UI/UX Design & Evaluation (5540)

Deliverable A1: Project Proposal & Plans

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Executive Summary

After conducting research, our team members concluded that the caregivers are usually the overlooked entities and have numerous problems. Our app will help the caregiver monitor the patient's behaviour and keep track of his meals, prescriptions, sleep activity and other general schedules. The app also furnishes the caregiver with the real-time location of his patient (say if the patient steps outside his house), along with an option to receive and send the emergency alerts if needed.

Scope

The project aims to add value to the culture of accessibility in Canada. Our scope is limited at this moment to the course material and duration. The memory loss field is massive in the medical world. Therefore, we are only targeting caregivers of Alzheimer and Dementia patients for now. The caregiver is the primary persona for this application. The application is developed for making the lives of caregivers easier in the incredible job they do.

Motivation of The Project

The motivation of this project is to improve life quality for caregivers of memory loss sufferers. This includes common diseases such as Alzheimer's, dementia etc. The project focuses on building an application that will ease the life and accessibility of the caregiver to their dependents. According to the neurology practices in the US, it is found that the caregiver is the most overlooked variable in the care of a patient (Barton, 2009).

The Problems to Be Addressed

The problems to be addressed are as follows:

1. The patient wandering dangerously on their own, when caregiver is away.
2. Monitoring daily nutrition requirement of the patient
3. Monitoring daily medicinal schedule of the patient
4. Tracking the sleep pattern and behavior of the patient
5. Monitoring abnormal patient behavior
6. Emergency respondents notifying the caregiver
7. The caregiver has multiple patients to address.

Survey of Existing or Related Problems/Solutions

The following solutions are from research online that includes the best solutions we have come across from the problems in the above section.

Problem 1:

According to Qiang Lin et al, the current solutions that exist commercially are GPS Shoes and in-home Escort system developed by MIT, which uses sensors around a closed environment (Lin et al, 2014).

Problem 2:

- One of the most innovative, yet expensive ways is covered by students from Copenhagen University, Denmark (Ofei et al, 2014). According to them, they have attached cameras, digital thermometer, weighing scale and RFID to take a picture before and after meals of patients in a hospital environment. The inputs from the various devices allow them to determine if the patient has completed his/her meal.

Problem 3:

- Karen et al have filed a patent that allows parameters to be input to track various inputs such as medicines and keep track of their usage based on their weight (Stone et al, 2010).

Problem 4:

- According to Herz of the Wired, 'prosumer' sleep trackers which are FDA approved are becoming more popular now. These measure heart rhythm (ECG), breathing volume and snoring (through tissue vibration) (Herz, 2018).

Problem 5:

- According to the U.S. National Library of Medicine, they conducted a research of eighteen studies that used DHT's (Digital Health Technologies) which included mobile apps (Batra et al, 2017). Mobile apps were the most popular approach that resulted in a strong positive response. However, it was only for short-term effectiveness.

Problem 6:

- There are designs that solve this challenge by making use of technologies such as sensory devices and circuit boards to create an integrated solution to notify emergency respondents for any type of input that the user determines (Hunter et al, 2007).

Problem 7:

- Research from Baptist Health College Little Rock's Edwina Jones, prioritization and keeping track of patients for nurses is one of the most important challenges (Jones, 2016). One of the current solutions that exist is schedule applications such as Doodle.

Potential Approaches to Address the Problems

1. Fall Detection

Fall detection from the various sensors in the patient's wearables allows the caregiver to know if an unfortunate event has taken place. It will notify the first respondents and the caregiver as well.

2. Sleep Tracking

The app tracks the patient's sleep pattern and their schedule, thereby allowing the caregiver some time to take off from the pressures of being constantly taking care of someone.

3. Meal Plan

The app allows the caregiver to create a customizable meal plan that addresses the dietary requirement of the patient. It will also notify the patient's wearable that it is time to eat.

4. Weekly Schedule

The app allows the caregiver to schedule events that is separate from the caregiver's personal calendar. This allows numerous schedules to be built for more than one patient and notify them remotely about a doctor's appointment or tests for instance.

5. GPS Tracking

The GPS tracker on the patient's wearable will notify the caregiver about the patient's location at all times. This is especially needed when the patient is outside a secure setting like their house or a hospital.

6. Emergency Alert

The emergency alert has a dual role. Firstly, it is to alert the caregiver at any time the patient feels it is an emergency and wants help. Secondly, the emergency alert can also contact first responders if the caregiver feels there is a need to do so.

7. Numerous Users

The app will have multiple portals for various patients. This is because we have taken the assumption that not every memory loss patient has family members to take care of them. Also, the caregiver can be a nurse in a hospital environment. Therefore, we need multiple patient accessibility as a feature.

We have come up with solutions that are user-centric, but they will be part of our future plans. We wish to build games that help the patients to recall their memory by using their past information from various inputs such as social media. By gamifying these inputs, we can test the user's severity and improve their function over time.

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