

# BUC Electronic HR System

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**Abstract**—In this study a new system has been created to be as simulation for Buraimi University College (BUC) and Human Resources (HR) system. So the two activities have been merged, the HR department with all personal information about faculty staff member and his/her time table. Both of them connected same system. In this system the staff have been classified to be full time or part time. And check the total load his /her degree to be sure that the created system is working properly and is matching the BUC regulation.

**Index Terms**—BUC, academic issues, human resources, HR staff system, software, Visual Studio 2015, E-draw Max, Photoshop.

## 1 INTRODUCTION

THE planning phase will provide us with general information about the problem case that we selected, in this chapter the researcher found that BUC portal system need more information that related to teacher them solves and also want to make a simulation program to try to implement this huge registration system in a partition case. The study is select IT department Academic staff members to put two option, one for their personal data, second for their academic load and time table, there is new technology given by merging in this study the two activities together to combine department requirement together with HR department.

In this paper, researcher try to use new computer system device provided with the newest tool technologies to implement the program. This will investigate the cost of development to the sustainability of the system and the benefits it offers. The cost and benefits are in quantitative and qualitative terms. The quantitative terms may include the monetary values, the spent in getting information. The new system will try to meet all organization requirements so it will launch the business without any problems.

## 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.

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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 diffi-

cult 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.

### 2.1 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.

#### 2.1.1 Waterfall Methodology

The waterfall Model is a linear sequential flow. In which progress is seen as flowing steadily downwards (like a waterfall) through the phases of software implementation. This means that any phase in the development process begins only if the previous phase is complete. The waterfall approach does not define the process to go back to the previous phase to handle changes in requirement. The waterfall approach is the earliest approach that was used for software development[1].

#### 2.1.2 Prototyping Methodology

The Prototyping Model is a systems development method (SDM) in which a prototype (an early approximation of a final system or product) is built, tested, and then reworked as necessary until an acceptable prototype is finally achieved from which the complete system or product can now be developed. This model works best in scenarios where not all of the project requirements are known in detail ahead of time. It is an iterative, trial-and-error process that takes place between the developers and the users[1].

#### 2.1.3 Incremental Methodology

It is developed to overcome the weaknesses of the waterfall model. It starts with an initial planning and ends with deployment with the cyclic interactions in between. The basic idea behind this method is to develop a system through repeated cycles (iterative) and in smaller portions at a time (incremental), allowing software developers to take advantage of what was learned during development of earlier parts or versions of the system [1].

### 2.1.4 Spiral Methodology

It is combining elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts. This model of development combines the features of the prototyping model and the waterfall model. The spiral model is favored for large, expensive, and complicated projects. This model uses many of the same phases as the waterfall model, in essentially the same order, separated by planning, risk assessment, and the building of prototypes and simulations[1].

### 2.2 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.[9]

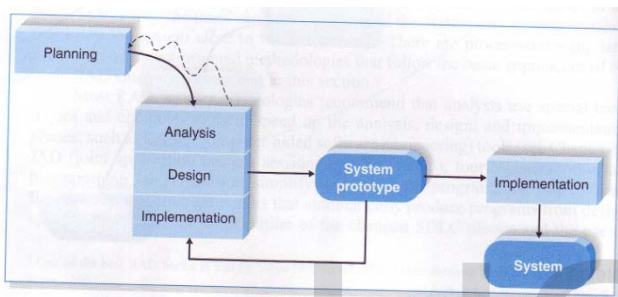


Figure 1: Prototype Methodology

### 2.3 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.

### 2.4 System Non-Functional Requirement

Behavioral requirements describing all the cases where the system uses the Functional Requirements are captured in use case.

- Reliability: Admin and user can deal with the System.
- Security: We have only one type of user called Admin and have authenticated to deal with the system.

### 2.5 Software Requirement

#### 2.5.1 Microsoft Visual Studio 2015

Visual Studio 2015 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 2015[2].

#### 2.5.2 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].

### 2.5.3 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].

### 2.5.4 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]

### 2.6 Hardware Requirement

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

## 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:

| Name             | Nationality | Passport_No | Age | Gender | Salary |
|------------------|-------------|-------------|-----|--------|--------|
| Raghad           | Iraq        | e05443      | 40  | Female | 990    |
| Ijaz             | India       | 72765       | 36  | Male   | 900    |
| Ibada            | Iraq        | e3455       | 41  | Female | 1200   |
| roy              | india       | 54322       | 44  | Male   | 1210   |
| AbdulMehdi Saleh | Iraq        | e2435       | 46  | Male   | 1250   |
| Nushad Ahmed     | india       | 24354       | 39  | Male   | 950    |

Figure.2HR-contract information table.

| ID | Ext | Name        | CourseCode | Section | ClassRoom | Time        | Date       |
|----|-----|-------------|------------|---------|-----------|-------------|------------|
| 1  | 557 | Abdulmahai  | COMP413    | 2       | A-313     | 11.00-12.00 | 21/5/2015  |
| 2  | 554 | Raghad      | COMP322    | 3       | Lab2      | 11.00-12.30 | 2/3/2014   |
| 3  | 552 | Badaa       | COMP488    | 2       | lab4      | 08.00-09.00 | 20/1/2012  |
| 4  | 555 | Roy         | Comp490    | 1       | A-208     | 09.30-11.00 | 11/9/2014  |
| 5  | 559 | Natarajan K | COMP413    | 5       | A-202     | 14.00-15.30 | 5/9/2015   |
| 6  | 556 | Ghala       | COMP100    | 2       | A-405     | 10.00-11.00 | 1/12/2015  |
| 7  | 23  | dc          | COMP490    | 2       | dd        | 23          | 01/03/2016 |

Figure.3HR-personal information table.

| Extension | Email                 | Name              | Dept | Degree | Experience |
|-----------|-----------------------|-------------------|------|--------|------------|
| 557       | AbdulMahdi@buc.edu.om | Abdul Mahdi Saleh | IT   | Master | 1990       |
| 552       | Badaa@buc.edu.om      | Badaa             | IT   | DOCTOR | 2004       |
| 560       | Ferkanda@buc.edu.om   | Ferkhanda         | IT   | Doctor | 2004       |
| 562       | Ghala@buc.edu.om      | Ghala Al-Fansi    | IT   | MASTER | 2014       |
| 551       | Ijaz@buc.edu.om       | Ijaz              | IT   | Master | 2004       |
| 553       | Jasim@buc.edu.om      | Jasim             | IT   | Doctor | 2000       |
| 558       | Nushad@buc.edu.om     | Nushad Ahmed      | IT   | Master | 2004       |
| 554       | Raghad@buc.edu.om     | Raghad            | IT   | Master | 1992       |
| 555       | Roy@buc.edu.om        | Roy               | IT   | Master | 2003       |

Figure.4InstructureTime table.

### 3.2Design Database

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

Table 1Personal Table.

| Data type     | Filed name  |
|---------------|-------------|
| Text          | Name        |
| Text          | Nationality |
| Number        | Passport No |
| Number        | Age         |
| Text          | Gender      |
| Number + char | Salary      |

Table 2Time Table.

| Data type | Filed name  |
|-----------|-------------|
| Number    | ID          |
| Number    | Extension   |
| Text      | Name        |
| Number    | Course Code |

|               |            |
|---------------|------------|
| Number        | Section    |
| Number + char | Class Room |
| Number        | Time       |
| Number        | Date       |

Table 3HR Table.

|               |            |
|---------------|------------|
| Data type     | Filed name |
| Number        | Extension  |
| Number + char | Email      |
| Text          | Name       |
| Text          | Dept       |
| Text          | Degree     |
| Number        | Experience |

### 3.3SystemModel

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].

### 3.4Context 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.

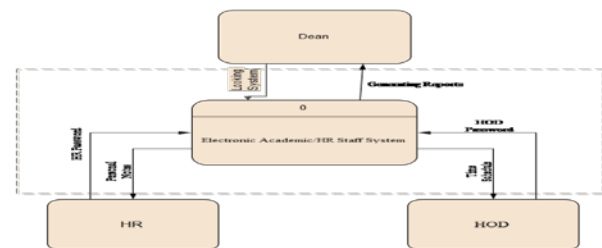


Figure 5. Context diagram model

### 3.5Level 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.

### 3.6Level 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].

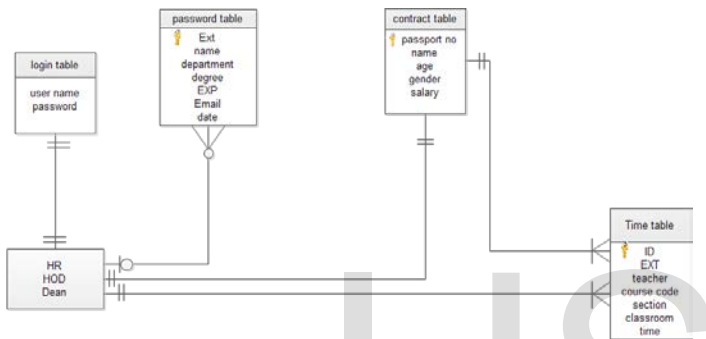


Figure 6 System ERD diagram

## 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.

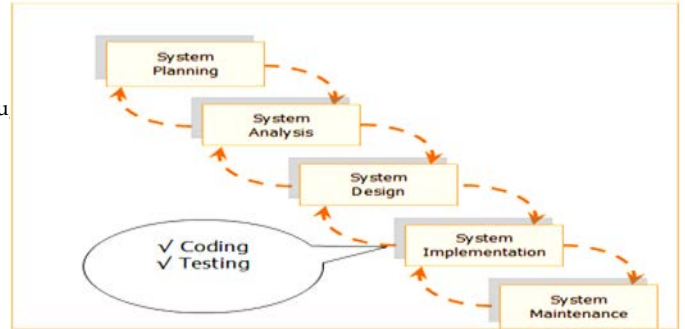


Figure.7 Activities in the System Implementation Phase.

### 4.1 Coding

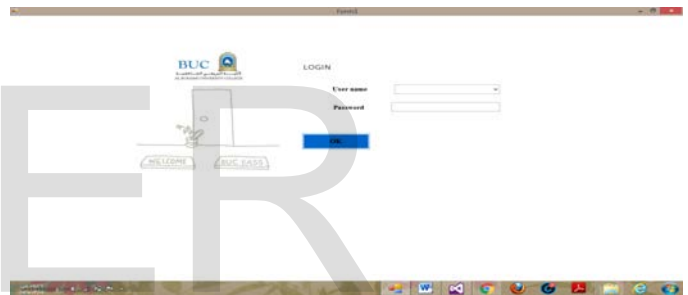
Coding is the process whereby the physical specifications created in the preceding phases are turned into working computer codes by the programmer team.

### 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.

#### 4.2.1 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.

Figure.8 Login interface

#### 4.2.2 Main Form and its code

In this form you can select personal information or timetable



information then you can enter to your selection form.

Figure.9 Main form interface

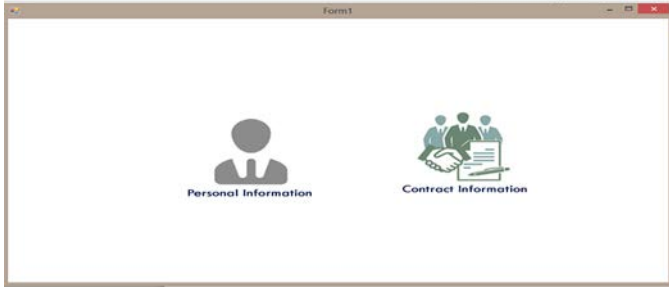


Figure.10 Personal interface

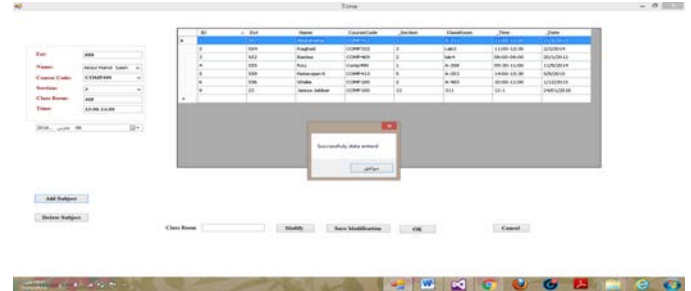


Figure.12 Contract information interface

```
Public Class Form1
    • Private Sub PictureBox2_Click(sender As Object, e As EventArgs) Handles PictureBox2.Click
        contract.Show()
    End Sub
    • Private Sub PictureBox1_Click(sender As Object, e As EventArgs) Handles PictureBox1.Click
        personal.Show()
    End Sub
End Class
```

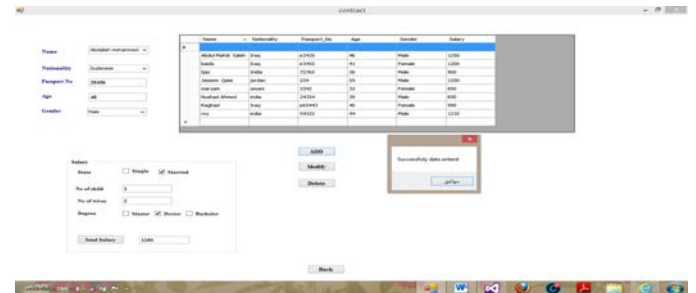
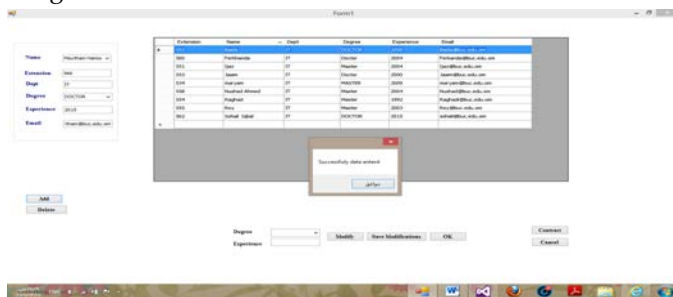


Figure.13 Add contract information interface

### 4.2.3 Personal 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.

Figure.11 Personal information interface



### 4.2.4 Search Personal Information Form

In this form you can see the personal information about any teachers and you can insert the name of teacher then see their personal picture. This information that stored in database like "extension, name, age, salary, nationality, gender, department, experience, degree, etc.. And you can print this information.



Figure. 14 Search personal information interface

### 4.2.5 Time Table Form

In this form all teachers and the courses which assign to them are stored. This form give the admin the ability to add, modify and delete the data of courses, at add option, the information about the course assign to a teacher will be stored "course code, time, number of section, class room number, etc ... In modifying option, perhaps the course data has changed, for example the class room number so it must be updated at admin records. The third option (delete option) which gives the ability to delete the all data related to some course.

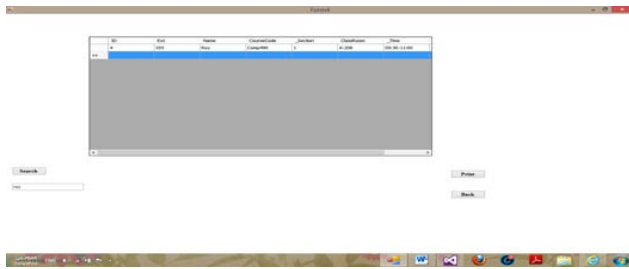


Figure.15 Time table interface

#### 4.2.6 Search Time Table Form

In this form you can search about any lecturers' timetable. First insert the name of teacher then search. After that all information about timetable will appear. This information that stored in database like name, cause code, section, class room, time etc.

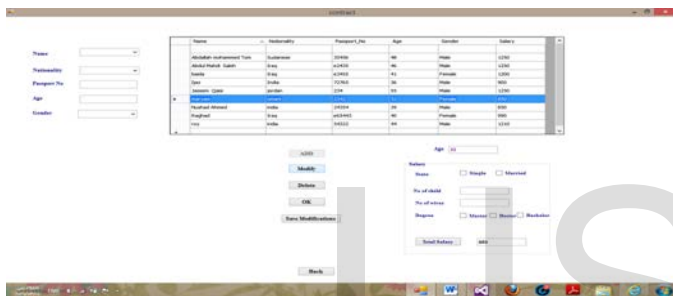


Figure.15 Search Time table interface

#### 4.2.7 Delete Form

In this form all information that add in timetable form and stored in database will come into this form. Then you can enter the name of teacher and select search option. All information about this teacher will appear after that you can delete the information.

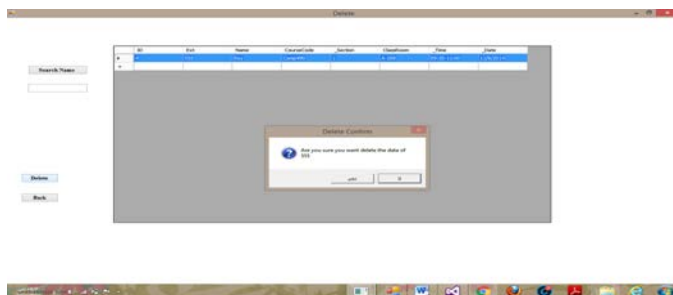


Figure.16 Delete interface

### 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.

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 "BUC academic & HR staff system" shown a very good efficiency.

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