Thought Locker

“Unlock Your Memories”

CS410 Team Green
Feasibility Presentation

Spring 2023
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Dementia: A growing problem

- 1 in 10 Americans ages 65 and older have some form of dementia
- The rate of dementia increases with age\[^1\]
  - 3% of adults ages 70 to 74
  - 22% of adults aged 85 to 89
  - 33% of adults 90 and up
- Characterized by distinct stages\[^2\]
  - 50.4 percent of cases are mild
  - 30.3 percent are moderate
  - 19.3 percent are severe
Stages of Dementia

Mild[^4]
Individual largely independent and only needs some assistance with daily living.

Moderate[^5]
Symptoms become more noticeable and the person will need more support in managing daily life while still living independently.
The person may now need frequent reminders and some help to wash and dress.

Severe[^6]
The person will need full-time care and support with daily living and personal care, such as eating, washing and dressing.
Living with Dementia

Mild

- Memory problems
- Difficulties in thinking things through and planning
- Language and communication
- Poor orientation
- Visual-perceptual difficulties
- Changes in mood or emotion

Moderate

- Memory problems worsen
- Increased speaking and language difficulties
- Orientation becomes more difficult to interpret
- More intense symptoms of anxiety and depression
- Development of paranoia
- Auditory and visual hallucinations
The Problem

Individuals with mild to moderate dementia are frequently unable to remember the locations of personal items, organize their schedules, and recall ways to contact their loved ones.
Caregivers and patients struggle with locating misplaced items.

Difficulties with planning and organizing daily activities causes patients to feel less independent.

Caregivers do not have the resources necessary to effectively care for their patients.

Patients forget how to contact loved-ones in the event of an emergency.
Stakeholders / Customers

- Family Members
- Direct Patients
- Medical Facilities
- Insurance Companies / Medicaid
- Alzheimer’s Research Groups
The Solution

Thought Locker is an application that will enhance the ability for those with dementia to retain control of their daily lives. The application will ensure patients maintain a degree of personal freedom despite the mental challenges they face.
Solution Characteristics

- Easily locate important items with Bluetooth tracking
- Provide caregivers with an effective tool to manage patient independence
- Provide patients with a simple and effective method to contact loved-ones
Solution Flow

Initial Diagnosis
- Caregiver Intervention
- Dementia Patient Self-Care
- Nurturing Independence

Calendar for tracking events
Daily activities to be completed

Task Manager

Dementia patient downloads Thought Locker to maintain independence

Contact Center

Item Finder

Dementia patient’s personal contacts
Priority queue of emergency contacts
Post Request for help

Calling
Messaging
Request for help
Emergency contact accepts request for help

Geolocating of item
Photograph of item
Auxiliary notification
What Thought Locker will NOT do

Replace the role of a caregiver
- Intended to foster the relationship between the two users

Support phone calls to all contacts
- Thought Locker can only call individuals that are added by the caregiver

Assist patients with severe dementia
- Thought Locker is intended for patients with mild to moderate dementia

Integrate appointment reminders with other health applications
- The caregiver must create each reminder for the patient
### Risk Matrix

#### Probability

<table>
<thead>
<tr>
<th>Impact</th>
<th>Very Low 1</th>
<th>Low 2</th>
<th>Moderate 3</th>
<th>High 4</th>
<th>Very High 5</th>
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<tbody>
<tr>
<td>Very High 5</td>
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<tr>
<td>High 4</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Moderate 3</td>
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<td></td>
<td></td>
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<tr>
<td>Low 2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Very Low 1</td>
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#### Customer Risk
- E1: Patient no longer engaged in the application
- E2: Patient unable to utilize application's functions
- E3: Patient unable to remember their login information

#### Customer Risk Mitigation
- E1: Send reminders to patient's phone to utilize the installed software
- E2: Hints will be provided after user input has not been received in a timely manner
- E3: Biometric sign in feature and forget password capability
## Risk Matrix

### Technical Risk
- T1: Server is unable to authenticate that the item has been found
- T2: Loses connection to calendar for appointments
- T3: Item that has been queried cannot be located

### Technical Risk Mitigation
- T1: Bypass photo identification by tapping geolocation device to phone
- T2: Cache important calendar information, locally store data on phone or tablet
- T3: Report item cannot be found to caregiver/family member option

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<th>Moderate 3</th>
<th>High 4</th>
<th>Very High 5</th>
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</tr>
<tr>
<td>Moderate 3</td>
<td></td>
<td>T1</td>
<td></td>
<td></td>
<td></td>
<td>T3</td>
</tr>
<tr>
<td>Low 2</td>
<td>T1</td>
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<td></td>
</tr>
<tr>
<td>Very Low 1</td>
<td>T2</td>
<td>T2, T3</td>
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</table>
## Risk Matrix

### Security Risk
- S1: User information breach
- S2: HIPAA violations due to storing information about medical condition
- S3: Anyone can access customer’s account because password has to be set

### Security Risk Mitigation
- S1: Modern Security Protocols, encryption based technology
- S2: User License Agreement that information will only be shared with organizations that have the need to know
- S3: Biometric Two-Factor Authentication, only the customer, family member, or caregiver can access

<table>
<thead>
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<tr>
<td>Very High 5</td>
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- S2: S1, S3
- S1: S2, S3
## Competition Matrix

<table>
<thead>
<tr>
<th>Features</th>
<th>Applications</th>
<th>Direct Competition</th>
<th>Indirect Competition</th>
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<tbody>
<tr>
<td></td>
<td>Thought Locker</td>
<td>MapHabit</td>
<td>MOJO</td>
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<tr>
<td>Patient</td>
<td>Calendar</td>
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<td>✓</td>
</tr>
<tr>
<td></td>
<td>Task Scheduling</td>
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<tr>
<td></td>
<td>Notifications (Audio/Visual/Haptic)</td>
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<tr>
<td></td>
<td>Important Item Images</td>
<td>✓</td>
<td>✗</td>
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<tr>
<td></td>
<td>Item Locator</td>
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<td>✗</td>
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<tr>
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<td>Family/Caregiver Contact Assistance</td>
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<td>✓</td>
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<tr>
<td></td>
<td>Emergency Contact Assistance</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
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<td>Family/Caregiver Patient Assistance</td>
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</tr>
<tr>
<td></td>
<td>Family/Caregiver Monitoring &amp; Analytics</td>
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<td>✗</td>
</tr>
<tr>
<td></td>
<td>Family/Caregiver Notes Log</td>
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<td>✓</td>
</tr>
</tbody>
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Benefits to Customer Base

- Allow patients to independently resolve common problems associated with dementia
- Caregiver can dedicate more time to other commitments (family, other jobs, etc.)
- Reduce miscommunication between patients and caregivers with issues such as:
  - Item location
  - Task planning
- Enhance the relationship between caregivers and patients
  - Provide strategies to resolve potential conflicts
Conclusion

Thought Locker will provide individuals diagnosed with dementia with resources to maintain their independence from a caregiver. This will be accomplished through the use of:

- Item location feature
- Schedule daily tasks and reminders
- Notify emergency contacts in the event they are needed
References