

The background features abstract geometric shapes. A large blue triangle points downwards from the top right corner. A smaller orange triangle points downwards from the top left corner. A large blue triangle points upwards from the bottom left corner. The central area is white.

# UNSW Seams

SDLC Report 2022

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## Development Summary:

Since initial development, a minimum viable (MVP) product for UNSW Seams has been achieved, with core implementation integrated into Seams' software.

### 1.1 Iteration 1

Iteration 1's sprint was intended to implement general user registration and user channel features for users, key features implemented includes:

- User registration, storage and authentication within application
- User channel creation for private and public channels
- Core channel features, including invitation and joining functionality for users
- User, channel and message backend requesting for frontend display

Alongside Iteration 1's core functionality, prototyping for data persistence was implemented with the use of a data store class. This allowed initial features to be tested and validated by our backend team.

### 1.2 Iteration 2

Iteration 2's sprint focused on core backend server implementation. Iteration 2's backend server was implemented locally using server framework Flask. Additional user features implemented include:

- User customization features for user profile names, profile handles and profile email address
- Ability for users to leave channels and other channel features for adding and removing owner users
- Core functionality for direct messaging (DM) channels
- Message send, edit and removing features for channels and DMs
- DM, channel and user data requests for frontend use.

Iteration 2 also implemented data persistence, using JSON persistence file for storing and retrieving backend data.

### 1.3 Iteration 3

Iteration 3's sprint focused on Seam's cloud deployment as well as the implementation of additional features. These features include:

- Message search, reacting and pinning and sharing features for channels and DMs
- Message sending based on specified time ('send later' implementation)
- The implementation of 'standups', where messages sent in channels can be buffered and wrapped into a single message for a given elapsed period.
- Password reset functionality for users
- Photo upload for user profiles
- Stats display for user, channel and message information

## ➤ Notification display for messages

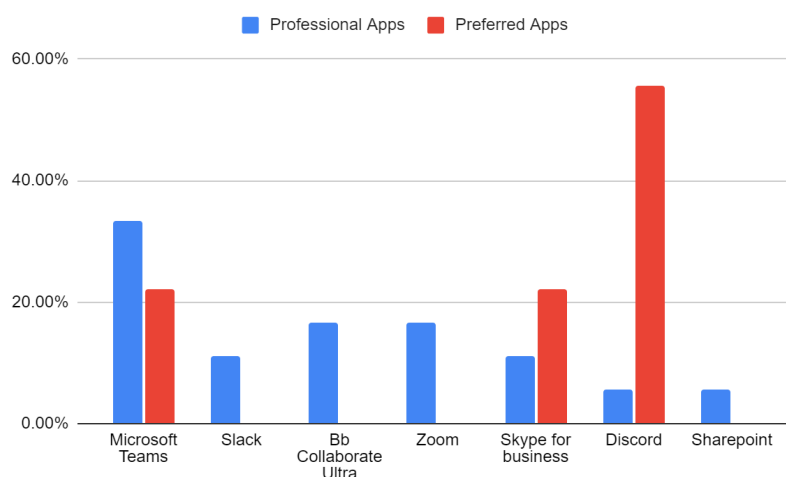
Iteration 3's backend has been deployed using cloud provider AlwaysData, allowing for local frontend testing without requiring a local backend.

## Planning ahead: Active User Problems

Looking ahead to the next stage of Seam's development cycle, users of other workplace collaboration software were surveyed to better understand active industry problems addressable by future iterations of UNSW Seams.

Several user themes appeared in the survey responses including.

### ***Users prefer apps that integrate message functions intuitively***

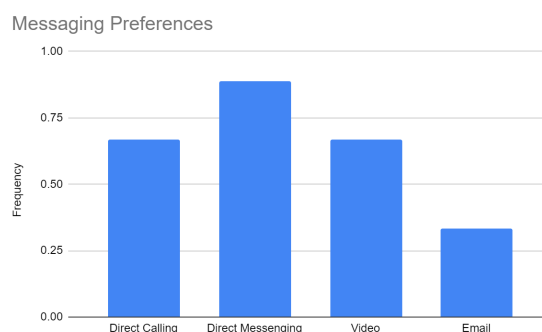


There was noticeable discrepancy between apps used professionally and personally. Despite 66% reporting to use Microsoft Teams in a professional setting, only 22% preferred the app. Most users preferred Discord, with 55.56% of users reporting the apps as their preferred app.

According to survey consensus users appeared to prefer Discord's due to integrated 'text & voice channels', as well as easy navigation for direct messaging and channels. Given that Discord had a reportedly low usage professionally of 11%, user feedback suggests a desire for increased integration and accessibility of communication methods.

### ***Users want remote communication to be versatile***

Users' survey responses showed a preference towards multiple communications methods, with a relative equal preference frequency between direct calling (66.67%), direct messaging (88.89%) and video communication (66.67%). Survey responses



indicate distinct use cases for each communication method.

Users reported to use direct messaging for convenience and fast communication:

*“Direct messaging is effectively instantaneous with messaging, direct calls are just there should you need to share data or show images.”*

*“Quick and convenient. People tend to respond to direct messages quicker than emails or post.”*

Users reported using Video communication and calling methods for a more “authentic” interaction, closely resembling in person communication:

*“(Calling and video) works best for me as it best represents a real life conversation and exchanges in conversation between parties. “*

*“(Direct calling and video) allows for an authentic human conversation”*

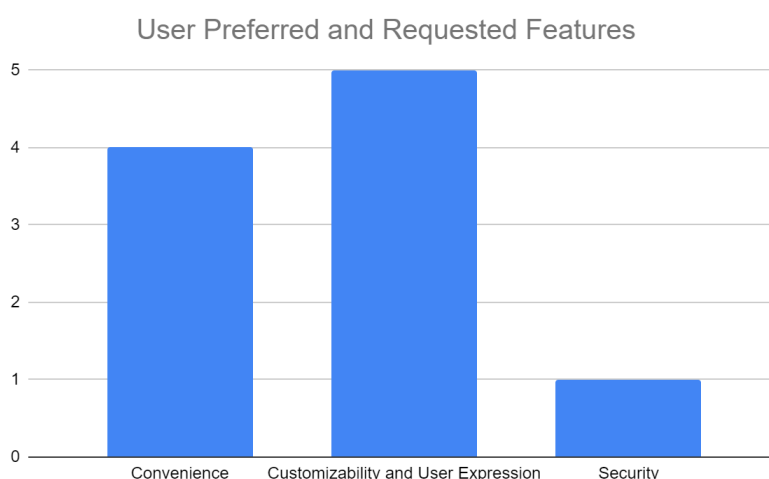
Despite the convenience and speed of direct messaging, calling and video communication, users still indicated a desire for email for “structured” administrative team communication:

*“email works best for a formal written conversation, eg administrative type stuff (eg agendas, task list, meeting papers) or to formally discuss issues or decide policy positions on issues”*

*“email allows for in depth and structured communication which needs to be kept on record”*

Given the user demand for a range of communication methods, survey responses indicate a desire for communication methods that satisfy a variety of business and communication functions. As Seams continues to iterate development, the feedback suggests a desire for refined, versatile communication.

### **User want customization and personal expression in communication**



User features when categorised by nature indicates that 55.56% of preferred and requested features serve to enhance customizability or user expression. Features included in this

category include dynamic screen sharing, “whiteboard” functions that allow user screen collaboration, file sharing, emojis and channel/server roles and customization.

This emphasis, which is also prevalent within requested user features, suggests an ongoing desire for enhanced user expression, as well as communication and collaboration customizability in workplace communication apps.

These themes can be summarised with the following user stories:

***As an employee in the workplace I want to easily be able to navigate and organise my messages and channels.***

***As an employee in the workplace I want my different conversations and messages to be easily integrated.***

***As an employee in the workplace I want a variety of different messaging options.***

***As an employee in the workplace I want to be able to communicate formally and informally and be able to choose between the two easily.***

***As an employee in the workplace I want to be able to vary the structure and presentation of my messages.***

***As an employee in the workplace I want remote collaboration to be dynamic and interactive between all involved parties.***

***As an employee in the workplace I want to be able to express my ideas in a number of different ways.***

***As an employee in the workplace I want my messages to be customizable and tailored to what I want.***

***As an employee in the workplace I want my communication feeds, and active conversations to be dynamic, customizable and mutable.***

***As an employee in the workplace I want more dynamic communication and collaboration.***

## **Use Cases**

Collating user feedback and user stories, we have the 3 following use cases:

### **USE CASE SCENARIOS:**

A use case to communicate formally/informally, express ideas in a number of different ways, communicate in a dynamic and customisable way.

- User logs onto Microsoft Seams
- User reads the last 50 messages in one channel they are a part of
- User reacts to messages to express approval/disapproval
- User logs out of Seams

A use case to allow dynamic and interactive remote collaboration and express ideas in a number of different ways

- User logs onto Microsoft Seams
- User sends a replit link in a DM to collaboratively code with partners
- Other DM members click the link and write code with the user
- User exports the written code into a file
- User uploads the file into the DM
- Other DM members download the file
- User logs out of Seams

A use case to easily navigate messages and channels, easily integrate conversations and messages, communicate formally/informally, express ideas in a number of different ways and allow communications feeds and conversations to be dynamic.

- User logs onto Microsoft Seams
- User starts a call within a DM
- Other DM members join the call
- DM members write messages in the channel during the call
- All DM members leave the call, ending the call
- User logs out of Seams

For the above use cases, we propose 3 new features:

**Calling** - A user can start an internet call with either a given user or given channel. Calls directed to individual users can be initialised by toggling the 'call' button within a direct message channel. For channel calls, users can toggle the 'call' feature within the channel.

**Emoji Reactions** - For a given message users will be able to react to the message using any of Seam's emojis. Messages reacted by a user can be unreacted or changed to a different emoji with the same toggle button.

**Url link messaging** - Url links can be sent through direct messages as directable hyperlinks. If the url string is sent spaced within the message, the link will be parsed and processed as a hyperlink request that is accessible within the direct message or channel.

## Interface design

The proposed features can be structured as the following http endpoints within Seam's interface:

Name	HTTP Method	Data Types	Exceptions
message/react/v2	Given a message within a channel or DM the authorised user is part of, add a "react" to that particular	<b>Parameters</b> → token, message_id, react_id <b>Return</b> → {}	<b>InputError:</b> <ul style="list-style-type: none"><li>• message_id is not a valid message</li></ul>

	message. The react id requests the associated emoji id and adds it to the message reaction.		within a channel or DM that the authorised user has joined
message/unreact/v2	Given a message within a channel or DM the authorised user is part of, remove a "react" to that particular message. The react id requests the associated emoji id and adds it to the message reaction.	<b>Parameters</b> → token, message_id, react_id  <b>Return</b> → {}	<b>InputError:</b> <ul style="list-style-type: none"> <li>message_id is not a valid message within a channel or DM that the authorised user has joined</li> <li>react_id is not a valid react ID</li> <li>the message does not contain a react with ID react_id from the authorised user</li> </ul>
dm/call/v1	Given a DM the authorised user is a part of, starts a call between the user and any DM channel members. Calls are started by connecting the call_id of the user with the call of the id of selected users in the dm.	<b>Parameters</b> → token, dm_id  <b>Return</b> → { time_call → integer }	<b>InputError:</b> <ul style="list-style-type: none"> <li>The user is not a member of the dm selected.</li> </ul>
channel/call/v1	Given a channel the authorised user is a part of, a call is started between the user and any channel members. Calls are started by connecting the call_id of the user with the call of the id of selected users in the channel.	<b>Parameters</b> → token, channel_id  <b>Return</b> → { time_call → integer }	<b>InputError:</b> <ul style="list-style-type: none"> <li>The user is not a member of the channel selected.</li> <li>The channel only has one user.</li> </ul>
hyperlink/request/v1	Given a valid message, an embedded url string is	<b>Parameters</b> → token, message,	<b>InputError:</b> <ul style="list-style-type: none"> <li>The message</li> </ul>

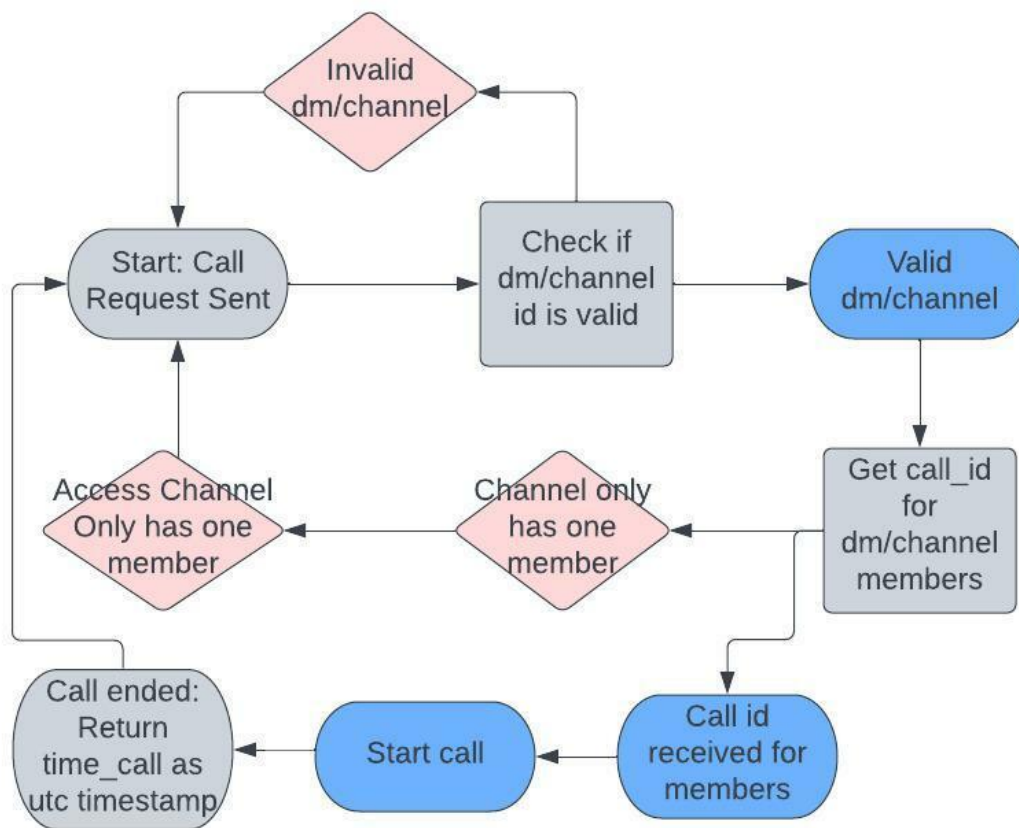


	parsed and converted into a hyperlink request. If the request is accepted the string is converted to the access link on the frontend.	<b>Return</b> → { url → hyperlink string }	has no valid hyperlink request. <b>Access Error:</b> - The hyperlink request is not valid (declined or non responsive).
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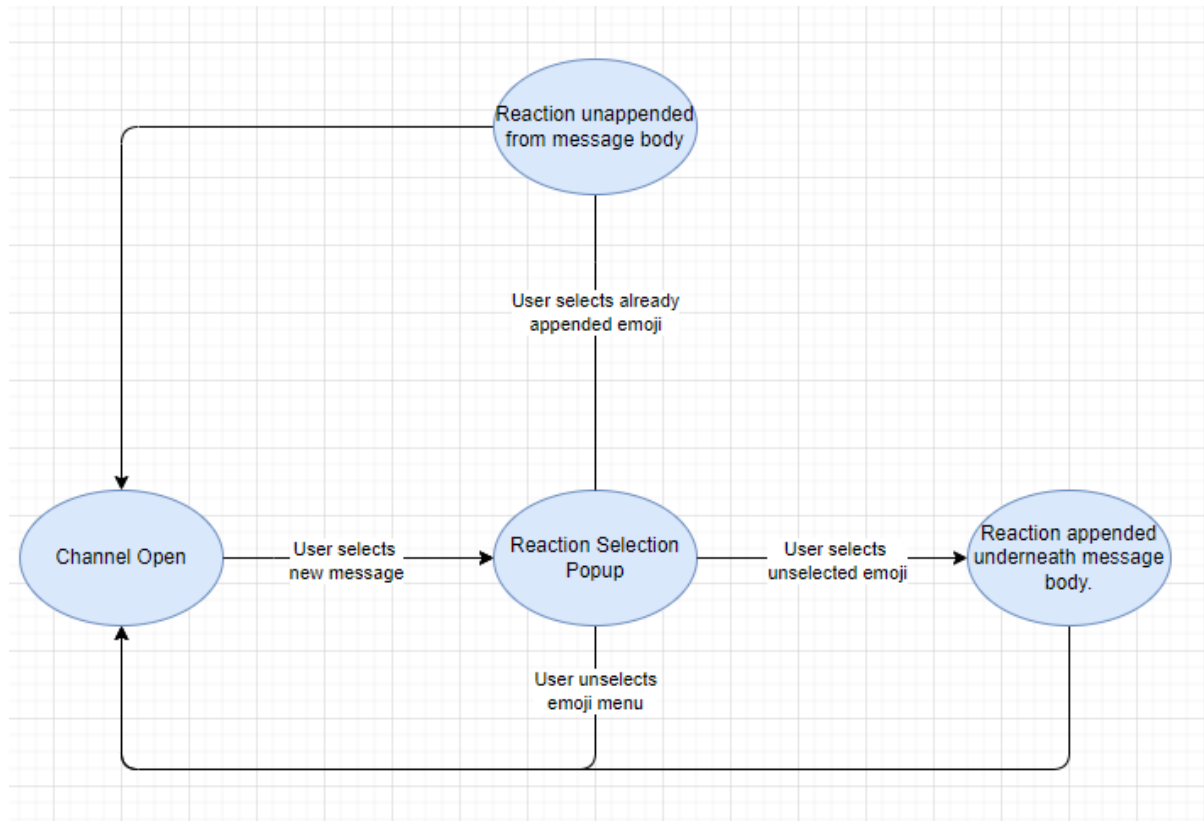
## Conceptual Modelling

Calling and reactions have been further elaborated with state based concept models:

### channel/call/v1 and dm/call/v1



### message/react/v2 and message/unreact/v2



## User Validation

In order to validate our analysis, we reached out to previous survey respondents about the proposed features. User responses indicate that proposed features are in line with user stories:

*"Yeah my main problem was lack of voice and text integration, adding calling would help a lot"*

*"Having more reactions allows me to more easily express what I'm trying to say"*

*"It would be cool to see calling stats so I'm excited for voice integration"*

*"Yeah, hyperlink messages would be great. It will make collaboration easier when I'm trying to share resources with my team".*

With these responses, we are optimistic that the proposed features and changes in the next iteration will further enhance Seam's integration, versatility and user customizability.

## Conclusion

From our initial survey results, it appears that users prefer integrated communications involving both voice and messaging functionalities, with a particular focus on user expressions. It appears that Seam's current focus on text-based communications with

independent channels and DMs could be improved upon in the future through support for voice functionalities.

In the future, Seams should aim to expand its features to address these user needs, adding some sort of voice call function, integrated with existing channel and dm functions.

Furthermore, Seams should aim to expand both its frontend and backend features to allow for urls and links to be sent in chats, as well as images to be sent and uploaded for diagrams and graphs.

## Appendix

### Survey respondents:

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