



Health Reporter

Presented by **D-HEALTH SOLUTION**

- **Team Organization**
- **Introduction**
- **Solution Design**
- **Solution Progress**
- **Finance**
- **Timeline**
- **Acknowledgement and Sponsor**
- **References**
- **Question**

ROAD MAP



D-Health Solution Inc.

- **Jue(Carter) Chen – CEO: Hardware and Firmware Engineer**
- **Simone Liu – CTO: Software Engineer**
- **Kai Geng – CFO: Software Engineer**
- **Janice Mardjuki – CIO: Technical Writer**
- **Xing Qiao – COO: Technical Writer**

Team Organization



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- Introduction
 - **FACT**
 - **SOLUTION: HEALTH REPORTER**
 - **PRODUCT OVERVIEW**
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ROAD MAP



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FACT

- Medical service faces staff, space shortage
- Many patients in critical condition were rejected by hospital because of no ICU beds available
- Waiting time in emergency department in Vancouver is 30mins to 4hrs

SOLUTION:

HEALTH REPORTER

- Body condition monitoring device
- Measure five aspects:
Temperature, Heart Rate, Oxygen rate in Blood, Sweating, Breathing, Body Position
- Real time data analysis
- Emergency Notification System
- Diagnostic Report

Introduction



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Skin Response Sensor



Air Flow Sensor



Body Temperature Sensor



Patient Position Sensor



E-Health shield[1]



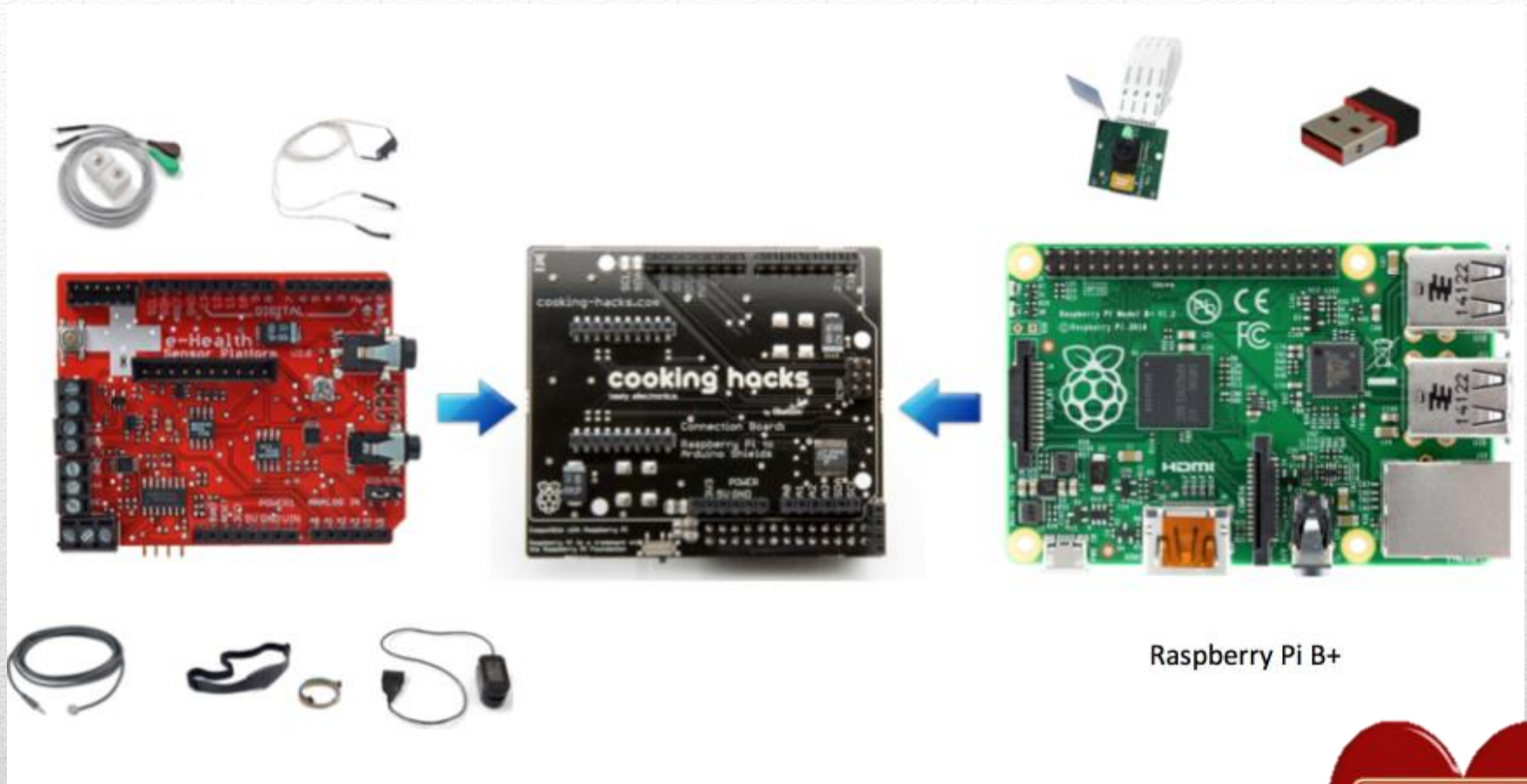
Pulse and Oxygen in Blood Sensor



Product Overview



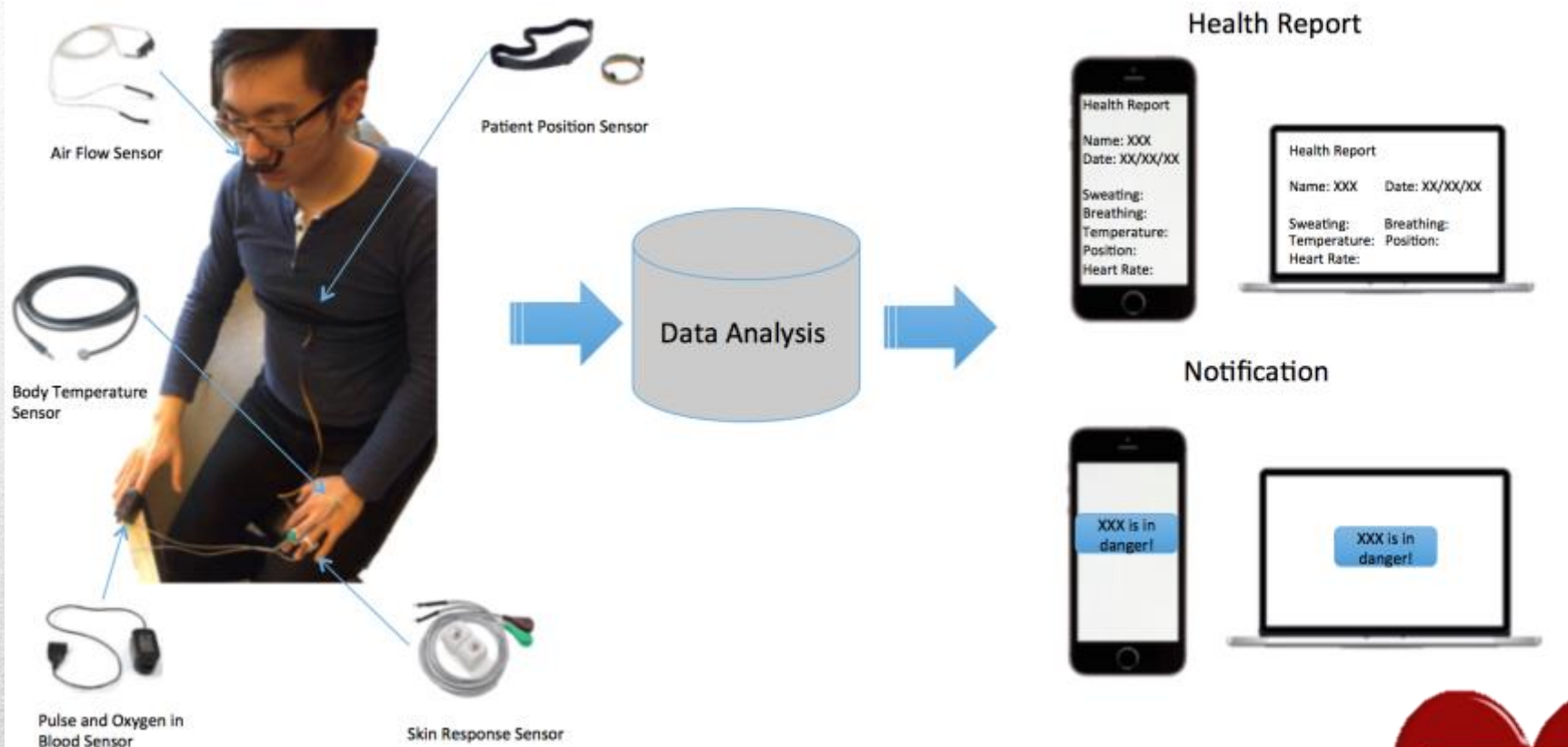
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Product Overview



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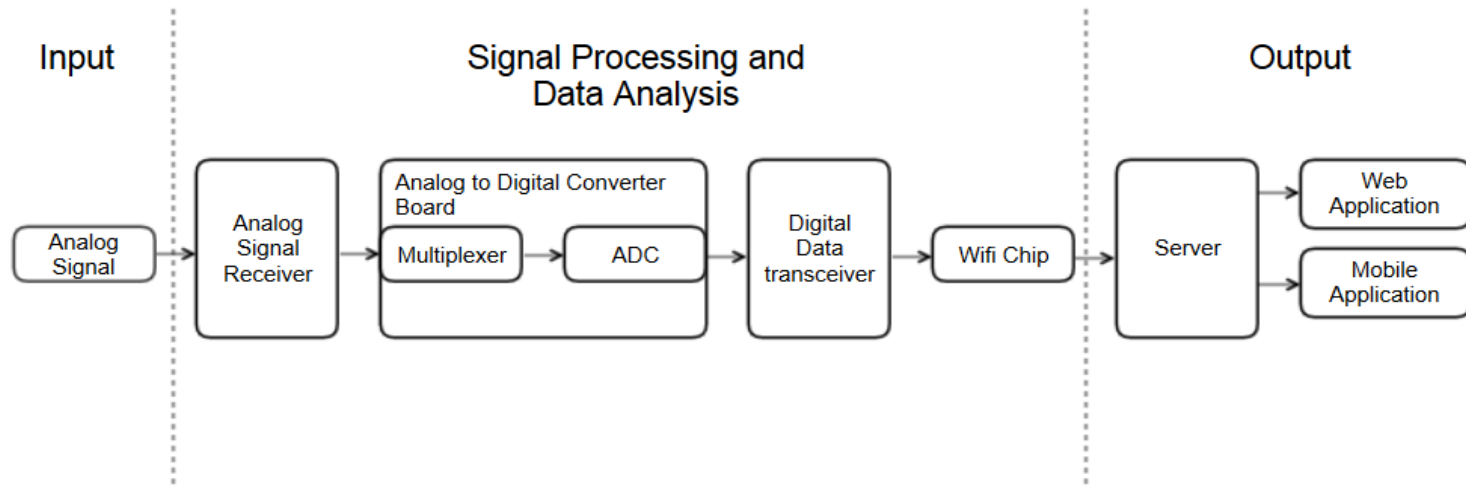
Product Overview

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System Overview



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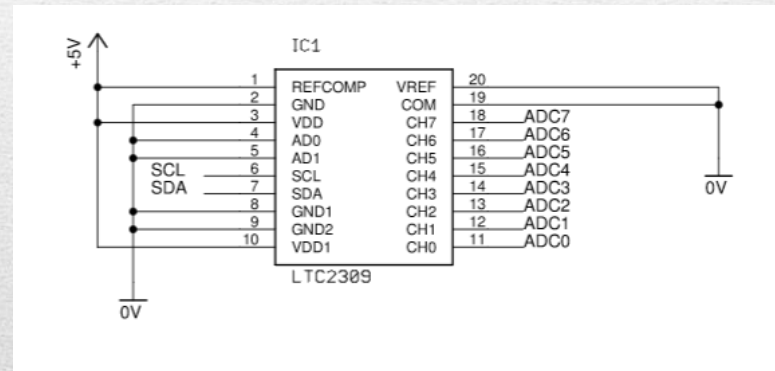
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- **Five analog sensors**
- **Analog Sensor Platform**
- **8-channel, 12-bit ADC: LTC2309[3]**
- **Digital Data Transceiver: Raspberry Pi**
- **Digital Data Transfer Method: Wi-Fi Protocol**



Hardware And Firmware Design



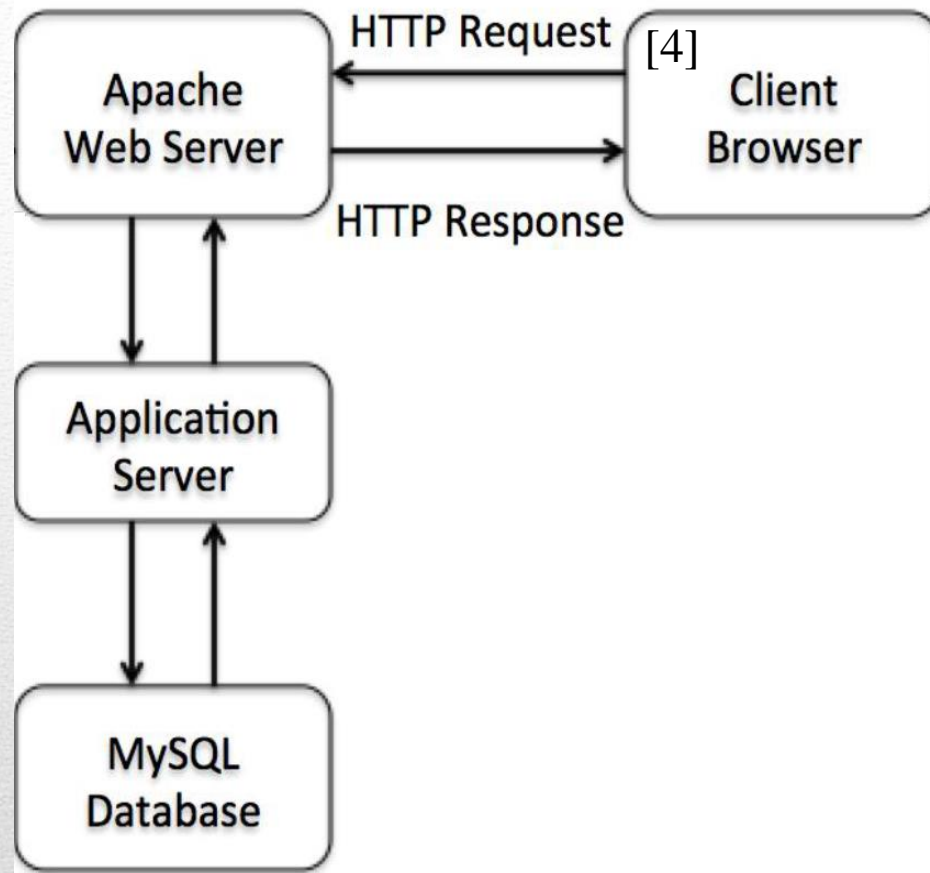
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 - **Server and Web Application**
 - Server Setup – Jersey
 - Web User Interface
 - Database - MySQL
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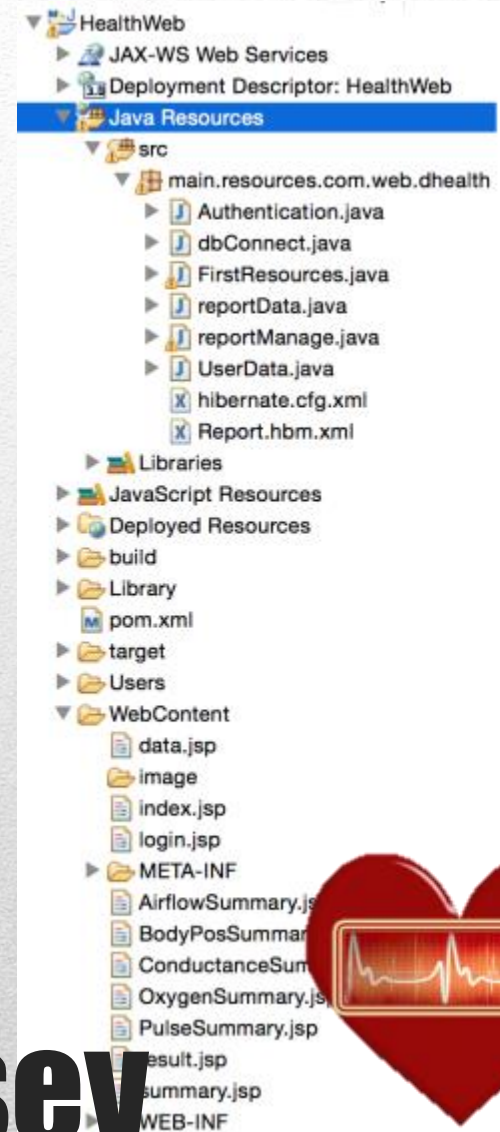
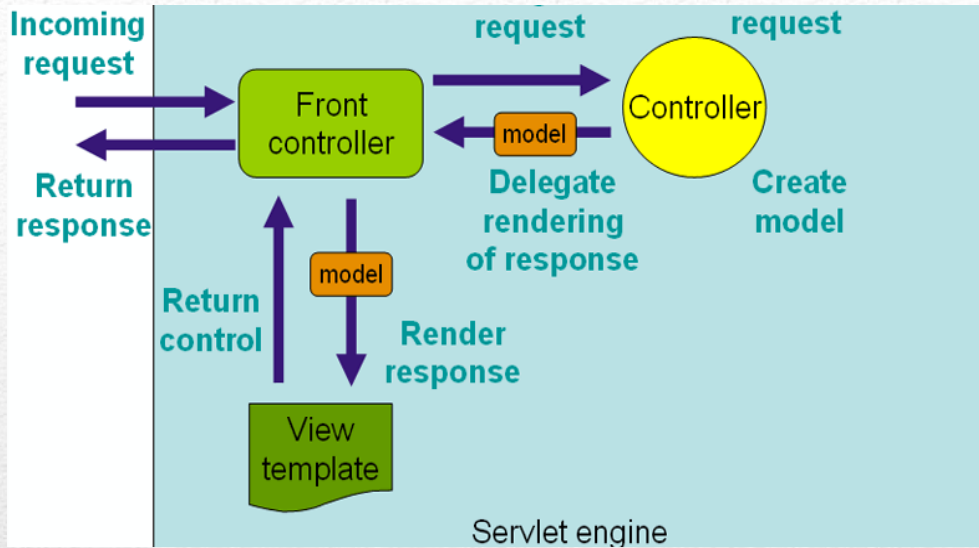
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Server and Web Application



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Server setup – Jersey

Welcome to Health Report

Login Here	
User Name	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Login"/>	<input type="button" value="Reset"/>
Yet Not Registered!! Register Here	

Web User Interface



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Database: health_report

```
mysql> show tables in health_report;
+-----+
| Tables_in_health_report |
+-----+
| REPORTS                  |
| USERS                    |
+-----+
2 rows in set (0.00 sec)
```

```
mysql> show columns in health_report.REPORTS;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id     | int(11) | NO | PRI | 0 | |
| pulse  | int(11) | YES | | NULL | |
| oxygen_in_blood | int(11) | YES | | NULL | |
| air_flow | double | YES | | NULL | |
| conductance | double | YES | | NULL | |
| body_position | varchar(255) | YES | | NULL | |
| temperature | double | YES | | NULL | |
| time   | datetime | YES | | NULL | |
| timestamp | int(5) | NO | PRI | 0 | |
| username | varchar(255) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
10 rows in set (0.00 sec)
```

```
mysql> show columns in health_report.USERS;
```

```
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| username | varchar(255) | YES | | NULL | |
| password | varchar(255) | YES | | NULL | |
| timestamp | int(5) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```



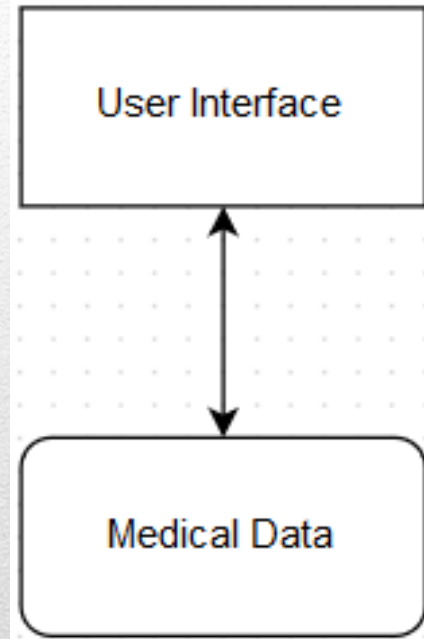
Database - MySQL

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Mobile Application



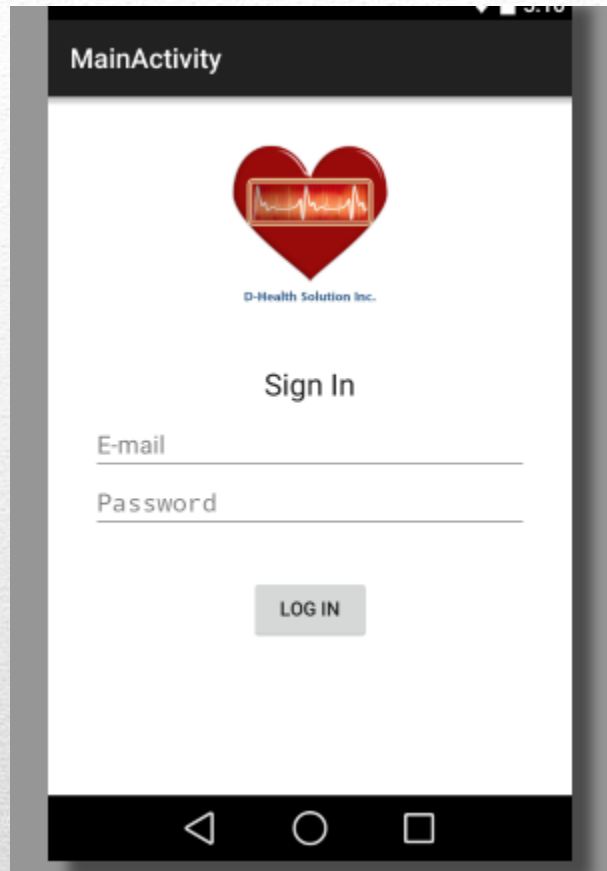
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- Log in→ Get Data Page→ Download the Data form Server→Final Result
- AndroidStudio, AVD and SDK Manager, Intel x86 Emulaor Accelerator.

Mobile Application OverView

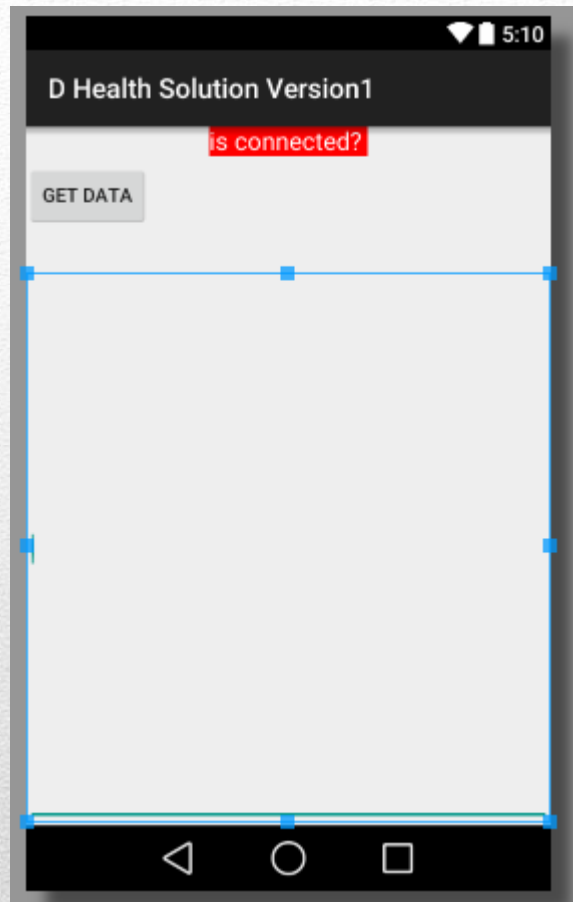


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Log in Page





Data Generate Page



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- **Proof of Concept Level**
- **Basic Functionalities**

Solution Progress



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Required Materials	Estimated Cost	Actual Cost
raspberry pi starter kit with <u>wifi</u> dongle	\$120	\$100
Waterproof temperature sensor with digital output	\$45	\$35
Heart rate sensor with digital output	\$120	\$85
E-HEALTH SENSOR <u>SHELD V2.0</u>	\$180	\$120
RASPBERRY PI TO ARDUINO <u>SHELDS CONNECTION BRIDGE</u>	\$105	\$80
GALVANIC SKIN RESPONSE SENSOR	\$85	\$40
PATIENT POSITION SENSOR	\$100	\$75
AIRFLOW SENSOR	\$75	\$45
Raspberry Pi Camera Module	\$55	\$50
Unexpected Import Tax and Duty	\$0	\$70
Unexpected Monitor with <u>HDMI</u> port	\$0	\$120
Total Cost	\$885	\$820

Finance



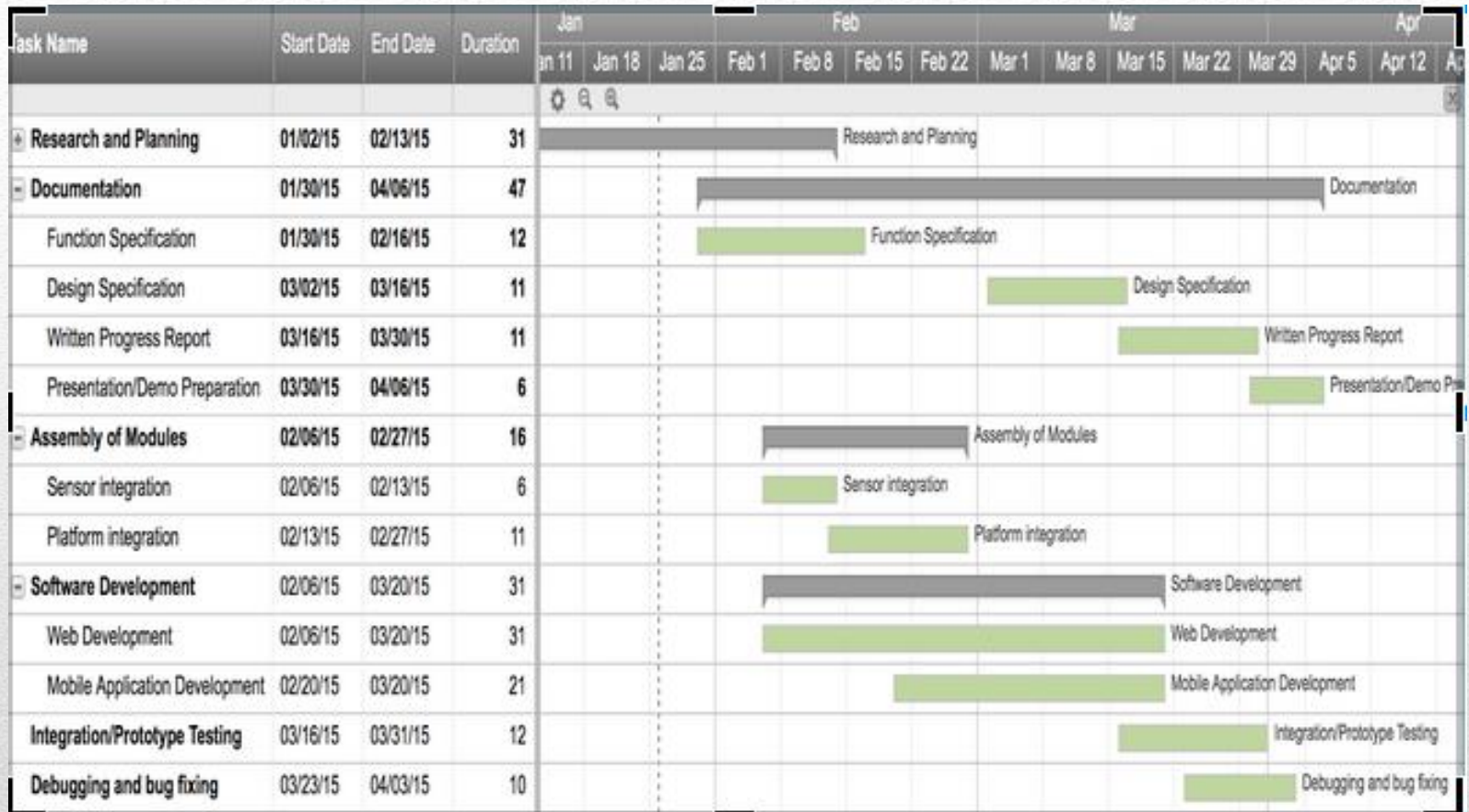
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TimeLine

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ROAD MAP



D-Health Solution Inc.

- **Dr. Andrew Rawicz**
- **Dr. Steve Whitmore**
- **Lukas-Karim Merh, TA**
- **Senate Undergraduate Awards Adjudication Committee**

Acknowledgement and Sponsor



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- [1]Cooking Hacks, “e-Health Sensor Platform V2.0 for Arduino and Raspberry Pi,” [Online]. Available: <http://www.cooking-hacks.com/documentation/tutorials/ehealth-biometric-sensor-platform-arduino-raspberry-pi-medical>. [Accessed 8th Apr 2015].
- [2]*Apache Software Foundation*, “Tomcat Architecture,” [Online]. Available: <http://tomcat.apache.org/tomcat-5.5-doc/architecture/>. [Accessed 8th Apr 2015].
- [3]Cooking Hacks, “Raspberry Pi to Arduino shields connection bridge,” [Online]. Available: <http://www.cooking-hacks.com/documentation/tutorials/raspberry-pi-to-arduino-shields-connection-bridge>. [Accessed 8th Apr 2015].
- [4]R. Amal, “Raspberry Pi making HTTP requests using Python,” [Online]. Available: <http://www.learn2crack.com/2014/03/raspberry-pi-post-get.html>. [Accessed 8th Apr 2015].

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Questions?



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