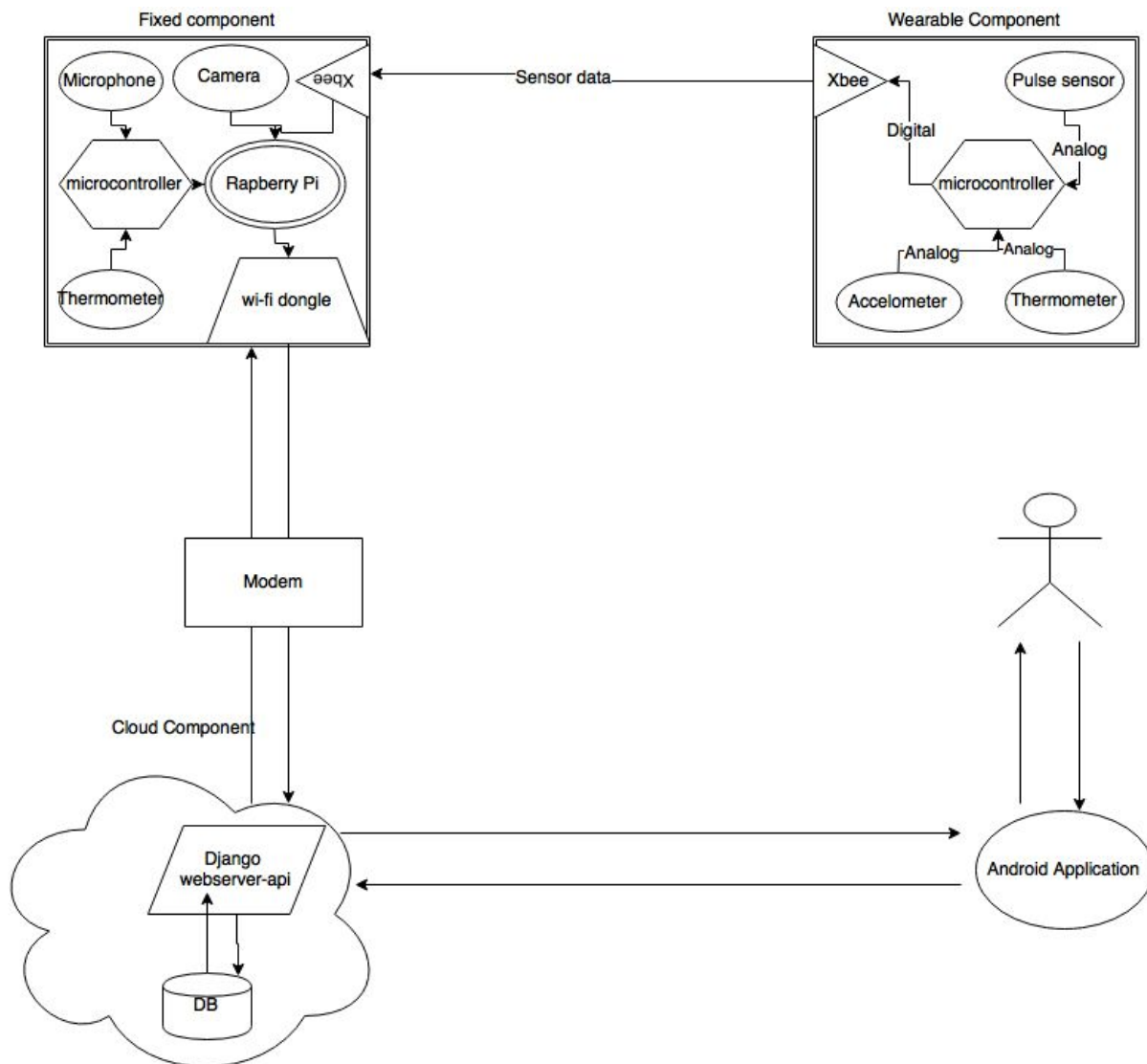# METU CENG491 2015 FALL

START-UP DOCUMENT

G13P12

Group Name: *newline*

Project Name: *Hypnos*

1. System Architecture

Wearable Component: It has 3 sensors including pulse sensor, thermometer, accelerometer. They measure pulse, body temperature and body movement respectively. It has also microcontroller which converts analog outputs of sensors to digital data. Then, this data is sent to xbee which sends them to another xbee on fixed component. It has battery on it.

- **Dependency:** battery

Fixed Component: The main part itself is a Raspberry Pi. It has microcontroller, camera to take photos and 2 sensors including microphone and thermometer connected to Raspberry. They measure room sound and temperature respectively. Raspberry Pi combines the data from these with the data from wearable component and processes them real-time. Raspberry communicates with the cloud component through an internet connection.

● **Dependency:** Internet connection

Cloud Component: The cloud component is basically a Django webserver running on a linux server. It has interfaces for both fixed and mobile components to communicate with them.

● **Dependency:** Server with static IP

Mobile Component: Mobile component will be an android app. It will communicate with the cloud. It will be used to configure the alarm and access the visual representations of the user data.

● **Dependencies:** Android phone, internet connection

User Interaction Model: The system will communicate with the user through mobile component which is actually an android app. User will be able to get visual representations of the user data like sleep quality, heart beat average etc. User also can set alarms and system will invoke the app so that the alarm rings at the appropriate time. User will be asked to report their mood as they wake up. After some amount of time app will start to give recommendations about ideal sleep environment to user.

2. Tentative Time Plan

TaskID	Short Name	Description
T1	generate dummy sensor data	generating dummy data for 5 sensors to be used in advance
T2	get digital data	converting analog data of the sensors to digital data with microcontrollers
T3	get sensor data directly	getting data from sensors to RPi directly
T4	get sensor data with Xbee	getting accelerometer, pulse and body thermometer sensor data to RPi with Xbee
T5	get movement density	constructing movement density data with respect to accelerometer data

	Iteration1	Iteration2	Iteration3
T1	■		
T2	■	■	
T3	■	■	
T4		■	■
T5		■	■

3. Deliverables

Deliverable	Description	When? (Sprint#)
D1	generated dummy data	1
D2	Joined RPi and sensors that you are able to get sensor data from RPi	2
D3	Joined RPi, Xbee and sensors that you are able to get sensor data from RPi wirelessly	3

4. Workload Distribution

	Sprint - I	Sprint - II	Sprint - III
Esref	T1, T2, T3	T2, T3, T4, T5	T4, T5
Ozge	T1, T2, T3	T2, T3, T4, T5	T4, T5
Baris	T1, T2, T3	T2, T3, T4, T5	T4, T5
Oguzhan	T1, T2, T3	T2, T3, T4, T5	T4, T5