Android-Based Billing Statement with Real-Time Update and SMS Notification System

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ABSTRACT: In healthcare, the distribution of PC's running operation systems is the rapid growth in Information and communication Technology. The power of the internet has strongly impacted the business and service delivery model in today's global economy. The android based: hospital billing statement with real time update and SMS notification system provide the benefits of streamlined operations, enhance administration, control and improve profitability of the billing section. In health insurance here in the Philippines like Philhealth, health maintenance organizations (HMO, like maxicare, Medicard, intellicare) and private insurance companies, that has become the norm of the Healthcare industry when it comes to billing management and patient information privacy. In this paper we present insight into the development process of a Google Android base. The system provides decision support for patient information, clinical laboratory, pharmacy, medical records section, room charges. I included doctor fee and nurse in the design process to use an interface based on establishing clinical workflow using real time prototypes.

KEYWORDS: SMS (short message service), HMO (health maintenance organization), hospital, insurance, real time notification

INTRODUCTION

The development of applications for smartphones and tablets running operating systems like android attracts the interest in many fields of daily living. Hospital wards smartphones and tablets enable the hospital accounting department especially in the billing section to easily notify the patient.

In this paper we present insights into the development process of a mobile android base in hospital billing statements. The system provides information about patient medicine cost, laboratories and medical records one account per registered smartphone so that it will not misuse the information to other patients .

METHODOLOGY

This section describes the methodology used for the user-centered design phase of the application. It gives insights into the technical aspects of a developing android based and discus typical related to the billing. The study is qualitative in nature and most of the data is based on secondary sources of survey. The research study is very broad to arrive at a conclusive idea of the larger picture on Android Based: Hospital billing statement with real time update and SMS notification system would give a better result in finding the answers to the research question framed.

In this step I gathered and analyzed requirements needed to create a research study. The requirements I collected from the hospital staff. Throughout the gathering process I successfully identified the factors and their uses. One account per android/smartphone, watcher register once upon inpatient admission. Registration expires in seven days.

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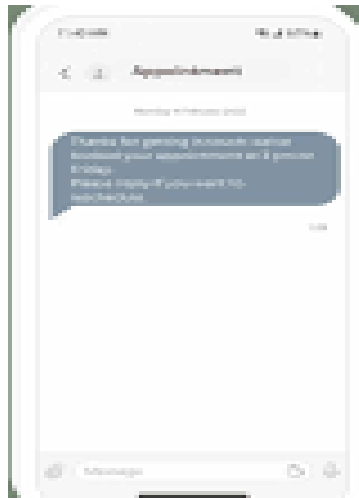
RESULTS

Figure 1.0 SMS send to inpatient watcher

Once nurses, doctors etc get a medical supply to patient it will send notification about the cost of medicine , laboratories, doctors fee etc shows in Figure 1.0

The quality in terms of Usability

Criteria	Expert 1	Expert 2	Expert 3	Mean	Interpretation
Operability	4	5	5	4.66	Very Good
Training	4	5	5	4.66	Very Good
Grand Mean	**4**	**5**	**5**	**4.66**	**Very Good**

Figure 2.0

The figure2.0 shows the different criteria in terms of Usability with its corresponding mean and the interpretation. In Operability, the experts with a mean of four point sixty-six (4.66) which is interpreted as Very Good and regarding Training, the expert rated with a mean of four point sixty-six (4.66) which is interpreted as Very Good.

The quality in terms of Maintainability

Criteria	Expert 1	Expert 2	Expert 3	Mean	Interpretation
Conciseness	3	5	5	4.33	Very Good
Consistency	4	5	5	4.66	Very Good
Instrumentation	5	5	5	5	Very Good
Modularity	5	5	5	5	Very Good
Self -Documentation	5	5	4	4.66	Very Good
Grand Mean	**4.4**	**5**	**4.8**	**4.73**	**Very Good**

Figure 3.0

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The figure 3.0 shows the different criteria regarding Maintainability with its corresponding mean and interpretation. In Conciseness the experts rated it with a mean of four point thirty-three (4.33) which is interpreted as Very Good. Regarding Consistency and Self Documentation the expert rated with a mean of four point sixty-six (4.66) which is also interpreted as Very Good and regarding Instrumentation and Modularity, the expert rated with a mean of five (5) which is interpreted as Very Good. The overall mean regarding Maintainability is 4.3 which is Very Good.

The quality in terms of Integrity

Criteria	Expert 1	Expert 2	Expert 3	Mean	Interpretation
Auditability	5	5	5	5	Very Good
Instrumentation	5	5	5	5	Very Good
Security	5	5	5	5	Very Good
Grand Mean	**5**	**5**	**5**	**5**	**Very Good**

Figure 4.0

The figure 4.0 shows a different criteria regarding Integrity with its corresponding mean and interpretation. In Auditability, Instrumentation and Security the expert rated with a mean of five (5) which is interpreted as Very Good. The total mean in terms of Integrity is five (5) which is interpreted as Very Good.

The quality in terms of Efficiency

Criteria	Expert 1	Expert 2	Expert 3	Mean	Interpretation
Conciseness	3	4	5	4.33	Very Good
Execution-efficiency	4	5	5	5	Very Good
Operability	4	5	5	4.6	Very Good
Grand Mean	**4**	**5**	**5**	**4.66**	**Very Good**

Figure 5.0

The figure 5.0 shows a different criteria regarding Efficiency with its corresponding mean and interpretation. In Conciseness the expert rated with a mean of 4.33 which is interpreted as Very Good, Execution-efficiency the expert rated with a mean of five (5) which is interpreted as Very Good,. In Operability the expert rated it with a mean of 4.6 which is interpreted as Very Good. The total mean in terms of Efficiency is four point sixty six (4.66) which is interpreted as Very Good.

Client Satisfaction

Area	Grand Mean	Verbal interpretation
Usability	4.66	Very Good
Maintainability	4.73	Very Good
Integrity	5	Very Good
Efficiency	4.66	Very Good

Figure 6.0 Client Satisfaction in different Area

Usability – the research prototype is easy to install and to operate. The inpatient watcher can install an application upon arrival in the hospital.

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Maintainability - the research prototype defined as the probability that as failest component on a system will be restored or repaired to a specified condition within a specified period or time when maintenance is performed in accordance with prescribed procedure.

Integrity - the research prototype the quality of being honest and showing a consistent and uncompromising adherence to strong moral and ethical principles and values. In ethics, integrity is regarded as the honesty and truthfulness or earnestness of one's actions. Integrity can stand in opposition to hypocrisy.

Efficiency – the research prototype is very efficient. It provides secure and accurate data by sending the real-time notification in the inpatient watcher through an SMS with this inpatient watcher monitoring scheme could be easier.

Applicability – the research prototype is very applicable in terms of the daily operation of the Hospital Billing statement; it provides a real time notification of the inpatient watcher by real time update.

Expert Evaluation

The developed prototype is very applicable in terms of admission of the inpatient. It provides a system of real time update of the watcher and billing section by updating billing statements. This system will be a great help to every inpatient and hospital billing section once installed and utilized.

Criteria	Mean	Verbal interpretation
Auditability	4.40	Very good
Accuracy	4.35	Very good
Completeness	4.60	Very good
Communication commonality	4.33	Very good
Conciseness	4.33	Very good
Consistency	4.52	Very good
Operability	4.67	Very good
Security	4.40	Very good
Self-documentation	4.33	Very good
Simplicity	4.47	Very good
Traceability	4.42	Very good
Execution efficiency	4.33	Very good
Expandability	4.33	Very good
Modality	4.53	Very good
	Grand Mean 4.43	

Figure 7.0

Figure 7.0 shows the Expert Evaluation when the system is installed and utilized in terms of criteria in Auditability and Security which is interpreted in Verbal interpretation as Very Good with the mean of four point forty (4.40). In terms of Accuracy the verbal interpretation is Very Good with the mean of four point thirty five (4.35). In terms of Criteria of Completeness the verbal interpretation is Very Good with the mean of four point sixty (4.60) . In terms of Criteria in Communication Commonality, Conciseness, Self-Documentation, Execution Efficiency and Expandability with the mean of four point thirty three (4.33) with the verbal interpretation of Very Good. In terms of criteria in Operability with the mean of four point sixty seven(4.67) with the verbal interpretation of Very Good, Simplicity with the mean of four point forty seven with the verbal interpretation of Very Good. In terms of Traceability with the mean of four point forty two with the verbal interpretation of Very Good.

The result of evaluation using the criteria in McCall's Evaluation. The above mentioned criteria determined the degree to which the research prototype to the standard in terms of its interface, characteristics and control.

DISCUSSION

In this research, the watcher can easily monitor the daily inpatient bill. Accurate and electronically stored medical laboratories and medicine. Visual and auditory generated abnormal test results or other important data. Time intervals of SMS notifications in every watcher account. A digitalized diagnostics test result. Expected the actual treatment costs.

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Android based: hospital billing statement with real time update and SMS notification system is designed for multispecialty hospitals, to cover the wide range of hospital administration and management processes. It is an integrated end to end hospital management system that provides relevant information across the hospital to support effective inpatient billing statements. With this research study it can lessen the hassle of every patient's watcher to go into accounting to ask for a billing statement.

The areas for further investigation are automated needs nursing staff, grams of medicine and time interval by taking the medicine.

CONCLUSION

Based on the findings stated, researchers include that could monitor the patient admission upon arrival with the use of Android based.

Therefore, attention will be placed in future maintainability of the user interface. The android development platform provides a basic framework of developing software components. The decision support service has been developed by clinicians in parallel to the development process. The validated protocol will be implemented into the android based. Policies have been slow to adapt to rapid advances in technology and increased demand for the service . On behalf of patients will ensure that coverage, billing and payment policies rise to the challenge of promoting continued innovation .

REFERENCES

1. **Arduino-Based Speed Limit Detector with SMS Support . Its Applicability and Usability to Traffic Management Unit KT Soberano** https://www.academia.edu/download/57873602/V7l11201828
2. Auto notification service for the student record retrieval system using short message service (SMS) IAS Muhamadi, AA Zaidan, S Raviraja https://www.academia.edu/download/30455880/20090829
3. **A Mobile Android-Based Application for In-hospital Glucose Management in Compliance with the Medical Device Directive for Software** Stephan Spat1 , Bernhard Höll2 , Peter Beck1 , Franco Chiarurgi3 , Vasilis Kontogiannis3 , Manolis Spanakis3 , Dimitris Manousos3 , and Thomas R. Pieber2 1 JOANNEUM RESEARCH Forschungsges.m.b.H., Institute for Biomedicine and Health Sciences, Graz, Austria {stephan.spat,peter.beck}@joanneum.at 2 Medical University of Graz, Department of Internal Medicine, Division of Endocrinology and Nuclear Medicine, Graz, Austria {bernhard.hoell,thomas.pieber}@medunigraz.at 3 Computational Medicine Laboratory, Institute of Computer Science, Foundation for Research and Technology - Hellas, Heraklion, Crete, Greece {chiarugi,vasilisk,spanakis,mandim}@ics.forth.gr
4. **Billing Quality Is Medical Quality Simon** C. Mathews, MD Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland. Martin A. Makary, MD, MPH Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland; and Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland
5. **E –Hospital Management & Hospital Information Systems** – Changing Trends Premkumar Balaraman, Kalpana Kosalram School of Management, SRM University, Vadapalani, Chennai 600026, INDIA premkumar.b@vdp.srmuniv.ac.in,kalpax4@gmail.com
6. Real-time Flood water level monitoring system with SMS notification AN Yumang, CC Paglinawan https://ieeexplore.ieee.org/abstract/document/82694681
7. SMS alert system at NSRRC TS Ueng, ZD Tsai, JC Chang https://ieeexplore.ieee.org/abstract/document/4440225
8. **Telemedicine pays: Billing and coding update** SS Bajowala, J Milosch, C Bansal - Current Allergy and Asthma Reports, 2020 - Springer https://link.springer.com/article/10.1007/s11882-020-00956-y
9. https://en.wikipedia.org/wiki/intergity
10. https://www.sciencedirect.com/topics/engineering/maintainability-#