Department of Computer Science
Faculty of Computing and Information Technology
King Abdulaziz University

KITCHEN
compass

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Section: A2

CPCS 381

Contents

1. Introduction

The aim of this project is to design an interactive user interface for a recipe finder application (Kitchen Compass) that is specifically designed for people with dietary restrictions, food allergies, and health enthusiasts who want to customize their food based on their nutritional needs.

1.1. Why it is a problem worth solving

There are many people who have dietary restrictions or food allergies, or who simply want to eat healthier. However, it can be difficult to find recipes that fit these needs. This is because many recipes contain ingredients that don't fit their food restrictions, preferences, or nutritional needs. As a result, they often have to spend a lot of time and effort searching for recipes.

1.2. The impact of a successful design

A successful design for this application would have a number of benefits for users. It would help them to save time and effort. Make it easier for them to find a variety of healthy recipes that fit their dietary needs, and it would help them to eat healthier. This would lead to improved health and well-being for users, as well as a more convenient and enjoyable cooking experience.

1.3. The proposed solution

An application that allows users to search for healthy recipes with the following features:

- Filters recipes by dietary restrictions, food allergies, and nutritional content.
- The ability to save recipes.
- The ability to share recipes with others.
- The ability to rate recipes.
- Watch step by step video guides.
- Suggestions on recipes that are trending.

1.4. Target users

- People who have dietary restrictions such as gluten-free, vegan, vegetarian, or lactose-free.
- People who have medical conditions such as diabetes, high blood pressure.
- People who have food allergies such as tree nuts, peanuts, or wheat.
- People who have food sensitivities such as soy or dairy.
- People who have specific nutritional needs such as high-carb, sugar-free, or high-protein food.
- People who want to eat healthier.

1.5. Context of use

- At home, when they are cooking for themselves or their families.
- At work, when they are preparing food for colleagues or clients.

1.6. Review

This section will discuss a review of existing designs similar to ours and a comparison between them highlighting good and poor practices.

1.6.1. Existing designs

There are a few applications such as "All Recipe Collection" and "Yummly Recipes and Cooking Tools" that offer some of the features our application offers, however there is no app that is special for people with restricted diets or food allergies making our application a very useful addition to our society.

1.6.2. Comparison

"All recipe collection" acts as a recipe collection book of different cuisines but has no filtration feature and is limited to certain food types. **"Yummly"** offer users AI-driven personalized recommendations and recipes with dietary restrictions however it lacks the communication between chefs and users our app offers. "**Kitchen Compass"** is a comprehensive recipe application that offers a unique combination of many features catering to the needs and interests of users who are passionate about cooking and recipe sharing. The application allows users to search for recipes based on nutrition, or dietary restrictions to make the process even more efficient and tailored to the user's interests and preferences. Kitchen Compass also provides a sense of community around cooking and recipe sharing. Users can create a profile and share their own recipes for others to recreate and rate. They can

also communicate with other users about recipes and give feedback. This feature can lead to new recipe ideas and inspiration, while rating on recipes can help users make more informed decisions about which recipes to try. Another unique feature of Kitchen Compass is the ability to follow your favourite chefs. This feature provides access to exclusive recipes, tips, and the latest cooking trends and techniques. Users can stay up to date with their favourite chefs and discover new chefs to follow. Kitchen Compass also suggests the meal of the week for all users based on the recipe with the highest rating. This feature encourages users to try new recipes and engage with the community. Overall, Kitchen Compass offers a valuable addition to the recipe application market by providing a unique and comprehensive set of features. Whether you're a seasoned chef or a beginner in the kitchen, Kitchen Compass has something to offer for everyone who loves to cook and share their creations with others.

2. Requirements

2.1. Questionnaire draft

No. #	Question	Type
1	* العمر /Age ○ اقل من 18 / Less than 18 ○ 18-24 ○ 25-30 ○ 31-40 ○ 41-50 ○ اكبر من 51 /Older than 51	User Characteristics
2	* المستوى التعليمي / Education level ○ ثانوي و اقل / High school or less ○ بكالوريوس / Bachelor degree ○ دكتوراة /Phd ○ غيرذلك /Other	
3	* الحالة الوظيفية / Job status ○ طالب / Student ○ موظف / Employee ○ غير موظف / Unemployed	
4	* خبرتك في استخدام التقنية /Your experience with technology ○ مبتدئ / Beginner ○ متوسط /Intermediate ○ متقدم / Expert	

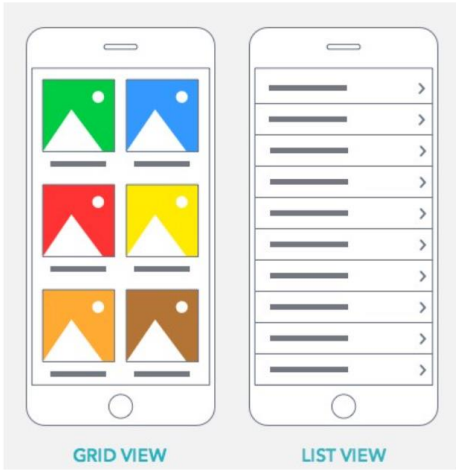| No. #	Question	Type
5	How do you usually search for food recipes that suits you? * كيف تبحث عادة عن وصفات الطعام التي تناسبك؟ ☐ تصفح الوصفات على محركات البحث/Browsing recipes on search engines ☐ منصات التواصل الاجتماعي/Social media platforms ☐ استخدام يوتيوب/Using YouTube ☐ الكتب/Books ☐ غير ذلك/Other	The proposed application being developed
6	Have you ever used cooking applications ?/ هل سبق لك ان استخدمت تطبيقات الطبخ؟ * ◯ نعم/Yes ◯ لا/No	
7	If your answer is yes, tell us what apps you have used before. اذا كانت اجابتك نعم، اخبرنا ماهي التطبيقات التي سبق لك ان استخدمتها؟ Your answer	

No. #	Question	Type
8	What types of dietary restrictions or preferences do you have that affect the way you plan and cook meals? * ما أنواع القيود أو التفضيلات الغذائية التي لديك والتي تؤثر على طريقة تخطيطك وطهي وجباتك؟ ☐ خالي من الغلوتين/Gluten-free ☐ Vegan- Vegetarian/نباتي ☐ حساسية الطعام/Food allergies ☐ خالي من اللاكتوز/ Lactose-free ☐ الحالات الطبية (مثل مرض)/Medical conditions (e.g. diabetes, high blood pressure, etc) السكري وارتفاع ضغط الدم وما إلى ذلك) ☐ الحساسيات الغذائية (مثل فول الصويا أو منتجات الألبان)/Food sensitivities (e.g. soy or dairy) ☐ لا يوجد/None	Evaluation of how tasks exist currently

9	Have you ever wanted to customize meal plans or diets based on your nutritional needs (e.g. high-carbohydrates, sugar-free, high protein etc)? * هل سبق لك أن رغبت في تخصيص خطط الوجبات أو النظم الغذائية بناءً على احتياجاتك الغذائية (مثل الكربوهيدرات العالية ، والخالية من السكر ، والبروتينات العالية ، إلخ)؟ ◯ نعم/Yes ◯ No/لا	
10	Do you think it is easy to find recipes that meet your preferences and food restrictions? * هل تعتقد انه من السهل العثور على وصفات تلبي تفضيلاتك وقيودك الغذائية؟ ◯ نعم/Yes ◯ No/لا	
11	How long does it take you to find a recipe that meets your preferences and dietary restrictions? * ما المدة التي تستغرقها للعثور على وصفة تلبي تفضيلاتك وقيودك الغذائية؟ ◯ اقل من 5 دقائق/Under 5 minutes ◯ اكثر من 5 دقائق/More than 5 minutes	
12	Did you feel like you need to have an application that filters recipes to match your preferences and food restrictions? * هل شعرت أنك بحاجة إلى تطبيق يقوم بتصفية الوصفات لتتناسب مع تفضيلاتك و قيودك الغذائية؟ ◯ نعم/Yes ◯ No/لا	
13	Do you think that this application will help you organise your daily meals and make it easier to find recipes that suit you? * هل تعتقد أن هذا التطبيق سيساعدك على تنظيم وجباتك اليومية ويسهل عليك العثور على الوصفات التي تناسبك؟ ◯ نعم/Yes ◯ No/لا	
14	Have you ever come across a recipe that you wanted to make, but couldn't because it didn't meet your dietary restrictions or preferences? * هل سبق لك أن عثرت على وصفة أردت صنعها ولكنك لم تستطع لأنها لا تتوافق مع قيودك الغذائية أو تفضيلاتك؟ ◯ نعم/Yes ◯ No/لا	

No. #	Question	Type
15	What type of device do you typically use to access the internet and/or applications related to cooking/recipes? * ما هي الأجهزة التي تستخدمها للوصول إلى الإنترنت و / أو التطبيقات المتعلقة بالطهي / الوصفات؟ ◯ هاتف ذكي /Smartphone ◯ جهاز لوحي /Tablet ◯ لابتوب /Laptop	Technical environment
16	What operating system do you use on your device? * ما هو نظام التشغيل الذي تستخدمه على جهازك؟ ◯ نظام اي او اس /iOS ◯ نظام اندرويد /Android ◯ ويندوز /Windows	

No. #	Question	Type
17	Do you often cook for others who have specific dietary restrictions or preferences? * هل تطبخ احيانا لاشخاص لديهم قيود أو تفضيلات غذائية معينة؟ ◯ نعم\Yes ◯ No\لا	Social environment
18	Would you like to have an application to share your feedback on recipes with other people and see recipes ratings ? * هل ترغب في الحصول على تطبيق لمشاركة ملاحظاتك حول الوصفات مع أشخاص آخرين والاطلاع على تقييمات الوصفات؟ ◯ نعم/Yes ◯ No/لا	

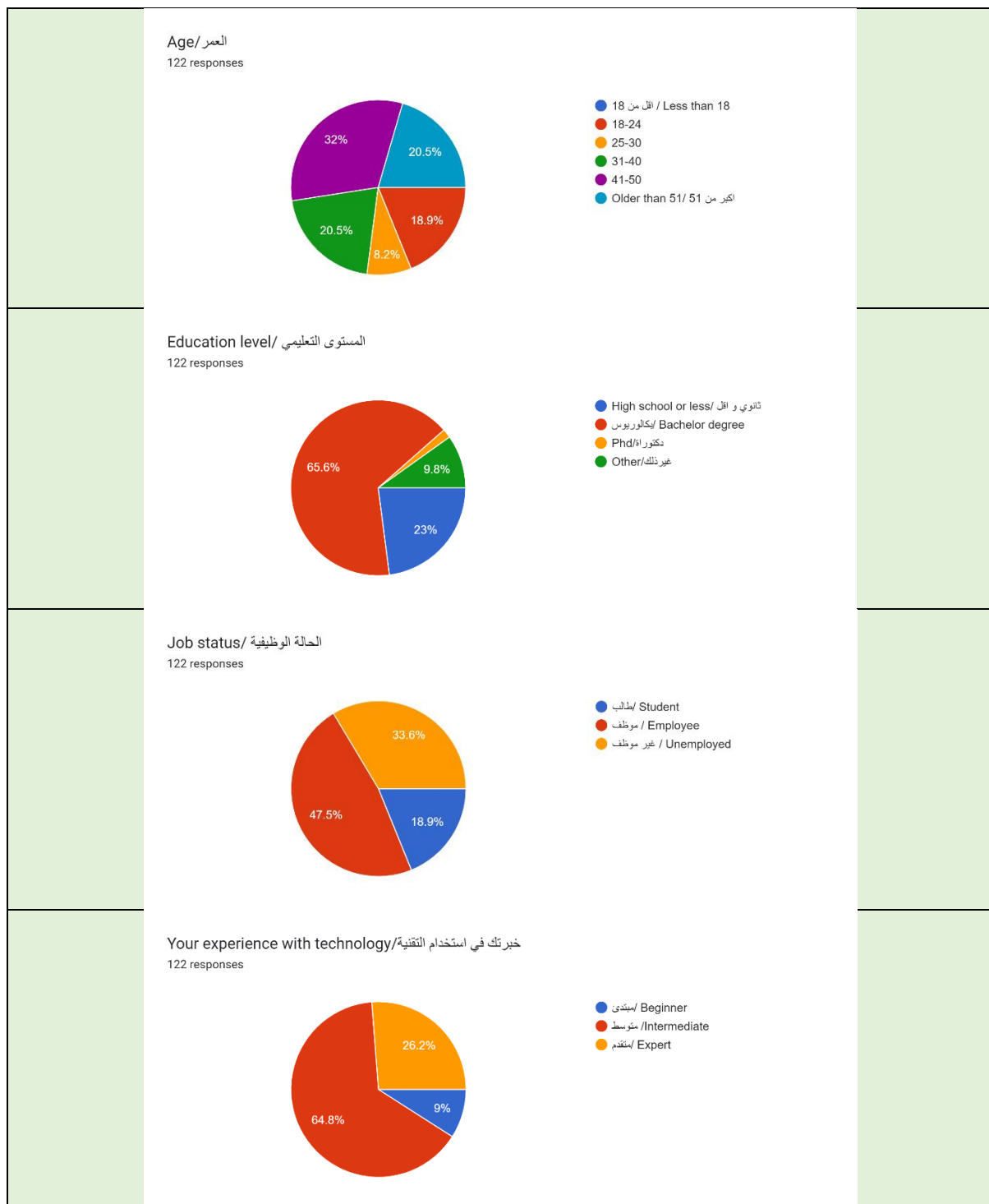| No. #	Question	Type
19	Do you have any concerns about using a recipe app while cooking? (e.g. device getting dirty, not being able to use your hands to interact with the app) * هل لديك أي مخاوف بشأن استخدام تطبيق الوصفات أثناء الطهي؟ (على سبيل المثال ، اتساخ الجهاز ، وعدم القدرة على استخدام يديك للتفاعل مع التطبيق) ◯ نعم/Yes ◯ No/لا	Physical environment

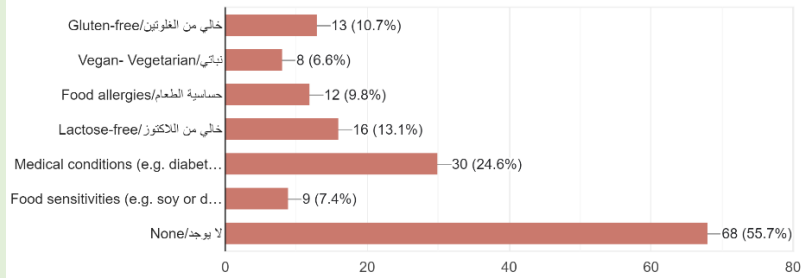| No. #	Question	Type
20	What is your preferred color scheme for the application? / كيف تفضل ان تكون واجهة البرنامج؟ * ◯ داكنة / Dark ◯ فاتحة / Light	
21	Would you prefer a minimalist design or a more visually simulating design with more elements? * هل تفضل تصميمًا بسيطًا أم تصميمًا أكثر محاكاة بصريًا مع المزيد من العناصر؟ ◯ تصميم بسيط/Minimalist design ◯ visually simulating design/تصميم محاكاة بصريًا	
22	Would you like to have an interface with Motion Graphics / moving items ? * هل تفضل الواجهات التي تحتوي على موشن جرافيك/ عناصر متحركة؟ ◯ نعم/Yes ◯ No/لا	The application design
23	How would you like the search results to be displayed? * كيف تريد أن تظهر نتائج البحث؟ ◯ عرض القائمة/List view ◯ Grid view /عرض شبكي List view vs Grid view عرض القائمة او عرض شبكي GRID VIEW LIST VIEW	

2.2. The result data

The table presents the data we collected from the survey to understand the users' preferences for the application we are developing. We asked many users who use recipe finder applications for enhancing a better version of this kind of applications. The table can be viewed from this link (Table). We used Excel as tool to help us organize the data.

2.3. Results analysis

العمر/Age
122 responses

- اقل من 18 / Less than 18
- 18-24
- 25-30
- 31-40
- 41-50
- اكبر من 51 /Older than 51

32% 20.5% 18.9% 20.5% 8.2%

المستوى التعليمي /Education level
122 responses

- ثانوي و اقل /High school or less
- بكالوريوس/Bachelor degree
- دكتوراه/Phd
- غيرذلك/Other

65.6% 9.8% 23%

الحالة الوظيفية /Job status
122 responses

- طالب /Student
- موظف / Employee
- غير موظف / Unemployed

33.6% 47.5% 18.9%

خبرتك في استخدام التقنية/Your experience with technology
122 responses

- مبتدئ /Beginner
- متوسط/Intermediate
- متقدم/Expert

26.2% 64.8% 9%

What types of dietary restrictions or preferences do you have that affect the way you plan and cook

ما أنواع القيود أو التفضيلات الغذائية التي لديك والتي تؤثر على طريقة تخطيطك وطهي وجباتك؟   meals?

122 responses

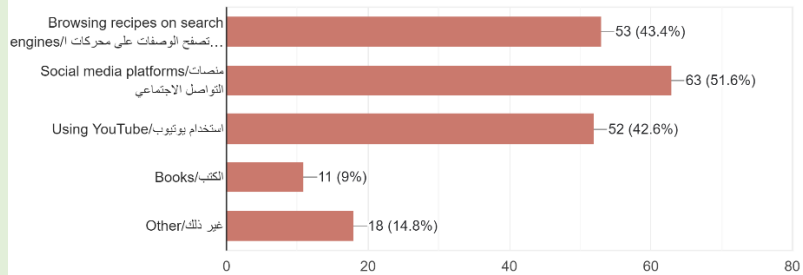|	
خالي من الغلوتين/Gluten-free	13 (10.7%)
Vegan- Vegetarian/نباتي	8 (6.6%)
Food allergies/حساسية الطعام	12 (9.8%)
خالي من اللاكتوز/Lactose-free	16 (13.1%)
Medical conditions (e.g. diabet…	30 (24.6%)
Food sensitivities (e.g. soy or d…	9 (7.4%)
لا يوجد/None	68 (55.7%)

Have you ever wanted to customize meal plans or diets based on your nutritional needs (e.g.

high-carbohydrates, sugar-free, high protein etc)?   هل سبق ل...ات العالية ، والخالية من السكر ، والبروتينات العالية ، إلخ)؟
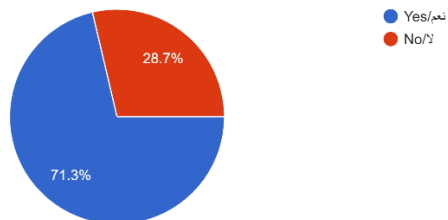
122 responses
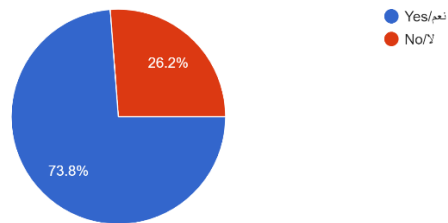
- Yes/نعم
- No/لا

26.2%

73.8%

How do you usually search for food recipes that suits you?   كيف تبحث عادة عن وصفات الطعام التي تناسبك؟

122 responses

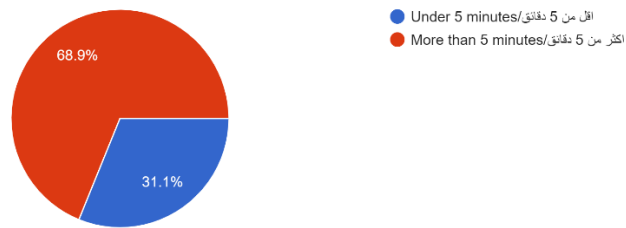|	
Browsing recipes on search engines/تصفح الوصفات على محركات ال...	53 (43.4%)
Social media platforms/منصات التواصل الاجتماعي	63 (51.6%)
استخدام يوتيوب/Using YouTube	52 (42.6%)
الكتب/Books	11 (9%)
غير ذلك/Other	18 (14.8%)

Do you think it is easy to find recipes that meet your preferences and food restrictions?   هل تعتقد انه

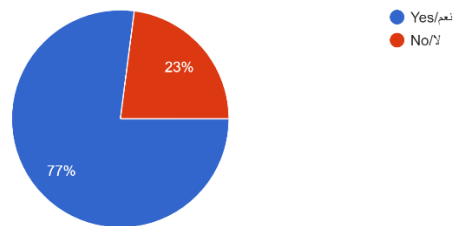من السهل العثور على وصفات تلبي تفضيلاتك وقيودك الغذائية؟

122 responses

- Yes/نعم
- No/لا

28.7%

71.3%

How long does it take you to find a recipe that meets your preferences and dietary restrictions? ما المدة التي تستغرقها للعثور على وصفة تلبي تفضيلاتك وقيودك الغذائية؟

122 responses

- اقل من 5 دقائق/Under 5 minutes
- اكثر من 5 دقائق/More than 5 minutes

68.9%

31.1%

Did you feel like you need to have an application that filters recipes to match your preferences and food restrictions? هل شعرت أنك بحاجة إلى تطبيق يقوم بتصفية الوصفات لتتناسب مع تفضيلاتك و قيودك الغذائية؟

122 responses

- نعم/Yes
- لا/No

23%

77%

Have you ever come across a recipe that you wanted to make, but couldn't because it didn't meet your dietary restrictions or preferences? هل سبق لك أن عثر...لكنك لم تستطع لأنها لا تتوافق مع قيودك الغذائية أو تفضيلاتك؟

122 responses
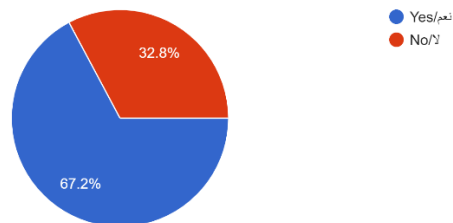
- نعم/Yes
- لا/No

32.8%

67.2%

هل سبق لك ان استخدمت تطبيقات الطبخ؟ /? Have you ever used cooking applications

122 responses

- نعم/Yes
- لا/No

77%

23%
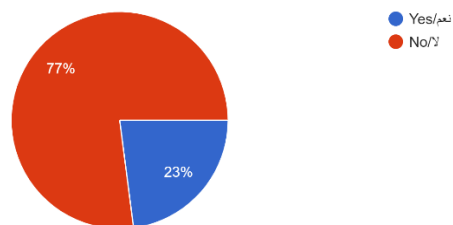
If your answer is yes, tell us what apps you have used before.

اذا كانت اجابتك نعم، اخبرنا ماهي التطبيقات التي سبق لك ان استخدمتها؟

25 responses

| |
|---|
| قوقل |
| Cookpad |
| Fitness pal |
| عالم حواء سيدتي |
| تيك توك وانستقرام ويوتيوب وسناب شات |
| كوكباد |
| اليوتيوب |
| السناب شات والواتس والتك توك |
| لايوجد |
| الحميه |
| يوتيوب انستقرام تويتر |
| تيكتوك -قوقل |
| Tastey |
| ... |
| يوتيوب انستقرام سناب شات |
| لايوجد |
| كثيرة |
| — |
| التصفح /اليتوب |
| يوتيوب |

What type of device do you typically use to access the internet and/or applications related to cooking/recipes?   ما هي الأجهزة التي تستخدمها للوصول إلى الإنترنت و / أو التطبيقات المتعلقة بالطهي / الوصفات؟
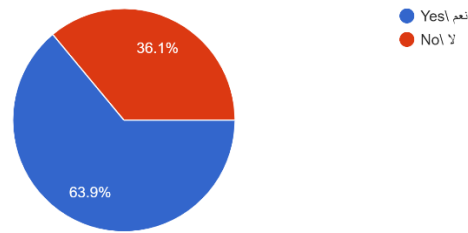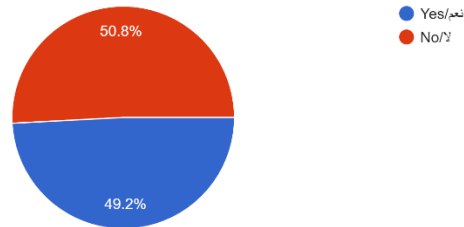
122 responses

- هاتف ذكي /Smartphone
- جهاز لوحي /Tablet
- لابتوب /Laptop

96.7%
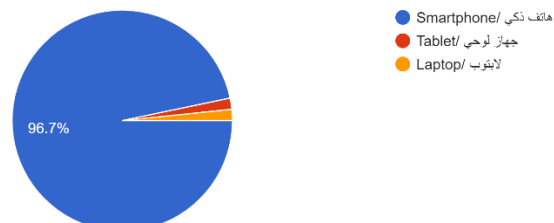
What operating system do you use on your device? ‫ما هو نظام التشغيل الذي تستخدمه على جهازك؟‬

122 responses
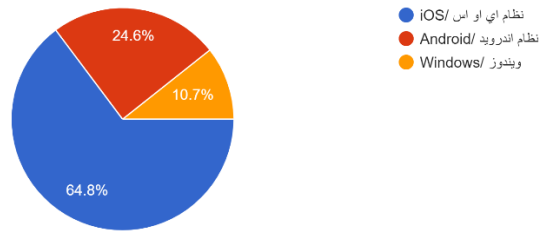
Legend:
- ‫نظام اي او اس /iOS‬
- ‫نظام اندرويد /Android‬
- ‫ويندوز /Windows‬

- 24.6%
- 10.7%
- 64.8%

Do you often cook for others who have specific dietary restrictions or preferences? ‫هل تطبخ احيانا لاشخاص لديهم قيود أو تفضيلات غذائية معينة؟‬

122 responses

Legend:
- ‫نعم \Yes‬
- ‫لا \No‬

- 36.1%
- 63.9%

Do you have any concerns about using a recipe app while cooking? (e.g. device getting dirty, not being able to use your hands to interact with the app) ‫هل... الجهاز ، وعدم القدرة على استخدام يدك للتفاعل مع التطبيق)‬

122 responses

Legend:
- ‫نعم /Yes‬
- ‫لا /No‬

- 50.8%
- 49.2%

Would you like to have an application to share your feedback on recipes with other people and see recipes ratings ? ‫ترغب في الحصول على تطبيق لمشاركة مل...حول الوصفات مع أشخاص آخرين والاطلاع على تقييمات الوصفات؟‬

122 responses

Legend:
- ‫نعم /Yes‬
- ‫لا /No‬

- 23.8%
- 76.2%

Do you think that this application will help you organise your daily meals and make it easier to find
هل تعتقد أن هذا التطبيق سيساعدك على تنظيم وجباتك اليومية ويسهل عليك العثور على الوصفات التي تناسبك؟   recipes that suit you?
122 responses

- ● Yes/نعم
- ● No/لا

86.1%
13.9%
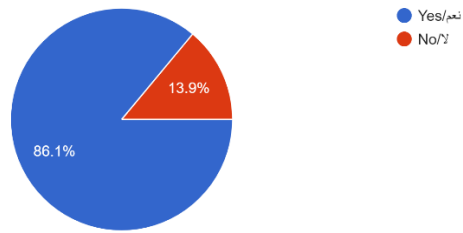
What is your preferred color scheme for the application? / كيف تفضل ان تكون واجهة البرنامج؟
122 responses

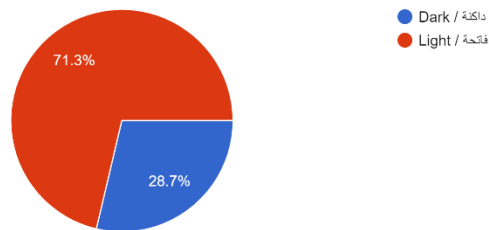- ● داكنة / Dark
- ● فاتحة / Light

71.3%
28.7%

Would you prefer a minimalist design or a more visually simulating design with more elements?   هل
تفضل تصميمًا بسيطًا أم تصميمًا أكثر محاكاة بصريًا مع المزيد من العناصر؟
122 responses
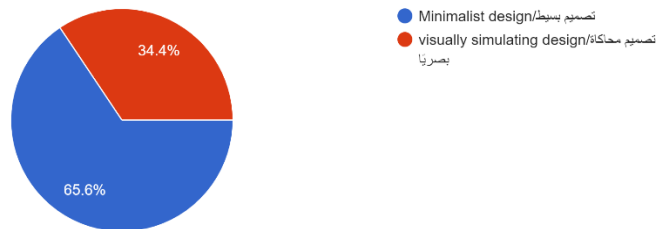
- ● Minimalist design/تصميم بسيط
- ● visually simulating design/تصميم محاكاة بصريًا

34.4%
65.6%

Would you like to have an interface with Motion Graphics / moving items ?   هل تفضل الواجهات التي تحتوي
على موشن جرافيك/ عناصر متحركة؟
122 responses

- ● Yes/نعم
- ● No/لا

32.8%
67.2%

How would you like the search results to be displayed? كيف تريد أن تظهر نتائج البحث؟
122 responses

- عرض القائمة/List view
- عرض شبكي/ Grid view

40.2%
59.8%

2.4. Data summary

Through the survey we noticed the following:

- The age of users is in different ranges. 20.7% are older than 51, 32.2% are between 41-50, while 20.7% are between 31- 40 years old.
- 65.6% of users have a bachelor's degree, while 23.1% have a high school degree or less.
- 47.9% of users are employed, while 33.9% are unemployed.
- 65.3% of users are intermediate in using technology, 25.6% are experts, while 9.1% are beginners.
- 24.8% of users have dietary restrictions due to medical conditions, 13.2% are lactose-intolerant, while 55.4% of users do not have any dietary restrictions.
- 73.6% of users want to customize meal plans or diets based on their nutritional needs, while 24,6% do not.
- 51.2% of users search for food recipes through social media, 43% browse for recipes on search engines, while 42.1% search for recipes through YouTube.
- 71.9% of users think it is easy to find recipes that meet their preferences and food restrictions, while 28.1% think it is not.
- 68.6% of user take more than 5 minutes to find a recipe that meets their preferences and dietary restrictions, while 31.4% take less than 5 minutes.
- 76.9% would like to have an application that filters recipes to match their preferences and food restrictions, while 23.1% would not.
- 66.9% of users have found a recipe but couldn't make it because it didn't meet their dietary restrictions or preferences, while 33.1% have not.
- 76.9% of users have used cooking applications, while 23.1% have not.
- 96.7 % of users use smartphones to access the internet and/or applications related to cooking/recipes.

- 65.3% of users have IOS as their operating system in their devices, and 24% have Windows.
- 64.5 % of users cook for others who have specific dietary restrictions or preferences, and 35.5 do not.
- 49.6% of users have concerns about using a recipe app while cooking, while 50.4% do not.
- 76% of users would like to have an application to share their feedback on recipes with other people and see recipes ratings.
- 86% of users think that kitchen Compass application will help them organise their daily meals and make it easier to find recipes that suit them.
- 71.9% of users prefer light colour scheme for the application, while 28.9% prefer dark colours.
- 66.1% prefer a minimalist design, while 33.9% prefer visually stimulating design with more elements.
- 66.9% of users would like to have an interface with Motion Graphics, and 33.1% would not.
- 60.3% of users would like a list view search results to be displayed, while 39.7% prefer grid view search results.

2.5. Requirements of the interface prototype

- "Kitchen Compass" will provide users with healthy recipes.
- "Kitchen Compass" will provide filters for all food restrictions, allergies, and nutritional needs.
- "Kitchen Compass" will provide a search bar to search for specific recipes.
- "Kitchen Compass" will provide an interface for your personal profile to share your own recipes and access recipes that you saved.
- "Kitchen Compass" will allow users to connect with other chefs and users.
- "Kitchen Compass" will provide consistent and amicable interfaces.
- "Kitchen Compass" will provide the user with easy and understandable interfaces.

3. Prototype

3.1. Prototype tool and supporting materials

We used Figma tool to create an interactive prototype and design the interfaces. The tool offers a variety of design resources and plugins to enhance the design workflow and productivity. It provides accessibility, flexibility, and ability to streamline the design process.

3.2. Prototype interfaces

- 2   *- 3*   *- 4*   *- 1*   *- 5*

b) visibility

- 6   *- 7*   *- 8*   *- 9*   *- 10*

a) feedback

- 11
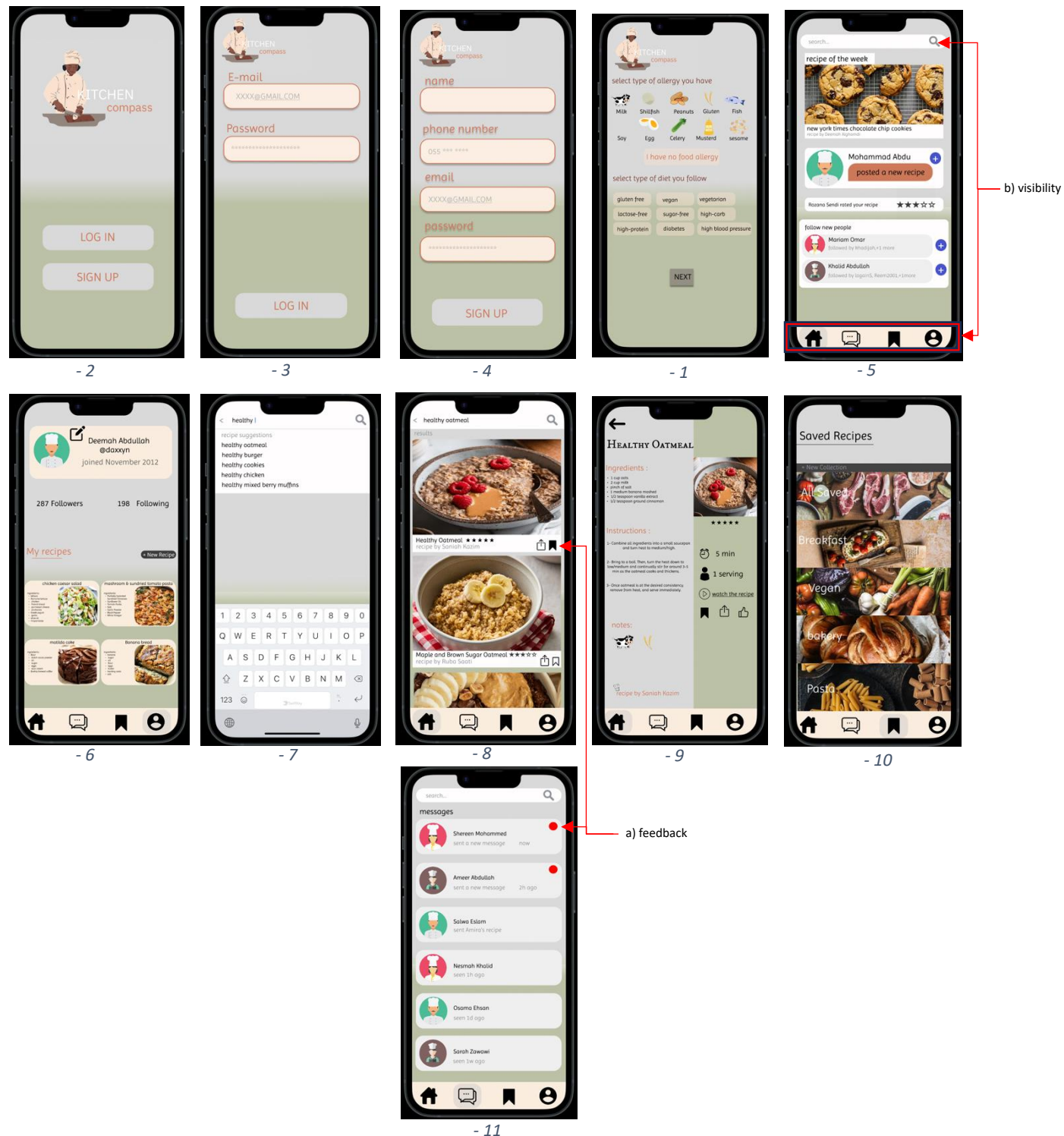
3.3. Design principles

a) Feedback	Saved Icon's colour change when a recipe is saved, and an alert icon indicates a new message. (Image 8, 11)
b) Visibility	All app functions are clear and visible making it easy to use. (Image 5)
c) Consistent	Every function is consistent throughout all the interfaces.

3.4. Cognitive process

a) Attention	Interfaces are tidy and contain just enough information.
b) Perception	The user can quickly determine the meaning of icons. (Image 4) white space and borders were used to make reading easier. (Image 7,8,11)
c) Learning	This interface allows users to select their allergy or dietary restriction but constrain them to what the app offers. (Image 4)

4. Evaluation

4.1 List of tasks

- Add a new recipe.
- Search for a recipe.
- Chat with someone.

4.2 Participants

The number of participants that participated in our experiment were 10 people, the range of their ages was between 31-40 and 41-50.
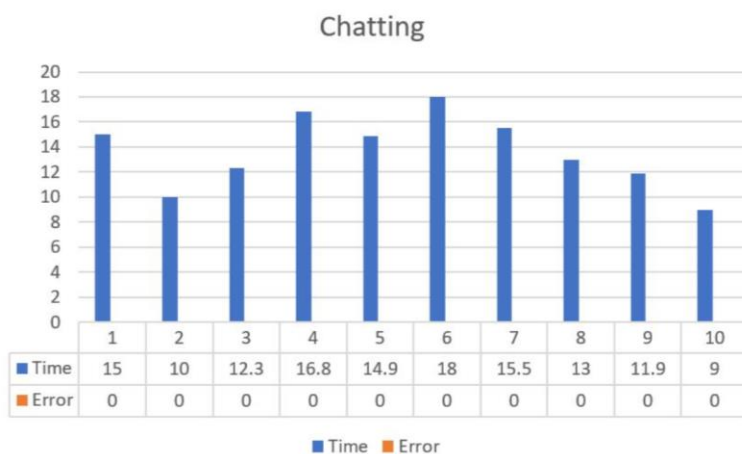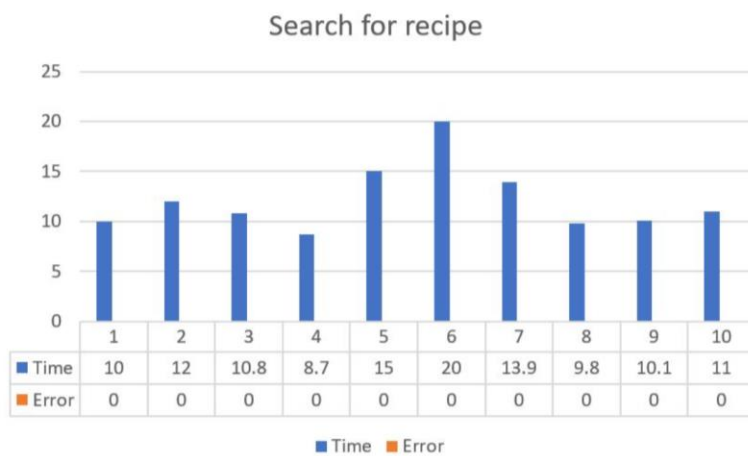
4.3 Environment

The experiment has been accomplished remotely through google meeting. The participants used their mobile phone to use kitchen Compass application.

4.4 Evaluation

Tasks	Measure	Participants									
		1	2	3	4	5	6	7	8	9	10
Add new recipe	Time	30s	25.5s	35s	40s	32.3s	37.7s	27s	31s	33s	24s
	Error	0	0	0	1	0	0	0	0	1	0
Search for recipe	Time	10s	12s	10.8s	8.7s	15s	20s	13.9s	9.8s	10.1s	11s
	Error	0	0	0	0	0	0	0	0	0	0
Chatting	Time	15s	10s	12.3s	16.8s	14.9s	18s	15.5s	13s	11.9s	9s
	Error	0	0	0	0	0	0	0	0	0	0

4.5 Analysis and results interpretation

Add new recipe

	1	2	3	4	5	6	7	8	9	10
Time	30	25.5	35	40	32.3	37.7	27	31	33	24
Error	0	0	0	1	0	0	0	0	1	0

Time ■ Error

Search for recipe

	1	2	3	4	5	6	7	8	9	10
Time	10	12	10.8	8.7	15	20	13.9	9.8	10.1	11
Error	0	0	0	0	0	0	0	0	0	0

Time ■ Error

Chatting

	1	2	3	4	5	6	7	8	9	10
Time	15	10	12.3	16.8	14.9	18	15.5	13	11.9	9
Error	0	0	0	0	0	0	0	0	0	0

Time ■ Error

5. Appendix

Questionnaire link:

https://docs.google.com/forms/d/e/1FAIpQLSeiMrlY770Y7PmWM7acRAPsbWYKeW1gN_efEUz4CWBIyLiKvQ/viewform?usp=sf_link

Prototype link:

https://www.figma.com/proto/0KqRqm4KJcb30uH4wyrObj/cpcs381?type=design&node-id=1-17&scaling=scale-down&page-id=2%3A2&starting-point-node-id=1%3A17

Excel sheet link:

https://docs.google.com/spreadsheets/d/1r0iUoq_t6r4cR6iiJ_F4Krs89_negYoYLxvDcCv752o/edit?usp=sharing