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Children Vaccination Reminder SMS Alert System

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ABSTRACT

This system presents a model for children vaccination reminder using short message services. The main objective of child care safety is sending a reminder about the childhood vaccination schedule. It is a general saying that prevention is always better then cure. Vaccines protect people from catching specific diseases. Vaccines also help to prevent the spread of infectious diseases in the country. Some of the diseases are polio, whooping cough, diphtheria, measles, rubella etc…In the existing system, the vaccination schedule is via written appointment. Nevertheless, such an approach may not be sufficient as parents may forget due to a tight work schedule and daily routines. In the proposed system, this app is helpful to show overall vaccine schedule details, the user can search injection location through this app. First, parents who decided to use the system will register. The registration is done by particular health centers. The information on the parents and child will be stored. The remainder system is an important service to send an alert message about child injection before injection date, and it contains the name of the child, type of vaccines, date, and name of the health center. The important diseases injection like polio, rubella injection date is sent to the parent's registered mobile number.

Keywords: Polio Vaccination, Reminder System, Measles, Vaccination, Diphtheria.

I. INTRODUCTION

Prevention of disease is the key to public health. It is a general saying that "prevention is always better than cure". Vaccines protect people from catching specific diseases. Vaccines also help preventing the Spread of infectious diseases in the country. Such diseases include polio, whooping cough, diphtheria, measles, rubella (German measles), mumps, Hemophilic influenza type b (Hib) and tetanus. Reminder systems have been in use for several decades, except for the more sophisticated computerized phone reminder systems, and are not complex either to initiate or to operate. Reminder systems can work through a variety of mechanisms meant to prompt the patient, including phone calls. Short message service (SMS) is an important and useful service included in mobile phones. It is offered in all types of mobile phones as it is easy to use and can operate with minimal cost. The child care safety is the care and supervision of child vaccine and treatment details. It is supervision of a child or multiple children at a time, whose ages range from six weeks to thirteen years. This Child Care application will be like in an online vaccine management and appointment to doctor and service provider with easy to use customizable options. The application is accessible from anywhere for private or at desktops or tablets etc. it will basically lessen the manual work and improves the quality of maintaining records and other information related to vaccine, treatment to children, appointment and remainder. It reduces time frame in adding any info related to children treatment and thereby reduce the complexity too. The Main motive of this application to provide seamless child care safety system wherein children info can be maintained in a secure way and also handle scheduling, treatment details given by doctor to children. One of the solutions that we are going to discuss here to speed up the database response by using SQL Server database and to reduce the time complexity by using multi-user environment. Multi-user environment reduces burden with effortless maintenance.

II. LITERATURE REVIEW

In ,K. Obahiagbon, et al, made a study and demonstrated the gains of improving effective immunization coverage in developing country like Nigeria through mobile remote monitory. It was glaring that remote monitoring will help improve better health care delivery towards meeting the yearning of citizens who cannot easily access health institutions because of distance, and limited health care providers. During critical situation, the patient's location can be geo-located using the address supplied by the users. Also, special health SMS alert are instantly sent by the EMR based on the age of user supplied during remote monitoring from the RUI. The system is an interactive expert system that provides a more precise solution that will address immunization coverage problems,

by maintaining a centralized database that track the progress of immunization schedule and inform physicians of current health condition of patient as regards to evidence provided from physiologic data remotely sent via the RUI. Childhood vaccination against common childhood vaccine preventable illnesses such as Measles, Whooping cough and Polio (poliomyelitis) can be identified and patient (child) can properly book an appointment to see a doctor. A system of this magnitude should be introduced into Nigeria general health care system (hospitals, clinics, maternity) to help ease the work of physicians and combat childhood preventable illnesses and death.

In ,Kamal Karkonasasi, et al, proposed a model of their study was tested using data collected from self-directed questionnaires filled up by 70 nurses in government hospitals and government clinics in Malaysia. A research method, which is based on the multi-analytical approach of Multiple Regression Analysis and Artificial Neural Networks, helps to refine the results of this study. The compatibility of the proposed system only has a significant and positive effect on attitude to use the system among other factors. Moreover, health centers intention was to use the system as further influenced by their perceived usefulness than their attitude to use. The mediating effect of Attitude is also proved. However, there is not any statistically significant difference in Intention scores accounting for the participants' demographic characteristics.

In 2007, Vivian H. Alfonso, et al, made an analysis of health survey data from DHS 2007 and 2013–2014, they assessed the changes in vaccination status among young children between 12 and 59 months of age in the DRC. Overall, improvements in vaccination coverage were observed over time: 26% compared to 44% of 12 to 59 month-olds were fully vaccinated in 2007 and 2013–2014, respectively. The biggest gains in coverage of individual vaccines were seen in OPV1-3, from 47% in 2007 to 66% in 2013–2014, and yellow fever, from 53% in 2007 to 70% in 2013–2014. This coverage was higher than some other developing nations such as Nigeria, where 23% of children were fully vaccinated in 2016,but comparable to others such as India, where 43% of children were fully vaccinated in 2016. However, source of vaccination information and method of assessment is important for the interpretation of results because large discrepancies in vaccination estimates exist. In 2014, DTP3 coverage in DRC was estimated as 61%, 80% and 93% according to DHS, WHO/UNICEF and country official administrative estimates, respectively. Only 17% of all children in this analysis presented their vaccination card at interview and reliance on maternal recall increased with child age, with a decrease in those presenting cards in the 2013–2014 DHS. Though information obtained from older children may be less accurate due to the lack of documentation and maternal recall, limiting analyses to the youngest age group (12–23month-olds) produced the same findings as for the whole sample.

In 2020, SourabhShastri, et al, explored the reasons why new born babies missed immunization schedules. In the result, they have reviewed that the reasons for missing immunization are bad health of children, parent's knowledge of immunization, family size, household income, place of delivery, high birth rate, low education status of mother etc. The factors for full immunization discovered in the papers were children whose parents are educated, children of parents who has a service holder, current age of respondents whose age is 21-30 years, highest education level, drinking water from tube well and who comes from better economic status households. Some researchers proposed conceptual frameworks using ICT to improve the process of child immunization while others examined by applying statistical and data mining techniques on immunization data to understand the differentials and changes in child immunization. The Government of India has launched the mission Indradhanush to immunize all children and pregnant women by 2020 under universal immunization programme. The Government of Rajasthan facilitated PCTS web based application for tracking pregnant women and children for providing services.

In, SantoshiKumari, et al, proposed a system with an idea of providing a common platform to store and retrieve medical records of child with mandatory vaccination schedule details to start with as the child mortality rate due to vaccine preventable diseases are significantly high in numbers. As the mobile and internet technology continuous to evolve rapidly, regular alerts to parents for providing timely vaccination to their child/children for giving protection from vaccine preventable diseases are implemented using SMS and E-Mail messages. The facility to view previous medical records can help in speedy diagnoses and action. Data storage on cloud platform in future can enable this cloud enabled technology. Integration to big data can further help find patterns. Based on the collection of all the children data on vaccination and medical history, new medical learnings and findings can also be explored. New trends and patterns of various diseases can also be studied by applying various advanced technologies such as data analytics, predictive analytics and artificial intelligence techniques. This will help in giving better treatment and quality services and avoiding carrying of paper work for medical checkups. Their work can further be extended not only to children but elderly also. Through leveraging IT in healthcare technologies, the quality of lives can be increased in future.

In, S Joselena Percy Jehane, et al, presented a software application named Child Immunization Tracker.

Here they register every child being born in a particular area along with the parent details by using their biometrics. They track the child for every immunization scheduled by alerting those using deep learning algorithms like MARSplines and Logistic Regression. They also maintain the record of the same for the child.

In, NukhbaAfzal, et al, proposed a technology oriented secure polio vaccination system. Their purpose was to build a system which makes the polio vaccination system effective and competent so the people will be able to stand against the wild polio virus and make the Pakistan free from polio virus. The focus of this paper was directed towards the use of advanced tools in current vaccination system. The goal of the work offered is to commence a technology to make the polio vaccination system efficient in general and security perspective. It investigates those tools which can be used to make a vaccination system effective and secure for the vaccinators which got death threat and find them defenseless in the fulfillment of their duties during vaccination campaign. Without proper security of health workers and general public it is not possible to carry out a successful campaign. On the other hand by making Polio vaccination system‘s model they researched a framework before building it and to check the correctness of their proposed system by formal modeling. They also talked about the use of Colored Petri Nets to the Polio Vaccination system ends up being an application area which could profit by the elements of Colored Petri Nets. There are numerous great explanations behind utilizing Colored Petri Nets for data displaying and examination. CPN model is a depiction of displayed framework, and it could be utilized as an important feature or as a presentation of a framework which need to be disclosed to other individuals. They did formal modeling of their Proposed technology oriented secure Polio Vaccination System. The authors verified their proposed model and by using colored Petri Nets to stimulate the different scenarios of their system. Hence the author proved the correctness of their system.

In, Muhammad Amith, et al, discussed about the design and development of a formal ontology to describe misinformation about vaccines. Vaccine misinformation is one of the drivers leading to vaccine hesitancy in patients. While there are various levels of vaccine hesitancy to combat and specific interventions to address those levels, it is important to have tools that help researchers understand this problem. With ontology, not only can one collect and analyze varied misunderstandings about vaccines, but one can also develop tools that can provide informatics solutions. They developed the Vaccine Misinformation Ontology (VAXMO) that extends the Misinformation Ontology and links to the nanopublication Resource Description Framework (RDF) model for false assertions of vaccines. Preliminary assessment using semiotic evaluation metrics indicated adequate quality for our ontology. They outlined, demonstrated and proposed the uses of ontology to detect and understand anti-vaccine information.

In, Yuhanisbinti, et al, presented a model for children vaccination reminder using short message service. The model consists of data flow in reminding parents of their children vaccination schedule. Existing practice on vaccination schedule is via written appointment. Nevertheless, such approach may not be sufficient as parents may forget due to a tight work schedule and daily routines. Their proposed model was evaluated by allowing selected respondents to use to the developed prototype. Results show that respondents do agree on the benefit of having reminder send via SMS. In addition, all of the respondents feel that the proposed system is useful.

III. EXISTING METHOD:

The existing system is computerized Ms office format and moreover it’s very difficult to access the reports. It takes more time for the user to get appointment from the doctor and collusion is occurred in the repetition of the name of the user and many duplicate records are updated in the process.

IV. PROPOSED METHOD:

The proposed system is overcome all the disadvantages of the existing system. Here all the data are maintained in the automatic manner and secure way. The reminder alert is implemented as main proposed system. The admin send notification to the user for vaccine injection date for their child.

Advantages

- To automate the manual system
- To make the system user-friendly
- Reports should be designed as it gives perfect view of required data
- Proper security to the data for the access

V. RESULT

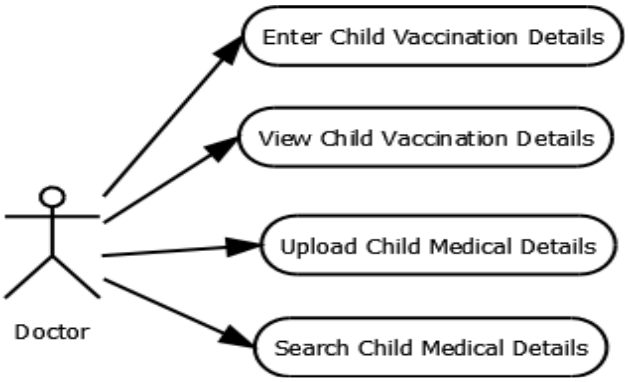
1. Web based application and android mobile based system design and development is designed and developed to store and retrieve the child medical history using technologies mentioned in the proposed architecture of this paper.

The overview of the vaccination schedule chart proposed is provided

I: IAP recommended vaccines for routine use

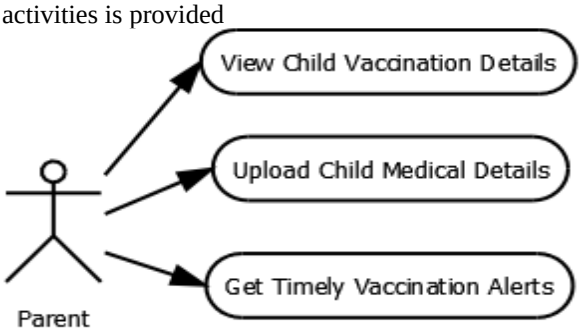
Age	Vaccines
Birth	BCG, OPV0, Hep-B 1
6 weeks	DTwP 1, IPV 1, Hep-B 2, Hib 1, RVS 1, PCV 1
10 weeks	DTwP 2, IPV 2, Hib 2, RVS 2/RV1 1, PCV 2
14 weeks	DTwP 3, IPV 3, Hib 3, RVS 3/RV1 2, PCV 3
6 months	OPV 1, Hep-B 3
9 months	OPV 2, Measles
12 months	Hep-A 1, 2 dose after 6 months
15 months	MMR 1, Varicella 1, PCV B
16-18 months	DTwP B1, IPV B1, Hib B1
2 years	Typhoid: revaccination every 3 years if Vi PS vaccine
4-6 years	DPT B2, OPV 3, MMR 2, Varicella 2
10-12 years	Tdap/Td every 10 years, HPV

2. Based on the child's date of birth and vaccination due date based on the age criteria, vaccination due date is calculated by the system. Doctors and parents can view the due date calculation with respect to child.
The activities of Doctor and Parent details are as follows:



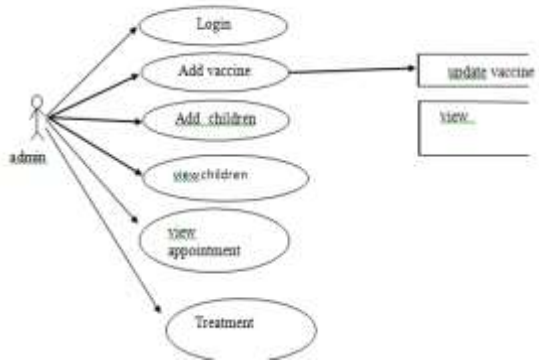
Use case diagram for Doctor

represents the use case diagram for Doctor with the activities is provided



Use case diagram for Parent

3.The main use cases for Doctor and parent are represented in the Figure 6 and 7 respectively. Separate access privileges to Doctor and Parents are provided for both web and mobile applications. Parent accesses his/her child vaccination and medical history details whereas the Doctor can view the complete child details along with vaccination and previous medical history records.



Vaccination details:

View vaccination:

Children details:

View children:

VI. CONCLUSION

The use of mobile phones increased as the number of users has dramatically risen; where mobile phones have become part of people's lives. Child Care Unit App can be applied in a health centre and the parents who need this service can register all the required information about their children in a health centre. The goal of this project is to help parents to receive SMS messages that provide time specific information about their children vaccination appointment. It may help parents in ensuring that children vaccination is taken as scheduled. This would lead to immunize children against diseases and prevent the spread of diseases.

VII. FUTURE ENHANCEMENT

In the future, this app will integrate more apps option to our main application to make it a more sophisticated auto-help tool and provide a wide range of facilities to the user. These app will include provides reminder to the parents about their children medications which help them to take medicine on time. Therefore through these reminders, the user will take care of their children health and Graphs of the output obtained will help the user to keep track of the changes to manage their daily food and health in a more effective way.

REFERENCE

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