

Requirements

Elicitation

To interview target users, ask their experience on similar tools and include functions they like or dislike. Then, state problems they might have with teamwork-driven communication tools currently unsolved by Streams, choose the essential part and reason of their choice.

There are three people interviewed, and the record sheets are attached in Appendix A. Below is their needs and a brief description of how we will meet the demand.

Nathanael:

Nathanael focuses on high-quality group meeting tools that can do video meetings for multiple users, meeting records and screen share. By doing so, Streams should implement video meetings in the channel. Members can join and leave while the standard message function is operating normally. It will be similar to standup functions, but it is for video meetings instead of buffered messages and does not give the duration time at the start. Also, at the end of the session, the person who starts the meeting might send the meeting time to the chat area. The notification on phones and bugs of who have seen the message annoyed him. Therefore, Streams should implement mute or cancellation of notification function. As Nathanael did not put who have seen message as an essential function, we may not implement it at this stage but may do so in further development.

Maomao:

Maomao is mainly focused on easy access and reaching friends. She would like easy access to files, message history, and accessible register by using other accounts. To meet her demand, Streams should give more register options to the user. Such as registering by using Facebook, LinkedIn, Twitter or Google account. There should be a function that can store users' files and chat history in the cloud if they share in channel or dm. Contact with a friend easily is essential to her so that Streams can implement the friend list function. Users can add another user to their list, so they do not need to search for the name or id but choose from their list to start a dm or invite a channel. Reply to the selected message is one of her favourite parts. Users can choose a message sent by another user or themselves before, then that user will be tagged first, and this user's statement will be quoted, followed by a reply on it. The reply message format may look like ["@user A: message"\n Reply message.]

Sean:

Sean has a lot of experience and thoughts about teamwork-driven communication tools. For the function currently unsolved by Streams, he would like to have a record function, which records the meeting and chat during the session needs to be recorded because some questions have been discussed there. To reach this goal, Streams might record the chat area and video area separately with a timestamp. Once you start to play the record, those two areas will go synchronously. He also mentioned subtitles for recorded videos. This needs voice recognition technology and embed the file (might be. ass or .srt format) to the record. He would like to have a robot assistant to answer some

frequent and straightforward questions for a channel. By doing so, we might ask the user to set some keywords and respond to them. Once a member tags a specific handle, the robot's name, and enters the keywords, there will be an automatic reply.

Analysis & Specification - Use Cases

Now, we will pick up some most relevant requirements for Streams from the interviewee and express their needs for user stories. Below will be the user stories and corresponding user acceptance criteria.

User Story 1: As a student, I want to have online meetings so that I can discuss with others easily.

- The “Start meeting” button on the bottom bar
- The meeting will start once the user clicks the button
- The meeting is for multiple users (no only 1v1)
- All members of the channel can join
- The user who is already in the meeting can invite all members from the channel
- Users can leave the meeting anytime but still stay in the channel
- The user who starts the session can end it
- The host can choose to close the meeting or not
- There is a timer
- Once the meeting is ended, Streams will send a meeting time to chat
- Users can turn on/off camera or microphone
- Streams will deliver the best quality of voice/video according to the user’s internet.
- One channel can have multiple meetings at the same time
- Users from another channel cannot join
- One user cannot join two sessions at the same time
- The meeting ends automatically if no voice or video is delivered over a half-hour.

User Story 2: As a student, I want to register and log in quickly to save time.

- Simplify steps for register
- Email addresses can be auto fill in
- Give the suggested password to the user
- More register options – can log in through a social media account
- Ask users if they would like the password to be remembered
- Ask users if they would like to stay log-in

User Story 3: As a student, I want to contact my friend quickly to save my time.

- The “Contacts” button on the left- or right-hand sidebar
- Streams will show the list of contacts once you click on that
- There is a list of recent contacts – even they are not your friends
- There will be an “add friend” option for users who is not
- There is a list of added friends
- There is a search bar on top of the list
- Users can be found by their u-id or handle
- Users can remove added friend
- Streams can add a maximum of 100 friends

User story 4: As a student, I want to reply to certain messages when sending a message so that other people can understand what I am talking about.

Scenario: Reply to the chosen message from the chat flow

Give: The user would like to send a message to discuss something

When: User find the message want to reply

And: Right-click on it

Then: There is a “reply” option in the menu

When: User clicks on “reply.”

Given: Navigate user to message type box.

And: Quote the selected message and tag the user as part of the message.

When: User typed and sent the message

Then: Tagged user receives notification, and others can see which message has been replied

to

User story 5: As a student, I want to check the meeting history to review it.

There is a “Record” button on the screen.

The host can choose who has permission to record the meeting

If there is no host, then all members can record the meeting

Once recording starts, every member can see it is recording

Streams will record both video and chat

The record of the chat will only be available for online watching

Video and chat will go synchronously for online watching

Only meeting records can be downloaded as a video

The chat record can be selected and downloaded as a file

Streams will generate subtitles after the meeting

Streams will add subtitles to the recording

Subtitle need to be as accurate as possible

The longest recording time is 2 hours

The recording will automatically stop when it is 2 hours long

Users can choose the quantity of record if the presenter is who is recording

If other users have recorded a meeting, the record quantity should be the same as their meeting quantity

User story 6: As a student, I want to have an assistant in the channel to reduce labour works.

Channel owners can find an assistant option in channel settings

There is a default name of the assistant

Channel owner can permit other members to set assistant

Authorised can put assistant’s name which will appear in the chat

The authorised user can give keywords and respond on keywords to assistants.

Assistant can have an automatic welcome message when a new member joins in

Assistant can send greets to an existing member. The greeting will be only once per day

Only the channel owner can turn the assistant on and off

There will be a few default and example keywords and responses preinstalled
The question to assistant must have a time gap, cannot send inquiries too fast
Each member can have up to 50 conversations with an assistant per day

Use case 1:

Use Case: Have an online meeting

The goal in Context: Users want to be able to have a meeting that they can see and hear each other without physically gathering together.

Scope: Web interface, Server,

Level: Primary Task

Preconditions: The user is a valid user who is a member of a channel/dm and has an installed camera and microphone.

Success End Condition: The user start/join, have and end a meeting successfully

Failed End Condition: The user is not able to start or join a meeting. Meeting unexpected ends.

Primary Actor: User of Streams

Trigger: User click “Start meeting” or “Join the meeting”.

Step 1: Host user click “Start meeting” on a web page or APP’s interface

Step 2: Program requests the server to verify if that’s valid-user

Step 3: Server backs Web of validity and options of meeting

Step 4: Program ask the host if it is a public or private meeting

Step 5: The host chooses to have a private meeting

Step 6: The program asks the user for a PIN code

Step 7: Host enters a PIN code

Step 8: Program sends “create a private meeting request” to the server with given PIN code

Step 9: The server creates a new session with the given PIN

Step 10: Host invites other users to the meeting with the PIN code

Step 11: Host press the “End the meeting” button after meeting

Step 12: Program sends a request to the server for end current session

Step 13: Server backs “End meeting command” to all the participants

Use case 2:

Use Case: Reply to a certain message

The goal in Context: User need to clarify which message she/he is replying

Scope: Web interface, Server

Level: Primary Task

Preconditions: The user is a valid member of a channel or dm in Streams.

Success End Condition: The user replied to the message and other users can see it.

Failed End Condition: User replied by others do not know which message has been replied

Primary Actor: User and other members

Trigger: User right-click the message and choose “Reply”

Step 1: User right-clicks on the certain message she/he wants to reply

Step 3: Program pop-up a menu with “Reply” option aside from the message

Step 4: User press “Reply” option

Step 5: Program copy the certain message and put it above the user’s chatbox as a reference

Step 6: User type down the words/sentences

Step 7: User press the “Send” button

Step 8: Program mix these two messages as one message (the certain message on the top section and replied message on the bottom section) and put it into the chat area

Step 9: The certain message sender will receive this message with a highlight coloured background and a system notification, other people in this session only receive the message without highlight and notification

Validation

Use case 1 comment by Sean (Have an online meeting)

I think starting with 'Start Meeting' instead of a series of options at the beginning is better, it makes me enter the working mode very quickly. I don't have to think around too many options such as private or public, PIN code or others.

But if I have entered the meeting already, please don't ask too many questions about public/private status, PIN code etc.

The current design is good, only keep the essential options after the meeting session begins. I'd love this process.

Use case 2 comments by Maomao (Reply to a certain message)

The function 'Finding a specific comment to reply in group chat flow' is a vital demand for all users, this case described a typical way to process it. Find the message you wants to reply to, right-click, press the reply button, then you can write down your ideas. Simple and practical. it matches my daily usage habit and intuitions, great works!

Use case 1 comment from Nathanael (Have an online meeting)

When I join an online meeting, I'd like to just press one button to go and ignore as many as possible settings. After reviewing this process, I thought it is what I imaged the system. Fast and less thinking before the meeting. The use case mainly focused on starting an online meeting, I may be interested in how we are going to join the meeting as well.

Interface Design

Problem 1. Making the users have more options during calls with other users

Name and Description	HTTP Method	Data	Exceptions
video/screenshare/v1 An authorised user will be able to enable screen sharing on their own screen to show other users. The user can only share one screen at a time. EG. if the user has two monitors, it can only share one at a time.	POST	Parameters {token, channel id, [screen display option]} Return {Screen display}	AccessError - The token does not belong to a valid user - The user does not have admin permission to screen share

<p>video/recordsession/v1</p> <p>An authorised user can record the conference call and also if the screen share is on by other users and their own screen.</p>	POST	<p>Parameters {token, channel id, [conference call]}</p> <p>Return Recording started</p>	<p>AccessError</p> <ul style="list-style-type: none"> - The token does not belong to a valid user - The user does not have admin's permission to record
<p>video/recordings/subtitles</p> <p>Enable subtitles of screens that has been recorded, using a subfield of Artificial Intelligence automatic speech recognition (ASR)</p>	POST	<p>{token, channel id, [subtitle, true/false] [ASR Detect Recording]}</p> <p>Return Subtitle on</p>	<p>AccessError</p> <ul style="list-style-type: none"> - The token does not belong to a valid user - User's language is not supported

Problem 2. Adding more register account options using social media, and a friends system.

Name and Description	HTTP Method	Data	Exceptions
<p>register/socialmedia/v1</p> <p>Using social media to register an account on Streams.</p> <p>Only includes big social media platforms</p> <p>Facebook/Instagram, Twitter and Google Account.</p>	GET	<p>Parameters (Name, Email, Phone number, Token)</p> <p>Return Account Successfully created</p>	<p>AccessError</p> <ul style="list-style-type: none"> - User's social media does not exist - User denied permission to register - User's information is not validated
<p>friends/add/v1</p> <p>Given an user id, the authorised user can add a friend</p>	POST	<p>Parameters (token, u_id)</p> <p>Return: Friend added :)</p>	<p>Input Error</p> <ul style="list-style-type: none"> - u_id does not refer to a valid user - u_id is already your friend

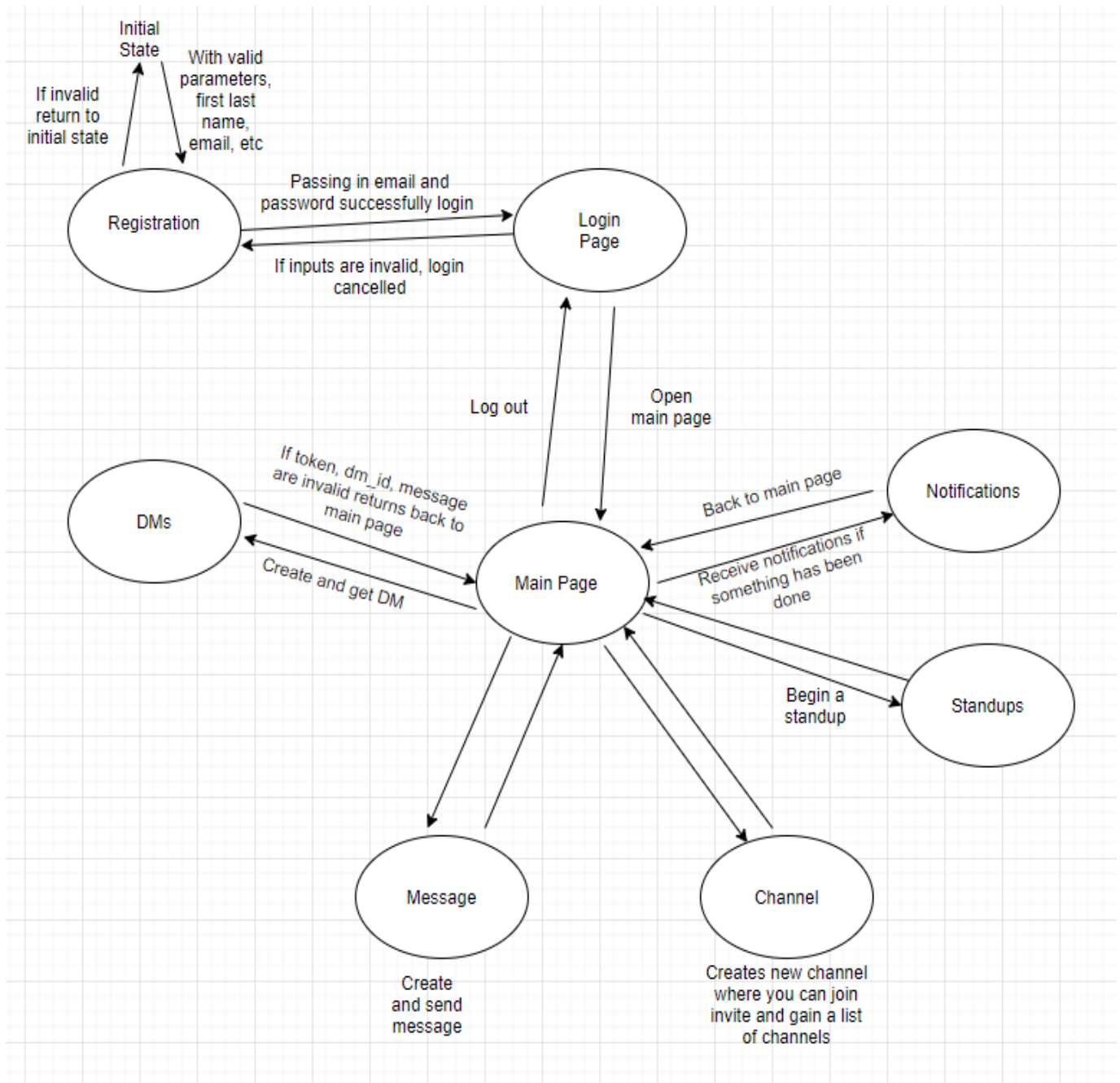
friends/remove/v1 Give an user id, the authorised user can remove a friend	DELETE	Parameters (token, u_id) Return: Friend removed :(Input Error - u_id does not refer to a valid user - u_id is already not your friend
friends/list Given a list of friends to the user when called upon	GET	Parameters (token, u_id) Return [friendlist]	NA
friends/profile Given a user profile when called upon, only works if your friends.	GET	Parameters (token, u_id) Return [friend profile]	Input Error - u_id does not refer to a valid user - u_id is not your friend

Problem 3 Increasing the applications accessibility

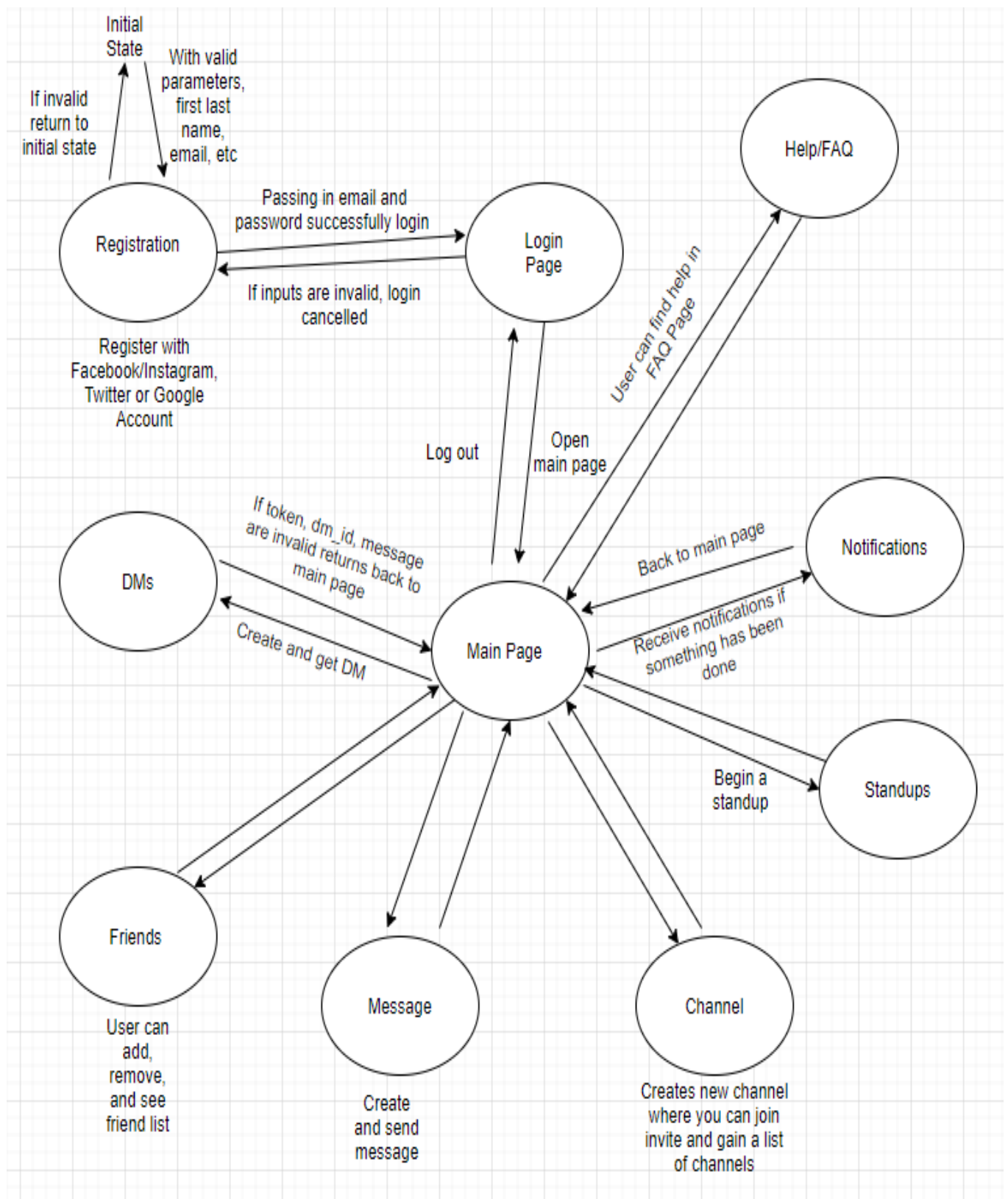
Name and Description	HTTP Method	Data	Exceptions
help/chatbot An AI Chatbot that uses speech recognition technology to read the input of the user's keywords then return a set of answers.	POST	parameters (token, u_id) Return [Chatbot]	AccessError - The token does not belong to a valid user
help/getFAQ Give the user a help page with commonly asked questions and answers.	GET	parameters(token,u_id)	AccessError - The token does not belong to a valid user

Conceptual Modelling

Existing Application



New Features to be suggested



Appendix A:

Interview Record Sheet				
Name	Nathanael	Gender	Male	
Email Address	nathanaelsingam@gmail.com	Occupation	Student	
Which of the following teamwork-driven communication tool(s) do you use?				
MS Teams	Discord	Zoom	WeChat	QQ
Line	WhatsApp	Messenger	Never use any	
Are you satisfied with the tool(s) you are using and why?				
yep - free, accessible and user friendly				
How often do you use those tool(s)?				
weekly if not daily				
Which function(s) you do not like of the tool(s) you are using now, why:				
MS teams - notifications messages on phones, Messenger - bugged whos seen the message				
What is your most favourite function(s) of the tool(s) you are using now, why:				
discord - easy to use, highest overall quality compared with competitors				
Which function(s) do you think is most important when you use the tool(s): (Choose three of them)				
Video meeting (1v1)	Video meeting (multiple user)	Record meeting	Sharing screen	Sharing document
Whiteboard while meeting	Calendar	Calendar reminder	To-do list	Reply to selected message
Automatic reply	Sounds for notification	Add friends/contacts	Share status (online/Busy/offline)	Quick register by using other accounts
Others (Please state below):				
Why do you think this/these function(s) is/are important?				
all are main components of a good quality meeting application (the essentials)				

Interview Record Sheet				
Name	Mao Mao		Gender	Female
Email Address	1013364771@qq.com		Occupation	Student
Which of the following teamwork-driven communication tool(s) do you use?				
MS Teams	Discord	Zoom	WeChat	QQ
Line	WhatsApp	Messenger	Never use any	
Are you satisfied with the tool(s) you are using and why?				
I don't like WeChat as a team working tool, the experience of finding a file or message makes me crazy. Slow speed, much time cost, the MS Team is better than WeChat especially when we use team video				
How often do you use those tool(s)?				
Every day for WeChat and QQ, MS Team while only during course				
Which function(s) you do not like of the tool(s) you are using now, why:				
Too much rubbish functions in the WeChat and QQ, not related to the teamwork.				
What is your most favourite function(s) of the tool(s) you are using now, why:				
Bookmark/favourite function in the WeChat and QQ, Reply function in MS Teams				
Which function(s) do you think is most important when you use the tool(s): (Choose three of them)				
Video meeting (1v1)	Video meeting (multiple user)	Record meeting	Sharing screen	Sharing document
Whiteboard while meeting	Calendar	Calendar reminder	To-do list	Reply to selected message
Automatic reply	Sounds for notification	Add friends/contacts	Share status (online/Busy/offline)	Quick register by using other accounts
Others (Please state below):				
Why do you think this/these function(s) is/are important?				
If logged-in has to spend a lot of time that makes me feel anxiety, and I need to talk with friend easily so the friends function is important as well				

Interview Record Sheet				
Name	Sean Yu		Gender	Male
Email Address	Seanyu0824@gmail.com		Occupation	Student
Which of the following teamwork-driven communication tool(s) do you use?				
MS Teams	Discord	Zoom	WeChat	QQ
Line	WhatsApp	Messenger	Never use any	
Are you satisfied with the tool(s) you are using and why?				
<p>I use the Zoom most due to the university requirement, all the courses are using Zoom to stream, actually I don't like it too much because the record cannot include the text content, only left the video but I need the live chat, I think it's very important, most of the time the streamer are interact with other people, so you have to check the chat area for the answers, if no text in the record, you will see a silence blank during that time. that's weird.</p> <p>on the other hand, the download function is not good. only the streamer will receive the email with the download link, if I want to all the record, I hope it can provide a subscription option there that I can sub it. Besides I love discord, it's the best communication software to connect my classmates. when I did my coding class, our team choose Discord as the ONLY option for the team work, it's combining the stream and text chatting functions together, we can write down the idea and problems during video meeting and also it's very handy for checking other's screen, no latency, clear voice, excellent!</p>				
How often do you use those tool(s)?				
almost 3-4 times a week				
Which function(s) you do not like of the tool(s) you are using now, why:				
<p>1. the participants area must connect the main area, if the participants more than 20 I think, the list will extend much longer, if I want to check other peoples I have to scroll down many times, it shares area with chat box and cannot be a pop-up window, that's very annoying.</p> <p>2. the live chat cannot embed in to the video record and it also cannot export as an individual file with time stamp, this leads to some problems bother me, I have explained in previous answer</p>				
What is your most favourite function(s) of the tool(s) you are using now, why:				
<p>For Zoom</p> <p>1 Blur the background</p> <p>2 if you are the participants, when you press leave button it only display leave the channel, but if you are the host, you have two buttons, one is close the window and another one is leave without close this session</p> <p>For Discord</p> <p>1 Robot management, automatically</p> <p>2 easy to join and invite</p>				
Which function(s) do you think is most important when you use the tool(s): (Choose three of them)				
Video meeting (1v1)	Video meeting (multiple user)	Record meeting	Sharing screen	Sharing document
Whiteboard while meeting	Calendar	Calendar reminder	To-do list	Reply to selected message
Automatic reply	Sounds for notification	Add friends/contacts	Share status (online/Busy/offline)	Quick register by using other accounts
Others (Please state below):				
Robot assistant channel management				
Why do you think this/these function(s) is/are important?				
robot can be triggered by keywords, that's very helpful for different level of knowledge of users, it can reply some simple and frequent questions, reduce the labor works.				

