INF5120 - Assignment 1

Smart Home – Support services for Elderly being able to stay longer at home – Business Architecture

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Changes:

In the business view, we saw that we had functions that were supposed to be in the application layer and not in the business layer. Therefore we moved these functions to the application layer and inserted the correct business functions in the business layer.

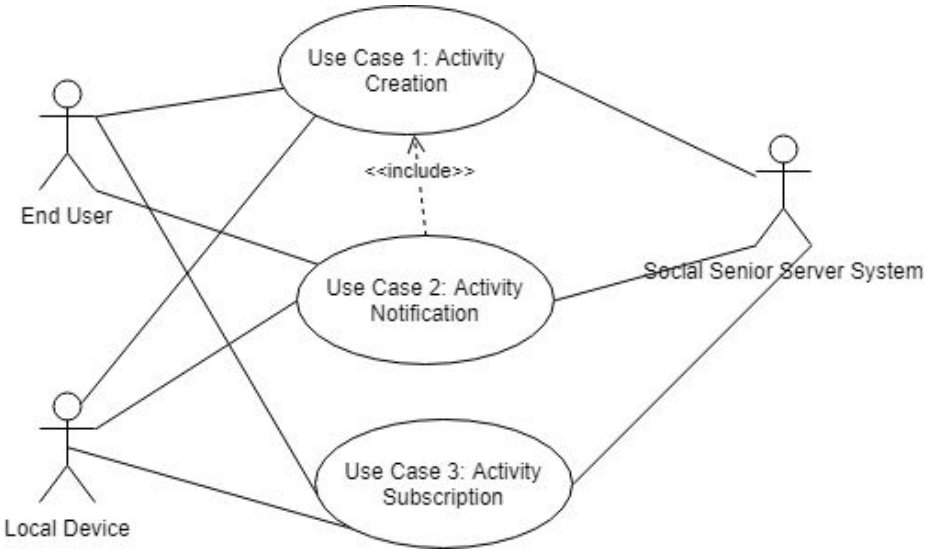
When making the different models for the system in Oblig 3 we understood that our use cases had to change because the original use case was overinclusive. The actual sequence of the different use cases has changed both as a result of the discussion of how the system should work when making the models and as a result of creating a working MVP in Node-Red with a chatbot in IBM Bluemix. Using the Watson Assistant chatbot functionality simplified the way the system stores and generates activity. The modification is shown in the new use cases below.

Our use case now consists of 3 main user functionalities:

1. Create an activity,
2. Get an activity notification,
3. Subscribe to an activity.

Use Cases

Idea: Device that lets users inform other users within proximity that they are doing something social, so others can join.
Use cases: See if the user is socially active and get them to interact with other users.
Equipment needed: speaker, microphone, button, GPS.



<table>
<tr><th>Use case template</th><th>Examples</th></tr>
<tr><td>Use Case Name</td><td>Create an Activity</td></tr>
<tr><td>Use Case ID</td><td>1</td></tr>
<tr><td>Revision</td><td>1</td></tr>
<tr><td>Status</td><td>Active</td></tr>
<tr><td>Goal</td><td>Map out any social activity for elders in a region</td></tr>
<tr><td>Summary</td><td>The user announces social activities, which gets broadcasted to other elders within a certain region, other elders' device announces the activity.</td></tr>
<tr><td>Category</td><td>Primary</td></tr>
<tr><td>Actor</td><td>Elderly people, Server System (social senior system), Client System (local device)</td></tr>
<tr><td>Primary actor</td><td>Elderly people</td></tr>
<tr><td>Stakeholder</td><td></td></tr>
<tr><td>
<table>
<tr><td>Requested Information Resources</td><td>Data input
Data access control
Data format</td></tr>
</table>
</td><td>
<table>
<tr><td>Button press and hold (2 seconds), speech</td></tr>
<tr><td>API key and userID from the local device is authorized by the server system.</td></tr>
<tr><td>Sound/audio file</td></tr>
</table>
</td></tr>
<tr><td>Precondition</td><td>Internet available, a device connected</td></tr>
<tr><td>Postcondition</td><td>The activities are successfully sent and updated to the system.</td></tr>
<tr><td>Sequence</td><td>1. The user indicates that he/she wants to create an activity by pressing and holding the button for 2 seconds.
2. A conversation is started by using the microphone sensor between the user and server system to set the activity parameter: type, location and time.</td></tr>
</table>

	For each parameter, the system stores each activity parameter. 3. The user gets a confirmation of created activity and then attends the activity

Use case template	**Examples**
Use Case Name	Engage in activity (get an activity notification)
Use Case ID	2
Revision	1
Status	Active
Goal	Receive notifications of new activities within the proximity area.
Summary	The user double clicks the device in order to get activities notification in the area.
Category	Primary
Actor	Elderly people, Server System, Client System
Primary actor	System
Stakeholder	
<table><tr><td>Requested Information</td><td>Data input</td></tr><tr><td></td><td>Data access control</td></tr><tr><td>Resources</td><td>Data format</td></tr></table>	<table><tr><td>Double button press.</td></tr><tr><td>API key and userID from the local device is authorized by the server system.</td></tr><tr><td>Sensor data is originally in Byte data type, but is converted to File data type.</td></tr></table>
Precondition	Internet available, Use Case 1 runs successfully. In order for a user to get a notification, an other user need to successfully create a activity.
Postcondition	The activities within a certain area are retrieved and played back to the user’s local device

Sequence	1. The user presses the button two times in order to request for activities happening around him/her. 2. The server system responds with the recorded activities in the user's location. 3. The user confirms attendance 4. The client system sets a reminder shortly before the activity start.

Use case template	**Examples**
Use Case Name	Activity Subscription
Use Case ID	3
Revision	1
Status	Active
Goal	Lettings users subscribe and filter certain activities.
Summary	The user wants to receive notifications from activities within certain categories.
Category	Primary
Actor	Elderly people, Server System (social senior system), Client System (local device)
Primary actor	Elderly people
Stakeholder	
<table><tr><td rowspan="3">Requested Information Resources</td><td>Data input</td></tr><tr><td>Data access control</td></tr><tr><td>Data format</td></tr></table>	<table><tr><td>Button press (1 click), speech</td></tr><tr><td>API key and userID from the local device is authorized by the server system.</td></tr><tr><td>Sound/audio file</td></tr></table>
Precondition	Internet available, a device connected.

Postcondition	User successfully subscribed to activities.
Sequence	1. User clicks the button to listen to the instructions of how to subscribe to activity types. 2. The user presses the button after each type he/she wants to subscribe to. 3. The user gets confirmation of types subscribed to.

User Stories

The main and most important features are explained in detail in the above use case templates. Additional features and one example of each use case are described as user stories in below tables. They are all mentioned in the motivation, strategy and business models.

Function	User stories	Description	Example
Sending invite	As a user, I want to create an activity to let others know that I am doing something social, so that they can join.	See use case 1	User: “create an activity” System: createActivity(), the system sends: “what type of activity?” User: “Walking” System: activityType = “walking” The system sends: “What location is the activity at?” User: “Park” System: activityLocation =

			“Park”, The system sends: “What time?” User: “2 pm” System: activityTime = “2pm”, The system sends: “Activity created”
Receiving invite	As a user, I want to receive information about social activities happening around me.	See use case 2	*User presses button twice* Server systems = “Activities happening around you includes.. #1, #2, #3”. *User confirms attendance* ClientSystem.activityReminder = attendActivity.time - 30min
Subscription	As a user, I want to subscribe to a certain type of activities, so that I will not be bothered by other types of uninteresting activities.	See use case 3	Sender: *clicks on button* The system: “To subscribe to a type, simply press the button once after the type has been listed. All types will be announced, so just wait if you do not want to subscribe to the one mentioned.” User: *presses the

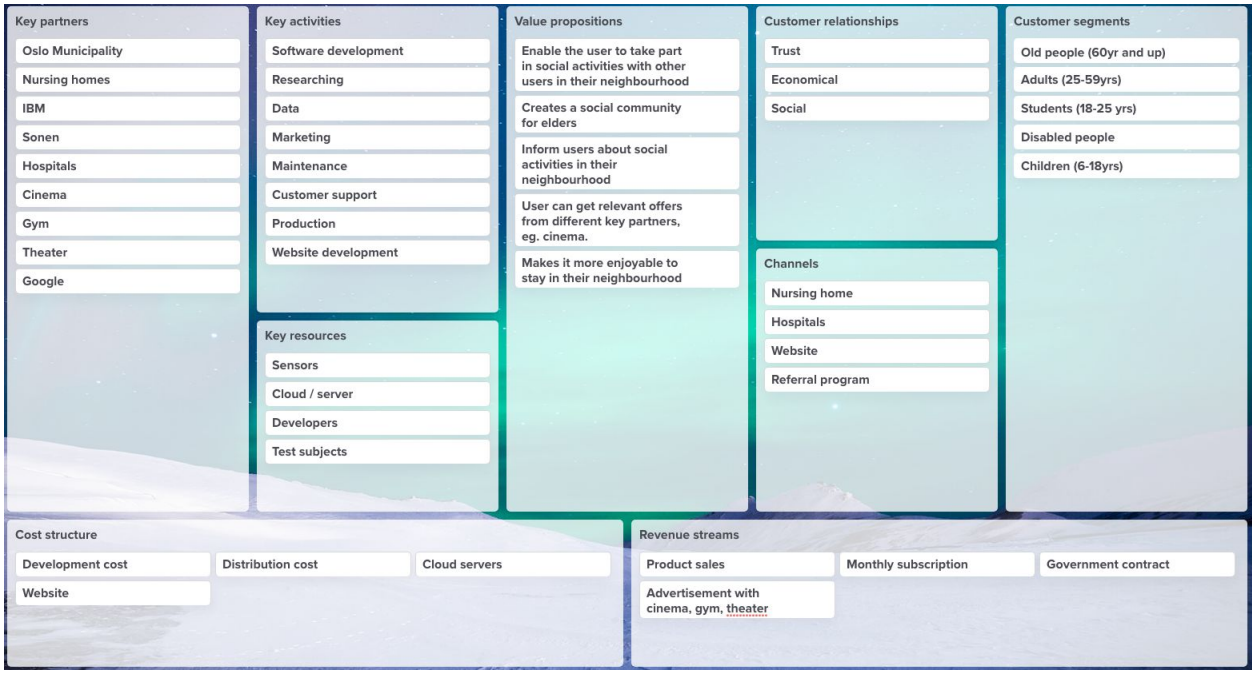
			button once after the types he/she wants* The system: *registers each type after each press and stores the types in the database* The system: “The types that you are subscribing to are: Walking, Cinema, Park …”
Reminder	As a user, I want to be reminded of an activity that I’m going to attend to	The receiver listens to a recorded message and double-clicks to change the status to attend. A reminder will be played 30 minutes before the activity start	If(activity.status = attending) reminderOn(Activity .startTime - 30min)
Deadline / Delete	As a user I want my messages to be deleted after the activity started		If(activity.starttime > = TimeNow + 2 hours) Delete activity

One functionality that we have not incorporated in the models in Oblig 3 is deleting and reminder. Both reminder and deleting are extra feature that are ‘nice-to-have’ but are not included in the MVP as the main functionalities of the product are broadcast activities, receive activity notification, and subscribe to certain activity types.
*reminder is used in the models, but not explicitly modeled.

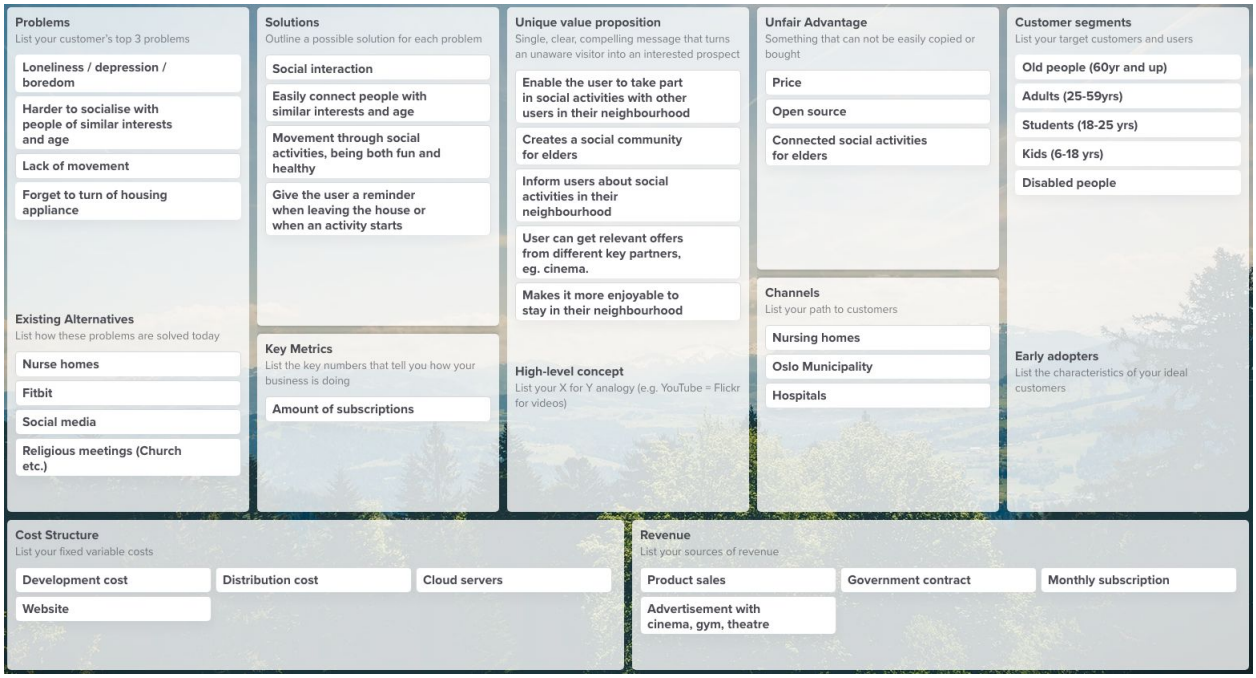
Business Model Canvas

Key activities:

- **Software development:**
    - **Retrieve info from voice sensor**
    - **Program keywords, speech to text, GPS coordinates, time of activity,**



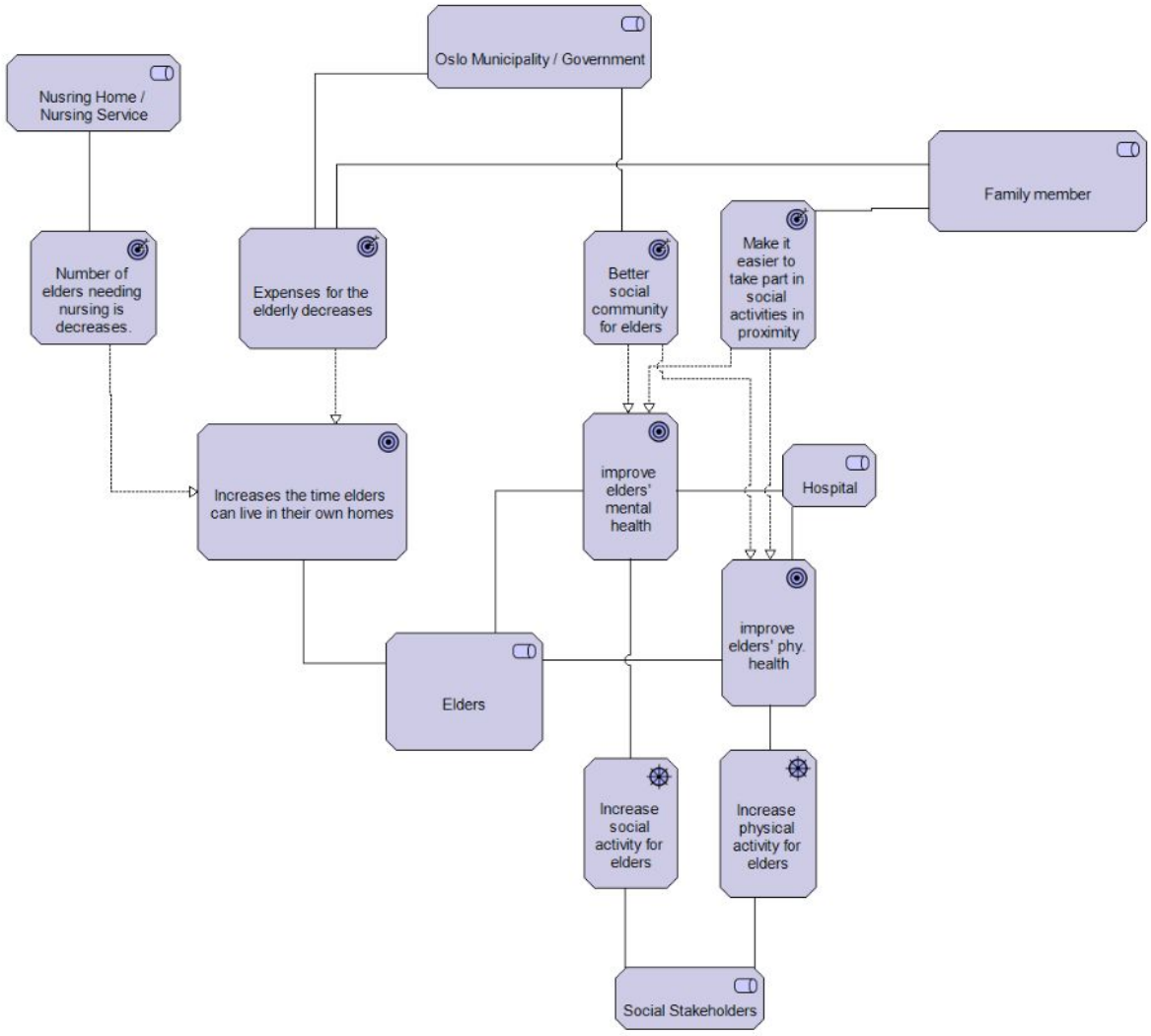
Lean Startup Canvas



Archimate 3.0 Models

The project motivation and strategy are summarized using ArchiMate diagrams.

Motivation model

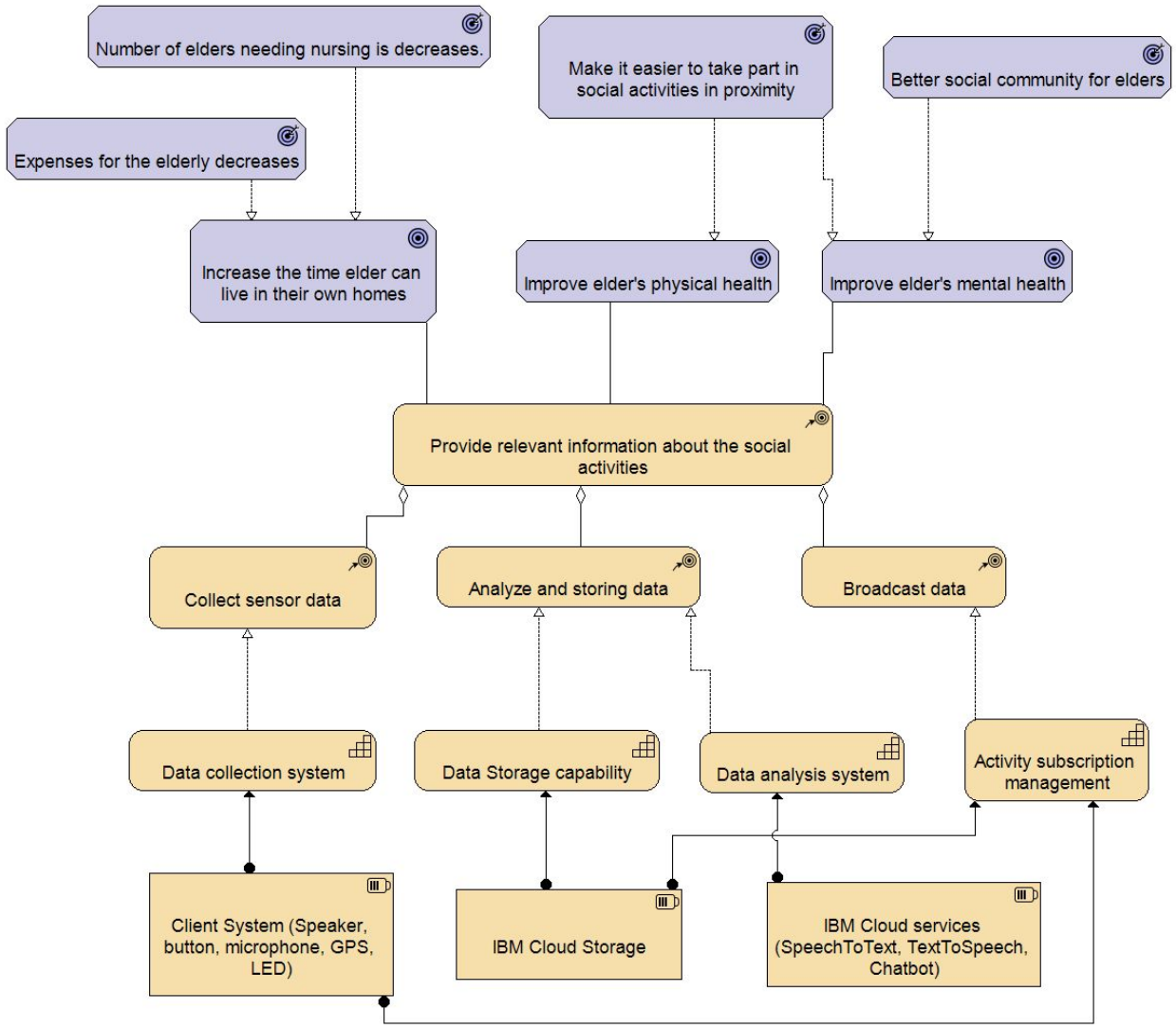


The main motivations for this project are:

- Increases the time elders can live in their own homes
- Improve elders' mental and physical health

The economic motivation of the government is to keep the expenses for the elders down. Expenses are higher if the elders are in a nursing home, compared to living on their own. The same goes for family members (children) who have to pay for their elders (parents) for the use of nursing home and nursing services. After talking to elders living in nursing homes, one of the main reasons for coming to nursing homes was due to loneliness. Their social and health motivation is, therefore, to improve mental health by increasing social activities for elders, this will also improve their life quality. Another reason was due to health issues, better physical shape of the elders could have enabled them to stay at their own homes longer and living a longer life. Families are interested in the well beings of their elders, and would, therefore, support these motivations. In addition, hospitals would be able to take more care of their patients due to less demand from elders. As stakeholders, nursing homes / services are ‘negatively’ affected by less demand from the elders.

Strategy Model



The table below lists the strategy model elements.

Name	Description
Collect sensor data	The ability to collect the audio message of the user from a microphone and other sensor data (GPS, button pressed, etc.) and update to the storage.
Analyze and storing data	The ability to process acquired data using a set of rules and algorithms.
Broadcast data	Send the message to the user in an audio format that can be played on the device's

	speaker.
Data collection system	The system with the ability to collect data
Data storage capability	System component with the ability to store the data collected in the cloud.
Speech analysis system	The system with the ability to analyze audio speech data by converting audio to text and text analysis.
Activity subscription management	System with ability to collect and update user subscription of activity types.

Business Model

The business process of this project is about broadcasting the activity information to relevant users that have interest of these activities. By recording the audio message about the activities which the users are going to participate in, analyzing their properties (date, time, location, containing keywords etc.) and collecting user preference of different types of activities, the system will be able to notify the users whenever there are new activities that are of their interest and/or around their home.

The business view of the operations is shown below.