ABSOLUTE CONTAGIOUS -PLAGIARISM STATEMENT

This term paper constitutes original work by the student signing below. The paper consists entirely of ideas, observations, information, and conclusions composed by the student, except for statements contained within quotation marks and attributed to the best of the student's knowledge to their proper source in footnotes or references. Direct quotations make up a very small proportion of the text and are appropriately cited. Material paraphrased from a source (e.g., print sources, multimedia sources, web-based sources, course notes or personal interviews) has been clearly identified by a numerical reference citation (or APA style citation). All of the sources consulted and/or included in the report have been listed in the Reference section of the paper. All drawings, diagrams, photos, maps or other visual items derived from other sources have been identified by numerical reference citations in the caption. No part of the document has been submitted for any other course.

Student 1:
Name: Aishwarya Narayanan
Student Number: B00820313

Signature: 
Date: 12/06/2019

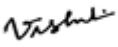
Student 2:
Name: Miles Redgate
Student Number: B00705540

Signature: 
Date: 12/06/2019

Student 3:
Name: Sithara Jayachandran
Student Number: B00824470

Signature: 
Date: 12/06/2019

Student 4:
Name: Vishaali Kadambur Srikanth
Student Number: B00821049

Signature: 
Date: 12/06/2019

Al-momentous- An Alzheimer's Helper App

Sithara Jayachandran
Halifax, Nova scotia
st962427@dal.ca

Miles Redgate
Halifax, Nova scotia
miles.redgate@dal.ca

Vishaali Kadambur Srikanth
Halifax, Nova scotia
vs255542@dal.ca

Aishwarya Narayanan
Halifax, Nova scotia
aishwarya.narayanan@dal.ca

ABSTRACT
Currently, 50 million people are affected by Alzheimer's disease and there are at least 10 million new cases every year. Unfortunately, the causes and issues related to Alzheimer's disorder are unknown to the common population and sometimes been mistaken for the normal pattern associated with ageing. It most commonly affects people over the age of 65. Our application is meant to help people with early Alzheimer's disease navigate their day to day life easier, as well as provide doctors and health professionals with more data on a patient's day-to-day activities to help understand both how the disease is affecting them as well as if the patient's status is deteriorating. Our app provides users with reminders of events, contacts, facial recognition, emergency contacts and a people diary, so while they may not remember things and people, they can manage and maintain some dignity. We conducted several studies which informed several prototypes in turn.

Author Keywords
Al momentous, Alzheimer's, disease; memory, prototype, study design, ageing

INTRODUCTION
Alzheimer's is a disease associated with memory loss and a person suffering from this disease will find it very difficult to remember and accomplish simple tasks of day to day life. Alzheimer's affects the patients on 7 different stages. Our app Al-momentous is intended for the patients who are affected up to stage 4(the beginning stages of Alzheimer's). Our application is meant to help people with early Alzheimer's disease navigate their day to day life easier, as well as provide doctors and health professionals with more data on a patient's day-to-day activities to help understand both how the disease is affecting them as well as if the patient's status is deteriorating. The main objective of our app is to help users remember events, stay connected and engaged with friends and family and recognize faces of friends using face recognition technology. As there is no cure for this disease, we aim to improve their quality of life for as long as we can. Research suggests that stimulating one's memory and socializing especially by using a computer or a mobile app could slow down cognitive decline over time. Background research based on the articles "Cultural Diversity and Alzheimer Disease: Introduction" [1] and "Alzheimer changes in nondemented patients younger than sixty-five: Possible early stages of Alzheimer's disease and senile dementia of Alzheimer type" [2] helped us identify the major difficulties faced by the patients and we considered this research while building the our low fidelity prototype. The features of our app (Al-momentous) will include photos, events, contacts, emergency, identify and reminders.

INITIAL STUDY
We conducted the initial study with our classmates during and at the lab locations using our low-fidelity paper prototype. Participants were explained the context of the study, what is being examined, the general guidelines that the participants have to follow while taking up the study. After they have agreed to these terms we proceeded with the study. Users were first asked to complete a series of tasks with our prototype while we observe their interactions with it, for either confusion or when they have done something right or wrong. The tasks we asked them to perform were, finding out who Uncle Ben is, finding out what a reminder/notification is about, contacting the doctor and setting a reminder for an event. The participants were then asked a set of both open and closed-ended questions about the application's prototype designs and features. Their feedback recorded for future iterations of the app. As our app deals with people suffering from memory loss, there's the potential for each interaction to be a "new" interaction for each user. Therefore, the order effect can harm our study as a user is likely to remember details of our app from performing previous tasks, e.g. remembering menu items from the last task, therefore already have an idea of what to do for the current task. To deal with this we gave each participant the tasks in a different order so that we can better evaluate the first impressions of as many different parts of our app as possible.

LOW FIDELITY PROTOTYPE
Our first low-fidelity prototype we designed with a couple of user considerations in mind. As Alzheimer's tends to affect

older individuals, keeping everything as simple as possible as they might not be as familiar with technology, is important. There is the potential for each interaction with the app to be their first, as they might have forgotten how it works, meaning initial impressions and the learnability of the app are very important. Finally, while they might forget things, they still want to maintain their dignity. The results of these considerations can be seen in the simplicity of our home screen, or using "Who is this" for the link to a person's page, rather than just "their page" or something of the like.

EVALUATION OF PROTOTYPE

Users found a few issues with our first prototype. However, none of them were truly app-breaking, based off of feedback on how difficult the requested tasks were easy to complete. Notable issues highlighted were overlap between creating an event and a reminder, potential confusion when accessing emergency but being taken to the contacts page (especially in a high stress emergency situation). Despite these issues, users rated the potential usefulness of our app fairly well (average of 3.7 out of 5).

PROTOTYPE IMPROVEMENTS

Based on the evaluation of our initial prototype we decided to make the following changes to our app. Combine events and reminders, make the emergency button on the home page link to a separate page with emergency numbers, and add links between a Person's page and their corresponding Contacts page (and vice versa).

SECOND PROTOTYPE EVALUATION

Users seemed to enjoy our second more than our initial prototype with the above improvements implemented. However, some issues remained with notifications and our events/reminders features. For the notifications issue, we had concerns as to whether this issue was due to our prototype design or an artifact of how our study was conducted, to better determine more about this issue would require evaluation of a higher fidelity prototype, so nothing was done about this. The events/reminders issue we will attempt to remedy by adding checkboxes to the create event page for if the event reoccurs daily and weekly.

HIGH FIDELITY PROTOTYPE

Figures 1-9 are the pages of our low-fidelity prototype. For the most part this prototype remains unchanged from our second lo-fidelity prototype, with the exception of the suggested changes, outlined above, being implemented, as evidenced in figure 7. We were unable to evaluate our prototype with our classmates as there was not enough lab time and people available between when the prototype was completed and presentations began.

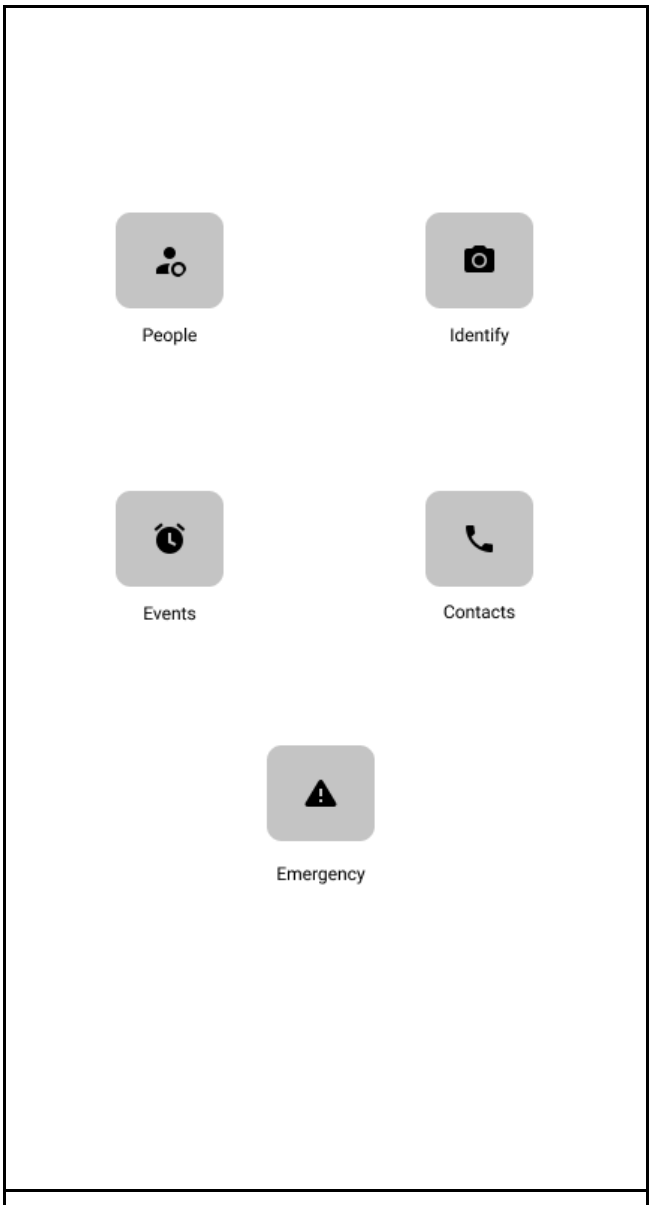


Figure 1. Home screen of app

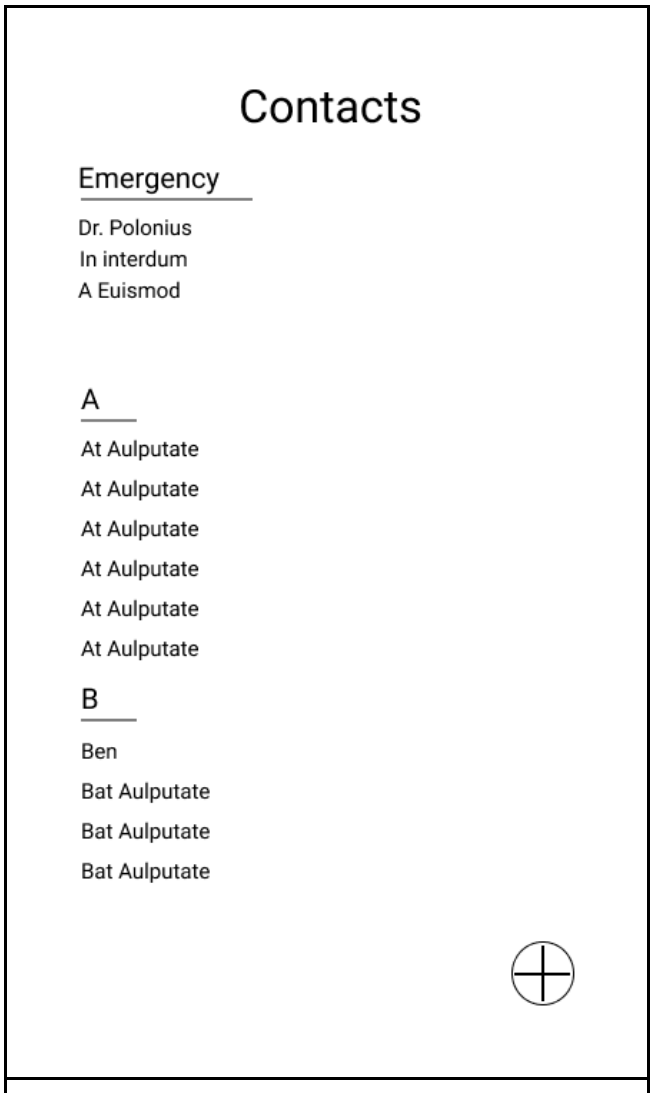


Figure 2. Contacts list

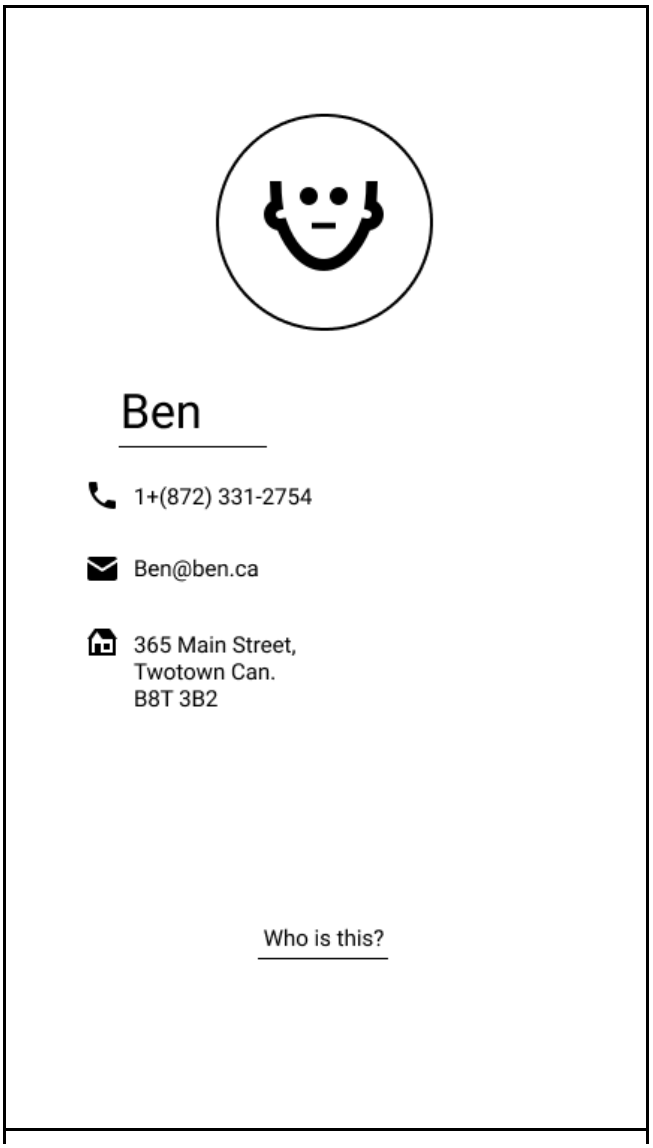


Figure 3. Contact page

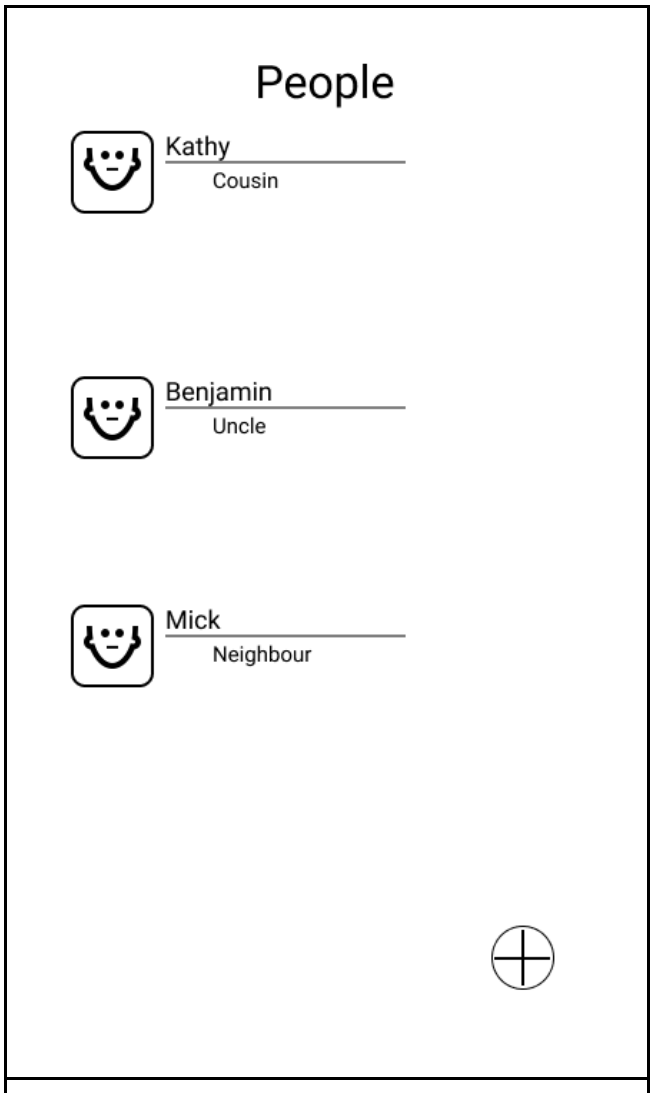


Figure 4. People List

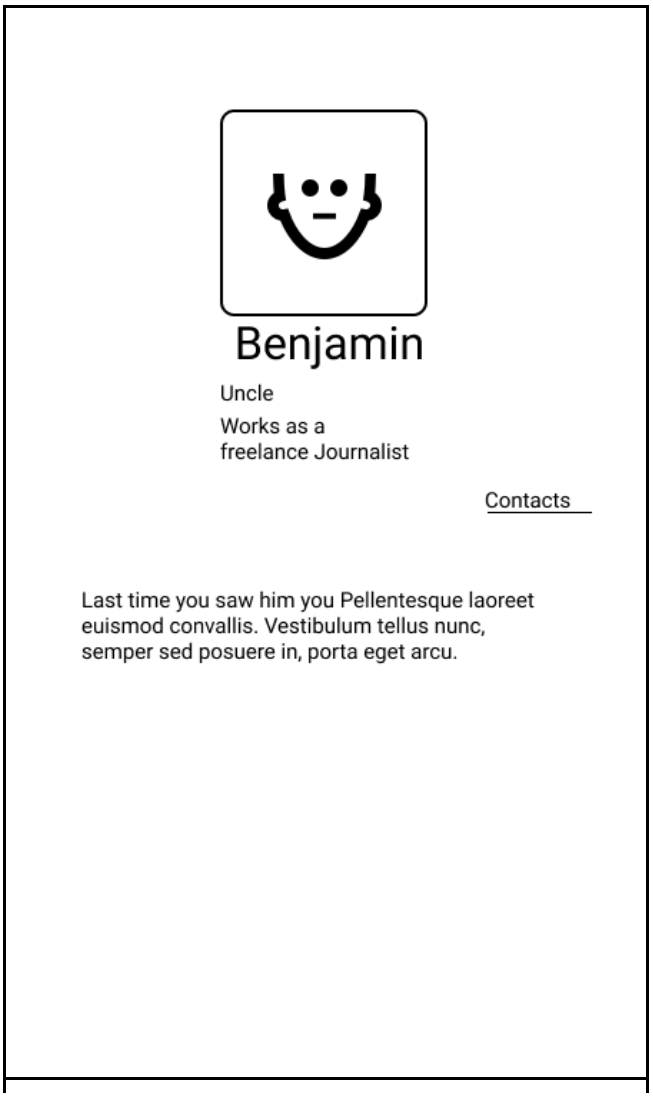


Figure 5. Person Page

Figure 6. Events list

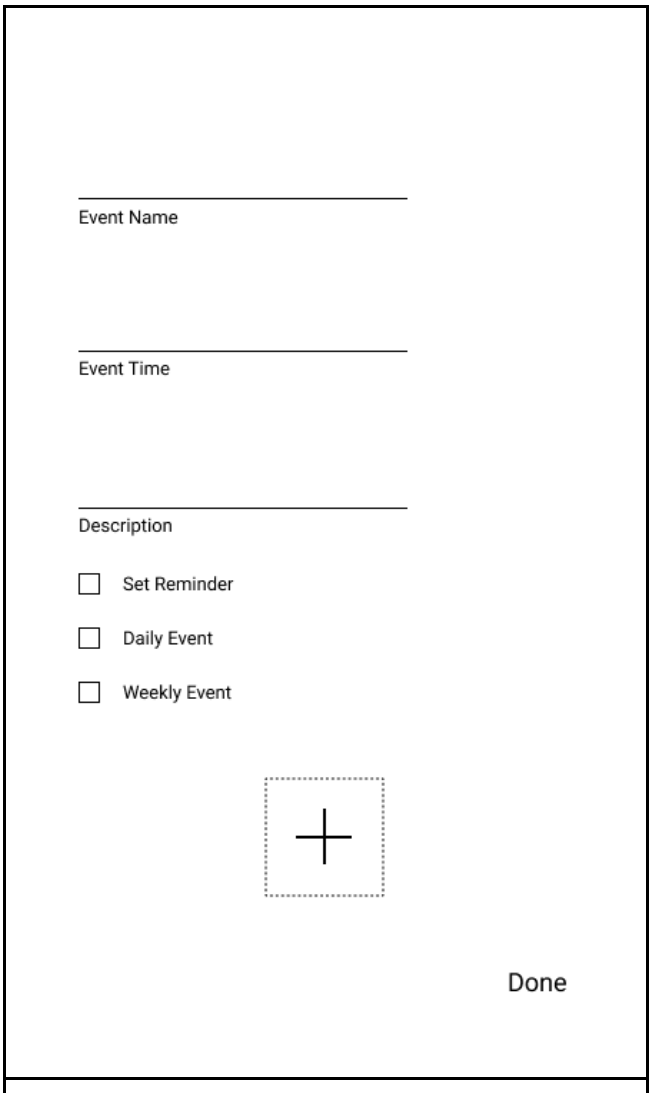


Figure 7. Creating an event

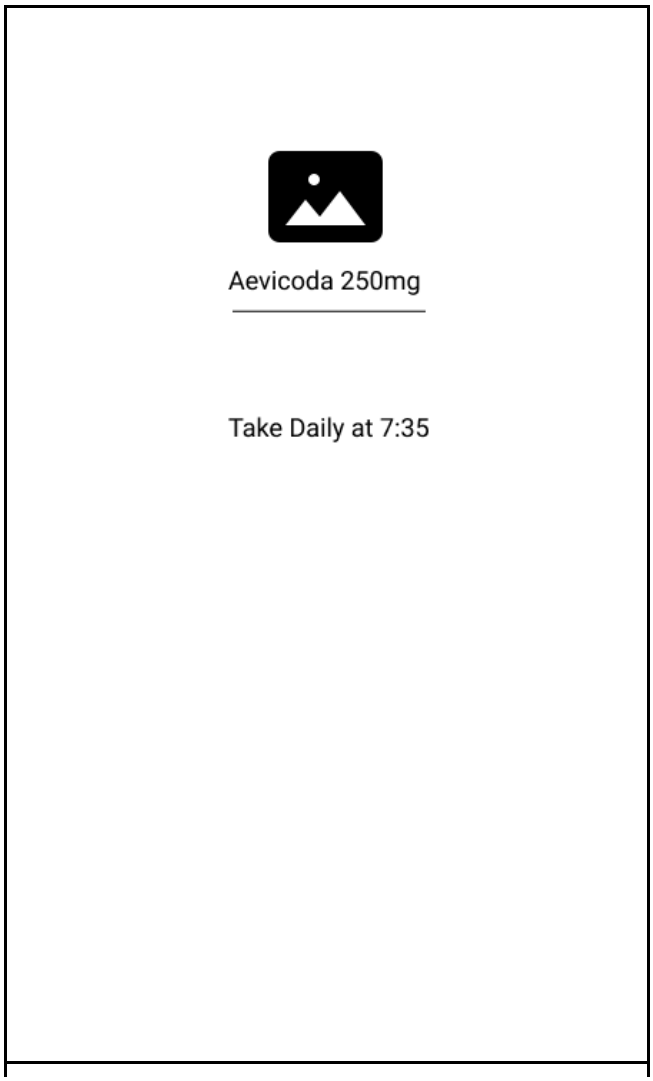


Figure 8. Individual event page

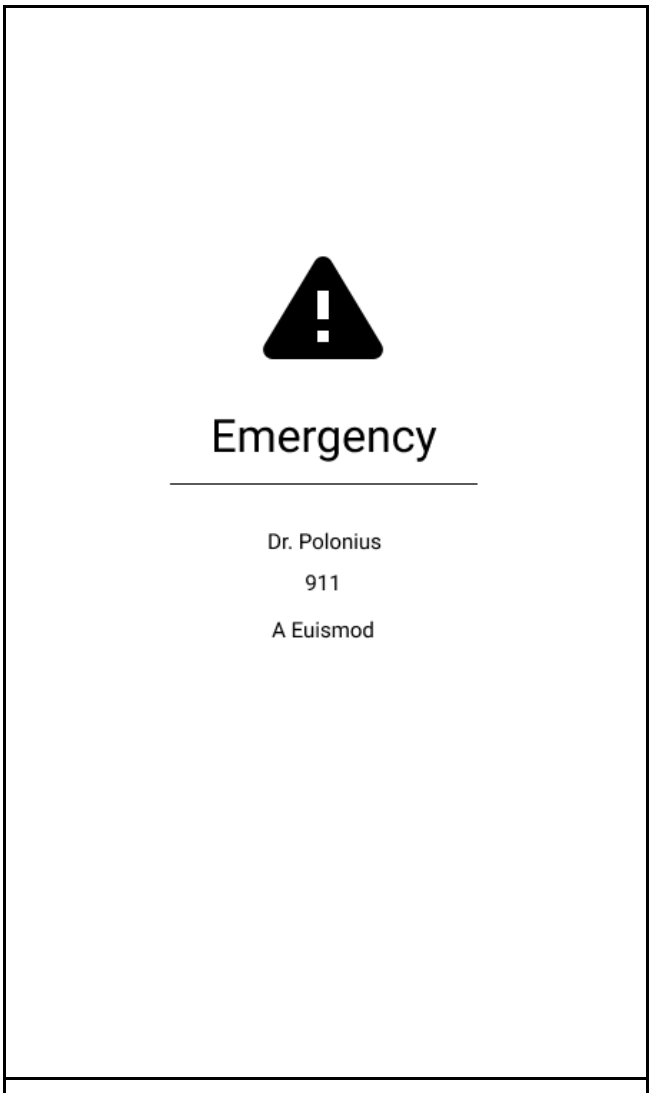


Figure 9. Event Page

OUTCOMES

With Al-momentous, we intend to provide Alzheimer patients the ability to lead a normal life. It is usually quite normal for patients to forget about their family members and their acquaintances. But our app would save them from embarrassment by questioning someone who they are. It could stimulate the patient's memory and possible help prevent it from deteriorating more. Especially when the patients are accompanied only by care-takers, this app would be extremely beneficial in such cases as they could get reminded of the upcoming events and regular activities that they are supposed to do in a day. In case of emergencies, they could get immediate assistance. With Al-momentous, we aim to improve the quality of the patient's life for as long as we can as there is no permanent cure for this disease.

FUTURE WORK

Moving forward we will have to consider how to handle notifications with our app, trying to strike a balance between allowing those who know/remember notifications to have easier simpler actions and those don't be able to figure out what to do with them. Currently, the mobile app is designed to cater to the Alzheimer patients indirectly, such that caretakers are operating the mobile app for setting up the upcoming events and other reminders to assist the patients. As future work, we plan to create a sister app that caretakers could link to create these reminders, contacts and info on loved ones.

CONCLUSION

A prototype of a mobile application that caters to the Alzheimer patients from stage 1-4 is created with various features like people, identify, events, emergency and contacts, that serves as a base for leading a good quality of their day to day life. This prototype evolved through several stages as we evaluated its design and usefulness throughout the project. The caretakers play an important role in managing the app and in assisting the Alzheimer patients, helping them set up the upcoming events and assisting them to recognize their friends and family.

REFERENCES

1.Radebaugh, T. and Ward-Robinson, J. Cultural Diversity and Alzheimer's Disease: Introduction. *Alzheimer's Disease & Associated Disorders 16*, (2002), S41-S42.

2.Ulrich, J. Alzheimer changes in nondemented patients younger than sixty-five: Possible early stages of Alzheimer's disease and senile dementia of Alzheimer type. *Annals of Neurology 17*, 3 (1985), 273-277.