

Personal Integrated Electronic Health Record

Lobna Abd Elaziz Abd Elale
Information Systems Department
Helwan University
Cairo, Egypt

Ahmed Sharaf Eldin
Information Systems Department
Helwan University
Cairo, Egypt

Mona Mohamed Nasr, PhD
Information Systems Department
Helwan University
Cairo, Egypt

ABSTRACT

One of the significant difficulties in healthcare is to make a Personal Health Record (PHR) available for every person. Huge systems were implemented to support this kind of record. In this paper a Simple and user friendly system has been introduced, not only for physicians but for simple persons to use it throws their stages of life.

General Terms

Information systems, medical & bioinformatics

Keywords

Electronic Health Records, Personal health record, integrated health record, EMR, PHR

1. INTRODUCTION

The Personal health record (PHR) still considered as a new concept although it's fully developed and implemented by many institutions and researchers [1]. Making (PHR) available for every citizen or making it part of their daily life with easy and cheap tools is a challenge especially in developing countries.

It is of important to give a brief comparison between an Electronic Health Record and a Personal Health Record as follow.

- Electronic Health Record (EHR) The EHR is an electronic version of the medical record of the care and treatment the patient receives. It is managed and maintained by the health care provider.
- Personal Health Record (PHR) The PHR is a collection of important information that the person maintains about his health or the health of someone he is caring for. PHRs may be short and simple or very detailed. A PHR can be in the form of: paper documents or, electronic files maintained by the person on his personal computer [2].

(PHR) systems are as advanced as one of the center components of Health Care change now. PHR systems are imagined to be driven and controlled by the user, it means that people can tracks health status over a lifetime. These systems introduce a new model of information systems in longitudinal design [1].

These systems in the developed countries have many affiliations in its institutions and designed for all levels of peoples [3]. In developing countries (for example Egypt), social media is being used by all the society members on daily basis. But a few of them have Personal health record system or alternative system, so how to motivate those people to have (PHR). This could be done only by introducing a simple and user friendly system easy to use, manipulate and carry by a simple user.

The main appearance of PHR in a scholarly diary was in Germany in 1969 - 'individual record linkage' in Strategies for Data in Drug Supplement among the classes of 'PCs, people, medicinal history taking, therapeutic record linkage, restorative records, and research [4].

Big concern has been given to accessing medical records by patient specially physicians who thought that patient must not review their electronic health record for many constrains, such as negative effects on patients, relationships between them and their patients and (or) public policy which still don't accept using PHR by any human except physician [5].

PHR confronting several challenging although there are respecting efforts have been made to recognize analysis and try solving them. But they are still appearing. That challenging considers barriers to be satisfied by patients and physicians together with consideration that the system is user friendly [6].

Recognition of Electronic personal health record systems (PHRs) as supporting System to patients/consumers by making this system more accessible, assisting and self-managing for them are our goals.

2. MATERIALS AND METHODS

2.1 Before Designing the System

Before designing the system appropriate methods for a given topic has been used, so choosing an appropriate research method consider challenging. Researchers group decided using simple, more honest respond to sensitive topic and accurate strategy. So two methods have been used which could be more effective (Interview and questionnaires at the same time), interviews helped in Visual observation and recording notes, and Questionnaires helped obtaining demographic information.

Here a briefly about the questionnaire that can be used as a documented record.

Using Questionnaires: For whom? The target here is the simple user Even if he was not suffering from any disease, nevertheless two kinds of questionnaires has been designed: one for simple person, the other for physician. The questionnaire has been implemented on Random sample.

There are two kinds of healthcare in Egypt (the public and the private sectors healthcare) which divided in to:

1. The public hospitals, are three different types:
 - Ministry of Health hospitals,
 - The universities hospitals.
 - The health insurance hospitals
2. The private sector, divided into three types; hospitals, medical centers and doctor's offices.

A plan has been designed to cover all those types of hospitals. Questionnaire Design Steps; Questionnaire is the strategy used in this study; the questionnaire has been designed in the following steps:

2.1.1 The first step; Preparation of the initial plan and design of the questionnaire

- Type of information: collecting information and obtaining it by using the closed questions it means using a list of predefined responses and specifying the type of demographic information.
- Testing: The most important steps to get Initial feedback on each section of the questionnaire. Initial questionnaire by borrowing Questions and adjusted and validated and then conduct interviews with a number of experts and specialists to verify the authenticity of the questionnaire and the easy to understand questions. In this step, the questionnaire items are tested, the feedback is obtained on each of them, and extrapolation of previous studies that discuss similar themes is done
- Final design: In this step the questionnaire has been finalized after some modifications. The data analysis plans and the results have been taken in consideration.
- Improve design.
- Implement preparation plans.
- Determined the time required to complete the questionnaire.
- Edit the questions based on new factors that have been discovered and that affect the response rates and data quality.

2.1.2 The second step; Construction of Questionnaires: This step is done as follows,

- Be sure that the answer instructions are understandable.
- Be sure that the words used in the formulation of the questions are clear and easy to understand.
- Be sure that the words used in the formulation of the questions do not contain Double meanings expressions could be misinterpreted.
- Be sure there is bias in the data collection process, which clustered around the concept of evaluation the adoption of the electronic health record.
- But variables and items that will be evaluated and refined.
- Formulation and rates the major search questions.

2.1.3 The third step; Description of Perceived Benefit Questionnaire Design: as follow,

- Item Development: The most important part of questionnaire design is generating items where the main concern is to ensure the reliability and validity of a minimum content of the adequacy of the measurement and the first step in building validated.
- Item Revisions: Interviews is one of the qualitative activities that have been made with many health care professionals to ensure that respondents understand the

intent of the survey questions and adjusted as easily understood if necessary.

- The benefits of the interviews also determine whether the change in response to certain items of perceived benefits is the result of a lack of clarity on this item, obtain accurate information on the increasingly throughout the data collection phase of the study necessarily require a review of the questionnaire items.

2.1.4 The fourth step; Validation the degree to which a test measures what it claims or purposes to be measuring

This step is necessary to prepare the measurement. In this section, face validity, content validity, pre-test and final instrument are described.

2.1.5 The Fifth step; determine the quality of the design of the questionnaire, these questions must be discussed during face validity

- Clarity and brevity of instructions.
- Choosing the appropriate forms in the design of the questionnaire.
- Sentences and questions Clarity and ease of understanding.
- Grammatical mistakes.
- The appropriate format for questions.
- Determine the required time to answer the questionnaire.

2.1.6 The sixth step; Validity of Content

Content validity is based on the extent to which a measurement reflects the specific intended domain of content, and must be built into the measure through the development of items.

As such, any measure must adequately capture the specific domain of interest which contains no extraneous content.

2.1.7 The seventh step; Pre-Test

This step requires preparing the sampling frame, record-keeping forms, and Questionnaire questions; then tests the items to see how well the process is working. It is import to keep in mind what thoughts occurred to respondents or reviewers as questions are read to them. Understanding the progress that respondents or reviewers use in answering questions helps us to write better questions and therefore collect better data.

2.1.8 The eighth step

The questionnaire analysis after filling it by the random sample of physician and simple people and get the results which helped in designing the following documented system [7].

2.2 Designed of the Proposed System

After analysis Questionnaires the result has been used for design a system for any person of the family who can carry it in his pocket when he visits physician (on his flash memory, personal computer, CD, tablet, etc) and physician can use it in emergency time. This system has designed as shown in the following figure.

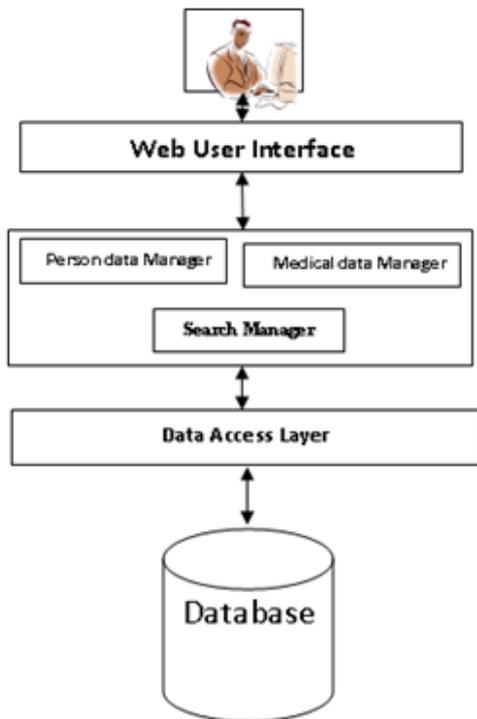


Figure 1: Personal Integrated Electronic Health Record System

2.2.1 Interface Layer

This layer enable user (Physician, patient, emergency agent.. etc) to perform different tasks like managing personal data, medical data and querying data.

2.2.2 Application Layer

The application layer composes of three components as shown in figure1:

- Personal data manager: this component allows user to register his/ her personal data (e.g. Name, phone; etc) and emergency data. Furthermore this component enable user to show his/her personal and emergency data at any time, as shown in figures (2,3)

Figure 2

Figure 3

- Medical data manager: this component is a central component in this layer, it maintains medical history of patient by enabling all users add specific diseases and its diagnoses, symptoms...in Addition adding any attachments such as old prescriptions, Diagnostic Radiology and any other document that may be useful for determine the suitable action that should be taken. Besides maintaining the historical medical data of patient, it helps to retrieve this data when needed, as shown in Figure 4.

Figure 4

- Search manager: this manager facilitates searching for patient (using id or name) then returns medical record for this patient, as shown in figure 5.

Figure 5

2.2.3 5.3 data access Layer

This layer is responsible for connecting to database and performs all database transactions such as (insert, update, delete, etc).

3. CONCLUSION

In this paper a simple/ user friendly interactive system has been introduced that will help normal users to keep track of their medical record.

The system has been designed and an implemented using popular commonly available tool doesn't require previous computing skills in order to use it. Moreover, the system will indoubly help physicians when being visited by the patient.

In order to collect the system requirement, two types of questions have been implied. One is directed to patient while the other is directed to physician in addition to this several in to views were conducted with both of them. The applicability of the system has been tested with small sample of users. The feedback obtained encouraging in to versus implementing such system on a large scale.

Main objective of this system is to improve the relation between the simple user and the PHRs and to provide benefits to consumers/patients. Many relevant papers have been found, indicating a generally growing interest in PHR use, but there is much more to be done in tailoring PHRs for patient health self-management and sustainability^[8].

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