

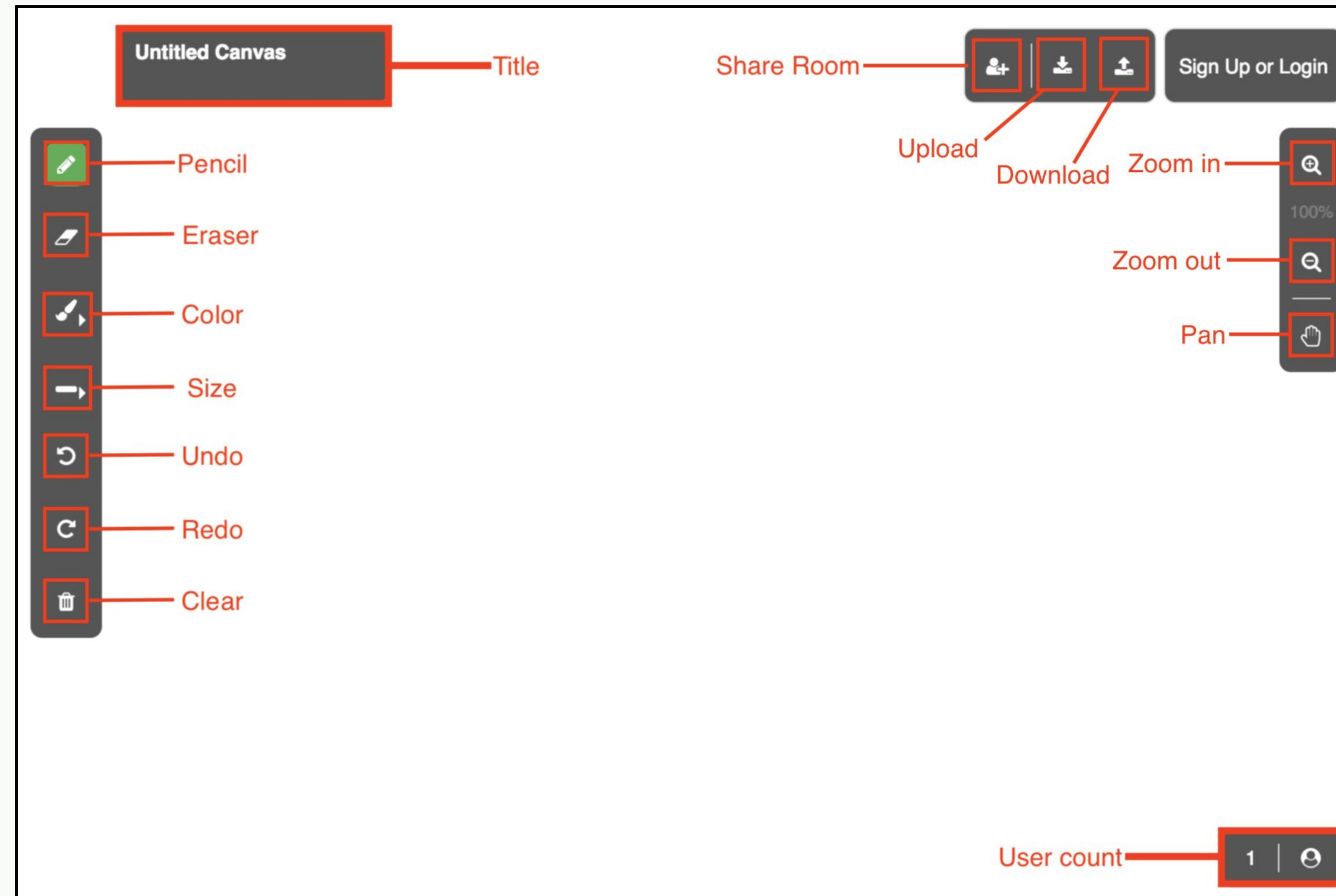
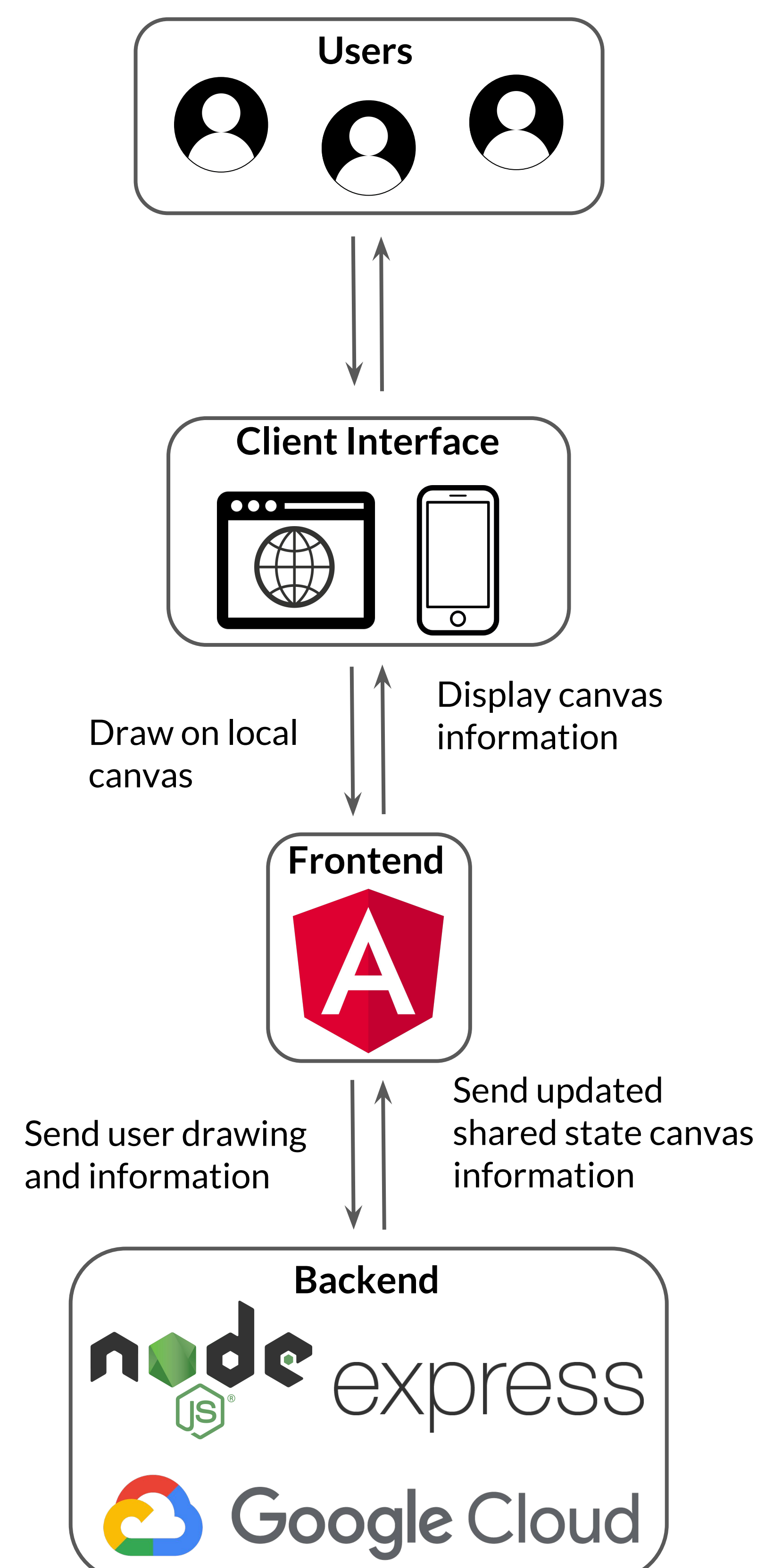
Introduction

Communicating online can be difficult, and sometimes visuals can immensely improve a listener's understanding. Drawback is an online whiteboard that allows users to share drawings in real time.

Design Criteria

1. Low latency between clients (within 2 seconds)
2. Quick and convenient way to invite others or join a room
3. Cross platform

System Architecture



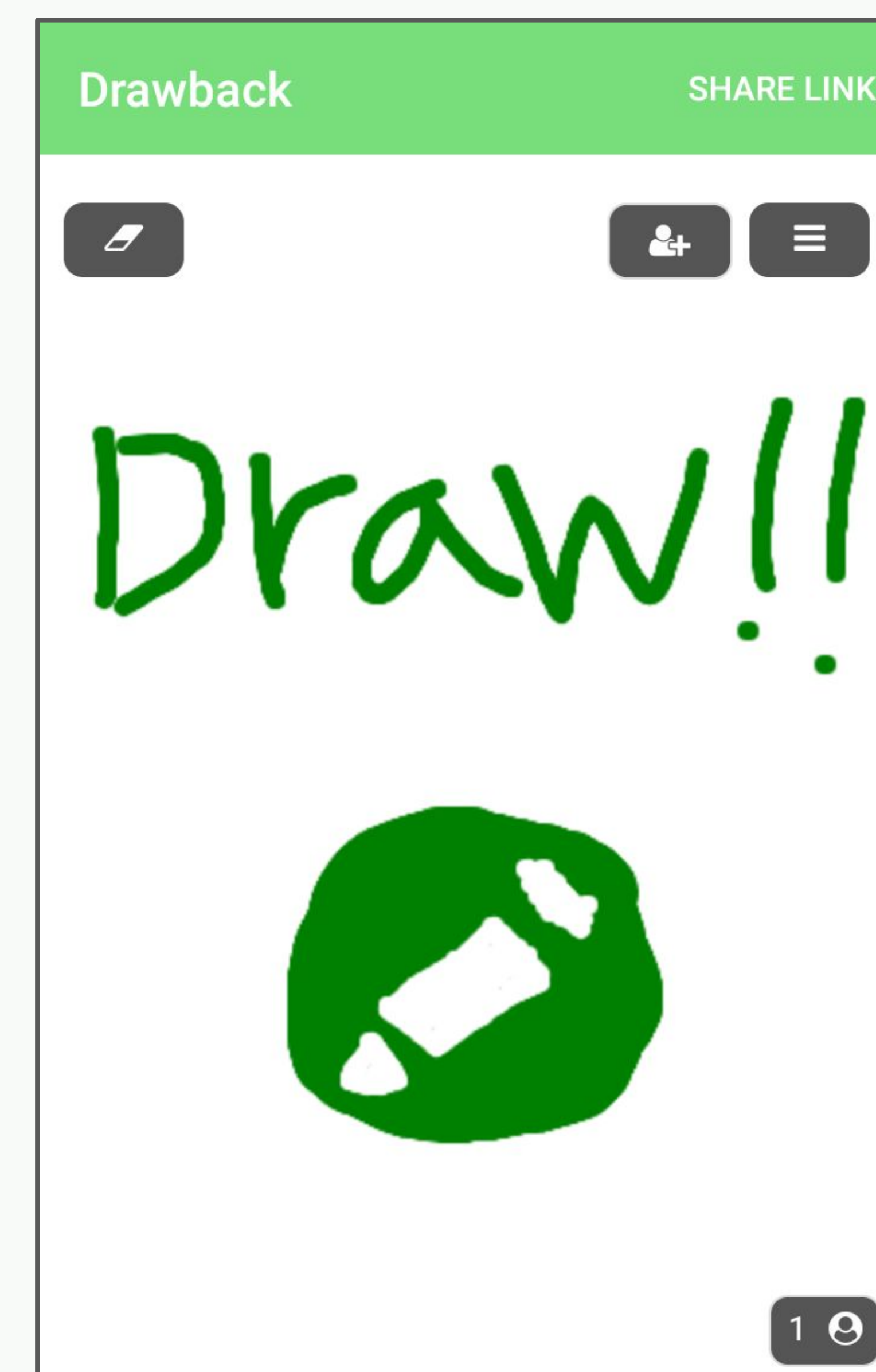
Implementation

System

The backend of the application is a node.js server with an express.js framework that is hosted on an instance of Google Cloud Platform's compute engine while the frontend is implemented using Angular4. The bidirectional communication between the client side and server side is handled by socket.io.

Logic

Drawback automatically redirects users to a new room with a blank canvas when the application is first opened to allow quick and easy drawing. If users enter an already existing room, the viewport is automatically scaled to allow visibility of the entire drawing that currently exists on the canvas. When a user does anything to change the state of the canvas, the changed information as well as the room that the user is in is sent to the server. The server stores this information, and then sends it to every other user that is connected to the same room. These updates are handled client side to reflect the shared state of the canvas.



Website Application

Drawback is developed primarily as a responsive website application. Users can enter Drawback with the URL <https://www.aggiesketch.com>, which will automatically reroute the user to a randomly generated room. In the room, the interface provides the tools to:

- Draw and erase
- Change pen colors and sizes
- Undo and redo strokes
- Clear the canvas
- Navigate the canvas by zooming and panning
- Share the room by copying the link to clipboard or moving to a different room
- Change the title of the room
- View the number of users currently in the same room

Mobile Application

The mobile application of Drawback is an Android webview wrapper of the website that provides functionality to make sharing links faster and more convenient.

Share Link Button

1. When users click the share link button, the app will copy the link automatically.
2. A dropdown menu will appear allowing users to share the link through any accepted Android application such as E-mail, Facebook message, or Instagram message, etc.

Sharing During an Ongoing Call

In an ongoing call:

1. The app will detect the ongoing call number.
2. Users can share current link.
3. App will send the SMS instantly.

Conclusion

Creating Drawback as an online website application allowed us to fulfill the design criteria. Using node.js, we are able to keep the latency within 2 seconds. The share room button makes it quick and easy to copy the link and paste it for others. Others may simply click that link or use the share room button to enter a 5-character ID to join another existing room. Finally, since Drawback is a website, we can simply create webview wrappers to port it to mobile devices, allowing web and mobile users to draw together.

Future Goals

1. iOS application
2. Online voice communication for each room
3. Nickname and color indicators for each user in a room
4. Download and upload full implementation
5. Hover indicator of other users' cursors on website application
6. Database storage of canvases for users
7. Creation of private rooms

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