

Healthcare An Important Aspect Of Human Life:Using IoT

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ABSTRACT

Internet of Things is one of the modern technologies and a fast growing concept. Applications of IoT have been expanded to almost all sectors. Health of a person is a major concern. The healthcare industry is in a state of great despair. We aim for a society where basic healthcare is provided to all. That is, healthcare in a pocket. By using IoT various checkups like blood pressure, sugar level, ECG, body temperature etc can be known. For this we are introducing a medical kit. The technique would provide various wearables for reusing and identifying health problems. We could easily reach to a doctor who is far away.

Key words: IoT-Internet of Things, Sensors, health monitoring

1. INTRODUCTION

Wearable devices for health monitoring are nowadays a trending habit because it not only monitors the health but is also able to predict the future issues that can occur. The present lifestyle of people demand such technology based health monitoring or lifestyle support due to the nature of busy life. The traditional technique used in this area will not be able to meet the requirement due to the lack of information collected. Effective monitoring as well as prediction can be done if more health related parameters are collected through variety of sources which could be embedded as wearables.

Frequent and regular health parameter from a person could form a big database and similar information from multiple people collected in a server could be considered as big data and the same can be used for prediction of different diseases as these data lead to interesting patterns.

The overall system utility and effectiveness could be improved through IoT based implementation[1][2].

2. HEALTHCARE ASPECTS

We often say health is wealth. Health of a person is always considered very seriously. The modern technologies have provided different wearables individually. But here we understand that a single wearable cannot provide suitable healthcare. So we distribute a medical kit to our users. These medical kits provide a better physical condition. The medical kit includes various equipments used daily by both male and female.

2.1 Medical kit

- **Watch:** A watch tied on the hand helps in detecting the pulse. Pressure could thus be identified.
- **Pen:** On using a pen it detects the temperature from the fingers. Once if the temperature goes beyond a level emergency alerts will be send.
- **Spectacles:** It helps in recognizing the defects caused in vision. The eye power can be identified. The device allows you to understand if your eye power has changed. And if so it sends message alerts.
- **Headphones:** They help in detecting ear problems. Provides fitness and heart rate tracking.

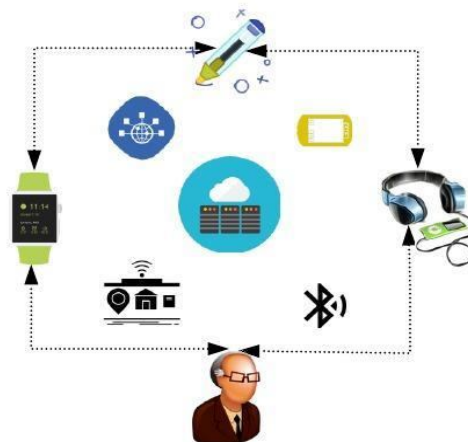


Figure 1: Interlinking of wearables

The Figure1 shows the various equipments used in the medical kit provided. That is a watch, a pen, a spectacle, a headphone. It shows how the equipments are interconnected.

2.2 Medical Information Updation

IoT gives access to patients about their updated health status. This helps to avoid miscommunication and provides better preventive care. Any mishaps could be avoided. Patients can thus take better care of themselves since they are aware about their health issues and doctors can also keep checking on them.

2.3 Real Time Location Services

Through IoT, doctors can use real time location services and track the devices used for treating patients. This helps in situations where it is unable to find the objects that are kept out-of-sight. Medical apparatus and devices like wheelchairs, scales, defibrillators, nebulizers, pumps or monitoring equipment can be tagged with sensors and located easily with IoT.

2.4 Predicting the Arrival of Patients

With the help of IoT, the arrival of patients to the hospital could be predicted. This way, proper assistance could be provided to the patient the moment they arrive. Time delay could thus be avoided and urgent cases could be handled. This also helps to provide emergency care to patients because the doctors will be notified even when they are miles away.

2.5 Immediate Care

The important point to remember is that the patient always comes first. They should be considered as priority. So IoT could be used to make the hospital experience better for them. Some ways to improve this are:

- Immediate attention when needed
- Proper communication
- Lighting control using sensors
- Updated information by storing it in cloud

2.6 Remote Monitoring

Health monitoring is an important factor when it comes to internet of things. Many patients die due to lack of proper care when needed. By monitoring them, it'll be easier for the doctor to keep a track on their health issues. This way everything stays up-to-date and medical assistance could be provided during an urgent situation. This is really helpful especially with patients (old citizens in specific) who live alone. If anything goes wrong, alerts will be sent to the corresponding hospital. This could be done using sensors in wearables and such applications.

3. DETAILED FUNCTIONING



Figure 2: Healthcare at your fingertips

Up-to-date healthcare networks driven by wireless technologies are expected to support chronic diseases, early diagnosis, real-time monitoring, and medical emergencies.[1]

The equipments provided in the kit are connected to a smart phone or computer via Bluetooth connectivity. Detailed updates are send to phone about the physical condition. The medical details will be stored in the server. IoT technology is used.

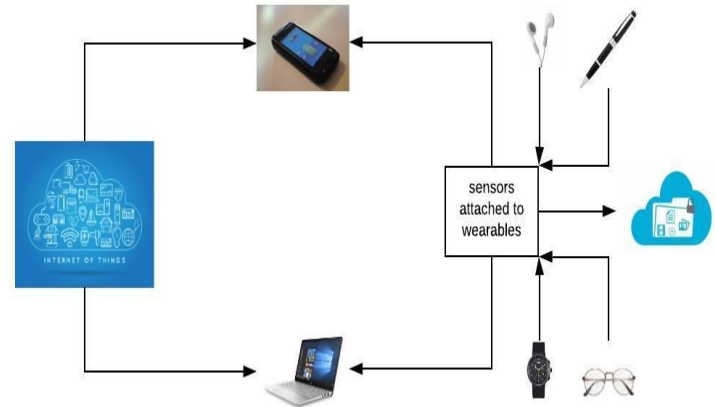


Figure 3: Architecture

The details of all users with privacy would be stored. The required medical treatments will be prescribed in the application via internet. User can always view his body condition. He can understand his medical growth. The growth can be analyzed and hence the emergency requirements can be known.

Based on the medical information he can further seek treatments. The diverse data collected from large sets of real-world cases increases both the accuracy and size of medical data. The precision of medical care delivery is also improved by incorporating new technologies.

IoT empowers healthcare professionals to use their knowledge and training in a better way to solve problems. It helps them utilize better data and equipment that in turn supports more precise and swift actions. IoT helps in the professional development of healthcare professionals because they practically exercise their talent rather than spending time on administrative tasks[6].

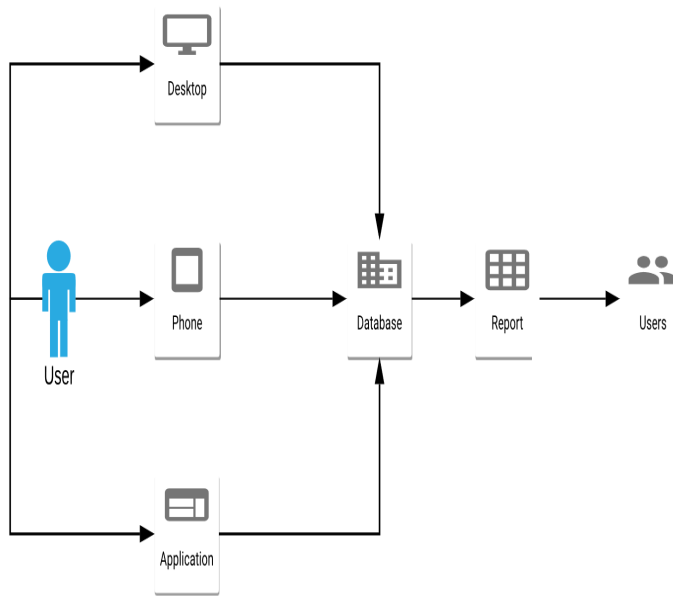


Figure 4: Usage and process

The user can access the application via a phone or a computer. The data stored in the database would include details of various users. Server could compare medical problems of different people and provide required treatments. The medical report can be received by the user. IoT devices not only improve health in the daily lives of individuals but also provide facilities and professional practice. IoT systems take healthcare out of facilities like hospitals and allow intrusive care into the office, home or social space.

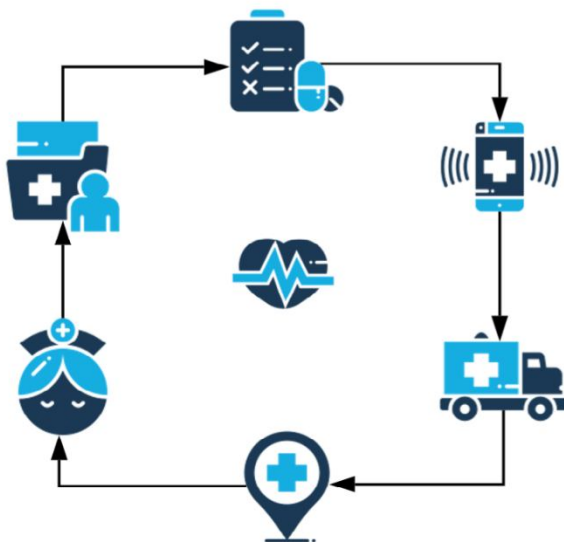


Figure 5: Medical Aids

The distribution of accurate and current information to patients remains one of the most challenging concerns of medical care. This data is stored in a database and can be

displayed in a website that can be accessed only by authorized personnel[2] And the server connects to the internet and utilizes all the medical information available based on a particular variation in the body. The variation will be identified and emergency treatment alert is send to the user. He could use medicines consult other doctors etc as per Figure5.

4. EXPERIMENT RESULTS

The proposed model which included a medical kit was provided to different wearers. According to his daily activities the physical conditions are stored to the database. The database stores information of all users using it with encryption provided to personal information. Users with similar health issues were identified. They were able to receive medical help from doctors across the world. The datas stored about an individual in the database would identify the required medical aid by using IoT. Hence early detection of various diseases could be done. The user daily gets a report on his physical health whereby he could take appropriate treatment[3][4].

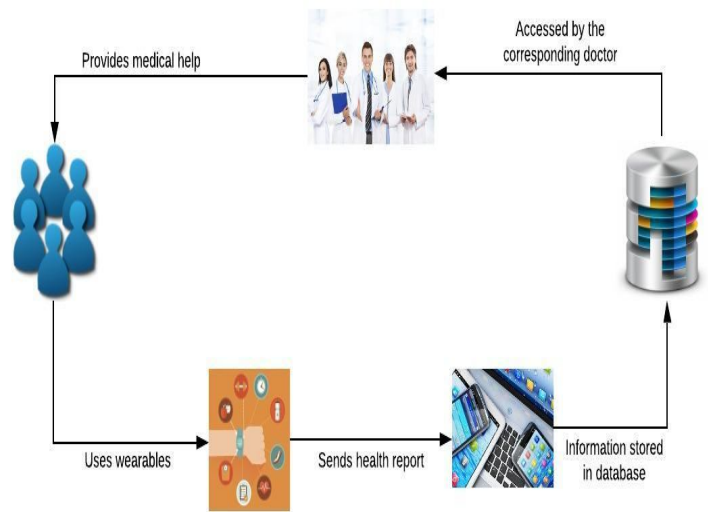


Figure 6:Function model

The model would help users to be more aware about themselves. Predictions could be made based on the analysis of previous reports[5].

5. CONCLUSION

The main idea of this system is to provide better and efficient health services for the patients. We have discussed about IoT applications in the healthcare field. We covered the different healthcare applications of IoT and how IoT is beneficial for healthcare. Better healthcare could be provided easily. Early detection could be done thus avoiding

problems that may occur in the future. This technology is really helpful as we live in a world where technology is growing and people get access to anything with just the touch of their fingertips. If we don't put health first, then there is no point in leading a busy life trying to earn money. Today's lifestyle takes a toll on every individual so it is our duty to look after ourselves. This IoT application in wearables will be really helpful and this technology could be modified in the future as every technology does.

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