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A Novel Smart Ambulance System

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Abstract— ***Modern communication, processing, and sensing technologies are used in the revolutionary smart ambulance system to transform the ambulance and emergency services. We suggest a clever approach that seeks to reduce the time it takes for an ambulance to arrive, the time it takes to get the patient from their location to the hospital, and the time they have to wait there. In order to make the best decisions regarding the hospital that responds to the patient's request and the ambulance it sends, the route that the ambulance takes to get to the patient, the hospital that the ambulance heads to after picking up the patient, and the route that the ambulance should take to the chosen hospital, we use the road traffic conditions and hospital loading information (collected on a real-time basis). While the last two selections are used to maximize response time, the first two are utilized to minimize response time are used to reduce door-to-needle time. We do both an analytical and simulation-based performance analysis on the suggested algorithm to ensure its validity. The results demonstrated excellent agreement between the simulation and analytical results, confirming the precision and validity of the analysis. Additionally, we contrast the performance of our suggested smart algorithm with a previous approach that reduces drop-off delay that is documented in the literature. The outcomes validated our clever algorithm's supremacy in the context of the scenarios and operational settings we thought about.***

Keywords—Algorithm, Smart Ambulance, Novel System, Data analysis.

I. INTRODUCTION

Recently, a smart ambulance has been suggested to enhance the performance of the ambulance. Smart ambulances use cutting-edge technologies to enhance emergency services, reduce response times, and deliver medical assistance with the least amount of delay. These technologies include the Internet of Things, real-time data communication and video streaming, connected vehicles, road traffic monitoring, big data, biomedical sensing, and body area networks. However, in order to allow high-quality and real-time video, data, and voice connection between ambulances and hospitals, smart ambulances require high speed data transmission. The authors of suggested a 5G-based wireless network to support the smart ambulance after demonstrating that current communication networks (such as Long-Term Evolution (LTE) wireless networks) cannot support the demands of the smart ambulance. Mobile apps were created by authors to help patients find the nearest ambulance. The mobile app displays neighboring hospitals when the ambulance arrives at the patient's location, allowing the user to choose the closest hospital based on their location. Finally, the ambulance's app determines the quickest path to the hospital.

Motivation:

Smart ambulances stand to change the way that emergency services around the world respond to threats and problems. From the mutual, two-way flow of data, they provide to the potential they offer to create a more efficient and seamless transition from paramedic to hospital, there are plenty of advantages to these innovative vehicles.

II. RELATED WORK

The need and demand for emergency medical response systems has created a push to develop more technology-based smart and efficient solutions for these systems. In view of this, authors are proposing a technology-based smart ambulance system. The proposed design uses technology such as wireless body sensor networks (WBANs), Internet of Things (IoT), big data analytics, and artificial intelligence [1].

In this Project, a smart ambulance management system is proposed in a smart city environment. If a patient needs an ambulance, the operator finds the nearest ambulance and direct it to the patient. The coordinates of ambulances are dynamically traced by the system, and Google Maps, as a third-party service, is used in order to calculate the shortest path to the casualty. After reaching to the patient, the expert (doctor or nurse) investigates the situation and finds the best available hospital by the proposed system [2].

III. OPEN ISSUES

In order to revolutionize the ambulance and emergency services, the cutting-edge smart ambulance system makes use of contemporary communication, processing, and sensing technology. The time it takes for an ambulance to arrive, to transport the patient from their location to the hospital, and for them to wait there are all factors that we propose attempting to shorten. We use the road traffic conditions and hospital loading information to make the best decisions regarding the hospital that responds to the patient's request and the ambulance it dispatches, the route that the ambulance takes to get to the patient, the hospital that the ambulance heads to after picking up the patient, and the route that the ambulance should take to the chosen hospital (collected on a real-time basis). The latter two options are used to increase response time, whilst the first two options are used to decrease response time. decrease the time from door to needle.

IV. PROPOSED SYSTEM

This system can be extended to implement the shortest distance from the accident site to the hospital so that the patient reaches the hospital in minimum time. Also, the patient’s information could be sent to the hospital before the ambulance reaches the hospital. By doing so, his arrangements could be made in the hospital according to the patient’s condition and the treatment could start as soon as the patient reaches the hospital. Information of several patients could be stored in the cloud server for a long period of time.

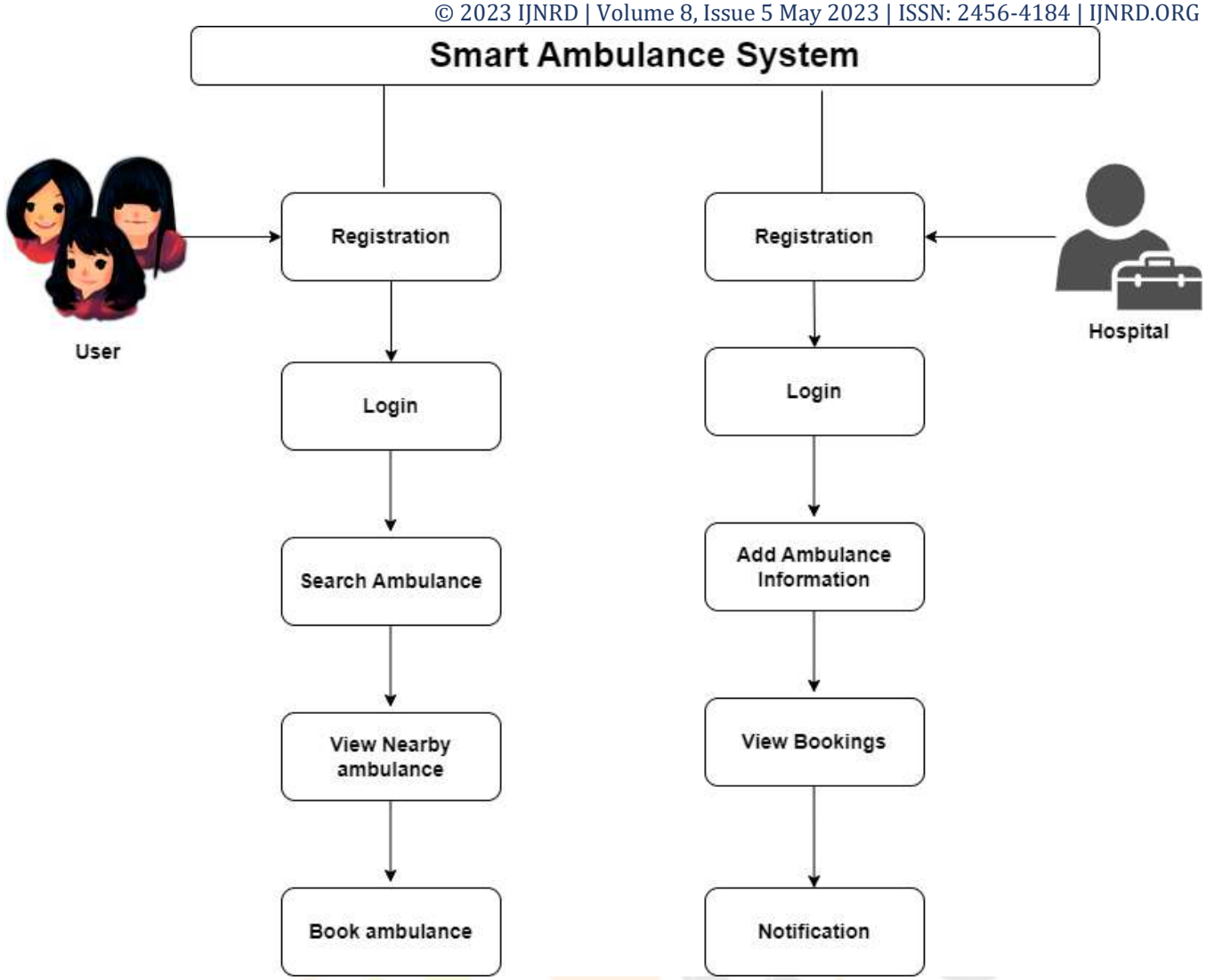

Figure 1. System Architecture

V. RESULTS AND DISCUSSION

Experiments are done by a personal computer with a configuration: Intel (R) Core (TM) i3-2120 CPU @ 3.30GHz, 4GB memory, Windows 7, MySQL 5.1 backend database and python. The application is web application used tool for design code in VS code.

Figure 2: overall system execution graph

Existing System (2018)	Proposed System
1236	932

Table1: overall system execution table

CONCLUSION

In this initiative, our goal was to transfer the casualty to the hospital that could provide the interventions most effectively while also quickly reaching the patient who required an urgent intervention. In the firebase database we built for these purposes, we have established an interface that displays hospital data and locations online so that if a patient contact is received, the nearest ambulance admin user will be pointed in the right direction. In order to expedite the processes once the ambulance arrives at the patient, we kept records of the hospitals' locations and the types of interventions that can be performed in our database. With the help of this filtering feature, we were able to arrange the best hospitals according to how quickly they could be reached and direct patients there. When taking into account the reaction and transportation times, this investigation has yielded successful outcomes. More data can be gathered from hospitals and other high-tech IoT components, such as smart traffic devices, to improve this project. This project proves that human life is more valuable than anything else, and that the more people that step in to rescue lives, the more lives will be saved.

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