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[Requirements] Elicitation

Purpose of Flockr (from spec): To manage the transition from trimesters to hexamesters in 2020, UNSW has established a new focus on building an in-house digital collaboration and communication tool for groups and teams to support the high intensity learning environment.

[Requirements] Questions to ask users

We interviewed two people to gather information about the users of Flockr.

During this interview, we started off with some general questions about communication tools for collaboration, and later on we enabled each interviewee to play around with the demo¹ of Flockr. The questions we used were of the form:

[GENERAL]

- **How often do you use communication tools?**
- **In general, what do you usually use communication tools for?**
- **What struggles do you have when communicating with your team members / colleagues**
- **What communication tool do you turn to when you need to work with a team for an extended project**
 - **What do you like about this tool**
 - **What deficiencies do you find in this tool**

[DEMO]

- **What parts of this were the most/least important for you?**
- **Is there anything you would change/add/remove to make this better for you?**
- **Was there anything surprising or unexpected?**

Response 1 - Shiv (Office worker user)

Email: shivchawla2092@gmail.com

Responses are recorded in italics.

[GENERAL]

- **How often do you use communication tools?**
Work email
- **In general, what do you usually use communication tools for?**
8 hours a work day Email. Also use Microsoft Teams and Skype. For personal use, FB messenger or text. I use a mix, though work email is the main one

¹The demo refers to the environment provided in this course for all groups in:
<http://flockr-unsw.herokuapp.com/>

- **What struggles do you have when communicating with your team members / colleagues?**

Network quality poor for VCs and Calls

Communicating via skype is hard for complex stuff...

you need to speak to them to discuss more complex ideas. Text is too limiting a medium

- **What communication tool do you turn to when you need to work with a team for an extended project**

Outlook - email main tool

- **What do you like about this tool?**

outlook good for efficiency Like ability to organise self as I've learned more features. Integration with my other tools I use

- **What deficiencies do you find in this tool?**

Outlook is very limited in what it can do: email and maybe calendar. Poor user experience. Microsoft Teams/s UX is better, conversation threads, feels more real time. You can easily launch a call via teams very quickly and Teams also gets my calendar data.

Because outlook is still heavily reliant on sending and receiving emails, it feels outdated.

Microsoft Teams has the same conversation window so it feels like a continued convo, so I'm always connected. With it Outlook, writing emails feels like a task to do...whereas Teams feels like a natural

[DEMO]

- **What parts of this were the most/least important for you?**
- **Is there anything you would change/add/remove to make this better for you?**

Add: Whiteboard functionality on virtual comms tool would be cool. Something really easy to all sketch ideas on, e.g. powerpoint slides transition once one screen is finished

Add: Team VMB -, i.e. a trello/kanban that helps us manage a project or deliverables, work agile

Remove: What is this Live/Step button do? It is unclear.

Add: "My Contacts" so i can message favourite contacts directly.

Add: Ability to share things: document, videos, images

Add: Team VMB -, i.e. a trello/kanban that helps us manage a project or deliverables, work agile

- **Was there anything surprising or unexpected?**

No, it seems like a standard messaging type tool

Response 2 - Clarissa (University student user)

Email: c.l.lu0306@gmail.com

- **How often do you use communication tools?**
Daily
- **In general, what do you usually use communication tools for?**
Chatting, discussing work, sharing memes and organising events
- **What struggles do you have when communicating with your team members / colleagues?**
People showing up on time - Availability
Poor internet connection
- **What communication tool do you turn to when you need to work with a team for an extended project?**
 - **How do you communicate with your team members?**
Discord and [Facebook] messenger mostly.
Zoom occasionally but rare.
I like using [Facebook] Messenger, because facebook is so big, so easier to add people and create groups on messenger for direct messages.
I use discord for actual calls because the internet connection is better, it doesn't cut out as much, it allows you to share screen and you can mute and deafen so you don't hear background noise. It also allows you to share content more easily, such as sharing music. It's faster and clearer than Zoom

[DEMO]

- **What parts of this were the most/least important for you?**
Deleting and editing messages, liking messages → i like the ability to retract what i say after i said or editing particularly in the case of typos → so i can reduce miscommunication
I like the reacting → makes it convenient for people to say yes - instead of overloading messages
Pinning messages is a nice feature → we don't use messenger as much because messages and other things get lost. Problem with pinning in my experience is that you can only pin one thing at a time but with Flockr you can pin multiple things so that is good
Search message function is important
What Clarissa doesn't like
Don't understand the purpose of step and leave feature; would prefer just live.
Public channels are unnecessary to me because I would rather be selective of who I talk to
- **Is there anything you would change/add/remove to make this better for you?**
Remove: step/live feature. Just have live
Add: Ability to upload photos or screenshot, videos and documents
A picture is worth a 1000 words

quiche G 8 minutes ago
d,fmas,dmf

quiche G 8 minutes ago
ok why u sending bro

quiche G 8 minutes ago
interesting

quiche G 7 minutes ago
mdfm

quiche G 7 minutes ago
hey

Easier to communicate and convey ideas by showing instead of telling

Change: Messages look less clunky

If one person sends continuous messages, it would be easier to read if that message was presented together instead of separately so in the image have all the messages be presented as one column under the name quiche G.

Add: Voice Call/ Share screen feature

Faster way of conveying information coz on average person type 60wpm but speak 200wpm

Add: Stickers

I like stickers

Change: When creating a channel - make it clearer if its secret or not secret

Add: It would be nice to be able to change channel colours so it is easier to identify and personalise

Add: Have notifications when someone messages on a channel

Add: Insert create poll feature like in messenger

Add: Scheduling reminders feature with obnoxious noises as an alarm or ringtone so people will be alerted when a scheduled meeting starts

Add: Separation between Direct Messages and group chats - on the left-hand side of the layout. Instead of just mychannels and other public channels, have a section for just Direct Messages where it's just members' names and only the group chats that you are part of have actual channel_names. Right now, to directly message one user, I have to make an entire new channel with just that one user.

Add: Add friends feature so you can message people you know directly and distinguish between members

Add: More react options so i can respond more emotionally to peoples messages and suggestions.

- **Was there anything surprising or unexpected?**

It was nice to have an editing feature. Though the downside of this editing feature is people are not held accountable if they say anything rude and they edit the message.

[Requirements] Analysis & Specification and validation

User Story 1:

"As a person who has to work/study remotely, I want a contacts view so that I can see who I can get in touch with directly *and who I contact most frequently*

Acceptance Criteria

- On the left-hand-side of the Flockr page, have a toggle to see Channels or 'Individual Contacts'
- 'Individual Contacts' contains two lists, first list is titled 'Favourites' and second list is titled 'All Users'
- 'All Users' displays a list of all other users on Flockr with a white star next to each name.
- If User clicks on the star next to another user's name, that other user's star turns yellow on the list and gets added to favourites-list
- Clicking the star on the favourites list makes the star white again and removes the user from the favourites list.
- Added due to feedback: search function for searching users
- Removed due to feedback: permissions-based system

Validation from interviewees:

Shiv: I don't like the permissions-based system for adding contacts to direct messages. You should be able to look them up and contact them directly within your larger group, e.g. work or university. Yes, I want this feature for both convenience and privacy reasons.

Clarissa: I want to be able to search up a specific user on Flockr - using either handle or names; if for uni then if people register using uni emails and zids then we can search with zids → convenient and easier. I would prefer a tab format where I can separate the favourites list from the all users so that I don't misclick. .

User Story 2:

"As a person who has to work/study remotely, I want a separation between direct messages with individual contacts and group messages in channels so that: it is more convenient to see my important messages, and I can have private chats with individuals easily

User Acceptance Criteria:

- On the Individual Contacts list, clicking on the direct message icon, a speech bubble, automatically creates a private channel (if no channel has already been created) with the name as a combination of the two users involved in the direct messaging.
- Channel page looks exactly like a group channel

- Messaging properties are the same as messaging in a channel so users in the direct messaging channel can search, pin, react, edit and remove messages.
- Both users are automatically made owners of this channel.
- Added due to feedback: Ability to turn off notifications

Validation from interviewees:

Shiv: Yes, convenience and privacy are the important things behind this. Keep this functionality simple.

Clarissa: Yes, makes sense.

User Story 3:

"As a person who has to work/study remotely, I want to be alerted with notifications when I receive a message so that I don't miss important messages."

User Acceptance Criteria

- In-website badge notification when a user receives a message in a channel that are a part of but not looking currently loading the messages of i.e they are looking at a different channel page from the one messages are being sent to.
- The badge notification contains the first 100 characters of the user sent with the name of the user who sent it as well as the name of the channel the message was sent to.
- Circle badge next to the channel name or next to the name of the user (who sent the message) on Individual Contacts if the message was sent as a direct message.
- Inside the circle badge is a number that corresponds to the number of messages in the channel that the user hasn't seen or loaded yet

Validation from interviewees:

Shiv: I like the badge notifications, but we should be able to choose the level of notification intrusiveness.

Clarissa: There should also be a way of muting certain groups/messages.

User Story 4:

"As a person who has to work/study remotely, I want the ability to easily start audio calls and video calls with both individual contacts and groups in a channel so that I can better collaborate and communicate with people.

User Acceptance Criteria:

- Call icon to initiate call on the left hand of each channel home page, underneath channel details and above where messages gets loaded

- When a call icon is pressed, a pop up appears saying the call started. Pop-up includes a microphone toggle to mute and unmute microphone and a button to disconnect from call.
- Film icon to initiate video call adjacent right to call icon. Pop-up includes a microphone toggle to mute and unmute microphone, a toggle to turn on and off camera, button to disconnect from call and an option to share screens so that we can collaborate centered around a document, presentation, code, etc.
- These calls integrate with the audio and video input/output of the device the user is using
- Once call is ended, summary in message history with that contact that there was a call that started at X time, lasted Y long

Validation from interviewees:

Shiv: A summary in message history with call started at X time, lasted Y long is nice to have but not necessary

Clarissa: This is an important feature. It is essential to be able to collaborate in this manner, as sending through documents/files/etc. is necessary for me as a uni student

User Story 5:

As a person who has to work/study remotely, I want to be able to upload documents/images to share so that I can give my colleagues/team members relevant information/ documents we are collaborating on

User Acceptance Criteria:

- Paperclip icon on message sending bar to choose files from my local machine to upload/share;
- Once a non-image file is uploaded, an icon is displayed with the file name in the message history. If users click on that icon, pop-up to prompt those users to download the files themselves onto their local machine
- Also, message_send can take in an image file if a user copies and pastes an image directly into message bar
- For images, display the image like you would do the content of a text-type message in the message history
- If I share a link, it should be hyperlinked so that users can just click that link to open it in their browser in a new tab
- Contextual icons: e.g. sound icon if a sound file, document icon if a document file....

Validation from interviewees:

Shiv: This is a really important feature. Keep it simple. User acceptance criteria all makes sense

User Story 6:

As a person who has to work/study remotely, I want to be able to have a kanban-like board so I can conveniently use it to keep track of the work being done in my team.

User Acceptance Criteria:

- To-do list icon on the left hand of each channel home page, underneath channel details and above where messages gets loaded
- When this icon is clicked, instead of loading messages, you load columns called boards
- There is a plus (+) icon to add more boards on the right hand corner
- When a user presses the add board icon, they are prompted to give a name for that list.
- By default, have two boards which are titled 'To Do' and 'Done'
- Each board contains a plus (+) icon to add tasks.
 - Each task has three sections: 'Task' where users type in the details of the task they want to accomplish; 'Assigned to' which defaults at None but can be given to any number of users who are currently members of the channel. 'Due' : which corresponds to the date due
 - "Task" can be no more than 200 characters

Validation from interviewees:

Shiv: Yes, a team management board is helpful for the check in/stand up meetings I regularly have.

Clarissa: That is very useful to me as it is a key feature that is currently missing from a lot of messaging apps that I use. Similar features that I've seen are usually made poorly eg. The poll feature in messenger only loads up when someone makes an edit to the feature and often gets lost within the rest of the messages.

[Requirements] Use Cases

We have chosen to translate a selection of these user stories into more detailed use cases.

Use Case 1: Direct Messaging Individual Contacts

Step 1: User One and User Two create an account on Flockr by registering

Step 2: Flockr directs each user to the homepage with a column on left hand to toggle between “Individual Contacts” lists and “Channels” lists (My Channels and Other Channels); default is “Channels” lists

Step 3: User One navigates to the Individual Contacts list

Step 4: Flockr displays two lists, one under the other. Both lists contain the names of users with a star next to the name; top list is titled “Favourites”, bottom list is titled “All Users”

Step 5: User One presses a white star next to User Two’s name in “All Users” list

Step 6: Flockr makes the star go yellow, and adds User Two onto the “Favourites” list

Step 7: User One presses the yellow star on the “Favourites” list next to User Two’s name

Step 8: Flockr removes User Two from the “Favourites” list and makes the star white next to the user’s name in “All Users” list

Step 9: User presses on a User Two’s name on either of the lists in “Individual Contacts”

Step 10: Flockr creates a private channel page titled “UserOneUserTwo” where both User One and User Two are owners of the channel

Step 11: User One types a message into the message box and presses send.

Step 12: User Two navigates to “Individual Contacts” page and clicks on User One’s name

Step 13: Flockr opens channel page and loads the messages on the channel message

Step 14: User Two reads the message sent by User Two and types a message into the message box and presses send.

Validation from interviewees:

Shiv: Broadly seems correct.

Clarissa: I would prefer a tab format where I can separate the favourites list from the all users so that I don’t misclick. I would also like a search feature because it would be more convenient.

Use Case 2: Video Calls on a Channel

Step 1: User One clicks relevant channel page from left hand side panel on homepage of Flockr. This can be an individual contact channel (per Use Case 1) or a traditional channel .

Step 2: Flockr displays channel page with relevant channel details and messages

Step 3: User One presses film icon

Step 4: Flockr commences connection to the call room in the channel.

Step 5: User One’s local device commences the process of connection in the call room.

Step 6: A coloured red bubble appears on the channel details section of the channel page saying “Call Active, Click to Access Call” on the channel page.

Step 7. User Two navigates to the channel page and Clicks Call Active bubble.

Step 8: User Two's local device commences the process of connection in the call room. User One and User Two are both in the call room. They receive any audio and video broadcasts in the room.

Step 9: User One selects to broadcast their own audio (via device microphone) and **either** the video (via device camera) or screen (their device's screen). Both users can toggle these options OFF/ON during the time they are connected, i.e. in the call room. User One selects to broadcast screen and speaks

Step 10: User Two hears User One's comments from their own device's audio and can see User One's screen from the call room page.

Step 11: User Two presses exit call icon

Step 12: Flockr disconnects User Two from the call. Call active remains as a red bubble. User One remains in the call room.

Step 13: User Two navigates to the channel page and Clicks Call Active bubble.

Step 14: User Two's local device commences the process of connection in the call room. User One and User Two are both in the call room.

Step 15: User One and User Two both press the exit call icon. No users remain in the call room.

Step 16: Call room closes and call is terminated. The coloured red bubble disappears from the channel details section of the channel page..

Validation from interviewees:

Shiv: Yes, makes sense.

Clarissa: Sounds good.

Use Case 3: Visual Task Management Board on Channel

Step 1: User One clicks relevant channel page from left hand side panel on homepage of Flockr.

Step 2: Within the channel/group view, there is a button at the top labelled "Board"

Step 3: Upon clicking the button, the user sees columns which by default are two labelled "To Do" and Done.

Step 4: The user presses a plus icon to add more columns to the board, or double clicks the headings of existing boards to edit their names.

Step 5: Within each column of the board, there is another + icon. Upon pressing it a dialogue box comes up which when completed, will create a card displaying the task on the board. The dialogue box's fields include Task Name, Due Date, Assigned To, etc....

Step 6: The cards with the tasks can be drag and dropped across columns

Step 7: At any time after creation, the cards displaying tasks can be double clicked to be edited. The user clicks this menu to press a button saying "Delete Task". This will remove the card, deleting its data and preventing its display on the columns.

Validation from interviewees:

Shiv: Yes, makes sense.

Clarissa: Sounds good.

[Design] Interface Design

Data Types

Orange is new, green is updated and pink is from current spec data information which is relevant to new data interface table below.

Variable Name	Type
task	string
assigned	List of u_ids
Has prefix_is	boolean
Has prefix time_	integer (unix timestamp), check this out
Has suffix _id	integer
(outputs only) name ends in members	List of dictionaries, where each dictionary contains types { u_id, name_first, name_last, profile_img_url }
(outputs only) named exactly channels	List of dictionaries, where each dictionary contains types { channel_id, name }
(outputs only) named exactly users	List of dictionaries, where each dictionary contains types u_id, email, name_first, name_last, handle_str, profile_img_url, is_favourite, is_direct_active
(outputs only) named exactly boards	List of dictionaries, where each dictionary contains type board_name, board_details where board_details is a list of dictionaries which contains task, time_due and assigned_members

Interface

Function Name	HTTP Method	Parameters	Return type	Exceptions	Description
users/other	GET	(token)	{users}	N/A	Returns a list of all users with the user itself omitted

users/favourite	GET	(token)	{users}	N/A	Returns a list of all users which the user has added as a favourite
user/favourite	POST	(token, u_id)	{}	Inputerror: u_id does not refer to a valid user	Adds a user with id 'u_id' as a member of the favourites of the user with token 'token'.
user/unfavourite	POST	(token, u_id)	{}	Inputerror: u_id does not refer to a valid user	Removes a user with id 'u_id' from the favourites of the user with token 'token'.
channels/direct/create	POST	(token, u_id)	{channel_id}	Inputerror: u_id does not refer to a valid user	Creates a private channel with the two members for direct messaging. Automatically creates a name in the form "tokenfirstnamexu_idfirstname". Channel name must be no longer than 20 characters long. Both users are added as owners.
channels/list	GET	{token}	{channels}	N/A	Provide a list of all channels (and their associated details) that the authorised user is part of that are NOT direct messaging channels.
channels/listall	GET	{token}	{channels}	N/A	Provide a list of all channels (and their associated details) that are not direct messaging channels.
board/create	POST	(token, channel_id, board_name)	{board_id}	InputError: Channel_id is invalid board_name is more than 50 characters long	Creates a board with name board_name

				AccessError: The authorised user is not a member of the channel	
board/edit/boardname	PUT	(token, board_id, board_name)	{}	InputError: Channel_id is invalid board_id is not a valid list within a channel that the authorised user has joined Name is more than 50 characters long	Given a board_id for a board, update the board's name with the name given as 'board_name'.
board/remove	DELETE	(token, board_id)	{}	InputError: Channel_id is invalid board_id is not a valid list within a channel that the authorised user has joined	Given a board_id for a list, remove the board_id from the channel and, as a consequence, all tasks associated with it.
task/add	POST	(token, board_id, task , time_due, assigned)	{task_id}	InputError: list_id is not a valid list within a channel that the authorised user has joined Task_details is over a 1000 characters Task_details is an empty string	Given a board_id, add a task with attributes task, date_due and assigned. If time_due is an empty string, set date_due to None. If assigned is an empty list, there are no users assigned to this task

				Time_due is a time in the past	
task/settask	PUT	(token, task_id, task)	{}	InputError: task_id is not a valid task within a channel that the authorised user has joined Task_details is over a 1000 characters Task_details is an empty string	Given a task_id, change its' details to the given input 'task'
task/setdate	PUT	(token, task_id, time_due)	{}	InputError: task_id is not a valid task within a channel that the authorised user has joined time_due is a time in the past	Given a task_id, update it's due date with the input time_due.
task/setassigned	PUT	(token, task_id, assigned)	{}	InputError: task_id is not a valid task within a channel that the authorised user has joined	Given a task_id, update the users assigned to the task with the users given in the input 'assigned'. Remove users not included in the input 'assigned' If assigned is an empty list, there are no users assigned to this task.
task/remove	DELETE	(token, task_id)	{}	InputError: task_id is not a valid task within a channel that the authorised user has joined.	Given a task_id, remove that task from its associated board..

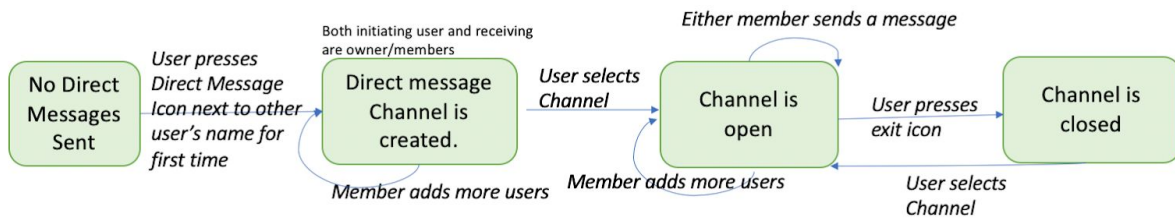
channel/boards	GET	(token, channel_id)	{boards}	InputError: Channel_id is invalid AccessError: The authorised user is not a member of the channel.	Given a channel_id, return a dictionary of all the boards in that channel.
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Errors for all functions

- Either an InputError or AccessError is thrown when something goes wrong. All of these cases are listed in the Interface table.
- One exception is that, even though it's not listed in the table, for all functions except auth/register, auth/login, auth/passwordreset/request and auth/passwordreset/reset, an AccessError is thrown when the token passed in is not a valid token.

[Design] Conceptual Modelling (State)

Direct Messaging – state diagram for Channels



Initiate a call – state diagram for Users

