



Health Information System in Buraimi City

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ABSTRACT

As a result of fast deployment of technology and accelerated development in different life fields. And all of this because of the large dependent of computerized system that make our lives much easier. This Project was taken from a real life problem, the health information system, is developed to describe and represent the main parts and function of a well designed and working hospital, starting from the main management unit down to the partial sections including the live entities as managers, doctors and patients. The main purpose of the project is to produce a well structured database application for Health registration system. This database application will collect all information related to patients, doctors and their appointments the hospital. Like patient personal details and doctor details and the appointment that will happen.

Key Words: health clinic, health system, registration, private clinic system, software, Visual Studio 2010, E-draw Max, Photoshop.

1. INTRODUCTION

The planning stage of the system development life cycle is the fundamental process of understanding solution in detail along with the approved project plan and schedule. This is known as the system request. A system request describes a problem or desired changes to be made to an information system. These changes can be minor or major changes. A minor change in the system involves a correction to the system interface or any other minor change within the system. While as a major change refers to a replacement of an old information system with a new one to be able to cope with environmental changes.[1]

The purpose of the Planning Phase is to define the solution in detail along with the approved project plan and schedule. This work includes creating a functional specification, developing the

solution architecture and design, and preparing cost estimates. Program Management combines these individual plans and schedules and synchronizes them to create the master project plan and schedules. The Planning Phase culminates in the Project Plans Approved Milestone. Passing this milestone indicates that the customer, the project team, and all stakeholders agree on the details of the plans, including what will be built, how it will be built, when it will be delivered, and what it will cost.[9]

2 Analysis

Analysis is collecting information which related to the study from different sources like internet to inventing new ideas. The most important point in analysis is determining the quality of analysis because it has a large impact on the speed of the system and its programming also. It determine the time which needed to study the program and study its errors to avoid it. The first step in the analysis is defined the objectives and how it can access to them. In addition, how thought about the ideas and put new plans to implement them.

Also, studied the problems that will be face during performing the program and developed plans to avoid getting caught in them. The thought how that will design this system according to the plan.

A good set of requirement is needed for any project to be successful. This where many project fail, in that they don't specify correctly what the system should do. An important and difficult step of designing a software product is determining what the customer wants to do. This is because the customer is often not able to communicate entirety of their needs, and the information that they provide may be also not been completed.[10]

2.1 System Objectives

- Replacing the manual system with a computerized system.
- Reduce the time.
- Improve technical skills
- Create a well structured database.
- Saving space.
- More accurate system.

2.2 Project Conrents

First Planning: Initial phase of SDLC that will identify the scope of the new system and show what we will follow and we are going to use the prototyping model in our software development life cycle.

Second Analysis: Here we are going to explain the primary objective of the analysis phase and try to understand and document what we do. Third Design: Make all designs required like data flow design, context diagram design and entity relationship design beside the interface for our program. FouthImplementation Here we are going to list all forms and codes which in this way we are going to use access 2007 as a programming language and we will not use any wizards but we will use the visual basic code completely. Fifth Testing results: Here we will check that our

system is working properly and there are no errors at all. We will test the design first and after that we will test our code.

2.3 System Development Methodologies

In SDLC system methodology development into phases containing activities with the purpose of improvement planning and management. There are basically four common types of approach development methodologies:

1. Waterfall methodology.
2. Prototyping methodology.
3. Incremental methodology.
4. Spiral methodology.

2.4 Selected Methodology

In this study prototyping methodology will be used because it is simple, clear and easy to implement. In this model phases we can change the prototype of our system in many times. This methodology is preferable in projects where quality is more important. Also we can fix the error for each phase.[10]

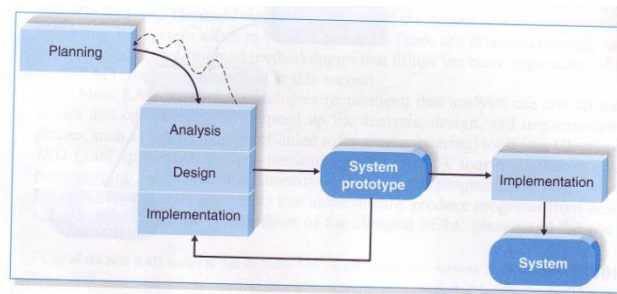


Fig.1: Prototype Methodology

2.5 Planning phase

The Planning Phase is the time when the project team translates the initial vision/scope from the Envisioning Phase into practical plans on how to achieve it.

The purpose of the Planning Phase is to define the solution in detail along with the approved project plan and schedule. This work includes creating a functional specification, developing the solution architecture and design, and preparing cost estimates. Team members draw upon their expertise to create detailed individual plans, such as the development plan, test plan, and deployment plan, as well as schedules for all aspects of the project.[7]

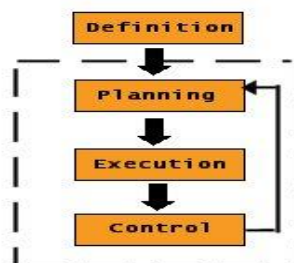


Fig.2: Planning steps

2.5.1 System Functional Requirement

Calculations, technical details, data manipulation and Processing and other specific functionality that define what a system is supposed to accomplish.

- Save personal data for academic staff.
- Facilitate search process.
- Inquire about employee, timetable and subject.
- Modify (update) employee data and timetable.

2.5.2 Feasibility Study

A feasibility study is an evaluation of a proposal designed to determine the difficulty in carrying out a designated task. Generally, a feasibility study precedes technical development and project implementation. In other words, a feasibility study is an evaluation or analysis of the potential impact of a proposed project. [2]

2.6 SYSTEM ANALYSIS ROLE AND SKILLS

Basically what a systems analyst does is an interview person with a goal to being able to write down what the system is required to do. So the two main skills are being able to interview and being able to write down what you learn in a way that others can understand - in particular in a way the systems designers can understand so that they can write the system specifications better than any other. [7]

2.7 Software Requirement

2.7.1 Microsoft Visual Studio 2010

Visual Studio 2010 is a rich, integrated development environment for creating stunning applications for Windows, iOS, and Android, as well as modern web applications and cloud services. To find out more information about the Visual Studio 2010 [2].

2.7.2 E-draw Max

Is definitely the easiest and fastest visualization software to create diagrams of any kind for any user, whatever his role is [3].

2.7.3 Adobe Photoshop CS6

Photoshop is a graphics editing program by Adobe that is used by professionals and regular consumers. It is usable on a variety of operating systems and is available in a variety of languages. This program can be used to create images from scratch or to alter existing images. You can get a degree or take classes in the use of Photoshop or you can teach yourself to use the program using this and other tutorials. We use this program to design the logo, design backgrounds and image to our website [3][10].

2.7.4 Microsoft office Word

Microsoft Word is almost more prevalent in the world's word processing programs. It is also one of the key programs in the Microsoft Office products suite. Microsoft Word and combines all associated with the creation, editing and proofreading tasks on the computer. It deals with all types of known file formats, which include the availability of property save files as PDF files or send documents via e-mail through Outlook immediately once written. We use this program to write the documentation of our study. [4]

2.8 Hardware Requirement

Hardware requirement for this study are: Personal computer, CD ROM, Flash, Printer and Laptop.

2.9 DRAWBACKS OF THE MANUAL SYSTEM

1. Time Consuming, Generate Errors, Overwriting, Difficult to Search, More Expensive, Low security Level, Lose the Space. [9]

3 Design

System Design Phase is the third phase of systems development life cycle (SDLC) phases. It is the most crucial phase in the development of a system. All requirements must transform into detailed specifications covering all aspects of the system to solve original problem. For example, Input, output, databases, forms, codification schemes and processing specifications are drawn up in detail. Describing the system design can be represented in several tools and techniques, which are: Flowchart, Data flow diagram (DFD), Data dictionary, Structured English, Decision table and Decision tree. Etc.

3.1 System Database

This study contains of three tables with their attributes which allow the system to enter the data into tables with their attributes as shown below:

All forms are related to one another using access and the end-user will fill out all doctors then employees and patients will be filled whenever they visit the hospital, and they will be assigned to their doctors and the transaction will be done by whom.

ID	patient Name	Nationality	Mobile	Address	appointment	General/specialist	Payment	medicine

Fig. 3: Hospital Entrance Form

3.2 Design Database

In this study, the created data type of system is described in the following tables:

Table 1: Patient Table

Field Name	Type	Size	Required	Description
Fname	Text	25	Yes	
Minit	Text	1	Yes	
Lname	Text	25	Yes	
Number	Number	Long Integer	Yes	PK
Sex	Text	1	Yes	
Bdate	Date		Yes	
Indate	Date		Yes	
Outdate	Date		No	
BloodType	Text	3	Yes	
Affliction	Text	60	Yes	
Phone#	Number	Long Integer	No	
Country	Text	12	No	
City	Text	12	No	
Address	Text	30	No	
Age	Number	Single	No	
Staying_Class	Text	10	Yes	
Nationality	Text	15	No	
SocialityCase	Text	10	No	
Religion	Text	10	No	
WarrantorName	Text	25	Yes	
Dept#	Number	Integer	Yes	FK(Dept)
DocSSN	Number	Long Integer	Yes	FK(DOCTOR)
Bed#	Number	Integer	Yes	FK(BED)
Room#	Number	Integer	Yes	FK(ROOM)

Table 2: Doctor Table

Field Name	Type	Size	Required	Description
Fname	Text	25	Yes	
Minit	Text	1	Yes	
Lname	Text	25	Yes	
SSN	Number	Long Integer	Yes	PK
Sex	Text	1	Yes	
Bdate	Date		Yes	
Hiredate	Date		Yes	
Shift	Text	1	Yes	
Phone#	Number	Long Integer	Yes	
Address	Text	30	No	
Salary	Number	Single	Yes	
Degree	Text	10	Yes	
Dno	Number	Integer	Yes	FK(Dept)

Table 3 :Department Table

Field Name	Type	Size	Required	Description
Name	Text	25	Yes	
Sex	Text	1	Yes	
Bdate	Date		Yes	
Relationship	Text	12	No	
DocSSN	Number	Long Integer	Yes	FK(DOCTOR)

Table 4 : Doctor-Department Table

Field Name	Type	Size	Required	Description
Name	Text	25	Yes	
Dnumber	Number	Integer	Yes	PK
Phone#	Number	Long Integer	Yes	
Location	Text	12	Yes	
MgrSSN	Number	Long Integer	Yes	FK(DOCTOR)

3.3 System Model

A system model is the [conceptual model](#) as a result of [system modeling](#) that describes and represents a [system](#). A system comprises multiple [views](#) such as [planning](#), [requirement analysis](#), [design](#), [implementation](#), [deployment](#), [structure](#), [behavior](#), [input data](#), and [output data](#) views. A system model is required to describe and represent all these multiple views. The system model describes and represents the multiple views possibly using two different approaches [5-7].

3.4 Context Diagram

A system context diagram in software engineering and systems engineering is a diagram that defines the boundary between the system, or part of a system, and its environment, showing the entities that interact with it. This diagram is a high level view of a system. It is similar to a block diagram.

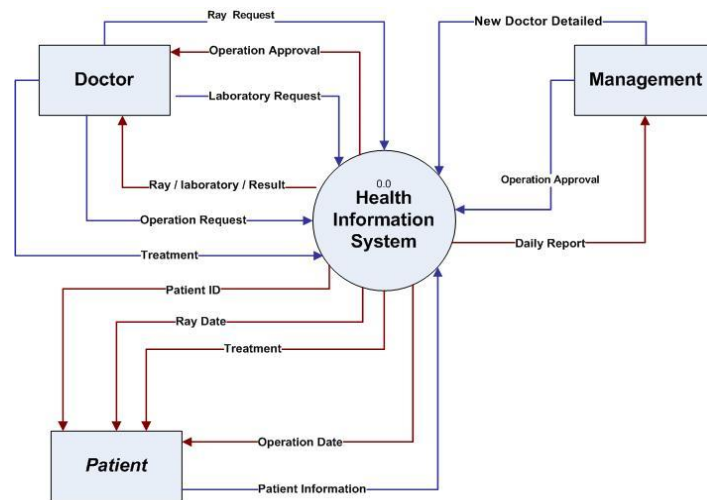


Fig.4: Context diagram model

3.5 Level 0 DFD

Level 0 DFD must balance with the context diagram it describes. Input going into a process is different from outputs leaving the process. Data stores are first shown at this level.

3.6 Level 1 DFD

Level 1 DFD must balance with the Level 0 it describes. Input going into a process is different from outputs leaving the process. Continue to show data stores.

3.7 Level 2 DFD

Level 2 DFD diagram are used for process that need more details and specification in process operations.

3.8 ERD

Entity-relationship model (ER model) is a data model for describing the data or information aspects of a business domain or its process requirements, in an abstract way that lends itself to ultimately being implemented in a database such as a relational database. The main components of ER models are entities (things) and the relationships that can exist among them. Entity-relationship modeling was developed by Peter Chen and published in a 1976 paper. However; variants of the idea existed previously and have been devised subsequently such as super type and subtype data entities and commonality relationships [8].

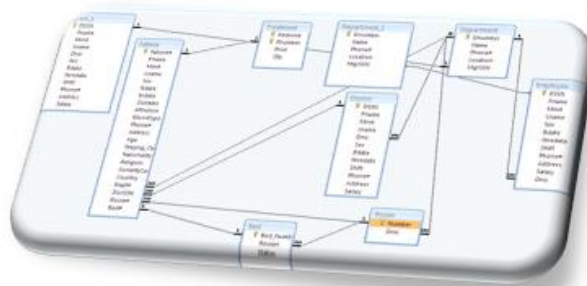


Fig. 5 : ERD of Health system

As we see from the ER diagram above is that the health information system has nine tables in the database, the tables are

- Doctors ,Patients , Treatment ,Department
- Employee , Doctor1, Bed, Room, Department1

4 Implementation

System implementation is the development, installation and testing of system components and delivery of that system into production. The purpose of system implementation is to build a system, install it, replace and old systems, preparing system and user documentation and train users. During this phase, it's also involved closedown the entire project. System implementation has several major activities. There are two major tasks in this phase; coding and testing. The purpose of this phase is to convert the physical system specifications into working and reliable software and hardware, document the work that have been done and provide help for current and future users.[10]

After that it is reviewed to insure that it met all of the user requirements and goals in the project plan. And five major activities make up the implementation phase and they are listed below:[11]

1. Construct software components
2. Verify and test
3. Convert data
4. Train users
5. Document the system
6. Install the system [6]

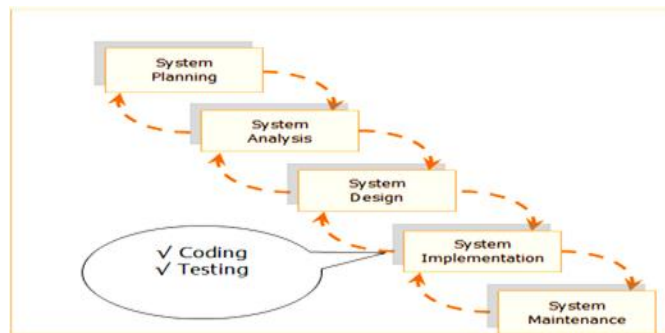


Fig.6:Activities in the System Implementation Phase.

4.1 Coding

Coding is the process whereby the physical specifications created in the preceding phases are turned into working computer codes by the programmer team.

4.2 User Interface

The name of the system is "BUC academic & HR staff system". In this section we will introduce the user interface that forms the system. At the beginning the user will double click on the system icon then the program will execute. When the program is run it will prompt username and password.

4.3 TESTING

Software testing is an investigation conducted to provide stakeholders with information about the quality of the product or service under test. Software testing also provides an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation. Test techniques include, but are not limited to, the process of executing a program or application with the intent of finding software bugs.[16]

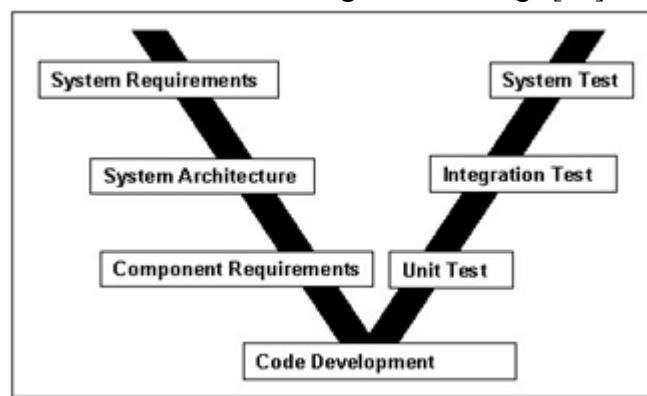


Fig. 7: Testing Phase

4.3.1 System testing importance

- System Testing is a crucial step in Quality Management Process. In the Software Development Life cycle System Testing is the first level where the System is tested as a whole.
- The System is tested to verify if it meets the functional and technical requirements
- The application/System is tested in an environment that closely resembles production environment where the application will be finally deployed.
- The System Testing enables us to test, verify and validate both the Business requirements as well as the Application Architecture[10][15]

4.3.2 Instalation

When the new system is developed tested and ready to be delivered the installation process will take place and this is a sensitive process because many conflicts and constraints may occur like cost and risks. And there are different approaches for installation processes that have different strengths and weaknesses, the most commonly installation approaches used are:[14]

1. Direct installation
2. Parallel installation.
3. Phased installation.

4.3.3 Project Assessment

is the process of documenting, often times in measurable terms, knowledge, skills, attitudes and beliefs. Assessment is often used in an educational context, but applies to many other areas as well.

Assessment should be valid and reliable. A valid assessment is one which measures what it is intended to measure. For example, it would not be valid to assess driving skills through a written test (alone); the most valid way of assessing driving skills would be through a combination of practical assessment and written test. Teachers frequently complain that some examinations do not properly assess the syllabus upon which the examination is based; they are, effectively, questioning the validity of the exam. [7]

4.4 Login Form

In this form you can select the username that can be entered into the form. There are three username "HR , HOD and Dean" Then enter the password for the username to use any form.



Fig. 8: Login interface

4.4.1 Main Form and its code

In this form you can select personal information or timetable information then you can enter to your selection form.

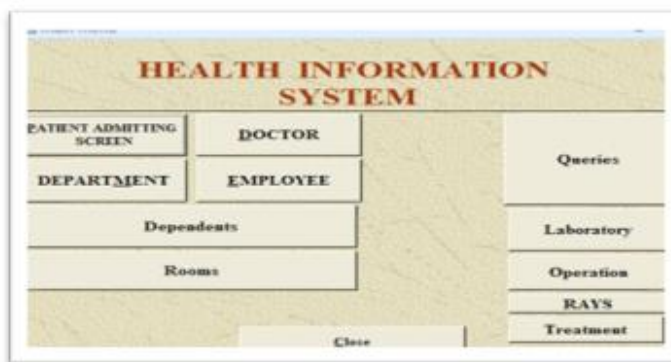


Fig. 9: Main form interface



Fig. 10:Personalcredit

PublicClassForm1

- PrivateSub PictureBox2_Click(sender AsObject, e AsEventArgs) Handles PictureBox2.Click 1 contract.Show()

EndSub

- PrivateSub PictureBox1_Click(sender AsObject, e AsEventArgs) Handles PictureBox1.Click 2 personal.Show()

EndSub

EndClass

4.4.2Personal Information Form

In this form all teachers personal information are stored, and if there is any new employee to a college, immediately all data about him will be stored in one database .This form give HR (human resources) department the ability to add, modify and delete the data of an academic employee, in addition option, all important data about an academic employee will be stored "extension, name, age, salary, nationality, gender, department, experience, degree , etc In modifying option , perhaps an employee has get a new certificate in higher education, so it must be updated in human resources records .The third option (delete option) which gives the ability to delete the all data related to some an academic employee who has resigned from his position.[17]

```

Private Sub Command1_Click()
On Error GoTo Err_Command1_Click

Dim stDocName As String
Dim stLinkCriteria As String

stDocName = "Patient"
DoCmd.OpenForm stDocName, , , stLinkCriteria
stDocName = "Macro1"
DoCmd.RunMacro stDocName
stDocName = "Macro4"
DoCmd.RunMacro stDocName
Exit_Command1_Click:
Exit Sub

Err_Command1_Click:
MsgBox Err.Description
Resume Exit_Command1_Click

End Sub

```

Fig. 11 Patient Screen Code

4.4.3 Doctor Form

The Doctor form has all information about Doctors in the health information system like doctor ID, first Name, last name, address and telephone number and we can add, save and delete doctors and also we have the feature to search for the desired doctor. Clicking the return to main menu will take us back to the previous form.

Fig. 12: Doctor interface form

4.4.5 Employee Form

The Employee form has all information about Employees in the health information system like Employee ID, first Name, last name, address, hire date, salary and telephone number and we can add, save and delete Employees and also we have the feature to search for the desired Employee. Clicking the return to main menu will take us back to the previous form.

The third option (delete option) which gives the ability to delete the all data related to some course.[18]

Fig. 13 Employee interface Form

5 Conclusion

1. Visual Basic is quick and easy language to create Windows applications. It supports object-oriented programming, but that this is not fully.
2. Choose Edraw Max the diagramming software that best maps to what you know and where you're heading. Fully vector-based graphic software, which facilitates the rapid creation of flowcharts, organizational charts, network diagrams and more. Supports to import the existing Visio XML file perfectly.
Creates professional-looking diagrams quickly with themes, effects and quick styles. Distinct colors, fonts, shapes, styles, pictures, text, and symbols are available for each diagram object. Easily visualize complex information with a wide range of diagrams. Make those diagrams even smarter and more useful by linking them to underlying data, which provides a more complete picture of the system or process. Works with MS Office well. [19]
3. Choose access to design database is easy to install and use, easy to integrate. NET-friendly, widely popular, saves you money, convenient storage capacity, multi-user support and importing data.
4. Testing "Health Information System in Buraimi City" shown a very good efficiency.

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