

Hey Food

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1 Our goal

Our initial idea is to build a voice service that enables the user to order takeaway food from a specific restaurant. So, the system should act as a waiter and give information about the menu. The service will save orders.

2 Similar services analysis

We analyzed several similar services. So, we looked into some food-ordering voice chatbots available online. These are a few of those.

2.1 RunnerPizza's Skill

It's a service that lets customers order pizza via a chatbot (Alexa). It's possible to make a new order, select a specific pizza from the list of pizzas available and finally choose delivery time and the address. Alexa provides feedback to the customer after each completed step in the process. The interaction is very intuitive and simple due to the developed schematic process, and in this way, every type of user is able to make a new order. The whole process takes very few minutes. On the other hand, it's only possible to check/modify or delete the order on RunnerPizza's website and this is the big limitation of this service. The power of this type of service is given by the use of the voice, which in the meantime allows the customer to do other things. So, each task related to this kind of service should also be completed with the voice. Even if our service takes into account different types of food and implements other operations related to the order (e.g. checking the status of the order via Alexa), this service is a very good starting point for what we want to achieve.

2.2 Domino's Skill

This skill is provided by Domino's Pizza; it allows the user to place pizza orders in their restaurants. Differently from RunnerPizza, this skill also lets you check the status of an order. Also in this case, the limitation is given by the fact that the system only works for one franchise of restaurants.

2.3 Starbucks Reorder's Skill

Pretty simple, it basically only allows you to place (usual) orders that were originally done through the app. Free to use, limited to a few functions, and also allows you to check the balance of the associated card. The app provides you with a history of your orders so that you can place an old order again. After that, it gives you a list of physical coffee shops where you can collect your order.

3 Need finding

We have made an analysis of the possible scenario in which this kind of system could be useful. Thus, we have thought about the main need that users could have. That is making an order to a given restaurant. This need will be tackled in subsequent sections by thoroughly describing the task.

4 Stakeholder interview

As for standard users that want to order food, it is important to understand the needs and points of view expressed by the other stakeholders of the system. In this case we interviewed the owner of a pizza restaurant, who started a takeaway and home delivery service during the pandemic crisis. We asked him for a personal opinion on the system we aim to deploy according to the logic of his business. This allow us to follow a design pattern that is not only user centered respect the interaction but also driven by the business needs.

1. **What are your ordering channels for the takeaway? What is the sales volume generated by each of them in proportion?**

I offer my customers different methods to order in my restaurant: by phone, through my website, through the generic delivery apps, and through social networks and in particular whatsapp business. Maybe, on average 50% of the orders are taken by phone, 30% via generic apps, 10% through our website, and the remaining through social media.

2. **How do you choose your restaurant sales channels? How important is it in your opinion to have multiple ordering methods?**

I choose the sales methods mainly based on the visibility that the method offers to my restaurant with respect to potential customers, and then i also look at the price i have to pay to use it of course. Have more sales channels is important to reach a larger customer population.

3. **Would it be interesting in your opinion to develop a voice chat software based on artificial intelligence that allows the customer to order pizza or something else?**

I think so, now people tend to use the smartphone and apps more and more, and the percentage of the calls are decreasing. It can also be an idea that can be specially advertised and can give a modern and advanced image of the restaurant that adopt it.

4. **In your opinion, what is the valuable feature that you consider more important for this system for the goals of your business?**

The most important thing for me is that the robot is as human as possible, or rather he knows the menu and knows how to explain our dishes to customers. The coolest feature would be if it acted like a virtual waiter, trying to sell more than what customers ask for themselves.

5 User Interviews

We conducted some interviews to have a deeper and less biased understanding of what people need when it comes to ordering takeaway food. The following points came out:

- Many people order takeaway food, at least sometimes. Most of them think that it is convenient since they do not have to cook. It also is a way to eat some particular food, that can be different from the usual.
- Some people are used to call restaurants to make orders, while others leverage food ordering apps. Somebody goes to restaurants in person to place an order.
- People that use apps think that it is a great way to order food without risking that the information comes across as incorrect, as it could happen with a phone call. Apps make it easier to check the menu, check the status of an order, and discover new restaurants. However, apps sometimes contain bugs. Somebody complains about having to call a restaurant multiple times because the line is busy. A waiter could be useful to give advice.
- Some people would feel comfortable ordering food with a voice chatbot. They think that it is fast and easy to interact via voice and it would feel similar to talking to a human, but in a more accurate way. Additionally, some claim to be technology enthusiasts and would appreciate such a situation. Others, instead, think that they would not feel comfortable talking to a bot.

6 Questionnaires

We conducted a questionnaire with the aim of verifying, on a large scale, the needs that were found in the interviews.

The questionnaire was structured to make it possible to select a completion language (i.e. English or Italian), and then to navigate among its sections. The choice of the dual language stems from the idea of wanting to reach as many people as possible in order to validate the observations relating to the interview phase, with an important consequence: as the sample size increases, the audience considered tends to be more heterogeneous, that is, it becomes less likely to consider only a particular target.

In fact, the questionnaire reached a larger audience than that considered in the interview phase, reaching over 160 people.

We present below the most interesting considerations that resulted from the questionnaires:

- Only 12% of interviewed people claim that they never order takeaway food (the remaining 88% do it at least sometimes).
- About 58% of them find it convenient so that they do not have to cook. 50% claim that it is fast and they can save time.
- The majority of people either order via phone call or use a general food ordering app.
- Almost three quarters of interviewed people would use a voice chatbot to make a food order. Almost 80% of them think that it would be easy and fast to use. More than a quarter of them is a technology enthusiast, and would just use for the sake of it.
- The most frequent reasons that the remaining quarter of people that would not use such a system have are: the impossibility to visually check a menu and the need of an app to do that; less comfortable experience; wariness for voice assistants.

6.1 Meaningful charts

Quanto frequentemente ordini cibo d'asporto? (inclusendo il servizio a domicilio)?

156 responses

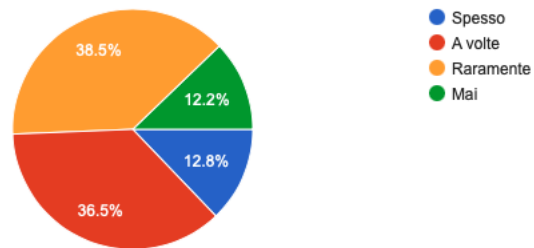


Figure 1: Takeaway order frequency.

Quali sono le principali motivazioni a questa scelta? (seleziona tutte le opzioni valide)

137 responses

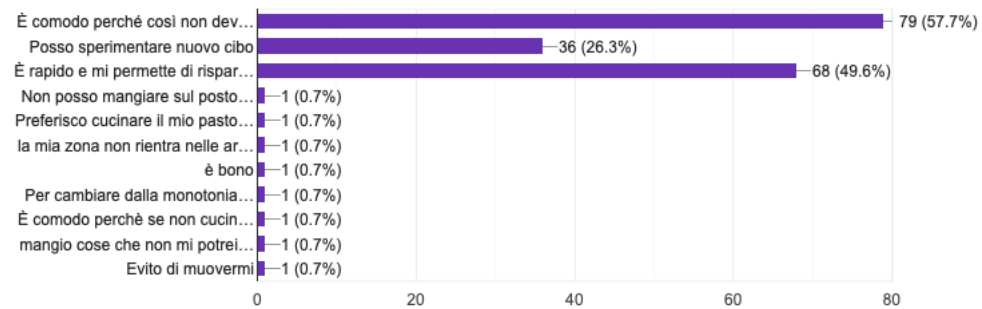


Figure 2: Reasons for ordering takeaway food.

Solitamente come ordini il cibo?

137 responses

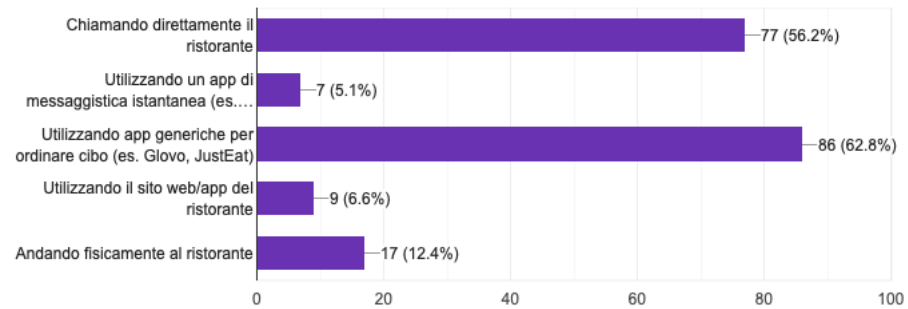


Figure 3: Ways of ordering takeaway food.

Utilizzeresti un assistente vocale per ordinare cibo d'asporto? (es. Alexa, Siri, Google Assistant)

137 responses

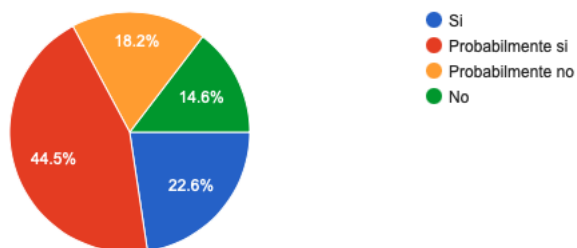


Figure 4: Opinions on using a voice chatbot for ordering food.

Perché lo utilizzeresti?

92 responses

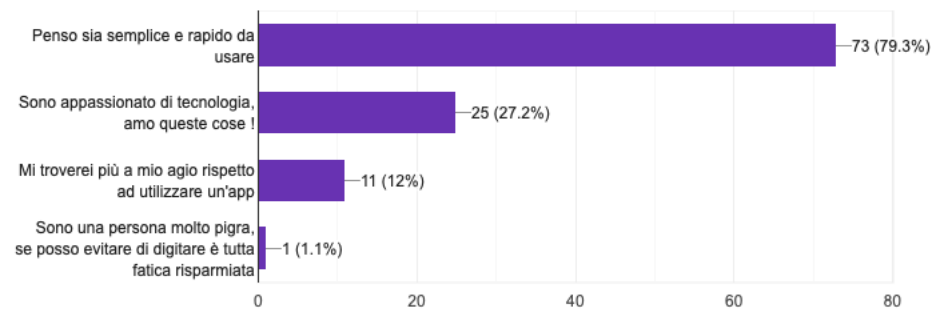


Figure 5: Reasons to use a voice chatbot to order food.

7 Real Ordering Calls

In this section, we report two real examples of phone calls to the restaurant made by customers that want to order their food. This is extremely important because we want to understand the practical flow of the conversation and the various problems that could arise in the real-world scenario.

First Call

Restaurant: Good Evening, ***** Restaurant.

Customer: Hi, I'd like to order some pizzas for tonight, is it possible?

Restaurant: Sure sir, absolutely, will you come here or will we bring them to you?

Customer: I want takeaway.

Restaurant: At what time did he want?

Customer: 8:30

Restaurant: 8:30 sir it is not possible we are already full, it is ok 8:15 or 8:45?

Customer: 8:15 is ok.

Restaurant: Perfect, leave me a name.

Customer: Moretti

Restaurant: Yes, please list me the pizzas.

Customer: One margherita

Restaurant: yes..

Customer: then two friarielli and salsiccia.

Restaurant: Something else, sir?

Customer: No thanks, that's ok.

Restaurant: Okay, kindly leave me a phone number.

Customer: 328 *** **** .

Restaurant: Perfect, see you this evening, have a nice day!.

Second Call

Restaurant: Good Evening, ***** Restaurant.

Customer: Hi, I want some pizzas for tonight at home.

Restaurant: Yes, at what time?

Customer: 8:15

Restaurant: 8:15 sir it is not possible, is it ok for 7:45?

Customer: 7:45 is fine.

Restaurant: Perfect, leave me the surname on the intercom.

Customer: Cingolani

Restaurant: Yes, please list me the pizzas.

Customer: One Bufala and Porcini

Restaurant: yes.. then?

Customer: One with the anchovies

Restaurant: Do you mean a Napoli?

Customer: Yes, exactly.

Restaurant: Do you want something else, a suppli, a bottle of coca cola?

Customer: Why not, also two suppli, thanks.

Restaurant: Okay, please give me your home address.

Customer: Via di San Martino 2**

Restaurant: Okay, kindly leave me also a phone number.

Customer: 380 *** **** .

Restaurant: Perfect, the total price is 16€, you have to pay to the delivery-man.

Customer: Thanks a lot, I'll wait for you tonight.

8 Wizard of Oz Test

Before starting to develop our voice chatbot, we applied a prototyping technique to test the main use cases on real users. These tests allowed us to detect various weak points in the interaction between the two actors and change the voice interface accordingly. The chosen technique is the Wizard of Oz. It consists of a person that pretends to be the voice chatbot and formulates sentences according to the pre-defined rules. The user, on the other hand, does not know that he is interacting with a human but thinks that there is a machine on the other side. We applied this technique both through text messages and through voice.

8.1 Text Messages Test

Test n°1:

Bot: Welcome to HeyFood. What pizza would you like to order? For example, you can ask me for a pepperoni pizza with extra cheese, and I will suggest you the most similar pizza available on the menu.

User: I would like a Margherita

Bot: Ok, we have the Margherita pizza. Its ingredients are: tomato, mozzarella cheese. It costs 10 euros. Is that fine?

User: With extra cheese

Bot: I am sorry, I didn't quite get it. What pizza would you like to order? For example you can ask me for a pepperoni pizza with extra cheese, and I will suggest you the most similar pizza available on the menu.

User: I would like a margherita pizza with extra cheese

Bot: Ok, we have the Margherita pizza. Its ingredients are: tomato, mozzarella cheese. It costs 10 euros. Is that fine?

User: Yes

Bot: How many Margherita pizzas would you like to order?

User: 1

Bot: Okay, it's 10 euros so far. Would you like to add anything else?

User: Yes please

Bot: What pizza would you like to order?

User: A veggie

Bot: Ok, we have the Special Veggie. Its ingredients are: green peppers, onions, tomatoes, mushrooms, black olives and cheese. It costs 15 euros. Is that fine?

User: Yes

Bot: How many Special Veggie pizzas would you like to order?

User: 2

Bot: Okay, it's 25 euros so far. Would you like to add anything else?

User: No thanks

Bot: Perfect, your order is 25 euros. You ordered one Margherita and two Special Veggie. Is the order correct? Otherwise you can start over saying no.

User: Yes

Bot: Okay, your order is confirmed at 20:15 and the order number is 42. Please communicate it at your arrival. Thanks for choosing us, and buon appetito!

Test n°2:

Bot: Welcome to HeyFood. What pizza would you like to order? For example, you can ask me for a pepperoni pizza with extra cheese, and I will suggest you the most similar pizza available on the menu.

User: I would like to order a capricciosa pizza

Bot: Ok, we have the Capricciosa pizza. Its ingredients are: ham, egg, tomato, mushrooms, mozzarella cheese. Is that fine?

User: Yes

Bot: How many Capricciosa pizzas would you like to order?

User: 2

Bot: Okay, it's 8 euros so far. Would you like to add anything else?

User: no thank you

Bot: Perfect, your order is 8 euros. You ordered two Capricciosa pizzas. Is the order correct? Otherwise you can start over saying no.

User: It is correct

Bot: Ok

8.2 Voice Test

Test n°3:

Bot: Welcome to HeyFood. What pizza would you like to order? For example, you can ask me for a pepperoni pizza with extra cheese, and I will suggest you the most similar pizza available on the menu.

User: A Margherita

Bot: Ok, we have the Margherita pizza. Its ingredients are: tomato, mozzarella cheese. Is that fine?

User: Yes

Bot: How many Capricciosa pizzas would you like to order?

User: 2

Bot: Okay, it's 7 euros so far. Would you like to add anything else?

User: No

Bot: Perfect, your order is 7 euros. You ordered two Margherita pizzas. Is the order correct? Otherwise you can start over saying no.

User: Yes

Bot: Ok

9 Voice skill

The end goal of the project was to develop a working voice chatbot. We decided to implement it as an Alexa skill. We took the interaction model designed during prototyping and brought it to life. The skill allows the user to make an order by selecting pizzas and amounts for every selection. It offers ways to recap an order and make confirmations/declinations.

10 User Interviews list

A man (40 years old)

1. **Do you order takeaway food?**
Yes, sometimes.
2. **What are the reasons why you do / don't do so?**
To be faster and avoid queues.
3. **How do you usually place food orders?**
Via telephone, or in person.
4. **What are the pros and cons about this approach in your opinion?**
Pros: I can do it from home, without having to reach the place. Cons: There can be misunderstandings.
5. **Would you use a voice chatbot to order takeaway? Why?**
Yes, because once you learn how to use a voice assistant it becomes very quick and easy to order.

A woman (50 years old)

1. **Do you order takeaway food?**
Rarely.
2. **What are the reasons why you do / don't do so?**
Because it's convenient, I stay home and they deliver my order right there.
3. **How do you usually place food orders?**
I'm happier if someone else does it for me.
4. **What are the pros and cons about this approach in your opinion?**
Pros: I don't have to waste time and interact with people. Cons: None
5. **Would you use a voice chatbot to order takeaway? Why?**
Yes, because it does it for me. It is more accurate.

A girl (18 years old)

1. **Do you order takeaway food?**
Rarely.
2. **What are the reasons why you do / don't do so?**
Because my mother cooks for me.

3. How do you usually place food orders?

Either I call the restaurant or I go there and order in person.

4. What are the pros and cons about this approach in your opinion?

Pros: My meal arrives already ready to eat. Cons: It's more expensive.

5. Would you use a voice chatbot to order takeaway? Why?

Yes, because it could be convenient and quick in my opinion.

A boy (25 years old)

1. Do you order takeaway food?

Sometimes.

2. What are the reasons why you do / don't do so?

It's convenient to have food delivered to you when you don't want to cook or go to eat out.

3. How do you usually place food orders?

Using food ordering apps.

4. What are the pros and cons about this approach in your opinion?

Pros: It's fast and you have the whole menu at your disposal. Cons: None

5. Would you use a voice chatbot to order takeaway? Why?

Yes, because it's convenient and almost feels like talking to a person.

A man (50 years old)

1. Do you order takeaway food?

Yes, sometimes I do.

2. What are the reasons why you do / don't do so?

I find it really convenient because I can place my orders directly from home.

3. How do you usually place food orders?

I use the mobile apps or directly call the restaurant, in this order. In particular, I find it easier to place an order using their app because it's faster but if there's no Internet connection I rather make a call.

4. What are the pros and cons about this approach in your opinion?

Placing an order with the app is safer because people can make errors when taking orders (e.g. wrong topping). Using the app reduces the number of misunderstandings.

5. Would you use a voice chatbot to order takeaway? Why?

Yes, I think I would do it for the same reasons of using an app.

A female (20 years old)

1. Do you order takeaway food?

Yes, sometimes I do.

2. What are the reasons why you do / don't do so?

It's easier, really fast and I do not have to cook anything by myself.

3. How do you usually place food orders?

I first search the product I want to order, look for discounts and select restaurants. After that, I call the restaurant or place an order using their app.

4. What are the pros and cons about this approach in your opinion?

Quick, no queue, I always find warm food reserving in advance. Of course there may be misunderstandings with waiters, for instance if they do not understand what I want. Moreover I may need to call multiple times because the line is busy.

5. Would you use a voice chatbot to order takeaway? Why?

Yes, I do not see any difference but the interaction should be simple.

A female (50 years old)

1. Do you order takeaway food?

Yes, I do.

2. What are the reasons why you do / don't do so?

I love it because I can try some new food without the need of preparing it by myself.

3. How do you usually place food orders?

I usually call them.

4. What are the pros and cons about this approach in your opinion?

When I call them and talk to a waiter sometimes we don't understand each other (e.g. wrong cheese on pizza). However it's really comfortable and easy.

5. Would you use a voice chatbot to order takeaway? Why?

I would not, I think I would not feel comfortable talking with a robot.

A male (61 years old)

1. Do you order takeaway food?

Yes.

2. What are the reasons why you do / don't do so?

I usually go to the restaurant but due to Covid it's the best choice for dinner

3. How do you usually place food orders?

I use the mobile apps and less frequently directly call the restaurant.

4. What are the pros and cons about this approach in your opinion?

I prefer mobile apps with respect to call the restaurant because in this way I can constantly check the order

5. Would you use a voice chatbot to order takeaway? Why?

Yes but I have to be sure that the voice chatbot understands perfectly what I'm saying. I think that in this way it's easier to make mistakes about the order with respect to classic mobile apps.

A female (53 years old)

1. Do you order takeaway food?

Yes

2. What are the reasons why you do / don't do so?

It's very convenient when I don't want to cook or when I want to eat something different from what I usually prepare at home

3. How do you usually place food orders?

I use app like JustEat or I call the restaurant

4. What are the pros and cons about this approach in your opinion?

Both are very convenient

5. Would you use a voice chatbot to order takeaway? Why?

Yes because I think it's even more convenient and faster than previous methods

A female (24 years old)

1. Do you order takeaway food?

Yes. I do it at least once a week

2. What are the reasons why you do / don't do so?

I like to order takeaway food because it's convenient when I don't want or I can't cook. It's useful also when I want to eat a particular type of food while being at home

3. How do you usually place food orders?

I usually order on mobile delivery apps and less frequently on sites of takeaway service

4. What are the pros and cons about this approach in your opinion?

I'm not forced to go to the restaurant to take my food. Moreover I can discover new suggested restaurants with the mobile app. On the other hand with this method I have to pay costs of service and delivery and the food when it arrives at home it may already be cooled

5. Would you use a voice chatbot to order takeaway? Why?

Yes, I think it could help to place an order faster

A female (20 years old)

1. Do you order takeaway food?

Yes

2. What are the reasons why you do / don't do so?

It's more convenient due to my university hours; I'm an off-campus student so in this way I don't need to cook or wash dishes. Moreover it's useful when I want to eat something different from what I usually prepare at home

3. How do you usually place food orders?

I usually order on mobile delivery apps. I rarely take personally my food at the restaurant

4. What are the pros and cons about this approach in your opinion?

It's the most convenient method and I have all the time I need to select the food. On the other hand I can't talk directly with the restaurant in the case in which I need to modify a specific plate. Moreover prices are often higher and If there are many of us ordering, it is difficult to divide the total cost

5. Would you use a voice chatbot to order takeaway? Why?

Of course. It would be like ordering at the restaurant if a voice chatbot interacts with the customer. I think that this could resolve the lack of communication that I find in the mobile apps.

A female (28 years old)

1. Do you order takeaway food?

Yes

2. What are the reasons why you do / don't do so?

I like to eat food that I'm not able to prepare myself. I can also order from restaurants far away from where I live

3. How do you usually place food orders?

I use mobile apps

4. What are the pros and cons about this approach in your opinion?

I think the process it's very fast and accurate. I think there are no cons

5. Would you use a voice chatbot to order takeaway? Why?

No because I don't think it would be different from what I use right now. I'm fine with what I already have.

A male (20 years old)

1. Do you order takeaway food?

Yes

2. What are the reasons why you do / don't do so?

I think that it's a faster process rather than going physically to the restaurant. Sometimes I don't want to go out, so it's very convenient.

3. How do you usually place food orders?

I use mobile apps like Glovo, JustEat and so on

4. What are the pros and cons about this approach in your opinion?

I feel more confident about the correctness of my order with a mobile app, I think there's a less chance of making mistakes. On the other hand I experienced some bugs with some mobile apps in the payment section in multiple occasions. Even though I had chosen the option to pay with cash, the app used the option "Pay by credit card"

5. Would you use a voice chatbot to order takeaway? Why?

No because I used voice chatbots a lot of times and very often they didn't completely understand what I said

A man (23 years old)

1. Do you order takeaway food?

Actually not very often.

2. What are the reasons why you do / don't do so?

The main reason is that i work in a restaurant, but the day i rest sometimes i order for dinner because i don't want to cook.

3. How do you usually place food orders?

In the past i ordered calling the restaurant, nowadays i use Glovo.

4. What are the pros and cons about this approach in your opinion?

Pros: I can do it with my smartphone, i can choose the food taking my time and i can pay directly using my credit card. Cons: I cannot ask advertise to the waiter.

5. Would you use a voice chatbot to order takeaway? Why?

Of course i will try, but actually i don't know, it depends on the experience i will have the first time.

A women (56 years old)

1. Do you order takeaway food?

I order pizza with delivery services every Saturday.

2. What are the reasons why you do / don't do so?

It's like a ritual, it's a habit we have in the family.

3. How do you usually place food orders?

I ever use the telephone. Sometimes can happens that i order using some apps if i have special coupon code.

4. What are the pros and cons about this approach in your opinion?

Pros: With telephone i can talk directly to a human, so we understand each other immediately. Cons: Sometimes happens that the pizzeria does not answer to the phone, or the signal is noisy.

5. Would you use a voice chatbot to order takeaway? Why?

I don't think, but if it will became a common pratice i will try.

A men (52 years old)

1. Do you order takeaway food?

I order burgers with delivery services every Friday for lunch, together with my work colleagues.

2. What are the reasons why you do / don't do so?

Yes, the last working day of the week, we want to eat something special.

3. How do you usually place food orders?

I use a whatsapp chat with the restaurant.

4. What are the pros and cons about this approach in your opinion?

Pros: I can use a chat, and i dont need to download external application or call the restaurant. Cons: Order, or have an answer can take a while.

5. Would you use a voice chatbot to order takeaway? Why?

I am old, but i am also a technology enthusiast, so i think yes.

A men (32 years old)

1. Do you order takeaway food?

Yes

2. What are the reasons why you do / don't do so?

I live alone and often don't want to cook.

3. How do you usually place food orders?

I live near a pizzeria, so i directly order going there.

4. What are the pros and cons about this approach in your opinion?

Pros: I can at the same time, order, pay and retire my food. Cons: I have to leave my house.

5. Would you use a voice chatbot to order takeaway? Why?

I dont think, i prefer the usual way to don't encour in any issue.