Internet of Things – Smart Cities – Household Application

Proactive Disease Avoidance

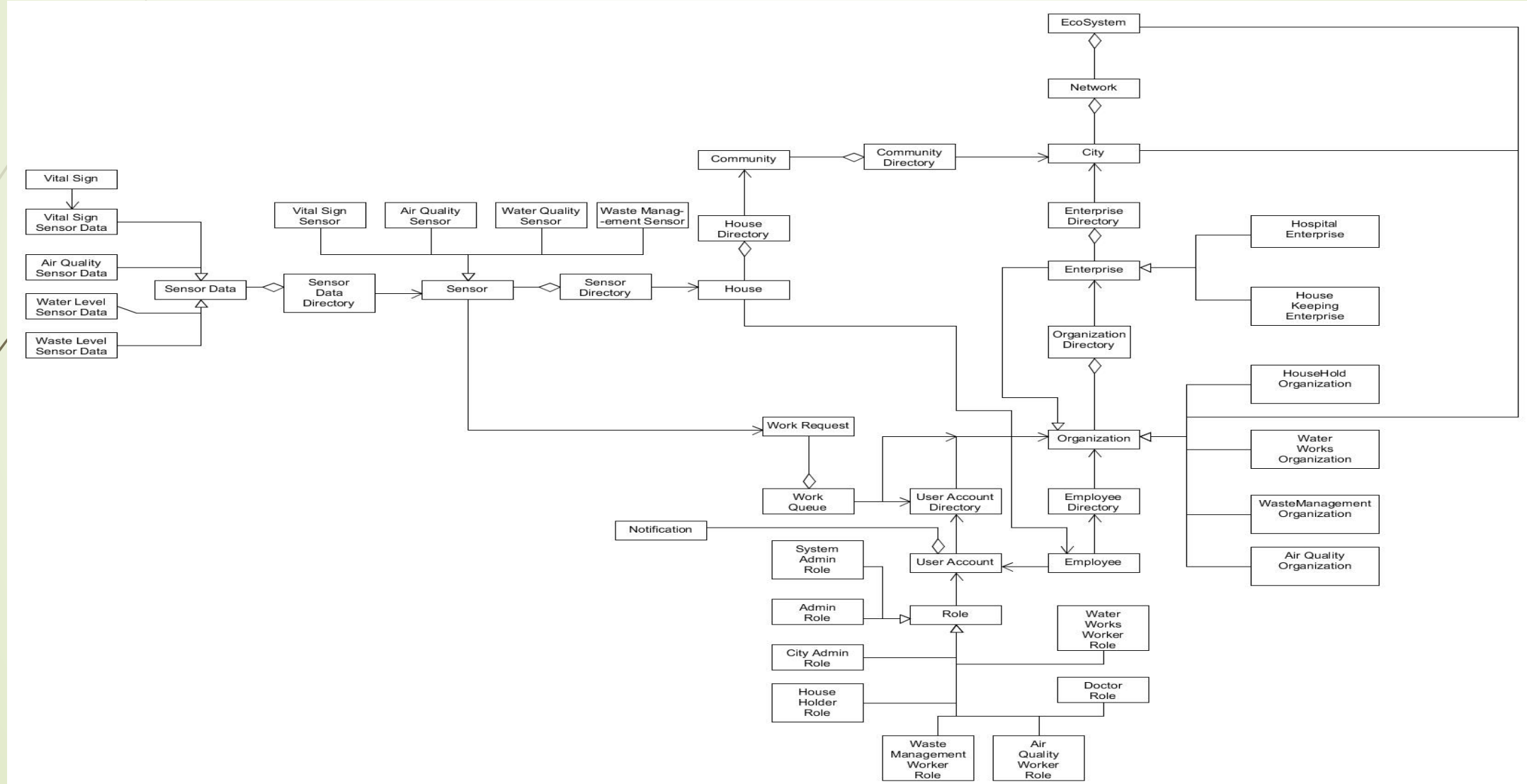
Problem

- In a city, people in few communities often fall sick.
- People at home are more prone to diseases if the following things are not properly managed:
  - Water Quality
  - Air Quality
  - Timely Waste Disposal
- Doctors are challenged by the frequency of disease occurrence.

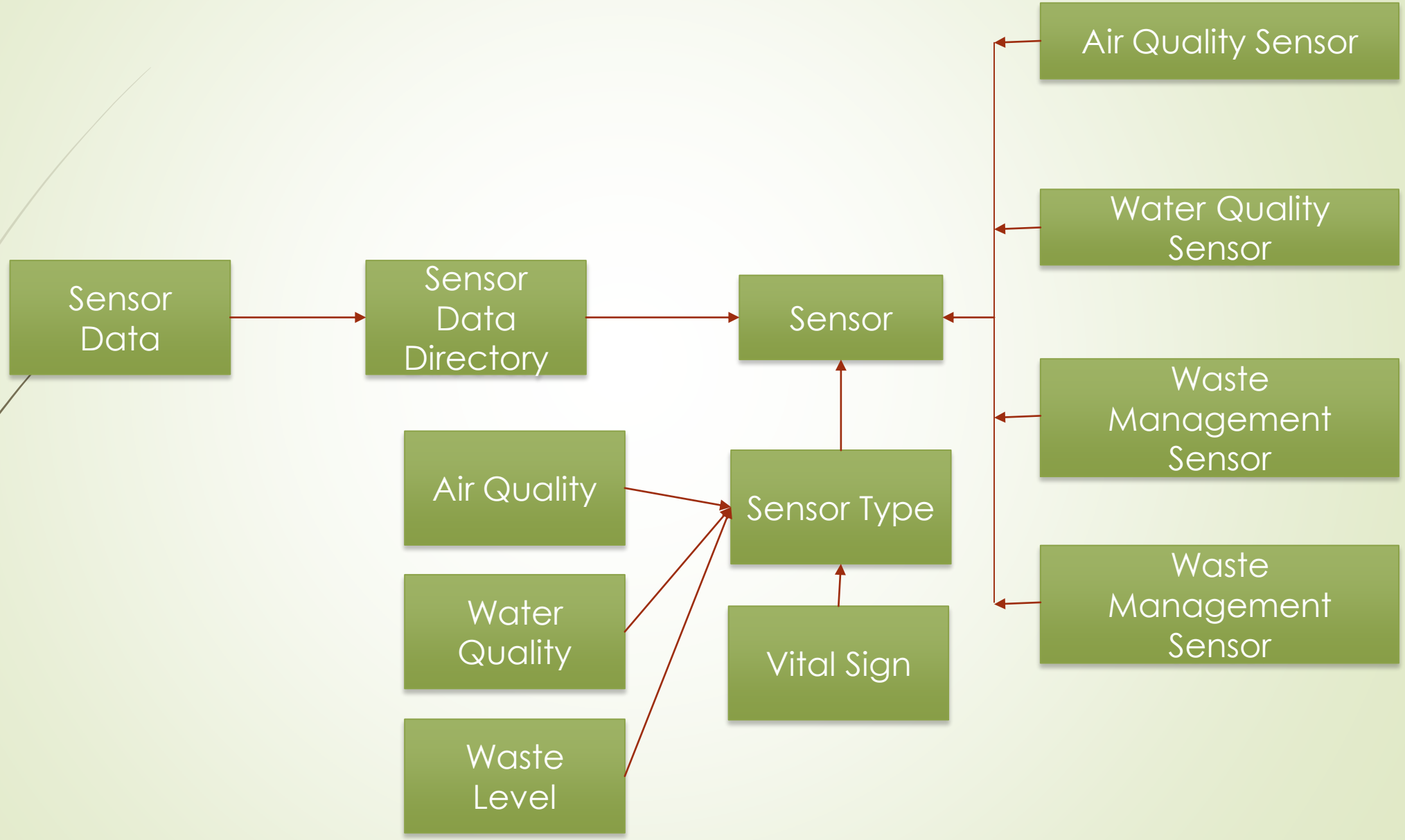
Proposed Solution

- Design and deliver an application to house holder in integration with Doctors, Waterworks, Air Quality and Waste Management Departments.
- Sensors are deployed in each household, sensors will be integrated with the application.
- The objective of this application is to make people life better and lead the life healthily in at most smarter way.
- Four different types of sensors deliver data to the application.
- Application will warn respective departments, if any sensor measurement hits threshold.
- Also, Application enables house holder to keep the city clean.
- Timely addressing the abnormalities of basic amenities will reduce probability of people becoming sick in a community.

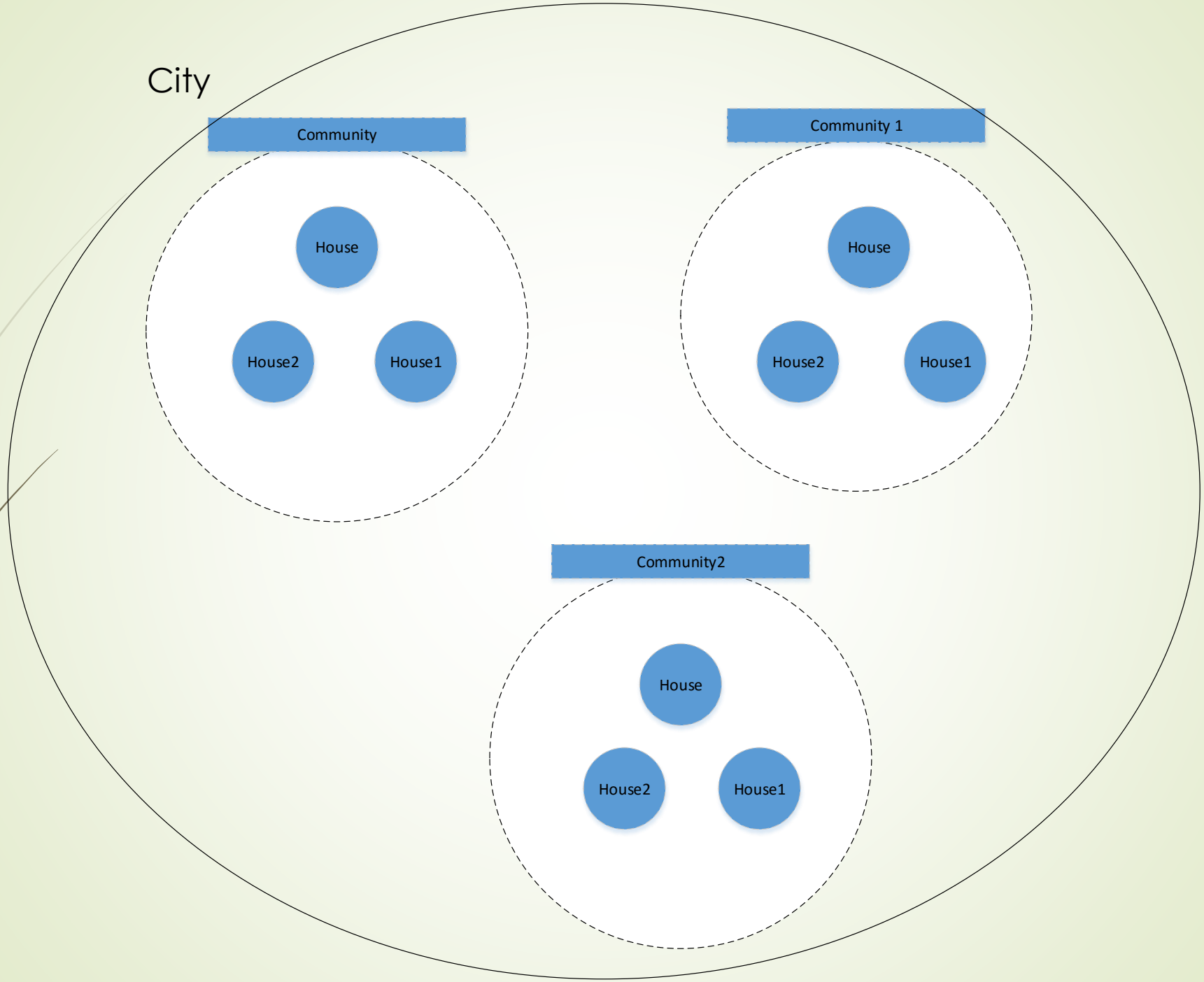
Object Model of Application



Sensor


Sensor Data
Sensor Data Directory
Sensor
Air Quality Sensor
Water Quality Sensor
Waste Management Sensor
Waste Management Sensor
Air Quality
Water Quality
Waste Level
Sensor Type
Vital Sign

City


Community
House
House2
House1
Community 1
House
House2
House1
Community2
House
House2
House1

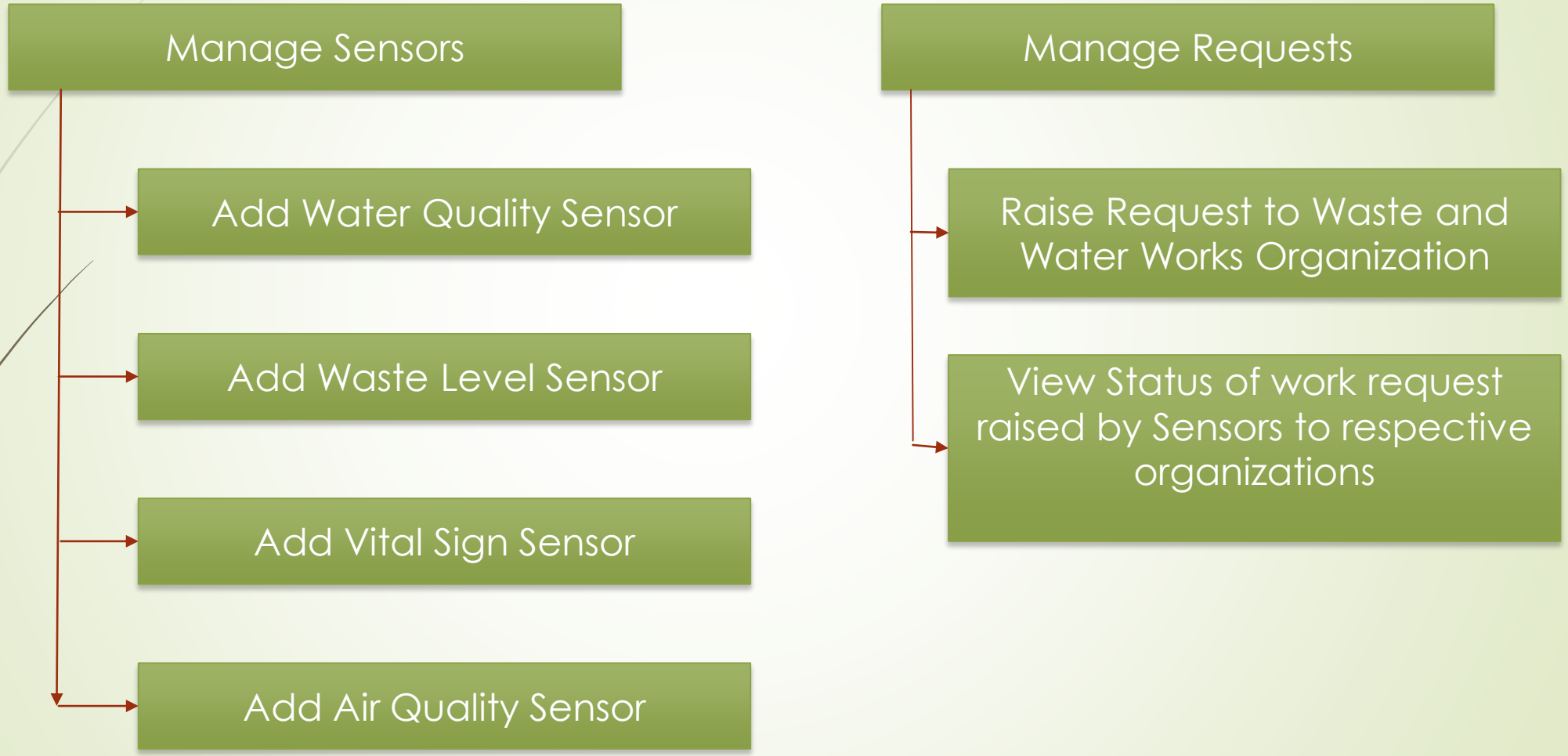
Key Roles

- House Holder Role
- Doctor Role
- City Admin Role
- Water Works Worker Role
- Air Quality Worker Role
- Waste Management Worker Role

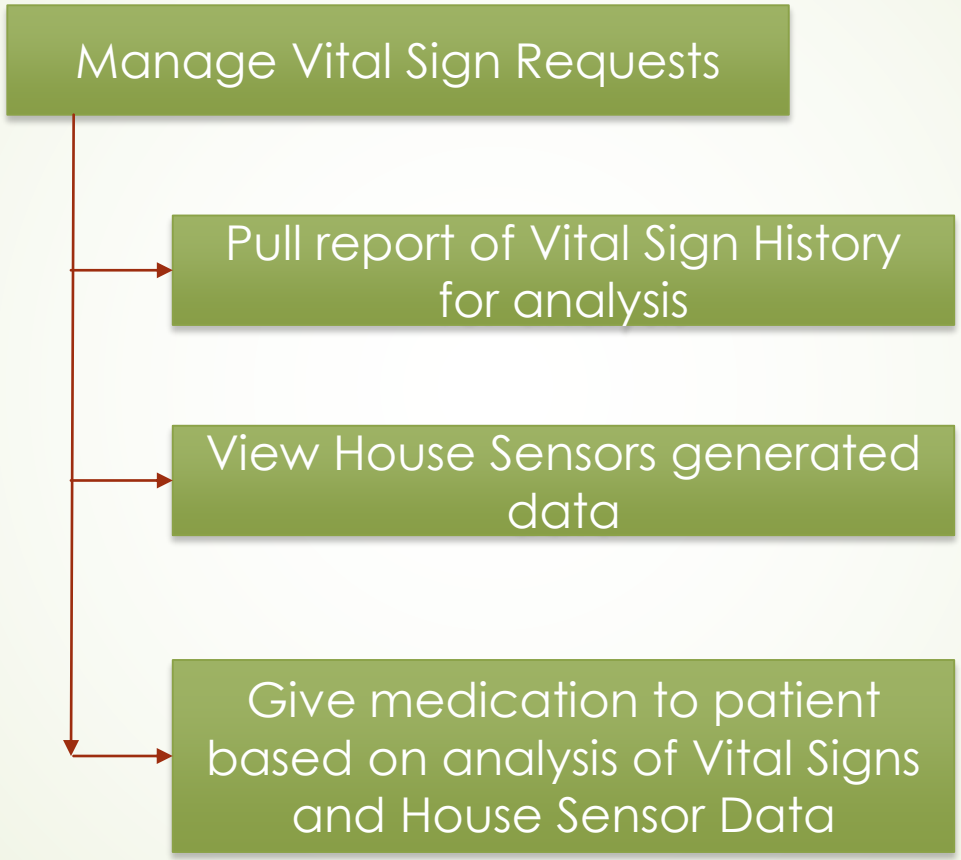
City Admin Role

- Create Houses
- Create Communities
- Add Houses to communities
- Map houses to employees
- City Dashboard

House Holder Role



Doctor Role


Manage Vital Sign Requests
Pull report of Vital Sign History for analysis
View House Sensors generated data
Give medication to patient based on analysis of Vital Signs and House Sensor Data

Features

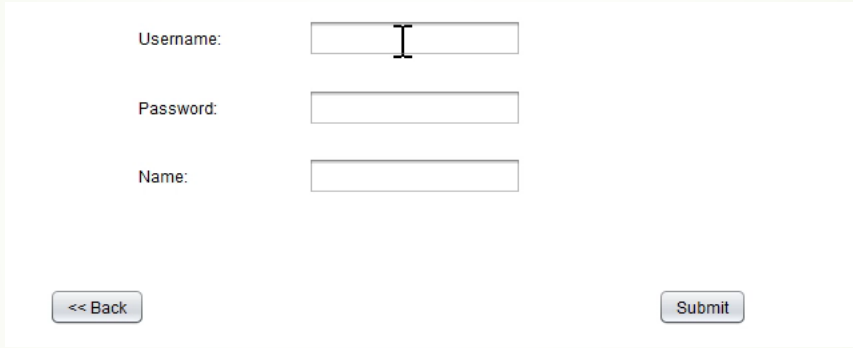
- Doctor an pictorially analyze householder's or patient's vital sign history as well as he can have look at house sensor's generated data.

Features

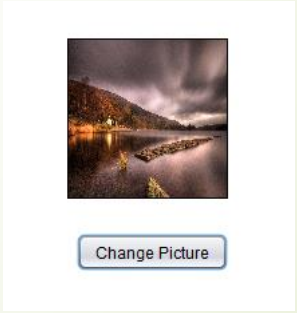
- House Holder can raise request to Waste Management Organization and Water works Organization if he finds any Water Leakage or Waste in city. House Holder must attach the picture of Waste or Water leakage.

Extra Features

- Unique User Name
  - Application will show availability of desired username.



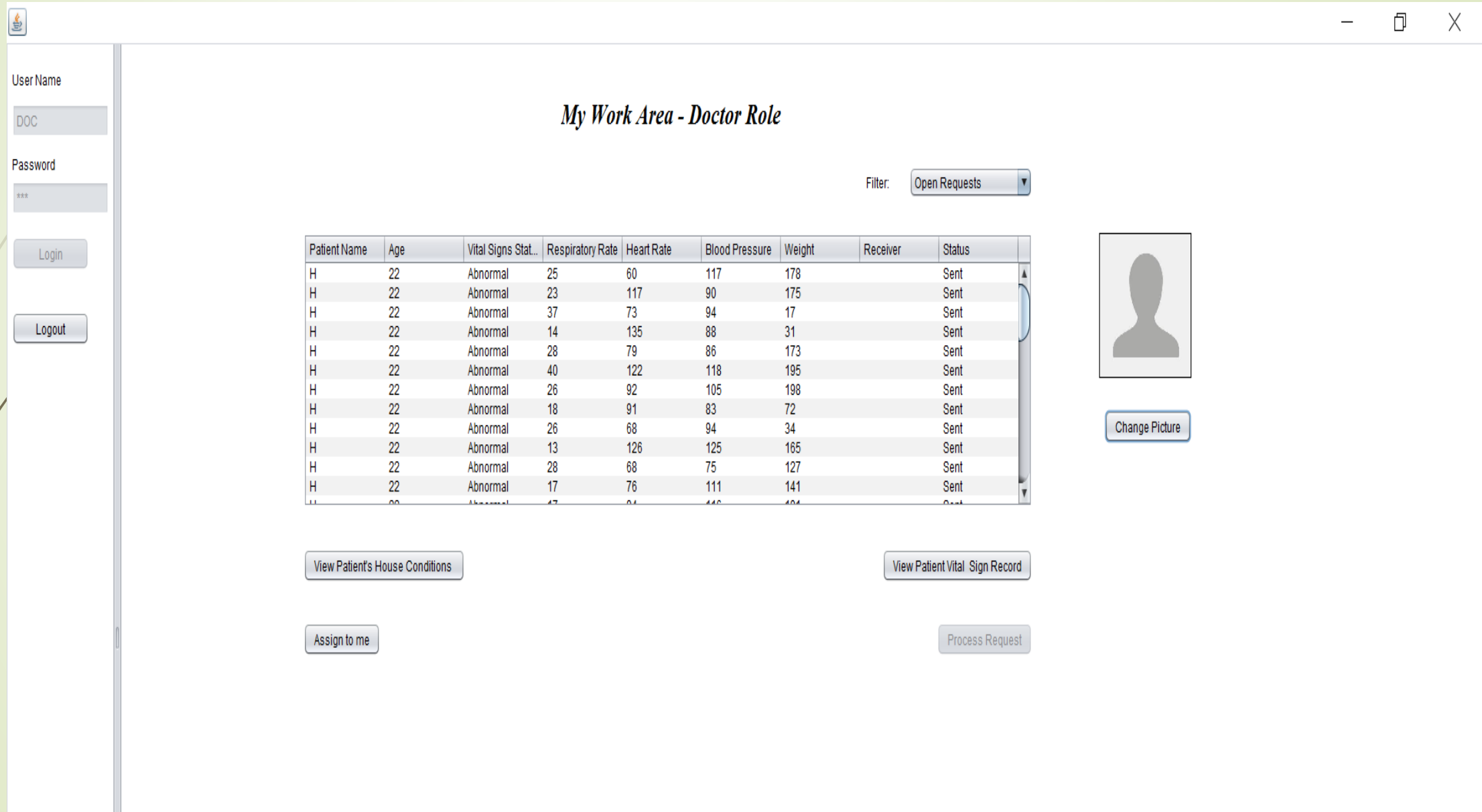
  - Profile Picture for each user login
    - User can change profile picture of his liking.
    - Added a filter to allow only JPEG and PNG formats.



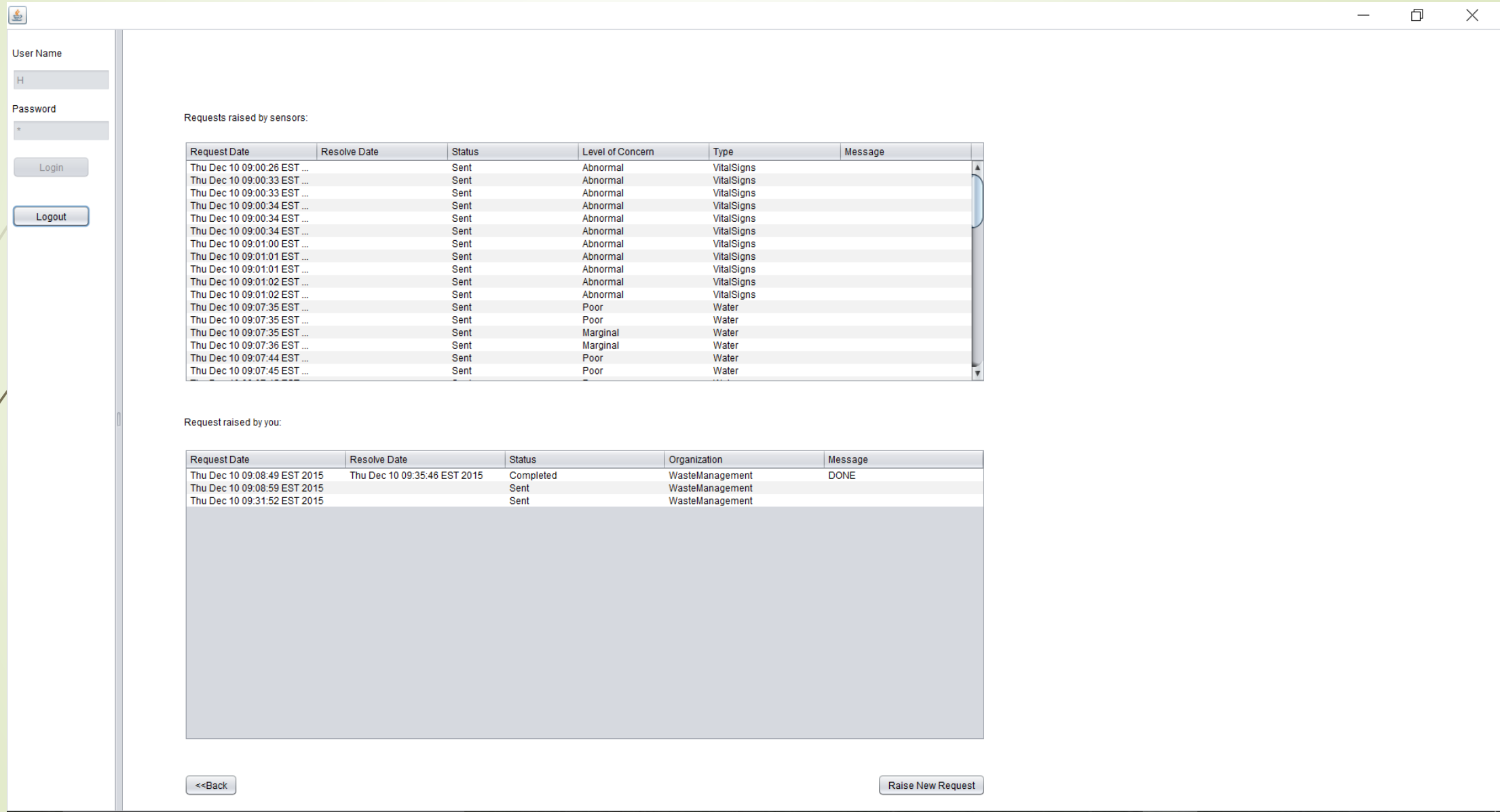
Cause and Effect Relationship

- House holder will be less prone to diseases.
  - Waste at home if not properly removed on time will have ramifications on person's health. Bacteria will spread and it will totally start effecting the whole community.
- Waste Management organization's employee can manage his accordingly based on the requests received.
  - The house keeping organization will have business advantage such as Waste Management employee don't have to do to go and check all the waste bins in the city.
- No one will be able to identify a room in house has impure air until they suffer with suffocation
  - IOT Application will help identify air quality issues at right time and help avoid issues in right time.
- Drinking water of less quality will cause a lot of health issues to people.
  - As an effect of perfect water quality control system, health issues will be avoided.

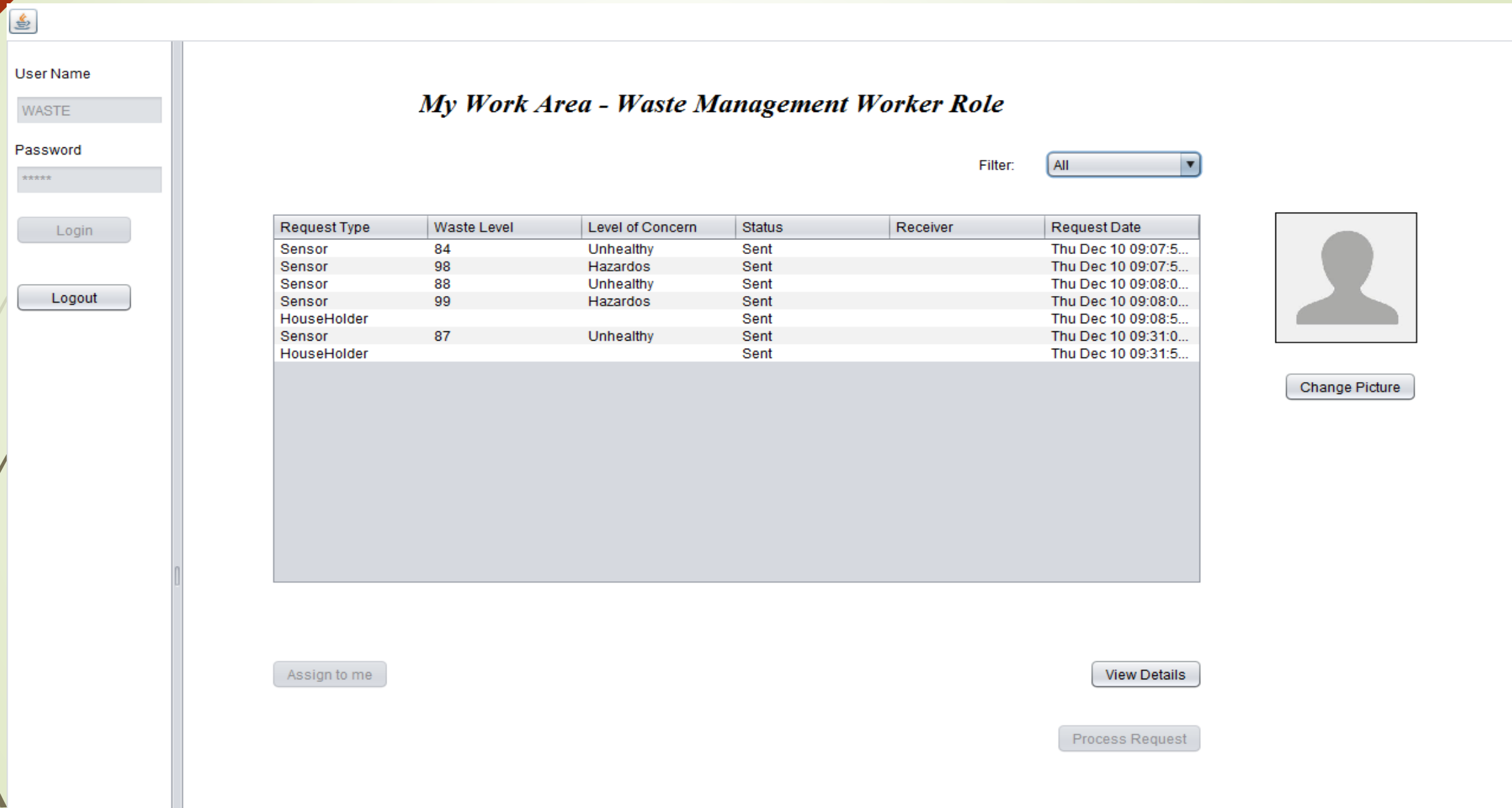
User Screens – Doctor Role



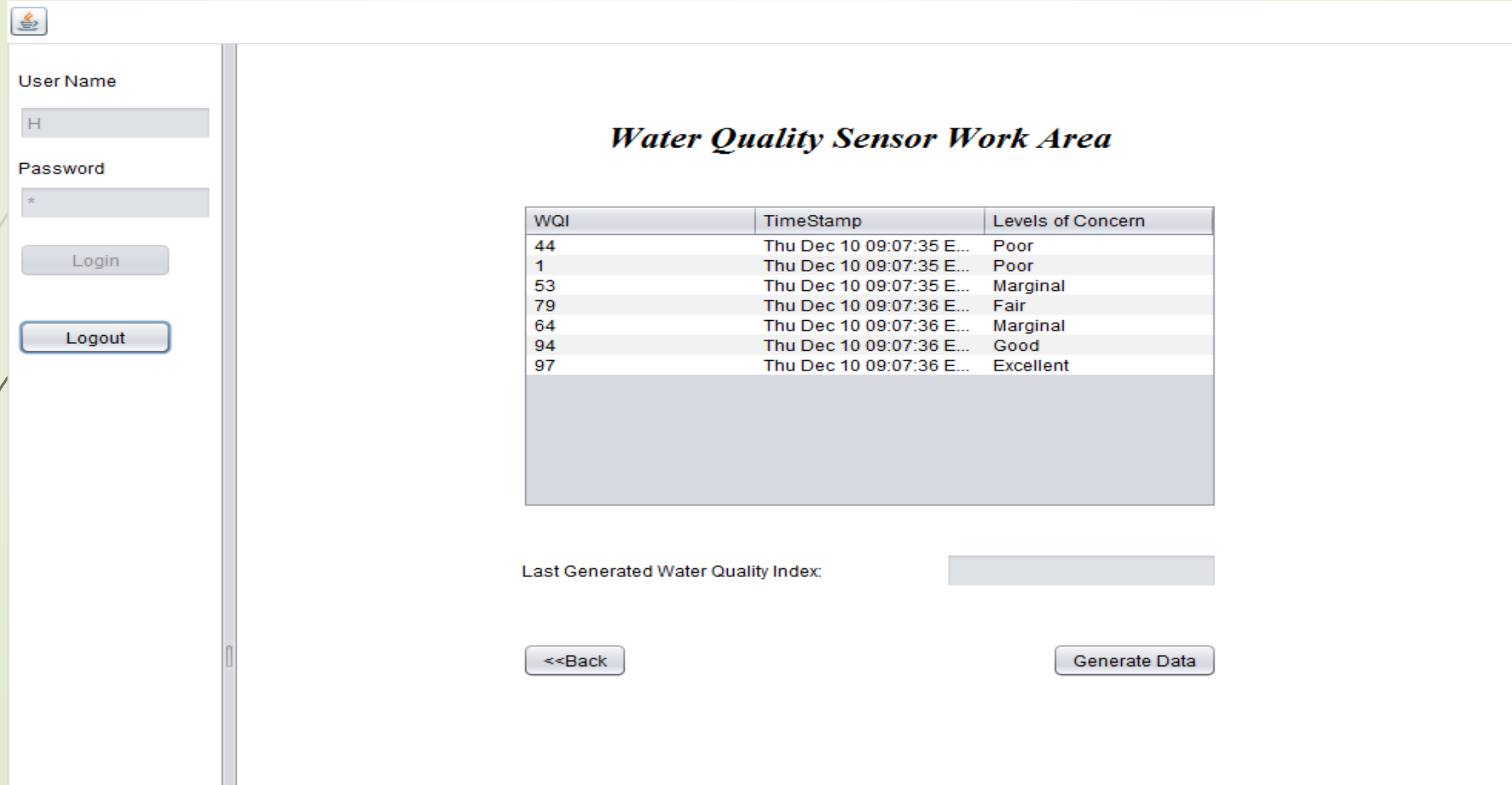
User Screens(cont.) – House Holder Role



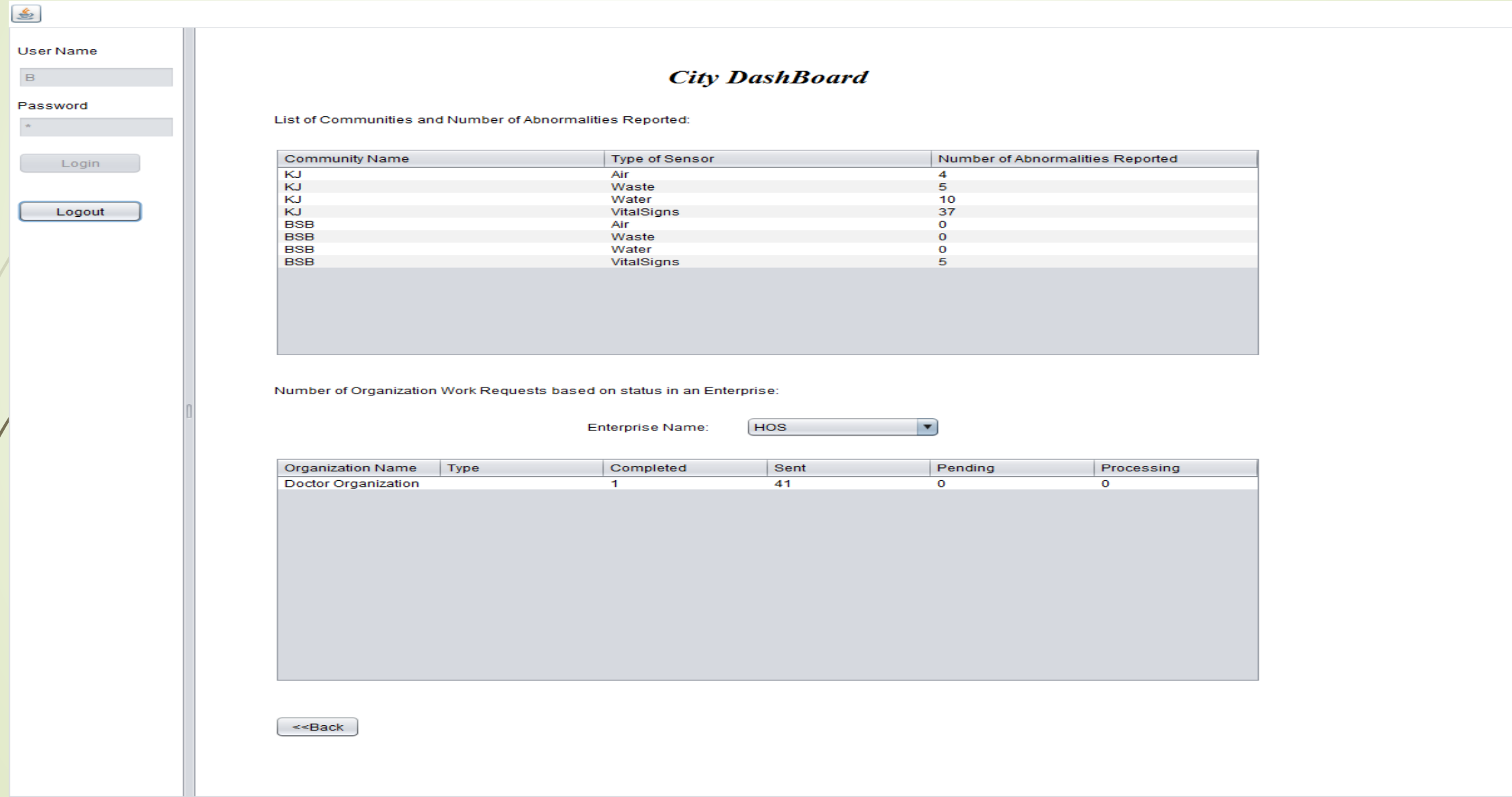
User Screens(cont.) – Waste Management Worker Role



User Screens(cont.) – Sensor Work Area



User Screens(cont.) – Sensor Work Area



Future Extensions to application

- Integrating the works request with maps. Waste Management worker will be presented with map markers using latitude and longitude data from all active work requests. Maps will also present the shortest possible routes from worker's starting point through all other work request locations.
- If a user's vital sign's are seriously abnormal, emergency alarm goes off and raises alerts for ambulance.