Storyboard and Paper Prototype: Heart Protector App

Ruizi Dong-drq12345

Ting Ding-shikiding

Namuhan-bauminds

1.Storyboard

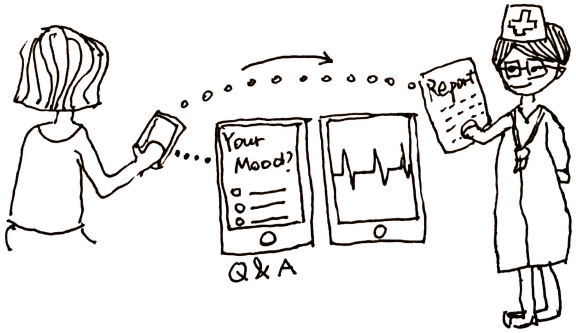
1

Amy is a heart attack patient. She uses “Heart Protecter”. For the first step, Amy connects her wristband to the application using blue tooth.

2

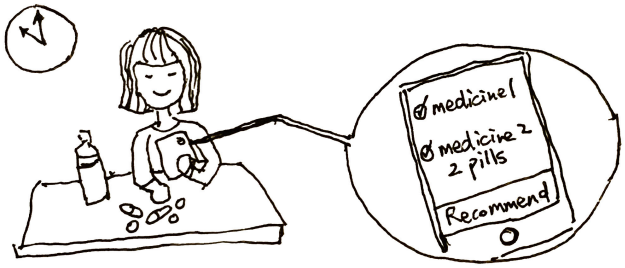
After connecting, the wristband will monitor and record Amy’s heart beat anytime.

3



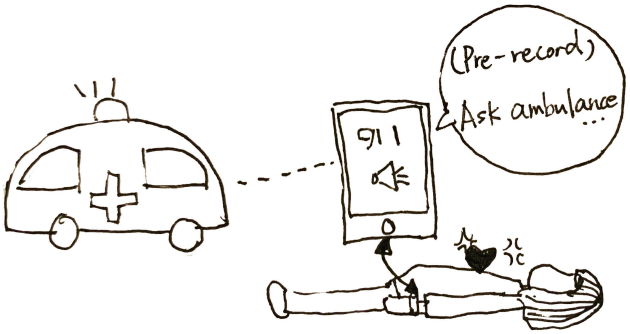
Amy needs to do the questionnaires regularly. These are questions about Amy’s daily life which are related to heart conditions.
The answer report and the monitored data will be provided to doctor so that Amy’s doctor can track Amy’s health condition.

4



For Amy’s daily life, Heart Protecter will provide Amy some recommendations, including food choices, exercises, sleeping time, medicine reminder.

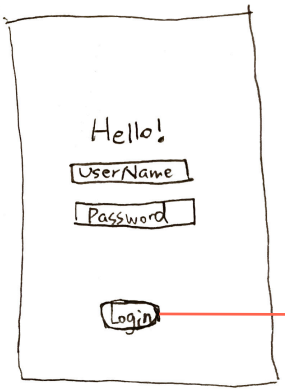
5



One day heart attack suddenly occurs. Heart Protecter directly call 911 to ask for ambulance. Her doctor and emergency contact will also be informed.

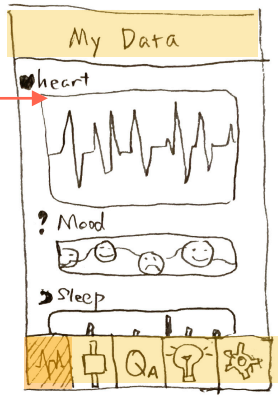
2.Paper Prototype

1



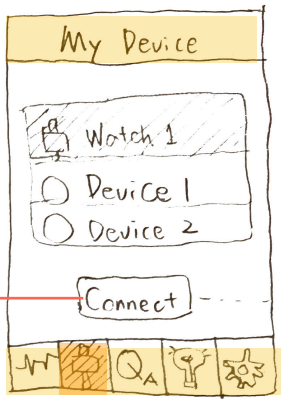
Login Page

2



Home: My Data

3

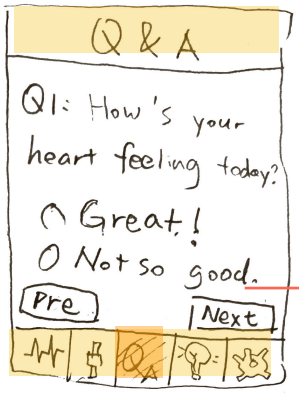


Device List

4

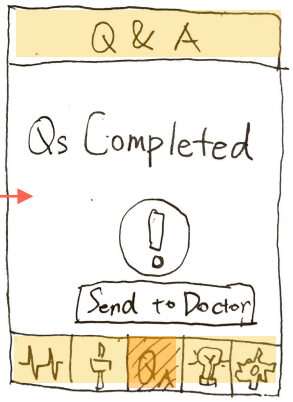
Device detail

5



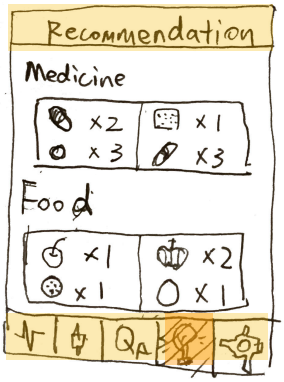
Questionare page

6



Complete & Send to Doctor

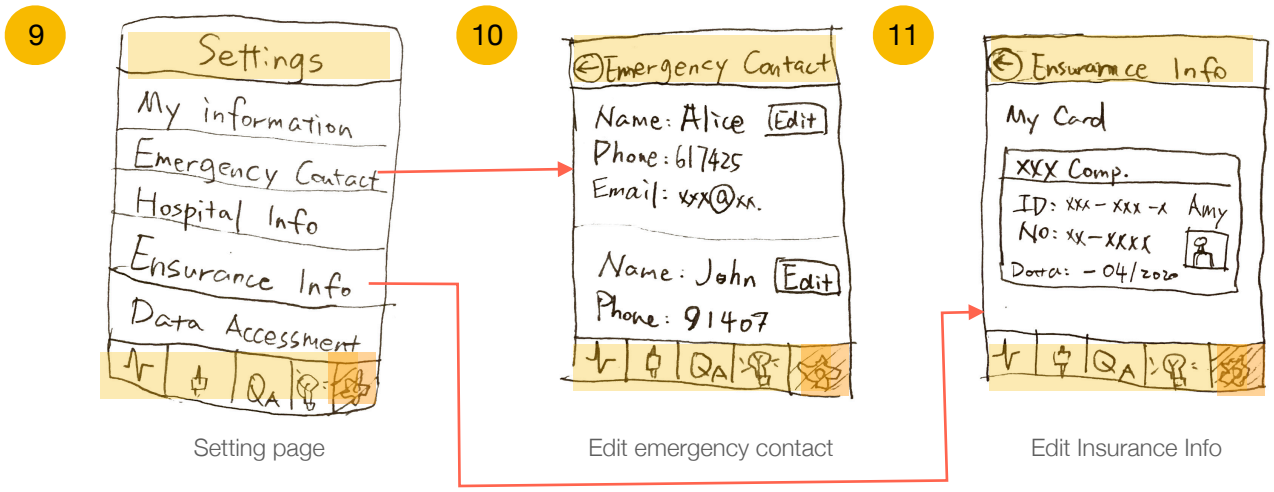
7



Daily Recommendation

8

Emergency Hearth Attack - 911



1. Monitoring symptoms of patients

Michael is a 75 year old user of our health app at home. Michael was diagnosed with heart failure one year ago. Recommended by his caregiver, Michael started to use this health app along with his health care devices. His smart bracelet can monitor his heart rate variability, blood pressure, weight, sleep, activity and movements, etc., and can work with our health app even more convenient and more accurate through his health id. Michael and his caregiver can check on any change of his health data, and pay attention to the ones that may indicate a worsening health condition, or directed by the app to call for additional help.

2. Displaying readily available health information

Michael was diagnosed with heart failure one year ago. He recently moved to another state with his son's family so that they can take better care of him. Michael met with a new doctor. To let the doctor have a detailed understanding of Michael's health condition, he added the doctor as one of the contacts in his health app so he can access all the information. The health card made it easier as well. The doctor went through the health card information, then he had a knowledge about Michael's records of doctor appointments, medications, hospital visits, and health-related tasks all in one place.

3. Pushing notifications of symptoms

Instead of having to do physical examination by himself, Michael has the smart bracelet to automatically keep track of his health data and send them to his health app. The health app then pushes notifications twice a day to remind him of his health data, give relevant suggestions such as food/activities.

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3. Usability Testing

3.1 Testing Success Matrices

3.1.1 Heart Protector App can successfully connect with a heart monitor devices such as iHealth and Apple's Health App, read data from it and show on screen.

3.1.2 Users can edit their profiles and details of body condition.

3.1.3 Heart Protector App can track one or more symptoms that may indicate a worsening of heart failure and report it to health care provider (call health care provider and 911 directly in emergency condition).

3.1.4 The app will provide questionnaire to users. After users complete it, the app can update health report automatically.

3.2 Testing Data

User basic information: Age, Gender, Health care provider
User health condition: Heart rate, Blood pressure, Symptoms
User experience: Feedback, Suggestions

3.3 Testing Strategy

Invite people to attend usability testing. After experiment, send questionnaire to collect information and feedback from users.

3.4 Testing Location

Hospital especially patients with heart disease
Nursing home with the old

3.5 Equipment Requirement

3.5.1 Mobile phone installed with Heart Protector App
3.5.2 Heart monitor devices such as iHealth, Apple's Health App

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4. Discussion and Analysis

4.1 Description

We are developing a mobile application combines with bracelet with monitoring function that is specifically designed for patients with heart disease to help with:

- regular monitor of symptoms
- first aid function when sudden heart attack occur
- provide lifestyle suggestions from personal doctor

with the help of Heart Protector application, heart disease patients will have a tighter connecter with the medical system, so as to prevent heart attacks steal lives from people.

4.2 Design metaphors

The interface of Heart Protector App contains several design metaphors.

Icon	**Metaphor**
The heart icon	a metaphor for the page contains the user's health data like heart rate and heart rate variability
The watch icon	a metaphor for the devices the user can connect the app to

Icon	Metaphor
The light bulb icon	a metaphor for the healthy suggestions for the user
The gear icon	a metaphor for the user settings for users to control the presentation of the app and to check on health card information

4.3 User analysis

The target user of Heart Protecter, is the people with heart diseases. They are not in hospital, but they have needs to track their heart health at the same time.

Age	Age: 18+, Mostly 35+
Job	Designer, Worker, Actuary, Recruiter, Retired, etc
Sick severity	Severe, Moderate, Less. • Severe patients need medical treatment everyday, and have high potential of relapse and need first aid • Moderate patients need regular treatment, and track heart condition and get regular hospital treatment • Less severe patients also need regular treatment, track heart condition
Potential user	Potential user is in great quantity. 7,900,000 Americans have had a heart attack or 3.1% to 4% of the U.S. adult population.
Lifestyle Risk Factors	High blood pressure, high LDL cholesterol, and smoking are key heart disease risk factors for heart disease. About half of Americans (49%) have at least one of these three risk factors.Several other medical conditions and lifestyle choices can also put people at a higher risk for heart disease, including: • Diabetes • Overweight and obesity • Poor diet • Physical inactivity • Excessive alcohol use
Living	With family members; live alone; With care workers

4.4 Advantages of the product

4.4.1 Heart Protector App works well with the smart bracelet. Apart from the physical examinations users need to do by themselves and the according questionnaires they need to fill out, the smart bracelet keeps track of some of users' health data and pushes health data to their health app, which is user friendly and helps with user interaction in the long run.

4.4.2 Heart Protector App not only provides the patients a good experience to keep track of their health, but also includes professional advice and help from medical system, even calls for

ambulance in an emergency. These features enable our application to make an actual impact in patients' treatment instead of being used as an amateur tool.

4.5 Improvements after test

4.5.1 Heart Protector App should present different interfaces based on user settings. For instance, if the user doesn't want the recommendation feature of lifestyle choices, such as sleeping time, exercises, food choices and medication reminders, the list shouldn't appear on their interface. After all, they're personal decisions and shouldn't be intervened by others if users prefer not to.

4.5.2 The feature of calling for ambulance in an emergency looks quite helpful as a tentative idea. But we should consider its practicality. There're several questions, for instance, who should talk to the operator in a call for emergency vehicles? How to raise the accurateness of the data appear on the app and avoid unnecessary call for emergency.