

REPORT ON SMARTWATCH

PROBLEM STATEMENT

To design and implement a smart watch a Smart watch which shows the following functions:

- Clock
- Stopwatch
- Alarm
- Reminder
- Timer
- Date
- Day

Also to design and interface a smart watch with the following sensors:

- Temperature sensor
- Heart rate sensor

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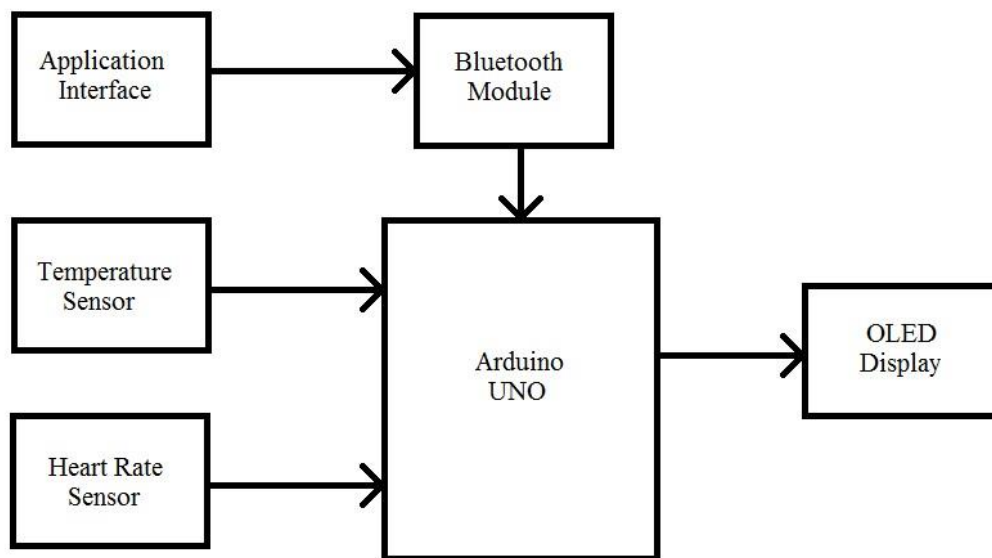
CHAPTER 01

INTRODUCTION TO SMARTWATCH

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 various other features such as alarm and temperature. This watch is embedded with various sensors that track and interpret user's actions into information. It provides the user another way to interact with an android smart phone. This watch can also be personalized according to the user's requirement for the functionality.

CHAPTER 02

BLOCK DIAGRAM AND ITS EXPLANATION



App Inventor is the application interface with arduino through the Bluetooth module.

Temperature Sensor generates calibrated digital output which is given to the arduino. Amplified heart rate sensor output linked to the arduino UNO. All the data are processed according to the program. It's done in accordance to the program which is written in the arduino IDE software. This processed data is given to the OLED display with the help of connecting wires.

CHAPTER 03

WORKING OF THE SYSTEM

The Microcontroller part of the project is the Arduino UNO. It controls the OLED display and other interfaces. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE via a type B USB cable. It can be powered by a USB cable or by an external 9 volt battery, though it accepts voltages between 7 and 20 volts.

Microcontroller ATmega328

Operating	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) of which 0.5 KB used by bootloader
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

App inventor is a cloud-based tool, through which we have designed an app. It's an opensource web application which is originally provided by Google and now maintained by Massachusetts Institute of Technology (MIT). It uses a graphical interface, very similar to Scratch and the Star Logo TNG user interface, which allows users to drag-and-drop visual objects to create an application that can run on Android devices.

To setup Wireless Serial Communication, HC-05 Bluetooth Module is used. This module can be used in Master or Slave Mode and easy switchable between these two modes, by default Slave mode is configured. Modes can be changed using AT Commands.

With the help of Bluetooth module, a communication network is established. Through the app we acquire the required data such as day, date and time. Reminder and alarm can be set by the smart phone using the app.

The heartbeat sensor is based on the principle of photo phlethysmography. It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ (a vascular region). In case of applications where heart pulse rate is to be monitored, the timing of the pulses is more important. The flow of blood volume is decided by the rate of heart pulses and since light is absorbed by blood, the signal pulses are equivalent to the heart beat pulses.

Pulse Sensor Amped adds amplification and noise cancellation circuitry to the hardware. It's noticeably faster and easier to get reliable pulse readings. Pulse Sensor works with either a 3V or 5V Arduino.

The DHT11 is a basic, ultra-low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin but requires careful timing to grab data. This sensor is less accurate and works in a smaller range of temperature/humidity.

To overcome these difficulties, we attain data related to temperature using weather forecast available in the smart phone through the app. We have also included stopwatch and timer in

our system. For further enhancement of the system to measure your walking stride length, steps as you walk across that distance is calculated.

0.96-inch OLED Display Module is a precise small, White OLED module which is interfaced with arduino UNO using SPI protocol. It is having a resolution of 128x64. Thus, the required functions are displayed on this OLED display module.

Though we carry our smart phone with us we need to pick the phone and unlock it to see the notifications, by using this smart watch we get message notifications which is time saving.

CHAPTER 04

PHOTOGRAPHES OF THE MODEL DESIGN



CHAPTER 05

FUTURE SCOPE

- Volume control includes increase, decrease, and mute sound of function such as call, alarm, and notifications.
- Call log displays last 9 call summary describing type of call by its color.
- Music player can be used to play/pause music, play previous/next song, increase /decrease volume of music.
- GPS can be used to determine location and speed of the android.
- Flight mode can be switched on and a time can be set such that flight mode is called off and automatic reconnection is established between watch and phone.
- Profiles can be switched between general, vibrate and silent.
- Home automation can be done.
- Replace Bluetooth shield by a touch shield to make it an Android watch.
- Adding more prominent features in the android application like calories burn during exercises.

CHAPTER 06

CONCLUSION

This Smart Watch is developed with minimum cost. Your phone can be in your bag, pocket or anywhere within 10 meters. Like a mini version of your Smartphone, Smart watch reflects what is happening in your world and lets you know. 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.