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# Connecting Intelligent Things in Smart Hospitals with Real Time Data Monitoring

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***Abstract:*** ***We are developed a system for online booking of doctor with infusion monitoring system to monitor the real-time drop rate and the volume of remaining drug during the intravenous infusion.In this web application there having two panel doctor and patient. Here after registration of patient , they can log into the system and makes a online booking of doctors by visiting doctors details. The patient will then send arequest for appointment. The doctor can either accept the appointment or reject it.With the online booking we also add a infusion monitoring system. we develop an infusion monitoring system to monitor the real-time drop rate and the volume of remaining drug during the intravenous infusion. Finally, we discuss the challenges and future directions for building a smart hospital by connecting intelligent things.***
***Keywords:*** ***Infusion monitoring system,*** ***online doctor booking***

## I. INTRODUCTION

We are developed a system for online booking of doctor with infusion monitoring system to monitor the real-time drop rate and the volume of remaining drug during the intravenous infusion. In health care institutions especially when the patients visiting the facility are either in pain or frail health, making it difficult for them to queue for long periods of time until a medical practitioner is available to treat them. This can cause patient to be fall in to dangerous situation. . This can cause patient to be fall in to dangerous situation. This will also make time delay for booking because the first one should complete booking process to proceed to the another .That makes more costly, time consuming, lack of security, variations in records. To overcome these we proposed a new system .The proposed system consists of two panels: permanently until the user deletes it or uninstalls it. The patient will have to register into the web application for the first time. On registering, the patient can provide a username and password. The patient can use this username and password for logging into the web application each time he uses it. After logging in, the patient will have to select a filtration type. The filtration is done on two bases: Area wise and Specialty wise. After selecting the filtration type, the doctors list will be displayed. The patient can select any and look for an appointment according to his convenience. The patient will then send a request for appointment. The doctor can either accept the appointment or reject it. The database will get updated accordingly and the patient will get a confirmation message particular doctor and view his profile. Also, the patient can view the doctor's schedule Doctor and Patient. Once configured, this web application will remain into the device. The widespread use of Internet of Things (IoT),especially smart wearables, will play an important role in improving the quality of medical care, bringing convenience for patients and improving the management level of hospitals. However, due to the limitation of communication protocols, there exists non unified architecture that can connect all intelligent things in smart hospitals, which is made possible by the emergence of the IoT (IoT). In light of this, we propose an architecture to connect intelligent things in smart hospitals based on IoT, and introduce edge computing to deal with the requirement of latency in medical process. As a case study, we develop an infusion monitoring system to monitor the real-time drop rate and the volume of remaining drug during the intravenous infusion. Finally, we discuss the challenges and future directions for building a smart hospital by connecting intelligent things.

## II. RELATED WORK

### *A. Existing System*

Medical Knowledge Extraction (MKE) system that can automatically provide high quality knowledge triples extracted from the noisy question-answer pairs. The MKE system is built upon a truth discovery framework, where we jointly estimate trustworthiness of answers and doctor expertise from the data without any supervision. The MKE system is applied on real-world datasets crawled from xywy.com, one of the most popular medical crowd sourced Q&A websites. Both quantitative evaluation and case studies demonstrate that the proposed MKE system can successfully provide useful medical knowledge and accurate doctor expertise. We further demonstrate a real-world application, Ask A Doctor, which can automatically give patients suggestions to their questions.

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*B. Disadvantages*

*1)* The system can't book a doctor through online for reduce the waiting time.

*2)* Here doesn't used a real time data monitoring.

*C. Proposed System*

We are developed a system for online booking of doctor with infusion monitoring system to monitor the real-time drop rate and the volume of remaining drug during the intravenous infusion. In this web application there having two panel doctor and patient. Here after registration of patient , they can log into the system and makes a online booking of doctors by visiting doctors details. The patient will then send a request for appointment. The doctor can either accept the appointment or reject it.With the online booking we also add a infusion monitoring system. we develop an infusion monitoring system to monitor the real-time drop rate and the volume of remaining drug during the intravenous infusion. Finally, we discuss the challenges and future directions for building a smart hospital by connecting intelligent things.

*D. Advantages*

*1)* Allow users to update their own

*2)* Centralized data is secure details.

*3)* Easy to backup.

*4)* Reach anybody, anywhere in the world.

## III. IMPIEMENTATION

*A. Architectural Design.*

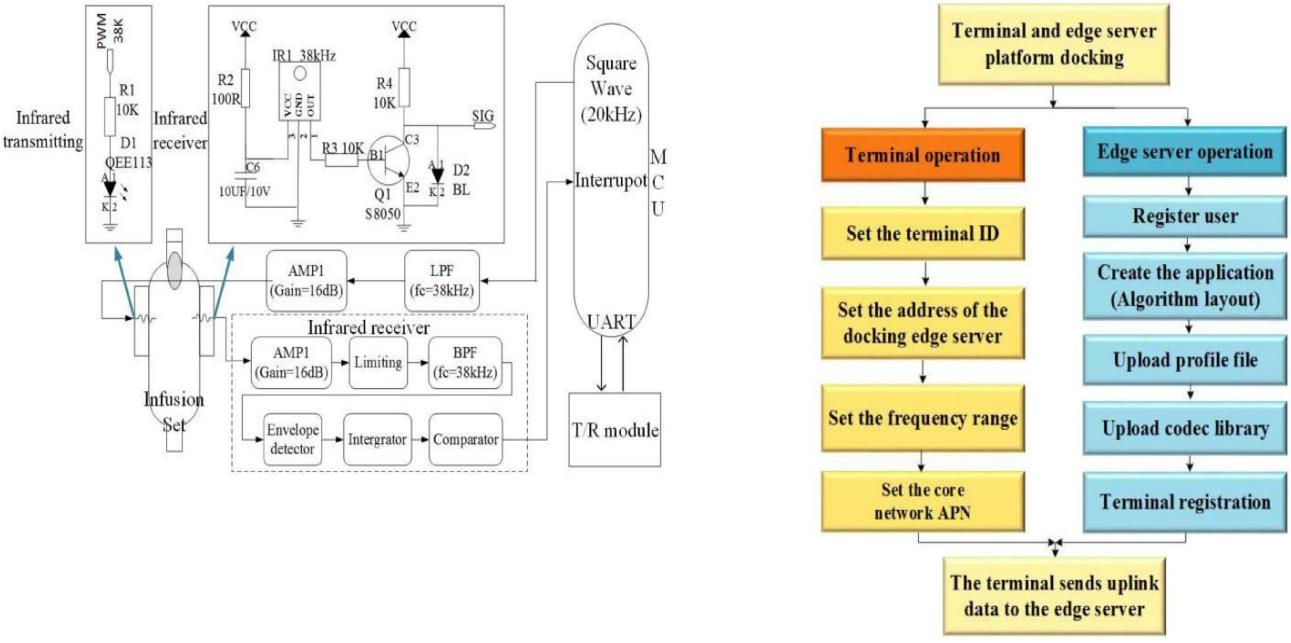


Figure 1: Architectural Design

The Fig. shows the block diagram of the droplet counting module. The module contains an infrared emission tube and a three-wire infrared receiver, which are placed on the Fimos pot. The infrared emission tube outputs the 38 kHz infrared light wave from the MCU as a carrier wave. The receiver receives the infrared signal, sends it to the internal amplifier and limiter for signal pulse amplitude amplification and con-trol, then it outputs an ac signal which will be dealt via the bandpass filter (38 kHz), demodulation circuit, integral circuit and comparator, and finally outputs a signal loading on the 38 kHz square wave. When the signal output by the infrared emission tube is not blocked by the droplet, it will be pro-cessed by the receiver which will produce a high voltage signal to the MCU. On the other hand, if the signal is blocked by a droplet, the receiver will produce a low voltage signal. Finally, the MCU uses its interrupt mechanism and a filtering algorithm to count the number of droplets dropping into the Fimos pot.

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## IV. WORKING

Narrowband IoT (NB-IoT) is a low power wide area wireless protocol that works virtually anywhere. NB-IoT has the advantages of low cost and low power consumption, which provides a new way for connecting devices that require small amounts of data, over long periods, in hard to reach places and has been used in intelligent parking, intelligent meter reading and the of shared bicycle. The emergence of NB-IoT makes it possible to formalize an architecture to connect all intelligent things in smart hospitals. One of the motivations is to formalize an architecture using NB-IoT to connect all intelligent things in smart hospitals. As a case study, we select the infusion monitoring issue which troubles patients deeply especially those patients whoare given fluids in the evenings. We first design an infusion monitoring terminal using infrared sensors and then connect those devices with NB-IoT.

Intravenous infusion is a common treatment for its rapid drug use and small trauma. However, medical staff cannot monitor the infusion constantly, which makes the drop rate anomaly and drug replacement unable to be timely noticed. The development of real-time infusion monitoring devices has great significance for both medical staff and patients.

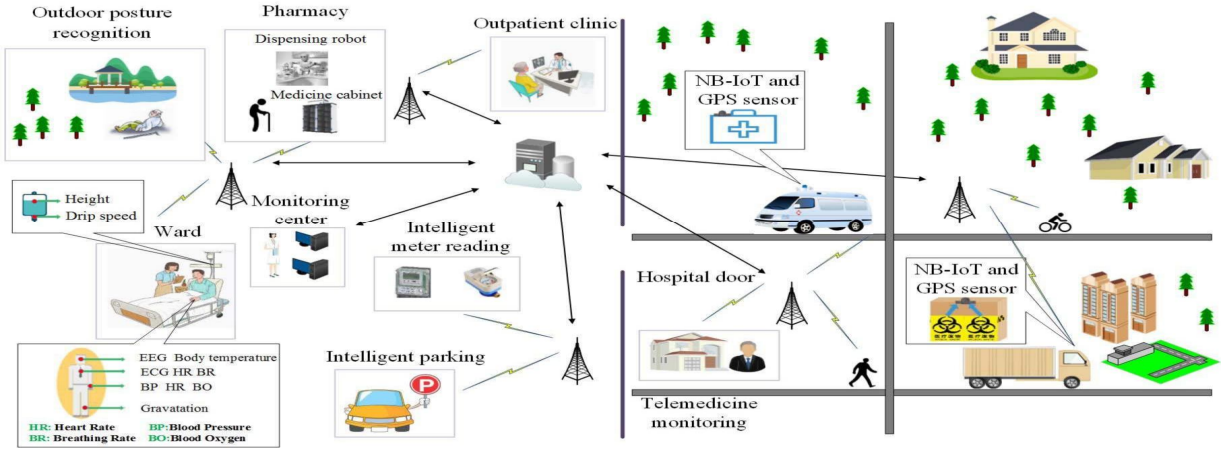


Figure 2: Working Principle

## V. PERFORMANCE EVALUATION

Compared to other communication protocols, NB-IoT is different in channel bandwidth, wireless channel type, frame structure and resource allocation methods, the corresponding idle mode, random access, radio resource control connection management, connection reconfiguration, wireless link monitoring, and possible redirection are also adjusted, which leads to that LTE testing instrumentation cannot be reused for NB-IoT. In addition, the access of large number of terminals leads to that the existing terminals for multiterminal network testing and optimization cannot be used for NB-IoT. Therefore, how to use emulators for simulating terminals indifferent locations and different scenarios to test the networkperformance is a challenge for connecting monitoring devicesin smart hospitals using NB-IoT.

## VI. EXPERIMENTAL RESULTS

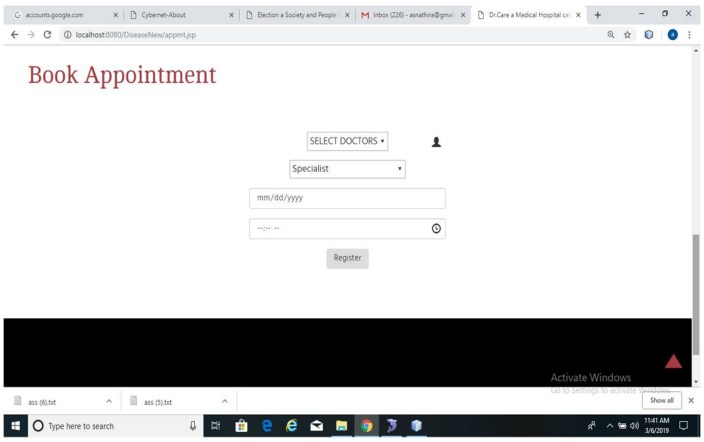


Figure 3: Book Appointment

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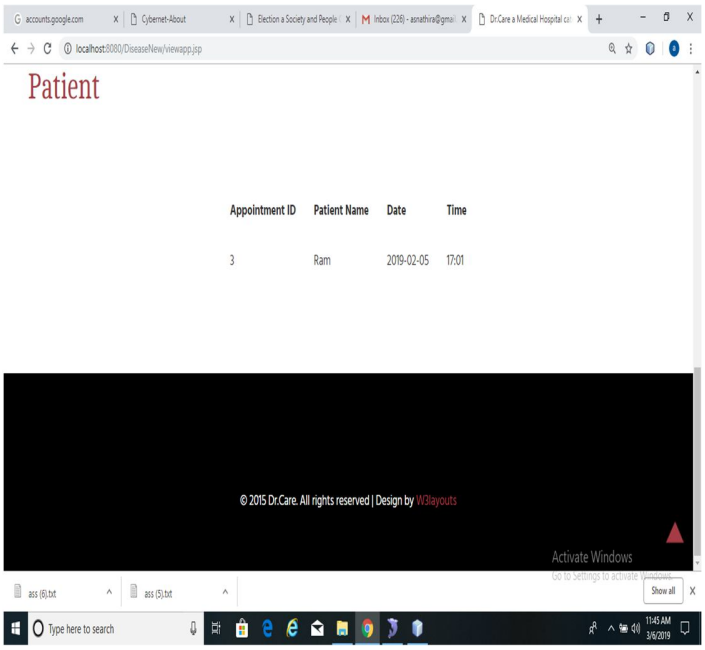


Figure 4: Patient Appointment

## VII. CONCLUSION

We are developed a system for online booking of doctor with infusion monitoring system to monitor the real-time drop rate and the volume of remaining drug during the intravenous infusion. In this web application there having two panel doctor and patient. Here after registration of patient, they can log into the system and makes an online booking of doctors by visiting doctors' details. The patient will then send a request for appointment. The doctor can either accept the appointment or reject it.With the online booking we also add an infusion monitoring system. we develop an infusion monitoring system to monitor the real-time drop rate and the volume of remaining drug during the intravenous infusion. Finally, we discuss the challenges and future directions for building a smart hospital by connecting intelligent things.

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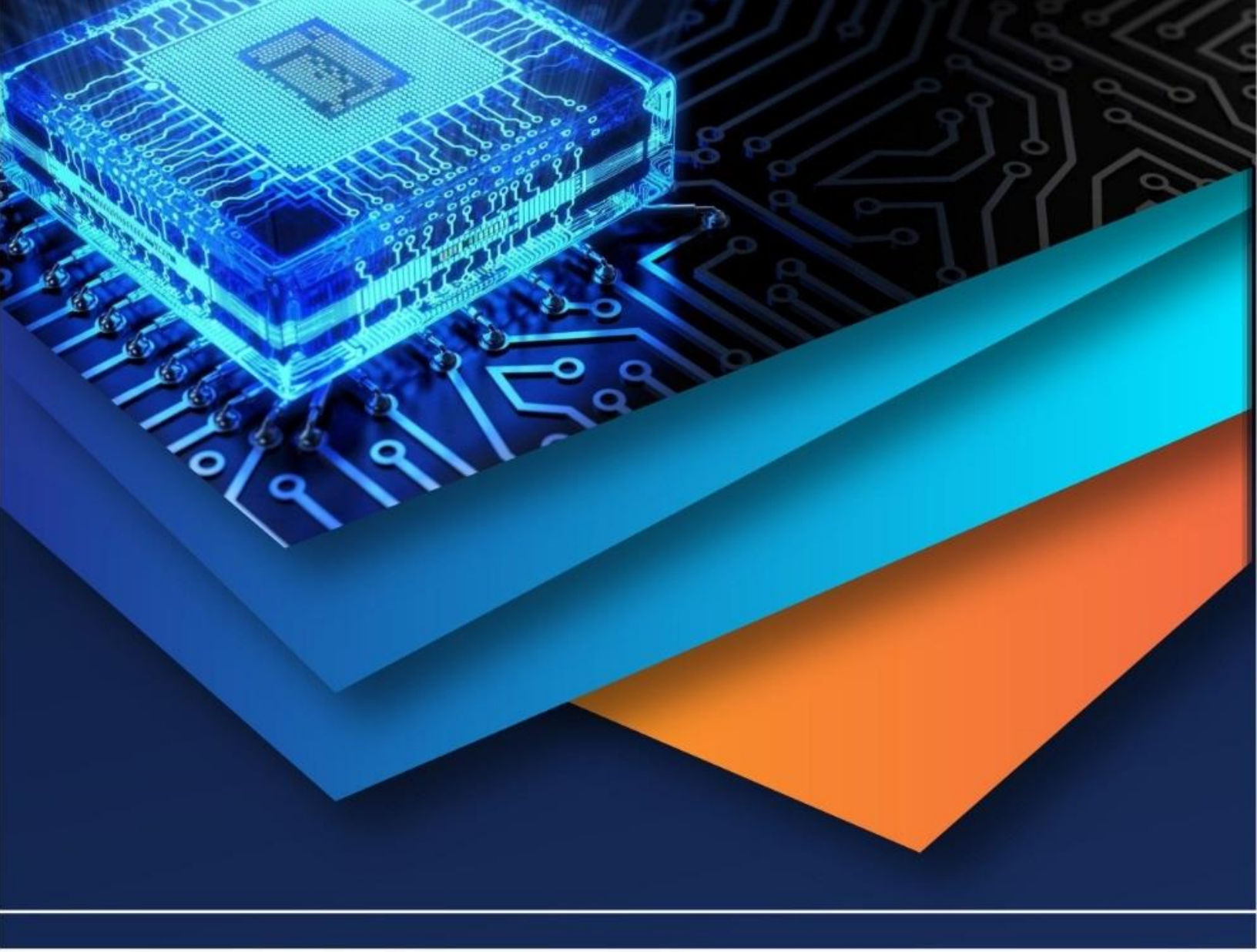

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