INTERACTION DESIGN



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Couch is a project that tackles the problems related to long-distance relationships. Designed for young people within 15 and 30 years old, it focuses on the topic of friendships and how to enhance them throughout a digital experience. Keeping video calls as the starting point, Couch aims to recreate on a digital level a lifelike hangout experience. To do so we focused on the typical conversations dynamics and their effects on friendships hangouts to then

translate them into digital interactions within the app. Couch is therefore a video chat service that allows people to easily meet online, to have a chat all together or split into sub-groups to have private conversations. The app also implements the chance to share media content with the other users or enjoy all together broadcast streaming. Thanks to all its feature Couch provide a seamless experience that makes online hangouts meaningful as real life ones.

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INTRODUCTION

Among the three main topic given, we choose the one that tackles long-distance relationships and providing meaningful online experiences by overcoming the remoteness to make people feel close to one another. We then investigated this wide theme and focused our attention on long-distance relationships between friends as it is a rich field, full of opportunities. Once we defined our target and the theme we wanted to focus on, the project scope almost came by itself: video calls. According to the netnographic research we lead, video calls are the preferred solution to keep in touch with friends, their usage is even higher than the normal phone calls. These choices then represented the starting point of our more specific research phase, aimed at identifying targeted problems related to video calls and long-distance relationships. We approached this phase with two successive steps: a survey and then targeted interviews. The survey has been fundamental to get a wide pool of information, to define in a static way which were the major problems encountered during video chats and which aspects of them made it difficult for people to feel close to

their friends and live memorable experiences. Thanks to this initial research we could then lead more targeted interviews in order to deepen the problems identified and get a more "human" understanding of them, we could ask how the problems affected the online hangouts and therefore the perception of long-distance friendships. Once we got all these data we could understand that the major gap between real life hangouts and online meetings layed on the conversations and all the factors and dynamics connected to it. Therefore it became our focus: what makes a conversation? What is it that makes it feel real, personal and valuable? Thanks to the interviews and the shadowing we did, we could identify some aspects to work on. Usually during chilled hangouts there's music that sets the mood, or friends that show some fun content to prompt the conversations, or maybe a movie. Friends never stick all together all the time, they split into subgroups, have different conversations on different topics. Finally conversations are messy: many people talking, little comments along the way, some people making big announcements and other whispering

little private secrets. We took all this into account and developed our app. Couch is a video chat service that aims to recreate a life like experience. It implements the smart audio feature: it analyses the number of audio sources, it modulates their intensity and organizes them into different audio channels, so the user can clearly hear more people talking at the same time. Following the example of real life hangouts the users can split into "couches" (subgroups) and enjoy private conversations. The user can choose whether to connect a broadcast and stream the content with all their friends or stay in the grid view where users' cameras are displayed. Finally on the "communication level" Couch implements three main features: the ephemeral chat, the whisper and the announcement one. All these features, that will be explained later on, help creating a complete experience with no limit for the users: the whisper allows them to send private message, the "speak out loud" function they can make broadcast announcement and finally the ephemeral chat allows them to share whatever content they'd like.



2. FUNCTIONS

To have a clearer understanding of the app and its structure, the following list goes through the main functions featured in Couch.

As some of these functions are unique, they also required a new glossary: room stands for the video call session and it includes all participants, which, by the way, are called couchers. The couches, from which the app takes its name, are instead the subgroups and each of them hosts separated audiovideo channels.



2.1 Subgroup control

The users can decide to split themselves into subgroups. They can either choose to create a new group, invite new people or join an existing group.

Create new group

At the beginning users are grouped in one main group. A button gives the users the chance to directly create new groups by selecting few participants. Afterwards, by selecting one or more people, the user can choose the Create function to make a new group. An invitation notification will be send to the people selected: they can either choose to join mmediately, join it later on, refuse or propose to join their actual group.

Join group

By selecting people from another group or by clicking the plus icon next to it, users can join other groups. A notification is sent to the members the new guest

Invite people

By selecting people outside their actual group, users can send invitation to other participants. A notification is sent to the people selected: they can either choose to join the new group immediately, join it later on, refuse the invitation or propose to join their group.



Hierarchical Structure



Couch subdivision

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2.2 Vocal chat tools

Beside the normal conversations, two tools are implemented to support and enhance subgroups.

Speak out loud

The user can make a broadcast announcement that can be heard by every other user. Each of them is able to mute it.

Whisper

Through Multiple Selection, the user can send private vocal messages to a specific pool of people, regardless of subgroup divisions. This messages are recorded and then listened whenever the receiver clicks on the notification. These messages are ephemeral can be listened once and they are not stored anywhere.



Speak out loud



Whisper



2.3 Ephemeral chat

A broadcast, audio or video, can be added by one of the users, the permission from the broadcasting user is required to change it. The user can decide to have the broadcast full screen, in grid mode or iconized.

Feed

Users can access the ephemeral chat feed where all the content shared by the other participants. Starting from the feed, users can access the chat history to navigate through the posted content.

Content editor

Each user will be able work on a visual canvas, following the examples of Instagram. A wide set of tools is available: they can upload personal pictures or shoot one live; add GIFs and stickers; include polls; edit several meme layouts; edit text boxes and use drawing tools. The media content will be i shared with everyone in the room. These editing tools are also immediately accessible after taking a screenshot with the built-in button.

Archive

The posted content is ephemeral, however the user can save it and make it always accessible in the Archive. Guest users will have the Archive saved in local, while the logged users will have a cloud back up on Couch's servers.





2.4 **Broadcast**

A broadcast, audio or video, can be added in the room by one of the users. In order to change it, the permission from the broadcasting user is required. The user can decide to have the broadcast full screen, in grid mode or iconized.

Integrated apps

Streaming services like Youtube and Spotify are integrated within the app. This means there is no need to share the screen and every user access the external services directly. Moreover, each integrated app has in-app custom controls.

Mirror

Each user can also mirror what they are seeing in their screen. Instead of having the whole interface, the caster has instead an unobtrusive overlay through which he can control both apps. The mirrored app can be seen as a broadcast to every other participant.



Integrated broadcast



MIrrored broadcast



3. NGR MODEL

In our NGR model we identify just two type of users. The couchers are our primary users, they are those people who actively use the app. Our secondary users are the streamers that are those people that provide content that can be streamed on couch (e.g. youtubers, instagrammers..). To identify the need as well as the context we relied on the research previously done. The needs concern what our users expect to be a conversation. The goals deepen Couch mission and try to answer to the needs through the requirements which list the features implemented in the app. Finally the external services includes the group of services useful for the broadcast function as well as those services that are fundamental along the customer journey as for example the external chats like whatsapp where our user can plan the meeting.







4. APP ARCHITECTURE

The app architecture describes Couch software structure and how the user can interact with the functions offered by the app. Starting from the sign in page, the graph shows all the possible paths that the user could take within the application. In this way all the different sections of the app are listed as well as their respective functions and finally also all the connections between one area to the other.







5 CUSTOMER JOURNEY

We organized our customer journey into two axis. On the horizontal one we listed 5 main stages through which the user experience develops: awareness, consideration, aquisition, usage loyalty. On the vertical one we firstly listed the touchpoints between the users and the app and secondly we have put our personas. By highlighting the intersections between the two axes we were able to show not only the passages that the user goes through during the customer journey but also the actions and emotions of our personas.









6. PERSONAS

We identified three personas, Luca, Marco and Alessia that we then linked to three different scenarios. Each personas is introduced by a brief description and then described by several graphs. Some describe their personality, other show their usage of technological device. Each one of them is analyzed against our application. Through a heatmap the most important goals and needs for them are highlighted. Finally, their favorite broadcast channels are listed



6.1 Luca

Before Covid-19

Luca attends a technical high-school. He uses his phone for about everything, in fact he has a desktop computer at home, but it is shared between every member of the family of four. Luca has a very active lifestyle, he plays water polo three times a week and is very fond of his teammates, so he often stops with them after training to have a chat. he's not very studious, but every occasion is right to meet people, so he usually hangs out with his classmates at the library, pretending to get work done.

After Covid-19

Because of COVID-19 outbreak he deeply misses his water polo training and his teammates, is really difficult to accept the lockdown and social distancing situation but the possibility to hang out through video chat helps to ease it. He hears from his classmates often to do homework together, while is more difficult to keep in touch with the team.





During video calls he would like to... being able to split into subgroups











6.2 Marco

Before Covid-19

Luca attends a technical high-school. He uses his phone for about everything, in fact he has a desktop computer at home, but it is shared between every member of the family of four. Luca has a very active lifestyle, he plays water polo three times a week and is very fond of his teammates, so he often stops with them after training to have a chat. he's not very studious, but every occasion is right to meet people, so he usually hangs out with his classmates at the library, pretending to get work done.

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During video calls he would like to... partecipate avoinding the spotlight











6.3 Alessia

Before Covid-19

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During video calls she would like to... enjoy realistic conversations











6.4 Final analysis

We cross-referenced the data of the NGR model with the profiles of our personas in order to verify the usefulness and validity of the application.



Interative relationships

Simulatneous conversations

Accessible interface

Fast registration

Media content sharing

> Grant privacy

Multi-tasking integration

Layered structure of functionalities

Personas



app streaming Favourite

Personas

Luca	Marco	Alessia
Netflix	Spotify	Instagram
He likes to chill at night whatching some movies	He listens to music as a background when he studies or to chill	She spends a lo of time checking the latest trend updates
Instagram	Twitch	Snapchat
She spends a lot of time checking the latest trends updates	He often follows live streaming gaming sessions	She uses Snapc for fun: she sendssilly pictur th her firends
Spotify	Youtube	TikTok
He usually listnes to music to relax and focus on what he is doing	During breaks, he wanders in YouTube watching casual videos	While having bro she keeps herse making funny videos

Higher daily usage



7. SCENARIOS

Around each of our personas we built a scenario. The scenarios include a high level visualization and several in-depth models which are coupled with a series of screenshots from our prototype. The scenarios are modeled using the BPMN framework.

The first scenario features Luca and we consider it to be tangential: in fact, Luca fully belongs to our target and one of the chances he has for using Couch is in parallel with his online schooling lessons. In fact, even if it is designed for pleasure, Couch can be of help also for study-related calls.

Marco is instead enjoying the app for his main purpose: hanging out with friends around some music during forced isolation.

Alessia goes through the first discovery of the app and can fully appreciate its fast registration.



7.1 Luca

Luca knows Couch through word of mouth: a friends of his often uses it. During the forced online schooling for Covid-19 outbreak, he suggested his friends to use Couch so they can comment live the lesson.

On monday moring, before the math lesson begins, Luca creates a new room, while still being logged to Teams with his lesson on his home pc. Right after, he sends the invitation link on Whatsapp so that his seven classmates can join him. Once everyone is in the room, they split into two groups and keep following the math lesson. The teacher gives them few exercises to solve and they use Couch to solve them together. Luca's group solves them faster, so they invite Luca to change group and help those behind.

Suddenly, the teacher's cat walks right on the laptop and Luca is fast enough to take a screenshot and then he edit it and posts it on the chat. Everyone laughs.





The context





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New room creation











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Couches division

Couch division



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Change couches divsion

Change couch division









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Ephemeral chat: new content creation









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7.2 Marco

Marco's friends organized the usual video call this evening to hang out and he is late. They are hanging on Couch as usual and when he logs in they are already divided in several couches. Who created the room also set his Spotify as a broadcast with a rock playlist.

They mainly stick within the same couches, but they share a lot of posts on the the chat. They are using the grid view and they talk as if they were physically together. Marco sends his memes as usual and someone asks if anyone wants to put something to watch together using the speak out loud function. A video he saw on YouTube he must share with his group comes up at his mind. Therefore, he speaks out loud back and asks the room creator to switch broadcast. The latter eventually accepts his suggestion and gives him the power to change broadcast.

The evening goes on smoothly and makes the group feel closer, even though they can't see each other in person.







Group entry via link





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Ephemeral chat: share and watch content











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Speak out loud





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Broadcast change

















7.3 Alessia

Alessia is scrolling on his Instagram feed when she discovers a band she and her friends like is broadcasting a live session in half an hour. She share the news with her Whatsapp group right away and they start looking for the right app to watch it together. That's when she comes across Couch on the App Store and she decides to try it out.

They try it out just in time when the session is starting and Alessia shares her screen with Instagram. They enjoy the music while also discovering the app: they like the ephemeral chat which resembles their favourite social networks content editors.

They also find out about the whisper function and Alessia starts using it to share more intimate comments. Once the concert is over, the hang some more to catch up before closing the call.









Sign in the app













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Ephemeral chat: share and watch content















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8. SYSTEM ARCHITECTURE

The system architecture of couch is pretty simple. Since the app can host multiple users (up to 12) we put three smartphones to represent them. Their devices connect to Couch server which refers to its own database. In addition the graph display also external server, linked to their databases, which can be connected either to the user devices or directly to Couch server. This difference depends on whether the external app is integrated in Couch or not. In this second scenario the user will have to connect to the external server and then mirror his screen.





*External server

Servers which hosts streaming services such as Spotify, YouTube etc.



9. SMARTAUDIO

Audio has driven more and more attention over the past few years, with the increased focus on audiorelated technologies. The new iPhones feature stereo speakers while the Airpods now support 3D audio. Binaural audio has been used more and more in spaces and experiences, high quality sound created new opportunities for content creators, from podcasts to ASMR. Even Playstation has invested a lot in spatial sound for its new PS5 with Tempest Engine.



Smart audio

Couch wants to ride this trend by focusing the video call on the audio channel to get close to the authentic experience of a real hangout.

Alterts

Right lower channel



Smart audio

In fact, to avoid the flat overlay of mono channels, Couch Smart Audio is designed to automatically position the audio channels within a virtual space when needed. In fact, most of video calls have trouble supporting multiple sources and the result is that those little comments which give depth to the conversation get lost in translation. Couch instead, while keeping the main source as mono or stereo depending on the microphone -, when an impromptu comment overlaps, it positions the comment on a side channel, right or left. The algorithm will make use of the established head-related transfer functions (HRTF) frameworks such as the open source 3D Tune-in Toolkit.

To do so, it simply requires a mono microphone, but it can benefits from the hardware update expected for the future: e.g., today's high-end headphone sets are already implementing binaural microphones.

3DTI Toolkit binaural structure in detail. https://doi.org/10.1371/journal.pone.0211899.g002

10. COMPETITOR ANALYSIS

Video call services just went through an incredible period of growth, of course due to worldwide Covid-19 induced lockdown. Some services, like Skype for Business, experienced great losses to competitors like Zoom, whose users exponentially increased.

Also among services for personal use, like Facebook services such as Messenger, Whatsapp and Instagram, the change was felt also within the developing teams. Whatsapp now supports up to 8 people, while Messenger now includes Rooms which hosts up to 50 people. Niche services like HouseParty got discovered and widely adopted in a matter of days. For our research, we first gathered several services both for business and pleasure to have a wider spectrum. Then, we narrowed down the list to few services which most than other serve a similar target. By comparing the supported features and our ethnographic research, we had a clearer look upon the needs of our users and the state of the art of the industry.

	Messenger	HouseParty	Zoom	Bunch	Discord	Gotomeeting	Cisco Webex	Microsoft Teams	Skype for Busines	Hangouts Meet	Google Meet	Google Duo	Snapchat	Skype	Facetime	WeChat	Whatsapp	Instagram	Teamspeak
Video support																			
Video quality	HD	?	VGA HQ	?	SD HD														
Cloud based		No	Partial	No															
Device support	Phone Pc	Phone	Phone Pc	Phone	Phone Pc														
Chat		No		No															
Range of people	8/50*	8	500	89	9														

Focus competitors

*Messenger now include Rooms, which supports up to 50 people

HouseParty Messenger Zoom Simultaneous conversation Video support Fast registration Embedded chat Interactive activities Video support New member alert Microphone controls Sub-group support Public events hosting Reactions Avatars

Perceived usefulness for the users

Bunch	Discord

*Messenger now include Rooms, which supports up to 50 people

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*Messenger now include Rooms, which supports up to 50 people

VALUE PROPOSITION

Couch offers a free video call service which includes several tools to empower conversation among friends.

Product and services

- Free video call servic
- Sub-group support
- Ephemeral image-based chat
- Broadcast support
- Smart Audio

Gain creators

- High compatibility with streaming services
- Chances for self-expression and communication
- Multi-tasking habits rewarded
- Easy access and registration
- Tailored experience

Pain relievers

- Easy access and registration
- Reduced chance for awkward moments due to lost piece of conversation
- Multi-tasking habits rewarded

Future

Couch is built upon a future vision of a world where online hangouts will be more frequent and natural. The app answers to the needs of the present, staying open for future technological improvements. In fact, headphones improvement can positively affect our service, which is eager to respond to the rapidly evolving trends among the new generations. For that reason, the content editor is designed to be steadily improved with new functions and the broadcast section with new integrated services. Compatibility is key to keep up with new services and to Couch's marketing strategy.

The app is also open to eventually host original content as a way to promote itself and its broadcast support while creating a devoted user base.

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