Operational Concept Description (OCD)

Citizens Hive

Team 4

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>Client, Administrator &amp; Maintainer</td>
</tr>
</tbody>
</table>
## Version History

<table>
<thead>
<tr>
<th>Date</th>
<th>Author</th>
<th>Version</th>
<th>Changes made</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/01/20</td>
<td>AK, KN</td>
<td>1.0</td>
<td>● Created the OCD outline template, various sections included.</td>
<td>● Created initial OCD skeleton from OCD Template.</td>
</tr>
</tbody>
</table>
| 10/10/20 | KN      | 1.1     | ● Added Section 1  
● Added Section 2 | ● Diagrams were redrawn to provide consistency based on feedback from the ARB presentation.  
● Details were added to diagrams for accuracy and clarity.          |
| 10/20/20 | AK      | 1.2     | ● Added Section 3 | ● Diagrams were redrawn to provide consistency based on feedback from the ARB presentation.  
● Details were added to diagrams for accuracy and clarity.  
● Some system requirements have been adjusted and added to better fit within the project scope. |
| 10/21/20 | AK      | 2.0     | ● Added Business Flow Diagram to capture more workflows  
● Edited LOS goals to be more quantifiable  
● Revised grammatical errors  
● Added descriptions to headings  
● Added page numbers  
● Fixed headings and subheadings | ● Wordings and grammatical errors were corrected for readability.  
● Details were added to diagrams for accuracy and clarity. |
| 11/23/20 | AK      | 3.0     | ● EditedOCD status  
● Edited Program Model  
● Revised grammatical errors  
● Added description to Benefit Chain Section  
● Updated Core Capabilities  
● Edited constraints  
● Edited Business Workflow diagrams |                                                                  |
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1. Introduction

1.1 Purpose of the OCD

This document provides, in detail, the shared visions and goals of the stakeholders of the Citizens Hive. The success-critical stakeholders of the project are Briana Cordova-Moore, as the project owner, administrator and maintainer; the seniors and caregivers, as users; and the students of USC CS577 Team 4, as the development team.

1.2 Status of the OCD

The status of the OCD is currently at the Operations Commitment Package version 3.0. This is the version that will be delivered to the client, including the finalized capability goals and screenshots of the proposed system. There have been significant changes to the project since we moved from the Development Commitment phase to the Re-baselined Development Commitment phase, due to time and personnel constraints as well as system dependencies. The scope of the Citizens Hive project has been re-evaluated to accommodate those challenges. Our core capabilities have been refined to accommodate all of the client’s requirements and the OCD captures the important characteristics of the proposed system.
2. Shared Vision

The shared vision for our system is shown as follows by the Program Model:

### Table 1: The Program Model

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Stakeholders</th>
<th>Initiatives</th>
<th>Value Propositions</th>
<th>Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All users have access to the internet.</td>
<td>- Client</td>
<td>- Developers develop a system to provide personalized care and jobs for seniors and caregivers respectively through custom profile creation/editing, search/filter, forums, messaging and payments</td>
<td>- Increased communication between seniors and caregivers</td>
<td>- Client</td>
</tr>
<tr>
<td>2. Users are willing to register</td>
<td>- Seniors</td>
<td>- Client sets up infrastructure, compute and storage services to support development and invest in marketing and partnerships to scale platform</td>
<td>- Improved caregiving experience for seniors and caregivers over existing offline system</td>
<td>- Caregivers</td>
</tr>
<tr>
<td>3. Users have minimal technical expertise</td>
<td>- Caregivers</td>
<td>- Seniors/Caregivers can login/register with the system to use the services like custom profile creation/editing, search/filter, forums, messaging and payments</td>
<td>- Increased satisfaction in the lives of seniors</td>
<td>- Seniors</td>
</tr>
<tr>
<td>4. Users are willing to make payments online</td>
<td>- Developers</td>
<td></td>
<td>- Increased job visibility for caregivers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Increased revenue and brand awareness</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- One-stop destination for seniors and caregivers</td>
<td></td>
</tr>
</tbody>
</table>
2.1 Benefits Chain

The benefits chain diagram illustrates the following information

- **Stakeholder(s):** Client, Seniors, Caregivers and Developers

- **Initiatives:**

  - Developers develop a system to provide personalized care and jobs for seniors and caregivers respectively through custom profile creation/editing, search/filter, forums, messaging and payments

  - Client sets up infrastructure, compute and storage services to support development and invest in marketing and partnerships to scale platform

  - Seniors/Caregivers can login/register with the system to use the services like custom profile creation/editing, search/filter, forums, messaging and payments

- **Contribution:** Faster profile matching, Availability of infrastructure, Improved communication, Increase in number of users, Improved user engagement and adoption

- **Outcome:** Improved caregiving experience, Increased communication among users, Increased satisfaction in the lives of seniors, Increased job visibility for caregivers, One-stop destination for seniors and caregivers, Increased revenue and brand awareness

- **Assumptions:**

  1. All users have access to the internet.
  2. Users are willing to register
  3. Users have minimal technical expertise
  4. Users are willing to use online payments
2.2 System Capability Description

Citizens Hive is a one-stop destination for seniors and their loved ones. The proposed web-based system will allow both seniors and caregivers to communicate with each other, search and filter, based on seniors’ location, type of care and availability. The communication is done through the messaging functionality. In addition, the system is capable of an online payment system through which a senior can pay for the services offered by the caregiver. There is an additional option for the seniors and caregivers to add or edit posts on forums which all the users can view. Citizens Hive will simplify the process as well as lessen the time involved apart from providing personalized care in an easy, seamless, convenient and hassle-free manner.

Our approach to differentiate our system from our competitors’ systems is the personalized care offered through a web-based system, which will be more user-friendly. We also offer better communication between caregivers and seniors using both messaging and an active public forum. The system will also lead to an increased satisfaction in seniors due to the personalized care and increased stability by providing three types of care: caregivers staying at the seniors place, seniors staying at the caregivers place and an hourly arrangement on particular days between seniors and caregivers.
2.3 System Boundary and Environment

The Citizens Hive system provides many services including Register, Login, Profile Creation, Profile Editing, Search/Filter Seniors and Caregivers, Add Rating/Reviews, Pay Caregivers, Messaging and Add post/comments on discussion Forum.

The stakeholders include seniors, caregivers, client who will also be the administrator and the development team. The services are accessed through a web browser running over the internet. For making payments, the system also interacts with a third party payment gateway service.

The support infrastructure used by our system include Amazon Lightsail server to host the web-based platform, Python Django framework, MySQL database, HTML/CSS/JavaScript. We also use Twilio API to implement real-time messaging and Stripe to process payments and track payment history.
3. System Transformation

3.1 Information on Current System

Citizens Hive is a novel concept that provides easy access to personalized care for seniors. It can be contrasted to the current system which is primarily offline. In the current system, seniors have to go through an offline painstaking process to find caregivers who match their needs and preferences. It is time-consuming, complex and laborious. The background and prior experience of the caregivers are not available to the seniors. There is no record of payments, availability and location details that are maintained. The current system has many flaws that can be corrected with a better system in place.

3.2 System Objectives, Constraints and Priorities

3.2.1 Capability Goals

<table>
<thead>
<tr>
<th>Capability Goals</th>
<th>Priority Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC-1 Registration and Login: The system allows new users to register to the system. If the user is registered, the user can login to access the services provided by the system.</td>
<td>Must have</td>
</tr>
<tr>
<td>OC-2 Profile Creation: The system creates base profile for the user</td>
<td>Must have</td>
</tr>
<tr>
<td>OC-3 Profile Editing: The system allows users to modify the existing profile information and preferences.</td>
<td>Must have</td>
</tr>
<tr>
<td>OC-4 Search and Filter: The system allows seniors to search and filter for caregivers based on zip code, radius, type of care and availability (start date and end date). The same is applicable for caregivers searching for seniors.</td>
<td>Must have</td>
</tr>
<tr>
<td>OC-5 Messaging: The system allows the seniors and caregivers to message each other.</td>
<td>Must have</td>
</tr>
<tr>
<td>OC-6 Reviews and Ratings: The system allows seniors to provide ratings and write reviews for caregivers based on the services they received.</td>
<td>Must have</td>
</tr>
<tr>
<td>OC-7 Payments: The system allows seniors to pay caregivers for their services.</td>
<td>Must have</td>
</tr>
<tr>
<td>OC-8 Forum: The system allows seniors and caregivers to discuss through a forum. All users can add posts, comment and view posts on the forum.</td>
<td>Nice to have</td>
</tr>
</tbody>
</table>
3.2.2 Level of Service Goals

### Table 3: Level of Service Goals

<table>
<thead>
<tr>
<th>Level of Service Goals</th>
<th>Priority Level</th>
<th>Referred WinWin Agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>System availability is expected to be with an uptime of 99.95% (Amazon Lightsail server)</td>
<td>Must have</td>
<td>LOS-1</td>
</tr>
<tr>
<td>Search latency &lt; 0.5ms achieved by fetching results from MySQL instance set up on Amazon Lightsail server</td>
<td>Must have</td>
<td>LOS-2</td>
</tr>
</tbody>
</table>

3.2.3 Organizational Goals

The high-level objectives of Citizens Hive are captured by the following organizational goals:

- **OG 1**: Increase in number of caregivers and senior citizens enrolling with Citizens Hive
- **OG 2**: Improved communication between caregivers and seniors
- **OG 3**: Increase in revenue for Citizens Hive with each booking that goes through the system
- **OG 4**: Increased satisfaction in the lives of seniors from easy access to personalized care
- **OG 5**: Increased stability in the lives of seniors as they stay in the homes of caregivers
- **OG 6**: Improves time and cost savings compared to the existing offline system

3.2.4 Constraints

The constraints to the proposed Citizens Hive system are indicated as follows:

- **CO-1**: Dependency on Python Django instance running on Amazon Lightsail
- **CO-2**: Dependency on MySQL instance running on Amazon Lightsail
- **CO-3**: Dependency on Twilio API for real-time messaging feature
- **CO-4**: Dependency on Stripe API to process payments

3.3 Proposed New Operational Concept
3.3.1 Element Relationship Diagram

The element relationship diagram summarizes the major relationships among the primary elements and external entities involved in the proposed new system. The users include seniors and caregivers. The proposed system contains a senior management system, caregiver management system, messaging system, forum system and payment system. These subsystems interact with the database to store, fetch and back up data. The system also interacts with an external payment gateway for the purpose of making payments.

![Element Relationship Diagram](image)

Figure 3: Element Relationship Diagram

3.3.2 Business Workflows

The business workflows highlight the business activities flowing in the proposed system. The business activity diagrams for some of the key business activities are provided below:
Figure 4: Business Workflow Diagram of Search and Messaging initiated by Senior

Figure 5: Business Workflow Diagram of Payments initiated by senior
Figure 6: Business Workflow Diagram of Forum
3.4 Organizational and Operational Implications

Organizational and operational transformations introduced by transitioning into the online system from the existing offline process are highlighted in the section.
3.4.1 Organizational Transformations

Significant changes expected in organizational structure by introducing the new system are discussed as follows:

- The need to hire a new maintainer/administrator as the system scales
- The elimination of registration with third parties to find a caregiver for a senior
- The elimination of registration with third parties to find caregiving jobs for caregivers
- The need to get familiar with the system by users as compared to the existing offline process

3.4.2 Operational Transformations

Significant changes expected in operational procedures and workflows by introducing the new system are listed below:

- The need to record offline payments by admin if the payment mode is requested by users
- The need to provide an option for someone else to book on behalf of the senior
- The need to carry out background checks for caregivers registering on Citizens Hive