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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 demo<sup>1</sup> 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](mailto: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*

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<sup>1</sup>The 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](mailto: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*  
*Easier to communicate and convey ideas by showing instead of telling*  
*Change: Make 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.*

*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 task management board so that I can conveniently 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 no boards exist
- 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. We have chosen to write these use cases as Goal in Context, with some informal list of steps.

### **Use Case 1:** Adding Favourites

**Goal in Context:** Users can add contacts from 'Individual Contacts' list to a 'Favourites List' for easy access to them in future.

**Scope:** Flockr website, Contacts list

**Level:** Primary Task

**Preconditions:** The user is a registered user of Flockr and there are multiple users also in Flockr

**Success End Condition:** The selected user is added to the 'Favourites List' and the star next to their name is yellow

**Failed End Condition:** The user tries to add a contact whose is already in the Favourite's list (this results in removing someone from the 'Favourite's list instead)

**Primary Actor:** Flockr user

**Trigger:** User presses the star next to the name of the of the user on 'Individual Contacts list'

### **Scenario Description:** Favoriting and Unfavoriting a user

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 the 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.

### **Use Case 2:** Direct Messaging

**Goal in Context:** Users can directly message another individual user without having to manually create a channel

**Scope:** Flockr website, channel

**Level:** Primary Task

**Preconditions:** The user is a registered user of Flockr and there are multiple users also in Flockr

**Success End Condition:** The user is able to send a message to another user and the other user is able to receive it

**Failed End Condition:** The message is an empty string or over a 1000 characters long.

**Primary Actor:** Flockr user

**Trigger:** User presses the speech bubble icon next to the name of the user they want to direct message on the 'Individual Contacts' list

**Scenario Description:** Direct messaging another user

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 the left hand side 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: User presses on the speech bubble icon next to User Two's name on either of the lists in "Individual Contacts".

Step 5: Flockr creates a private channel page titled "UserOneUserTwo" where both User One and User Two are owners of the channel.

Step 6: User One types a message into the message box and presses send.

Step 7: User Two navigates to "Individual Contacts" page and clicks on User One's name.

Step 8: Flockr opens the channel page and loads the messages on the channel message.

Step 9: User Two reads the message sent by User One 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 3:** Adding Board on a Channel

**Goal in Context:** Users can add boards (columns) that contain tasks (which users can also add) so that users can manage time and project goals when working in a team.

**Scope:** Flockr website, channel

**Level:** Primary Task

**Preconditions:** The user is a registered user of Flockr and a member of the channel that they want to add a board to

**Success End Condition:** The board appears on the channel page

**Failed End Condition:** Board name is over 50 characters long

**Primary Actor:** Flockr user

**Trigger:** User presses the to-do list icon on the default channel page (which loads the channel's messages) and presses plus icon on the top right corner of that page to add a board

**Use Case 4:** Adding Tasks on a Channel Board

**Goal in Context:** Users can add to boards on a channel so that users can manage time and project goals when working in a team.

**Scope:** Flockr website, channel, board

**Level:** Primary Task

**Preconditions:** The user is a registered user of Flockr, a member of the channel that they want to add a task to and that channel contains at least one board already

**Success End Condition:** The task appears on the selected board

**Failed End Condition:** Details of task are an empty string or over a 1000 characters; Due Date is a time in the past; a user that is assigned to the task is not a member of the channel.

**Primary Actor:** Flockr user

**Trigger:** User presses the presses the plus icon on a board

**Scenario Description:** Organising Boards and Tasks on a Channel (Use Case 3 & 4 Combined)

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

Step 2: Flockr displays the default channel page with the channel's messages loaded displayed in the body. To-do list icon located on the upper left corner of the channel page.

Step 3: User clicks the to-do list icon.

Step 4: Flockr displays a blank area as the body of the channel pages of the channel page with a plus icon.

Step 5: User presses plus icon.

Step 6: Flockr prompts the user with a dialogue with field: Board Name

Step 7: User fills in the input field in the dialogue box from step 6.

Step 8: Flockr adds a column to the page known as a board with the name of the board at the top of the column. Within the board, there is another + icon.

Step 9: User presses the plus icon within the board.

Step 10: Flockr prompts the user with a dialogue box with fields: Task, Due Date, Assigned To

Step 11: User fills in the input field in the dialogue box from step 10.

Step 12: Flockr displays the board with a card inside with the task information that was input by the user in step 11.

Step 13: User double clicks a task card to edit the task.

Step 14: Flockr displays a menu for the task with options to edit "Task", "Date Due" and "Assigned To" as well as the option "Remove Task".

Step 15: If the user uses any of the edit features, when the menu for the task is closed, Flockr will display the edited version of the task. If the user presses "Remove Task", Flockr shows a board without that task. In this case, the board would be empty.

Step 16: User double clicks the board name.

Step 17: Flockr displays a menu with options to edit "Board Name" as well as the option to "Remove Board".

Step 18: If the user uses any of the edit features, when the menu is closed Flockr will display the edited version of the task. If the user presses "Remove Task", Flockr will remove the board. In this case, the display in Step 4 should be displayed because there was only one board.

Step 19: User presses the to-do list at the top left corner of the channel page.

Step 20: Flockr displays the default channel page with channel messages as the body.

**Validation from interviewees:**

Shiv: Yes, makes sense.

Clarissa: Sounds good.

## [Design] Interface Design

### Data Types

Key:

- Orange: Completely new data types
- Pink: Same data types as iteration 3 spec (relevant to the inputs, outputs of the interface described below)
- Green: Data types that have been updated from iteration 3 spec for interface described below

Variable Name	Type
<b>task</b>	string
<b>assigned</b>	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 <b>users</b>	List of dictionaries, where each dictionary contains types u_id, email, name_first, name_last, handle_str, profile_img_url, <b>is_favourite</b> , <b>is_direct_active</b>
(outputs only) named exactly <b>boards</b>	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

### Key

- Yellow: Functions Relevant to Use Case 1
- Orange: Functions Relevant to Use Case 2
- Green: Functions from current specification that have to be updated for this interface design to support Use Case 2
- Blue: Functions relevant to Use Case 3 and 4

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)	{}	<b>Inputerror:</b> 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)	{}	<b>Inputerror:</b> 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}	<b>Inputerror:</b> 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}	<b>InputError:</b> Channel_id is invalid  board_name is more than 50 characters long  <b>AccessError:</b>  The authorised user is not a member of the channel	Creates a board with name board_name
board/edit/boardname	PUT	(token, board_id, board_name)	{}	<b>InputError:</b> Channel_id is invalid  board_id is not a valid board within a channel that the authorised user has joined  board_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)	{}	<b>InputError:</b> 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}	<b>InputError:</b>  board-id is not a valid board within a channel that the authorised user has joined  'task' is over a 1000 characters  'task' is an empty string  time_due is a time in the past  A u_id inside the list 'assigned' is not a member of the channel that contains the board with the id 'board_id'	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
task/settask	PUT	(token, task_id, task)	{}	<b>InputError:</b> 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)	{}	<b>InputError:</b>  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 its' due date with the input time_due.

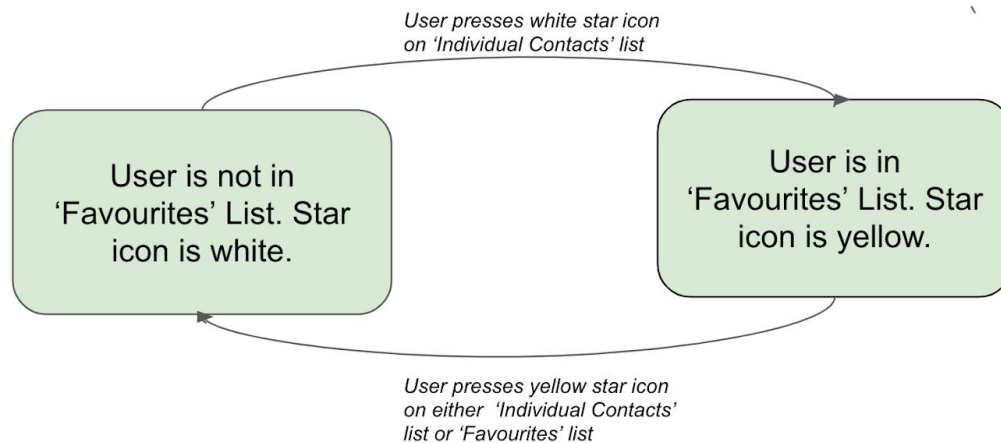


task/setassigned	PUT	(token, task_id, assigned)	{}	<p><b>InputError:</b></p> <p>task_id is not a valid task within a channel that the authorised user has joined</p> <p>A u_id inside the list 'assigned' is not a member of the channel that contains the board with the id 'board_id'</p>	<p>Given a task_id, update the users assigned to the task with the users given in the input 'assigned'. Remove users not included in the input 'assigned'</p> <p>If assigned is an empty list, there are no users assigned to this task.</p>
task/remove	DELETE	(token, task_id)	{}	<p><b>InputError:</b></p> <p>task_id is not a valid task within a channel that the authorised user has joined.</p>	<p>Given a task_id, remove that task from its associated board..</p>
channel/boards	GET	(token, channel_id)	{boards}	<p><b>InputError:</b></p> <p>Channel_id is invalid</p> <p><b>AccessError:</b></p> <p>The authorised user is not a member of the channel.</p>	<p>Given a channel_id, return a dictionary of all the boards in that channel</p>

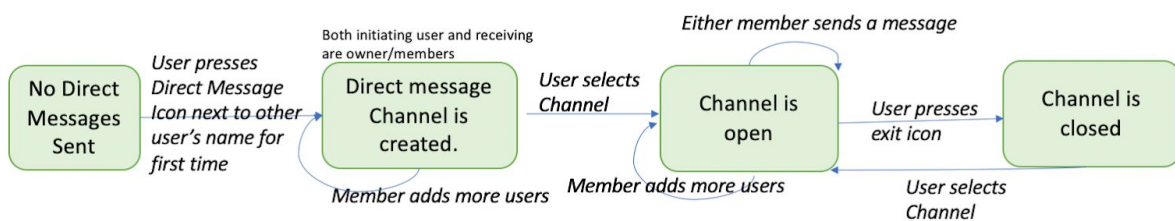
#### Errors for all functions

- 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.

## Favourite Flockr Contacts — state diagram for a User



## Direct Messaging – state diagram for Channels



## Using Task Management Board— state diagram for a Channel

