

ARDUINO BASED SMART WATCH

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Abstract – A smart watch is a unique device that helps the user wearing it to monitor various notifications of his android phone through this watch and alter them. Therefore the situational analysis is more focused to smartphone as the baseline comparison, rather than desktop PC, laptop or tablet. Given the phone has been picked out from pocket and now is on hands, a person still needs to do some steps such as unlocking the phone, finding the app. The number of steps involved are high and thus a smart watch device is helpful. Smart Watch that are already in this market are advanced and costly. This paper proposes a smart watch which not only shows time but provides additional features like health monitoring, notification display at a much cheaper price. This watch is programmed using arduino's open source libraries and functions. This watch is embedded in various sensors that track and interpret user's actions into information. It provides the user another way to interact with an android smartphone. This watch can also be personalized according to the user's requirement for the functionality.

The design is based on what technology is available today as well as what has been patented.

The present study aims to study the developed smart watch by studying the components used and the data optimized by it. During that study errors were found and preferable remedies were implemented.

2. Literature Review

[1] Perrault et al., 2013- looks at how wristband can be used for solving fat finger problem in the wristwatch due to their screen size.

[2] Kyu Yeol Paik highlights that gesture can be other considerable input modality.

[3] Rhodes et al. 1999 looks at the advantages and disadvantages of ubiquitous and wearable computing.

[4] Smart watch Barrier-to-use- The paper by Song studies the reason why consumers do not buy wearable devices and what is the ideal product they are willing to buy and wear.

[5] Chen explores input modality that combines smart watch gesture with smartphone spatial context to create new multi-device input interaction. Such new gesture-based interactions increases easiness compared to conventional way of doing it in following aspects: reduces cumbersome steps if they were done using smart phone alone, provides extended display on.

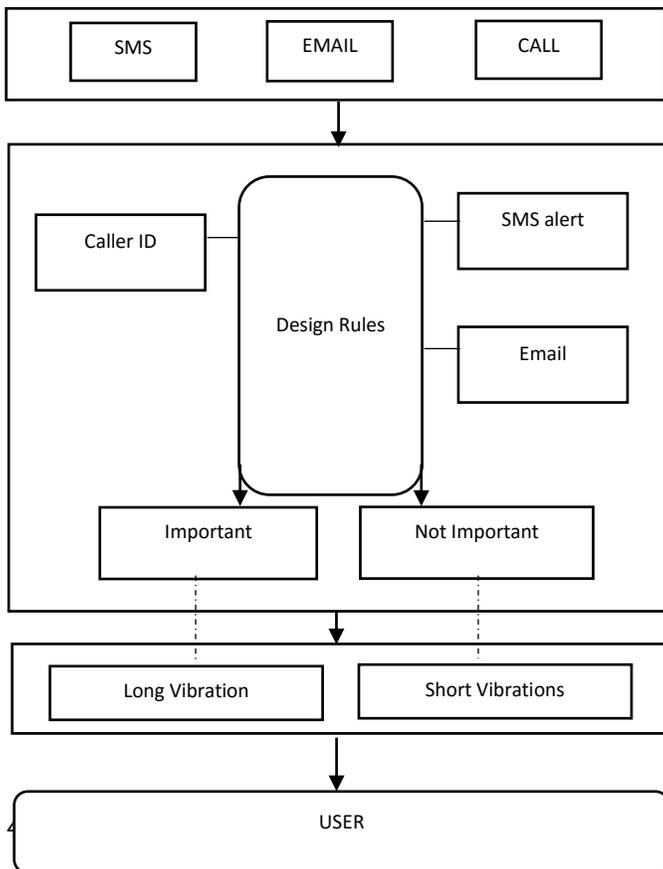
3. Design

The generic principle is that the smart watch interaction should be natural, simple and easy-to use, which translates to the following design principles:

1. Introduction

Though smart watch has been commercially available since early 80's, it has not gained much publicity or interest from public consumer. However in the past one year, it has gained significant momentum and 2013 was even said by analysts "could have been year of the Smart Watch". That momentum was signified by the release of several smart watch products such as Pebble, Razer Inc, Archos, LG, Motorola and even Google Android Wear. This paper is trying to explore what smart watch can or should do in order to save people time, by making some daily tasks processing easier and more efficient. One focus area is how the "human-smart watch" interaction should be designed in order to achieve that time-saving objective.

- Minimum number of menus on screen.
- Total number of steps required to execute the app's function should be less than steps required on smartphone.
- Visually appealing. The user interface should be simple to use and visually appealing.



4. Block Diagram

ARDUINO MINI- The microcontroller used in this project is ATmega 328p mini chip. It has 2KB RAM, 32KB EPROM, 64KB FLASH.

DISPLAY – A Nokia monochrome 1.3” display is used. It has a pixel shade of 128 x 64 bits.

BLUETOOTH MODULE – A Bluetooth Serial Transceiver HC06 is used. The HC06 Bluetooth module is the most widely used module with an Arduino project. It has low

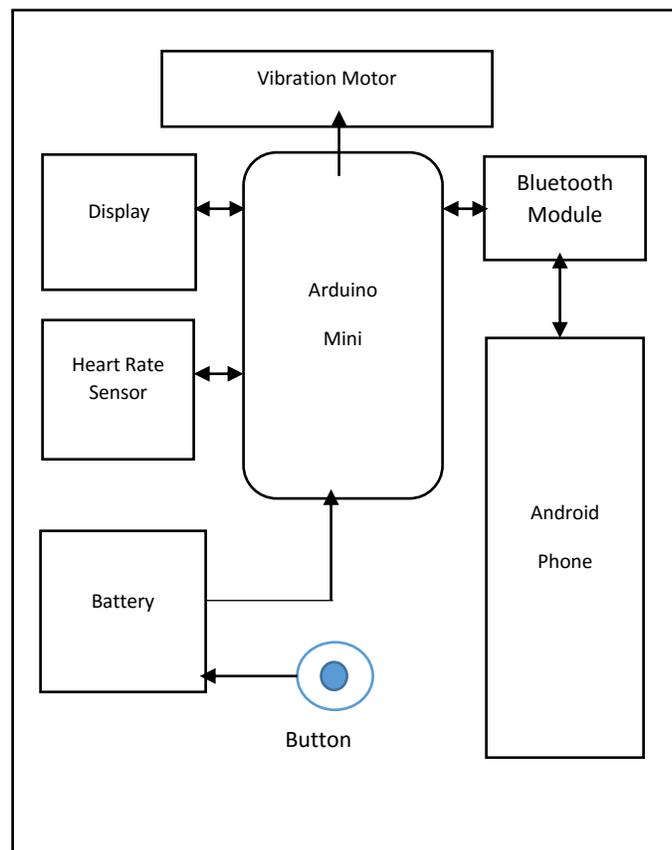
power consumption so that it can be powered by a small rechargeable battery.

VIBRATION MOTOR - LR50 Piezo LEGS Rotary 50.

The LR50 motor is a Piezo motor in a rotary configuration. The main purpose of the motor is to alert the wearer of any notifications or alarms. Can provide haptic feedback for any action the user takes.

HEART BEAT SENSOR - KY-039 compact heartbeat sensor is used. A heartbeat sensor is an essential sensor that helps with tracking various activities of the user. This is achieved by measuring the pulse which helps to determine the status of the wearer.

BATTERY - 3.7v 100mah Lithium-ion Batteries with charging modules are used. Powering the whole system is a battery which can last up to 12 hours with 2 hours of charging

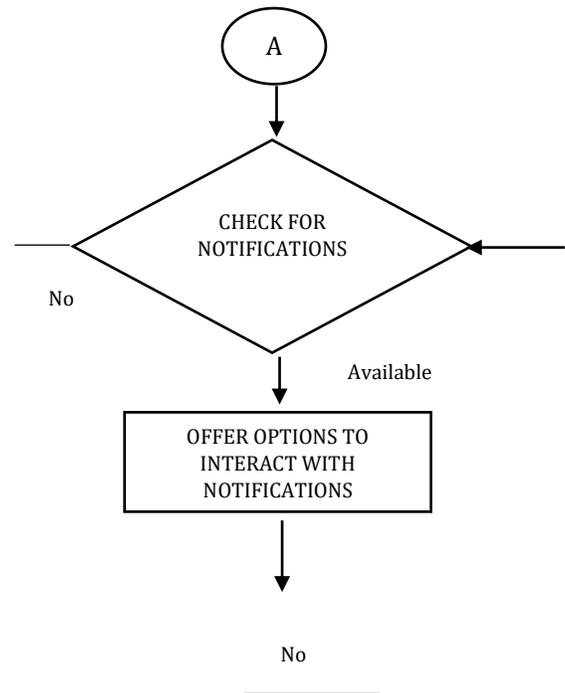
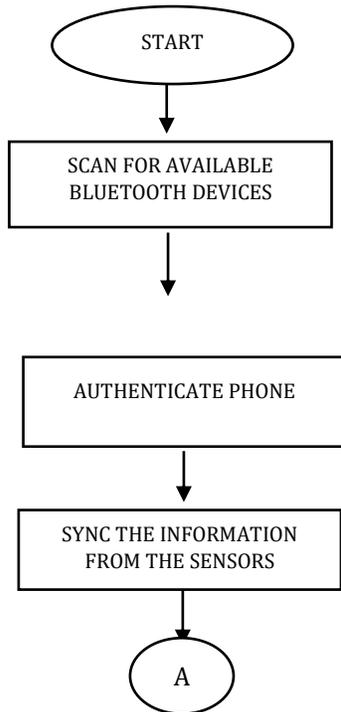


5. ALGORITHM AND SOFTWARE

The open source Arduino libraries are used for the development of the basic source code. The main android app is developed in Android Java Platform.

- Powering On the Smart watch switches On the components connected to it.
- The user needs to synchronize his Smart Phone with the Watch via bluetooth for the notifications on the fly functionality.
- Upon successful pairing with the bluetooth module and installation of the Android app notifications can be displayed on the watch and can be interpreted accordingly.
- The heart rate sensor monitors the users heart rate and shows it on the screen when that particular menu is selected.

FLOW CHART –



5. CONCLUSION

This Smart Watch is developed with minimum cost. It consists of two mechanisms. The first mechanism consists of the sensors embedded in the circuitry of the watch, whereas the second mechanism is the interaction between a smart phone and the watch.

The smart watch's functionality can be altered as per the users need.



6. ACKNOWLEDGEMENT

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