An Integrated Health Management System for National Health Insurance Scheme in Nigeria

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ABSTRACT

The National Health Insurance Scheme (NHIS) in Nigeria is faced with diverse challenges due to the manual method of operations among the various stakeholders. The paper-based methods/processes system used have resulted in a lack of effective connectivity among the major stakeholders in the scheme and this has led to a number of problems such as delay of registration and update, corruption in the manipulation of patient data and fee payment, duplication and misrepresentation of data, delay in the delivery of reports and long waiting period in accessing quality health care due to delay in obtaining clearance. This research therefore designed a system to integrate the various processes of the major stakeholders in the scheme into a single process. With the development of the system, the entire processes become very transparent, time is gained and duplication and misrepresentation of data becomes eradicated. The system developed was furthermore tested by 80 members of the stakeholder using five (5) parameters; utility, accuracy, timeliness, user-friendliness and responsiveness. The joint analysis of the stakeholders, among the five (5) parameters shows that there is no stakeholder with a percentage level lower than 85%. This in turn shows that the system is accepted among the stakeholders giving a high usefulness level of the system.

Keywords: National health insurance scheme, health facility, health maintenance organization, enrollee, integrated health management system.

1. INTRODUCTION

There is empirical evidence that the health of a nation significantly enhances its economic development. The way a country finances its health care system is a key determinant of the health of its citizenry (Olakunde, 2012). The health sector in any country has been recognized as the primary engine of growth and development. But despite the laudable contributions of the health sector to economic development, the Nigerian health sector has witnessed various turbulence that has negatively reversed the progress recorded at various times (Obansa and Akinnagbe, 2013). Accessibility to healthcare at affordable cost constitutes a high profile challenge in Nigeria (Agbae et al., 2010). Universal Healthcare Coverage (UHC) has been difficult to achieve in many developing countries, with large populations remaining over-reliant on direct out-of-pocket expenses that include over-the-counter payments for medicines and fees for consultations and procedures (Odeyemi, 2014). Today’s health care systems are different from the health care systems in the past, affordable and successful health care operations have to eliminate all waste and inefficiency from the health care delivery system. Thus, health is not only a human rights issue, but also a key driver of wealth creation, and ultimately of national development (Owusu-Sekyere and Bagah, 2014).

According to Carapinha et al., 2011, healthcare coverage can increase access to care and protect households from the detrimental economic effects of ill-health. A healthy population and indeed work force are indispensable tools for rapid socio-economic and sustainable development the world over (Agbae et al., 2010). Despite the various options of healthcare financing being identified in Nigeria, there is still a wide gap in the way health financing is being handled among the various categories/levels of people. These options ranges from fees for service to private insurance, general taxation, social insurance, community financing, loans and grants. In Nigeria, combinations of all these in different proportions have been practiced for decades. The most basic form of health care financing is that of fees for service, where a fee is charged to cover all or part of the cost of the service provided (Onyedibe et al., 2012).

Olaniyan & Lawanson, 2010 observed that lack of access to quality health care by the poor, severe budgetary constraints, uneven distribution of resources among the urban and rural areas, as well as across the geographical regions of the country, inequitable financial system results in increasing dependency on out-of-pocket spending with the rural areas, mostly affected by inequitable budgetary health expenditure allocation. Government wants to ensure that the full benefit of healthcare is available to all the citizenry at all levels. These benefits incudes access to good healthcare services to every Nigerian, protection of families from financial hardship of huge medical bills, limit the rise in the cost of healthcare services, ensure equitable cost of health care costs among different income groups, maintain high standard of healthcare delivery services, ensure efficiency in healthcare services, ensure equitable distribution of health facilities within the Federation, ensure appropriate patronage of all levels of healthcare and availability of funds to the health sector for improved services. To this effect, the Nigerian government is faced with various challenges in form of a stagnant
monocultural economy that depends on crude oil as a single export commodity, a rapid population growth, political instability and high rate of unemployment. Hence, the government cannot afford to commit enough money to the health sector which is now faced with the consequence of underfunding leading to decreased efficiency, decreased quality/quantity of service, diminished confidence in public sector health facilities and poor maintenance of equipment (Adesina, 2009). The Government has seen health care delivery as her responsibility to the citizens and thus a means of providing quality health care services is needed. An alternative source of health financing is thus inevitable if vital health indices in Nigeria will not continue to deteriorate; hence the evolution of the National Health Insurance Scheme in Nigeria.

The NHIS is a scheme designed to make the populace indirectly save towards unforeseen health challenges. It is a social health security system where the health of employees in the formal sector is paid for from funds pooled together through the contributions of employees and employers (Agbo & Okoh, 2014). It has however become increasingly clear that the reform in the country is to contribute meaningfully to the nation’s healthcare system and to be felt by the majority of the population (Omoruan et al., 2009). Health care provision in Nigeria is a concurrent responsibility of the three tiers of government, (Federal, States and Local Governments) in the country. However, because Nigeria operates a mixed economy, private providers of health care have a visible role to play in health care delivery (Igodan and Ukaoha, 2012). The Federal Government coordinates the affairs of the Teaching hospitals and the Federal Medical Centres (Tertiary Health Care), the State Government takes care of the General Hospitals and the Local Government manages the dispensaries (Primary Health Care).

The NHIS on the other hand is experiencing some major challenges in the day-to-day operations and processes of information which has resulted to a lack of effective connectivity among the major stakeholders in the scheme and this has led to a number of problems such as delay of registration and update, corruption in the manipulation of patient data and fee payment, duplication and misrepresentation of data, delay in the delivery of reports and long waiting period in accessing quality health care due to delay in obtaining clearance.

The use of Information Technology (IT) in solving some of these inherent problems in the healthcare sector cannot be overemphasized. According to Manish and Jyotip (2010), IT plays a core role in almost every core area of health sector. Such as providing quality services to the patients at reduced cost, maintaining patient history, providing referral and pre-certification services, case management, digital imaging of paper forms or generating Electronic Medical Records (EMRs) for speedy and accurate processing of information. Korpela et al., (2002) zoomed into an information system project facilitating medical records-keeping by new computer-based means, so that the latter can facilitate patient care, health education and management by better reports. IT indeed is playing a commendable role in the healthcare industry. Olaniyi & Lawanson, 2010 stated that developing countries are slow adopters of new technologies, particularly with regards to the health services of these countries. Nigeria in particular has a long way to go in respect to this subject. Today ICT embraces the literates and illiterates who use different technologies without reading and writing so far they are numbers.

As healthcare reform in Nigeria economy continues to present various challenges, innovative and advancements in healthcare, IT will provide the way out to ensuring compliance with the new legal requirements and in turn reducing costs and improving patient care. The inherent challenges faced in the paper-based methods/processes system being used have resulted in a lack of effective connectivity among the major stakeholders in the scheme and this has led to a number of problems such as delay of registration and update, corruption in the manipulation of patient data and fee payment, duplication and misrepresentation of data, delay in the delivery of reports and long waiting period in accessing quality health care due to delay in obtaining clearance. With this view in mind, this paper-based processes being adopted by the NHIS need to be looked into. The inherent challenges leading to the slow implementation of the scheme is being addressed in this work with the use of IT. This was achieved by integrating the processes of four major stakeholders in the scheme. These stakeholders include; Enrolee, Health Facility (HF), Health Maintenance Organization (HMO) and NHIS. The related works reviewed is presented in the second section, section three discusses the existing system, the Integrated Health Management System (IHMS) is discussed in section four, section five covers the result and the discussion of result follows in section six. The last section concludes and discusses the future work.

2. RELATED WORKS
To our knowledge, almost no published information exists on the scope of integrated health insurance management system where different stakeholders processes are built together into a single system. Preliminary researches have covered Electronic Health Record (EHR) systems and Health Insurance System.

A recently completed study by Abasset, Al., 2015 introduced a cloud based health insurance plan recommendation system to facilitate the purchase of health insurance by comparing different insurance plans in terms
of price, coverage benefits and quality. A cloud based framework was proposed to offer personalized recommendations about the health insurance plans. Multi-attribute Utility Theory (MAUT) was used to help users compare different health insurance plans based on coverage and cost criteria, such as: (a) premium, (b) co-pay, (c) deductibles, (d) co-insurance, and (e) maximum benefit offered by a plan. To overcome the issues arising possibly due to the heterogeneous data formats and different plan representations across the providers, a standardized representation was done for the health insurance plans. The plan information of each of the providers is retrieved using the Data as a Service (DaaS). The framework is implemented as Software as a Service (SaaS) to offer customized recommendations by applying a ranking technique for the identified plans according to the user specified criteria. Figure 1 shows the Cloud based health insurance recommendation system architecture.

![Figure 1: Cloud based health insurance recommendation system architecture.](image)

The work of Young et al., 2012 presented a study that evaluated the qualitative and quantitative performances of a newly developed information system which was implemented on November 4, 2011 at the National Health Insurance Corporation Ilsan Hospital. Registration waiting time and changes in the satisfaction scores for the key performance indicators (KPI) before and after the introduction of the system were compared; and the economic effects of the system were analyzed by using the information economics approach. After the introduction of the system, the waiting time for registration was reduced by 20%, and the waiting time at the internal medicine department was reduced by 15%. The benefit-to-cost ratio was increased to 1.34 when all intangible benefits were included in the economic analysis. The registration waiting time can further be reduced to improve the quality of services provided in the health sector.

The work of Mansi et al., 2010 designed a Hospital Management System which tries to eradicate the paper-based processes and streamlines operations in India. The Software is for the automation of Hospital Management maintaining two categories of users: Administrator and End user. The Software includes maintaining patient details, providing prescription, precautions and diet advice, providing and maintaining all kinds of tests for a patient and billing and report generation. The reason for the development of this system includes; lack of immediate retrievals, lack of immediate information storage, lack of prompt updating, error prone manual calculation and preparation of accurate and prompt reports. The software takes care of all the requirements of an average hospital and is capable of providing easy and effective storage of information related to patients that come up to the hospital. It generates test reports; provide prescription details including various tests, diet advice, and medicines prescribed to patient by the attending doctor. It also provides injection details and billing facility on the basis of patient’s status whether it is an indoor or outdoor patient. All these are done within the different departments of the hospital alone. There is no provision for other health sector stakeholders’ processes to be integrated into the system.

It is therefore essential and beneficial to create a paperless, easy-to-use, timely, accurate, responsive and streamlined online system to integrate the activities of the major stakeholders in the NHIS in a bid to ensure faster and easier access to quality health care. With this system, implementation of NHIS in Nigeria will improve tremendously thereby ensuring access to quality health care to every Nigerian which is the major goal of NHIS.

In this work, the operations of the four (4) stakeholders are integrated into a single system which makes communication and flow of information timely, easy and accurate. The four (4) stakeholders includes; enrollees, Health Facilities (HF), Health Maintenance Organizations (HMO) and National Health Insurance Scheme (NHIS).

3. THE EXISTING SYSTEM

In this section the general overview of the existing system will be discussed alongside the problems, impact and processes of the system.

3.1 General Overview

There are several stakeholders involved in the processes of National Health Insurance scheme. These include NHIS, Health Maintenance Organization (HMO), Health Facilities (HF), Enrolees, Insurance Companies, Insurance Brokers and Banks. The processes of only four
(enrolee, HF, HMO and NHIS) of these stakeholders will be considered in this research. The enrolee also called the beneficiary is the person who has enrolled (or have been enrolled) with NHIS and who by being up to date with payment of premium (or having been paid for) is entitled to cover by NHIS, the HMO is a private or public incorporated company registered by the NHIS solely to manage the provision of health care services through Health Care Providers accredited by the Scheme while the HF are primary, secondary and tertiary healthcare facilities that are licensed/credited by relevant authorities to provide services to the populace. The enrolees register with the HMO, HMO allocates HF to these enrolees and the NHIS manages all the activities all the stakeholders to ensure delivery of good healthcare services.

3.2 Problems and their Impact

The existing system used among the major stakeholders of NHIS identified is a paper-based methods/processes that have resulted in a lack of effective connectivity among the major stakeholders in the scheme. This has led to a number of problems such as delay of registration and update, corruption in the manipulation of patient data and fee payment, duplication and misrepresentation of data, delay in the delivery of reports and long waiting period in accessing quality health care due to delay in obtaining clearance.

a. Delay of Registration and Update

The registration process is often too slow as new enrolees are given an official processing/waiting period of 60 to 90 days but which most times exceeds the period given. The registration/update forms will be collated from local offices to national office in Abuja where all the forms will be scanned into the database. During this period, the enrolees will be unable to access the health care until the process of registration/update is completed. Enrolees will have to keep checking with the HMO to know when the registration process is completed. It is until this is achieved that registration can be processed for a participant’s accessibility to quality health services. Also, in some cases, some forms are discovered to be misplaced or missing in which the beneficiary after waiting for so long will have to fill another form.

b. Corruption in the Manipulation of Patient Data and Fee Payment

Most times after treatment has been given to the beneficiary, an empty form is presented to him/her to sign on after which the health providers will fill the details of the treatment given and the cost of the treatment. The beneficiary who has just signed an empty form will not know what will eventually be filled in the treatment form for him or her. The health providers will fill in any form of treatment which will give the facility enough money per time. Likewise, if the beneficiary is on admission, the days stayed in the hospital can be manipulated on the form in a bid to earn more money on the beneficiary. Even tests not conducted and treatment not given can be included on the form.

c. Duplication and Misrepresentation of Data

In the process of misplacement of forms, beneficiary is requested to fill another form and the new form is sent for scanning into the database. Thereafter when the missing form is found, the form is still sent again to the national office not knowing that the beneficiary has already filled another form. This causes duplication of data in the system and as such redundancy occurs. Also, the details of one beneficiary reside with the HF, HMO and NHIS. If the beneficiary changes HF or even HMO, the details are duplicated again with the new HF and HMO. During the scanning of the forms into the system, some of the details are misrepresented by the system. It is whatever the scanner can pick that it saves. For example, letter ‘s’ can be misrepresented as figure ‘5’ and so on.

d. Delay in the Delivery of Reports

The HF and the HMO are required to render weekly, monthly and quarterly reports to the NHIS. The reports are first collated at the local offices and sent to the zonal offices, thereafter to the national offices. In the process of these collations, some of the reports are missed up, misplaced or entirely missing. Also, the reports do not get to the national office in time due to the long process of sending from one location to the other.

These inherent problems have resulted in long waiting period in accessing quality health care, delay in decision making, slow communication rate among the stakeholders and eventually in a slow implementation of the scheme in Nigeria.

3.3 Process

It is impossible to specify the usefulness of designing a system for NHIS without first studying the existing system. This is done by defining who the intended users of the system are, the operations performed, how these operations are performed, and in particular the acceptability of the system by the user. This information then forms a basis for the development of a more reliable, useful and acceptable model for NHIS with a view to allow for a systematic delivery of healthcare services to the users.

The relationships among the aforementioned stakeholders in the existing system are practically manual. The interconnections of these processes from one stakeholder to the other are paper based and thus constitute problems in the interaction and processes involving these stakeholders. These major processes are further described:
a. Enrollee Registration Process
When a new staff is to be enrolled in the scheme, the HMO assigned to the staff gives the registration form to be filled. The forms filled by the different enrollees are collated by the HMO and sent to the NHIS Local office assigned to the HMO. The NHIS Local office collates forms from different HMOs and sends them to the NHIS Regional office. The same process takes place by collating all the forms received from the different NHIS Local office and sent to the NHIS National office. The forms are then scanned one after the other and stored in the database. The stored information is known as the digitized information. This digitized information is sent in form of excel sheets to the NHIS Regional offices which then sends downwards until they reach the HFs.

b. Enrollee Complaint Process
The enrollees have the opportunity of expressing their dissatisfaction about any of the services they are not satisfied with. For this to be done, he/she gets the complaints form from the NHIS Local office, fills and submits the form. The complaint forms submitted are collated and sent to the NHIS Regional office and NHIS Regional office collates all the forms received from NHIS Local office and sends to the NHIS National office. These forms are then attended to one after the other with resolutions noted. Resolutions are then collated and sent back down the line. The challenge here is that the enrollees will need to keep checking the NHIS local offices to check if the complaint has been addressed. At times, the enrollees checks becomes endless as the feedbacks take a long time before getting to the complainants or may never even get back to them. These response forms might have actually been sent but misplaced in transit. Some of these forms even get misplaced at the various collation and delivery centres.

c. Enrollee Change of Registration Data Process
Change is bound to happen. There are cases when enrollee wants to effect some of these changes in their data residing with the NHIS. Such change can be in their names, addition or deletion of dependants, residential address, place of work, health history, phone number, email address, marital status, Health Provider, etc. The enrollees visit the NHIS local to collect, fill and submit the form. These forms are collated from different enrollees and weekly sent to NHIS Zonal. The Zonal collates the forms collected from different NHIS local offices and sends them to the NHIS national. The nation scans each of these forms into the system overwriting the existing detail had in the database for each of the enrollees. The updated data and their ID cards are then sent back to the concerned NHIS Zonal offices in spreadsheets. NHIS Zonal sends to the various NHIS local offices and the latter sends to the HMOs concerned. The HMOs in turn sends then excel sheets to the HFs where those enrollees are registered and the ID cards are taken to the enrollees.

d. Report Delivery Process
Both the HMOs and the HFs are expected to submit their reports to the NHIS. Likewise, NHIS send reports to the HFs through the HMOs. These reports are sent weekly, monthly, yearly and quarterly. The HMO sends to the NHIS information on registration of new enrollees, enrollee data update, financial returns and quality assurance returns. The HFs sends to the HMOs information on the patients treated who are under a particular HMO, hospital attendance register and copies of prescriptions and referrals issued. The NHIS also sends to the HFs through the HMOs the detailed enrollee registration list per quarter. These reports are usually delayed and mixed up at collation points. This is what brings about the waiting period of 90 days patients experience in accessing quality healthcare services. For the reports of the HFs going to the NHIS, the various HFs sends to their corresponding HMOs, the HMOs collates all the reports from the HFs and send to the NHIS local offices. The NHIS local offices collate from different HMOs and send to the NHIS Zonal offices. The NHIS Zonal offices collate all reports received from their NHIS local offices and send to the NHIS national office. Figure 2 depicts the flow of processes and the relationship described above among the four (4) stakeholders.
4. INTEGRATED HEALTH MANAGEMENT SYSTEM

The proposed model is limited to four (4) major stakeholders as shown in Figure 3. These stakeholders include; National Health Insurance Scheme (NHIS), Health Maintenance Organization (HMO), Health Facility (HF), and Enrolee.

The process is initiated by the enrolee creating an account for registration. This is done by creating a username and password for subsequent activities or processes. With this account creation, the user can then log in and fill the bio-data form which comprises of the enrolee’s details and his/her dependants. Also, passport photographs are uploaded for the enrolees during registration. As soon as the form is submitted, the data goes into the database of the Integrated Health Management System (IHMS) and the NHIS is notified through a memo to show that an enrolee registration approval is waiting. Once the payment of premium is confirmed, the registration form is approved. The information of such an enrolee can be viewed by the HMO and HF approved for that particular enrolee. Enrolees can also fill complaint and change of provider forms. When these forms are filled, it goes into the database and NHIS is notified through a memo of such request. Response is sent to the enrolees by the NHIS on the system of the resolution of the complaint. Likewise for the HMO and HF registration, once the forms are filled and supporting documents are uploaded, it goes to the database and subjected to approval by NHIS. An automated memo is generated by the application to notify the NHIS that HMO or HF approval is waiting. After approval, memo is sent back to the HMO or HF that the registration is approved or not approved. HMOs and HFs report can be viewed by the NHIS via the system. There will be no reason for HF to send their reports through the HMOs again. NHIS reports are online-real time as any addition or deletion of any of the stakeholders is instantaneous after approval has been granted.

Before any NHIS staff can log into the system, he/she must have had an account created by the Admin sector of the NHIS. The sector is embedded in the NHIS at the National level. The sector is qualified to create or delete NHIS users on the system.
4.1 System Design

The model to be implemented is designed using Unified Modeling Language (UML) tools. The UML tools used were: the sequence, the activity and the use case diagrams. The Sequence diagrams depict how objects interact with each other via messages. They illustrate how messages are sent and received between objects and in what sequence. The objects identified in the system includes; Enrolee, Health Facility, HMO and NHIS. They interact in the sequence shown in figure 4.

The activity diagram is used to depict the sequential flow of activities of either a business process or a use case. They are also used to model actions that will be performed when an operation is being executed as well as the results of those actions. Figure 5 shows the sequential flow of activities among these objects.

5. RESULT

This paper reveals the theoretical background and challenges inherent in the paper based method of NHIS processes. It designed and implemented an integrated health insurance management system which serves as a solution to the inherent problems analyzed in the manual system.

On implementation of the developed system, the use of questionnaire was employed in the testing of the system. The responses obtained from the survey were analyzed and the result of the questionnaire was equally used in evaluating the system. The system was evaluated using questionnaire method by 80 supposed users of the system. These users were carefully selected to cut across the 4 major stakeholders i.e. Enrolees, HFs, HMOs and the NHIS. The questionnaire consists of 25 questions sectioned into 5 and each was to cover a particular parameter to be measured. These parameters include Utility, Accuracy, User-friendliness, Responsiveness and Timeliness. Questions 1 – 6 was to test the Utility, 7 – 10 for Accuracy, 11 – 18 for Timeliness (each stakeholder has only 2 questions to answer from this section), 19 – 22 for User-friendliness and 23 – 25 for Responsiveness. The options in each of the questions have 5 options ranging from A to E.

The questionnaire was analyzed using the Mean Opinion Score (MOS). From the responses from the questionnaires designed, the options to the questions which are from A to E were put on a scale of 5 to 1 i.e. A represents 5, B represents 4, C represents 3, D represents 2 and E represents 1. Here, 5 is the best option, 1 is the worst option and 3 means indifference/undecided. For each of the question answered by the user, the option picked was represented by the equivalent number. The sum of value (by the 20 respondents in each category of stakeholder) for each of the question was got and was divided by the number of responses to get the mean for each question i.e.

\[
Q_1 \text{ Mean } = \frac{\text{Sum of Values from } Q1}{20} \quad (1)
\]
Figure 4: Sequence diagram for the model.

To get the mean for each of the parameters measured, the sum of mean from the questions under each parameter is divided by the number of question under the parameter.

i.e.

- Average Utility = \[
\frac{Q_1 \text{Mean} + Q_2 \text{Mean} + Q_3 \text{Mean} + Q_4 \text{Mean} + Q_5 \text{Mean} + Q_6 \text{Mean}}{6}
\] (4)

- Average Accuracy = \[
\frac{Q_7 \text{Mean} + Q_8 \text{Mean} + Q_9 \text{Mean} + Q_{10} \text{Mean}}{4}
\] (5)

\[
\begin{align*}
Q_2 \text{ Mean} &= \frac{\text{Sum of Values from Q1}}{20} \quad (2) \\
Q_{26} \text{ Mean} &= \frac{\text{Sum of Values from Q1}}{20} \quad (3)
\end{align*}
\]

Figure 5: Activity diagram of the model.

Average Timeliness =
\[
\frac{Q_{11} \text{Mean} + Q_{12} \text{Mean} + Q_{13} \text{Mean} + Q_{14} \text{Mean} + Q_{15} \text{Mean} + Q_{16} \text{Mean} + Q_{17} \text{Mean} + Q_{18} \text{Mean}}{8}
\] (6)
Average Responsiveness = 
\[ Q_{10} \text{Mean} + Q_{20} \text{Mean} + Q_{21} \text{Mean} + Q_{22} \text{Mean} \]
\[ \frac{4}{4} \]  
(7)

Average User-friendliness = 
\[ Q_{23} \text{Mean} + Q_{24} \text{Mean} + Q_{25} \text{Mean} + Q_{26} \text{Mean} \]
\[ \frac{4}{4} \]  
(8)

This was done for the 20 supposed users in each category of stakeholders. Thus, the tables representing the analysis for the four (4) stakeholders are presented in Appendix E.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>MEAN (%)</th>
<th>Enrolees</th>
<th>HFs</th>
<th>HMOs</th>
<th>NHIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility</td>
<td>84.6</td>
<td>92.8</td>
<td>92</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>88</td>
<td>92.2</td>
<td>86.6</td>
<td>85.8</td>
<td></td>
</tr>
<tr>
<td>Timeliness</td>
<td>92</td>
<td>91.6</td>
<td>92.6</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>User friendliness</td>
<td>83.8</td>
<td>88.2</td>
<td>85.6</td>
<td>84.6</td>
<td></td>
</tr>
<tr>
<td>Responsiveness</td>
<td>85</td>
<td>85.6</td>
<td>85.4</td>
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</tr>
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</table>

<table>
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<tr>
<th>Parameters</th>
<th>MEAN (%)</th>
<th>Enrolees</th>
<th>HFs</th>
<th>HMOs</th>
<th>NHIS</th>
</tr>
</thead>
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<tr>
<td>Utility</td>
<td>86.2</td>
<td>92.8</td>
<td>92</td>
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<tr>
<td>Accuracy</td>
<td>88.2</td>
<td>92.2</td>
<td>86.6</td>
<td>85.8</td>
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<tr>
<td>Timeliness</td>
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<td>92.6</td>
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<tr>
<td>Responsiveness</td>
<td>85.4</td>
<td>85.6</td>
<td>85.4</td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

6. DISCUSSION OF RESULT

On the analysis of the questionnaire, it shows that the view of all the stakeholders varies in their opinion on using the system. This has made the system to have different levels of general acceptability. For the factors; Utility, Accuracy, User-friendliness and Responsiveness, the HF has the highest percentage among the 4 stakeholders. This shows that the system is better accepted by the HF users than the rest of the other stakeholders.

The result on the level of Timeliness shows that the HMO with a percentage level of 92.6 % has the highest level of Timeliness while the HF users with a percentage level of 91.6 % comes with a close second. This shows that the HMO’s take less period of time to complete their task. On the aspect of the other four (4) parameters, the HF has the highest percentage level of 92.8 %, while the HMO users have the lowest level of 82 %. This shows that the HF users, finds it more usable, accurate, user-friendly, and responsiveness than the other 3 stakeholders. From this analysis it is believed that when this system is deployed for general use by all the stakeholders, the acceptability level
among the HF users may likely be higher than that of the other 3 stakeholders.

Looking at the joint analysis of the four stakeholders, among the 5 parameters there is no stakeholder with a percentage level lower than 85%. This shows that the utility, accuracy, timeliness, user-friendliness and responsiveness of the system are well accepted among them giving a high usefulness level of the system. Thus at the final deployment of the system, the acceptability of the system will not be over emphasized and as such the fear of users' sabotage of the system will be reduced. Hence, a willingness to use the system is achieved.

7. CONCLUSION AND FURTHER WORK

In this research, an Integrated Health Management System for National Health insurance Scheme in Nigeria was developed. The study was limited to four stakeholders; Enrolees, Health Facilities, HMOs and NHIS. The existing system which is basically a manual system for integrating the processes of these aforementioned stakeholders was studied and a workflow process was designed to elicit information for its requirement. The developed system addressed the time consuming and delay problems among others by reducing the turn-around time of enrollee's access to quality health care with the NHIS. Also security and accuracy of patient's record is greatly improved, which in turn will improve the overall performance of the scheme. Result confirmed that the stakeholders find the system highly useable, accurate, timely, user-friendly and responsive.

Integration of Health Management System developed took into consideration only four stakeholders i.e. Enrolees, HMOs, Health Facilities and NHIS. Further research area can include processes of some other stakeholders who are equally very important in this scheme such as the Banking sector, Insurance Companies, the Federal, State and Local Government, Private organizations, etc.

Also, this research could not cover the billing system i.e. online payments of premiums and capititation. Incorporating the banks will surely make this a possibility. Hence, a billing system within this Integrated Health Management System is highly recommended.

The assumption in this work is that everyone is literate. Further research areas may include or consider the illiterates.

BIBLIOGRAPHY

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