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VedApp Research Paper

Anish Vaidya, Faizan Majgaonkar, Shruti Watave, Suyash Wagh

B.Tech Student, Computer Science and Engineering, Vishwakarma University, Pune, Maharashtra, India

Abstract-As Ayurveda is becoming popular, many new physicians are choosing Ayurveda as a medicine for practice and are content as there is a demand for this medicine. An Ayurvedic physician has different diagnostic requirements than a general physician. Thus giving rise to the different needs which are not fulfilled by General Clinic management applications. Doctors in small clinics generally use paper and file structure as a medium to store patient data and reports which proves to be highly inefficient, space-consuming and can also be a cause of a privacy breach. Old reports can go missing from the files and there is a high risk of loss of data. There is also the case of exponential use of paper as every time a patient visits, new sheets of paper are used.
This paper focuses exclusively on the features of the VedApp application and how it helps the doctors overcome the above mentioned difficulties and how it will restructure the ayurvedic practice.

Keywords: Database Management, Web Development, MERN Stack, Ayurveda, Analysis, Data Aggregation, Data Visualization

Introduction

VedApp is a web application which is specially designed to be a savior for the Ayurvedic Practitioners who have been struggling to find an application that supports their specific needs.
An Homeopathic doctor when diagnosing and treating a patient, has to follow the health guidelines given by WHO or the Indian Medical Council. The Ayurvedic physicians, though following the rules set for them, have a different way of checking a patient. The physician has to judge the structure of the patient down to the last detail. The patients who seek ayurvedic treatment are the ones seeking treatment for major diseases like Arthritis, Diabetes, Heart Problems which can't be treated with medicines when the treatment is given by general medicine. Most of the time for major diseases, the modern medicine is not sufficient and the doctors suggest surgeries, which is an expensive alternative to medicines and also does not guarantee a full recovery.
When a patient comes in for the first time the doctor does a detailed examination which includes examination of various systems. This examination is unlike any other examination where the doctor examines and notes down every detail about the body like, skin color, the body smell, and the major

parameter which the treatment revolves around is the *Prakruti* (constitution of the body) of the patient.
All these parameters are to be noted down by the doctor, but there isn't any exclusive application that lets doctors do so.
This is where VedApp comes in, it has been specifically designed for the Ayurvedic Physician, where he or she can note down all the parameters they look for in the human body following their vedic sciences rules.

Why VedApp:
Technologies Used

The technologies in this world are evolving rapidly. So we wanted to make sure the doctors in ayurvedic medicine, who are generally not that amicable with new technologies, don't fall behind on this front.
VedApp is made using the MERN Stack which is an acronym for **M**ongoDB, **E**xpressJS, **R**eactJS, **N**odeJS. MERN is a dictionary used to describe a specific set
of JavaScript-based technologies used in the web application development process. MERN stack is the latest technology used for the full stack web development right now in the industry. As it is new, the users can enjoy the new features in the world of web application development and get any tech support they need if they encounter any error or bug in the application.
There are many options to develop a web application, but according to many online articles and papers the MERN stack has been used and liked more by developers than the other technologies.

Convenient File Structure

As the Ayurvedic physicians have no exclusive application to turn to when it comes to the saving of patient data, the doctors, especially who work in small institutions are forced to use the traditional pen and paper. This patient data has a lot of important information, and as the patient is generally in need of treatment for a major disease, every part of the patient's medical history matters in the current mode of treatment. This data stored in the paper and file structure can get lost or destroyed easily and can hinder the procedure of the diagnosis and treatment of the patient.
VedApp offers two types of papers to be used to store the data. Casepaper and the FollowUp paper.

Casepaper: This paper is essentially a detailed form which contains all the required parameters that the physician needs. The fields in the casepaper are grouped according to their use and the treatment flow. They start from the general information of the patient and then get detailed, then go up to the diet and the medicine prescriptions. This paper is used by the doctor when the patient comes in for the first time or comes in for another major disease. VedApp is flexible so the doctor can create as many casepapers as they need.

FollowUp paper: This paper is used when the patient comes in for the followup of the treatment that is going on. It can be for seeing how the medicines are impacting the condition of the patient.

Both these papers have a one-to-many relationship with the patient.
This ensures that the clinics using paper and file structure reduce the paper usage by roughly 80%,

as the main information storage is on the computer. VedApp uses MongoDB Atlas(cloud) to store the data which ensures the secure storage of the data and there is no data loss even if the data is accessed after many months or years. This also solves the storage issues many small clinics have when they are using the paper and file structure. When they run out of space to store the files, there is a decision to throw the old case files away, but these case files have data that has a lot of potential in it, and can be used to treat the patient if they come again for any other major disease.

Personalized the Ayurveda Way

Now only having a convenient file structure won't do, as mentioned above the ayurvedic doctors have a different diagnosis and checking procedure which contains many parameters to be considered and noted down. These parameters are added in the casepaper when the patient comes in for the first time or when they come in for another major disease. The casepaper contains all the important parameters that the physician has to check and note down. These fields are not present in any of the applications which have been developed till now as these applications have been developed with modern medicine practice in mind and have not taken into consideration the ancient ways of checking a patient which were more natural and are still used by the ayurveda practitioners.

The doctor can store all the parameters that they check on a patient, it is as easy as filling a form, and store it on the cloud without any worry of space or integrity loss of the data.

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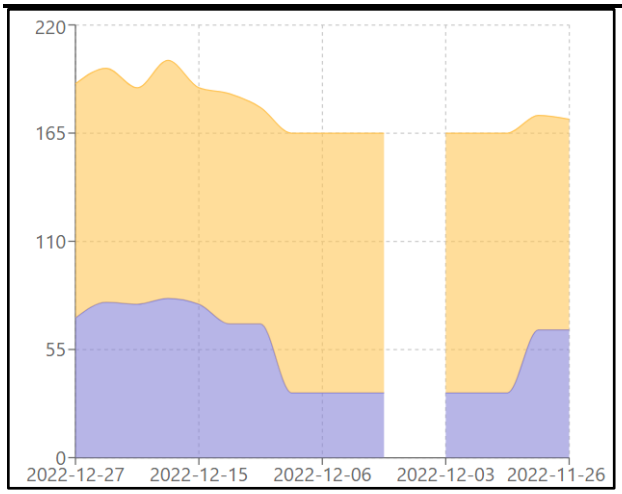
Patient Data Analysis

VedApp not only is a CRUD (Create Read Update Delete) application, it provides insights by analyzing the data which is stored on the database.

The application uses Node and Express to send queries to the database, get the response and map the response in the report page also called the doctor’s dashboard. The data before being represented in the is aggregated using statistical methods and then is plotted in the form of graphs. These graphs help the doctor gain quick insights on the patient’s current status using the graphs created from the previous visits, hence making the diagnosis for the current visit faster. This feature is also helpful for doctors who are just starting out in their fields and appreciate some insights that help them make the decisions regarding the diagnosis of the disease. The graphs in VedApp are given for every patient which is in the database, so the doctor gets insights for every patient, be it for any disease.

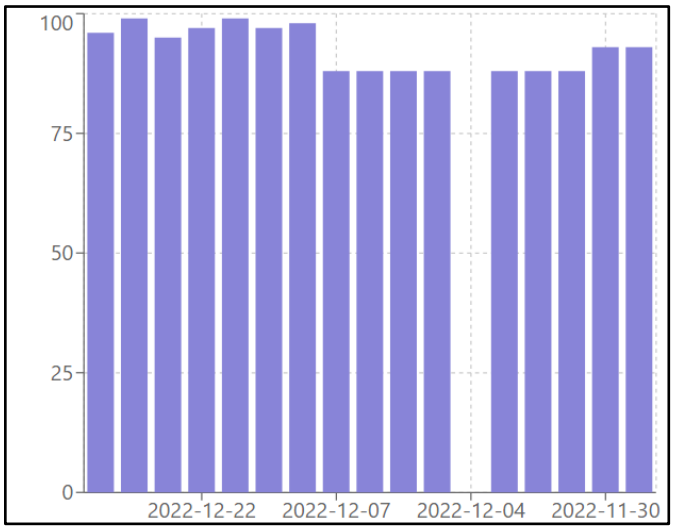
In VedApp, we have incorporated different types of visualizations for different types of measurements of the bodily functions. We have implemented graphs for numerical values which are: BloodPressure, BloodOxygenLevel, PulseRate, RespirationRate, Weight. These values were chosen as they are the ones which change frequently in a human body and also affect the treatment process of the patient, when the frequency of their change is high.

For BloodPressure:



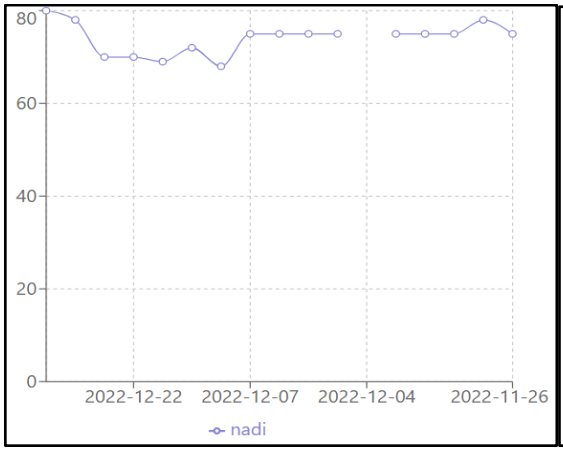
Here the yellow area represents the Systolic blood pressure and the purple area represents the diastolic blood pressure.

For BloodOxygenLevel:

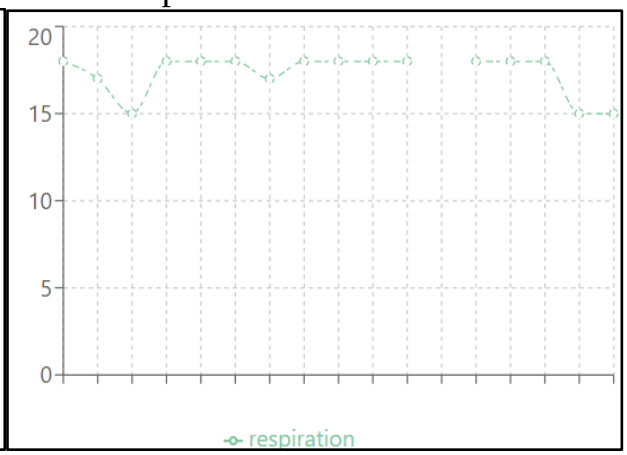


Here we chose a bar chart for Blood Oxygen data visualization as the measurement is always in percentage and the bar chart helps map the percentages in graphical format easily.

For PulseRate:



For RespirationRate:



Conclusion

With the newest and trending MERN Stack (MongoDB, ExpressJS, ReactJS, NodeJS) this project will focus on increasing the productivity of the clinics practicing Ayurveda, and help the doctors with the treatment of diseases. With the analysis the application provides, the doctors can give a quick diagnosis to the patient and the overall treatment process is optimized. We expanded this application by incorporating statistical analysis techniques to summarize the patient data and provide support to the doctors in making quick decisions during the diagnosis of the diseases. The graphs above add a unique niche to the application which has not been seen in any application which has been implemented especially for physicians who partake in practicing Ayurvedic medicine.
The application has an immense scope of expanding further into various departments in the medical field. Some of the future plans can be making the system scalable to be used by multiple physicians and collaborating with physicians of the same organization on the same database. Also making it more personalized for individual physicians without compromising the integrity of the system. More visualizations can be added which show various insights which affect the patient's diagnosis and treatment.

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