



Software Requirements Specification

for

Scan&Cook

Version 1.01



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1. Introduction

1.1 Purpose

This SRS describes the functional and nonfunctional requirements for software release 1.0 of the Scan&Cook. This document is intended to be used by the members of the project team who will implement and verify the correct functioning of the system. Unless otherwise noted, all requirements specified here are committed for release 1.0.

1.2 Document Conventions

No special typographical conventions are used in this SRS.

1.3 Project Scope and Product Features

This solution will provide users with the ability to scan groceries in real time, giving detailed information about their composition, possible dishes for cooking with them, as well as recommendations for a specific diet plan. The application provides a convenient way to monitor the food that users eat, to calculate the right balance of food. *Scan&Cook* will help to choose the right recipe for a specific groceries by user's request considering the groceries that are available. A detailed description is available in the *Vision and Scope Document* [1] and *Business Approach Document* [2], along with the features that are scheduled for full or partial implementation in this release.

2. Overall Description

2.1 Product Perspective

The **Scan&Cook** is a new mobile application that replaces the current manual processes of searching for recipes, diet tracking, foodstuff expiration dates control, assistance in cooking of meals and looking for missing groceries in supermarkets. The system is expected to evolve over several releases, adding more core features to it.

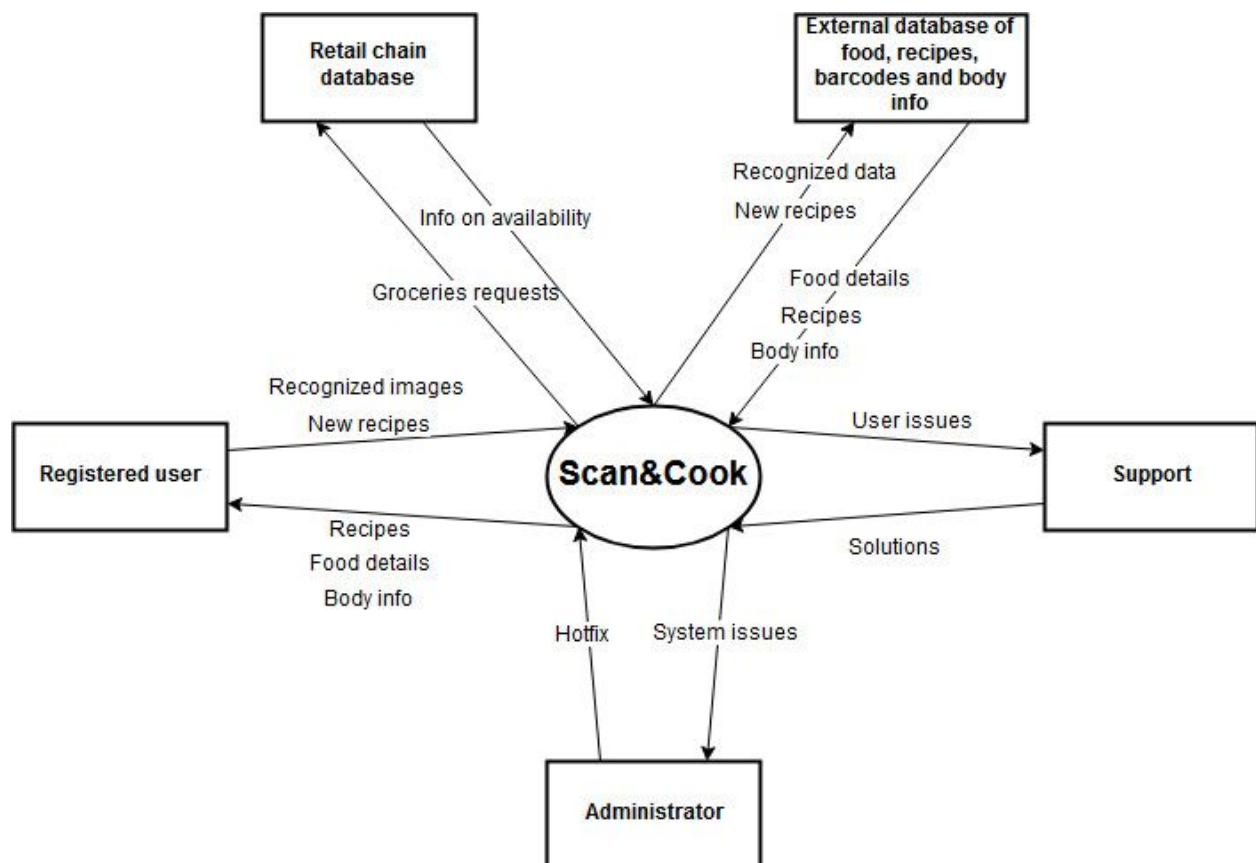


Fig. 1 - Scan&Cook context diagram

2.2 Product Functions

The main purpose of this product is to improve the organization of diet of the USA residents. Using this product, the customers should be able to select a suitable recipe for cooking according to both their dietary requirement for calories and food preferences, to find out information about chemical composition of a chosen food within a few seconds and discover new recipes with favorite foodstuffs. Furthermore, the customers should be able to get an information where and how to buy a particular groceries if they need it.

2.3 User Roles and Characteristics

User Roles	Characteristics
Registered User	A registered users can use the application to plan and build their diet. This means that the user have to be able to scan groceries, search for recipes in order to cook dishes adjusted to individual needs, define groceries with an expired consume date in the fridge and search for foodstuff in supermarkets.
Administrator	The administrator only interact with the back end of the application. He is managing the overall system so there is no incorrect information within it.
Support	Support department will collect and resolve issues, reported by end-users through app interface to maintain correct workflow.
Retail Chain Representatives	The retail chain representatives will manage the information about their chain, for example a description of the chain, contact information and their available goods.

Compliance user roles with application features can be seen in [Figure 2](#) (Appendix B).

2.4 Operating Environment

OE-1: The mobile application is created for iOS 9.0 and higher (iPhone 5-8);

OE-2: The MVP version of the mobile app supports English only;

OE-3: Amazon RDS is considered to be a suitable solution for users' data storage;

OE-4: The image database [ImageNet](#) is used to provide the correct work of the neural networks;

OE-5: The Apache HTTP server is used as a web server for the mobile application development.

2.5 Design and Implementation Constraints

CO-1: The design of the application should correspond to the corporate standards and specificity (color spectrum, logos etc.) of the Client;

CO-2: Swift 3 is used for native iOS development;

CO-3: Amazon RDS Instance is 10 GB.

2.6 Assumptions and Dependencies

AS-1: The Scan&Cook should operate at all times without maintenance;

DE-1: The operation of the Scan&Cook depends on changes being made in foodstuff range of retail chains;

DE-2: The operation of the Scan&Cook depends on external databases availability and we assume their uptime will be 100%.

3. System Features

3.1 Account

3.1.1 Description

The options of user's registration, login, logout, and password restore should be available. When a user signs in the app, there should also be an option to specify his personal information, make profile setup, and specify the parameters of his/her diet or ration.

3.1.2 The feature in the form of user stories

US-101	End user requirement
<ul style="list-style-type: none">● Requirement: As a non-registered user, I want to be able to create an account to sign in to the application;● Acceptance criteria:<ul style="list-style-type: none">- Application is connected to the internet;- Presence of a link "Don't have an account?" on the Registration (Login) screen;- Link opens "Create account" screen;- Filling all required fields allows to press "Create account" button;- Confirmation email sent to user's address;- User now able to login into app using specified info.	
Priority: H	

US-102	End user requirement
<ul style="list-style-type: none">● Requirement: As a non-registered user, I want to be able to sign up the application via Google and Facebook SSO in order to simplify the process of registration;● Acceptance criteria:<ul style="list-style-type: none">- Application is connected to the internet;- Presence of a link "Don't have an account?" on the Registration (Login) screen;- Link opens "Create account" screen;- Presence of a two buttons: "Sign in via Google" and "Sign in via Facebook";- Buttons open selected form, where user must fill required fields to login;- Notification about SSO policy sent to user.	

	Priority: M
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US-103	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to login to the application to manage it's features; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a clickable form on the "Login screen" with the fields "Email" and "Password"; - Registered user can enter his email and password to login to the app. 	
Priority: H	

US-104	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to logout of the application to have a possibility to login with another account; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a "Logout" button in the app menu; - Button opens "Login screen" and ends previous user session; - User now able to login again using any method provided. 	
Priority: H	

US-105	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to be able to restore my current password to login to the application; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a link "Forgot my password" on the "Login screen"; - Link opens "Restoration form" screen - User must fill required fields to receive new password to his email; - Email notification sent to user's address with further instructions. 	

	Priority: M
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US-106	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to be able to have access to primary features of the app on the main screen; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a four clickable info-blocks: "Scanner", "Daily calories", "Recipes", "Ration" - on the main screen; - Clicking on each block leads to corresponding block page with further functions. 	
Priority: H	

US-107	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to be able get access to the app settings from main screen to set preferred options; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a (≡) button on the top left corner of the main screen - Clicking the button opens pull-out menu with following clickable tabs: "Recognized groceries", "Recipes", "Ration", "My parameters", "Settings", "Logout"; - Clicking on each tab leads to corresponding page with further parameters. 	
Priority: H	

US-108	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to be able to set profile image to match my identity; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a clickable "Profile image" tab on the "Settings" page; - Clicking the "Profile image" tab leads to page, containing 3 tabs: "Pick avatar", "Upload image", "Delete avatar" and image on the top of the page (default image on first try); 	

<ul style="list-style-type: none"> - Clicking "Pick avatar" opens list of available images from avatar database; - Clicking "Upload image" opens uploading interface, where user can browse through his collection and pick one image - Clicking "Delete avatar" will restore default profile image; <ul style="list-style-type: none"> ● Restrictions: The app can upload only images 200x200 pixels, 2mb max 	Priority: L
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US-109	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to be able to get access to app settings to set preferred parameters; <ul style="list-style-type: none"> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a clickable "Settings" tab on the pull-out menu; - Clicking the "Settings" tab leads to page, containing 5 tabs: "Profile image", "Profile settings", "Preferences", "About", "Update" - "Profile image" described in US-108; - Clicking "Profile settings" opens page, which contains customizable profile parameters (Password, Email, Name, App theme); - Clicking "Preferences" opens page, which contains customizable system options (Date, time, Notifications, Security, Fonts, Data usage, Modes); - Clicking "About" opens page, which contains latest product information and terms & conditions link; - Clicking "Update" opens page, which contains app version information and "Update" button, that is available if the app version is not latest. 	
Priority: M	

US-110	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want "Send an issue" button in the application so that I could make report for support of the application if I meet some difficulties; <ul style="list-style-type: none"> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of the "Send an issue" button on the "Help and FAQ" screen where a user can write description of an issue; - The application saves written description on the server after a user taps "Send" button; 	

<ul style="list-style-type: none"> - Each sended issue is automatically numbered by the system; • Restrictions: Maximum issues sended by a user within a day is 5; Maximum issues sended by a user within a week is 25. 	Priority: H
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US-111	Support employee requirement
<ul style="list-style-type: none"> • Requirement: As a support employee, I want to receive users' issues so that I could provide correct app workflow; • Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of the "User's issues" button in administrative panel of the application where support employee can see automatically saved descriptions of user's issues; - The application saves written description on the server after a user taps "Send" button; - Each sended issue is automatically numbered by the system; - After a support employee opens an issue, status of the issue is changed to "In hand"; • Note: Most important issues should be assigned to most experienced employees of the support. 	
Priority: M	

US-112	Administrator requirement
<ul style="list-style-type: none"> • Requirement: As an administrator of the application, I want to have an opportunity to fix bugs on the spot so that the application could be available to users 24/7 ; • Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of the "User's issues" button in administrative panel of the application where administrator can see automatically saved descriptions of user's issues; - The application saves written description on the server after a user taps "Send" button; - Each sended issue is automatically numbered by the system; - After admin opens an issue, status of the issue is changed to "In hand"; - The system supports hotfixes for all bugs with "Minor" and "Medium" statuses; • Note: 	

Most critical bugs should be assigned to most experienced employees of the support.

Priority: H

3.1.3 Login feature in the form of flowchart diagram

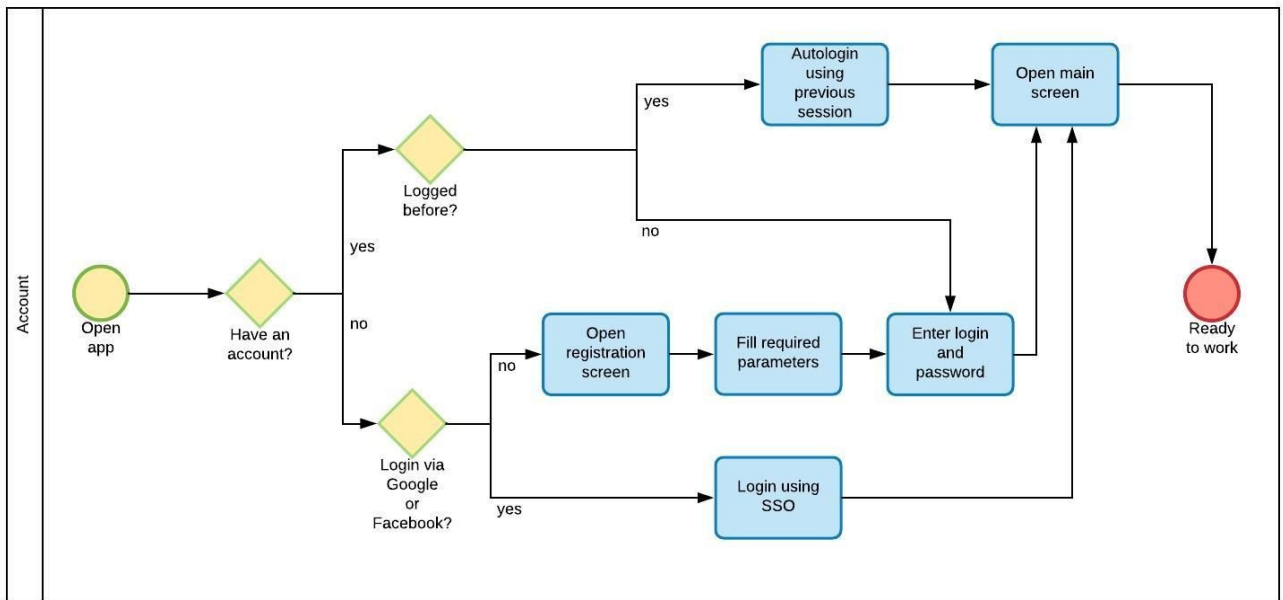


Fig. 3 - Account flowchart diagram

3.2 Recognition

3.2.1 Description

One of the main features of the application. It provides different ways to recognize object by it's appearance and provide necessary information about it or things it can influence in different ways (health, diet, recipe).

3.2.2 The feature in the form of user stories

US-201	Registered user requirement
<ul style="list-style-type: none"> Requirement: As a registered user, I would like to have an ability to scan groceries with phone camera to speed up the process of searching for suitable recipe; 	

<ul style="list-style-type: none"> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a button, that starts phone camera and opens screen that allows to point on the object and scan it; - Application can recognize groceries by visual appearance via neural network through phone camera and send them to match with food database; - Presence of a button, that opens recipe list, based on recognized groceries. - Screen with recipe list, based on recognized groceries 	Priority: H
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US-202	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like to have an ability to scan barcodes of the groceries with phone camera to speed up the process of searching for suitable recipe; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a button, that starts phone camera and opens screen that allows to point on the barcodes and scan it; - Application can recognize groceries by their barcodes through phone camera and send them to match with barcodes database; - Presence of a button, that opens recipe list, based on recognized groceries barcodes. 	
Priority: M	

US-203	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like to have an ability to have voice recognition of a groceries to speed up the process of searching for suitable recipe; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a button, that starts mic recording; - Application can recognize groceries named by voice through phone mic with help of Siri assistant functionality; - Presence of a button, that opens recipe list, based on recognized groceries. 	
Priority: L	

<ul style="list-style-type: none"> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a button on scan screen, that shows protein, fats and carbohydrates content of each recognized foodstuff, taken from external database; - Protein, fats and carbohydrates content determination accuracy of groceries recognized by appearance is 90% or more; - Protein, fats and carbohydrates content determination accuracy of groceries recognized by a barcode is 98% or more (depends on manufacturer info). ● Note: <p>The application rounds off the result of protein, fats and carbohydrates content determination to the nearest whole number.</p> 	Priority: H
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US-206	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: <p>As a registered user, I would like the application to determine the number of calories of each recognized foodstuff so that I could control calorie intake;</p> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a button on scan screen, that shows calories info of each recognized foodstuff, taken from external database; - The number of calories determination accuracy of groceries recognized by appearance is 95% or more; - The number of calories determination accuracy of groceries recognized by a barcode is 98% or more (depends on manufacturer info). ● Notes: <p>The application rounds off the result of the number of calories determination to the nearest whole number.</p> 	
Priority: H	

US-207	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: <p>As a registered user, I would like the application to determine mineral substances content of each recognized foodstuff so that I could control intake of the most important mineral substances;</p> ● Acceptance criteria: 	

<ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a button on scan screen, that shows mineral substances content of each recognized foodstuff, taken from external database; - Mineral substances content determination accuracy of groceries recognized by appearance is 85% or more; - Mineral substances content determination accuracy of groceries recognized by a barcode is 98% or more (depends on manufacturer info). <p>● Notes:: The application shows content of 10 the most common mineral substances in the recognized foodstuff.</p>	Priority: L
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US-208	Registered user requirement
<p>● Requirement: As a registered user, I would like the application to determine biologically active substances content of each recognized foodstuff so that I could control intake of the most important vitamins;</p> <p>● Acceptance criteria:</p> <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a button on scan screen, that shows biologically active substances content of each recognized foodstuff, taken from external database; - Accuracy of biologically active substances content determination of groceries recognized by appearance is 85% or more; - Accuracy of biologically active substances content determination of groceries recognized by a barcode is 98% or more (depends on manufacturer info). <p>● Notes: The application shows content of 5 the most common biologically active substances in the recognized foodstuff.</p>	
Priority: L	

US-209	Registered user requirement
<p>● Requirement: As a registered user, I would like to have access to my previously recognized groceries;</p> <p>● Acceptance criteria:</p> <ul style="list-style-type: none"> - Application is connected to the internet; 	

- Presence of a clickable “Recognized groceries” tab on the pull-out menu;
- Clicking the “Recognized groceries” tab leads to page, containing list of last 20 recognized groceries;
- Clicking on any item leads to “Info” page, which contains all information regarding picked item;

- **Restriction:**

The application can store only 20 recognized groceries and deletes most old one, when user makes new scan.

Priority: H

3.2.3 The feature in the form of flowchart diagram

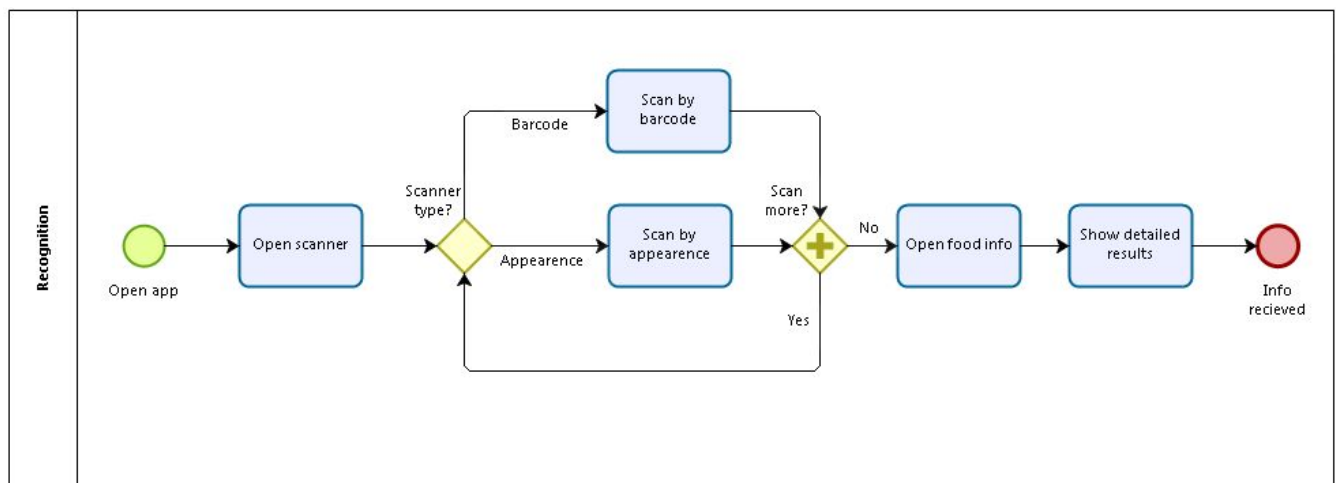


Fig. 4 - Recognition flowchart diagram

3.3 Recipes

3.3.1 Description

Functions choosing recipes by type, chemical composition and preferred type of used kitchen appliances should be available . When a user is looking for recipe to cook, the application should primarily advise him most useful dishes.

3.3.2 The feature in the form of user stories

US-301

Registered user requirement

<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like to have access to recipe list from menu to speed up searching process; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a clickable “Recipes” tab on the pull-out menu; - Clicking the “Recipes” tab leads to page, containing endless scroll list of 6 recipes per screen ordered from most suitable at the top 3 of it to alphabetic order after; - Clicking on any item leads to certain recipe page, which contains all information regarding picked item; 	Priority: H
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US-302	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like the application to suggest to me recipes based on available foodstuff in my fridge so that I could choose dishes without need to go to a supermarket; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a clickable “Recognized groceries” tab on the pull-out menu; - Presence of a “Recipes” button at main screen of the application; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%; - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; - Recommended dishes is shown on a screen with infinite scrolling; ● Restriction: The application displays only 6 recommended dishes on each screen. 	Priority: L

US-303	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like the application to suggest to me recipes based on a chosen foodstuff so that I could find dishes with most favorite food; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; 	

<ul style="list-style-type: none"> - Presence of the “My parameters” button on the pull-out menu that opens where a user can choose favorite foodstuff; - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; - Recommended dishes is shown on a screen with infinite scrolling; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%;. - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; <ul style="list-style-type: none"> ● Restriction: The application displays only 6 recommended dishes on each screen. 	
	Priority: L

US-304	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like the application to suggest to me recipes based on their chemical composition so that I could choose dishes with an appropriate protein, fats and carbohydrates content; <ul style="list-style-type: none"> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of the “Dish type” button on the “Recipes” screen where a user can find protein, fat or high-carb recipes; - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; - Recommended dishes is shown on a screen with infinite scrolling; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%;. - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; <ul style="list-style-type: none"> ● Restriction: The application displays only 6 recommended dishes on each screen. 	
	Priority: M

US-305	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like have an opportunity to look for types of dishes so that I could find an appropriate one; 	

<ul style="list-style-type: none"> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of the “Dish type” button on the “Recipes” page that opens screen where a user can choose dish type (main dish, salad, soups, appetizer, beverage, cookies, desserts); - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; - Recommended dishes is shown on a screen with infinite scrolling; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%;. - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; ● Restriction: <p>The application displays only 6 recommended dishes on each screen.</p> 	<p>Priority: M</p>
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US-306	Registered user requirement
	<ul style="list-style-type: none"> ● Requirement: <p>As a registered user, I would like have an opportunity to look for dishes by categories so that I could find appropriate dishes for different cases;</p> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of the “Dish type” button on the “Recipes” page that opens screen where a user can choose dishes by categories (celebratory, dietary, for adults, for children); - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; - Recommended dishes is shown on a screen with infinite scrolling; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%;. - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; ● Restriction: <p>The application displays only 6 recommended dishes on each screen.</p>
	<p>Priority: L</p>

US-307	Registered user requirement
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<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like have an opportunity to look for dishes based on type of used kitchen appliance for their cooking so that I could choose most appropriate recipes for me; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of the “Kitchen appliances” button on the “Recipes” page that opens screen which where a user can find dishes based on type of used kitchen appliance (slow cooker, microwave oven, bread maker, blender, oven, deep-fryer); - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; - Recommended dishes is shown on a screen with infinite scrolling; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%; - Caloric content of each dish shown a user doesn’t exceed rest of recommended daily calorie intake; ● Restriction: The application displays only 6 recommended dishes on each screen. 	Priority: L
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US-308	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like have an opportunity to choose random recipe so that I could discover new dishes; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of the “Random pick up” button on the “Recipes” page that can be tapped by a user to display random dishes; - Recommended dishes is shown on a screen with infinite scrolling; - The application primarily shows a user dishes where caloric content doesn’t exceed rest of recommended daily calorie intake; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%; ● Restriction: The application displays only 6 recommended dishes on each screen. 	Priority: L

	Priority: L
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US-311	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to look for dishes in the application by cooking time so that I could choose fast cooking dishes when I don't have time I and slow cooking dishes when I have time; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - There is function of dishes selection by cooking time in the application; - Presence of the "Cooking time" button on the "Recipes" page where a user can choose fast or slow cooking dishes; - Caloric content of each food shown a user doesn't exceed rest of recommended daily calorie intake; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%; ● Restrictions: Caloric content of each dish shown a user can't exceed the rest of recommended amount of calories; ● Notes: Cooking time of fast cooking dishes can't exceed 20 minutes; Cooking time of slow cooking dishes is no less than 120 minutes. 	
	Priority: L

3.3.3 The feature in the form of flowchart diagram

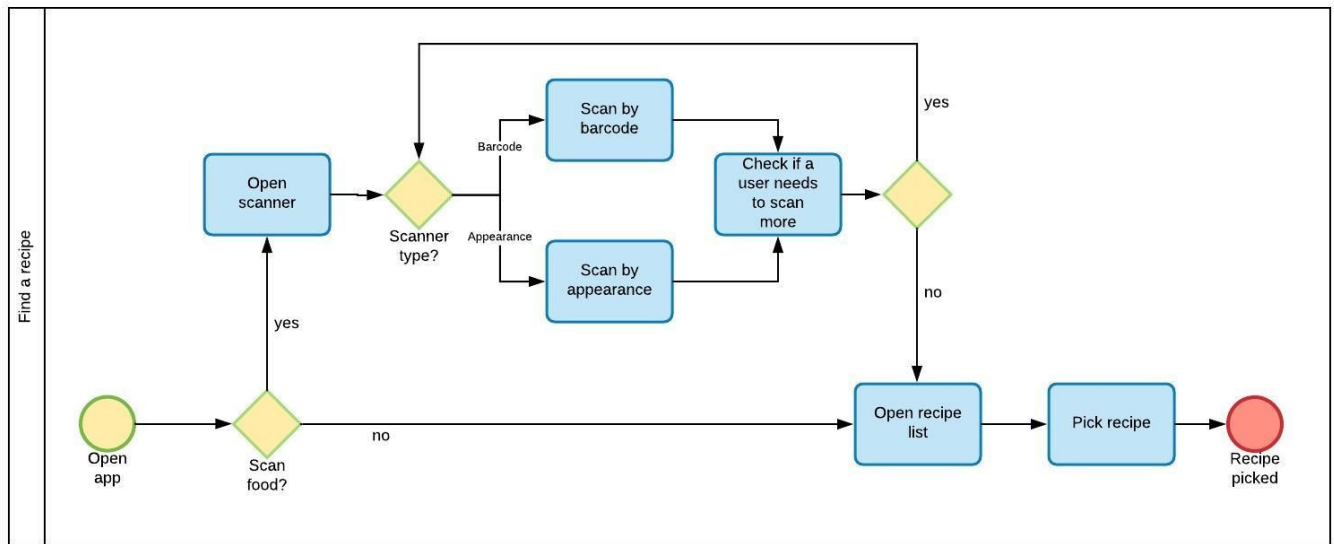


Fig. 5 - Find a recipe flowchart diagram

3.4 Ration

3.4.1 Description

Functions of calorie consumption control, dish selection by several parameters should be available. When a user is looking for dish to cook, the application should advise him dishes according to the daily ration of the user.

3.4.2 The feature in the form of user stories

US-401	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like the application to calculate daily intake based on recognized food products' analysis so that I could control calories consumption; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Calories meter automatically calculates intake after every receiving information about meal of the user; - Daily intake is displayed in the relevant screen; - Protein, fats and carbohydrates content of each recognized foodstuff is displayed in the relevant screen; - Presence of a button that opens screen which shows daily intake of the user; 	

- **Notes:**

Daily calories meter automatically resets at 12:00 a.m.

Priority: H

US-402

Registered user requirement

- **Requirement:**

As a registered user, I would like the application to advise me what dish to cook according to the daily ration so that I couldn't exceed daily caloric intake eating the dish;

- **Acceptance criteria:**

- Application is connected to the internet;
- The application shows the list of dishes to cook according to the daily ration of a user;
- Caloric content of each food shown a user doesn't exceed rest of recommended daily calorie intake;
- Presence of a button that opens screen which shows the rest of daily intake of the user;
- Presence of a button that opens screen which shows list of recommended dishes to a user;

- **Restrictions:**

Caloric content of each dish shown a user can't exceed the rest of recommended amount of calories;

- **Notes:**

A minimum of dishes shown to user is 3.

Priority: H

US-403

Registered user requirement

- **Requirement:**

As a registered user, I would like the application to advise me different diet types, so I can pick best solution for me;

- **Acceptance criteria:**

- Application is connected to the internet;
- Presence of a "Diet" button on "Ration" tab;
- Clicking "Diet" button opens diet choosing and information screen, where user can pick diet type: "Weight gain", "Weight loss", "Weight-holding";
- Clicking each type marks checkbox and opens diet list with suitable diet plans;
- Returning to previous page allows user to pick other diet parameters with saving diet

type picked; - Clicking same diet type again unmarks checkbox; - Clicking certain diet plan opens page with full information regarding it and clickable "Start using/Stop using" button - Clicking "Start using/Stop using" button starts/stops following certain diet with appropriate suggestions; • Notes: At least 3 diets for each type should be represented at first release.	Priority: H
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US-404	Registered user requirement
• Requirement: As a registered user, I would like the application to advise me correct dishes for each food intake according to my diet plan, so I can easily follow it; • Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a "Breakfast", "Lunch", and "Dinner" buttons with checkboxes on "Ration" tab; - Clicking each button opens corresponding page, containing list of recipes, which will be displayed according to picked diet plan, food left in fridge and expiration date; • Notes: At least 5 recipes should be shown to user at first release.	
Priority: H	

US-405	Registered user requirement
• Requirement: As a registered user, I would like the application to advise me different diet types, so I can pick what suits me best; • Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a "Diet" button on "Ration" tab; - Clicking "Diet" button opens diet choosing and information screen, where user can pick food type of a diet: "Ordinary", "Vegetarian", "Vegan", "Separate nutrition", "Raw diet", "Low carbs", "Low fat", "Mono"; - Clicking each type marks checkbox and opens diet list with suitable diet plans; - Returning to previous page allows user to pick other diet parameters with saving diet 	

type picked; - Clicking same food type diet again unmarks checkbox; - Clicking each type opens diet list with suitable diet plans; - Clicking certain diet plan opens page with full information regarding it and clickable "Start using/Stop using" button - Clicking "Start using/Stop using" button starts/stops following certain diet with appropriate suggestions; • Notes: At least 3 diets for each type should be represented at first release.	Priority: H
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US-406	Registered user requirement
• Requirement: As a registered user, I would like the application to be able to scan and save information about meal I've already cooked, so I can follow my diet plan correctly; • Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a "Breakfast", "Lunch", and "Dinner" buttons with checkboxes on "Ration" tab; - Clicking each button opens corresponding page, containing list of recipes, which will be displayed according to picked diet plan, food left in fridge and expiration date and "Scan meal" button; - Clicking "Scan meal" button opens scanner, allowing app to analyse prepared meal and show all necessary information about it; - If analysis was wrong, user can edit meal info by clicking "Edit" button on information screen; - Accepting analysis results marks checkbox with certain food intake; • Notes: At least 5 recipes should be shown to user at first release.	
Priority: H	

US-407	Registered user requirement
• Requirement: As a registered user, I want to be able to enter my gender, date of birth, current height, weight, and other specific info about myself in order to get precise calculations of my optimal ration;	

<ul style="list-style-type: none"> ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a clickable “My parameters” tab on the pull-out menu; - Clicking the “My parameters” tab leads to page, containing customizable parameters list including: “Gender”, “Date of birth”, “Body parameters”, “Restrictions”; - Clicking “Gender” tab opens dropdown genders list; - Clicking “Date of birth” tab opens date selection page; - Clicking “Body parameters” tab opens page where user can pick his weight and height; - Clicking “Restrictions” tab opens page where user can pick his food restrictions. 	Priority: H
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US-408	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I want to be able to enter my food restrictions regarding health problems and personal preferences, so the app will give me a suitable diet plan; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - Presence of a clickable “My parameters” tab on the pull-out menu; - Clicking the “My parameters” tab leads to page, containing customizable parameters list including: “Gender”, “Date of birth”, “Body parameters”, “Restrictions”; - Clicking “Restrictions” tab opens page where user can pick following parameters: “Allergic reactions”, “Illness”, “Pregnancy”, “Food I don’t like”; - Clicking each parameter opens corresponding page with list, allowing user to pick and save his preferences; - Application will take into account those restrictions and will suggest diets/recipes accordingly. 	
Priority: H	

US-409	Registered user requirement
<ul style="list-style-type: none"> ● Requirement: As a registered user, I would like the application to recommend me dishes according to their chemical composition so that I could eat the most useful foodstuff; ● Acceptance criteria: <ul style="list-style-type: none"> - Application is connected to the internet; - The application primarily shows a user dishes with higher biologically active substances content if caloric content of the dishes differs no more than 5%; - Chemical composition of recommended dishes is displayed on the “Ration” screen; 	

- Protein, fats and carbohydrates content determination accuracy of groceries recognized by appearance is 90% or more;
- Protein, fats and carbohydrates content determination accuracy of groceries recognized by a barcode is 98% or more (depends on manufacturer info).

- **Restrictions:**

Caloric content of each dish shown a user can't exceed the rest of recommended amount of calories;

- **Notes:**

A minimum of dishes shown a user is 3;

Priority: L

3.4.3 The feature in the form of flowchart diagram

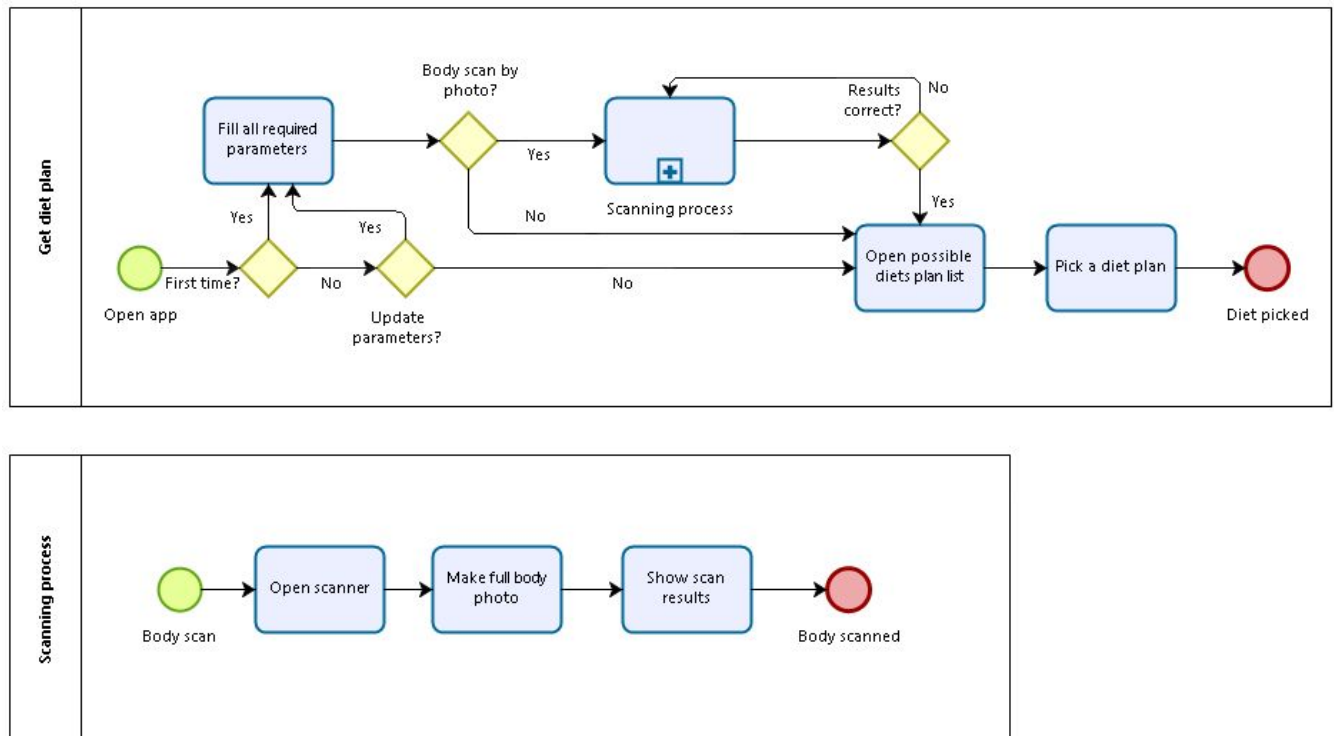


Fig. 6 - Ration flowchart diagram

Also see Product [Backlog](#) (Appendix B).

4. Data Requirements

4.1 Data Flow Diagram

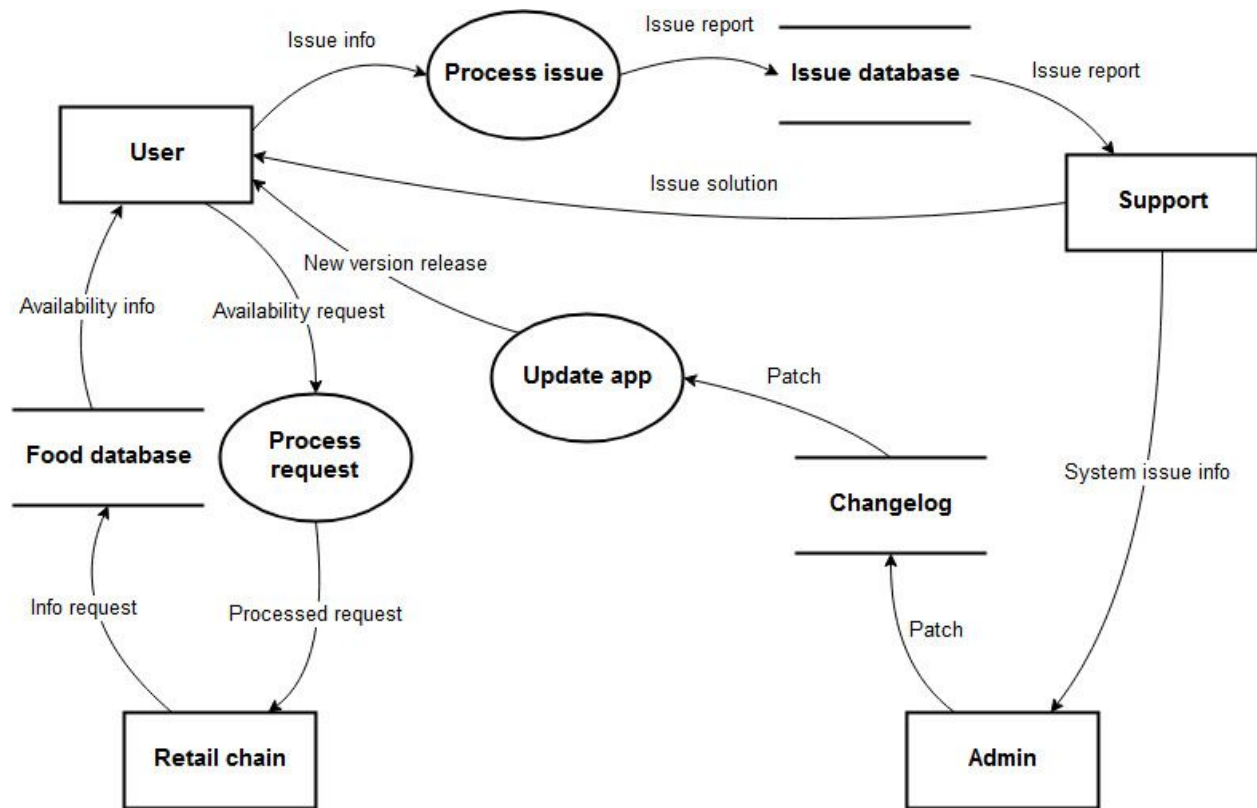


Fig. 7 - Scan&Cook data flow diagram

4.2 Data Dictionary

Data Element	Description	Composition Data Type	or Length	Values
E-mail	Used when an input of email is required	Alphanumeric	6-256	x@x.x, where x is any sequence of digits, letters or special characters (except @)

Full name	Used to display full names	Alphabetic (Latin) <First Name> <Last Name>	50	All the letters can be either capital or small
Location	Used to display a user living address	Alphanumeric	50	Hyphens and commas are permitted
Phone number	Used when an input of a phone number is required	AAA-EEE-NNNN XXXXX for area code (A), exchange (E), number (N), and extension (X)	18	
Date	Used to display dates	Date, MM/DD/YYYY	10	Default = current date
Food item description	Used to display the description of a food item	Alphanumeric	100	
Food item price	Used to display cost of a single food item	Numeric, dollars and cents	dd.cc	
Meal order	Used to display the details about a meal a user ordered	Meal order number + order date + meal date + 1:m{ordered food item} + delivery instruction + meal order status		
Meal order status	Used to display a status of an order a user made	Alphabetic	16	In process, accepted, pending delivery, delivered, cancelled
Payment method	Used to display a method how a user pays for the ordered meal	Alphabetic	16	Cash, credit card, debit card
Meal payment	Used to display the info about a payment accepted for a meal	Payment amount + payment method + transaction number		

4.3 Data Integrity, Retention, and Disposal

DI-1: The system should retain the info about recognized products for 1 week following the date of recognition.

DI-2: The system should retain the info about user's ration for 5 years following the date when his/her first meal was added.

DI-3: The system should retain payment history since the first transaction is made.

5. External Interface Requirements

5.1 Prototypes

5.1.1. Main Screen and Menu

The main screen is the starting screen of the application when a user logs in. There are the name of the app, the “Main menu” button, a user’s avatar, 4 clickable tabs, and 3 clickable buttons on the Main screen.

When a user clicks the “Main menu” button, the main menu appears. A user can choose any available option from the main menu: view recently recognized products, view all the recipes the app offers, set personal parameters, go to the app settings, or logout. If a user clicks the “Main menu” button again, the app returns him/her to the Main screen.

Clicking the “Scanner” tab, a user goes to the “Scanner Type” screen where he can scan the products which are in front of him at the moment.

Clicking the “Daily Calories Limit”, a user maximizes the picture of the diagram shown in this tab.

Clicking the “Recipes” tab, a user goes to the “Recipes” screen where he/she can find a necessary recipe.

Clicking the “Ration” tab, a user goes to the “Ration” screen where he can view and enter all the data related to his meals.

A user can send a message to the app support by clicking the question button.

A user can view the list of his/her favorite recipes clicking the star button.

A user can view what food products are in his shopping basket clicking the shopping basket button.

A user can view app updates clicking the newspaper button.



Fig. 8 - Main screen and menu prototypes

5.1.2. Scanner

One of the main features of the app is the possibility to scan and recognize food. When a user goes to the “Scanner Type” screen, he can scan the food he sees at the moment in real life. A user should wait for about 2 seconds to let the camera focus on the food shown. When the camera catches the food, its frames change the color. After that, user can press the button “SCAN” to let the app recognize the food.

Until user scan the food, the buttons “Recipe List” and “Results” are unavailable. When the food is scanned, a user can click “Recipe List” to know what recipes he can use based on those groceries app recognized. He can also click “Results” to know all the details about the food app recognized.

A user also has a possibility to get back to the Main screen from the “Scanner Type” screen.

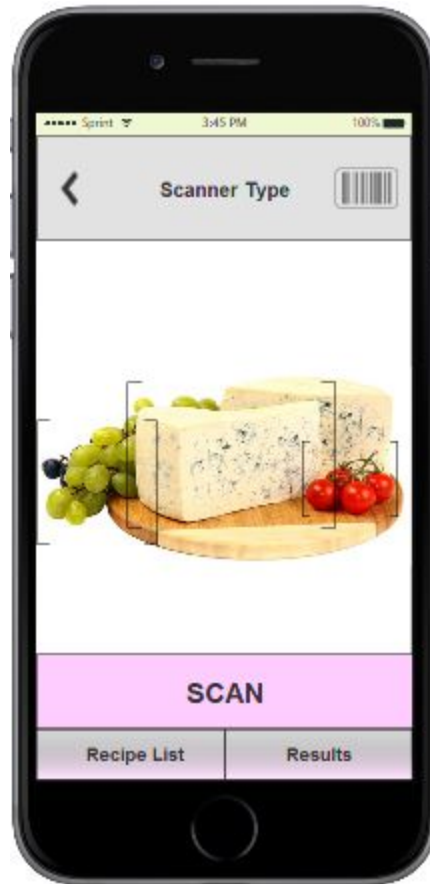


Fig. 9 - Scanner screen prototype

5.1.3. Ration

The “Ration” screen offers the following functionality:

- view the total number of calories the app user is recommended to consume per day;
- view the diagram of proteins, fats, and carbohydrates consumption;
- view short statistics on how many calories was consumed and how many calories should be consumed more today;
- add meals per one day.

A user can click any day's meal, depending on what he is eating at the moment, and scan the food (the "Scanner Type" screen opens). When the food is scanned and recognized, user automatically goes to the Meals screen - "Breakfast", "Dinner" or any other. Each meal has its own screen accordingly. All the data on a certain meal is added automatically after scanning. A user can also edit the data of his meal and save it.

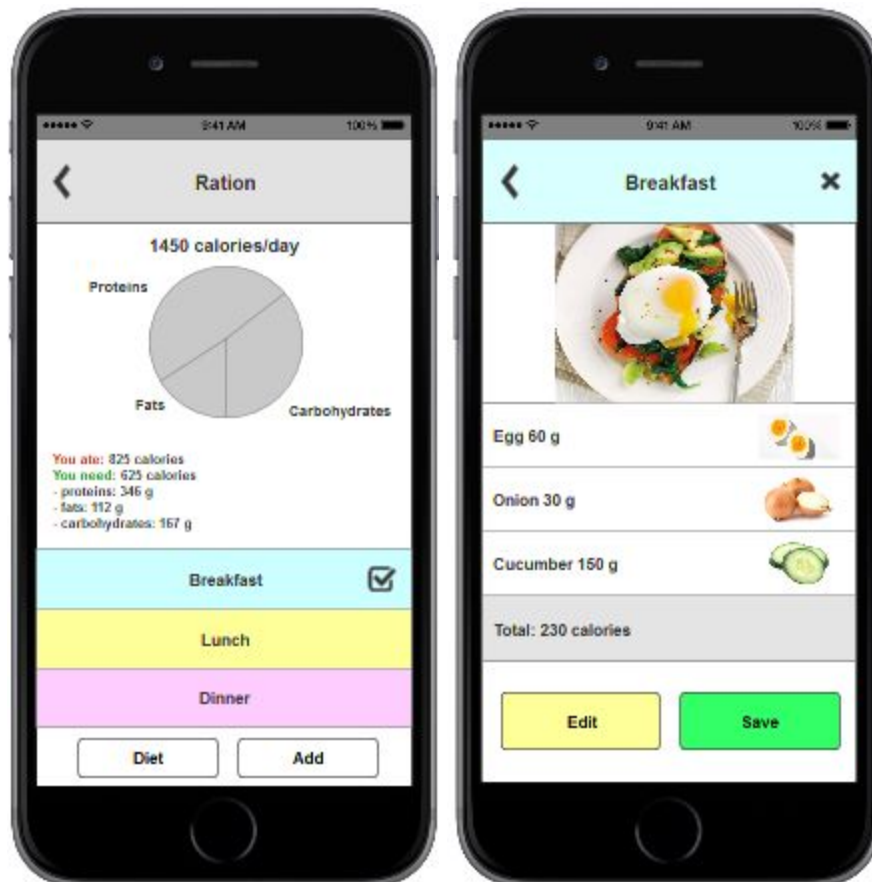


Fig. 10 - Ration screen and food intake prototypes

5.1.4. Recipes

The "Recipes" screen allows a user to make recipe selection by certain criteria:

- all recipes or recipes based on recognized food products;
- dish type;
- kitchen appliances;
- cooking time.

When all the criteria are defined, a user can click the “Search” button to find an appropriate recipe. Then a user automatically goes to the following screen where he can view the most appropriate recipes according to the specified criteria.

If a user didn't find any appropriate recipe in the proposed list, he can create his own recipe that will be automatically added to the app database.



Fig. 11 - Recipes main screen and recipe selection prototypes

5.2 User Interfaces

A first-time user of the mobile application should see the login page when he opens the application. If the is not registered, he should be able to do that on the login page. If the user is

not a first-time user, he should be able to see the main screen directly when the application is opened. Here the user chooses the type of search he wants to conduct. Every user should have a profile page where they can edit their e-mail address, phone number and password.

Also user interfaces of the application should meet a certain amount of generally accepted standards:

UI-1: User interfaces of the application shall conform to the Google's Mobile App UX Principles.

UI-2: The system shall provide a Home button from each displayed screen so that a user could return to the main screen with a single click.

5.3 Software Interfaces

The system requires a properly configured version of IOS 8 or higher to run the application. Mobile phones and tablets must have 8 megapixels camera in resolution with the image capture size of 3264 × 2448 or more. The system's server can use either Windows, Linux or UNIX, but it must have MySQL properly installed and configured.

5.4 Hardware Interfaces

The application may run on a hardware that supports IOS version 8 or higher. The device must have at least 200 megabytes of free disk space to install the application. The application does not write information directly to the user's cell phone or tablet, but instead uses a database which is located on a network server. The user's cell phone transfers and receives data from the server using basic networking protocols. All system's information is stored in the server's database which stores the data on the server's disk.

5.5 Communications Interfaces

All data transferred between the server, retail chain database and the individual devices shall use TCP/IP networking protocols through secured connection. In order to ensure unauthorized access is prohibited, Security Architecture for the Internet Protocol should meet RFC 2401 standard.

6. Quality Attributes

6.1 Usability Requirements

USE-1: The S&C shall allow a user to retrieve to previous screen with a single interaction;

USE-2: 90% of new users shall be able to successfully operate with the app without any problems on their first try;

USE-3: All buttons should be easy to allocate and tap;

6.2 Performance Requirements

PER-1: Application shall provide permanent access to ImageNet database for up to 100k users simultaneously at any given time frame with an estimated average session duration of 10 minutes;

PER-2: 98% of accessible content provided by the S&C app functionality shall be displayed completely within 1 second from the time the user requests it over a 3G or faster Internet connection;

PER-3: Application must run flawlessly on recommended devices or higher, tap response should not exceed 20ms.

6.3 Security Requirements

SEC-1: All network transactions that involve financial information or personally identifiable information shall be encrypted per BR-33;

SEC-2: Users shall be required to login to the S&C to operate it's functionality;

SEC-3: All personal information should be encrypted to prevent it's leak;

SEC-4: Any app advice that possibly will have impact on user's health condition must be followed by a warning message about responsibility.

6.4 Safety Requirements

SAF-1: S&C should allow users to upload files of appropriate formats only.

6.5 Availability Requirements

AVL-1: The S&C shall be available at all times without maintenance breaks;

AVL-2: All critical updates shall be deployed between 4:00 to 5:00 AM EST

6.6 Robustness Requirements

ROB-1: If the connection between the user and the S&C is broken prior to a new file being uploaded or received, the S&C shall enable the user to recover an incomplete action and continue working on it.

7. Appendix

7.1 Appendix A: Glossary

S&C - application name abbreviation;

SRS - Software Requirement Specification;

User story - a particular format of formulating user requirements;

MVP - minimal viable product;

App - application;

Avatar - profile image;

Google's Mobile App UX Principles - is a conversion optimisation framework tailored to "Smartphone" mobile apps. It defines the key considerations when assessing apps, in order to identify how to improve the user experience (UX), optimise conversion and measure performance;

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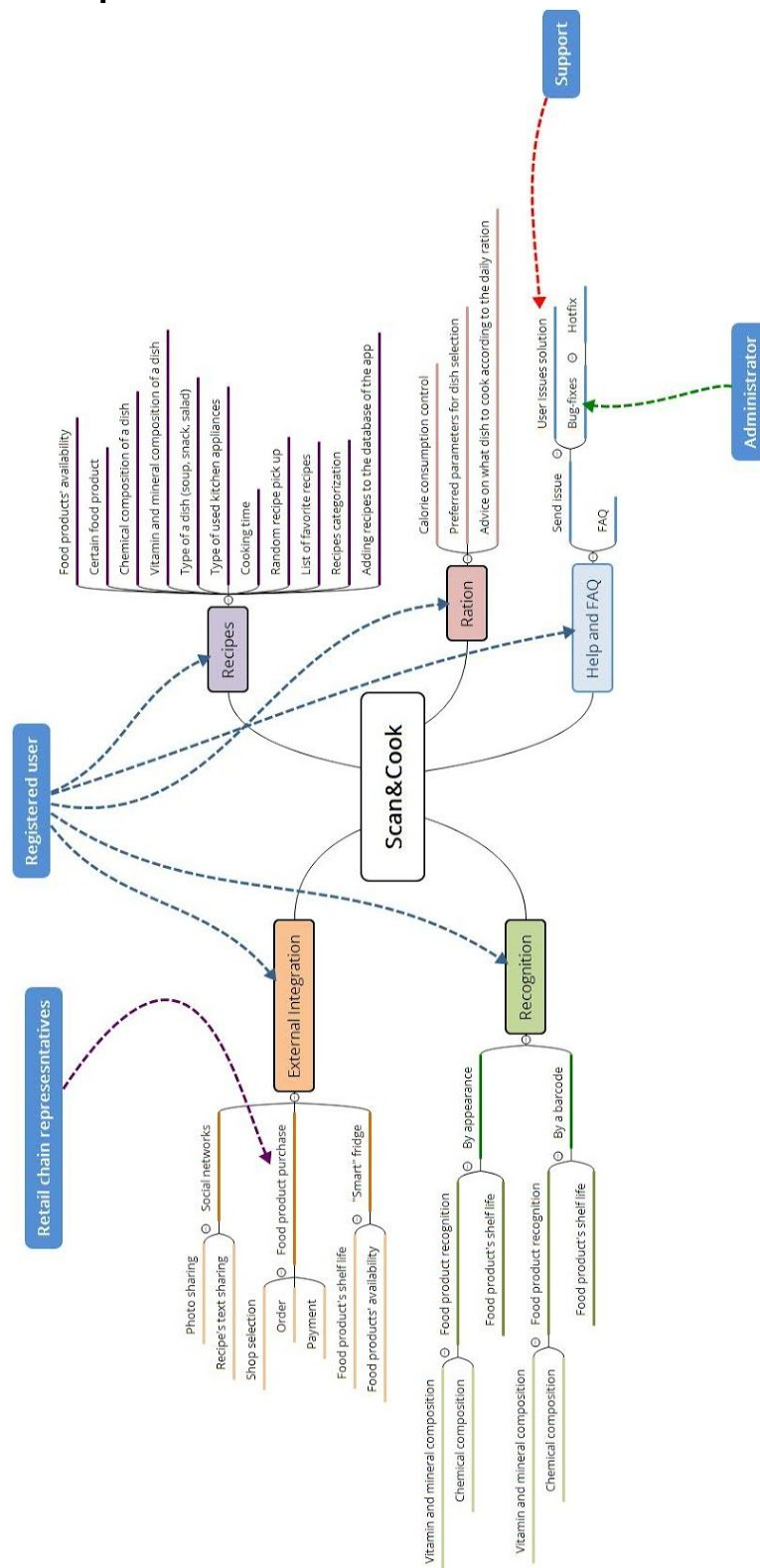


Fig. 2 - User roles on app features compliance

System Feature	ID	User Story	Priority	Status
Account	US-101	As a non-registered user, I want to be able to create an account to sign in to the application	High	Open
	US-102	As a non-registered user, I want to be able to sign up the application via Google and Facebook SSO in order to simplify the process of registration	Medium	Open
	US-103	As a registered user, I want to login to the application to manage it's features	High	Open
	US-104	As a registered user, I want to logout of the application to have a possibility to login under another account	High	Open
	US-105	As a registered user, I want to be able to restore my current password to login to the application	Medium	Open
	US-106	As a registered user, I want to be able to have access to primary features of the app on the main screen	High	Open
	US-107	As a registered user, I want to be able to get access to the app settings from main screen to set preferred options	High	Open
	US-108	As a registered user, I want to be able to set profile image to match my identity	Low	Open
	US-109	As a registered user, I want to be able to get access to app settings to set preferred parameters	Medium	Open
	US-110	As a registered user, I want "Send an issue" button in the application so that I could make report for support of the application if I meet some difficulties	High	Open
Recognition	US-111	As a support employee, I want to receive user's issues so that I could solve them as fast as possible	Medium	Open
	US-112	As an administrator of the application, I want to have an opportunity to fix bugs on the spot so that the application could be enabled for users 24/7	High	Open
	US-201	As a registered user, I would like to have an ability to scan groceries with phone camera to speed up the process of searching for suitable recipe	High	Open
	US-202	As a registered user, I would like to have an ability to scan barcodes of the groceries with phone camera to speed up the process of searching for suitable recipe	Medium	Open
	US-203	As a registered user, I would like to have an ability to have voice recognition of a groceries to speed up the process of searching for suitable recipe	Low	Open
	US-204	As a registered user, I want to be able to get the analysis of my body shape to provide best diet solution for me	Medium	Open
	US-205	As a registered user, I want to be able to get the analysis of my body shape to provide best diet solution for me	High	Open
	US-206	As a registered user, I would like the application to determine protein, fats and carbohydrates content of each recognized foodstuff so that I could control protein, fats and carbohydrates intake	High	Open
	US-207	As a registered user, I would like the application to determine the number of calories of each recognized foodstuff so that I could control calorie intake	High	Open
	US-208	As a registered user, I would like the application to determine mineral substances content of each recognized foodstuff so that I could control intake of the most important mineral substances	Low	Open
Recipes	US-209	As a registered user, I would like the application to determine biologically active substances content of each recognized foodstuff so that I could control intake of the most important vitamins	Low	Open
	US-301	As a registered user, I would like to have access to my previously recognized groceries	High	Open
	US-302	As a registered user, I would like to have access to recipe list from menu to speed up searching process	High	Open
	US-303	As a registered user, I would like the application to suggest to me recipes based on available foodstuff in my fridge so that I could choose dishes without need to go to a supermarket	Low	Open
	US-304	As a registered user, I would like the application to suggest to me recipes based on a chosen foodstuff so that I could find dishes with most favorite food	Low	Open
	US-305	As a registered user, I would like the application to suggest to me recipes based on their chemical composition so that I could choose dishes with an appropriate protein, fat and carbohydrates content	Medium	Open
	US-306	As a registered user, I would like have an opportunity to look for types of dishes so that I could find appropriate one	Medium	Open
	US-307	As a registered user, I would like have an opportunity to look for dishes by categories so that I could find appropriate dishes for different cases	Low	Open
	US-308	As a registered user, I would like have an opportunity to look for dishes based on type of used kitchen appliance for their cooking so that I could choose most appropriate recipes for me	Low	Open
	US-309	As a registered user, I would like have an opportunity to choose random recipe so that I could discover new dishes	Low	Open
Ration	US-401	As a registered user, I would like have at the application list of my favorite dishes so that I could choose their recipes with a single tap	Low	Open
	US-310	As a registered user, I want to have an opportunity to add recipes to the database of the application so that I could share my recipes with the others users of the application	Low	Open
	US-311	As a registered user, I want to look for dishes in the application by cooking time so that I could choose fast cooking dishes when I don't have time and slow cooking dishes when I have time	Low	Open
	US-402	As a registered user, I would like the application to calculate daily intake based on recognized food products' analysis so that I could control calories consumption	High	Open
	US-403	As a registered user, I would like the application to advise me what dish to cook according to the daily ration so that I couldn't exceed daily caloric intake eating the dish	High	Open
	US-404	As a registered user, I would like the application to advise me different diet types, so I can pick best solution for me	High	Open
	US-405	As a registered user, I would like the application to advise me correct dishes for each food intake according to my diet plan, so I can easily follow it	High	Open
	US-406	As a registered user, I would like the application to advise me different diet types, so I can pick what suits me best	High	Open
	US-407	As a registered user, I would like the application to be able to scan and save information about meal I've already cooked, so I can follow my diet plan correctly	High	Open
	US-408	As a registered user, I want to be able to enter my gender, date of birth, current height, weight, and other specific info about myself in order to get precise calculations of my optimal ration	High	Open
	US-409	As a registered user, I want to be able to enter my food restrictions regarding health problems and personal preferences, so the app will give me a suitable diet plan	High	Open
		As a registered user, I would like the application to recommend me dishes according to their chemical composition so that I could eat the most useful foodstuff	Low	Open

Fig. 12 - Product backlog