Design Document for the What's In My Kitchen mobile application

Alexandria Ogden | Jenna Lisicky | Mitchell Griest

Change History

Version	Summary	Author	Date
0.1	Initial Write-up	J. Lisicky , A. Ogden, M. Griest	02/16/2016
0.2.0	Changes based on Fault Form from ID 21	J. Lisicky , A. Ogden, M. Griest	02/25/2016
0.2.1	Changes based on Fault Form from ID 26	J. Lisicky , A. Ogden, M. Griest	02/25/2016
0.2.2	Changes based on Fault Form from ID 28	J. Lisicky , A. Ogden, M. Griest	02/25/2016
0.3.0	Changes by the WIMK team after reviewing Fault Forms	J. Lisicky , A. Ogden, M. Griest	03/01/2016
0.3.1	Alphabetized Glossary of terms	J. Lisicky , A. Ogden, M. Griest	03/01/2016
0.3.2	Changed page numbers to adhere to changes.	J. Lisicky , A. Ogden, M. Griest	03/01/2016
0.3.3	Added Figure 2V - Top of Visual Inventory Screen	J. Lisicky , A. Ogden, M. Griest	03/01/2016
0.4.0	Added Update Item Quantity Activity Diagram	J. Lisicky , A. Ogden, M. Griest	03/04/2016
0.5.0	Updated Table of Contents	M. Griest	03/25/2016
0.5.1	Added Detailed Class Diagram and some Detailed Sequence Diagrams	M. Griest	3/25/2016
0.5.2	Removed borders from use case diagrams	M. Griest	3/25/2016
0.5.3	Decreased size of screenshot mockups	M. Griest	3/25/2016
0.5.4	Added description for main use case diagram	M. Griest	3/28/2016
0.5.5	Fixed inconsistent names in main use case diagram	M. Griest	3/28/2016
0.5.6	Replaced class diagrams with most recent version of (detailed) Main Class Diagram	M. Griest	3/28/2016
0.5.7	Added description for Delete Item sequence diagram	M. Griest	3/29/2016
0.5.8	Added description for Update Item Properties sequence diagram	M. Griest	3/29/2016
0.5.9	Added description for Change Sorting Rule activity diagram	M. Griest	3/29/2016
0.5.10	Updated Add Item Functional Requirement Description	A. Ogden	3/29/2016

0.5.11	Updated Add Item activity diagram	M. Griest, J. Lisicky	3/29/2016
0.5.12	Updated Search for Item by Name activity diagram	M. Griest	3/29/2016
0.5.13	Updated Search Functional Requirement Description	A. Ogden	3/29/2016
0.5.14	Updated Update Item Quantity activity diagram	M. Griest, J. Lisicky	3/29/2016
0.5.15	Added Description for Add Item activity diagram	J. Lisicky	3/29/2016
0.5.16	Added Description for Delete activity diagram	J. Lisicky	3/29/2016
0.5.17	Added Description for Update Item Quantity activity diagram	J. Lisicky	3/29/2016
0.5.18	Added Description for Update Item Properties activity diagram	J. Lisicky	3/29/2016
0.5.19	Added Description for Search For Item By Name activity diagram	J. Lisicky	3/29/2016
0.5.20	Added Description for Change Sorting Rule sequence diagram	J. Lisicky	3/29/2016
0.5.21	Updated description for the Update Item Properties functional requirement	A. Ogden	3/29/2016
0.5.22	Updated description for the Add Item functional requirement	A. Ogden	3/29/2016
0.5.23	Updated description for the Update Item Quantity functional requirement	A. Ogden	3/29/2016
0.5.24	Added View Item functional requirement	A. Ogden	3/29/2016
0.5.25	Added Description for Update Item Quantity sequence diagram	J. Lisicky	3/29/2016
0.5.26	Added Description for Search For Item By Name sequence diagram	J. Lisicky	3/29/2016
0.5.27	Added Add Item sequence diagram	J. Lisicky	3/29/2016
0.5.28	Added Description for Add Item sequence diagram	J. Lisicky	3/29/2016
0.5.29	Edited Motivation/Purpose to reflect design elements added	J. Lisicky	3/29/2016
0.5.30	Updated Delete activity diagram	J. Lisicky	3/29/2016
0.5.31	Updated Delete sequence diagram and description	J. Lisicky	3/29/2016
0.5.32	Added priorities for functional requirements	J. Lisicky	3/30/2016
0.6.0	Extensive reworking of diagrams	J. Lisicky , A. Ogden, M. Griest	3/30/32016
0.6.1	Added methods to detailed class diagrams	J. Lisicky , A. Ogden, M. Griest	3/31/2016
0.6.2	Removed List Inventory	J. Lisicky , A. Ogden, M. Griest	3/31/2016
0.6.3	Updated descriptions for Update Item Properties, Change Icon, and	J. Lisicky , A.	3/31/2016

	Update Item Quantity functional requirements	Ogden, M. Griest	
0.7.0	Began final proofreading and added website information to introduction	M. Griest	4/1/2016
0.7.1	Proofread through Update Item Quantity functional requirement	M. Griest	4/1/2016
0.7.2	Extensive grammatical corrections throughout document	M. Griest	4/1/2016
0.7.3	Proofread Document	J. Lisicky	4/4/2016
0.7.4	Updated screenshot for top of Visual Inventory Screen	M. Griest	4/4/2016
0.7.5	Improved Delete Item activity diagram and Update Item Properties Sequence Diagram	M. Griest, J. Lisicky	4/4/2016
0.7.6	Added "Changes Since Initial Requirements" section	M. Griest, J. Lisicky, A. Ogden	4/42016

Table of Contents

Introduction

Motivation/Purpose

The purpose of this document is to outline the requirements and design for the What's in My Kitchen? mobile application (hereafter referred to as "WIMK"). This document includes a glossary of relevant terms, outlines of functional and nonfunctional requirements, and UML documentation of specific use cases, activity diagrams, sequence diagrams and the classes that will be used in the application's implementation.

Scope

WIMK will address the daily needs of its users and serve as a means of saving time and money while grocery shopping. WIMK will embrace smart phone technology on the Android platform to provide users with an application to aid in home inventory. The scope of WIMK is broad because it has the potential to be used daily by millions of grocery-buying individuals.

Goals

The main goal of WIMK is to provide a convenient interface, through which users can make informed decisions while grocery shopping as well as save time on unnecessary trips. Our goal is for the user to know what they have in their kitchen without having to go home and check. This application will focus on ease of use and the potential to save its users money.

Website

Information regarding the WIMK application can also be found online at http://mdgriest.github.io/WIMKsite/

Changes Since Initial Requirements

Since producing the Initial Requirements Document, we have decided to remove the List Inventory feature and focus on the Visual Inventory feature, which better represents the application's core focus on ease of use and visual interfacing without need for much text. Also, updating an item's quantity has been grouped in with updating the rest of an item's properties. Adding an item is now a special case of updating an item, in which a "null" item is immediately added to inventory and then updated as usual. We have also added a View Item Screen, which is displayed when the user clicks on an item on the Visual Inventory Screen.

Glossary of Terms

Chord

A partial circle, cut off to have a flat top at any point between the bottom-most and topmost part of the original circle. Chords in the WIMK application will always have a horizontal top. The height of the chord will be adjusted to show the quantity of an item (see *Figure 1C*)

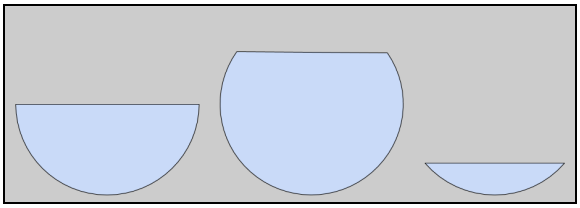


Figure 1C: Three examples of chords, filled to different amounts

Icon

The image chosen by a user to correspond with an item. An icon will always be enclosed by a circle

Inventory

All items that have been added by a user (excludes items that have been deleted by the user)

Item

Represents a specific food, such as apples, or a category of food, such as fruit (what a particular item represents is determined by the user, either when the item is added or as a result of updating the item's properties)

Visual Inventory

Continuously scrollable visual representation of the user's inventory, represented by the icons associated with each item in that inventory

WIMK

An acronym for "What's in My Kitchen"

Project Description

List of Features

- Users can add items to their inventory and give each item a color, name, quantity and icon
- Users can edit each item's color, name, quantity and icon as they see fit
    - The name of an item will be typed in by a user
    - The icon will be chosen by the user from a list of available icons
    - The color will be chosen by the user from a color wheel containing a fixed number of color options
    - The quantity can be adjusted by dragging the chord across an icon to an appropriate level
- Users can permanently delete items they no longer want in their inventory
- Users can access their inventory via the Visual Inventory feature
- Users can change the sorting priority for items in their inventory
    - Sorting options are:
        - Alphabetically, A-Z
        - Alphabetically, Z-A
        - Quantity, Low-High
        - Quantity, High-Low
    - These options options are available in the Settings Menu
- Users can also see an 'About the Application' page, a tutorial page, and an icon credits page, which are all accessible by clicking the "Settings" button on the Main Menu Screen
- Users can search for an item by name. All item names containing the input will be displayed. The user can select one of these items, which will bring up that items respective View Item screen; or the user can edit their search

Functional Requirements

Main Menu (Required)

1. When launched, WIMK will display the Main Menu Screen
2. The Main Menu Screen will consist of the WIMK title art, a Settings button, and a Visual Inventory button

Visual Inventory (Required)

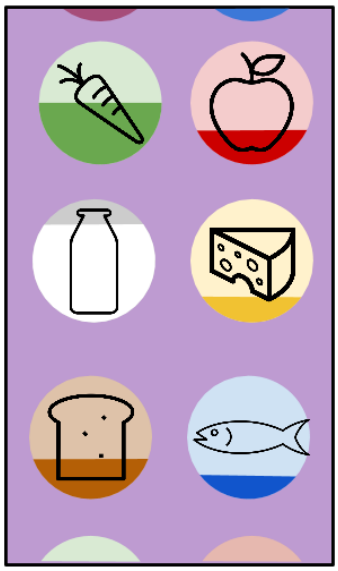


Figure 1V - Visual Inventory (Note: this example is not sorted)

1. Visual Inventory will consist of a single-color (flat) background, on top of which items appear as pictured in *Figure 1V*
2. Visual Inventory will be represented as a single, continuously scrollable list of all items in inventory, as pictured in *Figure 1V*
    a. Items will be listed in order according to the sorting rule currently selected in settings
3. When a user clicks on an item in Visual Inventory, they will be taken to the View Item screen for the selected item
4. There is an 'Add Item' button, 'Search' button and 'Back' button at the top of the Visual Inventory Screen, as pictured in *Figure 2V*.

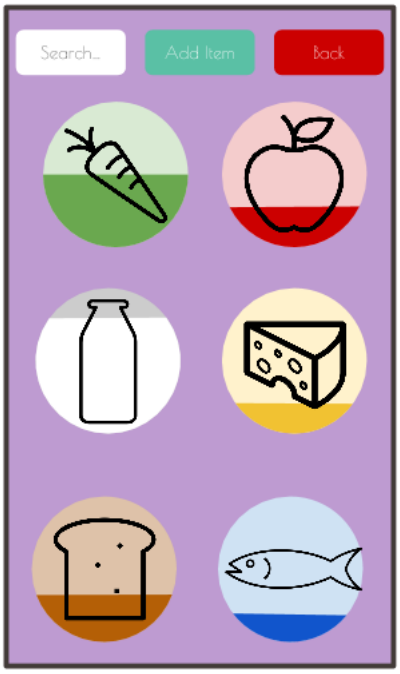


Figure 2V - Top of the Visual Inventory Screen

Add Item (Required)

1. The user can add an item to their inventory by clicking 'Add Item' at the top of the Visual Inventory Screen
2. Clicking this button adds an item to the user's inventory with default name, color, icon, and quantity values and launches the Update Item Properties screen for the new item (see "Update Item" below)

View Item (Required)

1. The user can view an item by clicking on the item icon on the Visual Inventory Screen
2. From the View Item Screen the user can click on the 'Edit' button, the 'Delete' button or the 'Back' button
    a. If the user clicks on 'Edit', they will be directed to the Update Item Properties Screen
    b. For information regarding what happens if the user selects 'Delete,' see "Delete Item" below
    c. If the user clicks 'Back,' he or she will be returned to the Visual Inventory Screen

Update Item Quantity (Required)

1. The user can adjust the item's quantity by clicking on the item's icon in the center of the Update Item Properties screen and then dragging the chord on the resulting Update Item Quantity screen
2. To cancel changes to the item quantity, the user can click on the red 'Cancel' button at the bottom of the Update Item Quantity Screen
3. To save changes to the item quantity, the user can click on the green 'Save' button at the top of the Update Item Quantity Screen
4. When the user clicks 'Save' or 'Cancel,' they will be returned to the Update Item Properties Screen

Delete Item (Required)

1. A user can delete an item by clicking 'Delete' on the View Item Screen
    a. When the user clicks 'Delete,' an alert will pop up asking the user to confirm that he or she wishes to permanently delete the item
    b. If the user selects 'No,' the alert is dismissed and the user is returned to the View Item Screen

c. If the user selects 'Yes,' the item is permanently deleted from Inventory and the user is returned to the Visual Inventory Screen

Update Item Properties (Required)

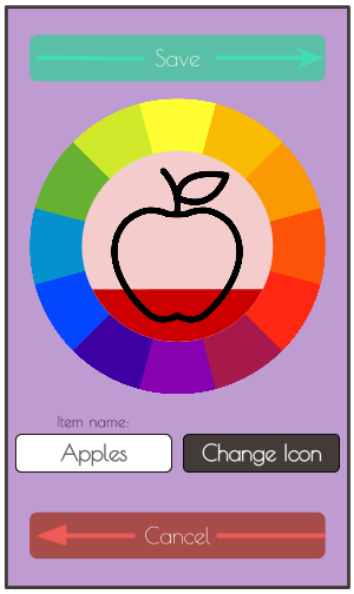


Figure 1P - Update Item Properties Screen

1. The user may access the Update Item Properties Screen (*Figure 1P)* via any of the methods below :
    a. By clicking 'Edit' on the View Item Screen
    b. By clicking 'Add Item' on the Visual Inventory Screen
2. As seen in *Figure 1P*, the user may input the item name in the text box provided (up to 15 characters)
3. The user may select a new color for the item by clicking on a wedge of the color wheel
4. The user may select an icon to represent their new item by clicking 'Change Icon.' Once the change icon button is pressed, the user is directed to the Change Icon Screen to select a new icon
5. The user can update the quantity for the item by clicking on the item's icon in the center of the screen. This launches the Update Item Quantity Screen (see "Update Item Quantity," above)
6. To cancel changes to the item properties, the user can click on the red 'Cancel' button at the bottom of the Update Item Properties Screen
7. To save changes to the item properties, the user can click on the green 'Save' button at the top of the Update Item Properties Screen
8. When the user clicks 'Save' or 'Cancel' they will be returned to the View Item Screen for the item they were editing

Update Item Icon (Required)

1. When the user clicks 'Change Icon' on the Update Item Properties Screen, they will be taken to the Change Icon Screen
2. The Change Icon Screen consists of a vertical list of thumbnails of all icons from which the user may choose
3. When the user clicks on an icon, it becomes the (only) selected icon
4. If the user clicks 'Save,' the item's iconID is overwritten with the iconID corresponding to the selected icon
5. If the user clicks 'Cancel' no changes are made to the item

6. The 'Save' and 'Cancel' buttons will remain fixed at the top of the page while the user scrolls vertically through the list of icons

Settings (Required)

1. Clicking on the Settings button on the Main Menu Screen will take the user to the Settings Screen
2. Clicking 'Change Sorting Rule' from the Settings Screen launches the Change Sorting Rule Screen
    a. The Change Sorting Rule Screen consists of a 'Save' button and a group of radio buttons, one for each available sorting rule. For a list of these rules, see above
    b. While on the Change Sorting Rule Screen, an integer named tempSortingRule stores the currently selected sorting rule. When the user clicks 'Save,' if the sorting rule has changed, it is updated and the inventory is re-sorted according to the new rule
    c. Upon clicking 'Save,' the user is returned to the Settings Screen
3. The Settings Screen contains an 'About' button. When clicked, an accordion-style drop-down reveals information about the release version of the application and the development team
4. The Settings Screen contains an 'Icon Credits' button. When clicked, an accordion-style drop-down reveals the names of the artists who created each of the icons included for use in the WIMK mobile application, as well as credit to The Noun Project in general
5. The Settings screen contains a 'Tutorial' button. When clicked, information about how to use the application will be displayed.
6. A user may return to the Main Menu by clicking the 'Back' button on the Settings Screen. Likewise, a user may return to the Settings Screen by clicking the 'Back' button on the About, Tutorial and Icon Credits screens or by clicking 'Save' on the Change Sorting Rule Screen.

Search for Item by Name (Possible)

1. The user can search for an item by name by clicking 'Search' at the top of the Visual Inventory Screen
    a. Clicking 'Search' launches the keyboard and search bar, and enables the user to enter his or her query into the search bar
2. When the user presses ENTER on the keyboard, signifying that he or she has finished typing the query, the keyboard is hidden and the search commences with the following behavior:
    a. Traverse each item in itemList
    b. If the item's name contains the query, set shouldShow to TRUE for that item
    c. Otherwise, set the item's shouldShow flag to FALSE
3. The Visual Inventory screen is then refreshed to show only those items for which shouldShow is set to TRUE
4. The user can click on an item shown to bring up that item's View Item Screen
5. The user can edit their search if they do not see what they are looking for
6. When the user is done, they can exit out of search by clicking the back button on their android device. This refreshes the Visual Inventory Screen to once more show all items in inventory, regardless of the status of their shouldShow flag

Nonfunctional Requirements

Platform

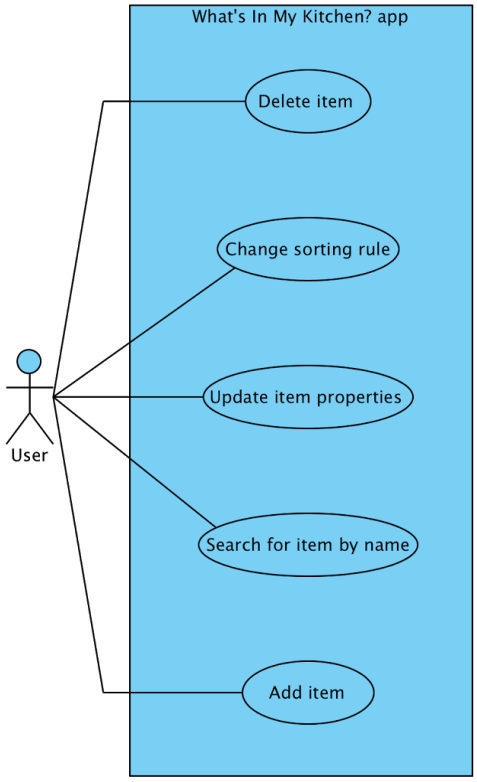
The WIMK mobile application will run on all devices running Android 4.0 (Ice Cream Sandwich) or later

Internal Representation of Inventory

The user's inventory will be stored as a Java ArrayList of Items
There is no pre-set limit on the number of items a user can store in their inventory

Diagrams

Main Use Case

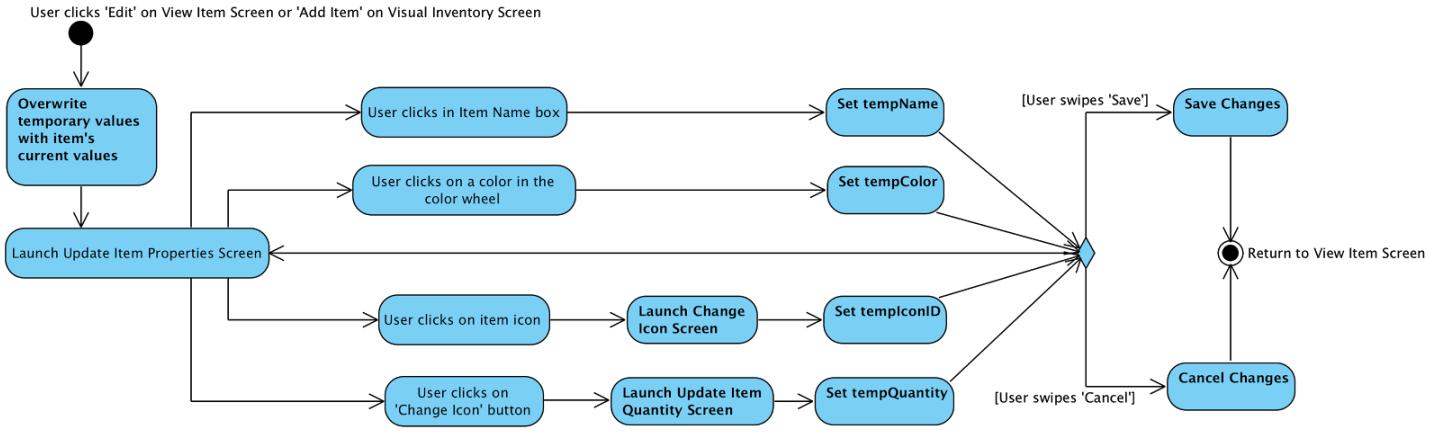


The use case diagram above demonstrates the idea that WIMK is intended to be used by a single person (namely the owner of the device on which the application is installed). This eliminates the need for an account, username, password, etc. and means that the WIMK team will not require any personal data from its users. The basic actions a user can take in the WIMK app can be broken into three main categories: setting and modifying application parameters, altering the contents of his or her inventory, and querying his or her inventory. These use cases are listed under their respective category below:

- Modification of application parameters:
  - Change sorting rule
- Modification of inventory contents:
  - Add item
  - Delete item
  - Update item properties
- Querying inventory:
  - Search for item by name

Activity Diagrams

Update Item Properties



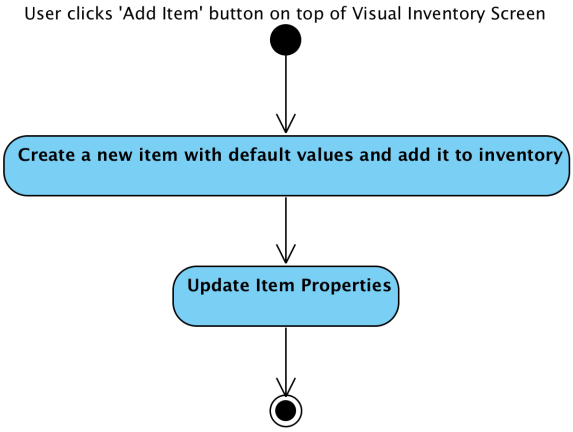
The Update Item Properties screen is accessible by clicking 'Edit' on an item's View Item Screen or the 'Add Item' button on the Visual Inventory Screen. When the Update Item Properties Screen is launched, the variables tempName, tempColor, tempIconID, and tempQuantity take on the corresponding values for the item that is being updated.

- To change an item's icon, the user will click on the 'Change Icon' button, which will launch the Change Icon screen. For more information on the process of changing an item's icon, see the functional requirement for "Change Icon" above
- To change an item's color, the user can click a color from the color wheel
- To change an item's quantity, the user must click on the icon representing the item, which will launch the Update Item Quantity screen. On this screen, the user can slide the chord to the desired quantity and choose to save or cancel their changes
- To change an item's name, the user must click on the item's current name, then enter the item's new name using the keyboard

The user can change the item's properties in any order. During the time that the Update Item Properties Screen is active, all changes the user makes affect the only temporary variables (tempName, tempColor, tempIconID, and tempQuantity). Only if the user swipes 'Save' are the item's attributes overwritten with these temporary variables.

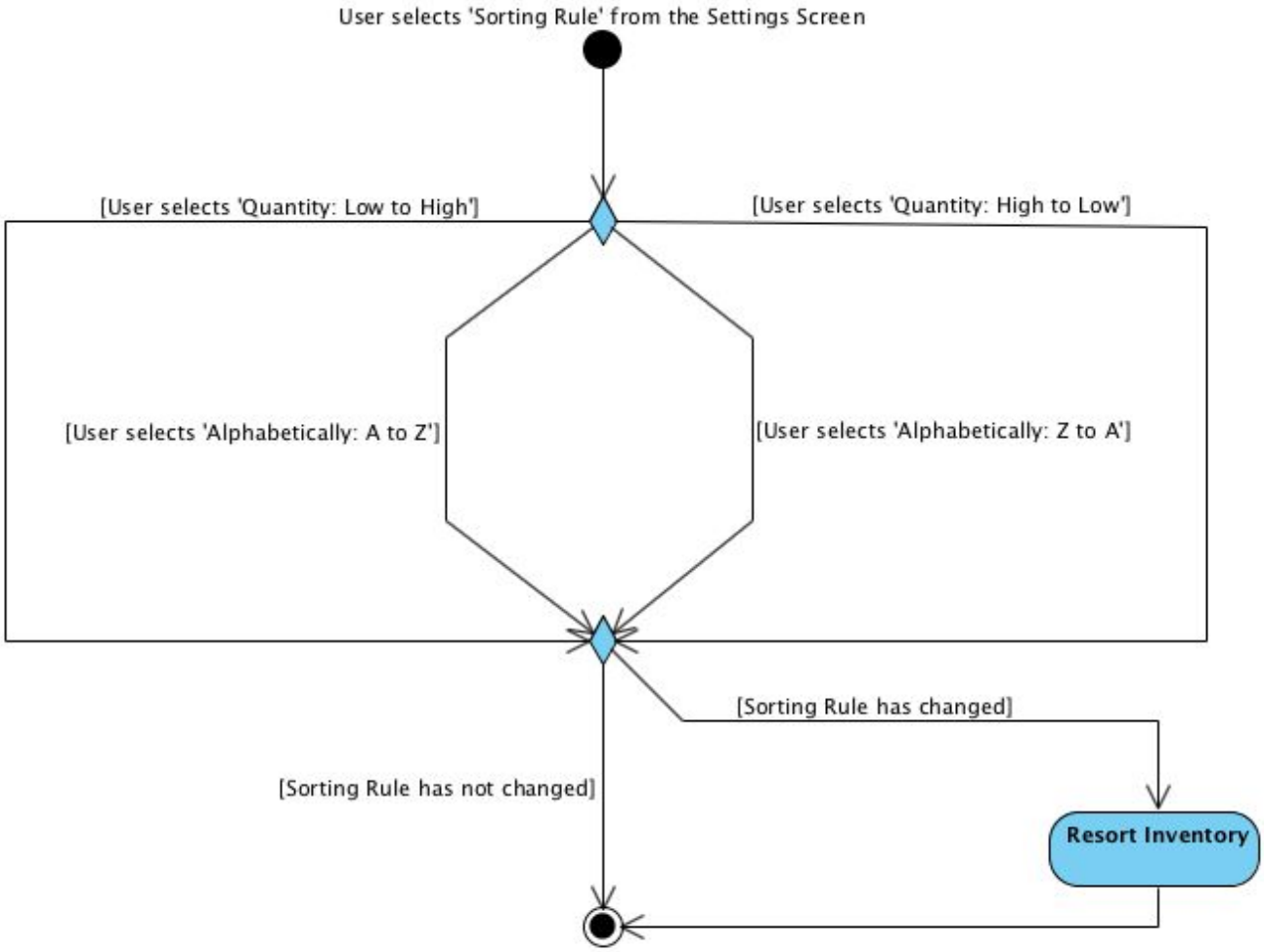
Swiping 'Save' or 'Cancel' returns the user to the View Item Screen.

Add Item



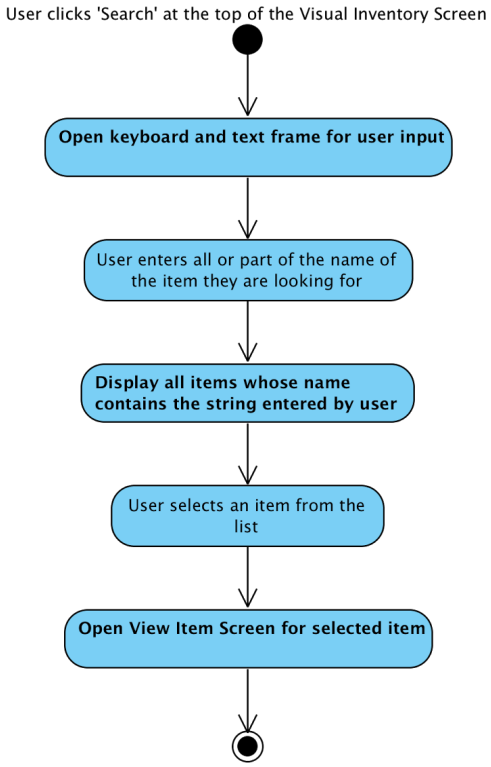
When a user clicks the 'Add Item' button from the Visual Inventory Screen, a new item with default values for name, color, icon and quantity is added to inventory and the Update Item Properties screen is launched for that item.

Change Sorting Rule



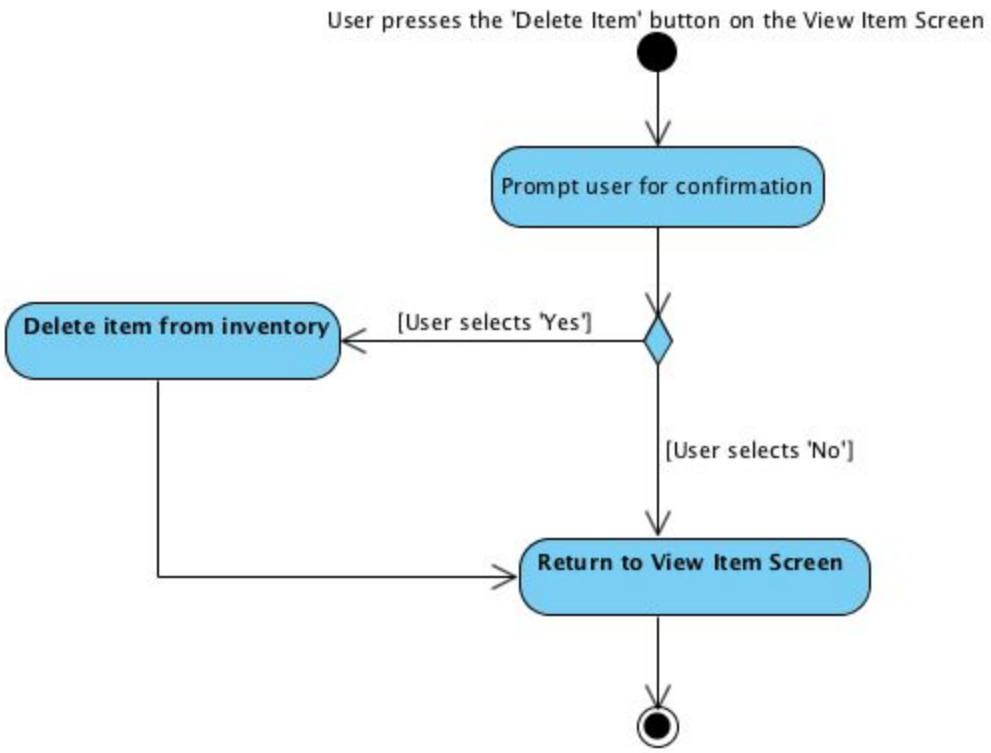
On the Change Sorting Rule screen, the user can select one of the radio buttons representing the available sorting rules (listed above). When the user leaves the Change Sorting Rule screen, if the selected sorting rule differs from the current sorting rule, the current sorting rule is updated and the inventory is re-sorted according to the new rule. If the user's selection matches the rule already in place, the inventory need not be re-sorted.

Search for Item by Name



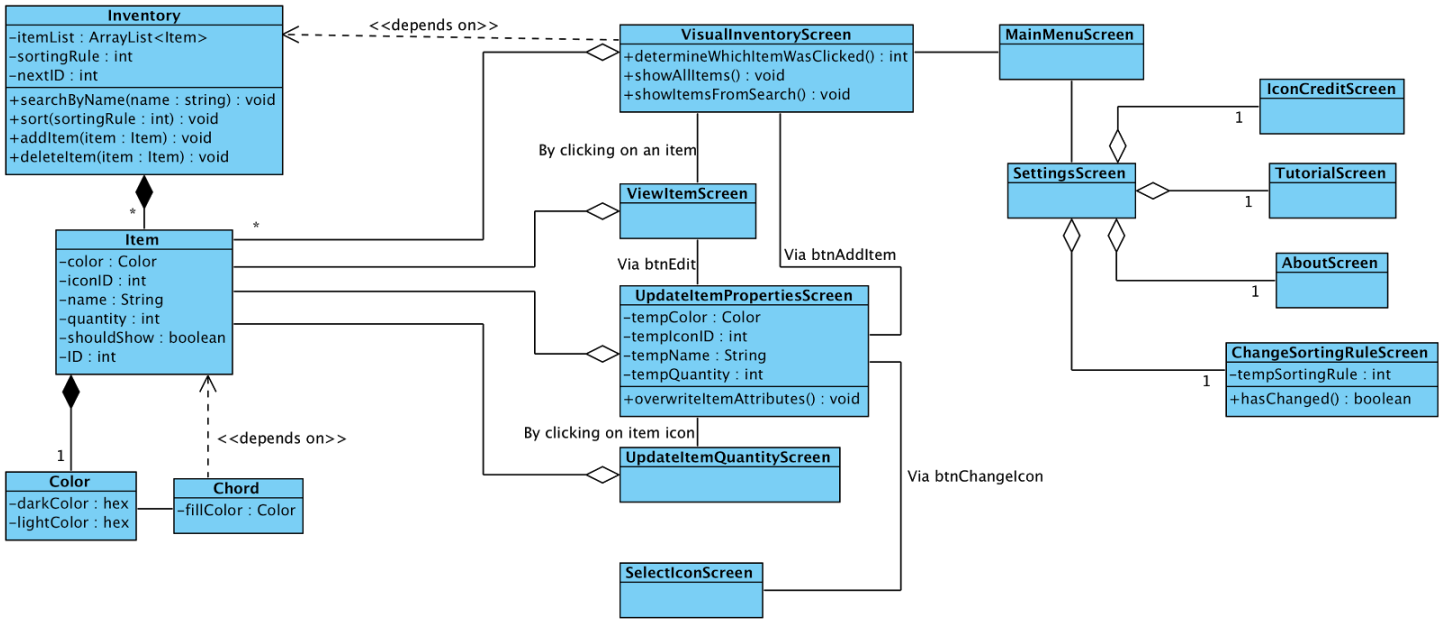
When the user clicks the 'Search' button on the top of the Visual Inventory screen, the keyboard and a search bar will appear and the user can enter a query into the search bar. Once the user is finished typing, they will press 'Enter' to start the search. The screen will display all items whose name contains the string the user entered. The user may navigate this subset of their normal Visual Inventory. The user may click on an item to bring up that item's View Item Screen. The user may instead choose to edit their query, in which case the process is repeated, or press 'Cancel,' in which case they are returned to the regular Visual Inventory Screen (with all items in inventory shown).

Delete Item



A user can delete an item by clicking the 'Delete' button on the View Item screen. The user will then be prompted for confirmation. If the user selects 'Yes', the item is permanently deleted from inventory and the user is returned to the Visual Inventory Screen. If the user selects 'No,' he or she is returned to the View Item Screen and the item is not deleted.

Detailed Class Diagram



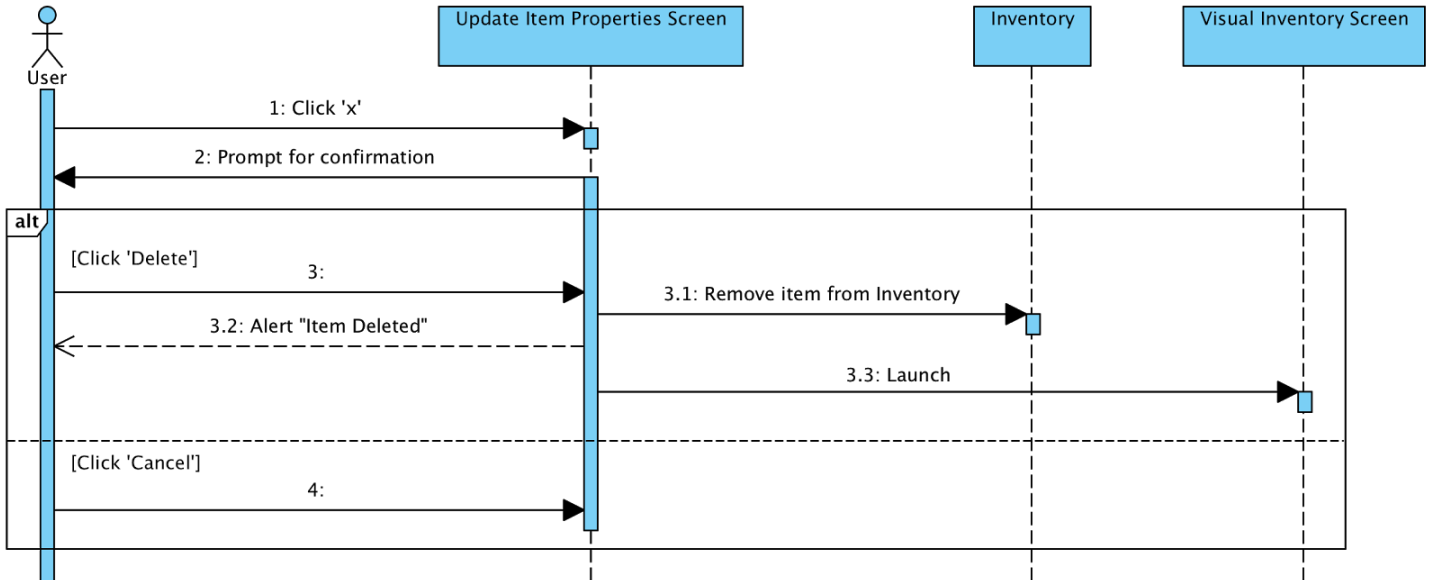
- From the Main Menu screen, the user can launch either the Visual Inventory screen or the Settings screen, by clicking on the respective button
- From the Settings screen, the user can select from any of the following: Icon Credit screen, Tutorial screen, About screen, Change Sorting Rule screen.
- The user can launch a View Item screen for a specific Item by clicking on that item on the Visual Inventory screen.
- The user can switch from the View Item screen for a given item to the Update Item Properties screen for that same item by clicking on the 'Edit' button.
- From the Update Item Properties screen for a given item, the user can:
    - Click on the item's icon to switch to the Update Item Quantity screen
    - Click on the 'Change Icon' button to switch to the Select Icon screen
- WIMK will maintain exactly one *Inventory*, which maintains a list of *Items*. This list, called itemList, will be kept in sorted order according to the applications current sorting rule.
    - itemList will be resorted when the user changes the sorting rule from the Settings menu. Note that itemList should not be resorted if the user selects from the list of eligible sorting rules the sorting rule that is already being used.
    - itemList will also be resorted each time the user adds an item to the inventory or updates the quantity of an item already in the Inventory.
    - itemList need not be resorted when the user deletes an item from inventory.
    - The Inventory class must include a sort(sortingRule) method that takes an indicator (in this case an integer) of which sorting rule to apply and sorts itemList according to the given rule.
- The contents of the Visual Inventory screen will depend on the current state of itemList.
- Each Item will include as attributes its own color, an integer identifying the icon that has been selected to represent that item, its name, a integer value between 0-100 (inclusive) representing the quantity of the item in the user's kitchen, and a boolean flag indicating whether or not the item should be shown in the Visual Inventory.
    - By default, all items in Inventory will be shown in Visual Inventory.
    - When a user searches for an item by name, however, WIMK will walk itemList and set to False the shouldShow flag of any item whose name does not contain the user's query as a substring. For instance, an

item with name attribute "Apple" would have a shouldShow flag of True for the query "app," but an item with name attribute "Carrot" would not.

- When the user either leaves the Visual Inventory Screen to return to the Main Menu screen or clears the search entry field entirely, the Visual Inventory will be re-populated without checking the status of shouldShow flags (and thus showing every item in inventory once more).

Detailed Sequence Diagrams

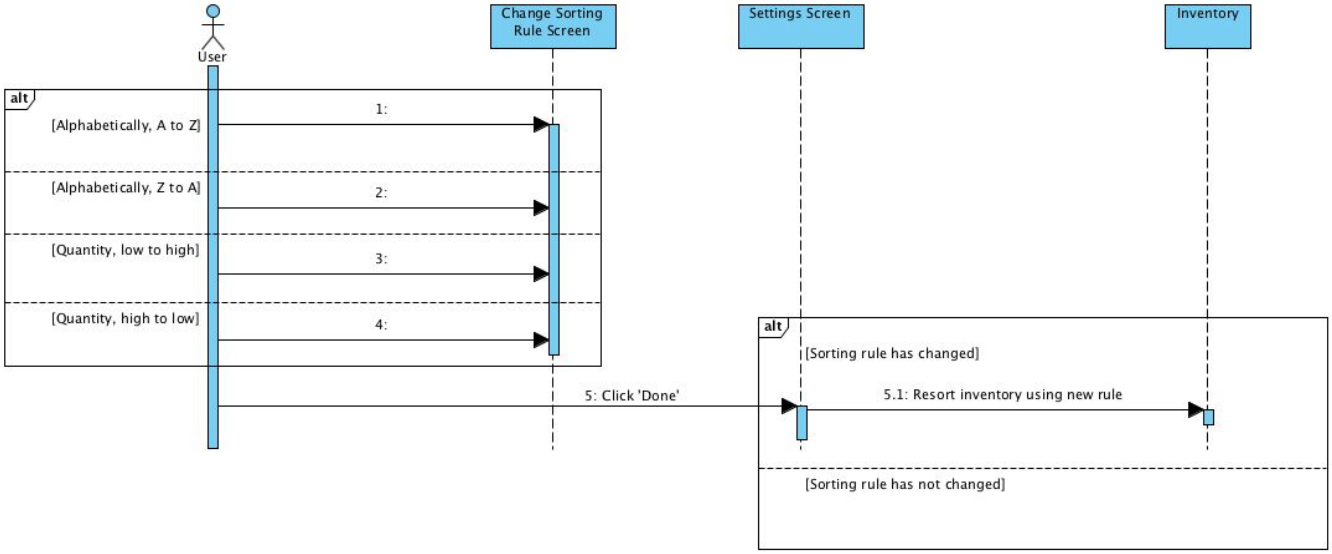
Delete Item



When the user clicks on the 'Delete' Item button on the View Item screen, he or she will be prompted for confirmation in the form of a popup menu with two options: 'Yes' and 'No.'

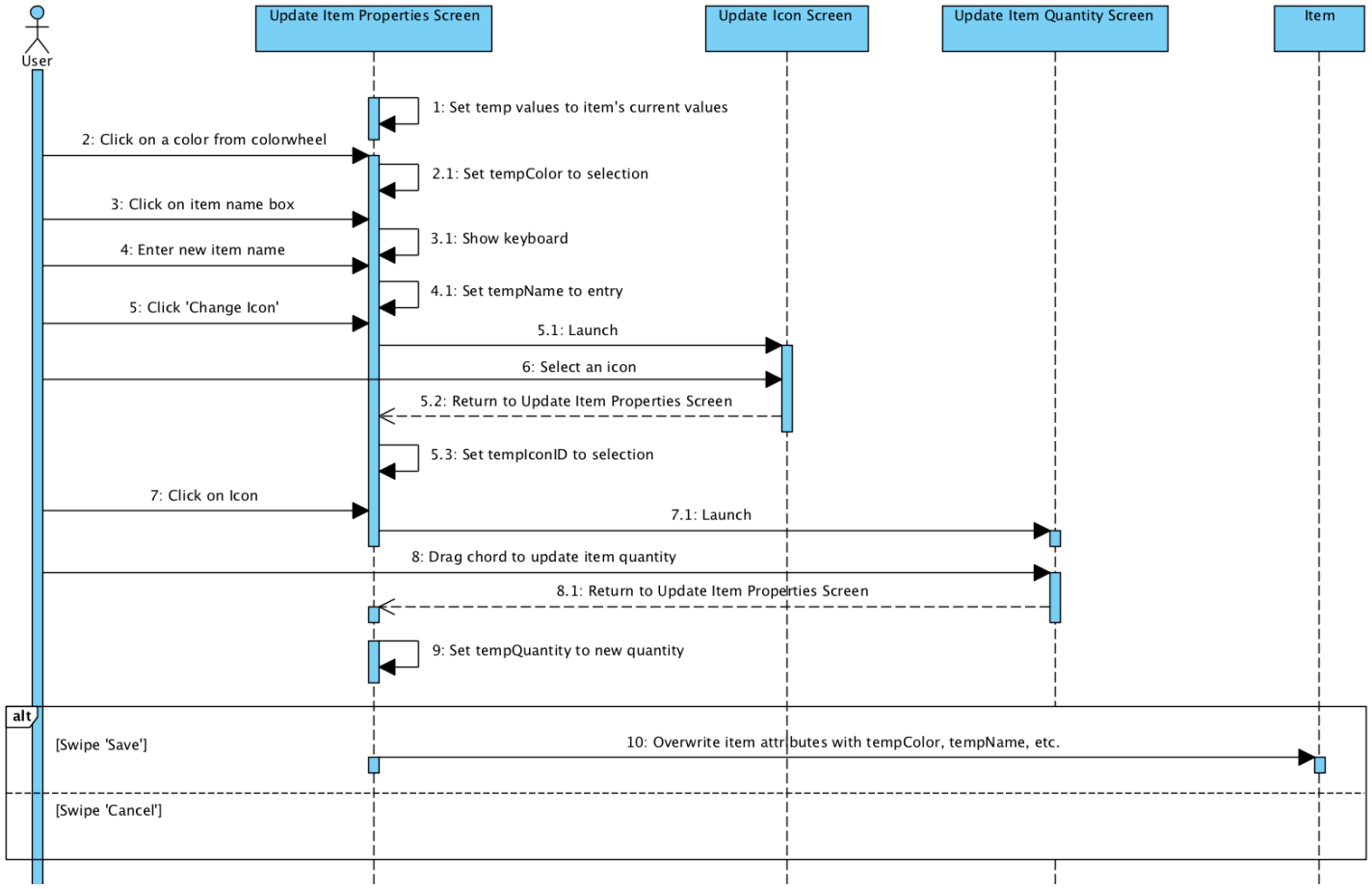
- If the user presses 'Yes,' the item is permanently removed from inventory. The user is then alerted of the deletion and taken to the Visual Inventory screen.
- If the user presses 'No,' no changes are made to the inventory and the user remains on the View Item screen.

Change Sorting Rule



The user may select one sorting option from the Change Sorting Rule screen, accessible through Settings. The sorting options are Alphabetically: A to Z, Alphabetically: Z to A, Quantity: low to high, and Quantity: high to low. When the user clicks 'Save' they will be taken back to the Settings screen. There will then be a check to see if the sorting rule has changed. If so, the inventory will be re-sorted according to the new rule. If the rule has not changed, no re-sorting is necessary.

Update Item Properties

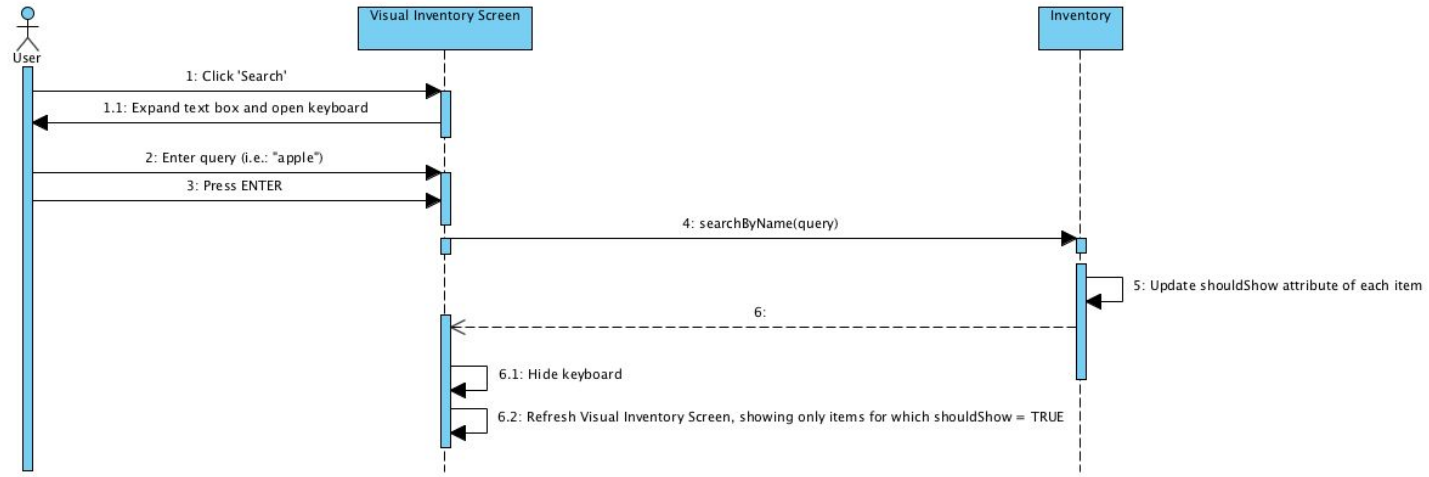


There are several parameters which the user can modify from the Update Item Properties screen. Because of the limited expressiveness of UML Sequence diagrams, changing these parameters is shown sequentially above, but the changes can in fact occur in any order, with the stipulation that no Item attributes are overwritten until the user selects 'Save' and the user may continue to repeatedly update any or all of the fields until choosing either 'Save' or 'Cancel.'

The Update Item Properties screen class maintains a Color object tempColor, a String tempName, an integer iconID tempIconID and an integer tempQuantity. Upon launch, these values are initialized to the current values of the selected Item. While the user is making changes, these temporary values are repeatedly overwritten, serving as a sort of buffer until the user opts to either save or cancel the changes.

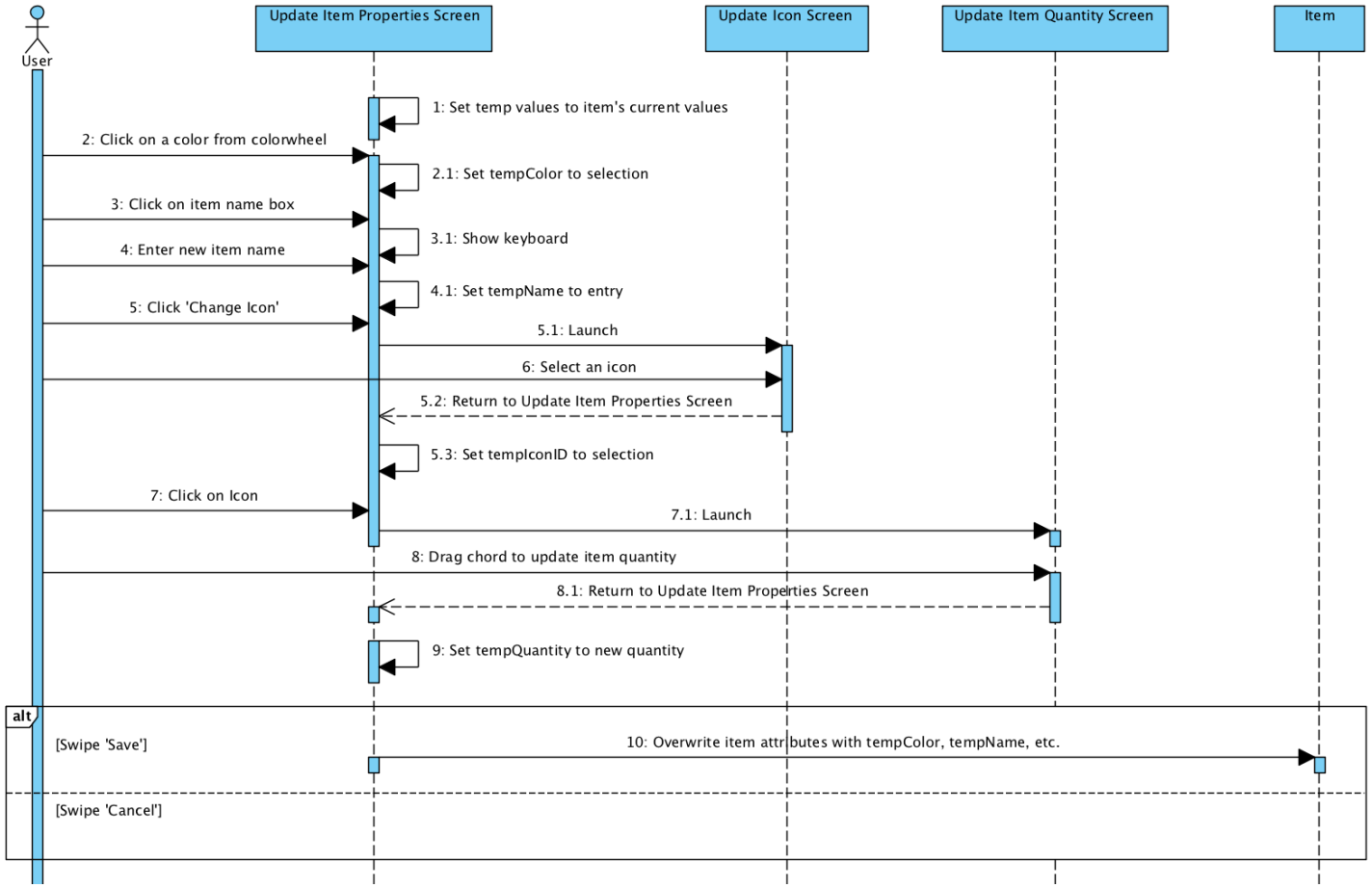
If the user selects 'Save,' the item's name, color, icon, and quantity attributes are overwritten with the values of tempName, tempColor, tempIconID, and tempQuantity respectively. If the user selects 'Cancel,' no changes are made to the item's attributes and the user is returned to the View Item screen.

Search for Item by Name



When the user clicks the 'Search' button on the top of the Visual Inventory screen, the keyboard will be displayed. The user can then enter all or part of the item name they would like to search for. Once the user is finished typing, they will press 'Enter' to start the search. The `shouldShow` attribute of all items will be updated. The items whose name contains the string the user entered will have a shoudShow attribute of 'True'. All other items will have a shoudShow attribute of 'False'. The screen will display all items whose shoudShow attribute is 'True'.

Add Item



Adding a new item has the same sequence diagram as Update Item Properties. The only difference between the two is that default values will be shown for item name, color, quantity and icon on the Update Item Properties screen after clicking the 'Add Item' button on the Visual Inventory screen.

There are several parameters which the user can modify from the Update Item Properties screen. Because of the limited expressiveness of UML Sequence diagrams, changing these parameters is shown sequentially above, but the changes can in fact occur in any order, with the stipulation that no Item attributes are overwritten until the user selects 'Save' and the user may continue to repeatedly update any or all of the fields until choosing either 'Save' or 'Cancel.'

The Update Item Properties screen class maintains a Color object tempColor, a String tempName, an integer iconID tempIconID and an integer tempQuantity. Upon launch, these values are initialized to the current values of the selected Item. While the user is making changes, these temporary values are repeatedly overwritten, serving as a sort of buffer until the user opts to either save or cancel the changes.

If the user selects 'Save,' the item's name, color, icon, and quantity attributes are overwritten with the values of tempName, tempColor, tempIconID, and tempQuantity respectively. If the user selects 'Cancel,' no changes are made to the item's attributes and the user is returned to the View Item screen.