Using a Simple User Interface to Promote the Use of Medical Billing Software in Nigerian Rural Community Health Centres

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Abstract: A significant part of the operation of any hospital involves the acquisition, management and timely retrieval of great volumes of data for different purposes which also includes the collation of bills. This data typically involves bringing together patient’s bills from different departments which could be tedious especially if the volume of data involved is large. This proposed Web Based Medical Billing System will automate the collation of bills in the hospital making it more efficient and error free. It aims at standardizing data, consolidating data ensuring data integrity and reducing inconsistencies etc. The Waterfall software methodology was employed in the development process. This is because the requirements of the system are very well documented, clear and fixed, the technology to be used in the implementation is well understood by the development team and is not dynamic, there are no ambiguous requirements, ample resources with required expertise are available to support the product and the research project is short. The programming languages and tools used in the development include: HTML, PHP, JAVASCRIPT, MYSQL and JQUERY.

Keywords: Medical Billing, Waterfall Model, Rural Community

1. INTRODUCTION

A significant part of the operation of any hospital involves the acquisition, management and timely retrieval of great volumes of data for different purposes which also includes the collation of bills. This data typically involves bringing together patient’s bills from different departments which could be tedious especially if the volume of data involved is large. This Web Based Medical Billing System automates the collation of bills in the hospital making it more efficient and error free. The research was aimed at standardizing data, consolidating data ensuring data integrity and reducing inconsistencies etc.

It is no news that hundreds of Nigerians are kept in hospitals like refugees because they find it difficult to pay their bills after services have been rendered to them from hospitals or health care centres.

The purpose of the web based medical billing system is to control, record and manage billing of patients. These services are to be provided in an efficient, cost effective manner, with the goal of reducing the time and resources currently required for such tasks.

Traditionally, calculating and paying of bills by patients are usually done manually. This method could result in inadequate billing of patients because there could be mistakes while collating the bills from different departments and also the time taken may be unreasonably long. Besides the calculations, the traditional billing system may also expose patients to risk of losing their money due to theft. This software will not only enable electronic computation and paying of bills but also provide the option of patients paying manually in a more secure and faster manner. This will promote efficient, stress less and accurate billing of patients. In addition to this, it will also give hospitals the power to serve as health insurance institutions by allowing patients to pay in advance for their medical treatment through a monthly or weekly deposit with the hospital.

The aim of this research is to design and implement an efficient Web-Based Medical Billing System that provides an efficient data model that caters for rapid access and security.

The specific objectives were to:

(i). Develop a Web Based Medical Billing System to replace the existing manual approach.

(ii). Develop an interactive interface for the web application that makes it easy to administer and navigate.
The proposed system is developed using the Waterfall Model of System Development Life Cycle. The steps include: Feasibility study, System Requirement, System design, coding and implementation, testing, and maintenance. The software development environment includes Requirement Gathering and analysis, System Design, Implementation, Integration and Testing, Deployment of system, Maintenance.

This proposed system is to be designed with focus on the Hospital and medical centres in Arigbajo Community, Ifo Local Government, Ogun State, Nigeria. The present billing system of the hospital is completely manual. Many problems were identified during the initial study of the existing system. This proposed system will focus on the following:

i. Control and management of patients billing to reduce the time and complexity of collating the figures.
ii. Hospital data integrity to avoid charging of different amount for the same kind of services render to patients.
iii. Patients comfort to provide alternative means of paying of bills to patient e.g. the use of insurance policy.
iv. Storage of patients billing and payments history.

One limitation we may face is the time and cost of training users that are computer illiterate.

2. LITERATURE SURVEY

Different systems and their features were studied to understand how billing systems work, thus creating a more efficient system. Each of the systems studied have their unique features peculiar to the field it was designed for.

3. EXISTING SYSTEM

Billing of patients after delivering treatment and medical services are common practices that are usually performed in medical institutions. In most Nigerian hospitals and health care facilities implement the manual billing system which consumes a whole lot of time and may in some cases lead to discrepancies. To overcome the problems of manual billing system, different systems have been created, implementing different algorithms to help automate the billing system of medical institutions. Some of these systems are:

3.1 NUEMD MEDICAL BILLING SOFTWARE

NueMD offers a comprehensive suite software and services for medical practices of all sizes. Some of the services offers include appointment scheduling, practice management, medical billing software, electronic health records etc. NueMD Billing Services offers the expertise of Certified Professional Coders and the transparency of constant communication about claims statuses; users report recouping lost revenue and increasing reimbursements between 5 and 10 percent within sixty days.

NueMD EHR is ONC-ATCB certified and offers robust functionality for clinical workflows. In addition to charting, the EHR includes e-prescribing, laboratory report tracking, and secure fax management.

NueMD features include a friendly user interface, cloud based and available for all sizes of medical practitioners. Strengths include NueMD being cloud-based, freeing practices from the burden of implementing, maintaining and upgrading software, it is delivered over a secure Internet connection, it operates independently of the web browser and thereby avoids many security risks and it is cheap. Weaknesses are the strict use for patients that have health insurance and increase in unemployment especially in the accounting sector. The supported operating systems include Windows XP, Windows Vista, Windows 2000, Mac OS.

3.2 PrognoCIS by Bizmatics Software

Bizmatics, Inc., a leading healthcare solutions company, and the producer of PrognoCIS EMR, is headquartered in Silicon Valley (San Jose, CA). PrognoCIS is a mature and stable platform with cutting-edge technology to ensure ease-of-use for end users. This Cloud-Based EMR and Practice Management software is offered as an integrated package or it can be easily adapted to the Beast of Breed approach if that may be preferred.

PrognoCIS received MU2 Certification with flawless execution and outstanding grades. Their users are in compliance of all measures for HiTEC now known as Meaningful Use Stage 2 (MU2). An easy to follow dashboard highlights the required documentation making steps along the way.PrognoCIS features include a scalable software (available for all sizes of medical practitioner), and also available on mobile phone. Strengths include easy to use and integration with
other packages. Weaknesses include it being expensive and increase in unemployment especially in the accounting sector. The supported operating systems include Windows XP, Windows Vista, Windows 7, Windows 2000, Web browser (OS agnostic), Linux.

3.3 MEDITOUCH

MediTouch PM by Health Fusion is an entirely web-based practice management system that can be used independently or in conjunction with the company’s MediTouch EHR®. MediTouch PM is designed and developed by revenue cycle management experts and offers exceptionally powerful medical billing functionality as a result. For example, the system automatically checks patients’ insurance eligibility 72 hours before appointments. The system will store payer contracts within the system so that billers can verify terms and requirements quickly. An online ERA service allows the practice to automatically post and download EOBs. Meanwhile, MediTouch PM operates its own clearing house, which transacts with more than 2,000 payers.

Finally, highly intuitive web reporting capabilities provide an at-a-glance view into critical practice management metrics. The system supports e-prescribing, which enables physicians to earn an additional 2% on Medicare reimbursements. Similarly, the system supports PQRI reporting, which can also qualify providers for an additional 2% in Medicare reimbursements.

MediTouch features include cloud based software, automates patient registration, medical billing and appointment scheduling for practices small and large. Strengths include MediTouch being highly differentiated by its attractiveness and easy-to-use web interface, it offers powerful functionalities and it is has no installation or maintenance cost. The supported operating systems include Windows XP, Windows Vista, Windows 2000, Mac OS.

4. PROPOSED SYSTEM

Web based medical billing system enhances the billing process of medical practitioners by providing a fast and cost effective system for the collation and recording of patients bill, processing patients claim with an insurance institution etc. Its features include:

Automated Billing Process:
Web based medical system automate billing activities such as bills calculation, receipts generation, retrieval of patient past billing record among many others thereby reducing the time and resources use to carry out this activities. It automates all the various activities carried out by the existing manual billing system.

Interactive Software
Interactive medical billing software represents the state-of-the-art in software billing (Jerry Fitzgerald, 1978). Interactive software expedites data entry and offers users easy access and help platform to facilitate their understanding and usage of the system. It gives non computing oriented staffs the power to use and understand the billing system.

Good Security
The system provide adequate security by ensuring that only authorize users in the organization have access to necessary information about the billing of patients. Any staff that want to access the system must provide its user name and password which makes it easier to get any staff that want to carry out ant fraudulent activities.

Cost Efficiency
Web based medical system is cost effective ,it has a very low maintenance cost and also reduce the amount of spent in acquiring labor.

Sharing the data:
Data can be shared in proposed system .This means that two or more persons can use the same data in existing system provided that they have right to access that data. Also the two or more departments in an organization can easily interact with each other without the actual movement of data (Anul Kmar A, Bhaiya Lal a& Saurabh J. 2012). It also permits the regular sending of mails to insurance institutions and insured persons about the status of their account with the hospital.

Figure 1: Entity Relationship Diagram of the System.
5. CONCLUSION

During the course of our research we discovered that there are quite a large number of existing medical system but never the less most medical practitioner still make use of the paper based method of billing and the major reasons for this include cost of maintenance of this application, the lack of confidence in this application, the complexity of some this applications, the lack of knowledge of how to operate a computer system, among many others. We have been able to develop a system that is cost effective with zero maintenance cost, we also ensure that the interface is simple enough for any user. The system can be easily navigated, no task in the system takes more than three clicks to complete.

Furthermore, this system present to clients a secure and efficient record of hospital billing activities, the tod Guide module of the system guides new user and existing on how to maximize the use of the system. It explain in details how the user can make use of the system. The medical practitioner need not worry about employing a database administrator to manage their databases nor buy a server, the operation and maintenance of the system is completely web based.

6. REFERENCES


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