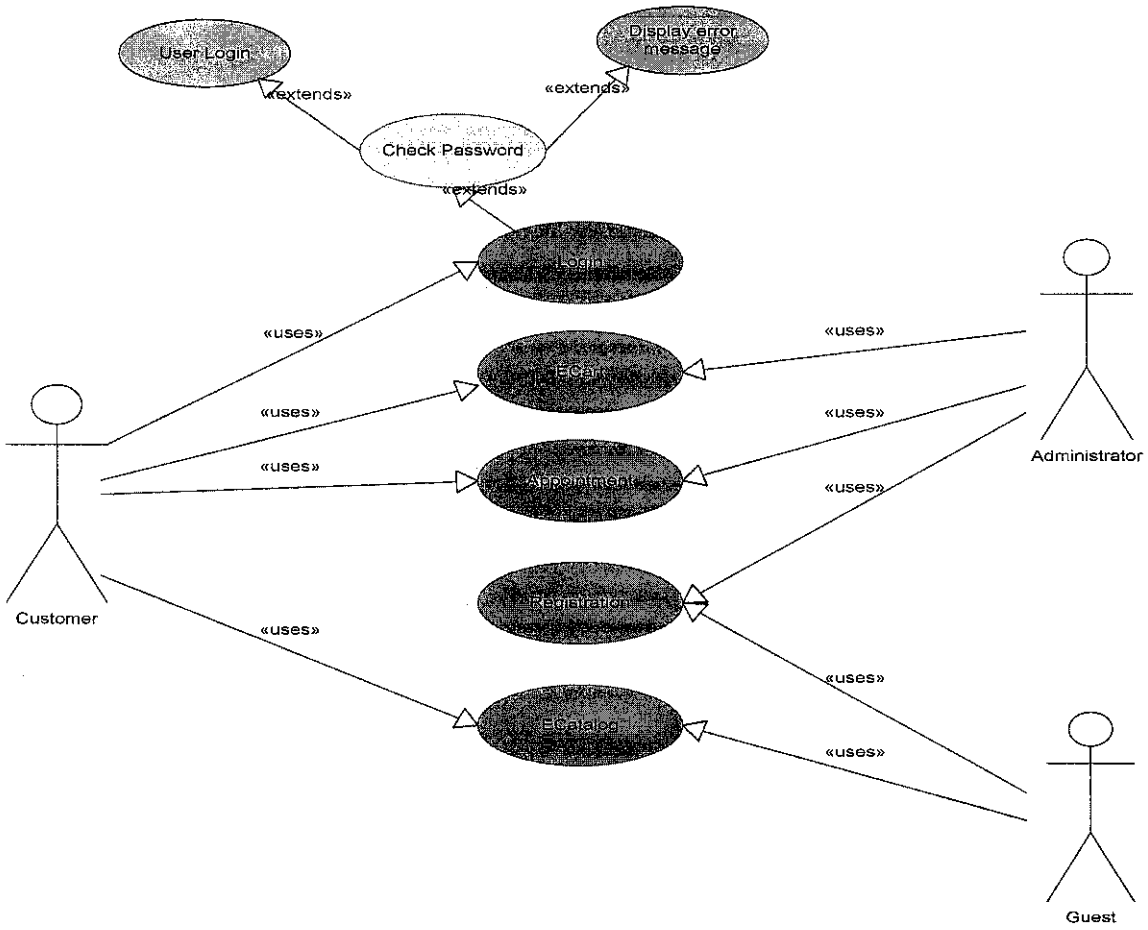

Figure 2: Use Case for Pharmacy Medical Network

4.1.2 Entity Relationship Diagram

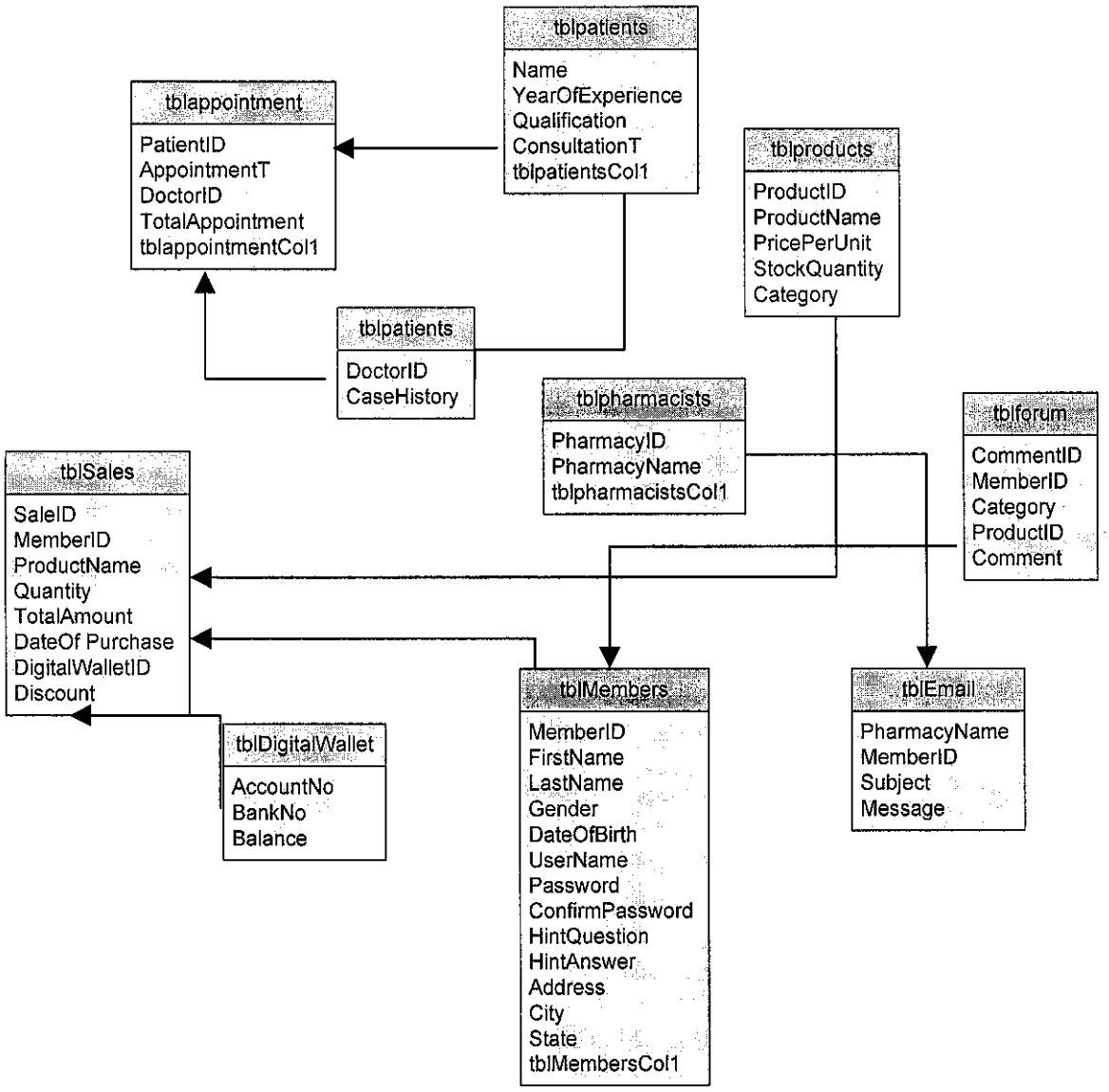

Figure 3: Entity Relationship Diagram (ERD) for Pharmacy Medical Network

4.2 System Functionality

4.2.1 System Architecture

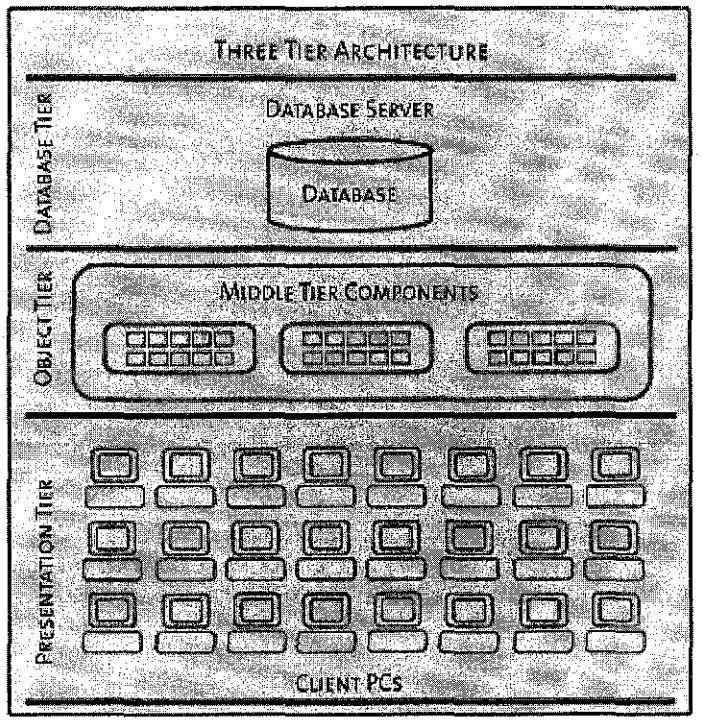

Figure 4 : Three tier Architecture

On this Pharmacy Medical Network, the best system architecture used is basically using the three tier architecture which has the following characteristics whereby:-

- ***Scalable*** - The system can easily be scaled to meet present and future needs. Simply add more middle tier servers as the number of clients increases.
- ***Highly Available and Redundant*** – At the middle tier level, there are more machines than are necessary to perform the daily operation of the hospital. If one machine fails, the others can take over the workload of the failed unit.

- ***Flexible*** – Business logic components on the middle tier can be upgraded easily and efficiently in one central location.
- ***High performance*** - The software development process includes an unusually high level of performance tuning. This helps to achieve staggering transactional volumes on relatively modest hardware. The software development environment used includes several powerful analysis tools. These tools can be used to monitor transactions at test site or even in production if necessary.

4.2.2 System Testing

Testing is intended to exercise the Pharmacy Medical Network so those latent defects are exposed before the system is delivered. This contrast with the validation testing which is intended to demonstrate that a system meets its specification system testing is actually a serious of different tests whose primary purpose is to fully exercise the computer-based system. Although test has a different purpose, all work verifies that all system elements have been properly integrated and perform allocated functions. Once information passed among components in accordance with the design. The system is tested as a whole, to ensure that it has the desired functionality. The test involved in the system testing, the function test performance test and user acceptance test. When the system all the tests, it is ready for installation and it will take place for installation test.

4.2.3 Performance Testing

Performance testing is the process of exercising a system by emulating actual users.

- Response times, time taken by the system to process users input and responded.
- Maximum users, numbers of users that can be handle in the same time without causing the system instability
- Optimum configuration
- Hardware & software performance

Performance is the primary way users judge, quality functionality is secondary to performance. Functionality will not meet; ultimately, the user defines performance goals. If the system performance fails then the system fails.

4.2.4 Unit Testing

Unit testing focuses verification effort on the smallest unit of software design – the module. Using the description as a guide, important control paths are tested to uncover errors within the boundary of the module. The relative complexity of tests and the errors detested as a result is limited by the constrained scope established for unit testing. The unit test based on the test logs is always white box-oriented, and the step can be conducted in parallel for multiple modules: -

Main menu

Button Name	**Test Action**	**Action**	**Status**
About Us	Mouse Enter &mouse down	Button Highlight	Working
E-catalog	Mouse Enter &mouse down	Button Highlight	Working
Sign Up	Mouse Enter &mouse down	Button Highlight	Working
Health Talk	Mouse Enter &mouse down	Button Highlight	Working
Discussion	Mouse Enter &mouse down	Button Highlight	Working
Smart Card	Mouse Enter &mouse down	Button Highlight	Working
Site Map	Mouse Enter &mouse down	Button Highlight	Working
Feedback Forum	Mouse Enter &mouse down Mouse Enter &mouse down	Button Highlight Button Highlight	Working Working

Members of smart card access			
Button Name	**Test Action**	**Action**	**Status**
e-mail	Mouse Enter &mouse down	Button Highlight	Working
e-cart	Mouse Enter &mouse down	Button Highlight	Working
e-catalog	Mouse Enter &mouse down	Button Highlight	Working
forum	Mouse Enter &mouse down	Button Highlight	Working
appointments	Mouse Enter &mouse down	Button Highlight	Working
search	Mouse Enter &mouse down	Button Highlight	Not working
sitemap	Mouse Enter &mouse down	Button Highlight	Working

Button Name	Test Action	Action	Status
e-mail- (send the e-mail button)	Mouse Enter &mouse down	-	Working
purchase button	Mouse Enter &mouse down	-	Working
appointments(enter the value for search)	Mouse Enter &mouse down	-	Working
search button	Mouse Enter &mouse down	-	Working

4.3 Results and Discussion

4.3.1 Benefits of Pharmacy Medical Network

i) Digital wallet concept

Information technology should specially support pharmacist across a wide range of public health functions while balancing the demands of everyday medical pharmacy practice. Looking into the highlight of pharmacy medical network, technology savvy would be a potential digital wallet. This multifunctional digital wallet can benefit all the clients as this reduces the number of fraud cases widely. A concept of this digital wallet comes into being, since personal information of client and varied the information can gain access to the project. In the other word technology savvy become smaller, cheaper and more powerful awakes shop with trust.

ii) Security

In this modern world is hard to convenience clients with the new technologies, this is due to the high rate fraud cases especially involving credit card system. In many cases credit details are easily exposed compared to the technology savvy. This applies for young schooling generation to shop wiser and creates trust for parents. This is due to the digital cash and has to be topped you before purchasing item in the pharmacy medical network.

iii) Cashless shopping

The other benefit of the software includes cashless shopping. Clients do not have to carry a large amount of cash to spend in the pharmacy providing the intranet services. The clients can now just purchase all the product the want using their digital wallet and the amount spend is deducted from their bank account. In other means it's like a secured debit card, which allows clients to enjoy the functionality of the intranet pharmacy, network.

iv) Appointment

Scheduling patient's daily appointment could cause a hectic for the day. As for today's innovation of this intranet pharmacy network allows clients to make hospital appointment in the pharmacy where they are linked to the intranet services. In order to access to the appointment services, client must be a signup for the digital wallet and they are entitled to make appointments with their doctors. As the matter of the fact, it a two in one approach, shopping and making appointment is a real time saving. In other ways clients are able to know the availability of the doctors. If the clients are busy or not being able to go to near by hospital or clinic they can consult with doctors by chatting with them in the service provided by the pharmacy. The time saving concept plays an important role model for many clients, which would make more people coming back to the pharmacy

v) E-cart

Searching for product in pharmacy could be time consuming. By accessing trough the large catalogue provided by the pharmacy network, clients are able to search and check most products in the pharmacy. Looking for a certain discount or product normally seeks help form the pharmacist, in this case clients is able look independently with the help of the pharmacy medical network. In other electronic cart

services allows to the customers to straight pick on the item to purchase by using their digital wallet. Customers are able to read comments on product before actually purchasing the item. Once the customer has chosen his/her product the amount of the purchase is deducted in your small card. Looking at most pharmacies today the shortage of pharmacist are seeking pharmacy to adopt to IT technology

vi) Forum & Discussion board

The other advantages of the software would include the forum and discussion board services available in pharmacy medical network. Forum relays on feedback of the clients on product. Giving comment on a particular product could keep up good standards in pharmacy. As the matter of fact client's feedback is really important on providing good services. Discussion Board is based on having a discussion on a particular topic regarding health topic. Gaining info mating of healthcare would grow by providing this services as well benefit to the clients

vii) Health Information

Health information is service providing knowledge or access to a wide scope of information regarding health. The young and old generation has a lack knowledge today's diseases which are widely happening around the world. As a matter of fact knowing information is benefiting full and educates of healthcare environment.
To provide pharmacist with readily, accessible healthcare information about patients, dieses and general healthcare. Pharmacist are looking forward of using this new technology the digital wallet concept in the intranet pharmacy network and deliver better patient and client care. It also reduces the need to hire additional staff to promote products in pharmacist and increase the medical pharmacies capability and resources to raise levels of better patient care.

4.3.2 Screen Layout

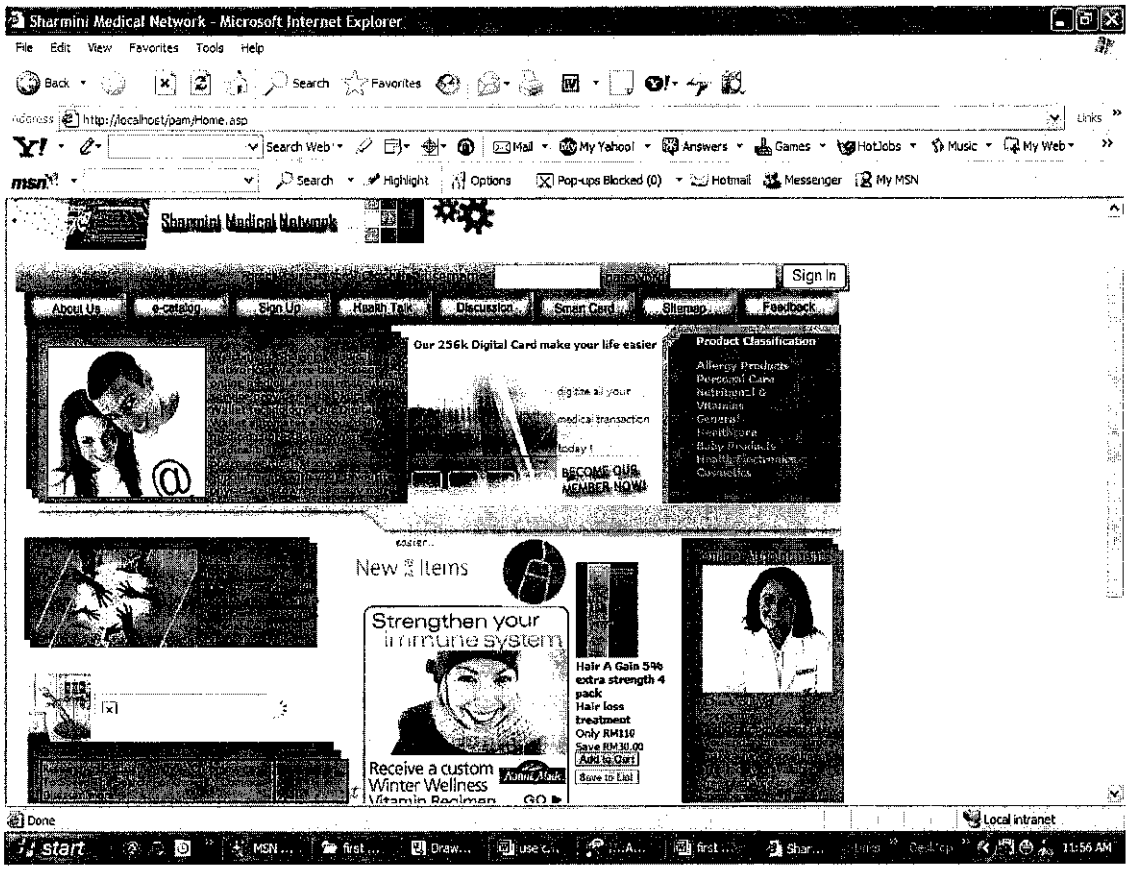

Figure 5: Home Page

This screen layout explains about the main home of the Pharmacy Medical Network. It allows the user to get registered to the new digital wallet concept technology approach and start using it as a smart and wise user in any pharmacy, clinics and hospital. This main frame is ease of use and user friendly to young and old generation

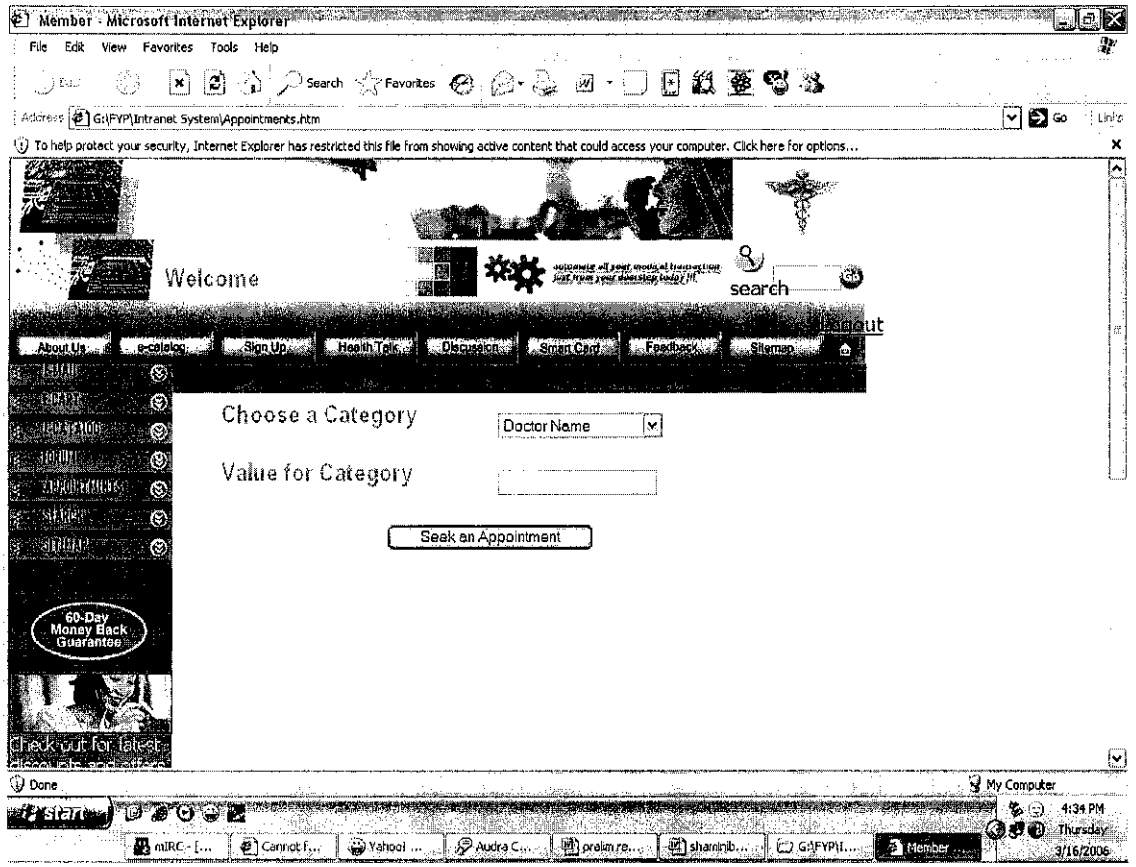

Figure 6 : Appointment page

This screen shot explains about the appointment screen layout and helps clients to make an appointment with the hospital integrated to this network. The appointment allows the software user to make an appointment in the pharmacy by using this service in the site. The customers can actually make an appointment by doctor name, timing and clinic name which make the whole appointment search and conformation easier

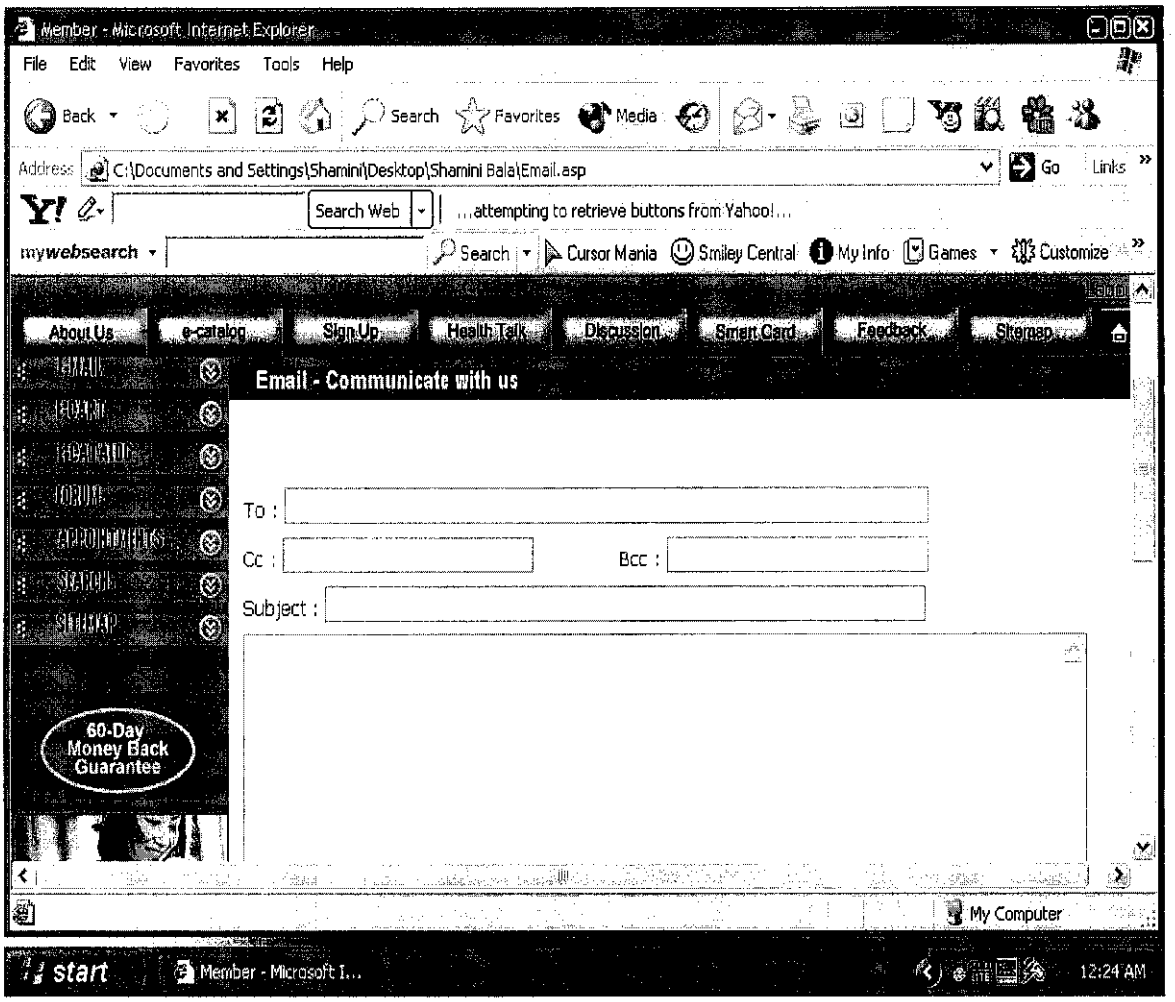

Figure 7 : Electronic Mail (e-mail)

This screen shot explains about another services provided in the site which is the electronic mail service for the Pharmacy Medical Network users. This e-mail allows the users to communicate in a faster approach of integrating and communicating with the pharmacy management and hospital.

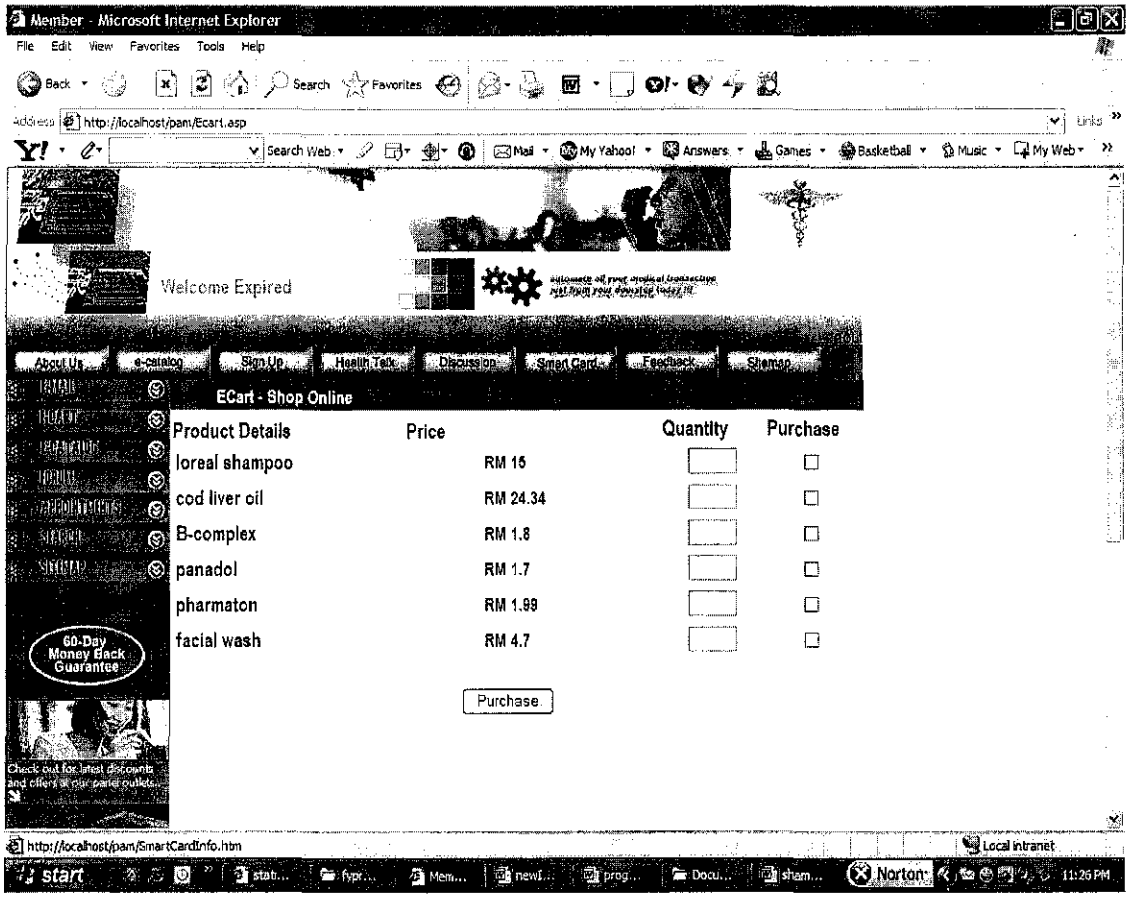

Figure 8: E - Cart

This screen layout explains about the e-cart, which allows the registered user entitled to use this service, which is an easier way of shopping rather than queuing up in long queues and purchasing a number of items by carrying a large amount of cash. At this point registered users would have just use their username and password to purchase the item to the group of pharmacies and hospital integrated to it. As the matter of fact clients can choose their products they would like to purchase in the e-cart and choose the quantity of each product to be purchased.

4.4 System Evaluation

4.4.1 Method of Data Gathering User Data

Further towards the development of the product a research will be done to make a comparison between the manual pharmacy systems with the online pharmacy system. For this a questionnaire will be done and given to the users to evaluate the existing system. The purpose of the questionnaire is to elicit information on the efficiency and effectiveness of the Pharmacy Medical Network. This questionnaire is an excellent way of obtaining either quantitative or qualitative data, since user data are written and can be tallied to illustrate preference. The user's opinion on the interface can only be evaluated from the questionnaire and not their behavior while using it. Please refer to Appendix for the questionnaire sample.

For this reason the Delphi survey is the best approach. Delphi was used to describe a reliable consensus of opinion obtained from a group of experts by a series of intensive questionnaires interspersed with controlled opinion feedback. This approach is characterized as a method for the systematic solicitation and collation of judgments on a particular interspersed with summarized information on feedback of opinions derived from earlier responses.

Delphi is particularly useful when accurate information is unavailable or expensive to obtain or where evaluation models require subjective inputs to the point where they become the dominating parameters. This survey has three special features:

1. Anonymity of participants
2. Iteration and controlled feedback between rounds
3. Statistical summary of group resources

Administering the survey by distributing the questionnaire is that they can be administered without an evaluator present whereby forms can be distributed to the individuals. Besides that, the benefits are forms can be given to people in widely distributed places and large populations. But one of the drawbacks is that the question cannot be rephrased like in the verbal interview.

From the initial research question, a research has to be logically designed in order to make a sensible and accurate conclusion. After deciding on the Delphi technique, the following decisions were made:

- The appropriate number of participants will be from 50 people in total, where there are 30 students from UTP and 20 lecturers.
- Since there is a time constraint, this technique can only be done one round
- Structured questions would be used for the questionnaire so that evaluators can analyze and understand the data well

The main steps involved in conducting the Delphi survey included:

- Identifying and contacting respondents to gain their agreement
- Designing and sending the questionnaire to the intended user
- Analyzing the results of the first round
- Producing feedback
- Preparing the final presentation of results

Before that making sure that the people who are in this survey are individuals who have a deep interest in the subject matter and the knowledge can be valuable for the study is very important. Therefore later in the study, a number of qualified individuals have to be selected to answer the questionnaire and their opinions on the subject matter.

4.4.2 Reaction towards Online Pharmacy Medical Network

The response from various people was very interesting because many had different opinions on the subject matter. Many wanted to know what this whole thing is all about. Explaining to the users took some time because they did not understand the functionality of the web application. Until demonstrated the usage of Pharmacy Medical Network, they used the system and gave a feedback on it. In this application, most of them realized the benefits and negative aspects of the web application but many argued in the form of security of the bank transaction involved. But despite that, many realized the benefits of this system whereby it can ease them in many ways, despite lining up and having a lot of trouble in fixing appointment nor purchasing products online.

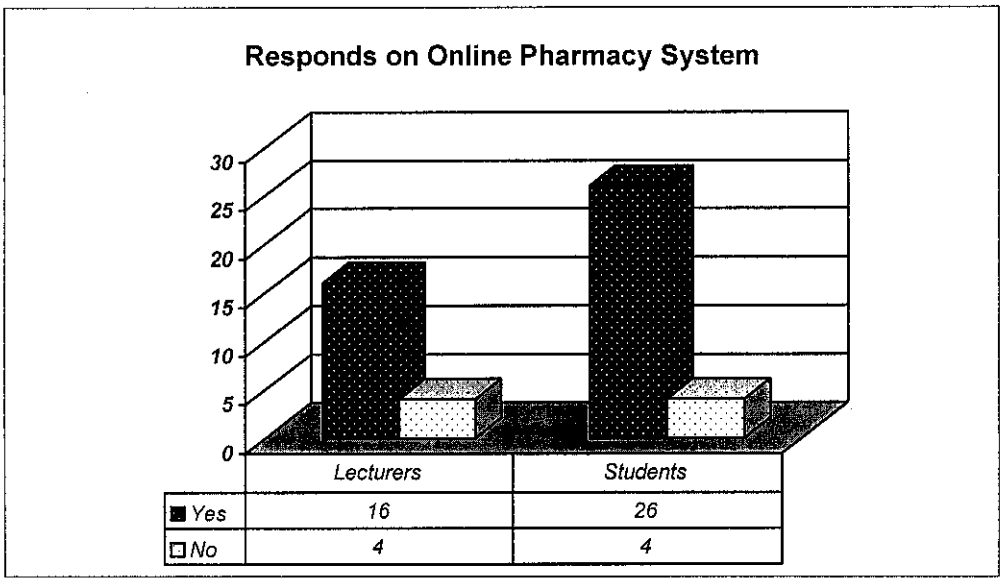

Figure 9 : Respondent on the usage of Pharmacy Medical Network

In this bar chart, we can see that many agreed to the usage of the application but what probably caused the disagreement between 8 others which consist of lecturers and students would be the bank transaction itself which they are still not convinced that doing transaction online is rather insecure and 20% of the candidates which disagree

thinks that this technology will be not applicable in Malaysia as they are not many users that fancy buying products online which makes them have the thought that it is rather tedious and not practical.

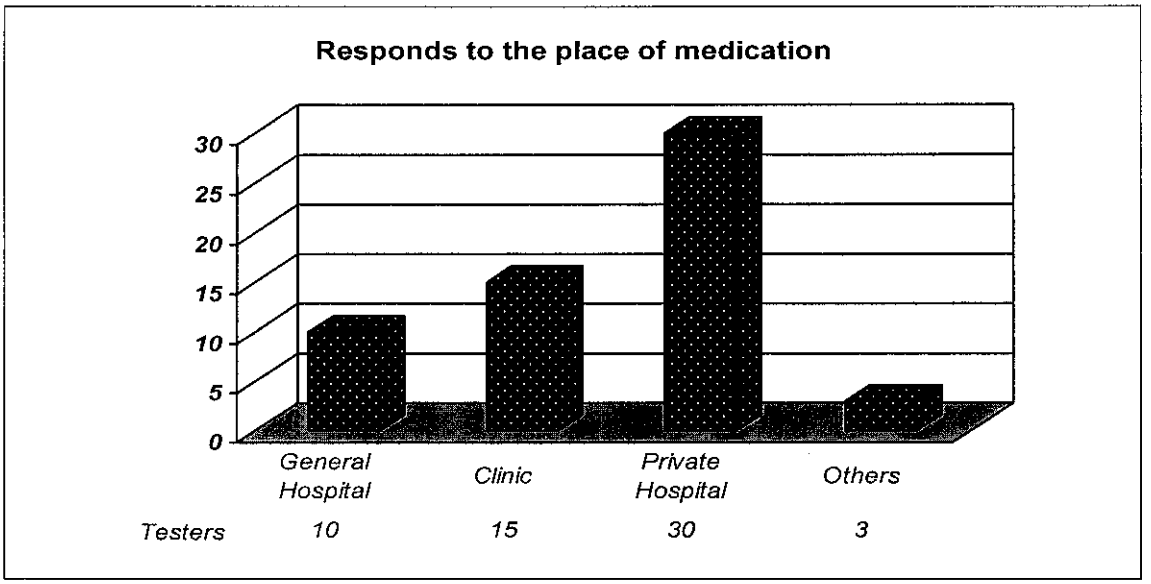

Figure 10 : Respondent on the place of medication

In this bar graph from Figure 12 shows us about the places of medication that the patients uses in order to get their treatment done. This survey is done because to know which place would it is rather practical to have this system. Many general hospitals would reduce on cost n technology and have rather really essential system to aid them in dealing with patients. In this case, the number of candidates that goes to private hospital is much higher than the rest, and it would be rather practical to have this system involved in this private sectors.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATION

5. 1 Conclusion

In our large integrated system, implementation of a pharmacy intranet improved our ability to manage knowledge and communicate information within the department and other society integrated with the pharmacy network. The rapid acceptance of the Pharmacy Medical Network by consumers has placed the burden implementing intranet health care network initiatives on wide scope of approach and according to current technology changers. Obtaining information on the processes, methods and lessons learned have enhanced the services provided by the pharmacy network. Central to these activities has been the goal to fulfill our customer needs for access to the pharmacy network. The intranet style of presentation is now familiar to so many people that staff feels comfortable and become quickly confident and competent in using the system that are available on the trust intranet. Digital Wallet concept have to potential to contribute greatly to the "integration of commercial transaction ", data ware housing and data mining. These cards support an impressive variety of application presently, and this variety should expand as the cards become smaller, cheaper more powerful, must be fully addressed before this concept can truly taken off. The concept of the Pharmacy Medical Network also stores and reuses health knowledge on the site serving as a central repository of knowledge in our integrated health system, implementation of a pharmacy network improved our ability to manage knowledge and communicate information within pharmacy to other health care network.

5.2 Recommendation

Areas identified for the future enhancement include investigational drug and data sheet, an interactive formulary, more intranets, based clinical references, electronics forms for capturing information and providing new and benefit web services to clients. As more pharmacies are functional these days and generate more health information. We are looking forward to make the site an educational health site for the young and old generation .I believe that intranet will become the pharmacy means of exchanging information between pharmacist and physicians in the hospital and others health care provides.

I am experimenting with delivering audio and video lecture on health issues to the digital wallet uses via the intranet pharmacy system. I am exploring the potential for holding consultation between patient and physicians in real time as meaning of physical distance that we encounter. This is formatted for patients whom come from out from town able the time saving concept. A search engine develop that allows the viewer to search the intranet with key words, phrases and Boolean Logic Search results are displayed as the tittles of the articles found, along the brief health education.

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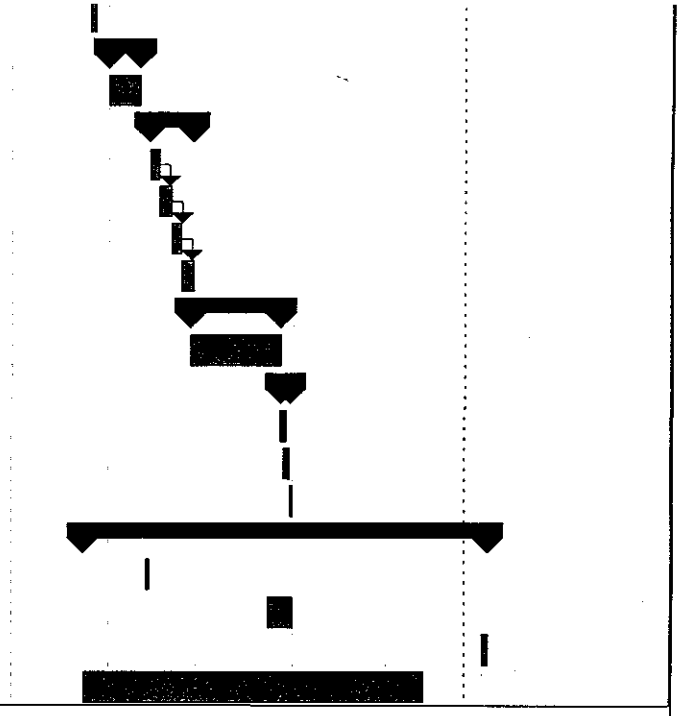
LIST OF APPENDICES

3		Topic Assigned to students	2 days?	Thu 1/26/06	Fri 1/27/06
4		**Analysis Phase**	**8 days?**	**Wed 2/1/06**	**Fri 2/10/06**
5		Research and planning	8 days?	Wed 2/1/06	Fri 2/10/06
6		**Design phase**	**10 days?**	**Tue 2/14/06**	**Mon 2/27/06**
7		Conceptual Design	3 days?	Tue 2/14/06	Thu 2/16/06
8		Physical Design	2 days?	Fri 2/17/06	Mon 2/20/06
9		Input and output design	3 days?	Tue 2/21/06	Thu 2/23/06
10		User Interface Design	2 days?	Fri 2/24/06	Mon 2/27/06
11		**Construction phase**	**21 days?**	**Mon 2/27/06**	**Mon 3/27/06**
12		System construction	21 days?	Mon 2/27/06	Mon 3/27/06
13		**Integration and Publishing Phase**	**3 days?**	**Tue 3/28/06**	**Thu 3/30/06**
14		Integration and Testing	2 days?	Tue 3/28/06	Wed 3/29/06
15		Publishing Testing	2 days?	Wed 3/29/06	Thu 3/30/06
16		**- Oral Presentation**	1 day?	Fri 3/31/06	Fri 3/31/06
17		**Documentation**	**94 days?**	**Tue 1/24/06**	**Fri 6/2/06**
18		Submit Preliminary Report	1 day?	Mon 2/13/06	Mon 2/13/06
19		Submit Progress Report	6 days?	Fri 3/24/06	Fri 3/31/06
20		Submit Dissertation	2 days?	Thu 6/1/06	Fri 6/2/06
21		Logbook	79 days?	Tue 1/24/06	Fri 5/12/06



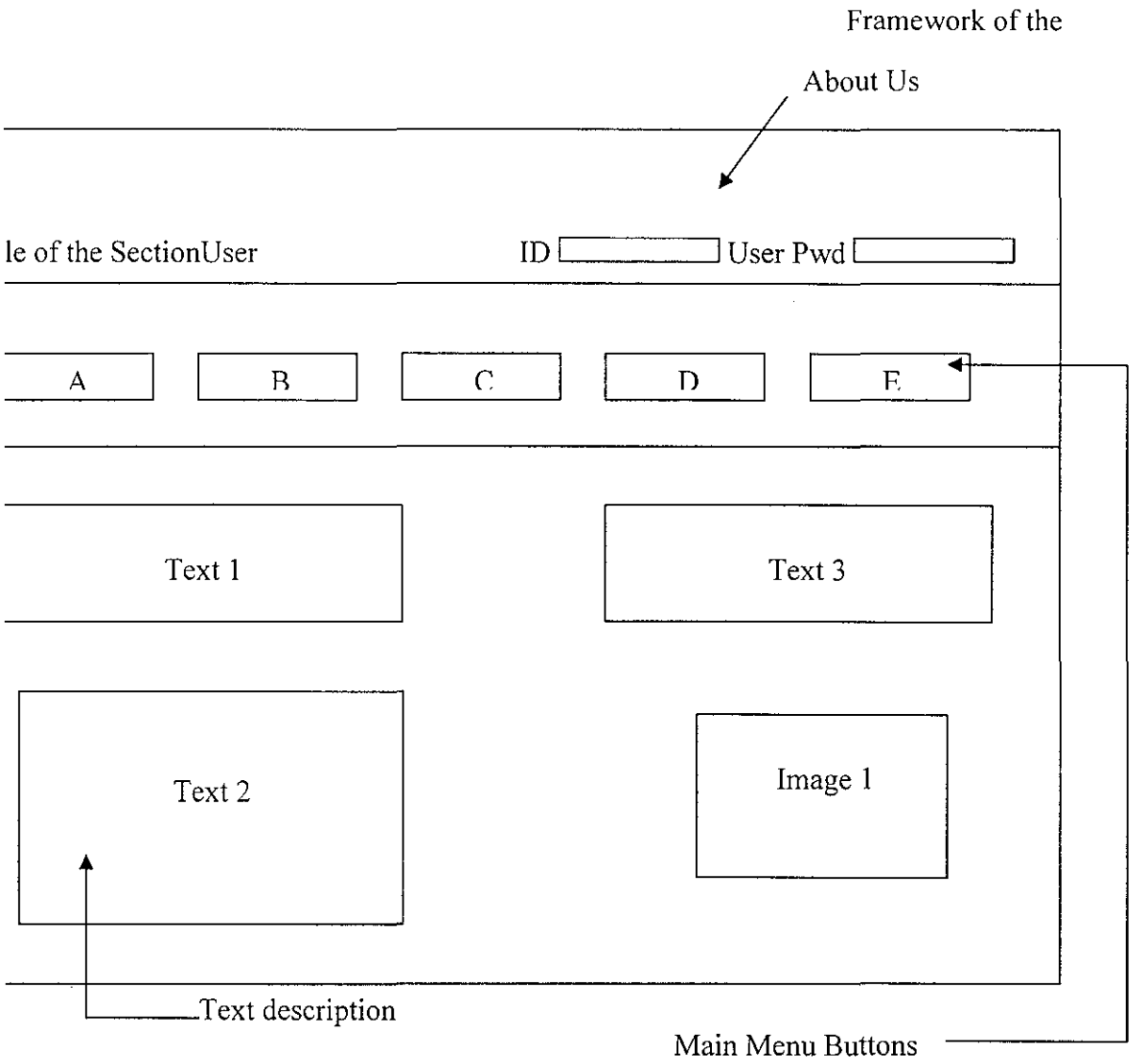
Project: Pharmacy Medical Network
Date: Fri 5/26/06

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

4.3 Storyboarding

Storyboarding is the process of rewriting the formation onto pieces of paper or into a computer template to represent separate screen layout or parts. It is the process defining the message and describing the user interaction with content and the system. Storyboarding involves complex effort to develop panels for screen layout and describe the content, flow and format. Storyboarding is sued to link content and information to the message so that it can be translated this system into a proper prototype. However, there are no specified rules on how to lie out storyboard page. Depending on the prototype may be as simple as it is seen but it helps in managing a make a good prototype.

4.3.1 Framework of About us



Comments

The about us framework consist of site information and description. The title of this section is about us as it is highlighted in the top of the framework it self.

Main Menu Button

In this main page the main menu button gives out the available functions of each button. The main menu buttons are linked up with different functions available on the site.

User Login for members

The user login is situated above the main menu buttons especially for registered user to gain access. The users have to key in the user password in order to access to the site, which is situated beside the user login.

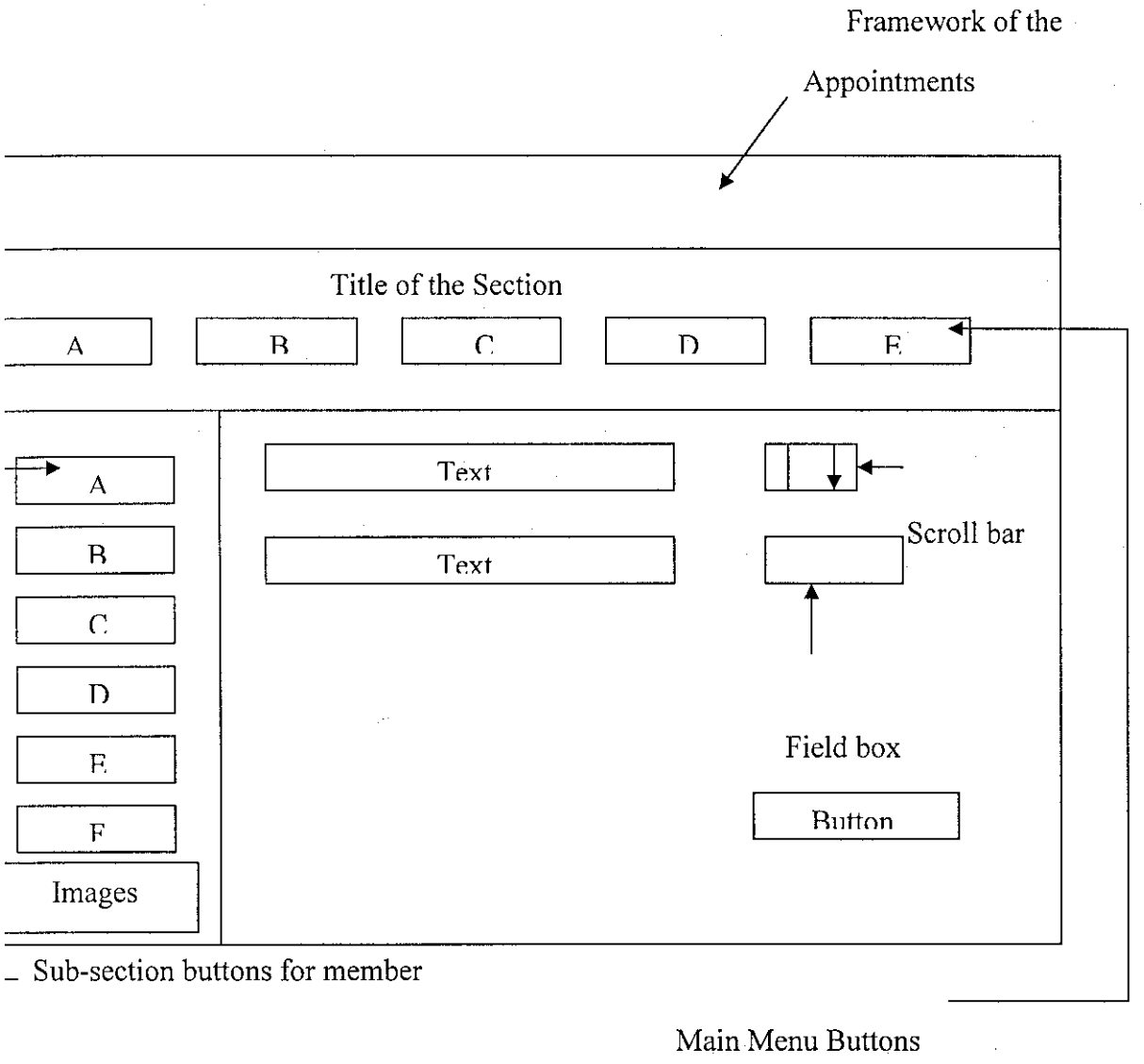
Images

The site has an image, which is suitable for the framework.

Text

Text descriptions are available three different parts of this framework. Highlights important text information about the site.

4.3.2 Framework of Appointments



Comments

The story board for this page is consist of appointments frame work which lays on the top level of the page which indicates the title of this section and the site buttons for services attached to the functions.

Main Menu Button

In this main page the main menu button gives out the available functions of each button. The main menu buttons are linked up with different functions available on the site.

Sub-buttons for member

Clicking on any of these buttons would display text content of the sub-section on the content window right. The storyboards consist of the main site, which is home. The title of this section is home and this is the main page of the functioning site.

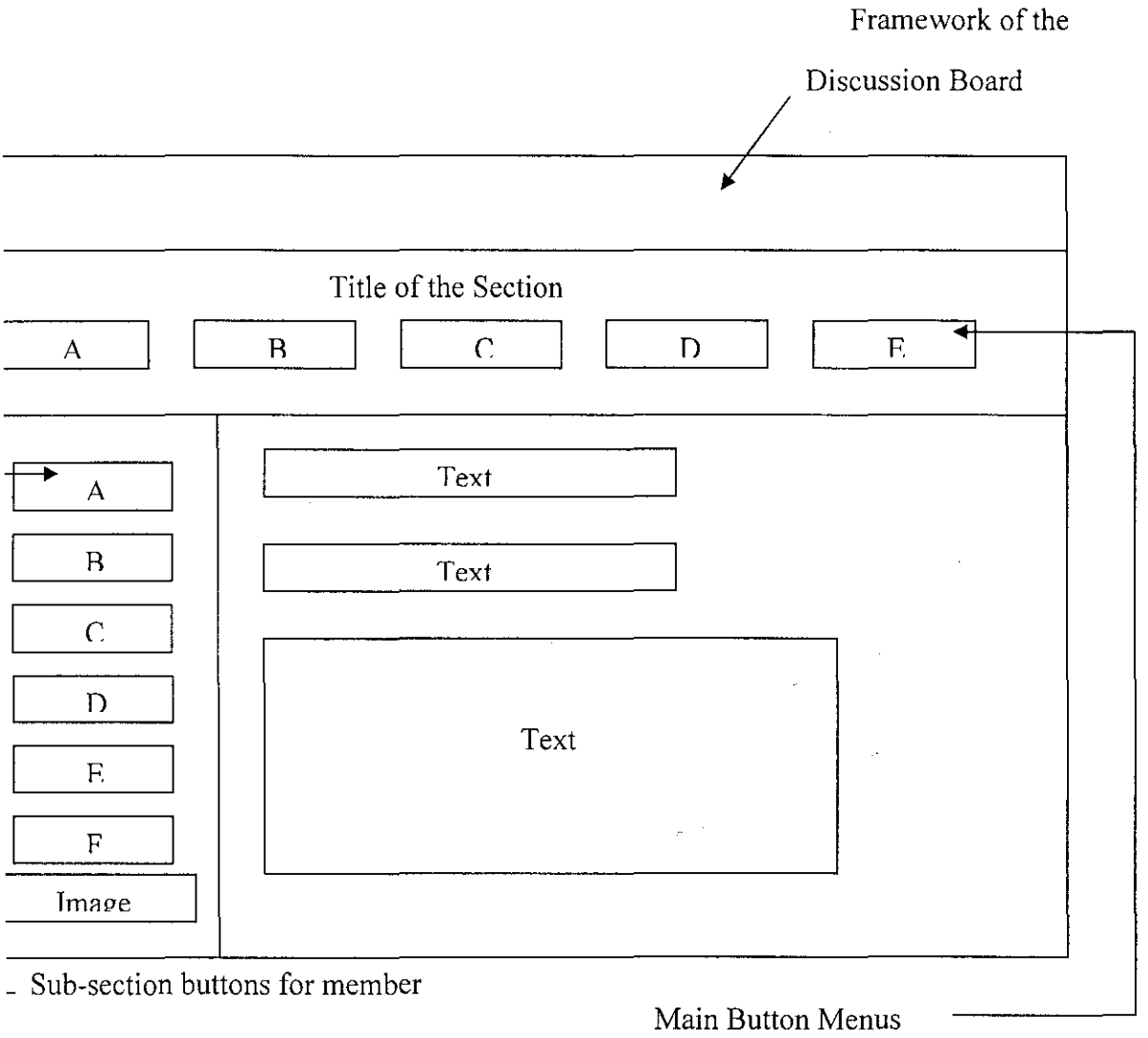
Images/Links

The site has a rapid usage of images and links to the site, which has been developed

Text

Text description about the particular framework explains in depth about job task at the main appointments based on clients request upon an appointment and conformation.

4.3.3 Framework of Discussion Board



Comments

The story board for this page is consist of discussion board frame work which lays on the top level of the page which indicates the title of this section and the site buttons for services attached to the functions.

Main Menu Button

In this main page the main menu button gives out the available functions of each button. The main menu buttons are linked up with different functions available on the site.

Sub-buttons for member

Clicking on any of these buttons would display text content of the sub-section on the content window right. The storyboards consist of the main site, which is home. The title of this section is home and this is the main page of the functioning site.

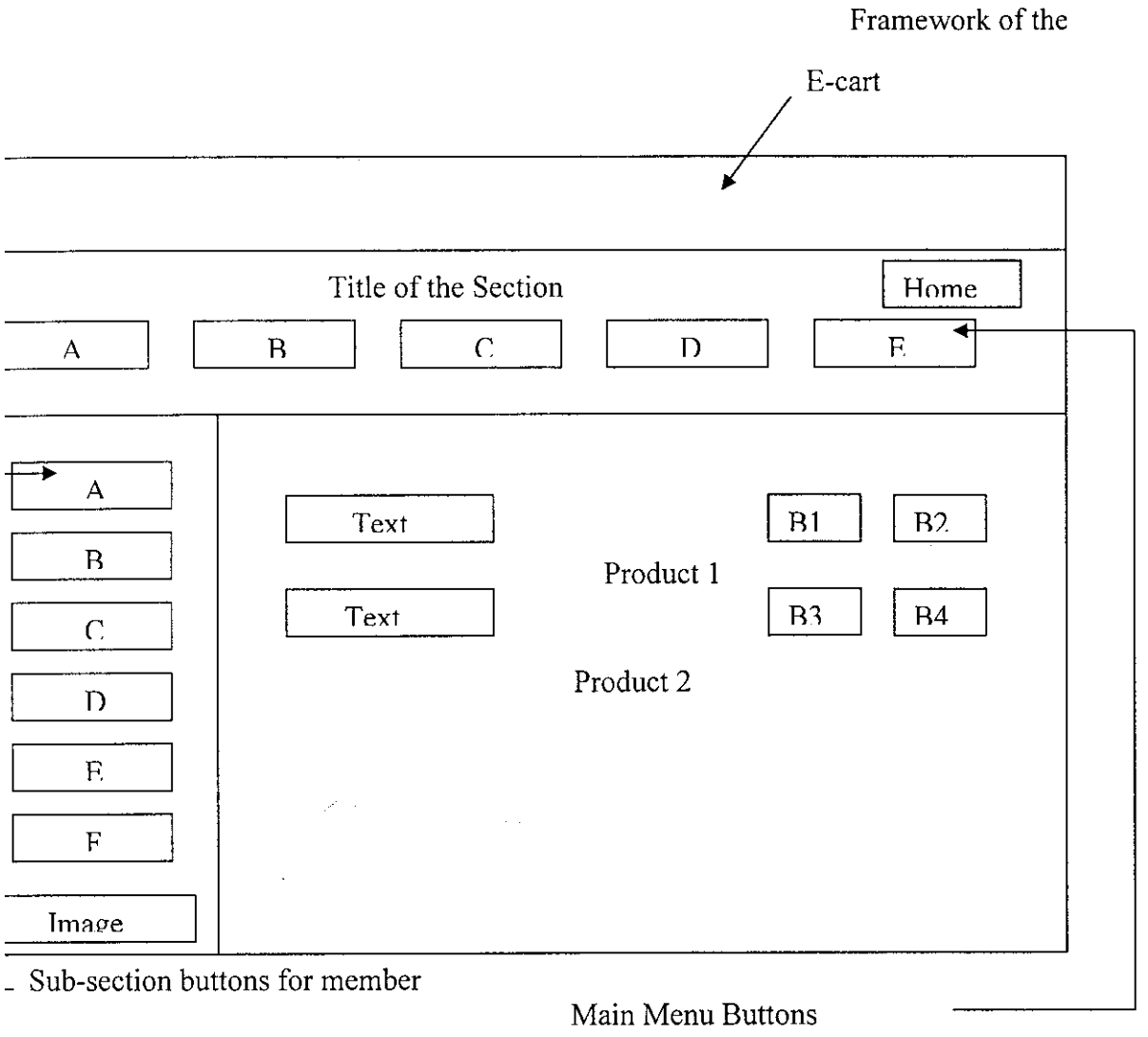
Image/Links

The site has a rapid usage of image and links to the site, which has been developed.

Text

The text explains about information given in by a particular client to make use of the discussion board.

4.3.4 Framework of E-cart



Comments

The storyboard or this page consists of an e-cart framework. At the top level of the page it indicates the title of this section.

Main Menu Button

In this main page the main menu button gives out the available functions of each button. The main menu buttons are linked up with different functions available on the site.

Sub-buttons for member

Clicking on any of these buttons would display text content of the sub-section on the content window right. The storyboards consist of the main site, which is home. The title of this section is home and this is the main page of the functioning site.

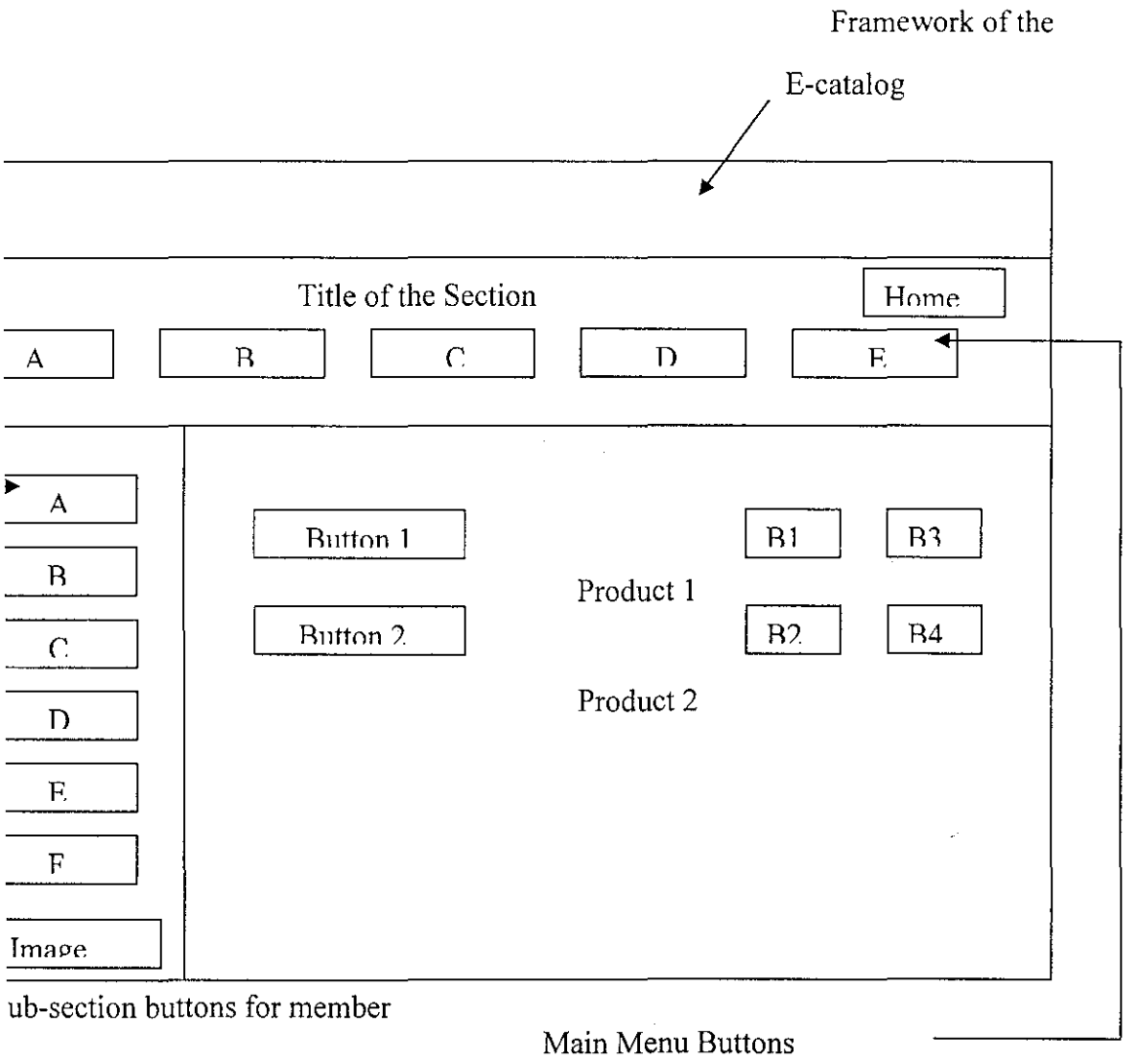
Image/Links

The site has a rapid usage of image and links to the site, which has been developed. Product descriptions of the products sold in e-cart are available with the amount to be purchased.

Text

Text description explains about the text information on the site.

3.5 Framework of E-catalog



mments

e storyboard or this page consists of an e-catalog framework. At the top level of the ge it indicates the title of this section.

Main Menu Button

In this main page the main menu button gives out the available functions of each button. The main menu buttons are linked up with different functions available on the site.

Sub-buttons for member

Clicking on any of these buttons would display text content of the sub-section on the content window right. The storyboards consist of the main site, which is home. The title of this section is home and this is the main page of the functioning site.

Button 1

Button 1 is right at the bottom of the framework of the forum. It allow the function to indicate the forum has been received and a page linked to it, explaining in text description that forum has been received successfully.

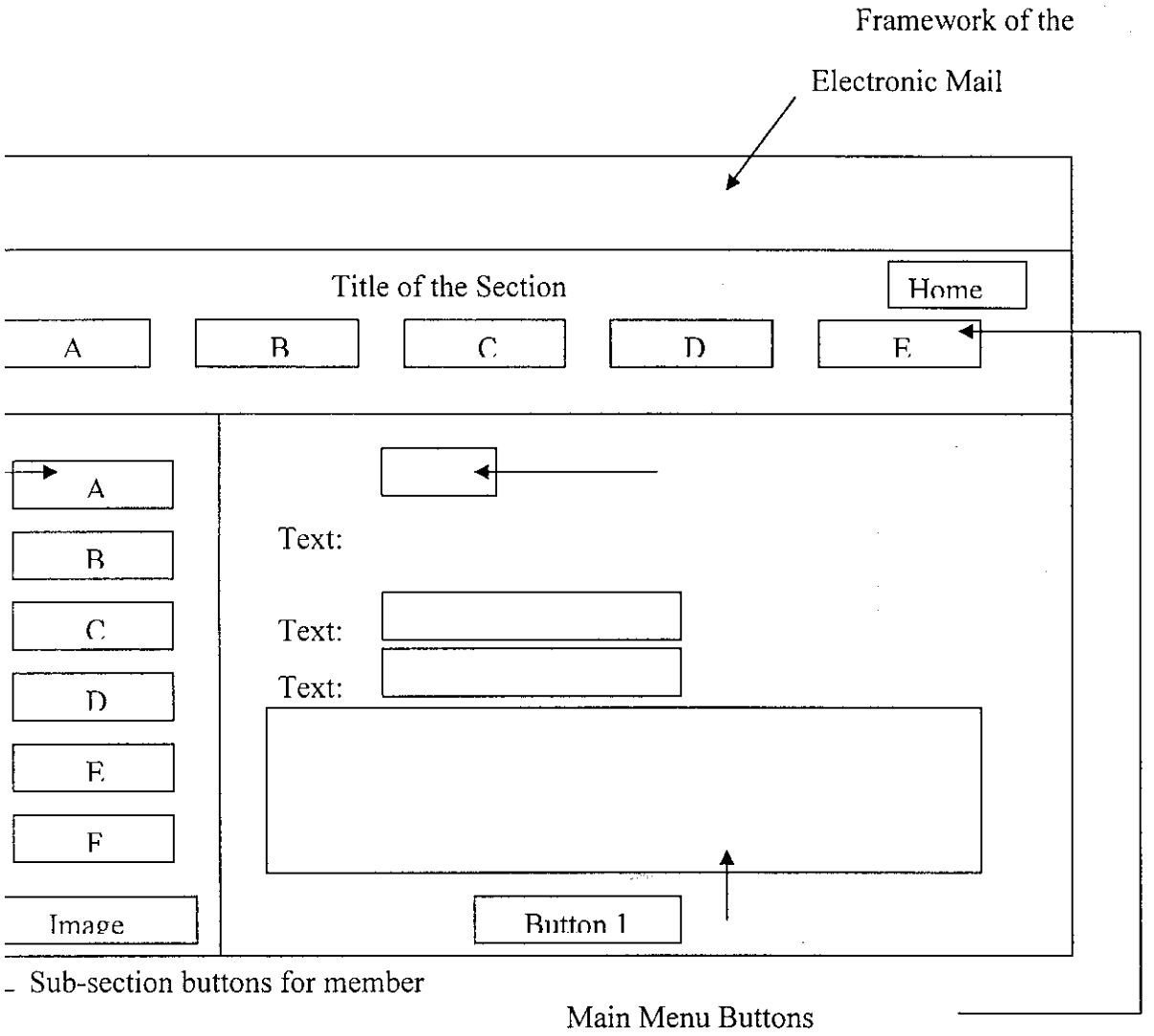
Image/Links

The site has a rapid usage of image and links to the site, which has been developed.

Text

Text description explains about the text information on the site.

4.3.6 Framework of Electronic Mail (e-mail)



Comments

The storyboard or this page consists of a electronic mail (e-mail) framework. At the top level of the page it indicates the title of this section.

Main Menu Button

In this main page the main menu button gives out the available functions of each button. The main menu buttons are linked up with different functions available on the site.

Sub-buttons for member

Clicking on any of these buttons would display text content of the sub-section on the content window right. The storyboards consist of the main site, which is home. The title of this section is home and this is the main page of the functioning site.

Button 1

Button 1 is right at the bottom of the framework of the electronic mail. It allow the function to indicate the electronic mail has been received and a page linked to it, explaining in text description that forum has been received successfully.

Image/Links

The site has a rapid usage of images and links to the site, which has been developed.

Text

Text description explains about the text information on the site.

UNIVERSITI
TEKNOLOGI
PETRONAS

The purpose of this questionnaire is to elicit information on the efficiency of Internet Pharmacy System and the user literacy concerning health and medical issues.

Age/ *Umur* : [ ] 20-35 [ ] 36-50 [ ] Over 65/ *Atas 65*

Gender/ *Jantina* : [ ] Male/ *Lelaki* [ ] *Perempuan*

Race/ *Bangsa* : [ ] Malay/ *Melayu*
[ ] Indian/ India
[ ] Chinese/ *Cina*
[ ] Others/ *lain-lain*

Status : [ ] Student/ *Pelajar*
[ ] Lecturer/ *Pensyarah*
Others/ *lain-lain* _____

Level of education/ : [ ] School/ *Sekolah* [ ] Degree/
[ ] Master's / *Ijazah Lanjutan* [ ] Phd./ *Dr.*

---

1. What is the kind of web browser currently employed?

[ ] Internet Explorer [ ] Netscape Navigator
[ ] Mozilla Firefox [ ] Opera

2. How many hours do you spend working with computers per week?

[ ] 60 hrs or more [ ] 20 hrs
[ ] 40 hrs [ ] 10 hrs or less

3. Are you using a computer based application to look for information in completing daily activities?

   [ ] Yes
   [ ] No

4. The amount of time spent browsing?

   [ ] 10hrs or more
   [ ] 7- 9 hrs
   [ ] 4- 6 hrs
   [ ] Less than 3 hours

5. Are you aware of the information regarding Online Pharmacy and how it can help you ease on buying products online?

Strongly agree	Disagree	No Comments	Agree
1	2	3	4

6. What is your primary motivation behind browsing?
   ?

   [ ] Education
   [ ] Personal
   [ ] Commercial
   [ ] Others

I) HEALTH FACILITIES

7. Where do u seek treatment?

   [ ] General Hospital
   [ ] Clinic
   [ ] Private Hospital
   [ ] Others

8. How accessible are the above facilities in terms of communication?

[ ] Inaccessible
[ ] Accessible
[ ] Others .....

9. Does the facility provide you with desirable services?

[ ] Yes
[ ] No
[ ] If No, please comment.....;.

PATIENT LITERACY (INTERNET AND HEALTH)

10. Have you ever been on a training to guide the usage of internet for health purposes?

[ ] Yes
[ ] No
[ ] Not sure

11. Do you know how online Pharmacy System differentiates from manual pharmacy functions?

[ ] Yes
[ ] No
[ ] Not sure

12. Do you agree with the idea of replacing the current manual pharmacy system towards an online Pharmacy System?

Strongly agree	Disagree	No Comments	Agree
1	2	3	4

13. Do you think this is an effective way to apply on a Medical benefits and privileges on fixing appointment and doing transaction online?

[ ] Yes
[ ] No
[ ] Not sure

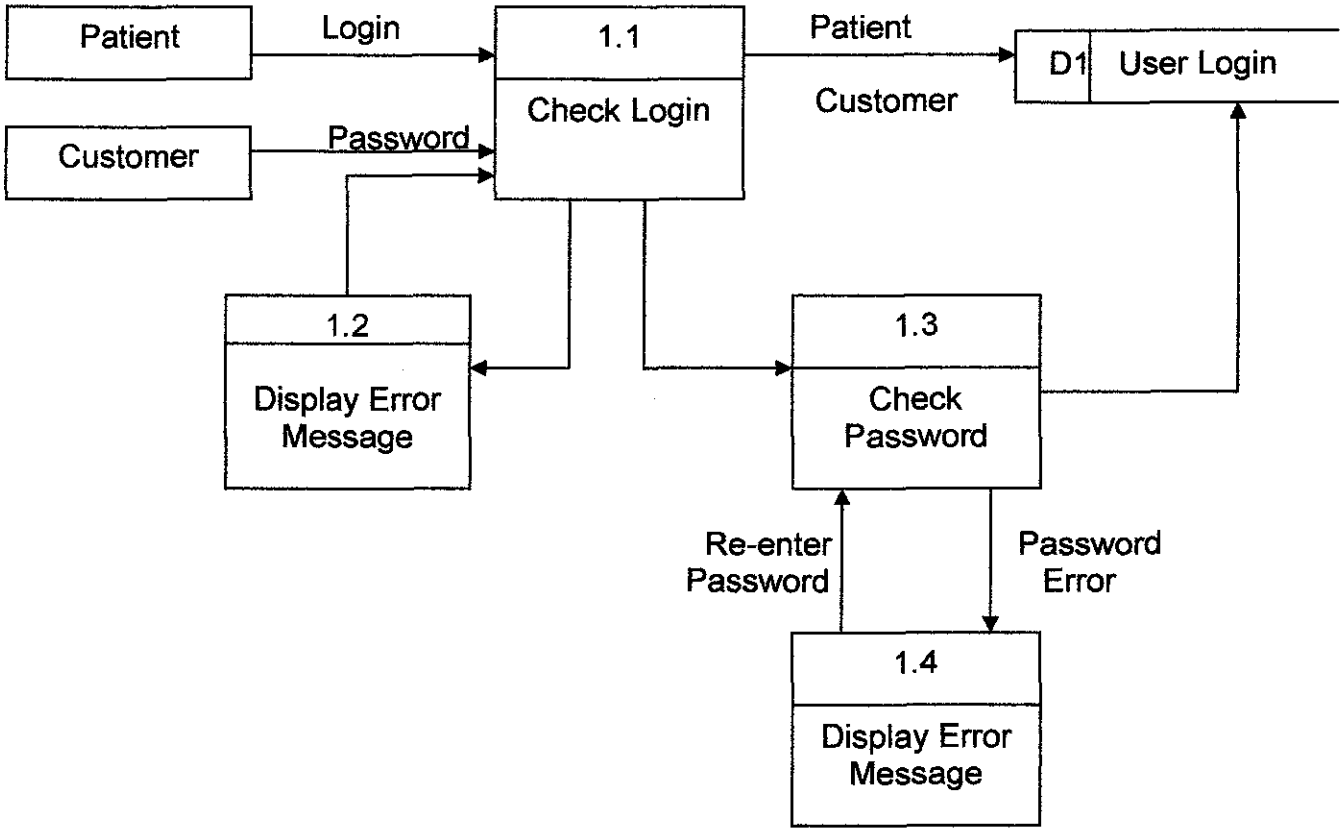
14. What do you consider the benefits doing transaction and buying products online?

[ ] Increase performance and satisfaction of user

[ ] Easier to get the product in time and reduce the tediousness of queuing up in counters.

[ ] Not secured....why? comment .....

Data flow diagram for patients and customers



Data flow Diagram for guest