The Smart Health Station

Progress Report

Axel Vigo
Josué Acevedo
Pedro J. Franceschi
Wilfredo Torres

Agenda

- Current Status
- Delays in Project
- Budget Analysis
- Technical Plan
  - Software
  - Hardware
- Future Work

Current Status

- What has been completed?
  - Tutorials
  - Software Requirements
  - Hardware/Software Design
  - Some hardware (70%)
- What tasks are left?
  - Finish hardware (30%)
  - Software Program
  - System Integration
- Gantt Chart
  - 1 ½ week delay

Delays in Project

- What is delayed in the project?
  - Project Design was extended (hardware/software)
    - Assigned time was not enough for proper design
    - More details = better design
- Contingency plan
  - Extra hours on weekends
  - Resource reassignment depending on priorities

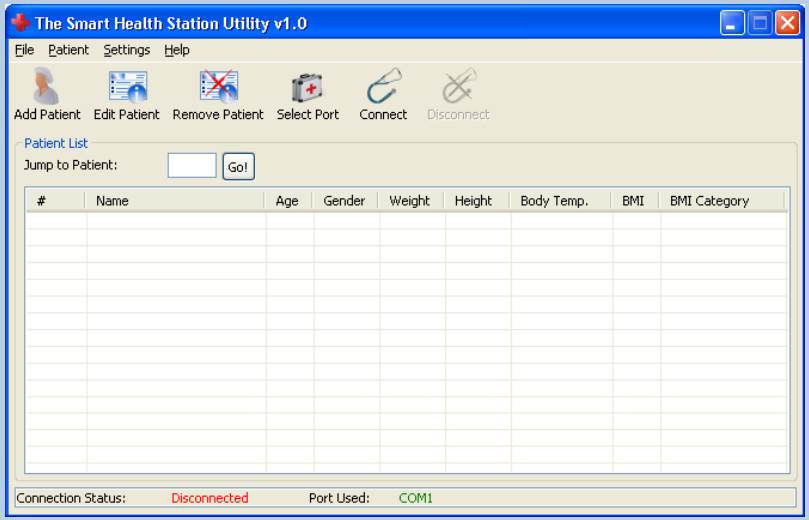
Budget Analysis

	Initial Calculated Costs	Actual Costs
Total Personnel Cost:	**$16,210.45**	**$17,484.70**
Total Materials Cost:	$313.65	$285.14
Subtotal Project Cost:	$16,524.10	$17,769.84
Overhead:	$9,981.63 (60.41%)	$9,726.63 (54.74%)
Total Project Cost:	**$26,505.73**	**$27,496.47**

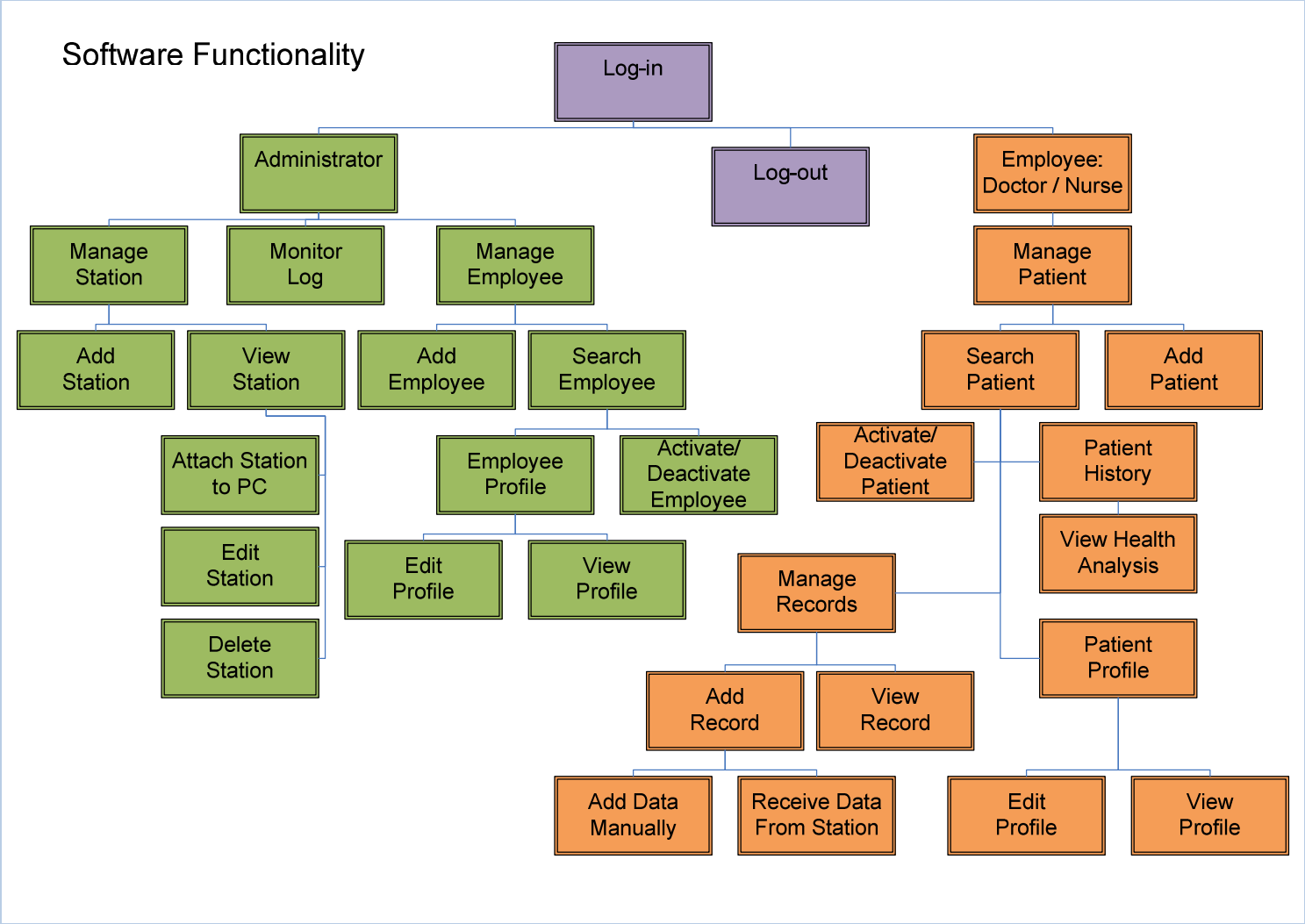
Technical Plan: Software

Software

- Design Documents
  - E-R Diagram
  - Class Diagrams
  - Activity Diagrams
  - Software Functionality Diagram
  - Screenshots
- Development Environment Setup
  - Eclipse
  - Java

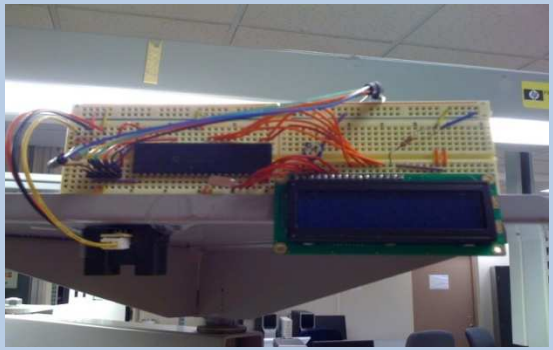


Software


Software Functionality
Log-in
Administrator
Log-out
Employee: Doctor / Nurse
Manage Station
Monitor Log
Manage Employee
Manage Patient
Add Station
View Station
Add Employee
Search Employee
Search Patient
Add Patient
Attach Station to PC
Edit Station
Delete Station
Employee Profile
Activate/ Deactivate Employee
Edit Profile
View Profile
Activate/ Deactivate Patient
Patient History
View Health Analysis
Manage Records
Patient Profile
Add Record
View Record
Add Data Manually
Receive Data From Station
Edit Profile
View Profile

Technical Plan: Hardware

Height Sensor



- Sharp GP2Y02YK0F IR Sensor
- Current consumption 33 mA
- Voltage supply of 4.5 to 5.5 V.
- Non-Linear Analog output
- Triangulation method avoid problems with reflectivity of the object and the environmental temperature.

Temperature Sensor

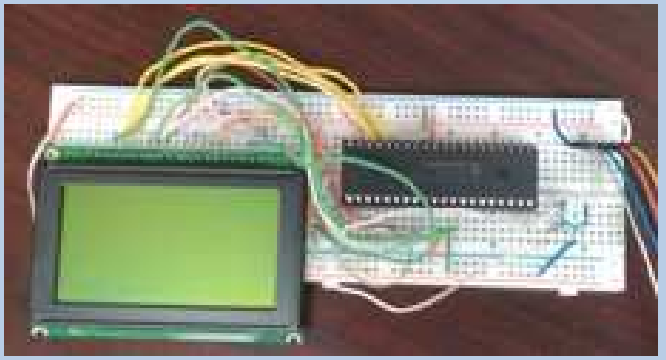
- The IVAC TEMP PLUS II MODEL 2080A is the thermometer that contains 2 probes design for body temperature readings

MODEL 2880/2882 Probes

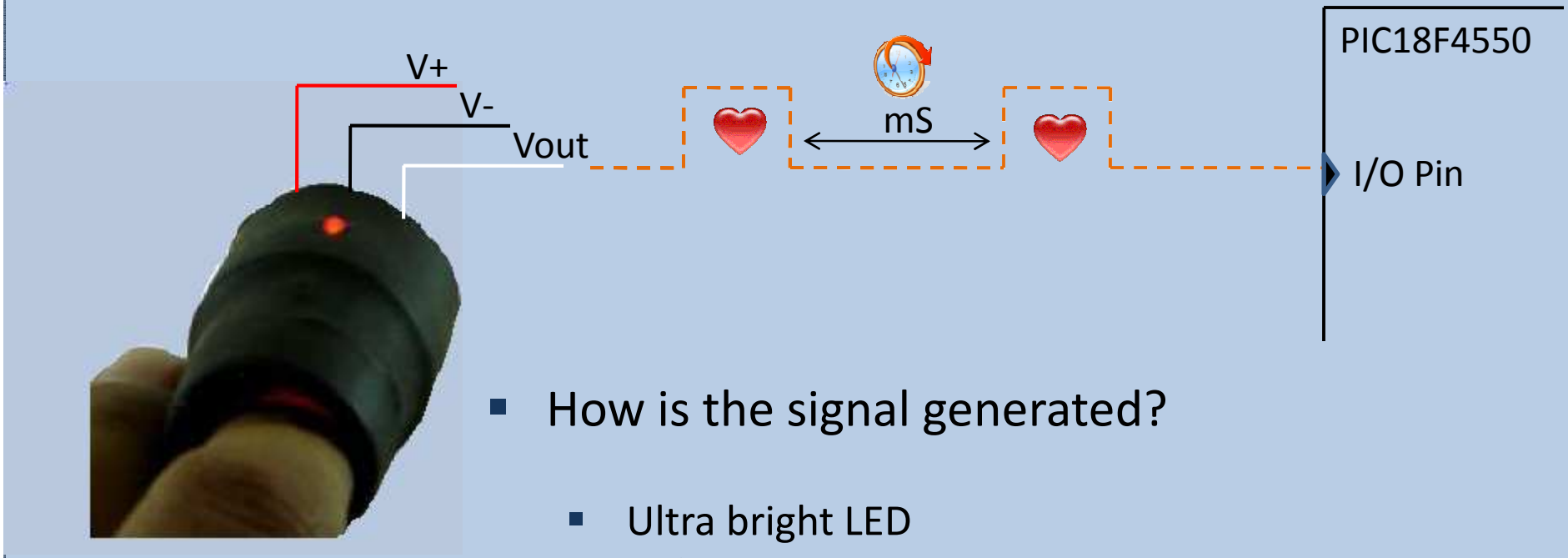
- Thermistor located at tip of the probe
  - Resistance changes proportional to the temperature
- Linear Analog output

Graphic Display

- Xiamen Ocular *GDM12864HLCM*
- 128 x 64 pixels
- Parallel Interface (Hitachi S0108B), Backlit, 5V Operating Voltage, 30mA Total Current
- Implemented with original SHS Keypad
- LCD Menus and Button interaction



Heart Rate Sensor



- How is the signal generated?
  - Ultra bright LED
  - Light detector
  - Variation in light is detected and converted into and electric pulse

Blood Pressure System

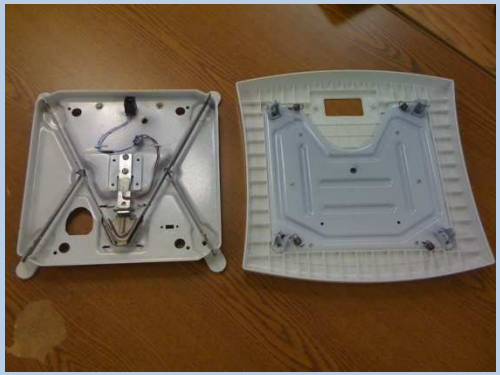
Major Components:

-Pressure sensor (analog output)
-Air Valve(empties strap)
-Air Pump/motor(fills strap with air)

Basic Functionality Concept:

1) Fill strap to maximum pressure
2) Begin to deflate strap slowly until first heart beat is detected
3) Register systolic pressure
4) Continue to deflate strap slowly until last heart beat is detected
5) Register diastolic pressure
6) Empty strap

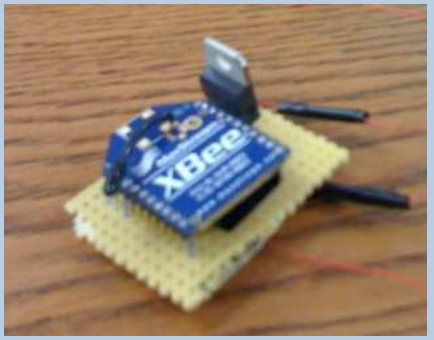
Weight Scale



- Home Digital Weight Scale
  - Mechanical assembly
  - Strain Sensor
    - Differential output, order of millivolts
- Amplifier
  - AD620 from Analog Devices
    - Low power, low noise, high gain (up to 10,000)

Wireless Communication

- Xbee Modules
  - No need to transmit big amount of data
  - Low power, simple protocol
  - Cheap solution compared to:
    - Bluetooth
    - WiFi
  - Reliable packet delivery – Retry/Ack
  - Encryption – 128-bit AES



Future Work

- Finalize Hardware implementation
- Start Software implementation
- System integration

Questions