Personal Health Assistant

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CSE 4904- Final Report

Personal Health Assistant, or PHA for short, is a mobile application developed for several platforms such as iOS, Android, and web to facilitate the interactions between patients and providers. When using the application, patients and providers will be creating an account and set up their profiles with information relevant to their care. The applications allow for patients and providers to add each other to their accounts; the patients will be able to search for providers and view the provider profile before choosing to add the provider to their account. Furthermore, the patient is able to choose which content on their profile and account that the provider is able to view and contribute to. For example, patients with diabetes will be able to add glucose levels to their profile and their provider, who is given permission to view these values, will be able to provide feedback to the patient as to whether they are taking the right amount or need to adjust the amount depending on the algorithm for suggested intake values. Providers who do not have permission to view certain things on the patient’s profile will receive an alert stating that they do not have the permission to view the content. Overall, the applications were developed to help patients communicate their health care information with their providers and providers to provide feedback to the patient to assist in their care.

The four main conditions that the provider will be able to monitor on the patient end are diabetes, heart disease, asthma, and obesity; the user will be able to add more conditions as relevant to their health. When monitoring the four main diseases, patients will be able to add values relevant to the condition such as glucose and insulin for diabetes to their account. This value will then be integrated into the visual representation of the fifteen most recent values in the form of a graph. Furthermore, the maximum, minimum, and average of these fifteen recent values, if they exist, will be calculated and displayed to the user. If the user chooses to view all of the values they have entered into the application, he/she will be able to click on the label containing the useful statistics and scroll through their history.

In addition to being able to maintain their history in regards to their conditions, the patients will be able to monitor their health in other categories such as allergies they may have and medications they may be taking. Patients will be able to add and edit the medications they are taking; these values will be added to the server and the data displayed on the application will be refreshed to reflect these changes. Similarly to adding medications, patients will be able to add and edit the allergies they have on the application. Since we trust the patient to take care in maintaining the information provided on the application, we allow them to be able to delete the medications and allergies they add to their profile; in a similar fashion, patients will be able to delete the conditions they have added to their account. Patients using the application will have the ability to edit their wellness diary, which includes measurements for their appetite, mobility, comfort, energy, and happiness. These values are entered all at once by the user on a scale of one to ten, but they are displayed in their own respective screens to modularize the values for the user. In addition to being able to maintain a wellness diary, the patient is able to add procedures they are going to undergo in the application; these procedures include upcoming surgeries. The final thing the patient will be able to do on their application given the functionality that we were able to fully implement by the final prototype includes the ability to view lab tests. Although the list is currently being populated on the server, the ability to add and edit these is not yet functional. The values in the detail screen is hard coded in and will need to be adjusted in future development to allow for dynamic values dependent on the data on the server.

In the provider application, the provider is allowed to view their patient’s health data and make adjustments to the care the patient is receiving as they see fit. However, it should be noted that the amount of monitoring the provider can do is limited to both the activeness of the patient in inputting data as well as the permissions that the patient has given to the provider. In other words, if the patient does not want certain providers to view certain data that they deem to be irrelevant to the care they need from that provider, they can easily prevent this provider from viewing the data. The adjustments to the care of the patient will be calculated using the algorithms provided on the application that will determine the suggested value for the user based on the characteristics of the patient and the information the patient enters. For example, the provider can choose to increase the glucose intake level of the patient if they notice the patient requires it based on the data he/she inputs into the application. The majority of the provider functionality will be dependent on the level of permissions they are granted by the patient.

Although we have been able to maintain the majority of the plans we had with respect to what we wanted to accomplish for functionality for the applications, we will not be able to implement all of the things we had originally planned. For example, we were planning on having the users be able to upload images to the application for things such as the medication they were taking, their profile picture, and the thing they were allergic to. This would have been a nice feature to add to our applications, but since we had to prioritize based on not only important features, but also useful information, this image upload feature was lower in our priority queue. It would have been ideal if we were able to implement the algorithms for all four conditions as we had originally prototyped. However, due to time constraints, we will only have the diabetes one fully functional by the end of this semester. We have the basic screens on the application functioning for asthma, heart disease, and obesity where the data can be inputted and viewed, but suggested values from the provider based on algorithms is not implemented. Since we were not able to get the algorithm on one of the applications, both patient and provider applications will be lacking this functionality. Another feature that we did not get fully functioning by the final prototype is checking the interactions of medications; when a patient is taking more than one medication at a time, they will see if these negatively affect the other. If it does, then the provider should have been able to adjust the medication appropriately, but we do not have this feature currently available. The final thing that we wanted to implement in the final version of our applications is the reminders feature on the patient application. This feature would have allowed users to put alerts in their application to remind them of tasks such as when to take their medication or an upcoming appointment they may have. As mentioned earlier, we would also need to add in the ability to add and edit the lab tests the patient will be undergoing; these are currently dummy screens that cannot be edited. Even though we did not achieve all of our goals in the development of PHA, we have accomplished some significant steps in order to get a functional application; with more time, we could have added some more features to enrich the applications further.