Lab 1 – Product Description

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1 Introduction

According to Alzheimer's Disease International (2020), one in ten Americans aged 70 and older have some form of dementia, and the number of individuals diagnosed with dementia is steadily increasing over the years. Furthermore, of the dementia patients diagnosed, 50.4% of cases are mild, 30.3% are moderate, and 19.3% are severe. Individuals with mild dementia diagnosis may need very little assistance in daily living activities and may experience changes in mood, memory problems, and difficulty effectively planning and thinking things through (Alzheimer’s Society, n.d.). On the other hand, individuals with moderate dementia may need frequent reminders and some assistance with washing and dressing. Moreover, they may develop paranoia, experience intense symptoms of anxiety and depression, and memory problems may worsen (Alzheimer’s Society, n.d.).

In the case of mild or moderate dementia, individuals would prefer to maintain some of their independence (Alzheimer’s Society, n.d.). However, as dementia symptoms worsen, assistance is required from either a family member or an outside source, and care becomes stressful for the caregiver/family member due to the required constant attention (MPH, 2020). It is, therefore, crucial to explore innovative ways to support dementia patients and their caregivers to enhance their quality of life.

As the number of individuals diagnosed with dementia continues to increase, there is a need for a solution that can help maintain their independence while also providing necessary support. That's where Thought Locker comes in - a mobile assistant designed to help dementia patients maintain their independence through reminders, item location, monitoring, and analytics that will be provided to the present caregiver.
The solution to the societal problem of dementia must address the needs of patients as they progress through different stages of the disease, providing support and assistance as required. It must also consider the needs of caregivers and family members, who can become overwhelmed by the constant demands of caring for a loved one with dementia. Thought Locker provides a comprehensive solution that can address these needs, allowing patients to maintain their independence while also providing the necessary support and assistance for caregivers.

The growing problem of dementia requires innovative solutions that can address the needs of patients and caregivers alike. Thought Locker is the answer, providing a comprehensive mobile assistant that can help patients maintain their independence while also providing the necessary support and assistance for caregivers. As the number of dementia cases continues to rise, Thought Locker is poised to make a significant impact on the lives of those affected by this debilitating disease.

2 Product Description

Thought Locker is a powerful and innovative application designed to assist individuals living with dementia. It provides a range of tools and features that help users stay organized and retain their independence, even as their symptoms worsen over time. The application includes a comprehensive suite of tools, such as an item finder, task manager, event viewer, and calendar, that allow users to manage their daily responsibilities and stay on top of their schedules. Thought Locker's item finder feature is particularly unique, using geotagging technology to help users locate misplaced items quickly and easily. Thought Locker is designed to be used in conjunction with the support of a caregiver, who can aid, and guidance as needed. With its user-friendly
interface and intuitive features, the app helps users with dementia stay organized and on track, reducing stress and improving their overall quality of life. Thought Locker is the ultimate app for managing the challenges of dementia and preserving independence, whether you are an individual living with dementia or a caregiver seeking tools to support a loved one. With its innovative features and comprehensive suite of tools, Thought Locker helps users stay organized and on top of their daily tasks, reducing stress and improving quality of life.

2.1 Key Product Features and Capabilities

Thought Locker is a comprehensive caregiver app that is designed to improve the communication and organization of tasks between caregivers and patients. The app's key features include an Item Finder, a Calendar, an Event Viewer, and a Contact Center.

The Item Finder feature of Thought Locker allows patients to locate items using a Bluetooth tracker API. This feature is particularly useful for individuals who have memory issues and tend to misplace their belongings. With this feature, patients can easily locate their belongings, such as keys, wallets, or phones, with the help of a tracker that is connected to the app.

The Calendar feature of Thought Locker utilizes Google's API to allow caregivers to keep track of appointments, meetings, and other important events. This feature enables caregivers to manage their schedules effectively and avoid any potential conflicts. The app also allows caregivers to set reminders for events, ensuring that they do not forget any important appointments. The Event Viewer feature of Thought Locker enables caregivers to monitor and track tasks completed by other caregivers, as well as the patient's condition. The app
allows caregivers to set alerts for low, medium, or high priority tasks, ensuring that important tasks are not overlooked. This feature also helps caregivers to identify any potential issues early on, allowing them to take necessary actions promptly.

The Contact Center feature of Thought Locker enables patients to contact emergency services or family members using a priority queue system. This feature is particularly useful in emergency situations when patients need to contact their loved ones or seek medical attention urgently. The app's priority queue system ensures that important messages are given priority, allowing patients to receive the help they need in a timely manner.

The patient's role within the app is to use the features provided by the app to improve their quality of life and manage their daily tasks. However, the patient's access to certain features may be limited or delegated to other caregivers if their cognitive function or memory declines. This ensures that the patient is not overwhelmed by the app's features and can continue to use it effectively.

In contrast, the caregiver's role within the app is to manage the patient's account and ensure that the app is tailored to the patient's needs. The caregiver has the ability to control the patient's access to features, delegate tasks to other caregivers, and monitor the patient's condition through the app. This allows the caregiver to effectively manage the patient's care and ensure that their needs are met.

By defining these roles and permissions within the app, Thought Locker creates a clear and organized system for managing caregiving tasks. The app's features and customizable settings provide caregivers and patients with a personalized and effective tool for managing daily tasks and improving quality of life.

2.2 Major Components (Hardware/Software)
Thought Locker is a comprehensive caregiver app that can be used on both Android and Apple mobile devices. It requires internet access to function properly. The app has various features, including the Item Finder, Calendar, Event Viewer, and Contact Center, that allow users to manage daily tasks and improve the quality of life for dementia patients.

To use the Item Finder feature, a Bluetooth tracker needs to be attached to the item that the user wants to locate. The user can select the item to be found from the app's interface on their mobile device. The app then interacts with the database to retrieve information on the item's location. The app's database is structured based on the user's defined role, which includes access permissions and restrictions. The information is stored in an analytic database for future reference.

The app's hardware requirements include an Android or Apple mobile device with internet access, an application server, and a database server. The software requirements for the backend server are Amazon Web Services (AWS) and PostgreSQL or MongoDB.
databases. The programming language used for development is Javascript with the React/Node.js framework. Jest is used for testing, GitHub for repository and version control, and GitLab for continuous integration/continuous delivery (CI/CD). Docker is used for containerization.

3 Identification of Case Study

Thought Locker is primarily being developed for individuals with mild to moderate dementia and their caregivers or family members. The app will provide an easy method to locate lost or misplaced items using Bluetooth tracker technology. Caregivers will also be able to retain analytics to visualize and monitor patient habits, such as the number of times an item has been lost or the number of times a door has been left open. The app will also remind patients to take their medication or inform them of upcoming appointments, and will provide patients with the opportunity to immediately contact a caregiver with an urgent need. Additionally, Thought Locker will offer patients and family members a more cost-effective option than hiring a full-time caregiver.

Aside from individuals with dementia and their caregivers, other potential beneficiaries of Thought Locker include medical facilities, insurance companies or Medicaid, and Alzheimer’s research groups. In terms of user cases, the prototype will demonstrate the functionality of the app for individuals with mild to moderate dementia, with six users (three mild and three moderate) mocked up. The prototype will showcase the app's item finding, scheduling, and contacting features. Additionally, three caregivers or family members will be mocked up to demonstrate the app's monitoring, providing help, and analyzing trends features. Overall, the
prototype will provide a comprehensive demonstration of how Thought Locker can improve the lives of individuals with dementia and their caregivers or family members.
4 Glossary

Did not utilize any terms that are not commonly known.

Example:

**Radio Frequency Identification (RFID):** an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be attached to or incorporated into a product, animal, or person for the purpose of identification using radio waves.

1. Product Prototype Description

1. Prototype Architecture (Hardware/Software)

2. Prototype Features and Capabilities

3. Prototype Development Challenges
5 References


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