User Perception Analysis of Medical Information Management System (Medistem)

Ahakonye LAC, Eze UF and Nwakanma IC*

Department of Information Management Technology, Federal University of Technology, Owerri, Imo State, Nigeria

Abstract

Health Information Systems used in the Nigerian National Petroleum Corporation (NNPC) Clinics is restricted to geographical locations and has over the years been implemented to improve the quality of service to staff and dependants of the multinational oil and gas industry. However this system has maintained a level of proficiency but has also constantly received criticisms from the users for shortfalls in certain areas. This therefore calls for an upgrade. Hence, in this paper an attempt is made at analyzing the existing medical information management system to ascertain the need for upgrade. Relative Index Importance (RII) is the statistical tool used to analyze data gotten from primary source. It was discovered that there is need to access patients' medical history (32.14%), casenote (52.22%) and capture medical detail (70.00%) on-site and off-site. Hence the argument of the research is valid and it is strongly recommended that the system be upgraded to accommodate the user requirements and expectations.

Keywords: Medistem; Relative index importance; Nigerian national petroleum corporation

Introduction

Information system is technically a set of interrelated components that collect (or retrieve), process, store and distributes information to support decision [1]. This decision in this tent will represent health. Health information system is a comprehensive and integrated system designed to manage all aspects of hospital operations, such as medical, administrative, financial, maintenance, legal and other related services. These systems are employed in hospitals since their activities are becoming extremely complex with large departments and units that coordinate care for patients.

Statement of the Problem

Most health information management systems are traditional client-server application with discrete implementations installed in different sites or locations. A major shortfall of this implementation is that each site keeps an independent medical records database, which implies that records of staff are only available in one site (zone). This makes inter-site mobility rather difficult. Hence access to medical facility in off-site locations faces a delay in generating health statistics (records). This causes medical professionals engaging in extra work to get patient health history as is the case in the Nigerian National Petroleum Corporation (NNPC).

Objectives of the Study

The general objective is to analyze the users perception of the medical information management system used in NNPC. However, the specific objectives of this are as follows:

1.   To examine the current health information management systems in use in NNPC.

2.   To determine the effect of health information management system in NNPC.

Research Question

Following from the objectivity of this research, this work seeks to proffer answers to the following research questions:

1.   What is the current health information management system in use in NNPC medical zones?

2.   What is the effect of health information management system on medical personnel and patients in NNPC medical zones?

Medistem

Medistem is the trade name of the medical software employed by each of the six medical zones in Nigeria National Petroleum Corporation. It is a relational database application developed for management of hospitals and company staff clinics. The software was developed around a modern hospital and has, therefore, taken into consideration all minute details of activities that may be required in the business of managing modern-day hospitals and clinics. One feature which makes *Medistem* very attractive to users is the fact that it was developed for the Microsoft™ Windows™ environment, a very user-friendly and easy-to-use operating environment which makes computing a delight. It is fully menu-driven with an interface that closely resembles all other Windows applications. As a result, people who are already familiar with the Windows operating environment will need little or no training before becoming power users of *Medistem*. It is a multi-user system designed to run on a local area network (LAN) with all the hospital's data stored in a central database from which all modifications and additions are made by various system users from remote personal computers or terminals. Each user is assigned a security access level which decides what part of the database he has access to as well as what modifications he is allowed (or not allowed) to make to the database. It also has provision for a general system administrator (who may be the head of the hospital if he so pleases or computer support staff). This system administrator has access to all parts of the database and application and it is his duty to assign passwords to users and decide what access level should be assigned to each.

Another important feature of *Medistem* is that it can be used to manage the pharmaceutical records of more than one pharmacy at a time. It could be configured to have a main pharmacy unit connected to several satellite stations, all of whose data could be managed centrally

from the central pharmacy or remotely from their individual locations. It could also be configured to have a main pharmacy store connected to a dispensary store that in turn will be connected to several dispensing units. The application was developed in Power Builder™, and supports a wide variety of relational database management systems (RDBMS), including Oracle versions 7.3.2, 7.3.3, and 7.3.4. This application was developed on Microsoft FoxPro™ and was named Capital Pro ver. 1.0. This software proved to be very successful, and before long, was in use in several other pharmaceutical companies in Lagos and other parts of Nigeria.

Following the success recorded in the sales and use of Capital Pro ver. 1.0, in 1995, and following a request by some Nigerian company-owned hospitals, Capital Pro was modified to handle the activities of the central store and drug dispensing units of company-owned hospitals. The modified application was named Autopharm 2.0. The Nigerian National Petroleum Corporation (NNPC) immediately adopted this for use in its Warri hospital. Again, this proved very successful, and before long, there were requests from other parts of the hospital to have their own share of this very good thing. Resulting from the above developments, a project team comprising of medical practitioners (medical doctors, pharmacist, nurses, etc.), systems development consultants, and very skilled computer programmers and systems integrations experts was set up to design from the scratch, and implement a complete medical information management system for use in company-owned hospitals. The result is MediStem 2000, an industry-standard medical information management system. This system is presently in use in NNPC and Central Benin Nigeria (CBN), State House Clinic and Garki Central Hospital [2].

Research Design

In order to get the perception analysis of the end users, a survey research was carried out. A survey research focuses on people, their beliefs, opinions, attitudes, motivation and behavior through surveys, researchers identify present conditions, prevailing needs as well as providing information on which sound decision are reached [3,4]. Since the needed information is subjective, a survey involving the use of questionnaire was adopted to evaluate the efficiency of the health information management. The population of this study comprises of 110 health workers in NNPC Medical Benin Zone who have been using the medical software in discharging their functions. For convenience, a sample size of 60 respondents was drawn through random sampling from across all medical zones.

Methods of Data Analysis

Descriptive statistics was used to present information relating to the demograph of respondents while mean were used to show health staff perception present software employed. The proposed enhanced web-enabled information management system was analyzed too. The paper employed questionnaires in capturing the required information from health workers that formed the sample. The responses from the questionnaires administered were analyzed using descriptive statistics in particular mean and relative importance index (RII) [5].

N = Total of respondents for each architectural content

Index for each row is gotten thus using the stated formula as follows: $\sum fx/x$

1. System is user friendly = $(1 \times 1)+ (3 \times 2) + (2 \times 3) + (25 \times 4) + (18 \times 5)=203$

Divide by N, where N=49

$\frac{203}{49} = 4.143$

Index = 4.143

Therefore, percentage index is given by index divided by the scale times 100

$= 5 \times x/100 = 4.143$

$X = \frac{4.143 \times 100}{5}$

X = 82.86%

This sequence is followed in computing for 2-13 in Table 1.

Any mean index from 3.75 (75%) to 5 (100%) is adjudged to be better effective and those less than 3.75 (75%) are less effective. This is employed in the analysis. From Table 1, in the design of Medistem, respondents are of the opinion that Medistem is very effective in the following areas: user friendly – 82.86%, Easy of access – 82.00%, consulting – 85.80%, communication with other departments – 84.40%, knowledge of available drugs – 81.60%, Access to laboratory results – 81.60% and reduction in patients wait time – 75.80%. All other features in Medistem are less effective because they have percentage index of less than 75%. Since in the 13-point architectural contents only 6 are effective and 7 are ineffective. This implies that Medistem is not well implemented [6].

Results and Discussion

Characteristic of sample

A total of sixty (60) questionnaires were administered to respondents in Benin Medical Clinic in Edo State. From the distribution fifty (50) were returned and the analysis of findings is represented below as follows:

It can be seen from Table 2, that 60 questionnaires were administered to the target population, of which 49 were returned, which implies a retrieved rate of 83% and subsequently 11 were not returned this implies a non-retrieval rate of 17% [7].

		Frequency	Percentage
Sex	Male	21	42
	Female	29	58
	Total	50	
Age	25-34	14	28
	35-44	32	64
	45-54	4	8
	55-64	-	-
	65-above	-	-
	No responses	-	-

Table 1: Gender and age of respondents.

	Questionnaires	Retrieval Rate (%)	Non-Retrieval Rate (%)
Administered	60		
Returned	49	83	
Non-Returned	11		17

Table 2: Characteristics of sample.

S/N	Medistem Architectural Content	N	Ineffective	Slightly effective	Don't know	Moderately ineffective	Highly effective	Index	% Index
1	Medistem is user friendly	49	(1)1	(2)3	(3)2	(4)25	(5)18	4.143	82.86
2	Has easy access	47	3	4	2	15	24	4.192	82.00
3	Does it consult	44	3	2	1	11	27	4.29	85.80
4	Can you dispense	40	6	6	7	7	14	3.35	67.80
5	Can you communicate with other departments	27	2	1	2	6	16	4.22	84.40
6	Can you know the quantity of available drugs	25	1	-	7	7	10	4.08	81.60
7	Can you access laboratory results	37	1	1	6	9	20	4.16	83.24
8	Medistem reduces patient's wait time	47	2	1	13	18	13	3.79	75.80
9	Improvement in registration	40	1	5	8	16	10	3.63	72.40
10	Can capture all staff details from other zones	38	8	1	5	12	12	3.50	70.00
11	Can retrieve medical staff history of patient's form other zone	18	7	1	5	2	3	2.61	52.22
12	Can access/retrieve casenote easily from within the zones	22	1	1	8	8	4	3.59	71.82
13	Can easily retrieve patient's medical history	28	20	2	4	1	1	1.61	32.14

Source: Author's computation, 2015.

Table 3: Effectiveness of medistem architectural content.

Demography of respondents

From Table 1, 42% of our respondents are male while 58% respondents are female. Interestingly, 64% of the sample is within 35-44 years, 28% are within 25-34 years and only 8% are between 45-54 years.

Health workers perception on the efficiency of medistem

Questions 5 and 6 seek to obtain from the respondents which parts of the software application (architectural content) is more effective and below are their responses as shown in Table 3.

Questions 6,7 and 8 are open ended designed to find out the challenges experienced in the use of Medistem software and the need for an enhanced web-based health information system [8,9]. Generally the challenges encountered in the application of the system are:

• Inability to view or have access to patient's medical records in other locations.

• Power outage a serious issue as it paralyses all the activities.

• Duplication of data between Medistem (electronic) and (hardcopy) casenote and staff jobs functions and privileges.

• Inability of departments to communicate.

Question 9: this provides answer for the need for a web link for all NNPC clinics in Nigeria. All respondents are of the view to web-link their medical operations in the Corporation.

Summary

From the analysis, it was observed that Medistem is a good medical information management system that enables easy consultation, drug dispensing, patient's waiting time, purchase and tracking of medical and non-medical consumables etc. Also that Medistem be upgraded.

Significance of the Study

This research is immensely significant to the NNPC medical, any other large medical facility with more than one branches or locations, state and federal ministries of health, policy makers and stakeholders in the in the country. For the NNPC medical, the findings and results that will be reported will guide the stakeholders of the healthcare facility in deciding whether to embark on the upgrade of the existing system. The authorities of state, federal ministries of health and policy makers will be aided with more valuable insights, reliable guide and empirical support on the effect of an improved system.

Limitation of the Study

A study of this nature requires the study of all medical zones in Nigerian National Petroleum Corporation. However, it is practically impossible because of time constraint. Hence, Benin Medical zone is chosen. Technical problems are envisaged due to poor network system and unstable power supply. Another limiting factor is the respondent's sincerity in answering questionnaires administered on them.

Conclusion

Computerization of all health institutions is necessary to achieve the elimination of manual processes, duplication and documentation of health records. This will also go a long way in minimizing error in medical information. It also has many benefits that can be harnessed such as no more tedious and time-consuming manual calculations, fast & accurate financial, medical and stock reports. Instant detection of fraudulent practices,

Recommendations

It is highly recommended that Government should be involved in the deployment of ICT infrastructures in hospitals due to its capital base and also invest in the power sector to ensure adequate steady power supply. It is strongly recommended that health institutions should upgrade or deploy such systems to improve the efficiency and service excellence.

References

1. Laudon KC, Laudon JP (1998) Management information systems (new approaches to organisation and technology) (5th edn.), Prentice Hall, Inc. Upper Saddle River, New Jersey.

2. Anosike D, Urum M (2005) Delivering high quality technology solutions to health institutions.

3. Eheduru GC, Okafor FC (2002) Introduction to research methods. University of Benin, AmiDei Computers Ugbowo, Benin City, Edo State, Nigeria.

4. Osuala EC (2001) Introduction to research methodology. Africana-FEP Publishers.

5. Agbonifo BA, Yomere GO (2002) Research methodology in the social science and education. Uniben Press, University of Benin, Benin City, Edo State, Nigeria.

6. Doolin B (2004) Power and resistance in the implementation of a medical management information system. Info Systems J 14: 343-362.

7. Cote RA, Robboy S (1980) Progress in medical information management systematized nomenclature of medicine (SNOMED). JAMA 243: 756-762.

8. Goldschmidt PG (2005) HIT and MIS: Implications of health information technology and medical information systems. Communications of the ACM 48: 68-74.

9. Barnett GO, Winickoff R, Dorsey JL, Morgan MM, Lurie RS (1978) Quality assurance through automated monitoring and concurrent feedback using a computer-based medical information system. Medical Care 16: 962-970.