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WIRELESS HEALTHCARE APPLICATION DEVELOPMENT FOR SITTING POSTURE MONITORING

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ABSTRACT
In the development of wireless healthcare application, a newly posture monitoring system is proposed in this paper. It involves analysis and simulation study of pressure sensor & LAN communication with brief literature review. The analysis of proposed system is done with the help of kill simulation. Lastly, it concludes that the proposed systems is efficient and highly implemented and have great future scope.

KEYWORDS: accelerometersensor,pressure sensor,zigbee configuration ,onlinemonitoring.

INTRODUCTION
Recent advances in the electronics industry and wireless communication have enabled the evolution of innovative application domains. Smaller embedded processors and systems have allowed a new level of mobile communication and interaction in everyday life. In particular, the expansion of broadband wireless services and the advancement of hand held technology have allowed for real-time patient monitoring in locations where not previously possible.

Low-cost sensors and wireless systems can now create constantly vigilant and pervasive monitoring capability at home, work, and in conventional point-of-care environments (e.g., primary care physician offices, outpatient linics, and rehabilitation centers). A large research community (e.g., the UCLA Wireless Health Institute) and a nascent industry is beginning to connect medical care with technology developers, vendors of wireless and sensing hardware systems, network service providers, and enterprise data management communities. Wearable devices focusing on personal health, rehabilitation, and early disease detection are now being prototyped. All of this has led to the new notion of "wireless healthcare".

A variety of applications lie within the wireless healthcare category. Initially, wireless healthcare (known previously as telehealth) mainly referred to remote consultation of physicians located in different geographical locations for diagnosis and advice on treatment. Later, with advances made in robotics and high-speed communication, telesurgery applications emerged where a surgeon performs surgery on a patient when the two are not physically in the same location.
Telehealth systems are not only used to make healthcare applications available in remote areas, such as homes, schools, nursing homes, and military camps, but also in ubiquitous infrastructures that can improve the quality of overall healthcare[1].

MATERIALS AND METHODS
Development of the PoSeat is proposed to demonstrate the system design and the implementation of a typical wireless healthcare application. A smart seat cushion for chronic back pain prevention will be developed. It has been shown that improper seated posture is one of the major causes of chronic back pain. The factors that increase back pain risk include the seated posture, the duration and the vibration strength of the seat.

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A low-cost and portable system that automatically detects these factors can help prevent chronic back pain. For instance, PoSeat can monitor a taxi driver's seat to calculate the accumulated vibration strength and warn when he or she is at risk of suffering back problems. The functionality of our PoSeat system is illustrated in Fig.1.
When the PoSeat cushion is attached to any chair, it will automatically collect various signals describing the user's sitting behaviour (i.e., postures and duration) and the ambient environment (vibration strength). These signals are sent to Portable PC periodically.
The PC analyzes these signals and sends the user a warning in real time if an inappropriate posture (e.g. leaning left for too long) is detected. In addition, the portable device will automatically synchronize with a remote database to upload the user's seated posture history. An up-to-date summary of the user's seated posture is provided through an online service. There, users can also see a
Comprehensive annual health assessment as reported by a personal physician based on the historical record from the database.
Block-Diagram:
As shown in Fig.1 ARM 7 is main part of system which will collect the pressure from different six points of the chair and then it will be transmitted to the PC using wireless communication which is possible with the help of the zigbee modules.
Similarly the accelerometer output can be transmitted to the PC using Zigbee module the whole data is collected at the PC. After analyzing the data it will become so easy to detect the Sitting habits of the person so as to suggest the proper remedies to avoid the near future pains on the body like back pain.
This data also made available on internet with the help of web page. So, it can be observed from anywhere i.e. from any remote location

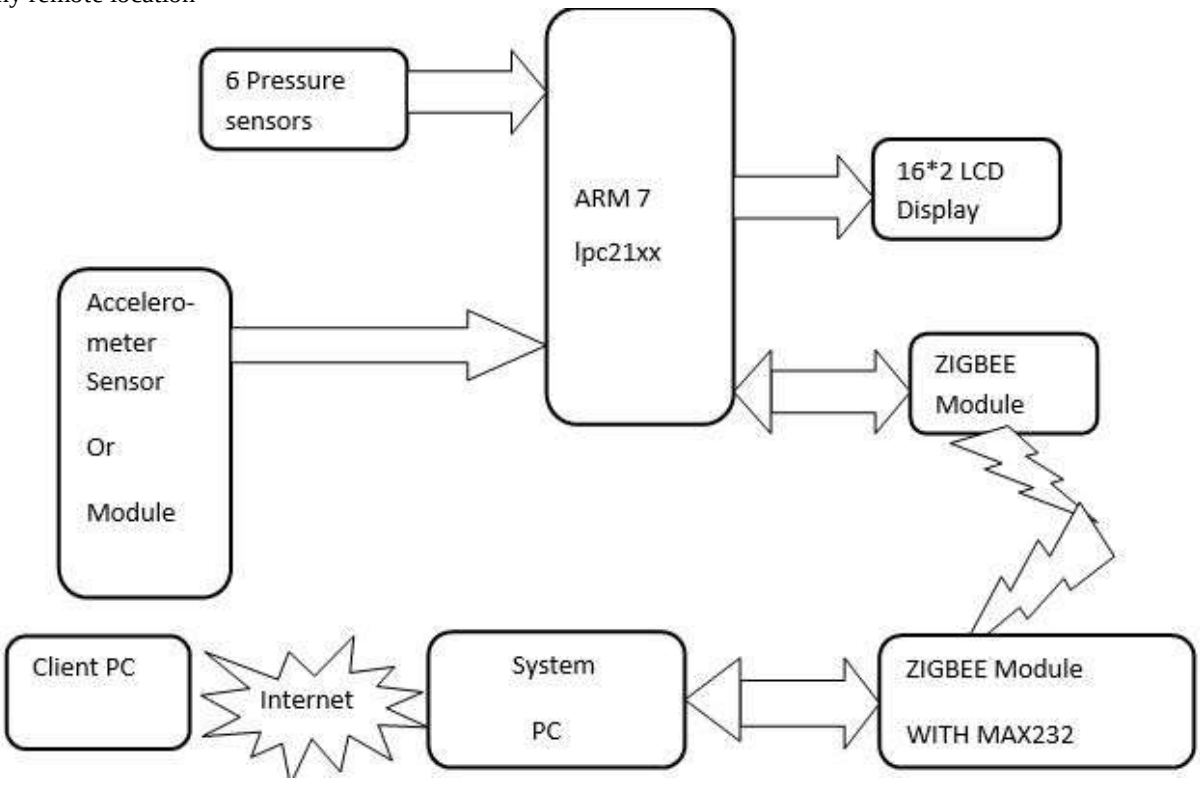

Fig.1 Block diagram of Wireless healthcare system

ANALYSIS OF SYSTEM

1) To obtain pressure of different six positions in the chair:
As here the six pressure points we are considering. So pressure sensor with signal conditioner or pressure sensor

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Fig: 2 user interface

module will help to give the different six positions data. This can be made digital with the help of ARM: four sensors are placed in the back of the chair and two sensors will be placed at the bottom of the chair

2) To obtain accelerometer output
To obtain accelerometer output and send to the Pc.Following image shows accelerometer sensor module

3) Zigbee configuration:
To configure two zigbee to communicate with each other and transfer datawirelessly to pc using zigbee.

4) On-line monitoring:
Design web page that will show the online monitoring of the data to communication between the Web service server and client.

RESULTS AND DISCUSSION

When person was sitting on chair we get the results, following Images shows sitting posture processing results After analyzing the data it will become so easy to detect the Sitting habits of the person so as to suggest the proper remedies to avoid the near future pains on the body like back pain.

Image showses a person sitting on the chair

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Result1

Result 2

This data also made available on internet with the help of web page. So, it can be observed from anywhere i.e. from any remote location as shown in result 4 & result 5

Result 3

Result Main System

Result 4

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Result 5

CONCLUSION

Finally, we conclude that the modified sitting posture monitoring is most efficient and have high efficiency.
The simulation study shows that as. The main advantage of the chair is preventing back pain problems, minimization sitting problems. and design of proposed system which have great future scope.

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