SMART WAIST BELT USING INTERNET OF THINGS

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Abstract: Back pain is the most common and widespread problems in today's workaholic lifestyle. Reasons for having back pain problems can be muscle spasms, heavy lifting, cracked discs, sciatica, abnormal spinal curvature, poor sleep habits etc. Sitting and sleeping in the wrong place are the most common causes of muscle pain in the lower back. Changing these habits is the ultimate solution to standing back. The "Smart waist belt" is a clever tool to solve this problem. Smart belt + Mobile Application helps the user not to get into any wrong position. It simply alerts the user whenever he enters the wrong place. Users will also receive notifications on his Smartphone regarding malicious status, suggestions made by our app. The mobile app will enable the user to set up tracking and notify performance according to their needs.

Index Terms - Internet of Things, Wearable Device, Activity Recognition, Health Behavior Change, Smart Health Care, Digital Health Care, Posture Alert, Accelerometer.

I. INTRODUCTION

The cause of back pain is mostly seen in work-related disability in most of the cases. In a large study, more than a quarter of adults testified experiencing back pain in the past 9 months. Men and women are equally affected by low-grade pain, which can range from severity, chronic pain to sudden, sharp sensation that leaves a person paralyzed. Pain may begin suddenly because of an accident or lift a heavy object, or it may develop over time as a result of age-related changes in the spine. Lifestyle lifestyles can also set the stage for low-level pain, especially when the midweek exercise program is very low with weekend exercise. Most low back pain is severe, or short-lived, and lasts for a few days to a few weeks. It tends to fix itself by taking care. Low back pain is routine in nature, which means that there are dysfunctions in the way parts of the meet and move Acute and chronic low back pain is defined as pain that lasts between 4 or more weeks. The cause of the lower back pain is either after the initial injury. Some of the people affected by lower back pain develop chronic pain within a year. The treatment effectively relieves chronic back pain, but in other cases, the pain continues notwithstanding treatment. The severity of the burden from low back pain has increased significantly in recent years. In the case of death or poor health due to diseases that have placed low pain in the sixth place; in 2010, low back pain increased to third place, with only heart disease and chronic obstructive pulmonary disease.

II. LITERATURE SURVEY

The human body system includes three-dimensional data based on anatomy and anthropometry, three-dimensional seat data and flexible assembly interactions between the body and the seat based on the kinematics of the human body [1]. Inactivity is a very common situation in modern society. A certain posture may cause health problems [5]. To prevent injuries in recent years, many wearable devices and Internet of Things (IoT) health care equipment (s) have been developed and released on the market. However, their price is not expensive for individuals. The chair recognition system can categorize seven different health-related seats. This technology focuses on health management based on empathy and perception of the current state of users. The arrangement uses six flex sensors. While waist position is known as the most suitable place in the body for independent work recognition because the acceleration patterns are very similar to the same function for different users. The WaistonBelt X provides sensory and interactive functions with a device with a wearable belt type. The sensor automatically measures with a magnetometer that recognizes the action of the metal placed in the bucket and monitors the basic purposes of the cyclic life of the user with sensors without a 3-axis accelerometer and gyroscope. Belt also has a purpose for occurring in a user's activity by vibrating. The vibrotactile intervention is triggered by a habit (activity) set by the user, such as a poor sitting posture. The data are forwarded to the application via a Bluetooth module [4].
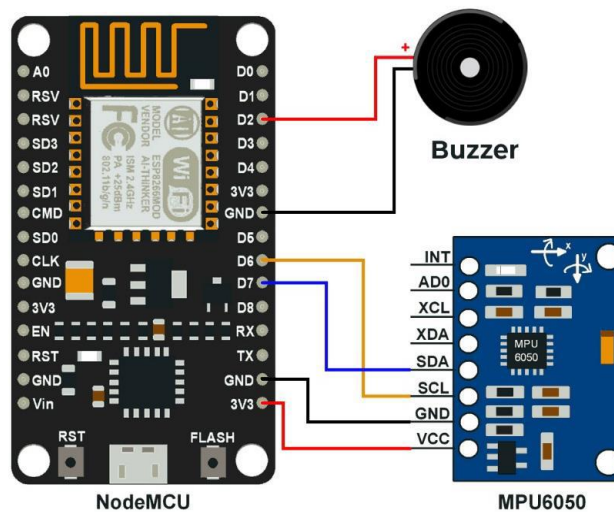
III. PROPOSED SYSTEM

Figure 1 Proposed System

The advocating system has NodeMCU, MPU6050 and buzzer. The MPU6050 gyroscope sensor with NodeMCU is used to sense various angles. NodeMCU is a controller that takes care of receiving data from the hearing process, transfers it to the database, and provides notification via buzzer. The Mpu6050 is a digital motion processor that offers 6 different angles. In addition, we use a real-time database to store all user data, which was later used for displaying in our application. Our app provides a good interface to see various data about positions in an understandable format.
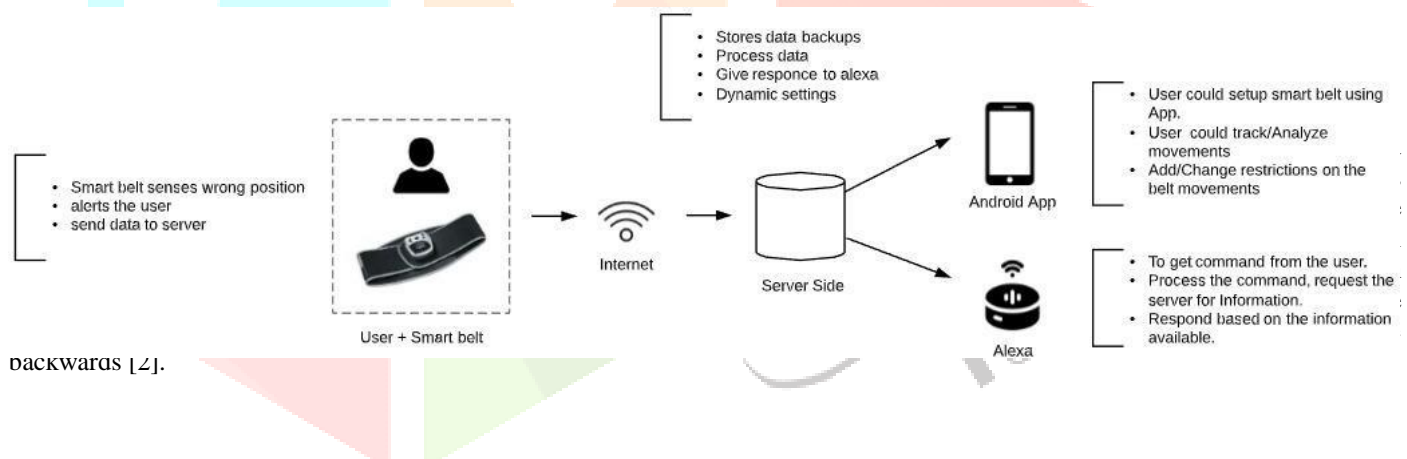
3.1 System Overview

Figure 2 System Overview

Our desired system is much simpler to understand. Firstly, the patient has to wear the belt, which will detect the initial state   or the position angles, which will then set as default. Now as the patient will move to a disturbing position a beep or buzzer will give an alert. It will give an alert until the patient come back to its normal position. All the data of patient likely the default position, wrong posture, alert time, no. of alert will be recorded and save in the database online. We are using google firebase service or the online database. Which will store data as well as process data in a dynamic and static configuration. Adding to it online voice assistant will work with it by getting use command. Respond will be based on the information it processes. In addition, support of mobile applications will be provided which will work on Android and iOS. The app has to configure with the smart belt with a static or dynamic IP. The application will give analyze of movement and help to set default positions and it contains a user-friendly interface.
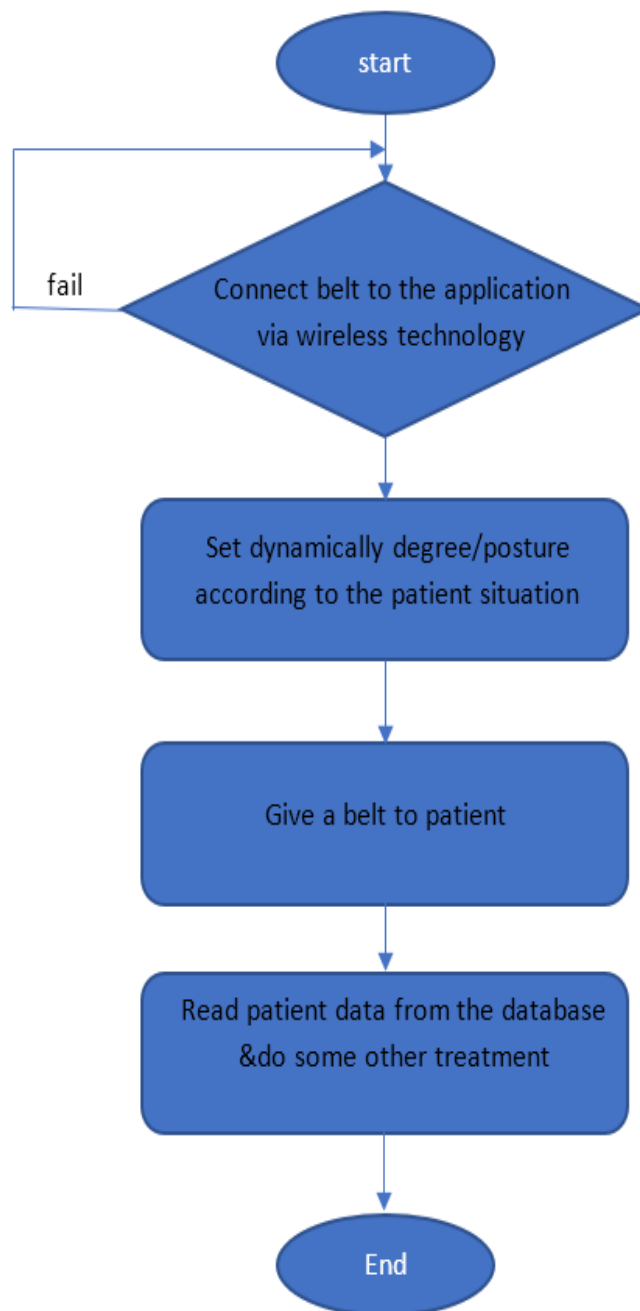
IV. Process

4.1 Doctor's Plan

Figure 3 Doctor's Flow.
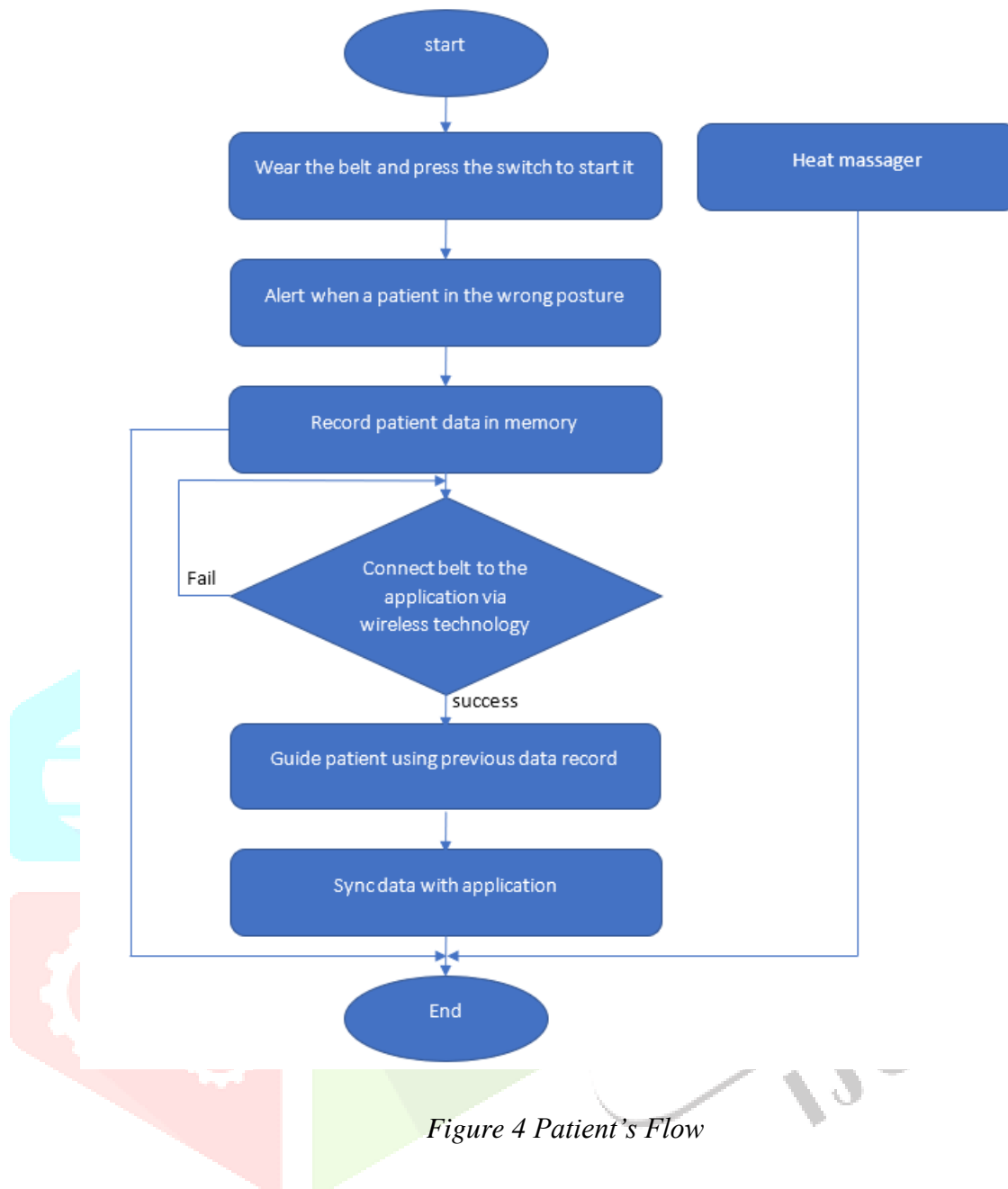
4.2 Patient Flow

Figure 4 Patient's Flow

V. CONCLUSION

In this regard, we have proposed a health support system that provides a solution to improve, maintain, or restore health or prevent   disease with smart tape. Our work has achieved very low power consumption, hardware simplicity and high accuracy among related functions. This solution changes your bad habits very quickly.

VI. ACKNOWLEDGMENT

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