

# Wearable Device Health Management System

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# Part 1: Background

- ▶ Nowadays, wearable devices provide a great deal of change and great convenience to our lives. The emergence of smart wearable devices brings Internet of Things-extending from internet into the user's daily life.
- ▶ Wearable device is not just a hardware device, it is supported by the software, data exchange, and cloud interaction to achieve powerful functions.
- ▶ A variety of smart wearable devices are sensors, transferring the body functions of users and exercise data to the cloud via smartphones, then analysis and application. The work principle is the use of sensors, radio frequency identification (RFID), global positioning systems and other information sensing device. It accesses to the mobile Internet according to the agreed protocol, and enables the connection and exchange of information between people and things at anytime, anywhere.

## Part 2: Problem Statement

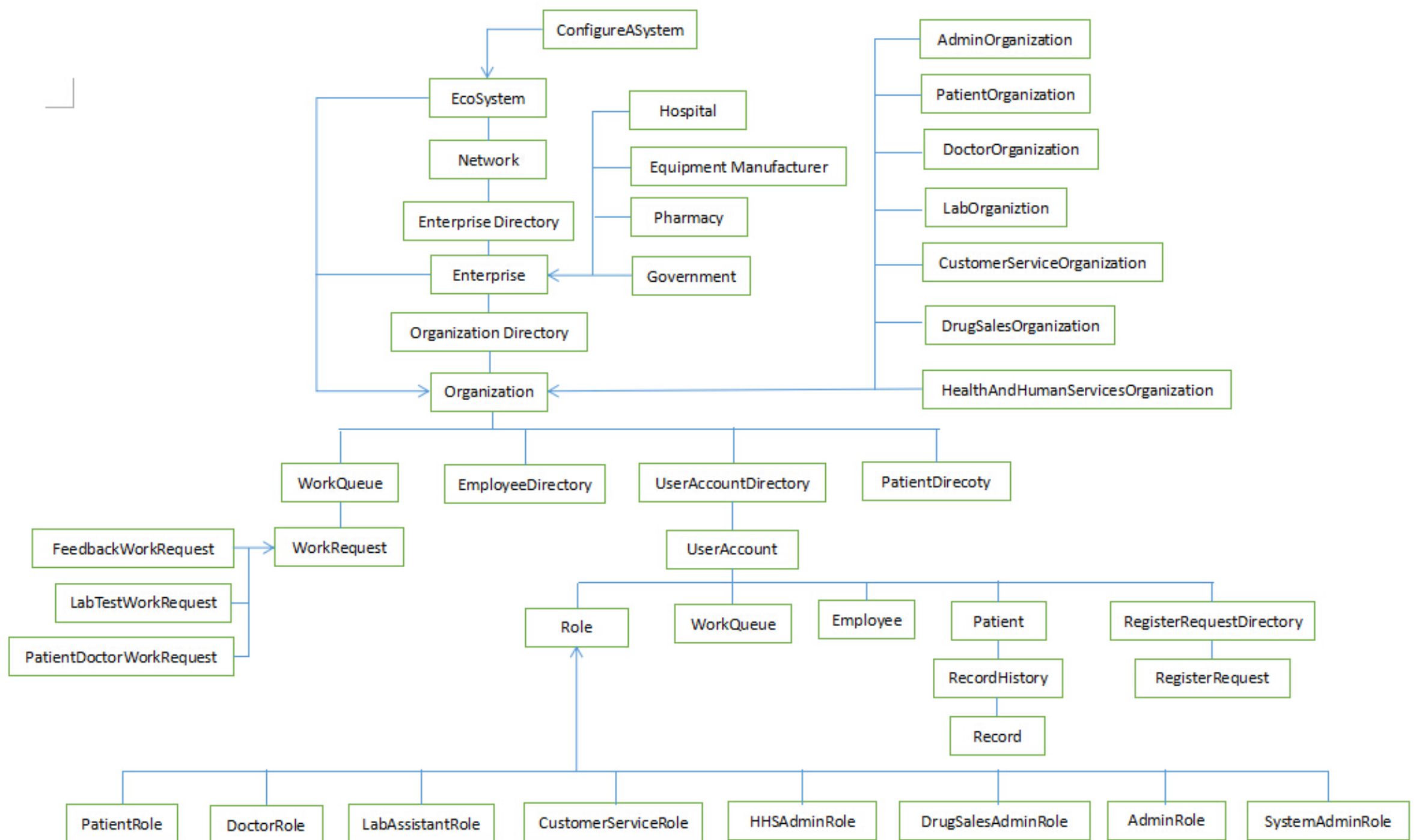
- ▶ Due to imperfect public health management system, high medical costs, fewer channels and low coverage problems are plaguing public's livelihood. In particular, "the low efficiency of medical system, the poor quality of medical services, the difficult and expensive medical treatment" as the main focus of social concern.
- ▶ In the past, only through the hospital or professional medical institutions for medical examination, resulting in long examination period and physical symptoms often can not be found in time, a lot of patients miss the best treatment period.

## Part 3: Proposed Solution

- ▶ This project provides a Wearable Device Health Management System which is related to patient, doctor, pharmacy, government, equipment manufacturer and so on. This system can collect the data on wearable devices, and allow users to measure their physiological information at home. By analyzing the real-time monitoring health data of wearable devices such as vital signs and fitness record, we can give more appropriate individual feedback on human health and sent the data to the patient primary doctor in time to get diagnostic advice. Especially for patients with chronic disease, it will help lot. At the same time, government departments can get more accurate health information, which is used to plan the urban health problems.

# Part 4: Object Model





# Part 5: Features -- Register

The screenshot shows a web application window titled "Wearable Device Health Management System" in a purple script font. Below the title is a blue "Register" heading. On the left is a sidebar with "User Name" and "Password" labels, input fields, and "Login", "Logout", and "Register" buttons. The main area contains registration fields: "User Name" (emily), "Password" (\*\*\*), and "Name" (Emily). To the right are four dropdown menus for "Please Select your State" (MA-Massachusetts), "Please Select your Hospital" (Massachusetts General Hospital), "Please Select your Department" (Doctor Department), and "Please Select your Role" (Business.Role.DoctorRole). A "Submit" button is at the bottom right.

User Name

Password

Login

Logout

Register

*Wearable Device Health Management System*

**Register**

User Name

Password

Name

Please Select your State

Please Select your Hospital

Please Select your Department

Please Select your Role

Submit

# Part 5: Features -- Register

User Name

admin1

Password

\*\*\*\*\*

Login

Logout

Register

Wearable Device Health Management System

Register Request List

Username	Network	Enterprise	Organization	Status
emily	MA-Massachusetts	Massachusetts Gene...	Doctor Department	

<<Back

Approve

Decline



# Part 5: Features -- System

The screenshot displays a web application interface for system administration. On the left, a sidebar contains a login section with fields for 'User Name' (containing 'aa') and 'Password' (containing '\*\*\*'), and buttons for 'Login', 'Logout', and 'Register'. The central pane features a tree view with a collapsed 'System' folder, an expanded 'Networks' folder, and two sub-items: 'MA-Massachusetts' (selected) and 'NY-New York'. The right pane, titled 'System Admin Work Area', shows 'Selected Node: MA-Massachusetts' and three buttons: 'Manage Network', 'Manage Enterprise', and 'Manage Enterprise Admin'.

✕ ◯ ⊕

User Name

aa

Password

\*\*\*

Login

Logout

Register

▼ System

▼ Networks

▶ MA-Massachusetts

▶ NY-New York

## System Admin Work Area

Selected Node: MA-Massachusetts

Manage Network

Manage Enterprise

Manage Enterprise Admin

# Part 5: Features - Check Username Unique

User Name

admin1

Password

\*\*\*\*\*

Login

Logout

Register

Manage User Account

Name	User Name	Role
Doc1	doc1	Business.Role.DoctorRole
Doc1	doc2	Business.Role.DoctorRole

Org

Emp

Role

User Name

doc1


Password

doc1

Create Account

<<Back

Message

 Sorry, this username has already exist

OK

# Part 5: Features--Check Record Status

User Name

pt1

Password

\*\*\*

Login

Logout

Register

**Manage Vital Signs and Fitness Record**

Refresh

Timestamp	Vital Signs	Fitness Total Time(...	Fitness	Respond
Thu Dec 10 23:11:...	Abnormal	35	Need More Excercise	Waiting
Thu Dec 10 23:12:...	Abnormal	152	Reach the Standard	Waiting

Add Record

View Details

Edit Record

Delete Record

Show Vltal Signs Chart

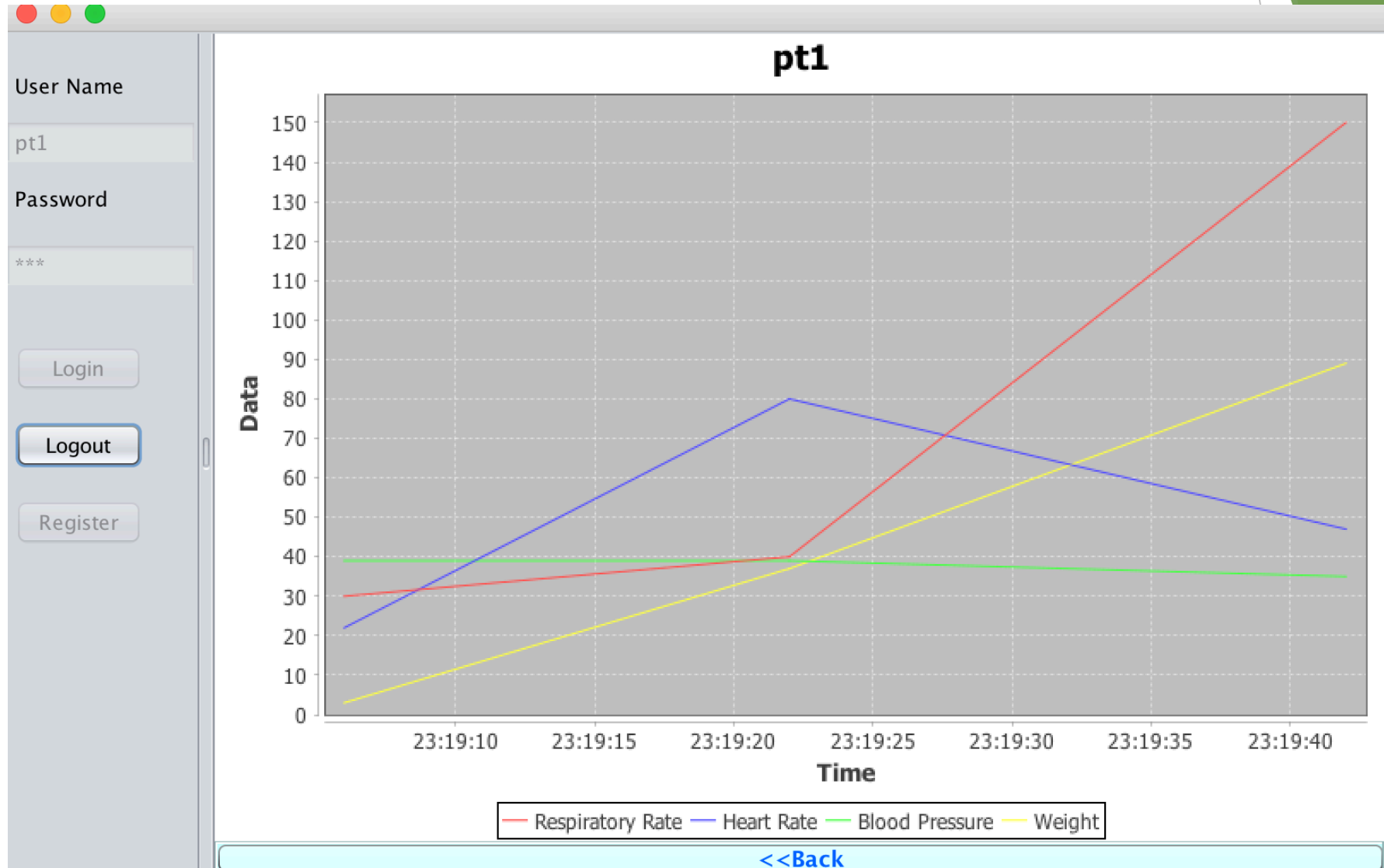
Show Fitness Chart

View Response

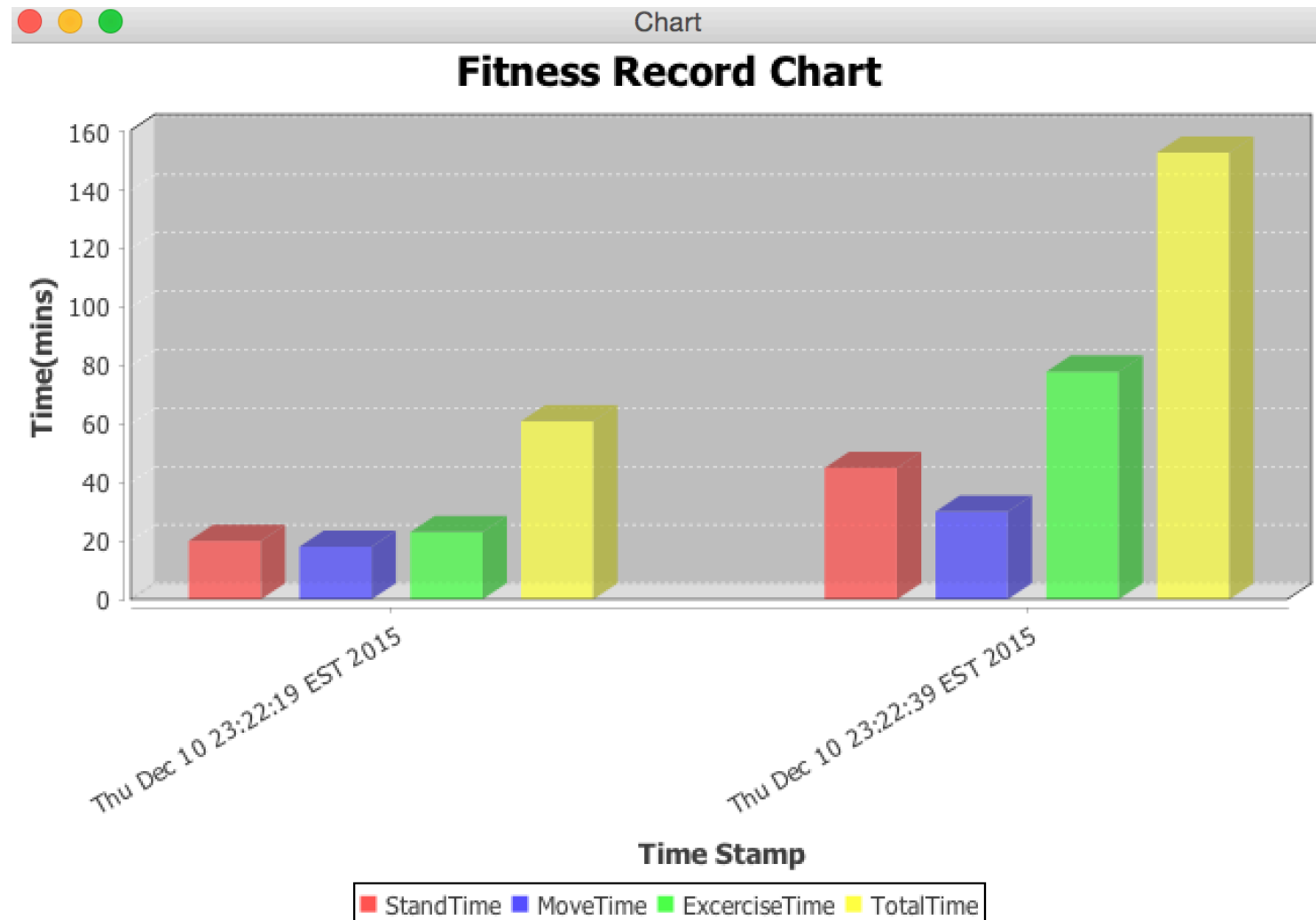
Send To My Doctor

<<Back

## Part 5: Features - Chart



## Part 5: Features - Chart



# Part 5: Features -- Feedback

The image shows a web application window with a sidebar on the left and a main content area on the right. The sidebar contains a 'User Name' field with the value 'cs1', a 'Password' field with three asterisks, and three buttons: 'Login', 'Logout' (highlighted with a blue border), and 'Register'. The main content area has a title 'View Feedback Details' in blue. Below the title are four questions, each with three radio button options: 'Not satisfied', 'Satisfied', and 'Very satisfied'. The selected options are: Question 1: Satisfied; Question 2: Satisfied; Question 3: Very satisfied; Question 4: Satisfied. Below the questions is a section titled 'Customer comments:' in purple, followed by a text input field containing 'Good Job!'. At the bottom left of the main content area is a '<< Back' button.

User Name  
cs1

Password  
\*\*\*

Login

Logout

Register

## View Feedback Details

1. What do you think of the design of our products?

☐ Not satisfied ☒ Satisfied ☐ Very satisfied

2. What do you think of the weight of our products?

☐ Not satisfied ☒ Satisfied ☐ Very satisfied

3. What do you think of the power of our products?

☐ Not satisfied ☐ Satisfied ☒ Very satisfied

4. What do you think of the performance of our products?

☐ Not satisfied ☒ Satisfied ☐ Very satisfied

**Customer comments:**

Good Job!

<< Back

# Part 5: Features - Doctor Response

User Name

doc1

Password

\*\*\*\*

Login

Logout

Register

Wearable Device Health Management System

Welcome doc1 !

Refresh

My Patients List

Search Patient By Name

Timestamp	Patient Name	Vital Signs	Fitness	Lab Status	Prescription	Respond
Thu Dec 10 23:26...	pt1	Abnormal	Need More Exercise			
Thu Dec 10 23:26...	pt1	Abnormal	Need More Exercise			

View Details

Respond To Patient

Request / View Test

Make / View Prescription

Report to Government Health and Human Services Department

# Part 5: Features -- Government

The screenshot shows a web application interface with a sidebar on the left and a main content area. The sidebar contains a 'User Name' field with the value 'hhs1', a 'Password' field with masked characters '\*\*\*\*', and three buttons: 'Login', 'Logout', and 'Register'. The main content area has a title 'Report Lists' in blue italicized font. Below the title is a table with two rows of data. The table has seven columns: 'Timestamp', 'Hospital', 'Sender', 'Patient', 'Vital Signs', 'Fitness', and 'Status'. The first row has values: 'Thu Dec 10 2...', 'Massachusetts ...', 'doc1', 'pt1', 'Abnormal', 'Need More Exc...', and an empty status cell. The second row has values: 'Thu Dec 10 2...', 'Massachusetts ...', 'doc1', 'pt1', 'Abnormal', 'Need More Exc...', and an empty status cell. At the bottom left of the main area is a '<<Back' button, and at the bottom right is a 'Process' button.

User Name

hhs1

Password

\*\*\*\*

Login

Logout

Register

## Report Lists

Timestamp	Hospital	Sender	Patient	Vital Signs	Fitness	Status
Thu Dec 10 2...	Massachusetts ...	doc1	pt1	Abnormal	Need More Exc...	
Thu Dec 10 2...	Massachusetts ...	doc1	pt1	Abnormal	Need More Exc...	

<<Back

Process



# Part 5: Features -- Pharmacy

The screenshot shows a web application interface for a pharmacy. On the left is a sidebar with login fields and buttons. The main area is titled 'Drug Sales Work Area' and contains a table with drug sales data. At the bottom are two buttons: 'Assign To Me' and 'Process'.

**User Name**  
ds2

**Password**  
\*\*\*

Login

Logout

Register

### Drug Sales Work Area

Date	Drug Name	Demand Quantity	Sender	Receiver	Status
Thu Dec 10 23:29:18 ...	ABC	10	doc1	Walgreens	Accept

Assign To Me

Process

# Part 5: Features -- Lab

User Name

lab1

Password

\*\*\*\*

Login

Logout

Register

Refresh

## Lab Assistant Work Area

Timestamp	Message	Sender	Receiver	Status	Result
Thu Dec 10 23:31:19 ...	BloodType	Doc1	lab1	Complete	AB

Assign To Me

Process

# Part 6: Approach

## ► Inheritance

- I organized classes using inheritance to avoid duplication and reduce redundancy. As there are many kind of roles of user using this system. I make Role class abstract and every different role will extend Role class.
- Another example of using inheritance. Based on my design, this system will allow different kind people login and the data will be saved in different organization and departments. These organizations share many common things, for example, every organization has its own name, user account directory, work queue and so on. So I created an Abstract class named Organization, subclass which represents different organization extends this class. This approach has greatly reduced my work while I do not need to create the same variable and method for each class over and over again.

# Part 6: Approach

- ▶ **The "instanceof" Operator**
- ▶ "instanceof" operator used for check whether a class is one specific subclass or not. For example, when creating user account for different people, the user information should be save based on what kind of organization they belong to.