

Blue Blueberries

a cookbook application

Raffaelli Claudia, Chaudhry Abdullah
claudia.raffaelli@stud.unifi.it, abdullah.chaudhry@stud.unifi.it
Human Computer Interaction



Department of Information Engineering
University of Florence
Via di Santa Marta 3, Florence, Italy



Main idea

Blue Blueberries [1] [2] is a cookbook application, created with the aim of guiding the user in his process of discovering new recipes [3] and decision to save them in private collections or grocery list. All this by focusing on the visualization of the recipe that represents the core of our application.

We will see:

- ▶ A first step of **needfinding**.
- ▶ The **application development** phase.
- ▶ A final stage of **usability tests**.



The Needfinding

This process allows to lay out the foundations for a good software design right from the start.

It can be broken down into several phases concerning:

- ▶ The execution of **interviews** to a group of participants,
- ▶ Formulation of the **personas**,
- ▶ Cast to **scenarios**,
- ▶ Extraction of the main **requirements**,
- ▶ The design of **mock-ups**.



The interviews were conducted on a sample of eleven people of many ages and skills and with different types of smartphone:

18-24	25-34	45-50
5	4	2

They were asked:

- ▶ General questions about **main features** they would have liked in a cookbook like app,
- ▶ Opinions about a **voice assistant**, and what it could do for them,
- ▶ Types of **advanced filters** they would have found useful.

Needfinding - Personas



► **Jack** [4], age 47, cooks occasionally but has enough culinary experience to prepare dishes without rigidly following a recipe. He hardly uses his phone but often lacks of inspiration.



► **Cindy**, age 24, doesn't know how to cook. She has never used a cookbook app but is open to it, since she is good at using her phone. She would really like to learn cooking but needs clear step-by-step instructions with plenty of photos.



► **Emily**, age 30, enjoys cooking on a daily basis and is good at it. She uses apps from time to time to try new recipes. However she suffers from a few allergies and is tired of having to scroll through recipes that she can't do.



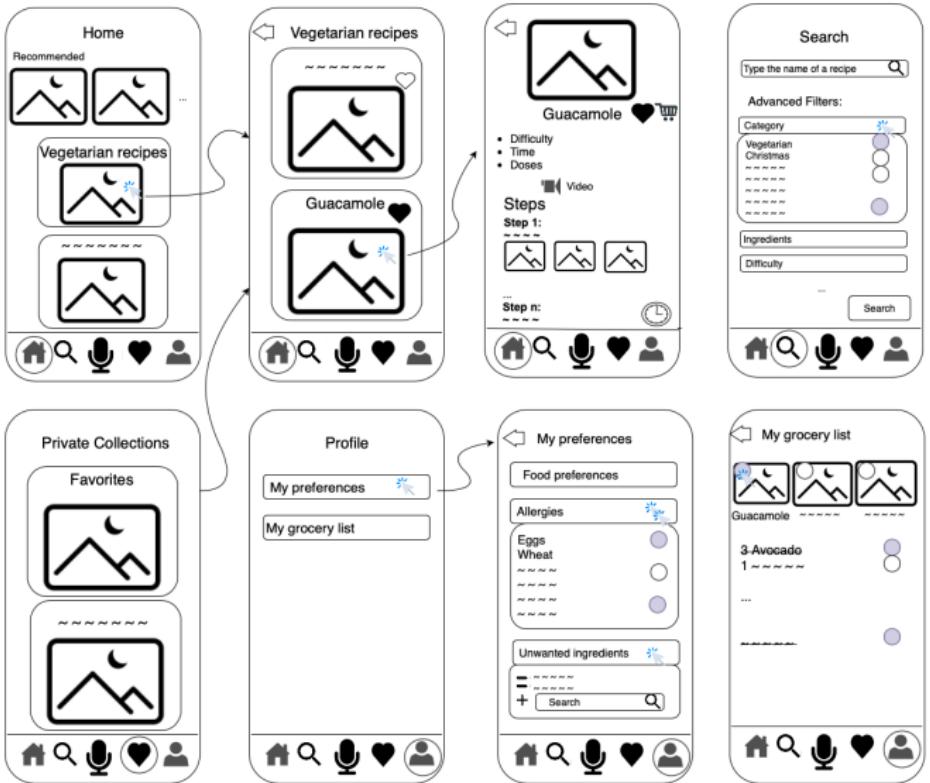
- ▶ **Jack** tonight is home alone, nothing's ready, he opens the fridge and sees a handful of ingredients. Unfortunately, he has never used those
 - He would like to ask someone for advice by listing what he has.
- ▶ **Cindy** has found a recipe she really wants to do but is not detailed. While she cooks is often hitting on the screen to keep it on.
 - She wished she had a clear recipe and someone to read it for her.
- ▶ **Emily** is looking for a new recipe but every time she opens one finds out that it doesn't meet her dietary requirements.
 - She wished she could set her food preferences.
- ▶ **Cindy** is going grocery shopping and has prepared a messy list. She has to carry a pen and stop to cross off things. She has reconsidered making a dish and now doesn't know which ingredients not to take.
 - She would like to have a clearer list.



The requirements extracted from the scenarios:

- ▶ Recipes divided into **steps** and plenty of **pictures**.
 - The **most important data** is displayed first in a recipe.
- ▶ The **screen must not go off**.
- ▶ **Categories** that group recipes to discover new ones easily.
- ▶ An **advanced filters** section.
- ▶ Possibility to **exclude certain foods**.
- ▶ A **grocery list** that is intuitive, clear and quick to use.
- ▶ The **voice assistant should be an additional feature** rather than the main one.
 - It must be able to execute a variety of tasks for the user.

Needfinding - Mock-up



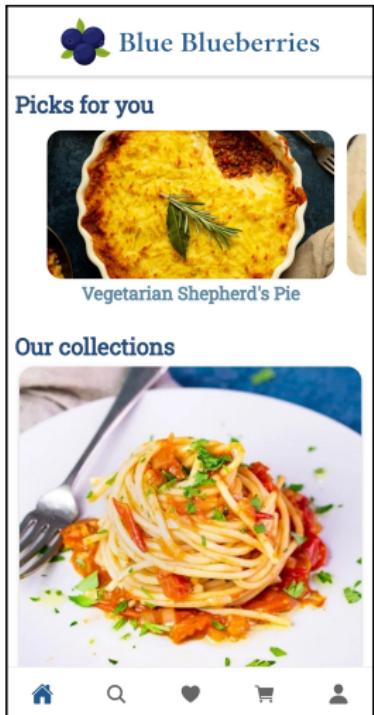


- ▶ **Ionic framework** [5] for building a cross-platform mobile app, integrated with **Angular** [6].
- ▶ **Cordova** [7] to deploy it as a native app.
- ▶ **Firebase** [8] as a remote database to store recipes and related data on the cloud.
- ▶ **Ionic Storage** [9] to keep all users' own data on their very same device.
- ▶ **Ionic Speech Recognition** [10] plugin for the text to speech of the voice assistant.
- ▶ The library **TalAter Annyang** [11] for speech to text recognition.



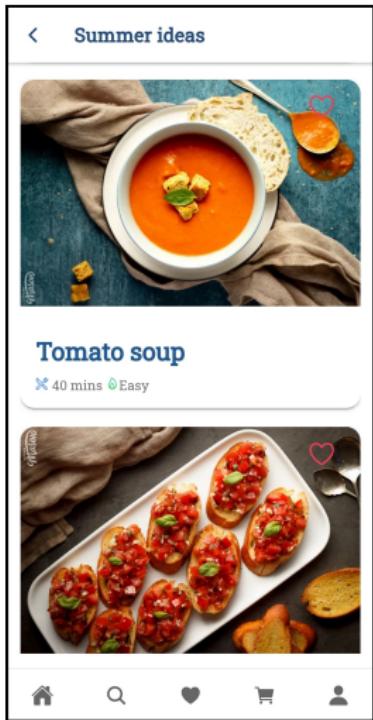
The first time the app is launched it is shown the app-tour that includes a series of slides on how to:

- ▶ View the **collections**,
- ▶ Manage the **private collections**,
- ▶ Make an **advanced search**,
- ▶ Use the **grocery list**,
- ▶ Set up the **timer**.
- ▶ Use the **voice assistant**.



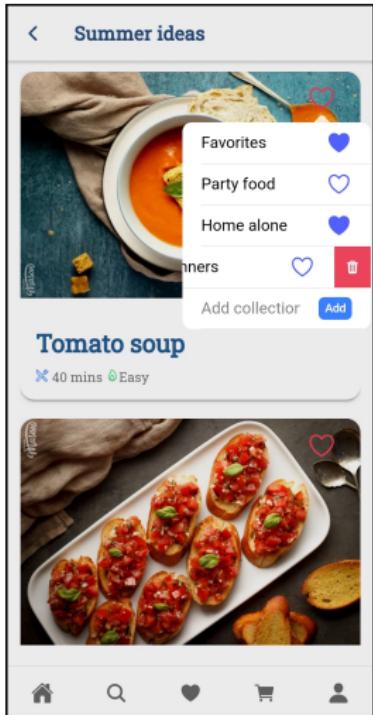
The home page is split into two parts:

- ▶ The **picks for you**, that is three recipes picked randomly.
- ▶ The **public collections** that gather recipes in thematic categories.
 - Are stored on Firebase.
 - Each recipe is assigned to a collection at database insertion.
 - They cannot be modified by users.



A generic public collection page contains cards of recipes. Each with:

- ▶ A representative image,
- ▶ name,
- ▶ time required of execution,
- ▶ difficulty,
- ▶ a heart shaped icon for adding to a private collection.

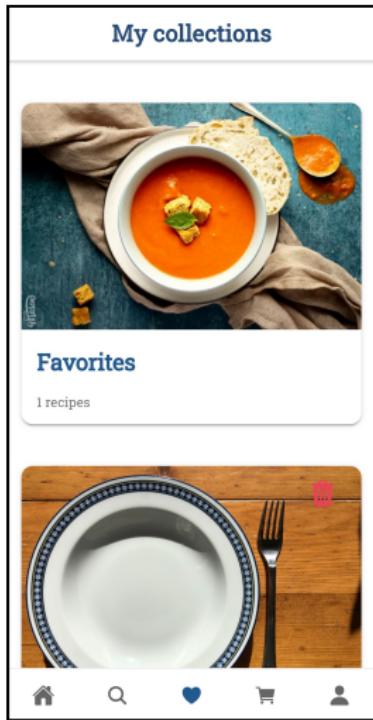


The private collections:

- ▶ Are kept in the local storage,
- ▶ Can be managed opening the pop-up on the heart-shaped icon,
 - to add them,
 - or remove them with swipe left,
- ▶ The Favorites are fixed.

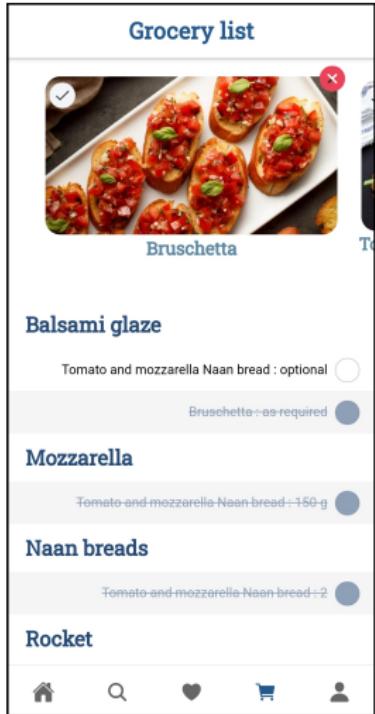
The recipe can be added to a collection by pressing on the collection name.

Private collections - Continue



The private collections:

- ▶ Look similar to the public collections,
- ▶ Have an empty plate as cover image when empty,
- ▶ Can be removed pressing the trash icon.



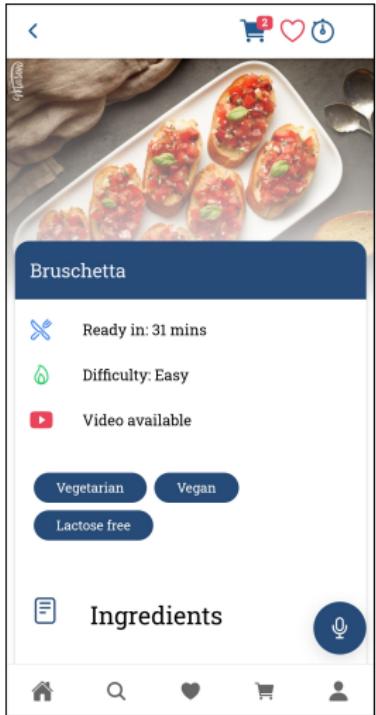
The recipes in the grocery list:

- ▶ Persist in the local storage,
- ▶ Are added from the recipe page,
- ▶ Can be removed by pressing "X",
- ▶ Can be temporarily excluded removing the check,

In the list of ingredients:

- ▶ All the occurrences are grouped,
- ▶ The checked ones go at the bottom of the sub-list,
- ▶ Checked ingredients appear as crossed.

Recipe page



At the top of the page are displayed the most important information and functionalities:

- ▶ Buttons of:
 - Grocery list,
 - Private collections,
 - Timer.
- ▶ Information related to the recipe,
 - Time of execution,
 - Difficulty,
 - A video of the recipe if available,
 - Type of recipe (e.g. vegan),
 - Ingredients.

Recipe page - Continue



Step 7

Preheat your oven to 210°C/Fan 200°C. Using around 4 tbsp of the olive oil, brush each slice on both sides. (This will make them super crispy!) Then place them onto a large baking tray.

Step 8

Bake in the preheated oven for 6 – 8 minutes until crisp and golden. Allow to cool completely. Just before serving add the remaining 2 tbsp of olive oil to the tomato mixture and mix well. Now all you have to do is...

Home Search Heart Cart User

- ▶ The body of the page holds the recipe,
 - The text is split into steps,
 - each with buttons to scroll up or down to the closest step,
 - and plenty of images.
- ▶ The screen remains always on,
- ▶ The voice assistant can perform actions like,
 - read a step,
 - go to a step,
 - set a timer,
 - add to grocery list,
 - add to Favorites.



Search recipes

Desired ingredients

Advanced filters

Time required

Undesired ingredients

Difficulty

Keyword

Collections

Search in Easy recipes, ...

Summary

Search in Easy recipes Holiday Recipes

Search

The search can be done **manually** or with the **voice assistant**, combining seven filters to obtain recipes:

- ▶ with only or also desired ingredients,
- ▶ with required execution time,
- ▶ without some ingredients,
- ▶ of some difficulty,
- ▶ with some keyword,
- ▶ in some collection.

Some filters set:

Ready in 30 minutes

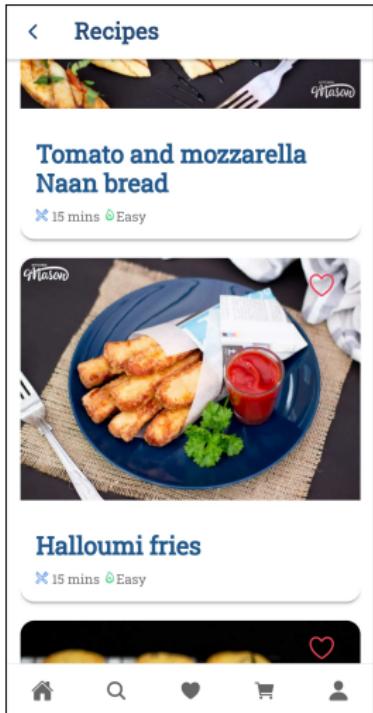
Difficulty easy

Search in • Holiday Recipes
• Summer ideas

Something with **Potatoes**
 Tomatoes

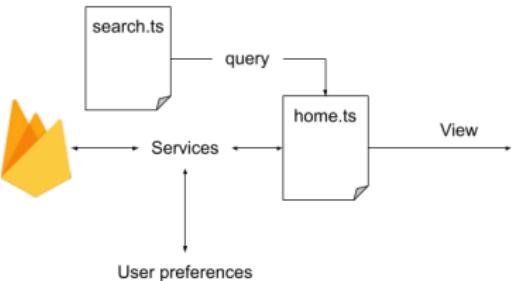
I don't want **Red wine**

Search recipe - Continue



The recipes returned are:

- ▶ only the ones that fit the query,
- ▶ and that also meet the dietary preferences.





Preferences

Dietary preferences Vegetarian

Allergies Peanuts

Undesired food Onion

SAVE

- ▶ The preferences are kept in the local storage.
- ▶ Once set, no page will show any recipe that does not meet the criteria.
 - Icon shown on the collection card when there are preferences applied:

Summer ideas

3 total recipes Preferences



The assistant can be either:



- ▶ **Idle**: is neither listening nor speaking,
 - if pressed it starts listening through Annyang.



- ▶ **Listening**: has started voice recognition,
 - will stop when the user finishes a sentence.



- ▶ **Speaking**: is providing feedback through Cordova TTS.



Usability tests

Are used to test the interface in order to identify problems, uncover opportunities for improvement, learn about users' behaviours.

The app was distributed to the participants of the needfinding:

- ▶ First the users were allowed to freely explore the app,
- ▶ then they were asked to complete a series of goals.
 - After the execution of each goal were addressed Single Ease Questions [12] to identify the weaknesses of the application.
 - The feedback was used to fix the issues.
 - The goals asked were eleven, we see the most significant ones...

Usability tests - Continue



Some of the goals:

Single Ease Questions	1-2	3-5	6-7	Avg
Finding the recipe was easy	0%	0%	100%	6.8
I'm satisfied with the recipe visualization	0%	0%	100%	6.8

Single Ease Questions	1-2	3-5	6-7	Avg
Where to set them was easy to find	0%	0%	100%	6.5
I preferred different preferences	100%	0%	0%	1.5
I don't find this feature useful	47.6%	52.4%	0%	1.9

Single Ease Questions	1-2	3-5	6-7	Avg
Activating the assistant was easy	16.6%	16.6%	66.8%	5.5
I had a hard time giving the order	0%	66.6%	33.4%	5.1
The timer was clearly visible	0%	0%	100%	6
Overall it is a useful feature	0%	0%	100%	6.8

Single Ease Questions	1-2	3-5	6-7	Avg
It was easy to ask this command	0%	0%	100%	6.8
The outcome wasn't the expected	100%	0%	0%	1
I didn't know how to stop it	100%	0%	0%	1.1
I find this feature useful	0%	16.6%	83.4%	6.3

- ▶ Open a recipe.
- ▶ Set the dietary preferences.
- ▶ Set a timer through the voice assistant.
- ▶ Let the voice assistant read a recipe for you.

Usability tests - Continue



Other goals:

Single Ease Questions	1-2	3-5	6-7	Avg
Performing this task was easy	0%	0%	100%	6.6
The heart shaped icon is well suited	0%	0%	100%	7
It wasn't clear if I had succeeded	100%	0%	0%	1.1
Removing the recipe was easy	0%	6.8%	93.2%	6.6
I'm satisfied with this feature	0%	0%	100%	6.5

Single Ease Questions	1-2	3-5	6-7	Avg
It was easy to do	13.5%	37.8%	48.7%	3.4
It wasn't clear if I had succeeded	100%	0%	0%	1
I had to try several times	7.1%	17.9%	75%	5.1

- ▶ Add/remove a recipe to/from a personal collection.
- ▶ Delete a personal collection from the collection page.

Usability tests - Continue



Other goals:

Single Ease Questions	1-2	3-5	6-7	Avg
Performing this task was easy	0%	0%	100%	6.6
The heart shaped icon is well suited	0%	0%	100%	7
It wasn't clear if I had succeeded	100%	0%	0%	1.1
Removing the recipe was easy	0%	6.8%	93.2%	6.6
I'm satisfied with this feature	0%	0%	100%	6.5

Single Ease Questions	1-2	3-5	6-7	Avg
It was easy to do	13.5%	37.8%	48.7%	3.4
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Home alone

1 recipes

- ▶ Add/remove a recipe to/from a personal collection.
- ▶ Delete a personal collection from the collection page.

Usability tests - Continue

Other goals:

Single Ease Questions	1-2	3-5	6-7	Avg
Performing this task was easy	0%	0%	100%	6.6
The heart shaped icon is well suited	0%	0%	100%	7
It wasn't clear if I had succeeded	100%	0%	0%	1.1
Removing the recipe was easy	0%	6.8%	93.2%	6.6
I'm satisfied with this feature	0%	0%	100%	6.5

Single Ease Questions	1-2	3-5	6-7	Avg
It was easy to do	13.5%	37.8%	48.7%	3.4
It wasn't clear if I had succeeded	100%	0%	0%	1
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Home alone

1 recipes

- ▶ Add/remove a recipe to/from a personal collection.



Home alone

recipes

- ▶ Delete a personal collection from the collection page.



Feedback received:

- ▶ The application appears fluid and consistent across screens.
- ▶ The users were satisfied with the wide variety of filters available.
- ▶ Some participant had issues with the voice assistant due to language gap,
 - more language options could be provided,
 - it could be improved using Google DialogFlow [13],
 - it can be added more support for iOS users.
- ▶ Could be integrated an authentication system.
- ▶ The timer could be improved letting it ring an alarm when time runs out.



Thanks! Any questions?



Bibliography



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