King Saud University
College of Computer and Information Sciences
Information Technology Department
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medication organizer

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1)Introduction :

These days, with the many responsibilities and distractions, we noticed in the early stages of the research that many people face a problem in taking their medicines on time, especially the elderly, so we think that it is necessary to have a machine that organizes medicines for everyone who suffers from that problem.

Due to technology in our time has become one of the most important factors that help transform problems into technical solutions, we have created the idea of (medication organizer), which is a device that can be controlled through the application of "medication on time" using the Wi-Fi network, the application provides a simple and easy way to deal With the machine, organize medicines on time and many other services to solve the problem of forgetting medicine and facilitate taking the right dose of medicine at the right time

2)Methodology:

To know more about our users and meet their requirements more efficiently, we conduct interviews and questionnaires to collect data and determine the results. We were looking for people who take medicine (pills) regularly , of different ages, that start at least from 18 to over 40 years old, to get as much information as possible.

For the interview, we interviewed 6 random people that fit our sample specifications. We asked them 10 questions that serve our topic. We focused on knowing their experiences with taking regular pills and their problems, and how we could develop a machine-connected app to meet their needs.

For the questionnaire, we did an online survey and shared it via different social media applications to collect information from various kinds of people. It contains 9 closed questions to know what users prefer about the " medication organised Machine " and the most important features and usability that suit their requirements
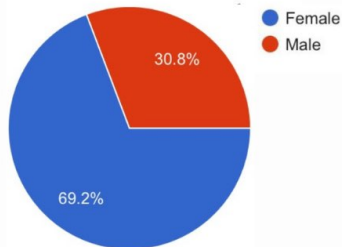
3)Result :

• interview result:

We did interviews with 6 people of different ages and gender and those people were suitable for our device's goal because of them the importance of the "Medication on Time" become clear to us. We asked them various questions to determine their difficulties in taking their medication and what they hope from "Medication on Time" to contain. The common problem they have is forgetting to take their medications on time specially older people since they often are alone and no one help them to organize their pills or read their description.

Our health is our responsibility but we notice that many people do not take their medication correctly and this will be harmful to their health, as a result, we designed (a medication organizer) that works as a reminder to help people take their medication on time, check the expiration date, and check the pills stock. The way remainder will work as a notification that contains sounds, text, and vibrations to be suitable for all possible needs. And we add a feature to connect the user profile with his family and also we add a feature that helps organize the pills with the exact dose.
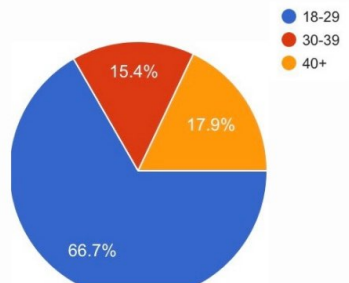
• Questionnaire results:

Based on the 40 Quistionnaire responses we have collected,we noticed that the users who answered are from different ages and most of them are suffering of forgetting their medication so we thought about making a notification system in our device and since that the majority of responses agreed on making the device connected with phones we decided to add the feature of connect our device to the phone application "medication on time" to remind the users to take their medicine on time and to make it easier to the users to deal with the medication organizer.
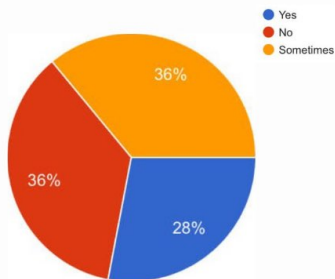
What's your gender?

- Female
- Male

Female: 69.2%
Male: 30.8%

how old are you?

- 18-29
- 30-39
- 40+

18-29: 66.7%
30-39: 15.4%
40+: 17.9%

Do you check your medicine stock regularly?

- Yes
- No
- Sometimes

Yes: 28%
No: 36%
Sometimes: 36%

do you have difficulty when in swallowing some medicine?

- Yes
- No
- Sometimes

Yes: 30.8%
No: 50%
Sometimes: 19.2%

Do you check the expiration date of your medicine?

- Yes
- No
- Sometimes

Yes: 38.5%
No: 30.8%
Sometimes: 30.8%
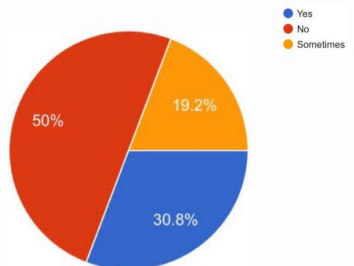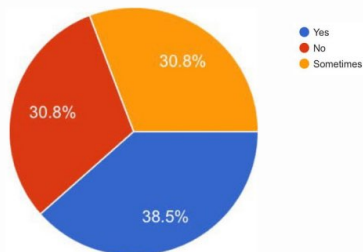
do you wish to have adevice that helps you reading your prescription?
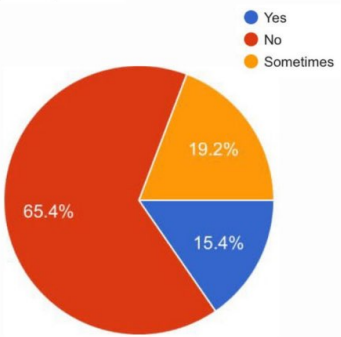
- Yes
- No
- Sometimes

19.2%

65.4%

15.4%

would you like to connect the device to your phone or just a standalone device?

- Connected to my phone
- Standalone device

7.7%

92.3%

Would you rather to have a device that helps you to organize your medication?

- Yes
- No
- Sometimes

15.4%

80.8%

Do you usually forget taking your medicine?

- Yes
- No

19.2%

80.8%
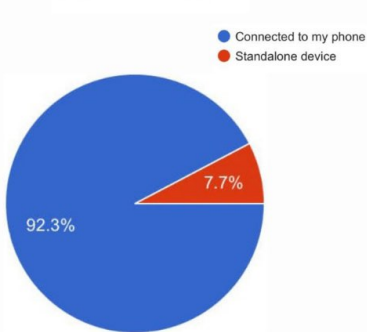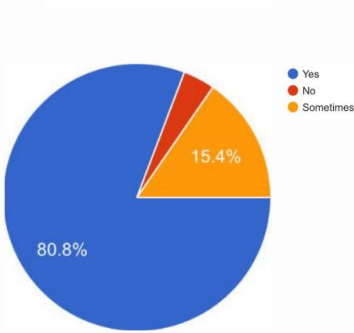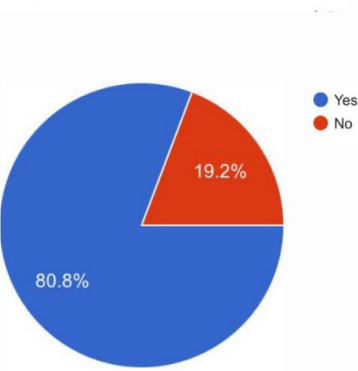
We identified our personas based on the information we gathered from interviews and the questionnaire. The first persona is "Sara " she is 26 years old employee , she has diabetes, so she needs to make her family more informed about her health to help her organize her medication and make sure she takes it. We defined "Sara" based on [Interview 1 answer (4,9)], [Interview 2,5,6 answer (9)], [Interview 3answer (4,6,9)], and the questionnaire results.
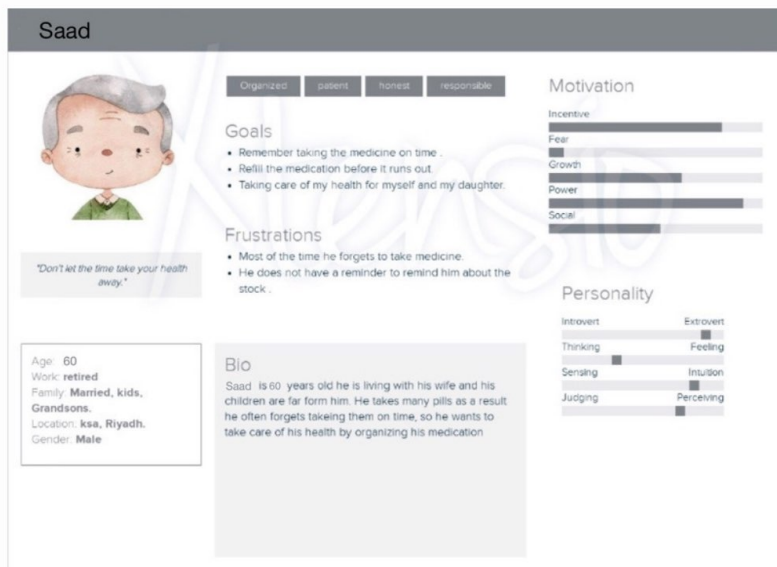
The second persona is "saad " is a 60 year old retired , he takes many medicines and suffers during that, as he always forgets to take them. He needs to be reminded of the times of his medication in order to maintain his health . We defined "Saad " based on [all Interviews answer (4,)], [Interview 1, 3 5 answer (7,8)],and the questionnaire results.

Saad

Organized patient honest responsible

Goals
- Remember taking the medicine on time .
- Refill the medication before it runs out.
- Taking care of my health for myself and my daughter.

Frustrations
- Most of the time he forgets to take medicine.
- He does not have a reminder to remind him about the stock .

"Don't let the time take your health away."

Age: 60
Work: retired
Family: Married, kids, Grandsons.
Location: ksa, Riyadh.
Gender: Male

Bio
Saad is 60 years old he is living with his wife and his children are far form him. He takes many pills as a result he often forgets takeing them on time, so he wants to take care of his health by organizing his medication

Motivation
Incentive
Fear
Growth
Power
Social

Personality
Introvert — Extrovert
Thinking — Feeling
Sensing — Intuition
Judging — Perceiving

Sara

powerfull outgoing hard working

Goals
- Informing my family about my health state all the time.
- Pay more attention to the time.
- Make sure to take all the medications before bed.

"I'm not lit my pancreas is just lazy"

Frustrations
- She does not have a daily medication schedule to check.
- Her family do not know where her decicine is, so they can not help her.

Age: 26
Work: employee at a company
Family: Parents, siblings
Location: ksa, Jeddah.
Gender: Female

Bio

Sara is 26 years old she lives with her family. She works at a company for 8 hours per day she forgets the exact time to take her medication, when blood sugar drops her family doesn't know where to find her medicine, so she wants to inform her family about her health and make sure to take her medication package to the job.

Motivation
- Incentive
- Fear
- Growth
- Power
- Social

Personality

Introvert	Extrovert
Thinking	Feeling
Sensing	Intuition
Judging	Perceiving

4)conclusion:

And because most people have responsibilities and preoccupations, but despite that, we must not forget to take care of health in the midst of those work and preoccupations, so most people will need a device that regulates medicines. This is exactly why our application is useful for many users, it will help a various group of users to use and organize a variety of medicines.

Upon interviewing these people and sharing our questionnaire, most of the answers were exactly as we expected, however some of the answers made us collect some points that we missed while thinking about this app.

Firstly , we thought that the target group is especially the elderly, as they are the group that suffers the most when organizing medicines, but we discovered that all groups need a medication organizer and everyone suffers from forgetting to take and organize medicine.

Secondly ,another thing that benefit us from these interviews is that we discovered that most of the age groups and even the elderly have the desire and ability to make technology help in facilitating his life, as even the elderly who cannot read are not satisfied with making their children read for them, but also want to learn to use technology in facilitate it

To conclude , these points prompted us to add a few functionalities. Such as: the alert to refill the medication a period before the end of the quantity, and the feature of choosing between taking a package for all of today's medicines and the alerts be from the application or that the medication be in the device and alerts from the device, and the feature of reading the text for those who cannot read, and in order to preserve the privacy of the user, he can choose to share his information with the family or not share it.

Appendix A : interviews

• Questions:

Q1- Tell me what kind of medicine do you prefer ? (drink , pill , or effervescent tablet)

Q2- How would you like the size of medication regulator to be ?

Q3- what are the difficulties you face in organizing your medicines?

Q4 - Do you think that the medicine regulator device will help you? Why?

Q5 - What kinds of pills do you take?

Q6 - what are the reasons that make you forget to take your medicines on time?

Q7- If you will design the device what features do you want to add?

Q8- When a notification is sent, how would you like it to be?

Q9 - Do you feel comfortable sharing your medication information with your family members? Why?

Q10- Would you rather be shown how much medication you have left to take in your day or the notifications is enough for you?

- ## interview transcription:

interview #1

interviewee: sultan ,68-year-old man.
interviewer : Taif .

Q1: pill and effervescent tablet
Q2: not too big.
Q 3: I often forget the appointment of the medicine, and sometimes I remember, but the quantity is out.
Q4: In fact, yes, it will help me very much. Sometimes I may not forget the medication that I take daily, but I always forget the weekly or monthly medication.
Q5: Currently I take a lot : vitamin D every week, stress pills every day, and some other vitamins.
Q6: As I mentioned, some of my medications are once a week, so I forget about them, and there are a lot of responsibilities that make me forget to take the medication.
Q7: I want notifications. I think this is enough to remind me. I also wish if it alert me a week before the amount of medicine runs out so that I can make an appointment with my doctor. I prefer that the application be easy to use and simple.
Q8: I wish it had a sound so that I could distinguish it among my notifications.
Q9: Of course, that would be very convenient, as my daughter always worries about me.
Q10: Notifications are enough, but having that would be more than wonderful.

interview #2

.interviewee: Haya ,55-year-old Woman
. interviewer : Taif

Q1: pills.
Q2: big, but I can carry it with my hands.
Q3: I think I forget because life's responsibilities are many.
Q4 : Wow, that would be nice. I can't read and sometimes my medicines have the same color. It is good for him to organize them for me to distinguish them.
Q5 : I am currently taking bone and joint pills, vitamin D, some sedatives.
Q6 : There is no reason why I am so forgetful, even in my daily work, I always need someone to remind me.
Q7 : I hope that I can share my information with my children, as they are taking care of me. I cannot read, so I hope that there is a feature that helps me use the application. I do not want bright colors, as they disturb the comfort of my eyes.
Q8 : I want it to have a sound and read the content of the notifications to me.
Q9: Yes, this is wonderful. My children will be able to check on me without having to visit me while they are busy.
Q10: Yes, I prefer that. I hope that the warning will be a time before the quantity runs out so that there is an opportunity to inform my children.

interview #3

interviewee: Sara ,26-year-old men.
 interviewer : Shahad .

Q1: pills

Q2: Not too big nor too small.

Q3: As a diabetic patient, some medications require to be scheduled with mealtimes the problem is I usually forget if the pill is taken before or after the meal.

Q4: I think yes since most people don't pay attention to medication time, furthermore the people who work long hours will help them a lot.

Q5: Yes as I said I am a diabetic patient so I take diabetes medication and vitamin D.

Q6: There are many but the most important I don't pay attention to is the pill's time, also sometimes I don't bring my pills with me to my company.

Q7: The feature I want is a reminder to inform me when it's my pill's time and to remind me to take my medication with me to my job.

Q8: I think both I will need because sometimes the phone is not close to me so the sound will help.

Q9: of course because if my diabetes is starting to drop down sometimes I can't even go to find my pills so my family will help me with that.

Q10 : yes I prefer to know how much left I need to consider if I can sleep or not.

interview #4

interviewee: Kahlid ,22-year-old men.
 interviewer : Shahad.

Q1:pills

Q2: Medium size like a coffee machine.

Q3: I don't take my medicine on time since I have a busy life I am a senior and I have a part-time job.

Q4: Yes surely will help me to regulate my medication and achieve the goal of treatment correctly.

Q5: I suffer from anxiety so I take anxiety pills and some vitamins.

Q6: I often forget to take it with me outside the house and as you know I go to the university and I have a part-time job, thus I don't take my medication on time.

Q7: I need it to remind me to bring my pills with me when I go out and I wish the device to be connected to my phone so I can know the time of medication easier.

Q8 :I think I would like it to be as a text.

Q9: No actually my family doesn't know about all my medicines so if it connects to them they will be
 worried about me if I take it or not.

Q10 :yes, of course, it is going to help arrange the rest of my day considering how much I have left to take.

interview #5

interviewee: Shoug ,40 -year-old women .
 interviewer :Raghad

Q1:pills and effervescent tablet
Q2:portable size.
Q3:I am suffering of forgetting my medicine
Q4 :Yes,It will help me to take my medicine at time and organize them
Q5: I take thyroid medication and vitamin D.
Q6:because I am a mother and I am always busy with my children so I forget
my medicine
Q7 : I would like a feature about the expiration date so when one of my pill has expired I receive a notification
Q8 : I like that the notifications would have a sound like an alarm and my
phone vibrate
Q9 : yes,so they help me manage my medication and remind me of them
Q10 : yes I would like to know so I don't forget taking them before I sleep.

interview #6

interviewee: Saleh ,35 -year-old men.
 interviewer : Raghad .

Q1:pills.
Q2: l don't mind the big size
Q3 : I forget taking them and sometimes i forget the right dose to take .
Q4 :yes,so it will remind me of taking my pill and keep my pills so I don't lose them
Q5: I take diabetes pill and urinary tract pills
Q6 : I forget to take them with me at morning before going to work and because the diabetes medication is hard
to organize .
Q7: I want to add a feature about my job time so before I go to my job the device reminds me to take my pills
with me
Q8 :I like to show the notifications on my phone screen and receive an alarm so I hear the alarm and see the
notification
Q9 :yes,so they know where I put my diabetes medication so they give them to me when I get tired
Q10: yes,so I know how much medicine left to take this day

Appendix B: questionnaire

• Questions :

Q1- What is your gender?

Q2- how old are you?

Q3 - do you usually forget taking your medicine?

Q4- would you rather to have a device that helps you to organize your medication?

Q5- do you check the expiration date of your medication regularly?

Q6-do you wish to have a device support you to read your prescription?

Q7-Would you like to connect the device to your phone or just a standalone device?

Q8 - do you have difficulty when you need to break your pills into two parts?

Q9- do you check your medicine stock regularly?