HouseHold

Analysis

Documentation of a project for the purpose of the course BIE-SI1.

Authors:

Contents

1. Project specification

The goal of the application is to track various information about the state of a household.

1.Stock management

One of the main features is the management of stock of various items and material in a household. The items can range from cooking stuff (milk, flour, rice, cooking oil, etc.), to hygiene and health stuff(shower gel, toothpaste, various drugs and medicines), to maintenance and reconstruction material (paint, bulbs, packed concrete mixture, planks, bricks) to inventory (furniture, books, DVDs, etc.). The items should be categorized (with a hierarchy of categories (paint -wood paint -brown paint) and have a location (which should be shared by multiple items). It is necessary to track different pieces of item of the same type separately (2 cans of the same paint separately), including the possibility to track portions of the items (1 can of paint already used with just a half of paint remaining). For each items, time information should be tracked (when added/bought, when opened, when used).Amount of material in each item should be tracked (one sack of 1kg of rice, one can of 0.5l of paint, ...). All basic units should be supported (weight, volume, distance, dimensions). Aggregation for the amounts is expected (How much paint do I have in total?).Basic information like title, description, tags, picture, and similar for each item is obvious.It should be possible to set up expiration date for each item and get notifications when an item is about to expire so it can be discarded or restocked.Advanced searching is needed, obviously. Listing items based on category of various levels (getting all paints, getting only wood paints, etc.), name, date of expiration or opening. 2.Sharing the household

It should be possible to share the household data with other users (explicitely or in a group/family/friends). Individual items should have a visibility level set to determine, who can see the properties of that item.

3.Energy consumption tracking

Along with the information about the inventory of the household, tracking of energies should be also possible. Registering consumption of water, electricity, gas or others should be possible. It should be possible to attach bills for specific period and value ranges. It should be possible to set up reminders for registering the consumption values. It should be possible to browse the values, including visualization of the consumption, comparing consumption in different periods of time.

4.Tasks

When sharing the household information, it should be possible to manage tasks. The user can create tasks of different types, setup deadline, priority, assign a responsible person from the users in the household...

2. Business Process Model

2.1 Energy consumption
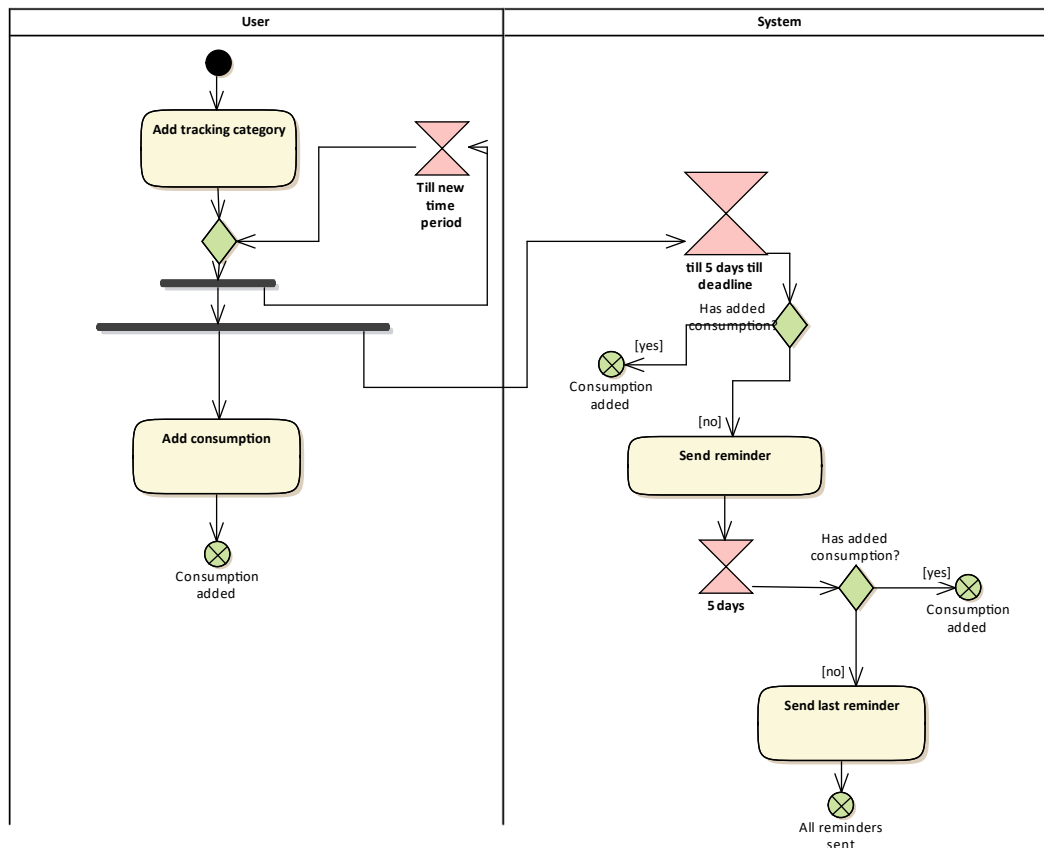
Figure 1 - Energy consumption

This diagram represents the process of tracking energy consumption of a household. After tracking category is added, each month system sends user remainders 5 days before and on the day of monthly deadline.

2.2 Sharing household
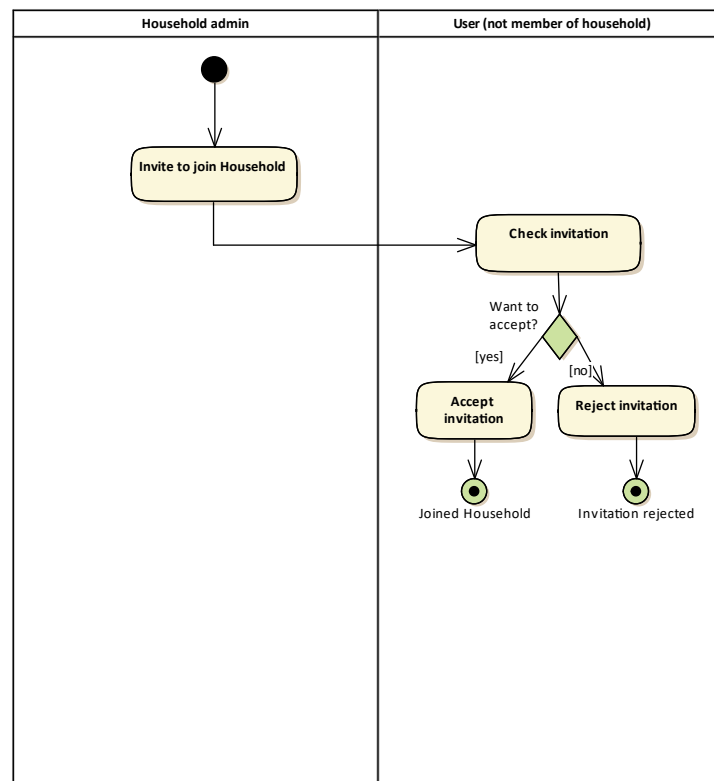
Figure 2 - Adding new member to the household

This diagram shows the process of adding new member to the existing household.
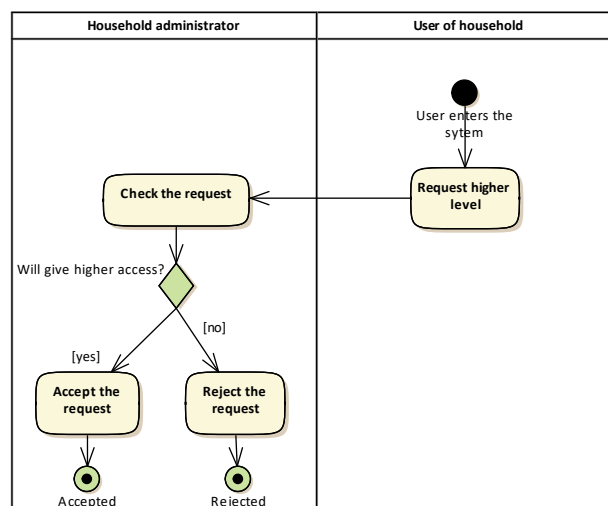
Figure 3 - Requesting higher access

This diagram shows the process of
user requesting higher access level from admin of the household, and admin accepting/rejecting it.

2.3 Stock management
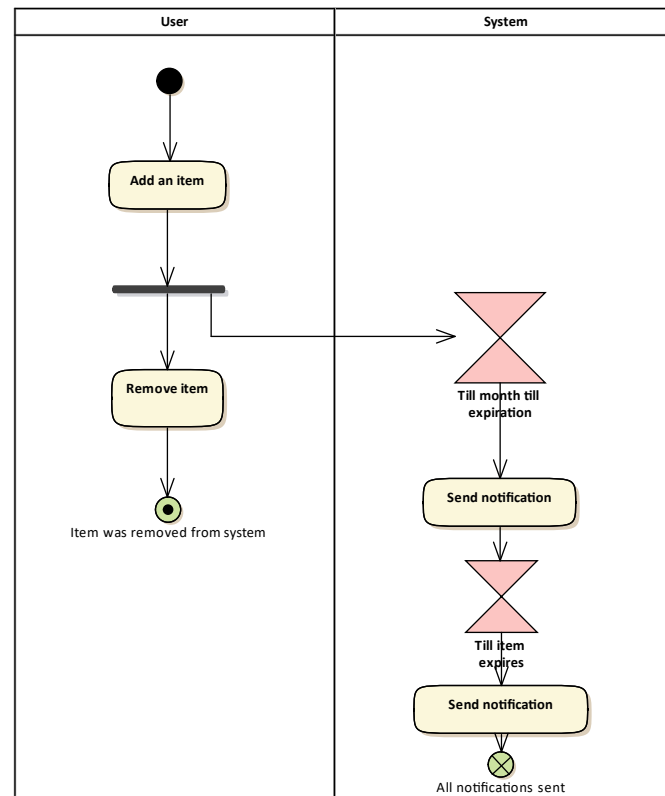
Figure 4 - Stock management

2.4 Task Assigning
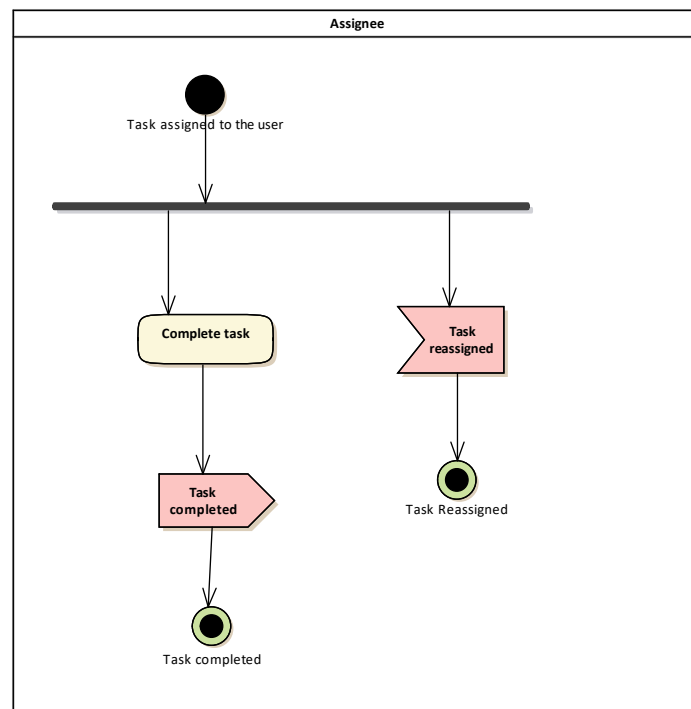
Figure 5 - Task Assigning - Assignee
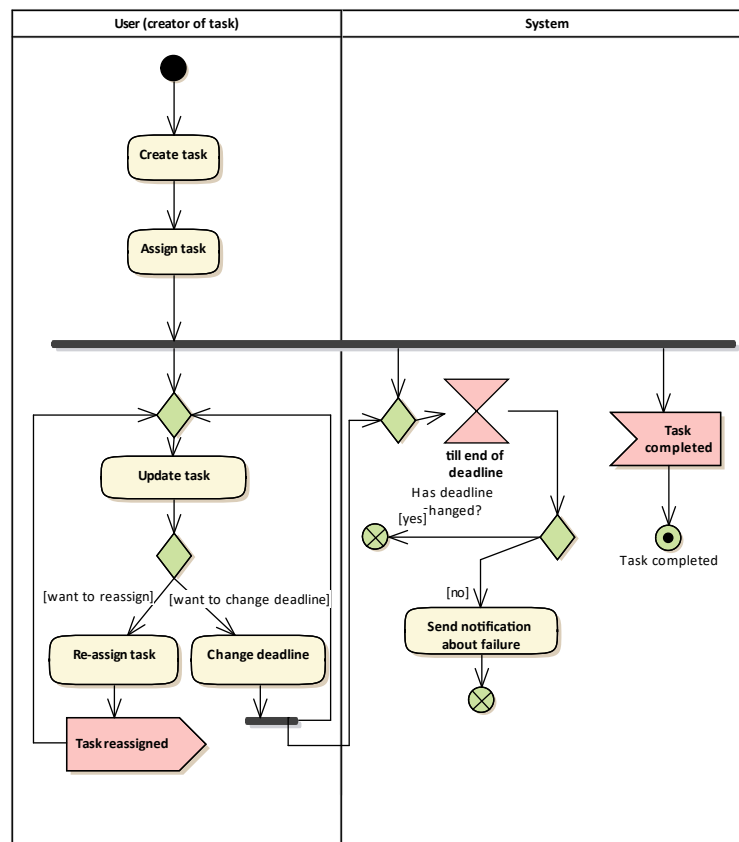
Figure 6 - Task Assigning - Main

This diagram shows the process of assigning, re-assigning and completing tasks.

2.4.1 Assignee

User who was assigned by someone to do a task.

2.4.1.1 Complete task

User competes the task that he was assigned to complete.

2.4.1.2 Task completed

Send an event that task was successfully completed.

2.4.1.3   Task completed

Task was successfully completed by the user.

2.4.1.4   Task reassigned

Task was reassigned to someone else, this process finishes here.

2.4.1.5   Task assigned to the user

Process begins when task was assigned to the user.

2.4.1.6   Task Reassigned

The task was reassigned to a different user so the process of this user ends.

3. Requirements
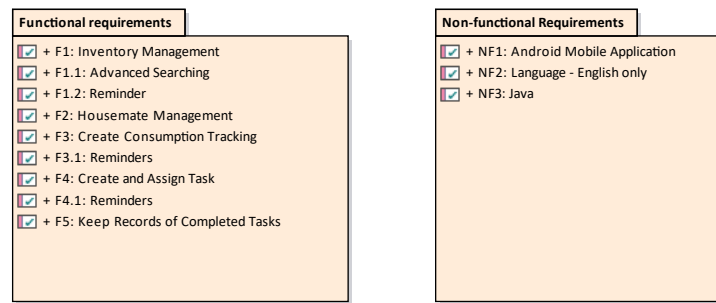
Figure 7 - Requirements

We have a rigorously defined a list

3.1 Functional requirements
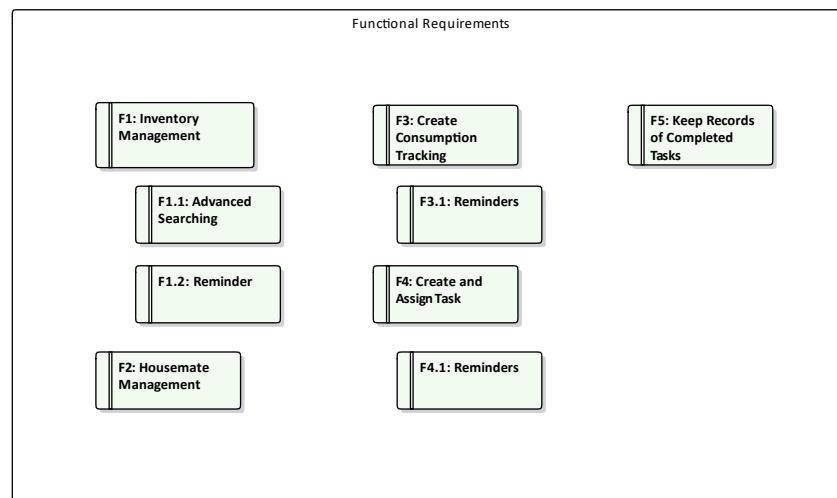
Figure 8 - Functional requirements

3.1.1 F1.1: Advanced Searching

It will be possible to search through all items , We can select tags which can help us in searching all items of a particular tags. For eg - if we search all items by tag hygiene, then we will get all items that have tag hygiene.
 - We can combine multiple tags to do more advances searches for example we can select tags, vegetarian and gluten free and then list items by closest expiry date.
 - we can list searched items or all items by bought date, expiry date and name.
- Every Item can have multiple tags but it also may not have any tag, more than that there will also be category assigned to item in Inventory.

The Fields tags and Category will not be global and will be created specifically by each Household

3.1.2 F1.2: Reminder

We should be able to send notification reminders to household members about items that are about to expire soon so that they can restock them.
The user will be able to choose when does he want to recieve notification and how often.
for eg -
they can get notification one week before expiry or 3 days before expiry or one one day before expiry date ,
users can also choose to get reminder when an item has been consumed 90% , 80% or 70% or any other options.
they can select different reminder setting for different category of items.

3.1.3 F1: Inventory Management

All instances of the item in inventory would be tracked their date of purchase, expiry date and remaining level would be stored at all times.
Expired Items would be still be able to be consumed but the item instance will have another state called spoiled which the user will have to report himself and then the item cannot be consumed and must be disposed.

3.1.4 F2: Housemate Management

The House Leader will be responsible for adding or removing housemates, However it is possible for one household to have multiple House Leader.

Household Members can add more members who are called Audience members to share data of the household (List of tasks, Inventory , consumption tracking) with but they should not be able to edit any data, they are only allowed to see the data and visualise the data.

3.1.5 F3.1: Reminders

We should be able to send notification reminders to household members when the due date of different tracking category has arrived.
Similarly here it will be modifiable how often and at what time the reminder will be sent and if the reminder will be sent just to house leader or everyone living in the household

3.1.6 F3: Create Consumption Tracking

It should be possible to track different category of services in a household like Electricity, Water, Heating , internet and other

if available.
 - we should be able to set time period which can be weekly , monthly or fortnightly , we should be able to set start day or date depending on the chosen value of the time period

3.1.7 F4.1: Reminders

- We should be able to send notification reminders when the deadline is approaching but only to the household member to whom the task was assigned.

3.1.8 F4: Create and Assign Task

It should be possible to create and assign task to different house member, the task will have a deadline.
It will work very much like a ticketing system different users can assign task to different people, tasks will have varying level of priority and it will be possible to change the deadline of the tasks even when the deadline has passed.

3.1.9 F5: Keep Records of Completed Tasks

We should be able to keep a record of all tasks that have been completed, their due date, the assignee who completed the task and the date on which the task was completed.
not only that but during the task the comments made by different users will be recorded.

3.2 Non-functional Requirements

Non-Functional Requirements

NF1: Android Mobile Application

NF2: Language - English only

NF3: Java
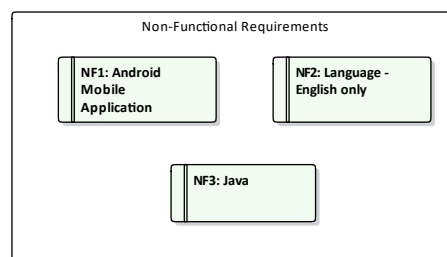
Figure 9 - Non-functional Requirements

3.2.1 NF1: Android Mobile Application

The application will have a dedicated state of art Android Application and will support all android versions upward of Android 6.0, There are no future plans to support any IOS version.

3.2.2 NF2: Language - English only

The Software will only support English Language. However the language will not be hardcoded into the software and there will be possibility to add more languages in the future.

3.2.3 NF3: Java

During a thorough discussion with our teammates we have found out that the best way to develop the software together will be using Java, as it is a technology that most of us know and can work on together.

4. Use Case Model

4.1 Actors

4.1.1 Anonymous User

A user who is logged out of the Household App and is thus not recognized as an authenticated user

4.1.2 Authenticated User

A user logged in the Household App but not a member of any Household

4.1.3 Household Leader

Household Leader is the user of the Household with maximum privileges for creating and editing tasks, managing other users' permissions, and inventory management

4.1.4 Household Member

A Household Member represents the average user of the Household who does not have admin privileges, but is able to still

create tasks and do basic stock management but is not allowed to manage permissions of other users or add other delete other users from the household

4.2 Consumption Tracking
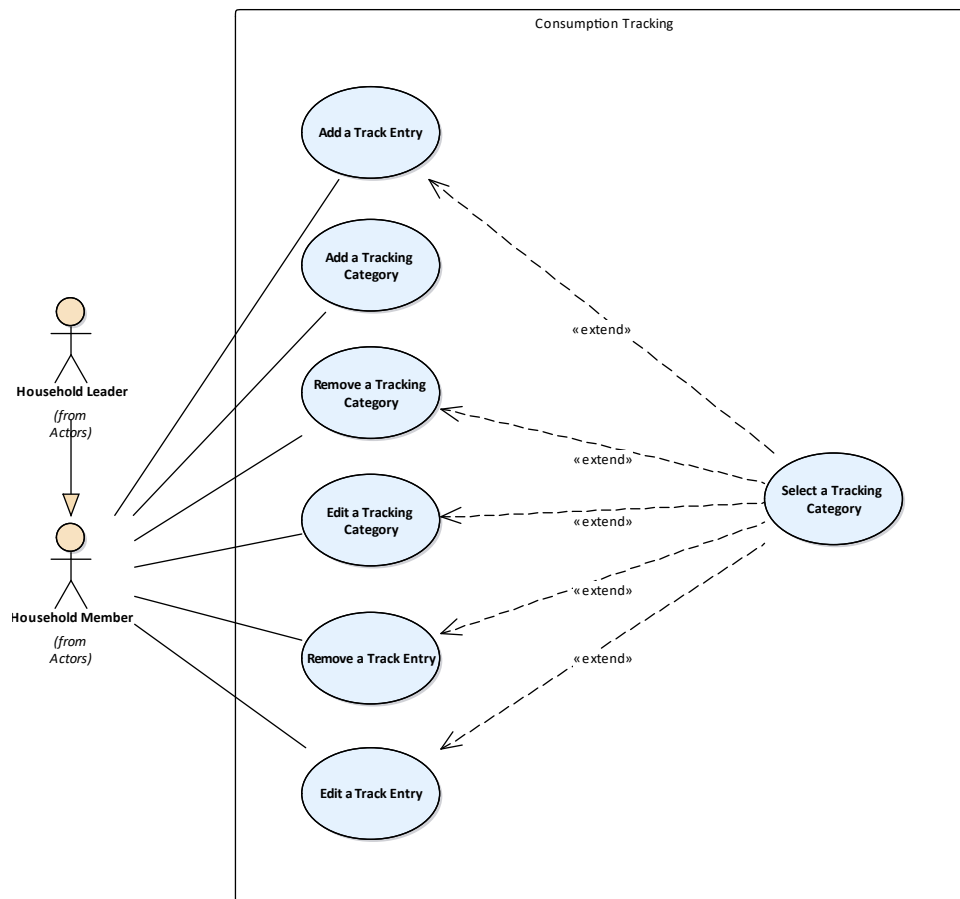
Figure 10 - Consumption Tracking

4.2.1 Add a Track Entry

Household Owner and Household Members can add a new consumption.

4.2.2 Add a Tracking Category

Household Leader and Household Members may add a Tracking Category.

4.2.3 Edit a Track Entry

Household Leader and Household Members may edit any values belong to the track entry.

4.2.4 Edit a Tracking Category

Household Leader and Household Members may edit a Tracking Category. Ex: Lets assume that when creating a new tracking category household leader or household members made a mistake by assigning different values to the category rather than the values they wanted to assign or they want to change any values belong to the tracking category, they can do that by editing the tracking category.

4.2.5 Remove a Track Entry

Household Leader or Household Members may remove a Track Entry.

4.2.6 Remove a Tracking Category

Household Leader or Household Members may remove a Tracking Category.

4.2.7 Select a Tracking Category

Household Leader and Household Members may select Tracking Category to remove,edit,add a Track Entry that belongs to the Tracking Category or to edit, remove an existing Track Category.

4.3 Home Page
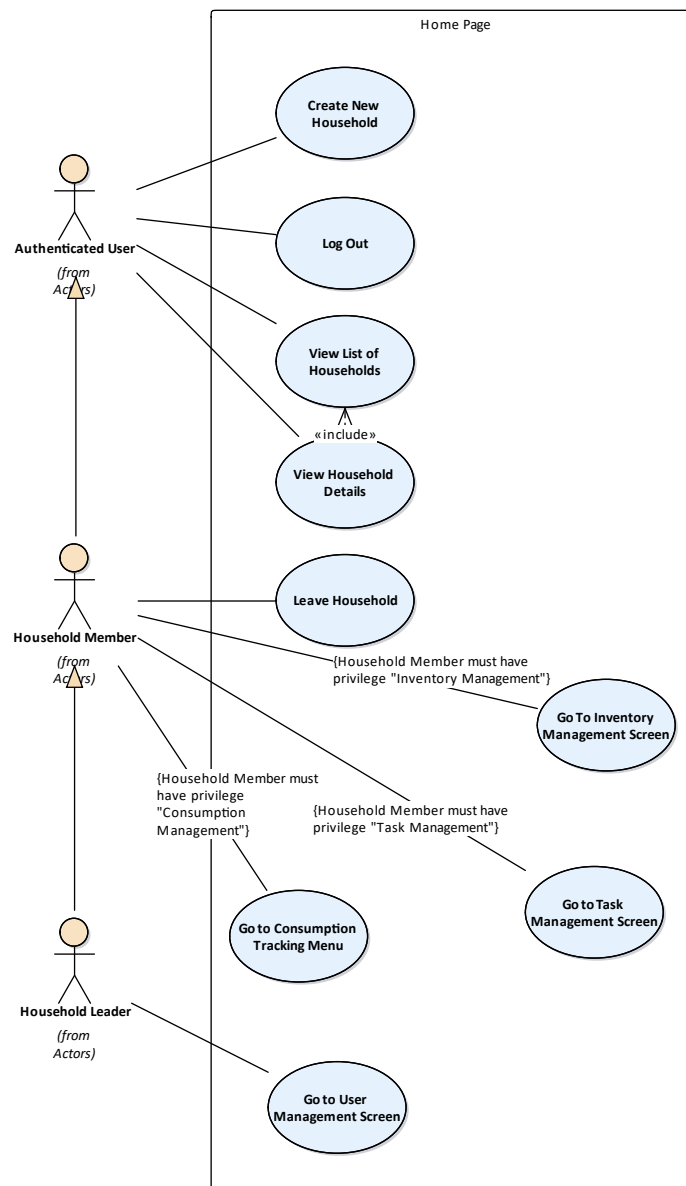
Figure 11 - Home Page

4.3.1 Create New Household

Lets users create a new household with a name and description

4.3.2 Go to Consumption Tracking Menu

Pressing the "Consumption Tracking" button takes the Household Member to the Consumption Tracking Menu

4.3.3 Go To Inventory Management Screen

Pressing the "Inventory Management" button takes the Household Member to the Inventory Management Menu

4.3.4 Go to Task Management Screen

Pressing the "Task Assignment" button takes the Household Member to the Task Assignment Menu

4.3.5 Go to User Management Screen

Pressing the "User Management" button takes the Household Leader to the User Management Menu

4.3.6 Leave Household

A Household Member may press the "Leave Household" button if they wish to leave the household they are currently a part of. A prompt will present itself "Are you sure you wish to leave this household". If the member clicks yes, then they are immediately exited from the household and all other users are notified of this

4.3.7 Log Out

The Authenticated User can log out of the Household App by pressing the "Log Out" button on the Home Page

4.3.8 View Household Details

If an authenticated user clicks on a household in the households list, then it will drop down and display details of this household. (Number of users, and description of the household)

4.3.9 View List of Households

This functionality allows an authenticated user to view a list in their general location

4.4 Login Interface
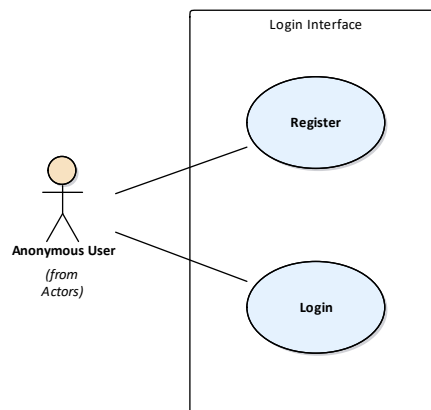
Figure 12 - Login Interface

4.4.1 Login

User may press the "Login" button to Login to the Household App

Basic Path: Basic Path

1. User Presses Login Button
2. User Types in Username and Password
3. User is Taken to Home Page

4.4.2 Register

A user registers to the Household App by writing a unique username, password of at least 8 characters, and an e-mail address

Basic Path: Basic Path

1. User Presses Register Button
2. User enters unique username
3. User enters password of at least 8 characters
4. User enters e-mail address
5. The system registers the user to the Household App as "username" and they then become a Authenticated User

4.5 Stock Management
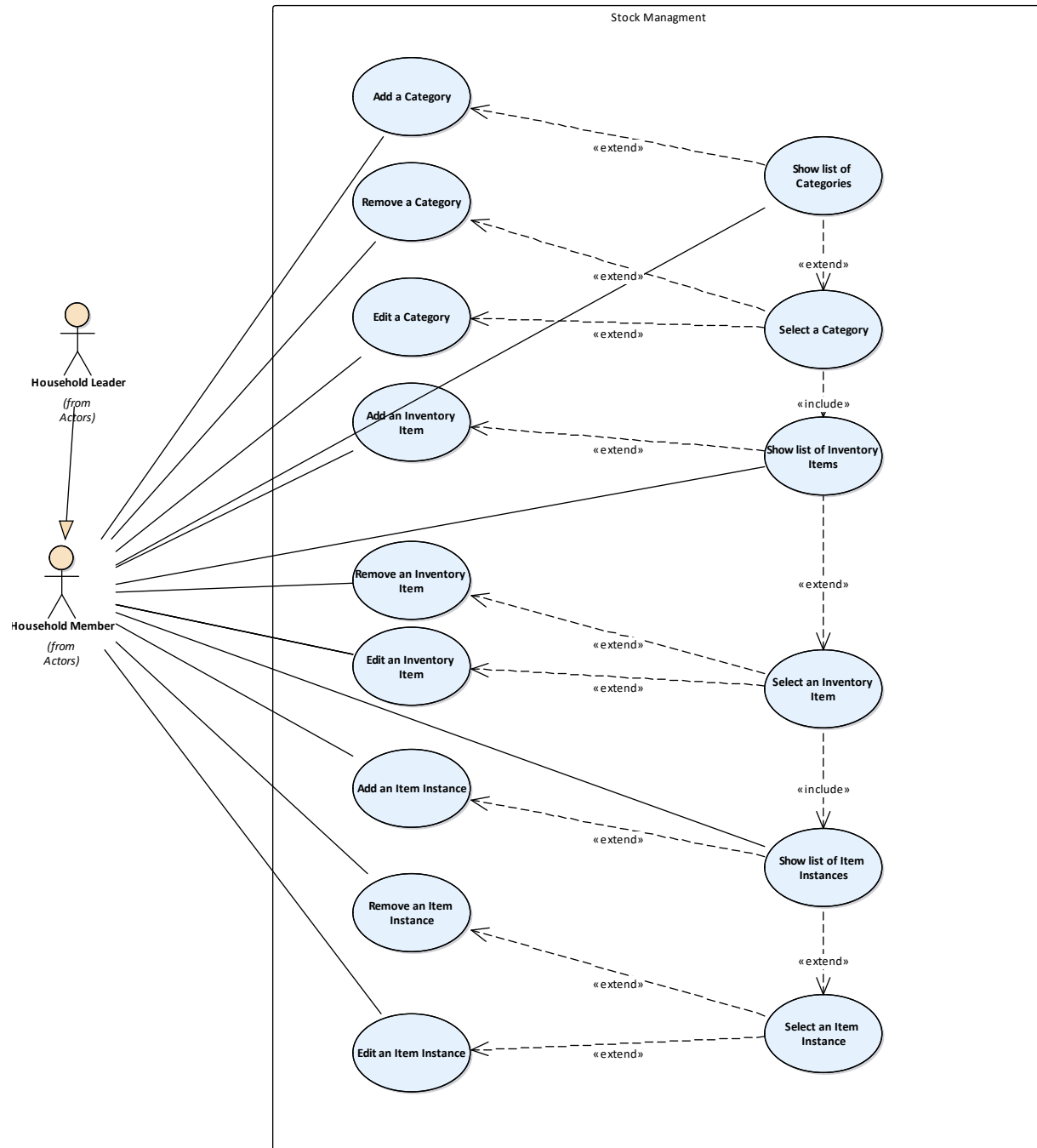
Figure 13 - Stock Management

4.5.1 Add a Category

Household Leader and Household Members can add a Category.

4.5.2 Add an Inventory Item

Household Leader and Household Members may add an Inventory Item.

4.5.3 Add an Item Instance

Household Leader and Household Members may add an Item Instance that belongs to an Inventory Item. Ex: We want to add 1 more bag of rice to the Inventory Item called Rice.

4.5.4 Edit a Category

Household Leader and Household Members can edit any values that belongs to Category.

4.5.5 Edit an Inventory Item

Household Leader and Household Members can change any values that belongs to an Inventory Item.

4.5.6 Edit an Item Instance

Household Leader and Household Members may edit an Item Instance that belongs to an Inventory Item. Ex: We want to change amount of rice in a bag of rice that belongs to the Inventory Item called Rice.

4.5.7 Remove a Category

Household Leader and Household Members may remove a Category.

4.5.8 Remove an Inventory Item

Household Leader and Household Members may remove an Inventory Item.

4.5.9 Remove an Item Instance

Household Leader and Household Members may remove an Item Instance that belongs to an Inventory Item. Ex: We want to remove 1 bag of rice from the Inventory Item called Rice.

4.5.10   Select a Category

Household Leader and Household Members can Select a Category to remove a category or edit a category.

4.5.11   Select an Inventory Item

Household Leader and Household Members can select an Inventory Item to remove or edit an already existing Inventory Item.

4.5.12   Select an Item Instance

Household Leader and Household Members can select an Item Instance to remove or edit an Item Instance.

4.5.13   Show list of Categories

Household Leader and Household Members can view the list of Categories then can add a new category or select an already existing category.

4.5.14   Show list of Inventory Items

Household Leader and Household Members may view the list of Inventory Items and can add a new Inventory Item.

4.5.15   Show list of Item Instances

Household Leader and Household Members can view the list of Item Instances that belong to already existing Inventory Item and can also add a new Item Instance.

4.6 Task Assignment
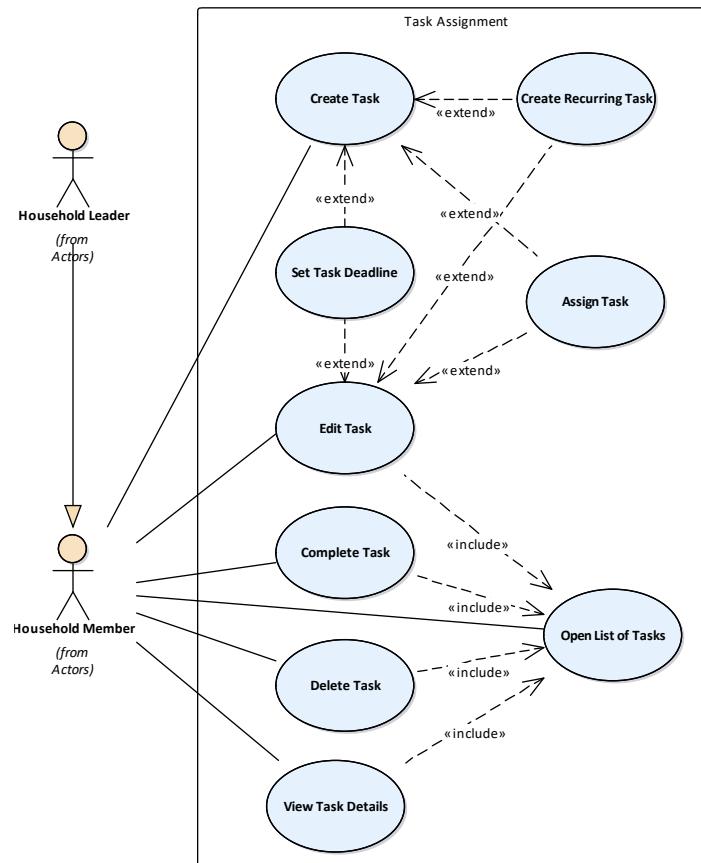
Figure 14 - Task Assignment

4.6.1 Assign Task

A Household Member may assign a task to a certain other Household Member from the same Household(It can be themselves)

4.6.2 Complete Task

After a Household Member feels the condition described by the Task name and description is satisfied they may click on the tick button after opening the list of the tasks. This will remove the task from the list of tasks and mark it as completed

4.6.3 Create Recurring Task

This functionality allows a Household Memberto create a task that duplicates itself according a timeframe described by the Household Member creating the task.

When creating a task there is a checkbox option "Recurring Task?". If a Household Member presses this checkbox, then another field opens up which allows the user to set a time period (daily, weekly, biweekly, monthly etc.) that this task needs to be done.

4.6.4 Create Task

A Household Member may Create a task, name it and describe it.

Basic Path: Basic Path

1. Household Member presses "Create Task" button while in the Task Assignment menu
2. A new menu presents itself where Household Member enters a Task Name, and Task Description
3. Household Member then presses the OK button and a new task is added to the list of tasks

4.6.5 Delete Task

A Household Member may delete a task if it is no longer relevant to the household. This is different from "Complete Task" which would remove the Task from the Active Tasks list but leave it the Task History list

Basic Path: Basic Path

1. A Household Member opens the list of tasks
2. A Household Member presses the trash can symbol next to a task of their choosing
3. The system provides a prompt "Are you sure you wish to delete <task_name>?" with buttons "Yes" and "No"
4. The user presses "Yes"
5. The task is marked as deleted and removed from the task list

Alternate: User presses "No"

1. The Household Member presses "No"
2. The task remains in the list of tasks and user is taken back to the list of tasks

4.6.6 Edit Task

A Household Member may press the edit an already existing task and modify its name, description or other attributes by opening a list of tasks and then selecting "Edit Task" on the task they wish to edit. This will take them to a menu similar to the one when they select "Create Task"

4.6.7 Open List of Tasks

A Household Member needs to open the list of tasks before they may edit, delete, or change the status of a task.

The list of tasks provides a Household Member with all the active tasks in the Household

Basic Path: Basic Path

1. A Household Member, when they are in the Task Assignment menu, presses the "List of Tasks" button
2. A list of active (created and not completed) tasks is displayed on the screen with their name, and deadline or recurrence period (if they have any)

4.6.8 Set Task Deadline

A Household Member may set a deadline for a certain task in the format DD/MM/YYYY HH:MM

4.6.9 View Task Details

A Household Member views details of a task by first opening the list of tasks and than pressing on the task they wish to see. A area of text opens up with the name and details of the task, as well as deadline and/or recurrence period of the task displayed below the desciption
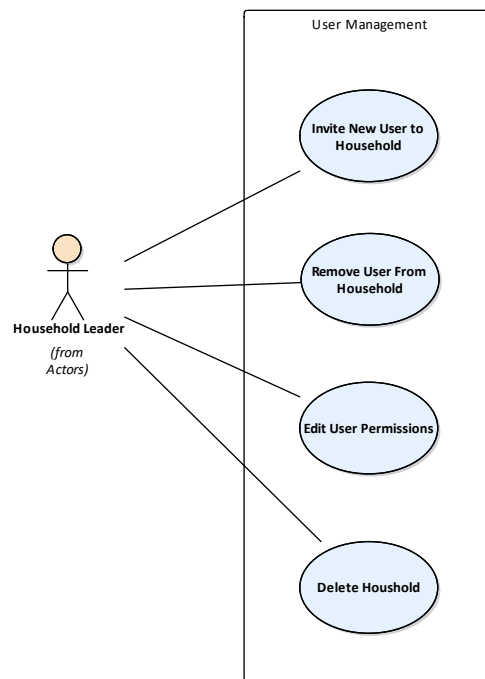
4.7 User Management

Figure 15 - User Management

4.7.1 Delete Houshold

A Household Leader may delete the household they are the leader of by selecting the "Delete Household" button in the Household Management menu. This will prompt the user if they are sure about this selection, and, if affirmed, the Household will be scheduled for deletion in 7 days from when the "Delete Household" button was pressed and all other household members will be notified of this action

4.7.2 Edit User Permissions

This allows the Household Leader to add or revoke privileges from a certain user. This could involve giving them admin rights, or the possibility to view specific items, or edit specific kinds of tasks

Basic Path: Basic Path

1. Household Leader selects "Edit User Permissions" button next a Household Member's name from the list in the User Management menu
2. A menu presents itself with checkboxes for "Task Assignment", "Inventory Management", "Consumption Tracking"
3. The Household Leader selects and deselects which privileges they want this user to have
4. The Household Leader presses "Confirm changes" button
5. The menu closes and the relevant user is notified of their new permissions

4.7.3 Invite New User to Household

This functionality allows an Household Leader to invite a new User to the Household

Basic Path: Basic Path

1. Household Leader presses "Invite New User to Household Button"
2. Menu presents itself with an input field for an e-mail address
3. Household Leader types in email address of user they wish to invite
4. Menu closes and an email is sent on this address with a link to join the Household Leader's household

Alternate: E-mail address already associated with user

1. There is a message "E-mail address is associated with existing user. Send invite directly to user instead?" with buttons YES or NO
2. Household Leader presses button YES
3. Invite is sent directly to user through the application itself

Exception: Wrong

4.7.4 Remove User From Household

This functionality allows the Household Leader to remove a currently existing User from the Household

Basic Path: Basic Path

1. Household Leader selects "Remove Member" button next a Household Member's name from the list in the User Management menu
2. The Household Member is removed from the list of Household members and the relevant user is notified of this action

5. Domain Model

Domain model of the Household project.

Figure 16 - Domain Model

5.1 Category

Some category of the inventory items. Can have a hierarchy of categories.

Attribute title	Description
name	

5.2 HOUSEHOLD

Household, for which all the tracking and management is done.

Attribute title	Description
Address	
Name	
Picture	

5.3 Inventory Item

Some item that user keeps track of in the inventory. Represents a group of same items. For example, rice.

Attribute title	Description
Description	
Picture	
Title	

5.4 Item_Instance

Represents a single piece of Inventory Item entity. For example, 1 bag of rice.

Attribute title	Description
Bought	
Expiration date	
percent left	
quantity type	

5.4.1 StateMachine
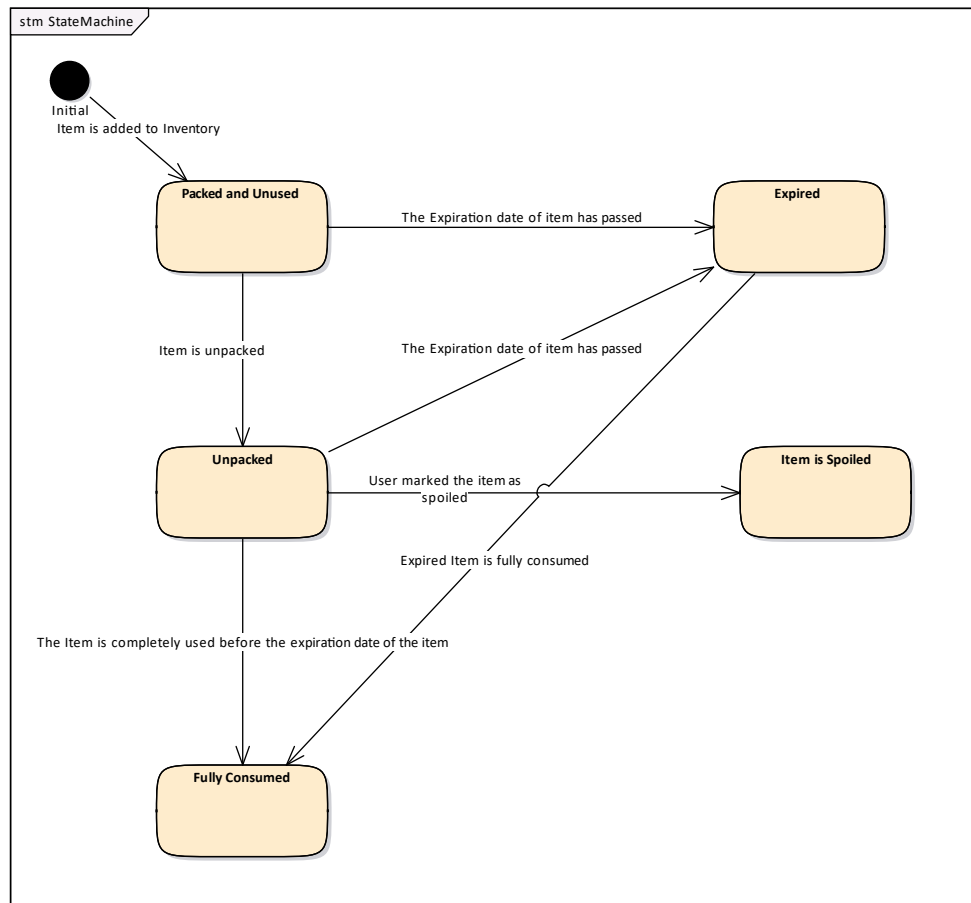
Items instance state diagram.

Figure 17 - StateMachine

5.4.1.1   Item is Spoiled

Any new instance of item from the inventory that is bought is first packed and in unused condition.

When any user of the household uses the item for the first time the state of that particular instance of the item is changed to Unpacked and Partially consumed.

If during any of the previous two stages the item's expiration date arrives then the states moves to expired.

If any of the item is stored inadequately by the carelessness of the user then the state moves to spoiled and it is one of the final state, nothing more is possible.

From the Unpacked state if the item is fully consumed the item moves onto another final state which is Fully Consumed.

5.5 Location

A location in the household, in which some inventory items can be stored. Can have a hierarchy of locations.

Attribute title	Description
name	

5.6 Member

Type of the membership of user in the household. Could be Leader, Member, Audience Member.

Attribute title	Description
Membership type	

5.7 Stock Tag

A tag that can be assigned to an inventory item. Has a name and a color as attributes.

Attribute title	Description
Colour	
Name	

5.8 Task

Tasks can be though of similar to tickets in a ticketing system.
Each HouseHold Member can create and assign task to other members in the Household.
The task have Deadline, Priority and Type attributes which help define the task type.

Attribute title	Description
Deadline	
Description	
Priority	
State	
Title	
Type	

5.8.1 State Model for Tasks
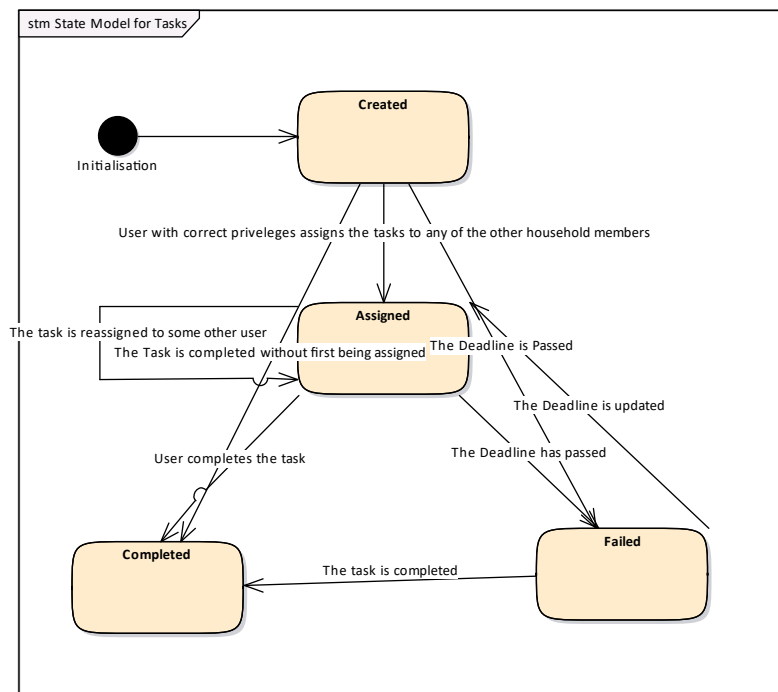
State diagram for Task.

Figure 18 - State Model for Tasks

Whenever a new task is added by the user with correct access level the task is considered created and then waits to be assigned to a user.

As the task is assigned to a user there are two possible scenarios either the task can be completed before deadline or the deadline passes and the task is failed.
However there is another possibility that is to reassign the task to some other user

if the deadline passes then the task is considered failed, the user may change the deadline to some other date in the future and the state of tasks moves back to Assigned.

5.9 Task Action

An action associated with the task, for example task assigned, task deadline changed, task finished and so on. Contains a textual description of the task in the attribute.

Attribute title	Description
Date Time	
Description	
performed by	

5.10   Tracking Category

Category of consumption tracking. Possible categories are electricity, gas, water etc.

Attribute title	Description
Category	

Attribute title	Description
Start Date	
Time Period	

5.10.1 StateMachine

State diagram for Tracking Category.
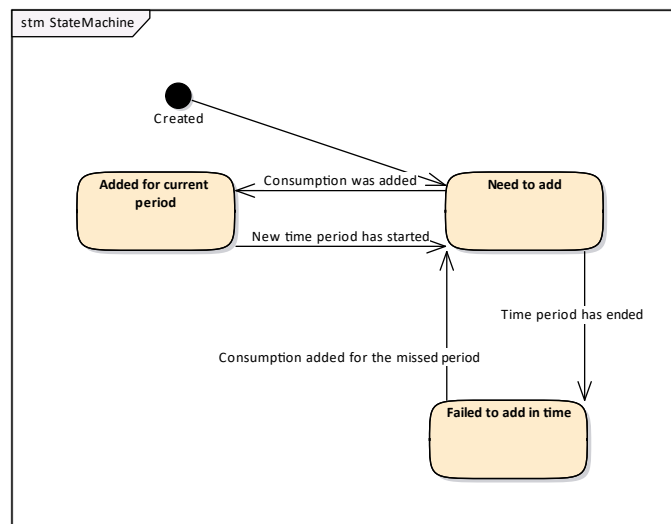

Figure 19 - StateMachine

5.11 Tracking Entry

Single entry of consumption for some period of time.

Attribute title	Description
Bill	
Consumption	
Entry Date	

5.12 User

Any user registered in the app.

Attribute title	Description
Age	
Email	
Full Name	
Password	