

SPEC 2.0 Smart Pill Expert System

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ABSTRACT

The article throws light on the implementation of an enhanced idea of the smart pill expert system. The proposed system is used to automate the capability of dispensing the right dosage of medicines at a given day-time interval. The spec 2.0 can be used at one's home, workplace, at hospitals by a user of any age group, and then possibly expanding the functionalities to a wider audience. It mainly focuses on providing access control and monitoring management functionality through a mobile app on a daily basis with no monthly subscriptions required. There will be alerts and SMSs sent across to the user based on the pill dispensing event's result. The spec 2.0 mainly focuses on providing an "over-dosage" functionality so that the user won't have to consume the medication if he hasn't taken them at the allocated time interval, to prevent over consumption. The system has been tested and the results have been formulated on a daily basis.

KEYWORDS

Dispensing System, Expert System, Health, Healthcare IOT, IOT Motorization Service, Medicine Dispenser Application, Medication Monitoring, Smart Medication, Smart Medicine Dispenser

INTRODUCTION

Advancements made in the field of smart healthcare technologies have provided people a better life situation in the present years. This would have been even more notable if the percentage of medication errors could be identified and corrected. Due to this negligence, there has been quite a lot of deaths and quite an enormous increase in the expenditures by millions each passing year. In the present-day scenario, since medical devices are incorporated on a network, due to its security issues, interoperability breaches are increasing in number day by day, resulting in enormous business losses. To curb this very risk, automation and consumer-based technologies are being adopted for the medical devices. Health care is at the heart of IOT, with applications varying from health monitorization to disease prognosis. These applications provide the visualization of identification, diagnostic study, treatment procedures

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and regular monitoring through the devices that are implanted in IOT. The main achievements are to reduce the cost and easy usage for its users by providing better user experience and easy operational customization. For seamless connectivity and better performance, a systematic scheduling scheme plays a very important role due to the availability of limited resources. In the healthcare domain, smart devices like a gateway, a server, and a database help in creation of data to be sent as medical services to the authorized organizations. In the upcoming years, IOT will play a huge role to address the above issues in the healthcare domain. Through IOT, various countries across the world, have adopted this new turnover in the field of medical health care, by designing and developing new frameworks and applications integrating services and security. The objective is to construct a device that is relatively small and light weight, that is developed as a software in such a way that patients receive their medication reliably and safely as prescribed by their physician. The device also provides alert messages which helps to take medicines in time as well as refilling the medications.

LITERATURE SURVEY

(Al-haider et al., 2020) The system SPES provides expertise on the real-time analysis and support to every user relying on medication. Since Medicinal Nonadherence (MNA) is one of the huge factors for extended betterment, money issues, and sudden demises, SPES tries to curb these inconveniences by supporting several users, the option for controlling and monitoring their actions, simultaneously, to curb any misleading events. The SPES provides an easy UI and a trouble-free way of maintaining the physical dispenser system with an AI-Chat service that caters to the needs of the user's queries. (Batz et al., 2005) The medicine planner provides functionalities to pre-sort a prescription daily. This is especially catered to the needs of elderly and visually impaired personal to have a better management of their medicines. The planner has 2 distinct functionalities of providing a self-filling mechanism and an alert notification mechanism during the time of medicine intake. (Becker et al., 2009) The kit proposed can be programmed to provide a proposition to guide users to consume their correct medicine at the exact specified time interval through the employment of an alert functionality, buzzers, and LED. This is a small grant to improve life existence for a better healthy future for the world. (Bombarda et al., 2019) This IOT based intelligent medicine container houses several sensors and servers for frequent health monitoring check-ups. This allows wireless communication between the user and their caregivers regarding their monthly health check-ups and removes the burden of a physical meeting session. Since the main goal is to focus on the correct medication schedules, aged generations will be benefited the most as they require constant taking care off. The servers are used for embedding the time schedule along with the medication details. There is also an embedded temperature sensor for examining of the user's body temperature. (Casciaro et al., 2020) An automatic pet feeder has been constructed for allocation of the dry pet food for dogs and cats, with customization based on each pet owner. This provides an effective manner of taking care of the food patterns comfortably. (Chawla, 2016) The design facilitates easy monitoring and controlling functionalities via mobile app with no cost plans. The system is controlled by the user through his phone or through the buttons present on the machine itself for choosing his required number of medications for a given time interval. There are alert messages sent to provide an indication for whether the medication was removed from the container or not. (Diaz & Vepuri, 2012) The system has been built around prescription drugs which will assist in authenticating a patient's access of such medication based on their identity and prescribed schedule and simplifies the pharmacist or doctor to monitor this consumption. The system consists of intelligent reminders, caretaker reminders, and dosage tracking and notifies each time the container box is opened to provide a security feature that avoids stealing of medicines. Prescription drugs are sometimes consumed without any intent initiated by a doctor and sometimes the users may be forgetful to consume their medication, causing irregular consumption periods. To help curb these events, the system helps patients take their medication on time with value added safety measures, facilitating for a speedy recovery. (Hayes et al., 2006) The product improves the automation of

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