

Collaborative Whiteboard Web Application

Web Application Technologies – Summer 2025

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Project Overview

A web-based collaborative whiteboard designed for real-time interaction. Users can create and manage textboxes, shapes, and shared files within a shared workspace.

Role Definitions & Permissions

- **Editor**
 - Can view and edit the canvas
 - Cannot manage users or settings
- **Owner**
 - Full control over the canvas
 - Can assign or remove moderator roles
 - Can transfer ownership
 - Cannot be removed by anyone else

User Stories: Classification and Legend

	Must Have		Should Have		Could have
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List of User Stories with Acceptance Criteria

01

As a **user**,

I must be able to **sign up**,

so that I can **create an account and save my canvases**.

User visits the website:

- ☐ If not logged in, they are shown a Sign-Up / Log-In screen.

User selects "Sign Up":

- ☐ A sign-up form appears with the following fields:

- ☐ Email address
- ☐ Password
- ☐ Confirm password

Email input Validation:

- ☐ Must be in a valid email format (e.g. user@example.com)

If invalid:

- ☐ Email field is marked invalid
- ☐ inline error message appears (e.g. "Please enter a valid email address")

Password input requirements:

- ☐ Minimum 8 characters
- ☐ At least one uppercase letter
- ☐ At least one lowercase letter
- ☐ At least one number
- ☐ At least one special character (!@#...)

If requirements are not met:

- ☐ Password field is marked invalid
- ☐ Message like "Password must be at least 8 characters long and include a number"

Submit button

- ☐ Disabled until all fields are valid

Once clicked:

- ☐ A loading spinner may appear
- ☐ Backend checks if the email is already in use

If email is already taken:

- ☐ Error shown: "This email is already registered"

On successful sign-up:

- ☐ User is redirected to their personal dashboard

02

As a **user**,

I must be able to **log in**,

so that I can **access my saved canvases and continue previous work.**

User visits the website:

If already logged in:

- ☐ User is redirected straight to their dashboard.

If not logged in:

- ☐ They are shown the Sign-Up / Log-In screen.

User selects “Log In”:

- ☐ A log-in form appears with the following fields:
 - ☐ Email address
 - ☐ Password

Email input validation:

- ☐ Must be in a valid email format (e.g. user@example.com)

If invalid:

- ☐ Email field is marked invalid
- ☐ Inline message appears: “Please enter a valid email address”

Password input validation:

- ☐ No formatting requirements enforced client-side (user may enter any string)

If field is empty:

- ☐ Field is marked invalid
- ☐ Inline message: “Please enter your password”

Submit button:

- ☐ Disabled until both fields are filled with valid input

Once clicked:

- ☐ A loading spinner may appear
- ☐ Backend attempts to authenticate using submitted email and password

If login fails:

System checks for two common issues:

1. Incorrect email/password:
 - ☐ Error shown: “Invalid email or password”
2. Account not found:
 - ☐ Error shown: “No account found with this email”
 - ☐ Form is not cleared; user can try again

If login succeeds:

- ☐ User is redirected to their dashboard

03

As a **user**, I must be able to **change my email**, so that I can **update my login address without losing access to my account**.

- ☐ While on any authenticated page (dashboard or canvas), a small avatar icon is visible in the top-right corner. User clicks the avatar → dropdown includes “Change Email.”
- ☐ User has to confirm current password to confirm identity.
- ☐ If incorrect, show “Incorrect password”.
- ☐ New email must be valid (the same rules as when creating the account).
- ☐ If email is already in use show error “This email is already in use.”

04

As a **logged user**,
I must be able to **log out**,
So that I can **securely end my session and protect my account**.

While on any authenticated page (dashboard or canvas):

- ☐ A small avatar icon is visible in the top-right corner of the screen.

User clicks the avatar icon:

- ☐ A dropdown menu expands beneath the avatar.

It contains at least the following option:

- ☐ Log Out

User clicks “Log Out”:

- ☐ The session is terminated (e.g. token/cookie is cleared).
- ☐ User is immediately redirected to the Sign-Up / Log-In screen.

Post-logout behavior:

- ☐ User cannot access any authenticated routes (e.g. dashboard, canvases) unless they log back in.
- ☐ If they try, they are redirected to the login screen.

05

As a *logged user*,

I must be able to *change my password*,

So that I can *secure my account*.

While on any authenticated page (dashboard or canvas):

- ☐ A small avatar icon is visible in the top-right corner of the screen.

User clicks the avatar icon:

- ☐ A dropdown menu expands beneath the avatar.
- ☐ Menu options include:
 - ☐ Change Password
 - ☐ Log Out

User clicks "Change Password":

- ☐ A Change Password form appears (modal or full-page).

It contains two fields:

- ☐ Current password
- ☐ New password
- ☐ Confirm new password

Current password field:

- ☐ Required to confirm the user's identity

If incorrect:

- ☐ Inline error: "Incorrect current password"

New password requirements:

- ☐ Minimum 8 characters
- ☐ At least one uppercase letter
- ☐ At least one lowercase letter
- ☐ At least one number
- ☐ At least one special character (e.g. !@#\$%^&*)

Confirm new password:

- ☐ Must match the "New password" field

If it doesn't match:

- ☐ Inline error: "Passwords do not match"

Submit button:

- ☐ Disabled until all fields are valid

Validation logic:

- ☐ All fields must be filled
- ☐ New password and confirm password must match
- ☐ Current password must be correct (validated server-side)

If everything is valid and submitted:

- ☐ The password is securely updated in the backend
- ☐ User is returned to login page

06

As a **logged user**,

I must be able to **create a canvas**,

So that I can **start a new workspace for collaboration**.

User is on the dashboard:

- ☐ The dashboard is divided into two rows/sections:
 - ☐ My Canvases – lists all canvases the user created
 - ☐ Canvases I Joined – lists canvases shared with the user via invite link
- ☐ A “New Canvas” button is visible:
 - ☐ Placed above or beside the My Canvases row
 - ☐ Always visible when user is on the dashboard

User clicks “New Canvas”:

- ☐ A new blank canvas page loads
- ☐ A toolbar/menu bar is visible on the screen
- ☐ The canvas default name (timestamp?) is shown at the top of the canvas

If a canvas is already open and has unsaved changes:

- ☐ User is prompted: “You have unsaved changes. Do you want to save before creating a new canvas?”
- ☐ The new canvas appears in the My Canvases section on the dashboard

It includes:

- ☐ Canvas name (editable later)
- ☐ Last modified timestamp
- ☐ Option to open or delete the canvas

07

As an **editor**,

I must be able to **enter text on the canvas**,

So that I can **add notes, labels, or ideas to my workspace**.

- ☐ I can select a “Text” tool from the toolbar.

- ☐ After selecting the tool, I can click anywhere on the canvas to place a text box.
- ☐ I can type up to 2000 characters inside the text box.
- ☐ I can delete the text box.
- ☐ Text is automatically saved as part of the canvas.

08

As a **editor**,

I must be able to **draw on the canvas**,

So that I can **sketch ideas or annotate visually**.

- ☐ I can select a “Draw” tool from the toolbar.
- ☐ After selecting the tool, I can click and drag on the canvas to draw freehand lines.
- ☐ I can change the stroke color and thickness.
- ☐ Drawings are automatically saved as part of the canvas.

09

As an **editor**,

I must be able to **erase drawings on the canvas**,

So that I can **correct mistakes or clean up my workspace**.

- ☐ When I select an element, the “Eraser” tool is highlighted on the toolbar.
- ☐ I can select an “Eraser” tool from the toolbar.
- ☐ When the tool is active, I can click and drag to remove parts of previously chosen freehand drawings and shapes.
- ☐ Erased content is removed immediately.
- ☐ Changes are automatically saved as part of the canvas.

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As an **editor**,

I must be able to **move and resize things on my canvas**,

So that I can **organize my workspace however I want**.

- ☐ I can select elements on the canvas (text boxes, shapes, etc.).
- ☐ Once selected, I can click and drag to move the element to a new position.
- ☐ I can resize elements using drag handles or a resize option.
- ☐ The position and size updates are reflected immediately.
- ☐ Changes are automatically saved as part of the canvas.

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As a canvas **owner**,

I must be able to **share my canvas**,

So that I can **collaborate with others in real time**.

- ☐ In the current active users list, I can see a “share” button

- ☐ Clicking on this button takes me to the invite link management panel

In this panel:

- ☐ I can generate a unique shareable link for each canvas that I own.
- ☐ I can set a validity period:
 - ☐ Expires in 24 hours
 - ☐ Expires in 7 days
 - ☐ Custom date/time
 - ☐ No expiration
- ☐ If the link is **active** and **not expired**, they are granted access to the canvas
- ☐ If the link has **expired** or is **disabled**, access is denied.

If they are not logged in:

- ☐ They are prompted to log in or sign up before continuing.

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As a **logged user**,

I must be able to **join a collaborative canvas**,

So that I can **work on it with others in real time**.

- ☐ I can open a shared canvas by clicking a valid invite link.
- ☐ If I'm not logged in, I'm prompted to log in before accessing the canvas.
- ☐ I can see live updates as other collaborators make changes.

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As an **editor**,

I should be able to **add and click hyperlinks in text boxes**,

So that I can **reference and access external resources easily**.

- ☐ When I type or paste a valid URL into a text box, it is automatically turned into a clickable hyperlink.
- ☐ Hyperlinks are styled to look interactive - they are underlined and colored.
- ☐ Clicking a hyperlink opens the link in a new browser tab.
- ☐ Hyperlinks can be removed or edited like normal text.

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As an **editor**,

I should be able to **add my own images to the drawing board**,

So that I can **illustrate ideas or include visual references**.

- ☐ In the toolbox, I should have an 'upload image' choice. Upon clicking it, I should be able to select an image file (e.g. PNG, JPG, SVG) from my device to upload.
- ☐ I can also drag and drop the image, as long as the extension is supported. If the extension is not supported, it should say so as a pop up on the screen.
- ☐ Uploaded images appear on the canvas and can be moved or resized.
- ☐ Images are displayed within the canvas boundaries.

- ☐ I can delete images if needed.
- ☐ Uploaded images are saved as part of the canvas state.

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As an **owner**,

I should be able to **manage invite links**,

So that I can **track access and control how people join my canvas**.

In this panel, I can:

- ☐ Set a validity period for each link (e.g. 24 hours, 7 days, no expiry)
- ☐ View a list of all invite links associated with the canvas
- ☐ Disable any active link, making it immediately unusable.
- ☐ Delete expired links to keep the list clean.
- ☐ Disabled or expired links cannot be used to access the canvas

For each link, I can see:

- ☐ The status (active or expired)
- ☐ The expiration date/time
- ☐ The number of users who joined via that link

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As an **editor**,

I should be able to **zoom onto my canvas**,

So that I can **see what I've created better**.

- ☐ I can press onto the "Plus" button, which enlarges my canvas.
- ☐ I can press onto the "Minus" button, which shrinks my canvas.

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As an **editor**,

I should be able to **copy and paste elements on the canvas**,

So that I can **quickly duplicate content and organize my workspace efficiently**.

- ☐ I can select an element using "Select" tool (text box, image) on the canvas.
- ☐ Copied elements retain all their properties (e.g. size, relative position, content).
- ☐ Support is added for keyboard shortcuts: Ctrl+C to copy, Ctrl+V to paste

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As an **editor**,

I should be able to **change font family and size of my text**,

So that I can **bring attention to what is more important**.

- ☐ On the toolbar on the right I can select font family and size of my text.

- ☐ Selecting this allows me to place a textbox with different looks, like Inter, Arial, Helvetica, Times New Roman, Courier New, Georgia, System UI, Comic Sans, Impact.

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As an **editor**, I must be able to **create and manipulate circles**, so that I can **diagram or highlight areas visually**.

- ☐ Selecting "Circle" in the toolbar allows user to create a circle on the canvas.
- ☐ "Move" tool allows to move and resize the object.
- ☐ Color of the circle can be changed similarly to stroke color.
- ☐ Circles can be deleted via the delete tool.

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As an **editor**, I must be able to **create and manipulate rectangles**, so that I can **structure layouts or call out areas**.

- ☐ Selecting "Rectangle" in the toolbar allows user to create a rectangle on the canvas.
- ☐ "Move" tool allows to move and resize the object.
- ☐ Color of the circle can be changed similarly to stroke color.
- ☐ Rectangles can be deleted via the delete tool.

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As an **editor**,

I could be able to **add audio files to the canvas**,

So that I can **leave quick audio notes or explanations**.

- ☐ In the toolbar, I should be able to choose 'upload audio file'. Upon clicking it, I should be able to select an audio file (e.g. MP3, WAV) from my device to upload.
- ☐ I can also drag and drop the audio file, as long as the extension is supported. If the extension is not supported, it should say so as a pop up on the screen.
- ☐ An audio player icon appears on the canva.
- ☐ I can move or delete the audio element.
- ☐ Other users can click the icon to play the audio.
- ☐ The audio file is saved as part of the canvas.

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As an **editor**,

I could be able to **add locations to the canvas**,

So that I can **reference real-world places visually**.

- ☐ In the toolbar, I should be able to choose a location pin.
- ☐ After clicking it, I can select a real world location.
- ☐ After selecting a location, I should be able to put the pin icon anywhere on the screen. It will stay and be visible to everyone as a pin icon.

- ☐ Clicking the pin opens the location in a mapping service (e.g. Google Maps).
- ☐ I can move or remove the location marker.

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As an **editor**,

I could be able to **highlight with a temporary pen**,

So that I can **draw attention without leaving permanent marks**.

- ☐ I can select a temporary highlighter tool from the toolbar.
- ☐ The temporary highlighter will work just like a normal pen, but it will fade and disappear automatically after a few seconds.
- ☐ Everybody on the whiteboard can see the temporary highlighter until it disappears.
- ☐ Temporary highlights do not get saved with the canvas.
- ☐ It is possible to select color and size of the pen, and that setting will be automatically saved for next uses.

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As a **editor**,

I could be able to **rotate the objects I created**,

So that I can **customize my canvas even more!**

- ☐ I should be able to press the "Rotate" tool.
- ☐ When the tool is selected, clicking on the circle, rectangle, image, or textbox allows me to rotate them.