

Document and Drawing Annotation Module

User's Guide

Abhijit Parate

Advisor

Dr. Barry Levine

Table of Contents

Overview	4
Drawing & Document Annotation Module	5
Drawing Editor	6
Action Panel	7
Attachments	7
Save	8
Cancel	8
Canvas Panel	8
Canvas	9
Object Interaction	10
Zooming	12
Panning	13
Keyboard Shortcuts	13
Edit panel	13
Draw	14
Transform	17
Position	19
Layers	22
Edit	24
Import	25
Attach	27
Print	35
Export	35
Restore	35
Add Drawing	36

Viewing Encounters	38
Patient Dashboard View	38
Collapsed View	38
Expanded View	38
View Encounter	40
Edit Encounter	43
View Drawing in new popup window	44
Backup Encounter	45
Delete Encounter	45

Overview

The providers use drawing/sketches to record findings of patient's examination. These drawings are later linked to the patient's medical records within OpenMRS. Document and Drawing Annotation module provide a means to create such drawings and tools to annotate them efficiently. Along with drawings, providers can also attach additional files such as audios or videos to the patient's records which are saved as a part of encounter.

This is how the drawing editor looks like. User can free draw on the canvas using mouse/touch or use other tools to create shapes or import images. Along with this, user can also embed media files directly in the drawings and can view it later by double-clicking the icons on the canvas itself. More details are available in next chapters.

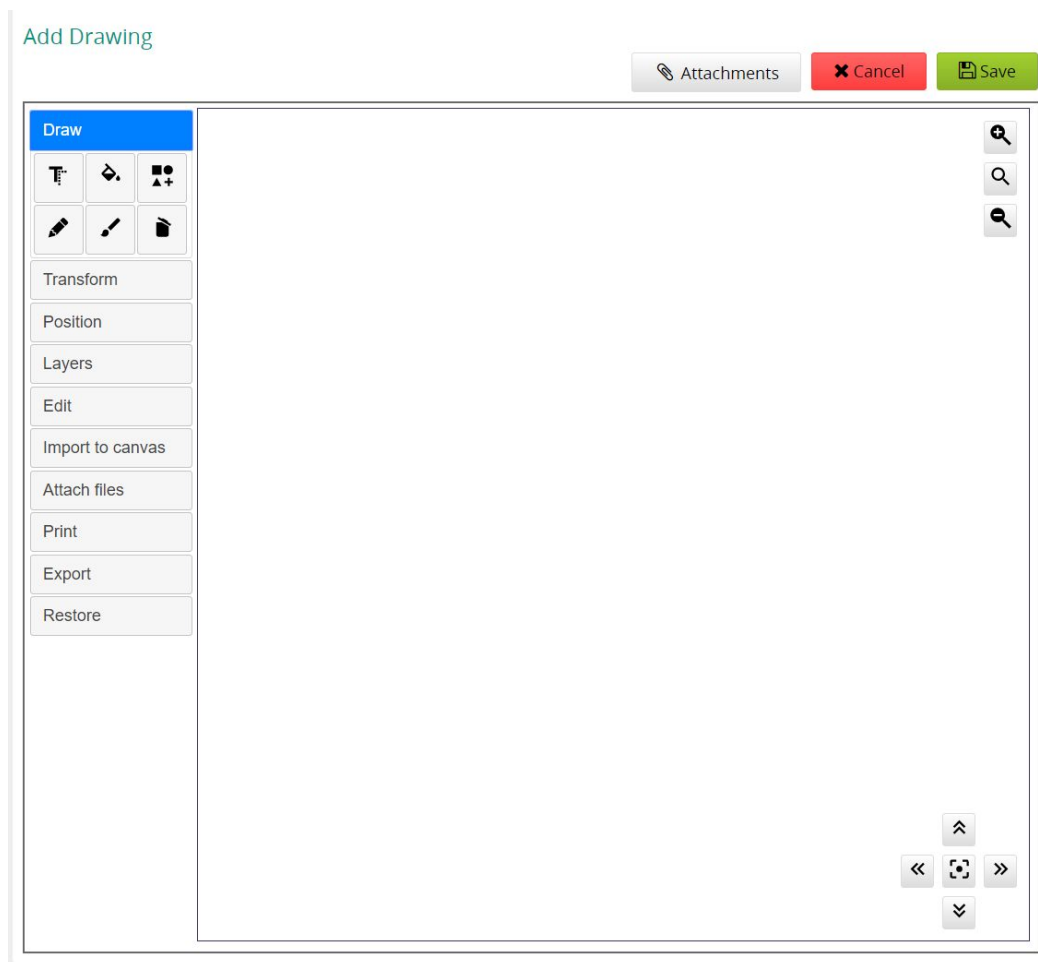


Fig. 1 Drawing Editor

Drawing & Document Annotation Module

The drawing module facilitates providers to document examination findings of the patient in the form of drawing which then can be linked to the patient's medical records in OpenMRS.

The Document and Drawing annotation module allows providers to record drawing and sketches and add additional contextual information to the drawings for example, images, audios, videos, etc. which can also be embedded in the drawings itself. Along with this, module also provide feature to record additional files to be attached to the drawings as a part of the observations to be recorded as a part of examination.

The linked observations and attached files are made available at patient's dashboard along with other encounters. Module also provide ability to view and edit the encounter in an intuitive way.

In brief, user can add drawing and files using "Add Drawing" link under current actions section of active visit which directs to Add Drawing page. Here user can add drawing/sketch with the help of provided tools to assist in drawing. If needed files can also be attached or embedded within the drawing.

On saving, the drawing and files are persisted in the server under the encounter type "Drawing & Docs" which is available at the patient's dashboard.

Drawing Editor

The primary / main feature of drawing module is the Drawing Editor. The editor enables user to draw sketches and drawing and annotate them. It also provide multiple tools to help in creating drawings and annotating it efficiently.

The editor is accessible using the “Add Drawing” link from the patients dashboard or “View” or “Edit” drawing link from Encounter list. This is how the drawing editor looks like.

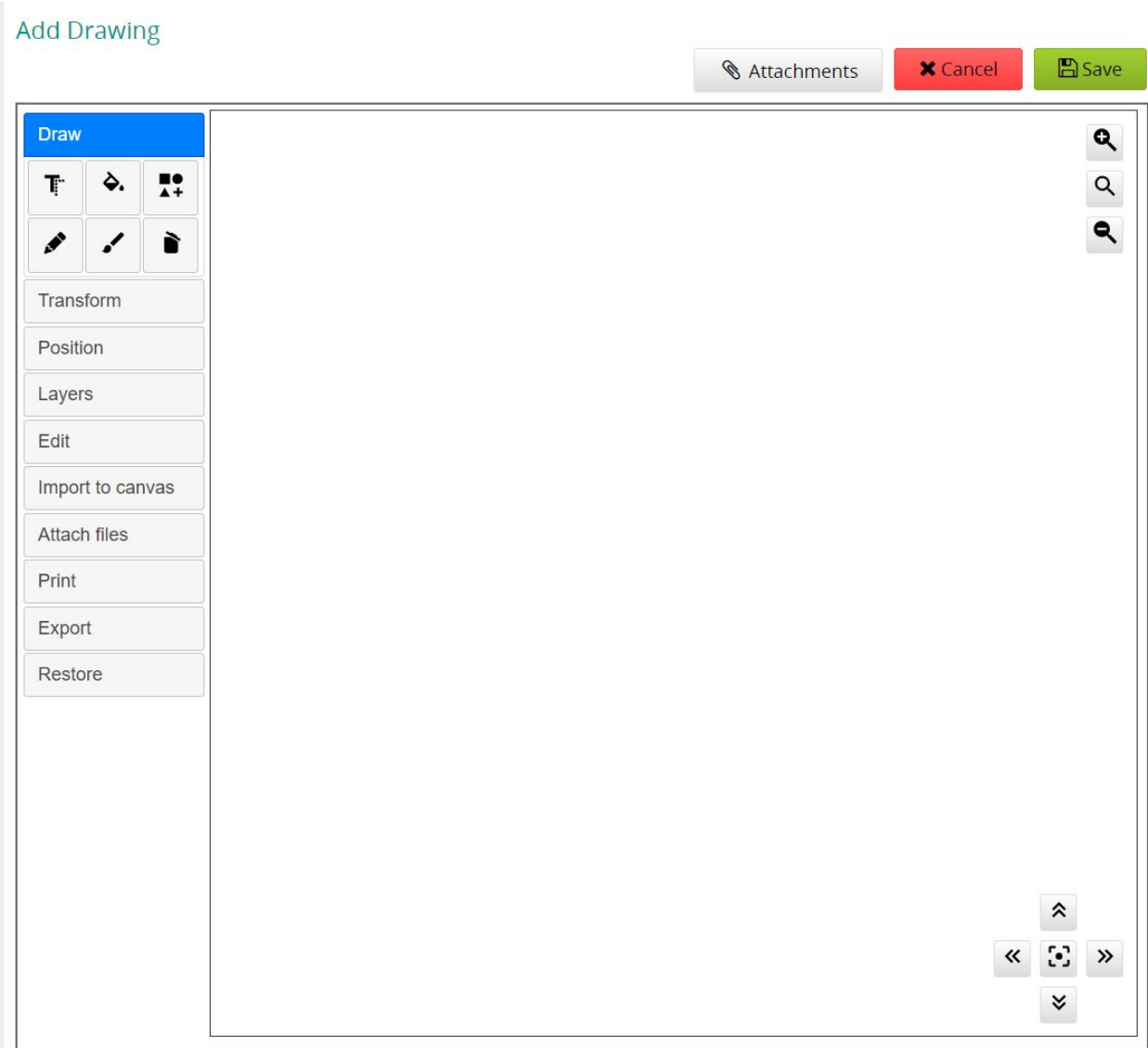


Fig 2 Drawing Editor - Add Drawing

The editor has mainly three regions, as follows...

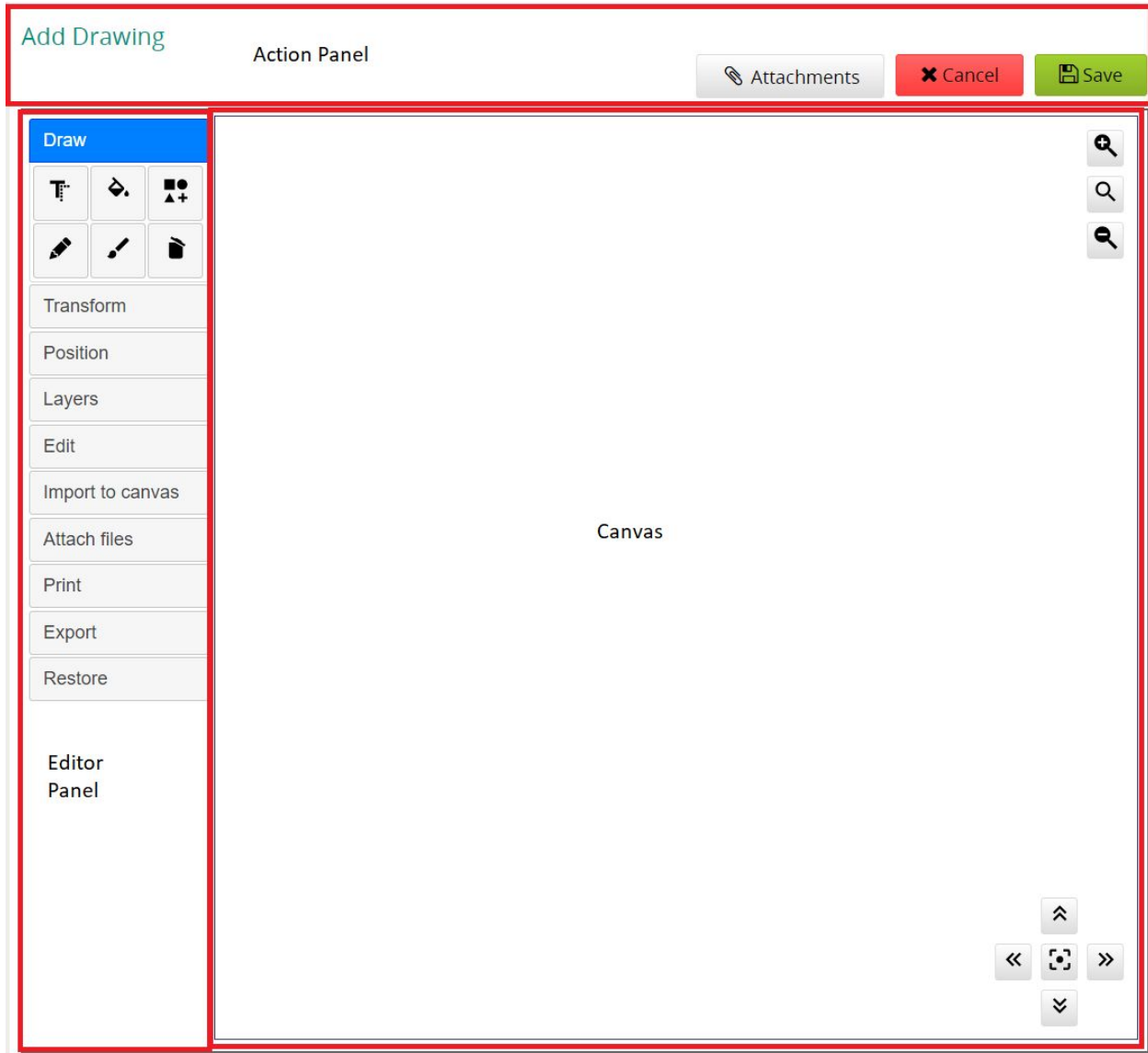


Fig 3 Drawing Editor regions

1. Action Panel

The topmost section of the editor is the Action panel which has three buttons

- **Attachments**

This shows all the attached files in a list form in a dialog. The preview of that file is available on click on each attachment. (The preview only works for files of type image, video, audio and text)

- Save

This saves the drawing along with the attachments to the server by creating a new encounter on the server. On success, a message is shown on the top right corner of the screen and user is redirected to patient's dashboard.

- Cancel

This cancels the current observation and redirected to patient's dashboard.

2. Canvas Panel

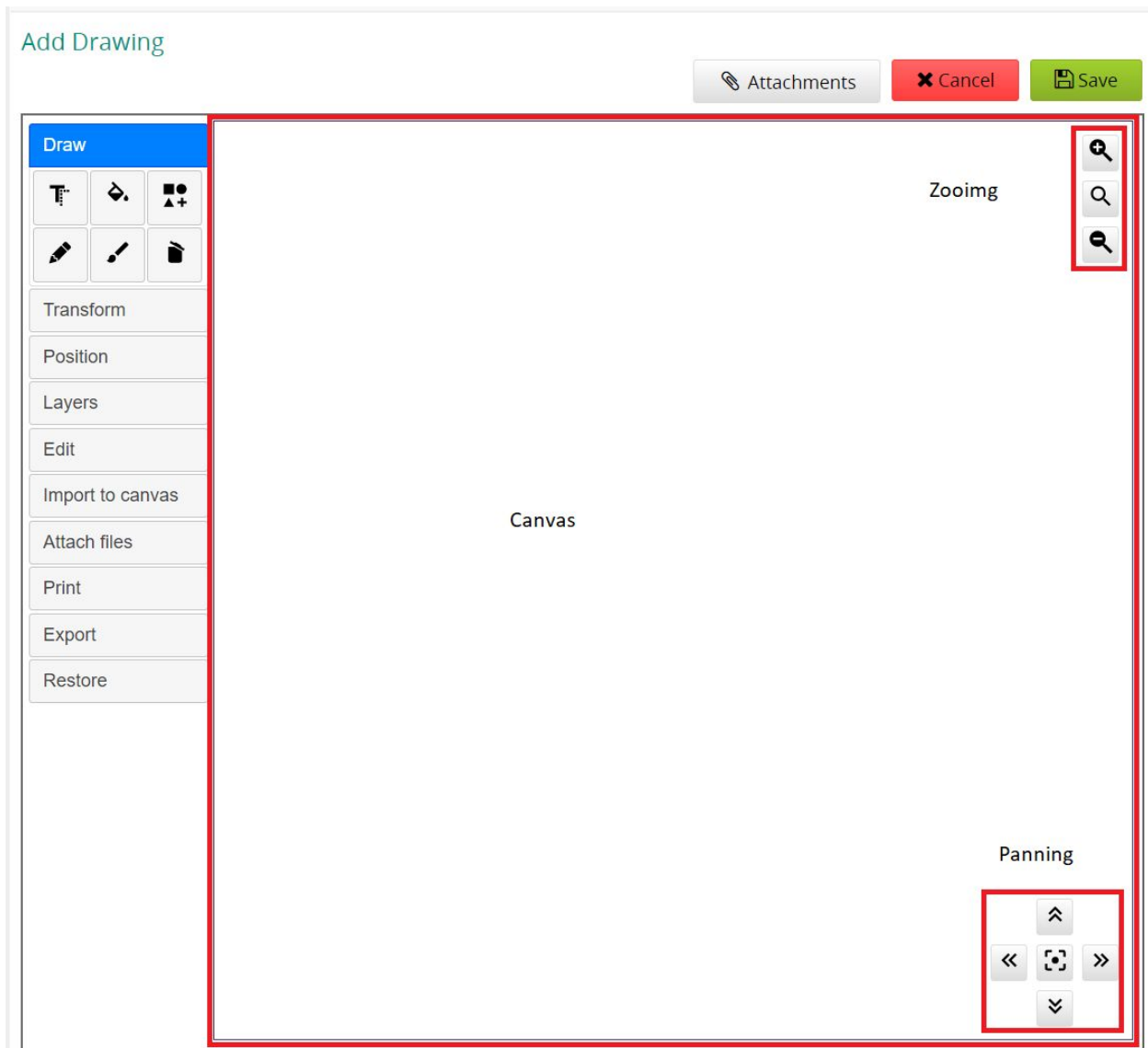


Fig 4 Drawing Editor - canvas region

Canvas

It's the drawable region of the drawing editor where user can draw using mouse or touch screen. The tools to help user draw on the canvas are provided in edit panel. The area of the canvas is 800px in width and 800px in height.

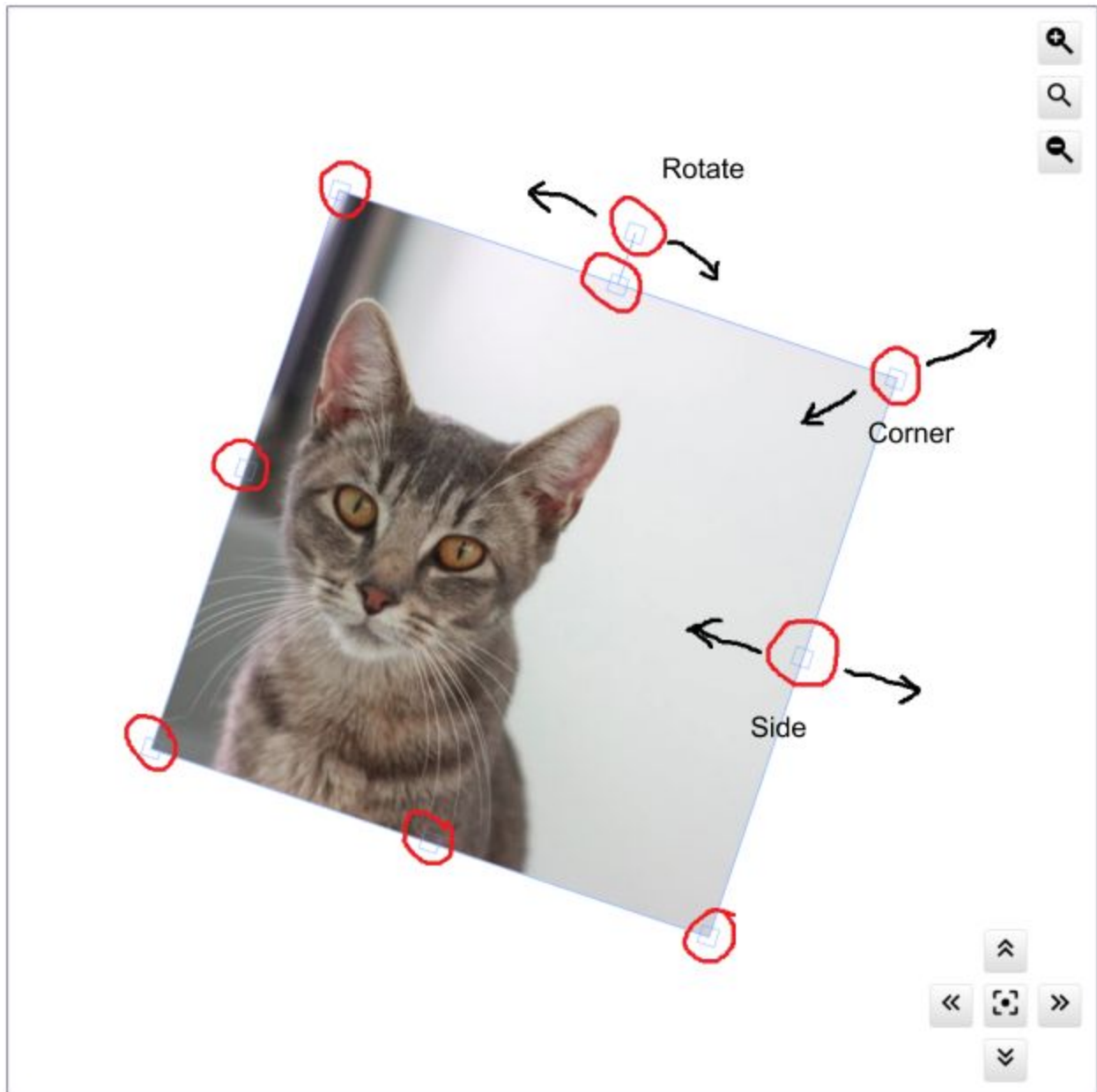


Fig 5 Drawing Editor canvas

Object Interaction

To interact with objects (shapes, text or image) on the canvas, use mouse to select the object. Once the object is selected, several handles are created as shown in above image.

Corner handles are used to alter the size of the object.

Side handles are used to alter the width or height.

Rotate handle is used to change the angle of the object.

Context Menu

Context menu is available on right click on the canvas which can be used to embed additional medias directly into the canvas. There are three alternatives for the medias which can be embedded in the canvas, viz. Images, Audio and Video.

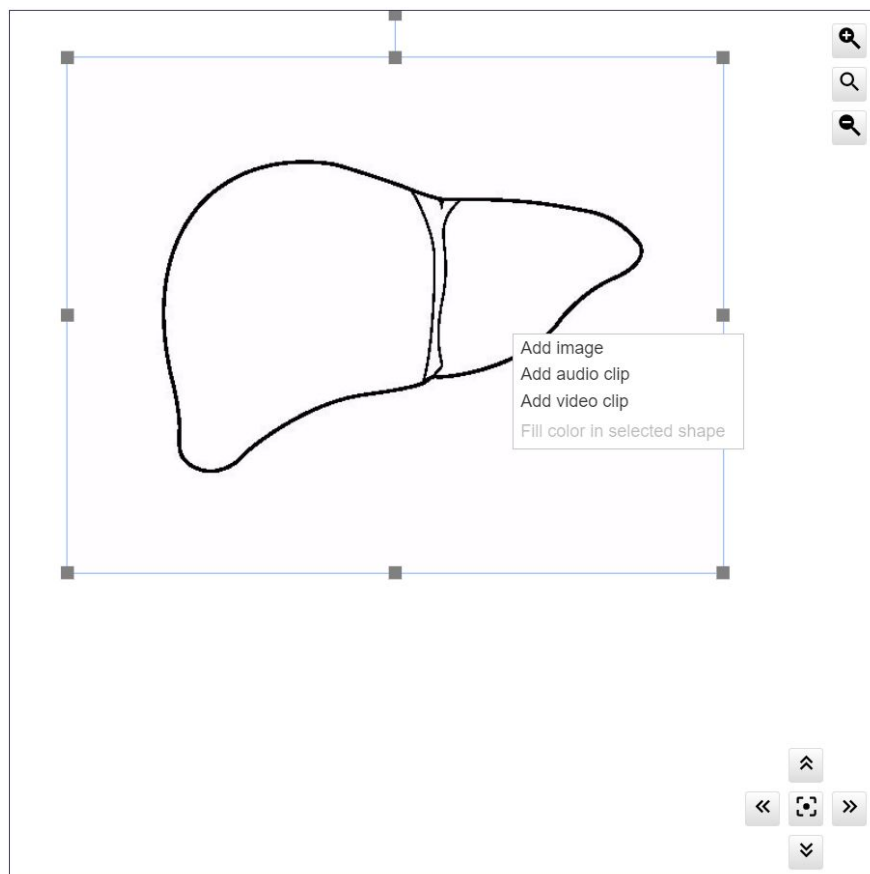


Fig 6 Drawing Editor - context menu sample

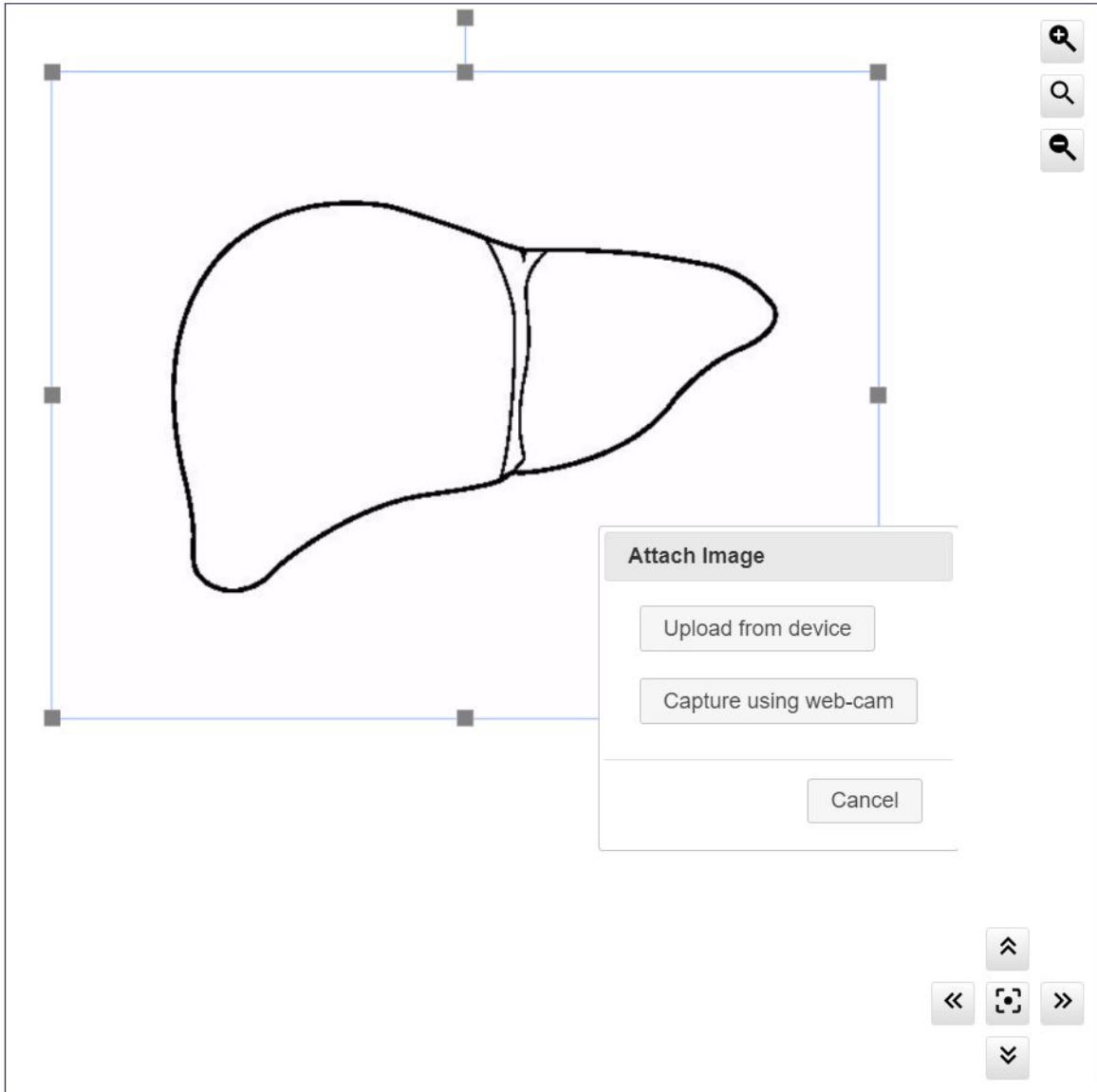


Fig 7 Drawing Editor - Context Menu - Attach Image

On selecting or capturing the image, a small icon is created (fig 8) on the canvas. On double click on the icon, a preview window is created which shows the embedded media.

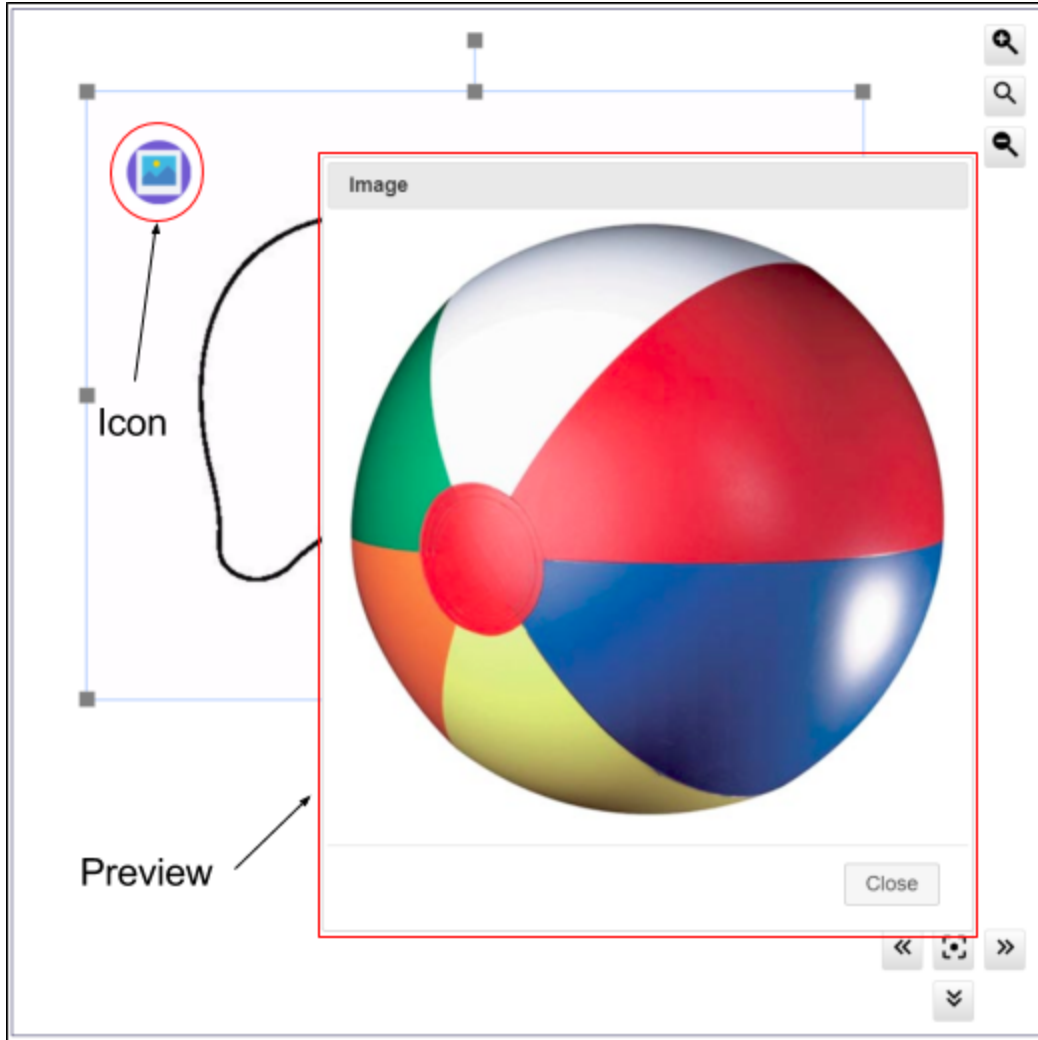










Fig 8 Drawing Editor - Context Menu - Attach Image

Context menu also allows to fill color in the shape.

Zooming

The zoom section consist of three buttons Zoom In , Zoom Out  and Reset zoom . The buttons do exactly what they suggest. The whole canvas is zoomed in or out with respect to a static point a the center of the canvas.

Panning

The pan section moves the canvas in 4 directions up , right , down  and left . The canvas pan can be reset using reset button  at the center of the section.

Keyboard Shortcuts

There are several keyboard shortcuts which can be used to interact with canvas.

Key	Action
Delete	Delete object / objects
Ctrl + c	Copy Object
Ctrl + v	Paste Object
Arrow keys	Pan canvas

Table 1: Keyboard shortcuts

3. Edit panel

Edit panel provides different tools to help user draw and annotate drawing on canvas. The tools are categorized in different sections.

This is what the edit panel looks like.

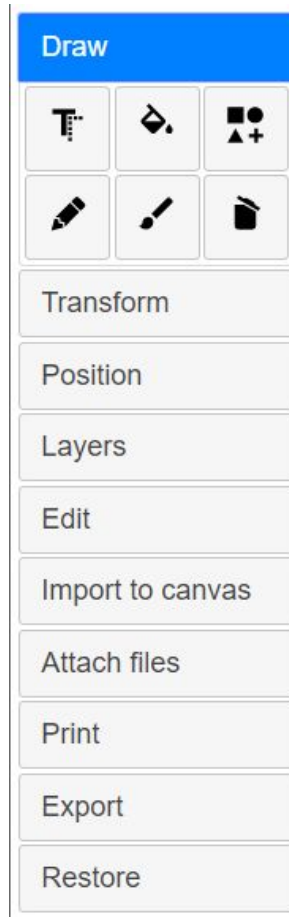


Fig 9 Editor actions panel

Only one section is open at once. On opening new section previous one gets collapsed automatically.

Let's Discuss one section at a time.

Draw

The draw section has tools which can be used to create contents on the canvas.



Fig 10 Draw section

All the buttons have tooltips to help user identify what it does. Some of the buttons open up another panel on hovering over it which have more elements to interact.



Pencil tool : This button acts as a toggle switch between free drawing and selection mode. In selection mode, one or more objects on the canvas can be selected. In drawing mode user can perform free form drawing on canvas. The default color of the pencil is black but can be changed using the draw color picker tool. (details later in this section). The width of the pencil can be altered using the slider which appears in a small panel when user hovers mouse pointer on the button or click the button.

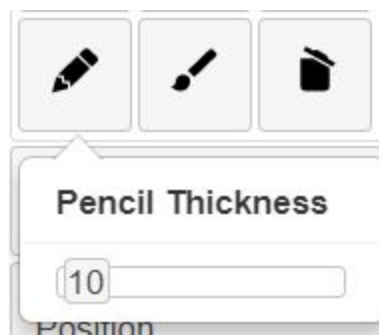


Fig 11 Draw section - pencil thickness

The default thinness (line-width) is 10. The line-width can range from 1 to 99.



Shapes: Used to draw different shapes on the canvas. On hover or click on the button, it opens up a panel which has more button to select a shape.

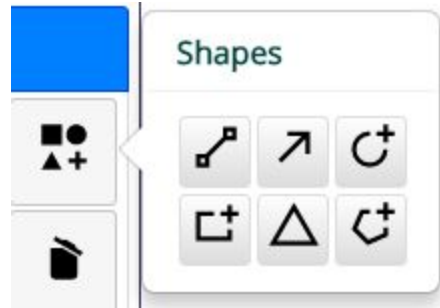







Fig 12 Draw section - shapes

The provided shapes include Line , Arrow , Circle , Rectangle , Triangle , Pentagon .



Delete : This deletes the selected objects from the canvas. Note, the keyboard delete key may also be used to delete the selected object(s).



Text: Adds editable text on the canvas.



Draw Color: On clicking it opens up a color selector panel, which looks like this.

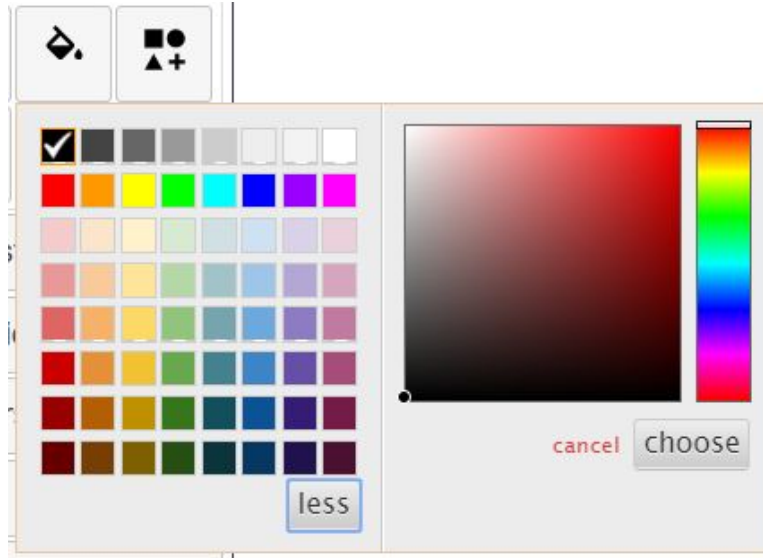


Fig 13 Draw section - fill color

There are two alternatives to choose colors from, a grid of predefined colors (left side) or color generator using color hue.

The draw color is changed either by selecting one of the colors from the color grid or generating color and clicking choose button.



Fill Color: Similarly, user can also select the fill color for the shapes. Fill color option is available only for the shapes created using the shapes panel. Once the color is selected, canvas is in fill-color mode, on clicking the shape, the color is applied to the selected shape.

Transform



Fig 14 Transform section



Flip Vertically: Flips the selected object vertically.



Fig 15 Transform section - flip vertically



Flip Horizontally: Flips the selected object horizontally.

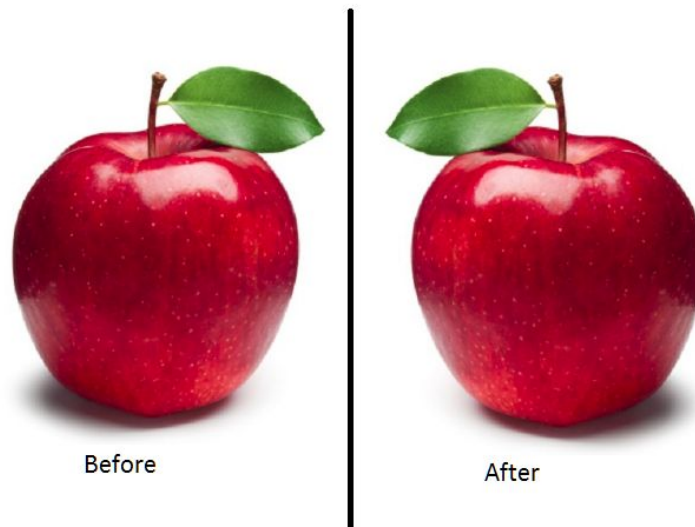


Fig 16 Transform section - flip horizontally



Rotate Counterclockwise: Rotates the selected object counter-clockwise.



Rotate Clockwise: Rotates the selected object clockwise.



Fit: Enlarges selected object to 700px X 700px and places at the center of canvas.

Note: Available only for objects of type image.



Crop: Discards objects which are not selected.

Position



Fig 17 Position section

We divided the canvas into an imaginary grid of 3x3.

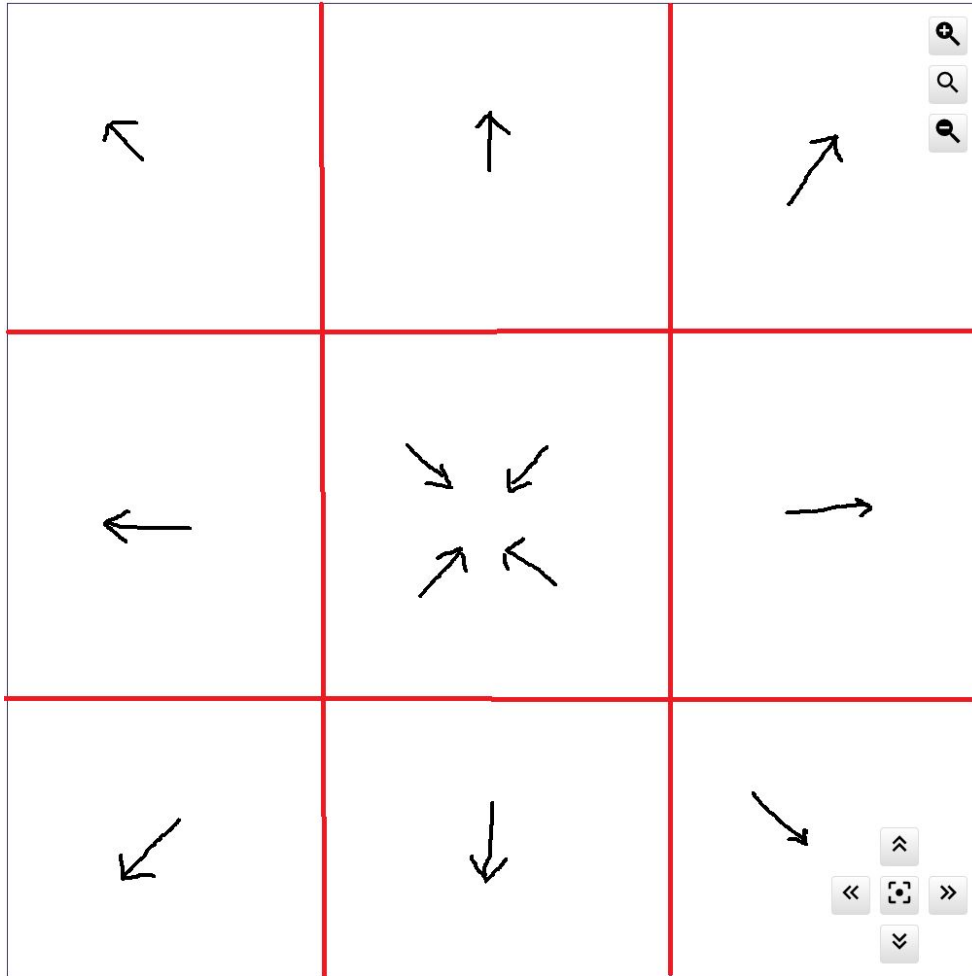


Fig 18 Position section - grid

The buttons in the position section represent the corresponding square in the grid.

Each of these buttons, will reposition the selected object from the canvas at the center of each of the square.

Ex, if we have an circle at somewhere on the canvas like,

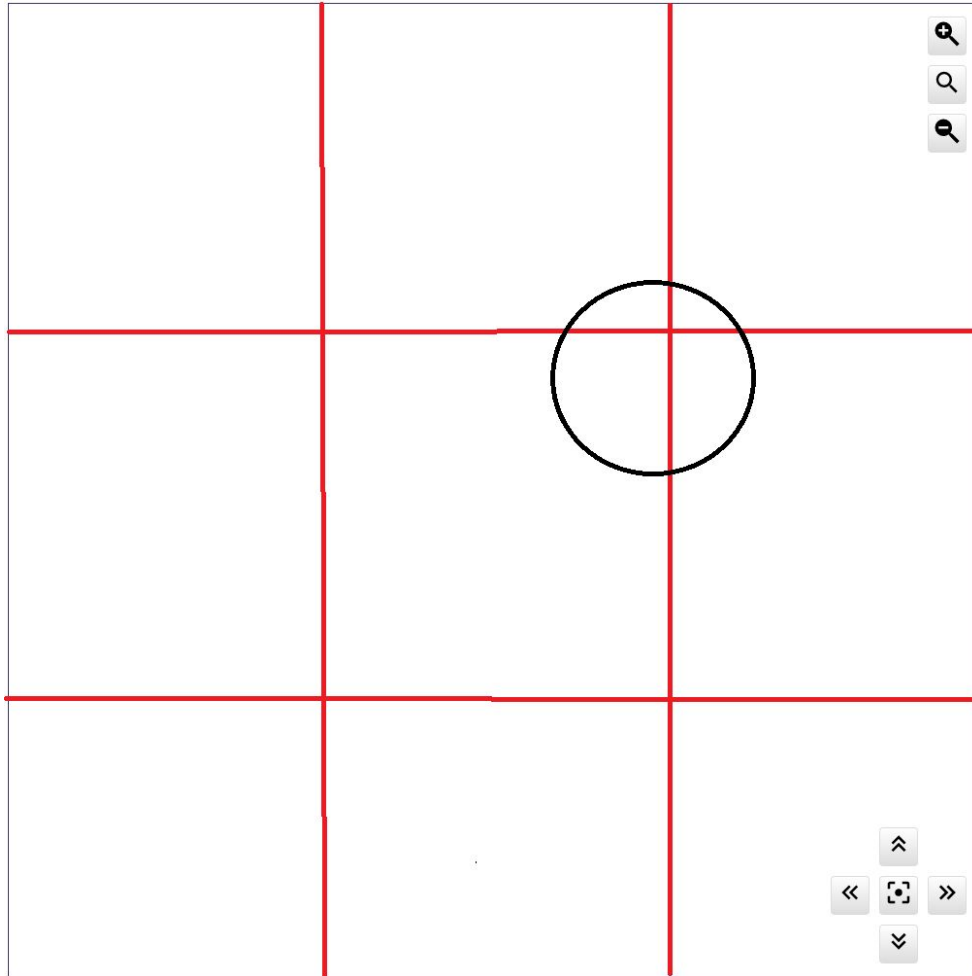



Fig 19 Position section - object positioned in the grid

On clicking top left button  will position the circle at the center of the top left square of the canvas.

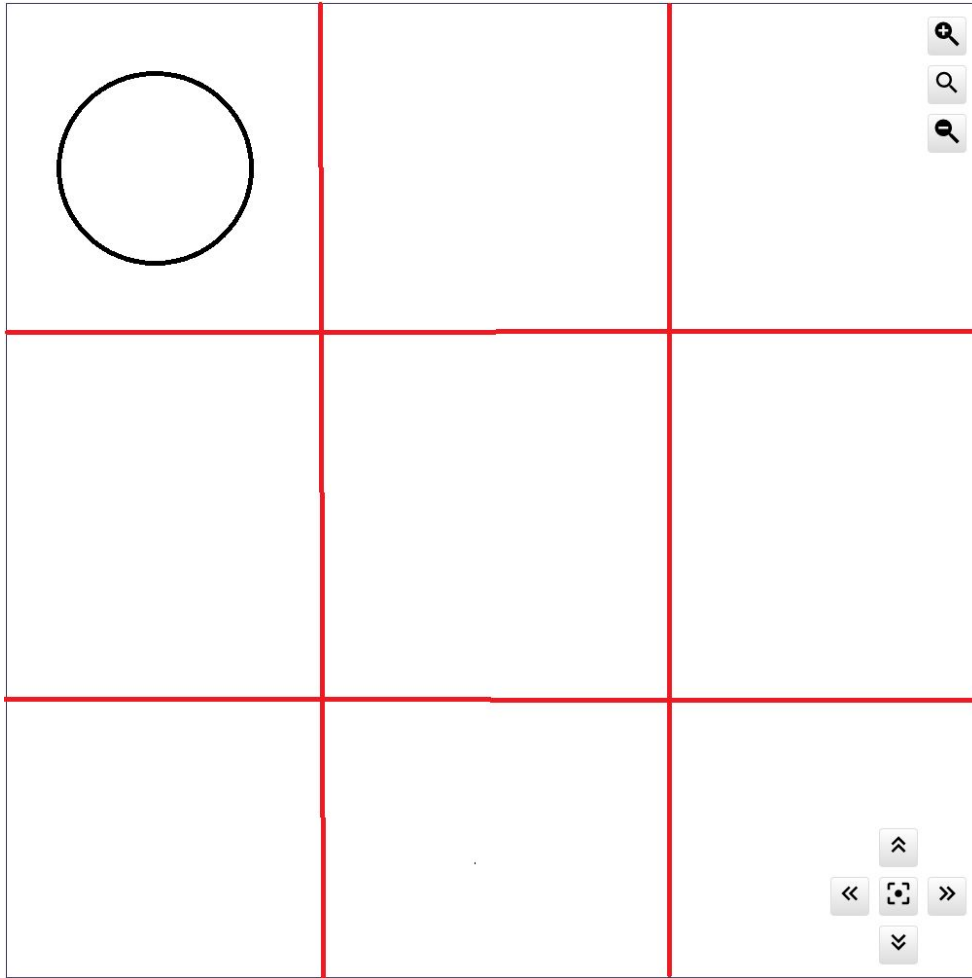


Fig 20 Position section - object positioned in the grid

Layers



Fig 21 Layer section

The objects in the canvas are stacked upon each other in transparent layers. So, the objects can overlap each other. The objects on the top layers can obscure the objects from lower layers.

Tools in this section provide means to handle such situations efficiently.



Move one layer UP: Moves the selected object one layer up.



Move one layer DOWN: Moves the selected object one layer down.

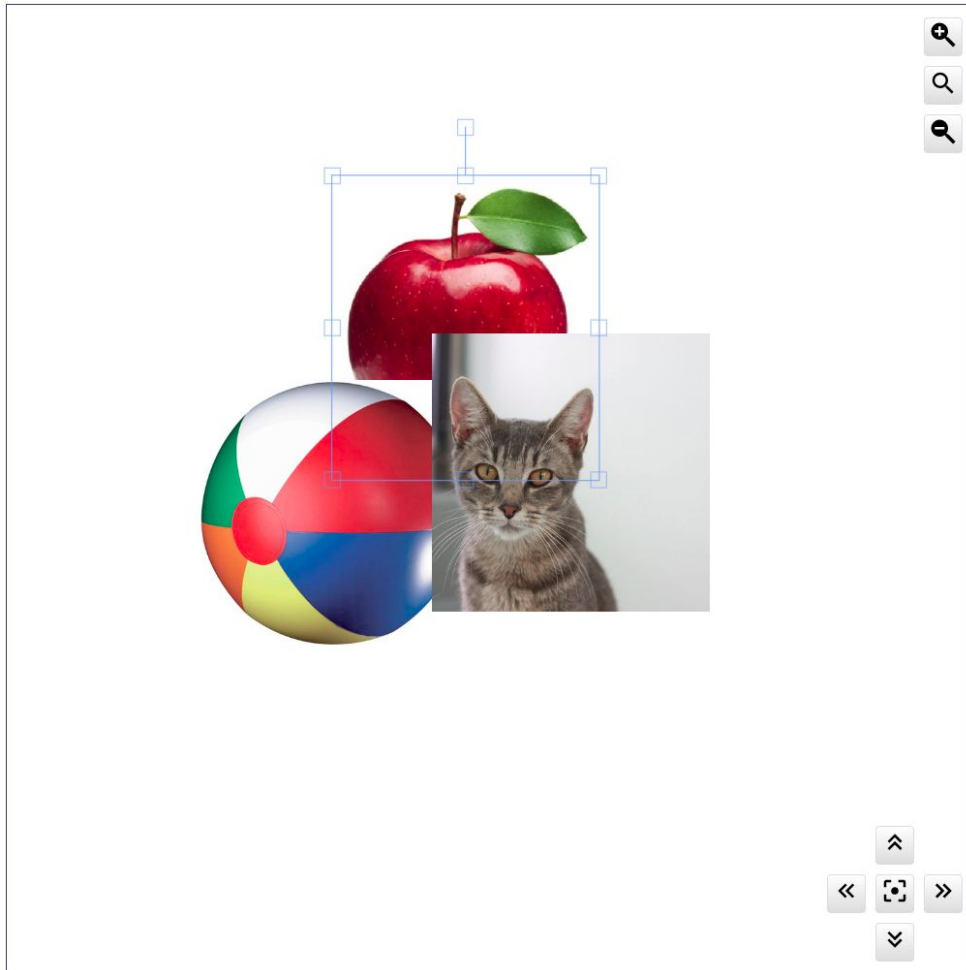


Fig 22 Layer section - Before

Note: Each object on canvas occupy a single layer, if you have multiple objects on the canvas and some of them are not overlapping each other then you might need to click several times to get the desired outcome.

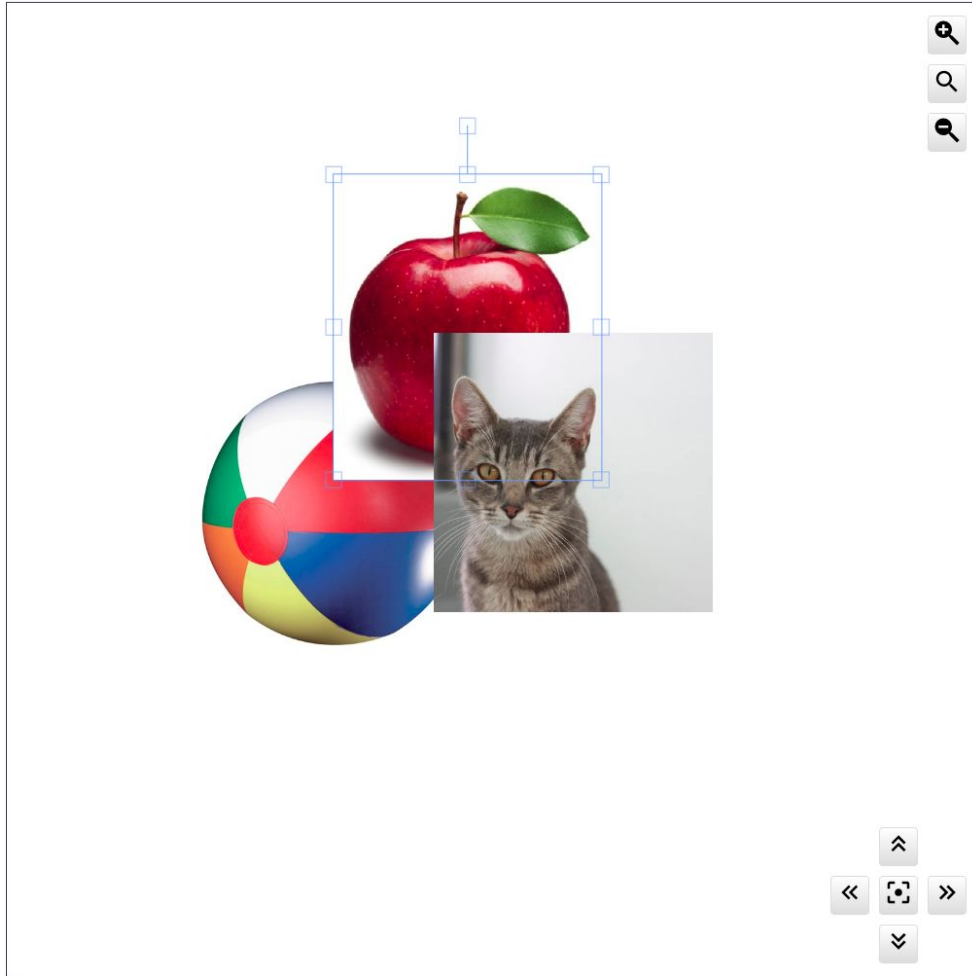


Fig 23 Layer section - After moving apple up

Edit

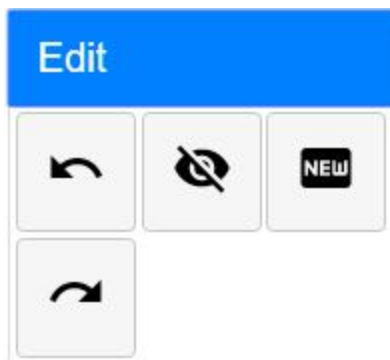


Fig 24 Edit section



Undo and



Redo: Undo and Redo action on canvas



Hide: Temporarily hides canvas panel.



New: Clears the content of canvas and reset it to blank canvas.

Import

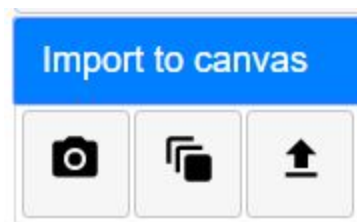
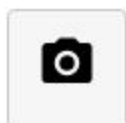


Fig 25 Import to canvas section

This section is useful for importing external content (mainly images) to the canvas which later can be annotated or combined with other tools.

There are several alternatives to import images, as follows:



Using camera: Capture new picture using webcam. On click. It creates a new dialog which shows preview from the default camera. It also has Capture / Reset buttons for camera. Once the image is captured. Use button gets activated which on click imports the previewed image to the canvas.

There are two sizes available for capturing images.

- 640px X 480px
- 320px X 240px

which can be selected from the dropdown list at top right corner of the dialog.

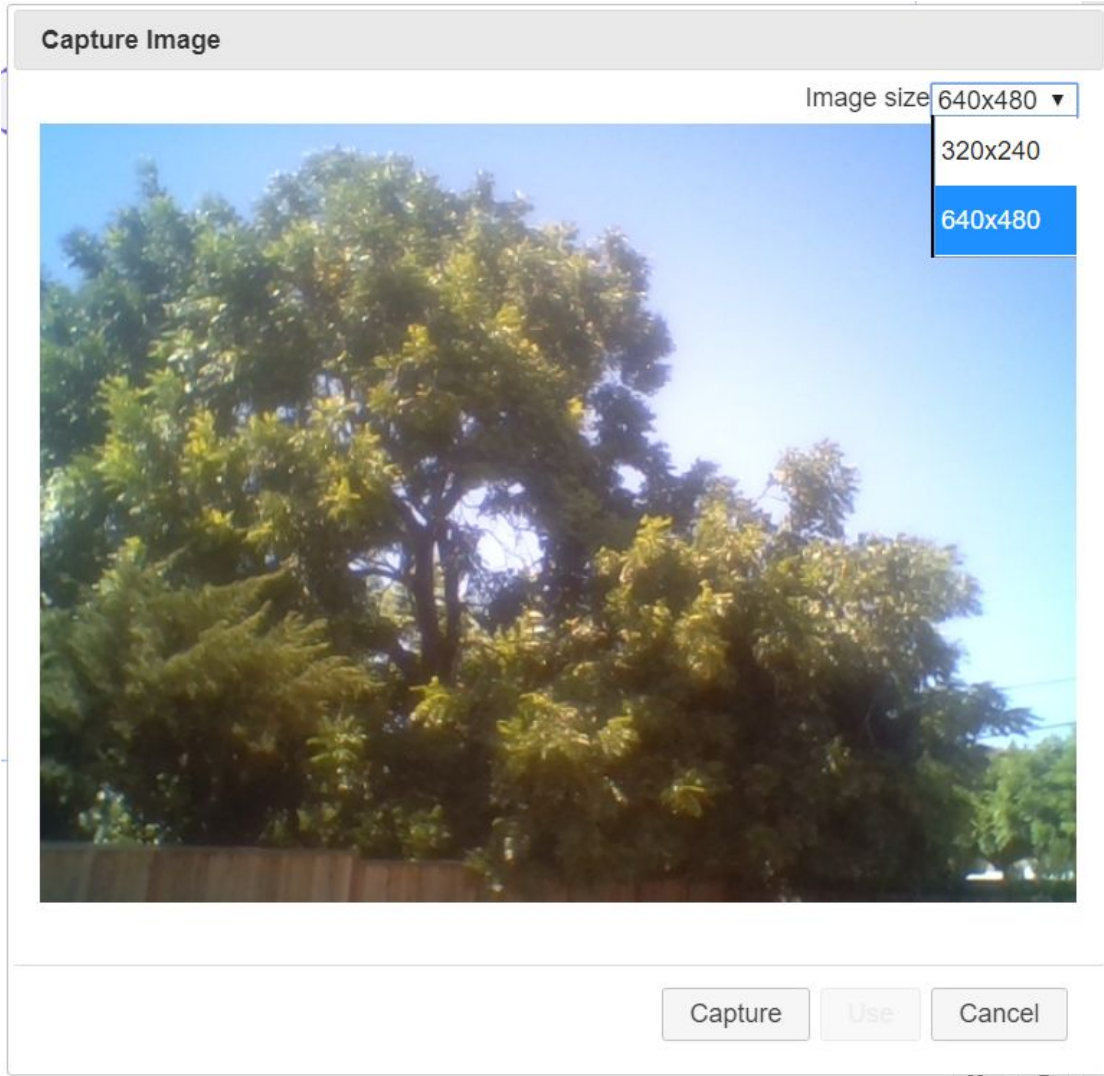


Fig 26 Import to canvas section - Capture Image



From Templates: These are predefined images from the server which can be used as template to draw and annotation. There are multiple images provided, which can be selected from the menu which preview.

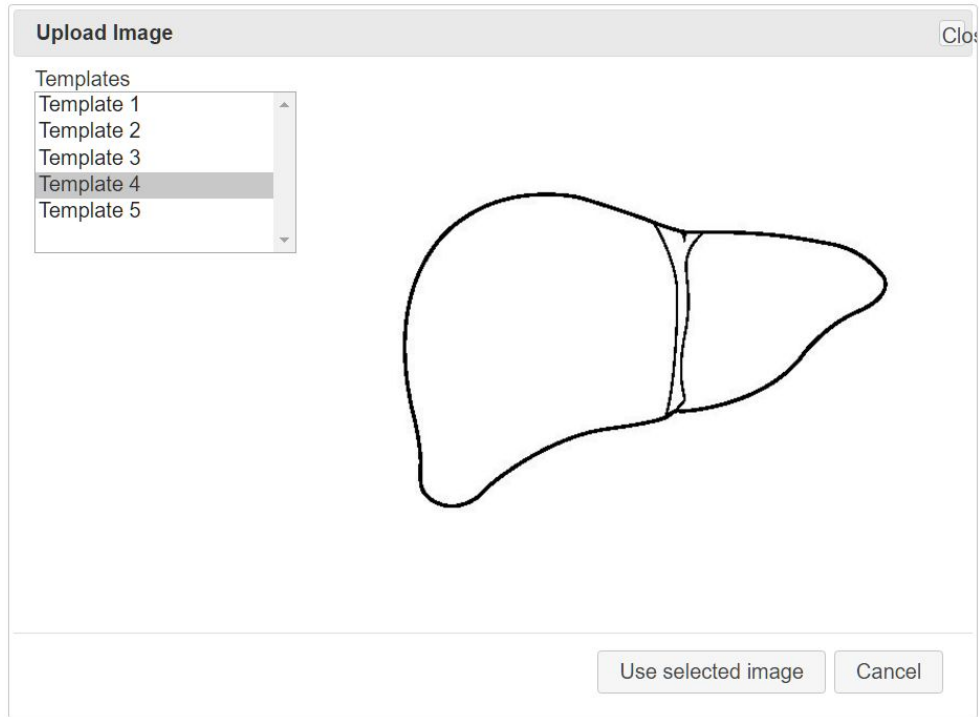


Fig 27 Import to canvas section - Templates



Upload from device: User can also upload image files from the file system of the device.

Attach



Fig 28 Attach section

This section is useful for attaching additional contextual files along with the drawing. These files are saved and linked to the patient's records as a part of same encounter.

There are several types of files that can be attached, as follows:



These allow to create new content from camera and mic or use files from the file system of the device.

A dialog is shown with option to select the method

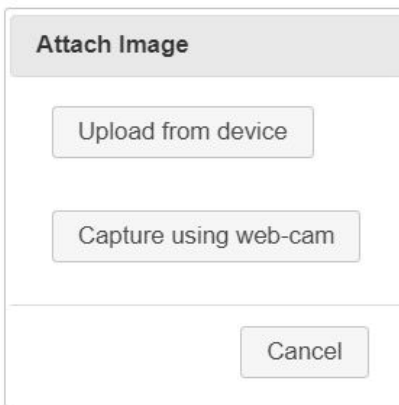


Fig 29 Attach Section - Image

If used from file system, another preview dialog is created which also act as confirmation dialog.



Fig 30 Attach Section - Image from system

User can switch method to webcam or re-select the image. To use the selected / previewed image, user can click the "Attach" button. The process is same for attaching videos, audios and notes.

To capture media from Webcam, reselective dialogs are created.

Image:

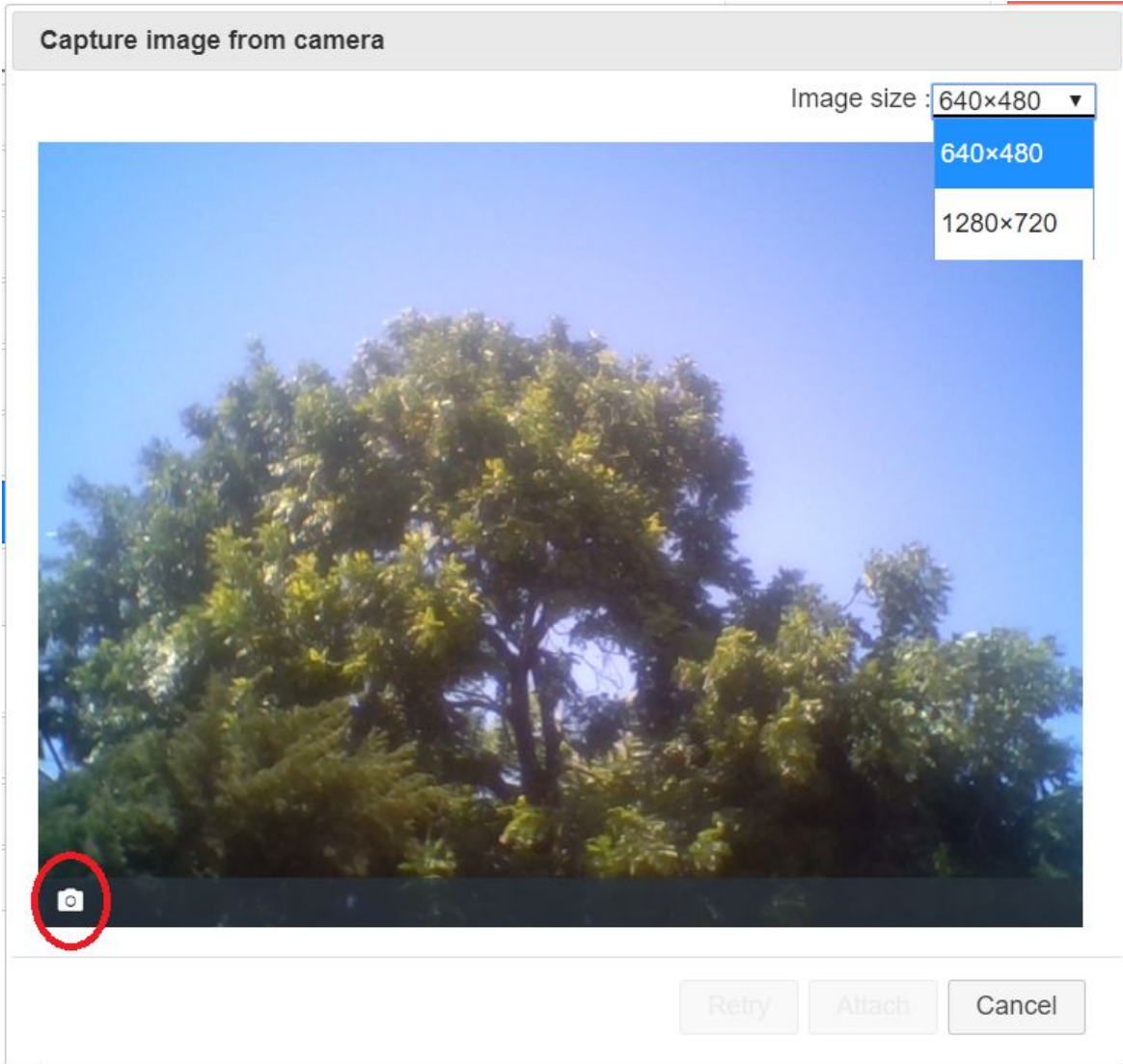


Fig 31 Attach Section - Image from camera

On clicking the capture button "Retry" and "Attach" button are activated which does exactly as name suggests.

Video:

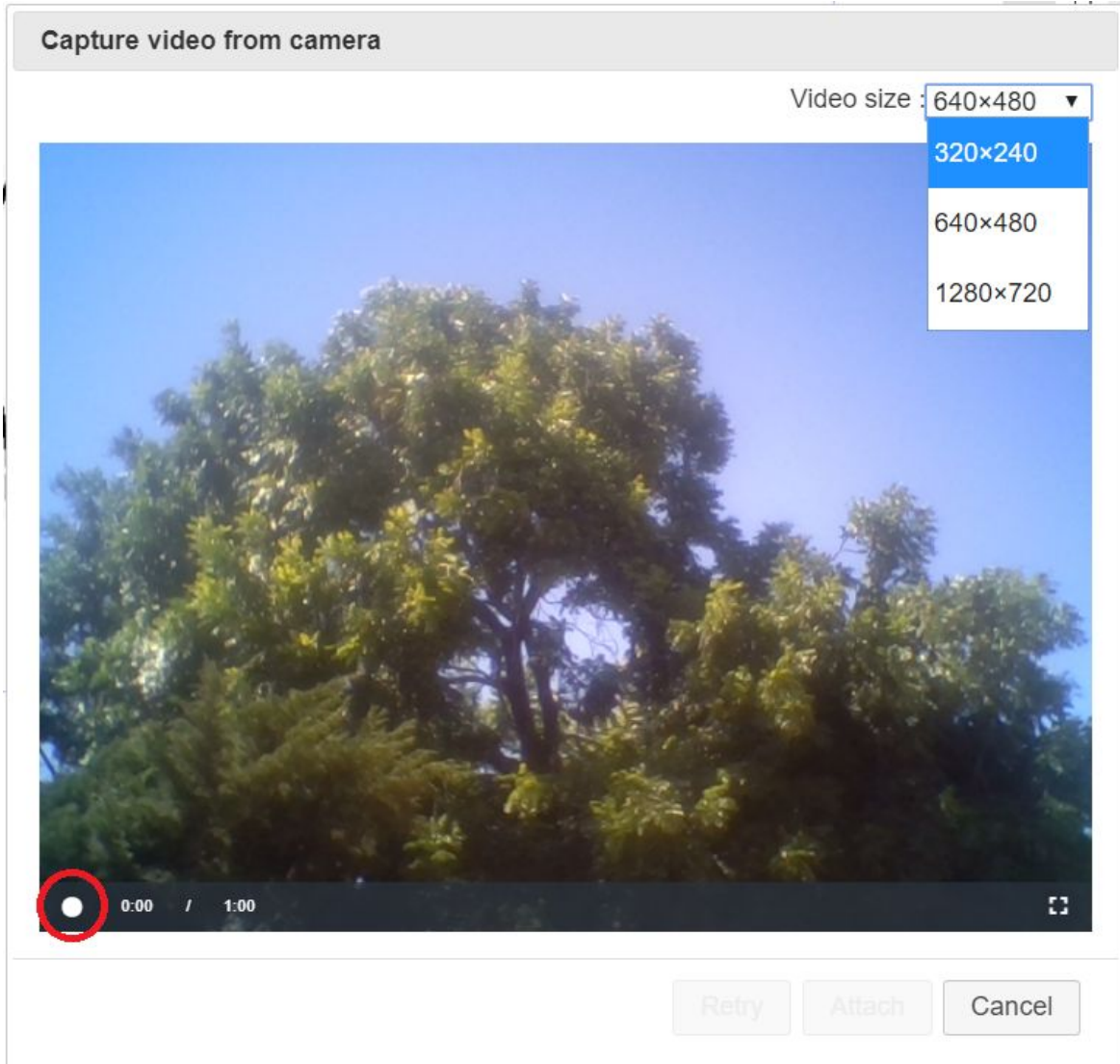


Fig 32 Attach Section - Video from camera



Start recording button will start a new video recording. The same button is swapped



with Stop recording button. Once stopped, the preview of the recorded video is

available in the same dialog.



Play button can be used to play the video.

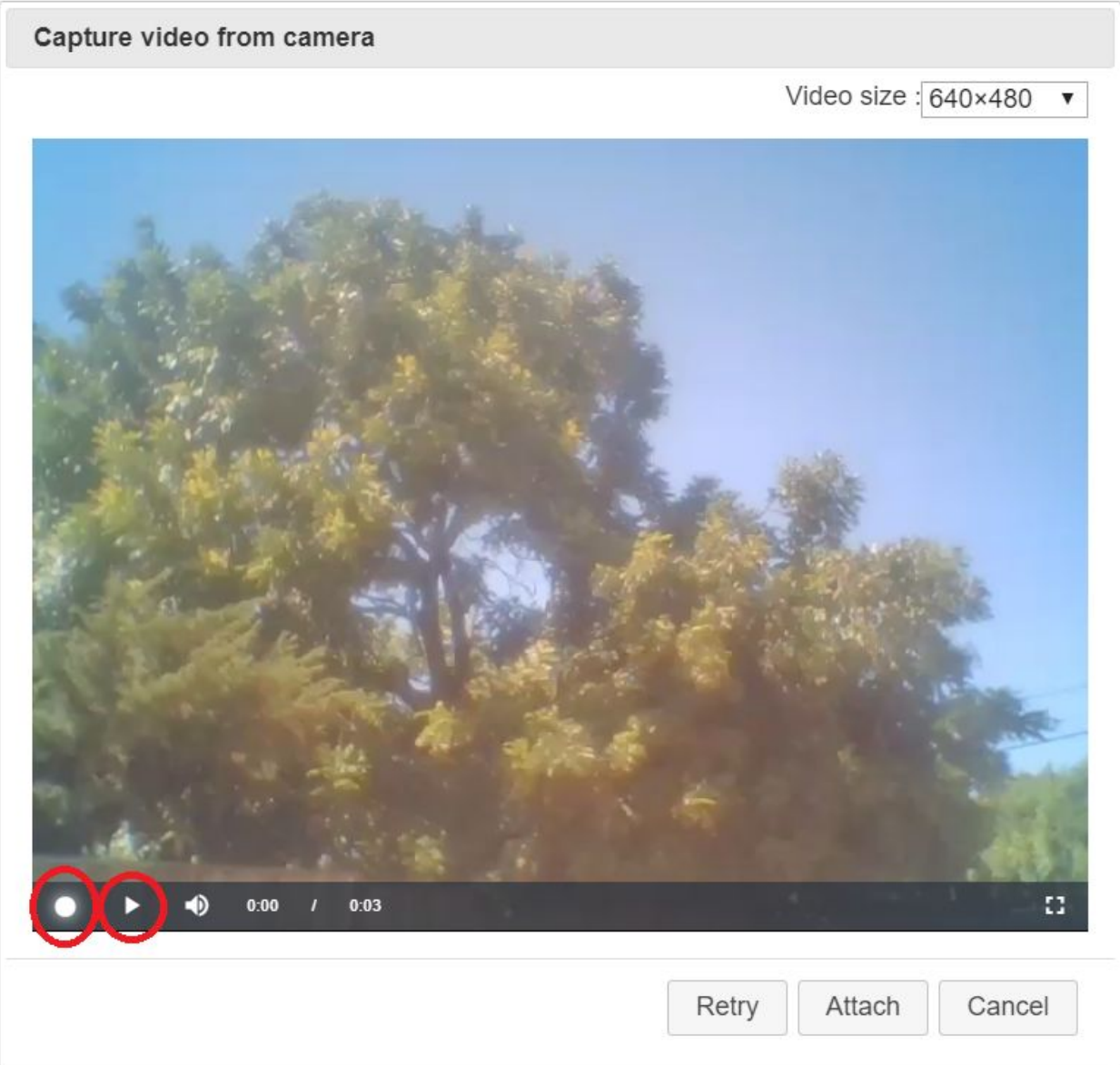


Fig 33 Attach Section - Video from camera 2

Audio:

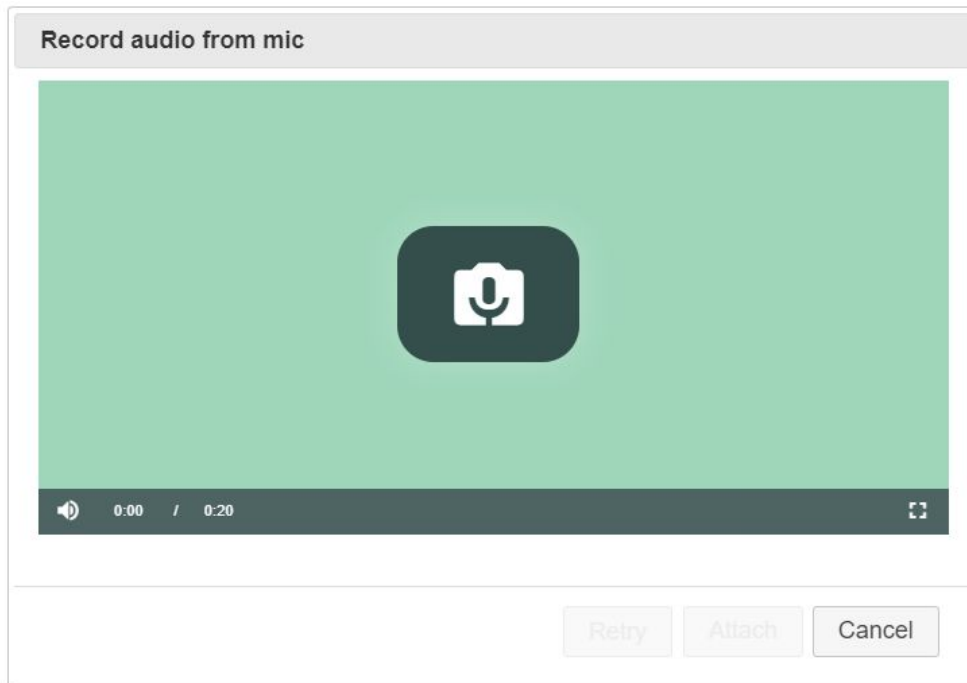


Fig 34 Recording Audio from microphone

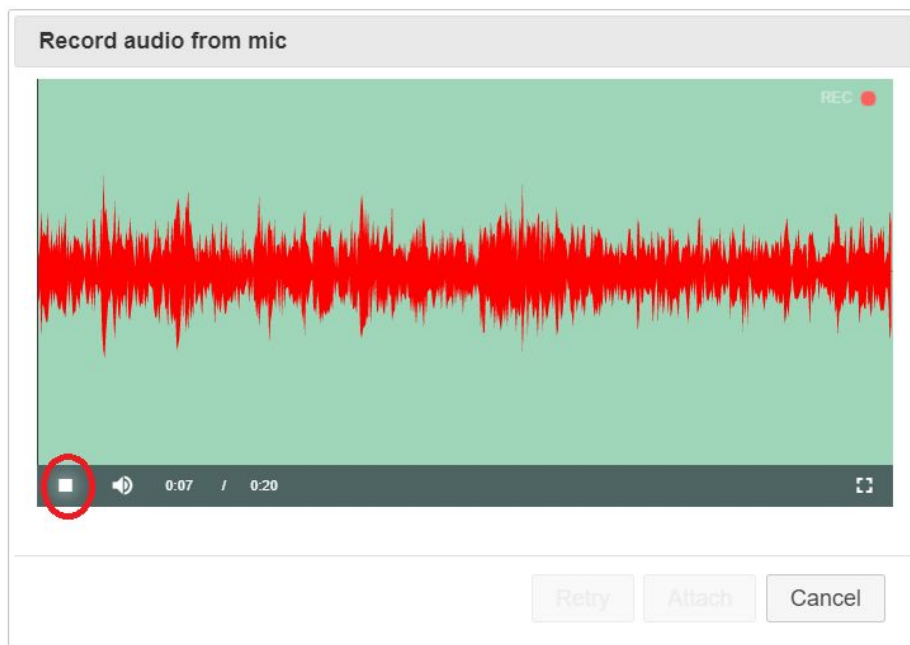


Fig 35 Recording Audio from microphone (Recording started)



Fig 36 Recording Audio from microphone (Recording complete)

To activate the audio recorder, click on the mic button in the center (Fig. 34). Once recorder is active, audios can also be recorded similar way as videos (select rectangle icon in Fig. 35).



Notes: Note can be typed into the editor dialog. User can also provide a name to the note to differentiate among different notes.

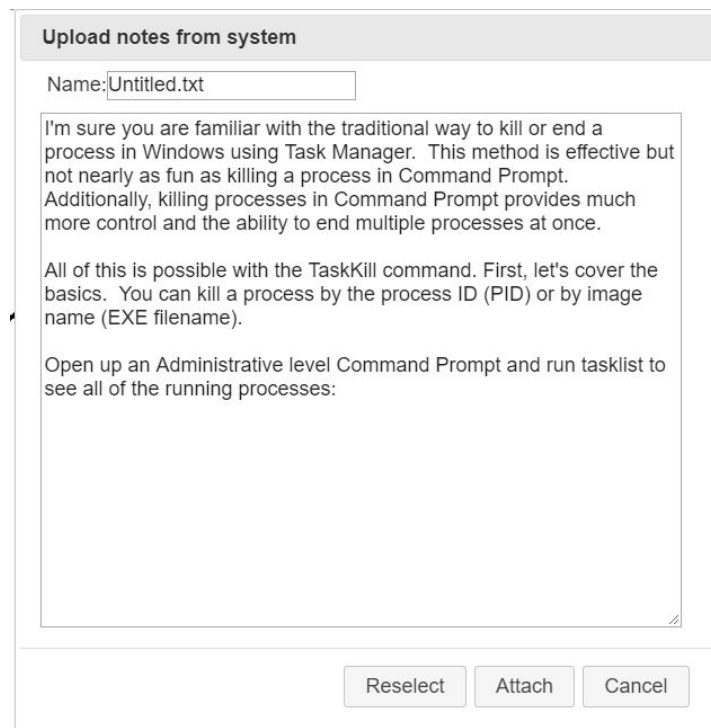


Fig 37 Attach Section - Note from device



File: Apart from media files, any other type of files can also be attached.

Print



Print canvas drawing

Export

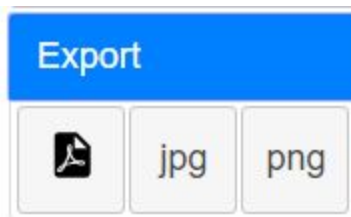


Fig 38 Export Section

The canvas can be exported or saved outside OpenMRS. There are several alternatives to save

the exported file which include,



PDF,

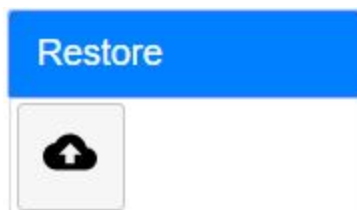


JPG,



PNG.

Restore



The encounter can be backed up and restored using the drawing editor.



Restore: restore the encounter by importing “.drw” file. On screen notification is shown when the backup is restored successfully.

Note: *If editor doesn't load the canvas on first try, please try again. You should see a notification on screen when encounter loads successfully.*

Add Drawing

To create a new encounter using drawing module. A ‘Add Drawing’ link is available in current actions panel of patient’s dashboard. The link is available only for the active visits.

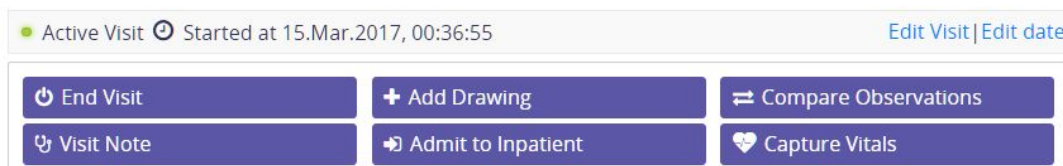


Fig 39 Active Visit Actions in Patient’s Dashboard

On click of ‘Add Drawing’ link, user is directed to Add Drawing page. Add drawing page has editor. (shown in the screenshot below)

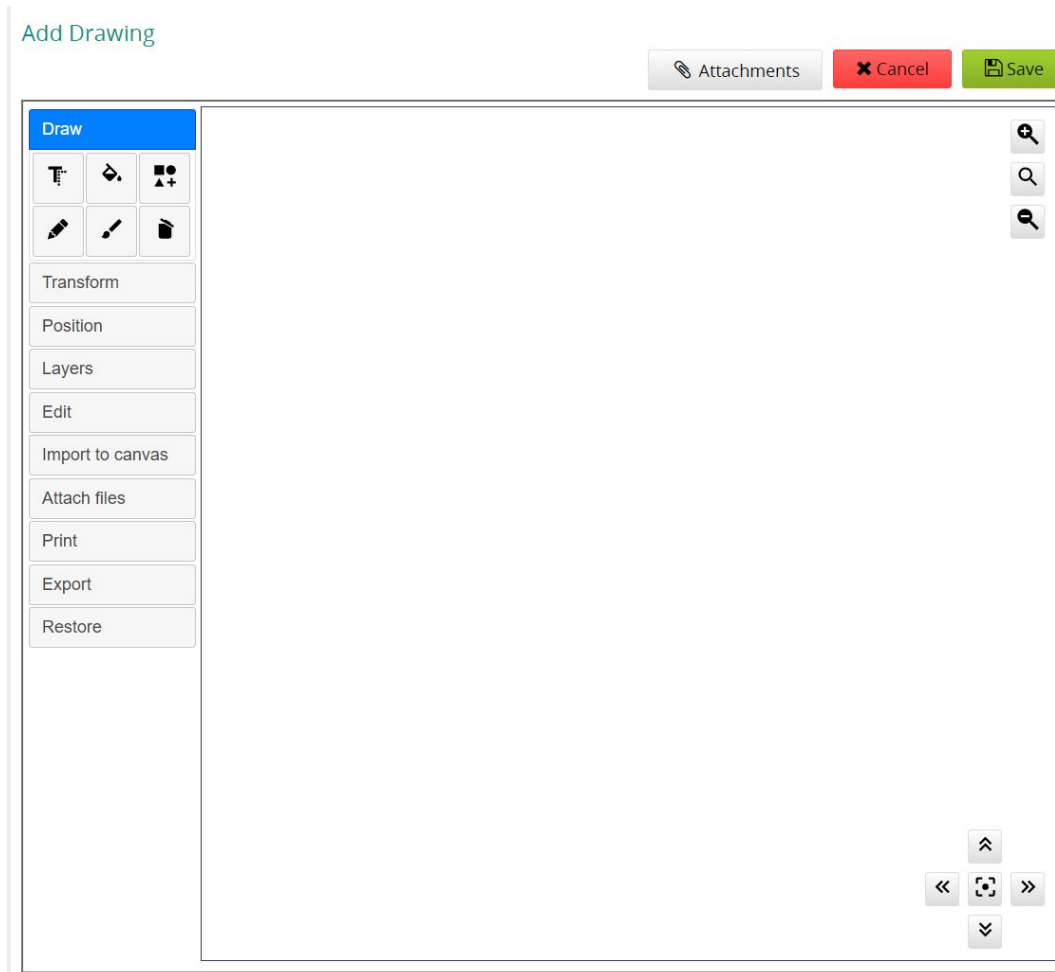


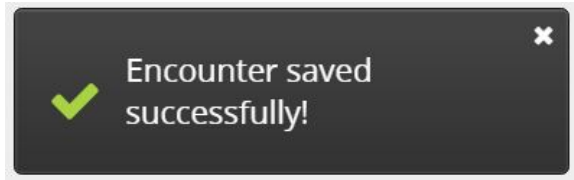
Fig 40 Add Drawing

On saving, progress is shown on the screen. Once the saving is complete, user is automatically redirected to the patient's dashboard.



Fig 41 Save encounter

A toast message is also shown on the screen.



If you want to add multiple drawings simultaneously or compare them side by side, please open the editor windows in separate windows.

Viewing Encounters

Patient Dashboard View

Collapsed View

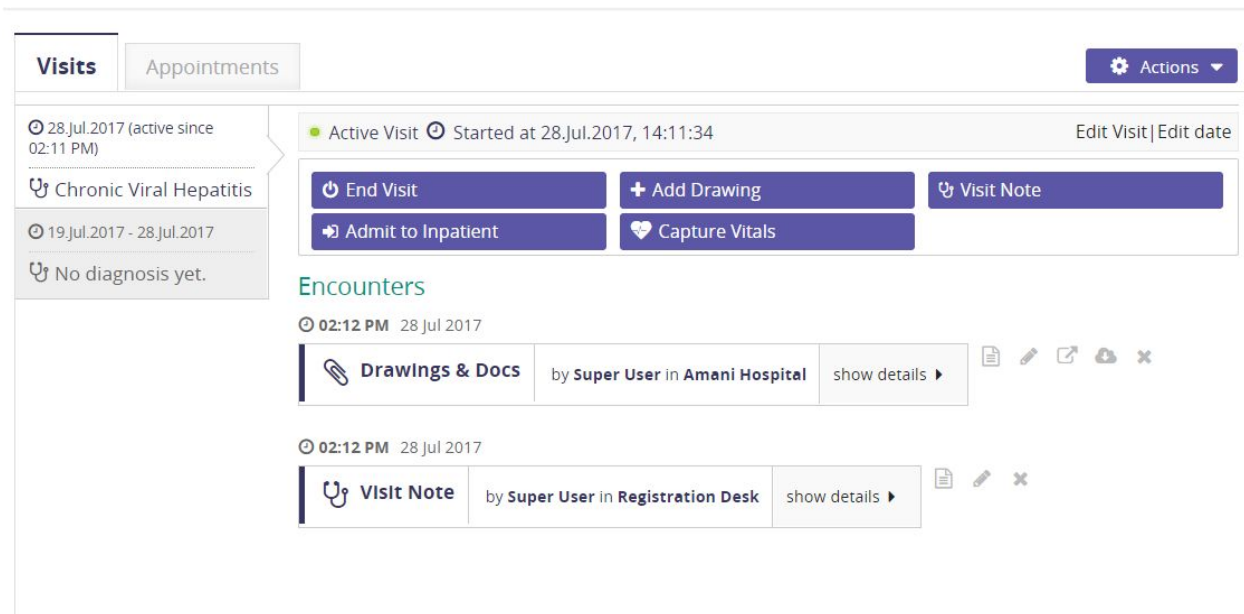


Fig 42 View Encounter from patient's dashboard

Patient's dashboard has all the encounters recorded for the patient including the ones from this module. The encounters are shown on chronological order and are grouped into visits. A collapsed view of the encounter is shown in above screenshot.

Expanded View

On clicking 'show details', a detailed view of the encounter is revealed. The details panel is divided into two sections, Drawing and Attachments. Drawing section shows a thumbnail of the

canvas which was saved. In clicking the thumbnail, a larger full screen view is shown in overlay on the whole page.

The attachment are listed in the Attachments section which can also be previewed on clicking. However, there are few limitations while previewing the attachments. *Preview feature is limited to images, audios, videos and notes.* For the files with incompatible extension, preview is not available(). Another limitation is that only one attachment can be previewed at once.

To view attachments simultaneously or to download, please use the full editor by opening the encounter in view or edit mode. (Explained in later sections).

The screenshot displays a medical software interface with the following components:

- Visits Tab:** A sidebar on the left lists visit dates and status. The current visit is highlighted: 30 Jul. 2017 (active since 12:14 PM) with a status of "No diagnosis yet." Other visits include 29 Jul. 2017 - 30 Jul. 2017 (No diagnosis yet), 28 Jul. 2017 - 29 Jul. 2017 (Chronic Viral Hepatitis), 19 Jul. 2017 - 28 Jul. 2017, and another "No diagnosis yet." entry.
- Active Visit Summary:** Shows "Active Visit" started at 30 Jul. 2017, 12:14:07. It includes buttons for "End Visit", "Add Drawing", "Visit Note", "Admit to Inpatient", and "Capture Vitals".
- Encounters Section:** Displays an encounter from 04:54 PM on 30 Jul 2017, created by "Super User in Amani Hospital". It features a "Drawings & Docs" section with a "hide details" dropdown and icons for document, edit, share, and delete.
- Drawing Panel:** Contains a drawing of a red apple with a green leaf. A black arrow points to the apple with the label "Apple".
- Attachments List:** Lists several files: "image_Ball.jpg", "video_elephants-dream.webm", "audio_acadia anthum.mp3", and "note_SampleText.txt".

Fig 43 Details panel

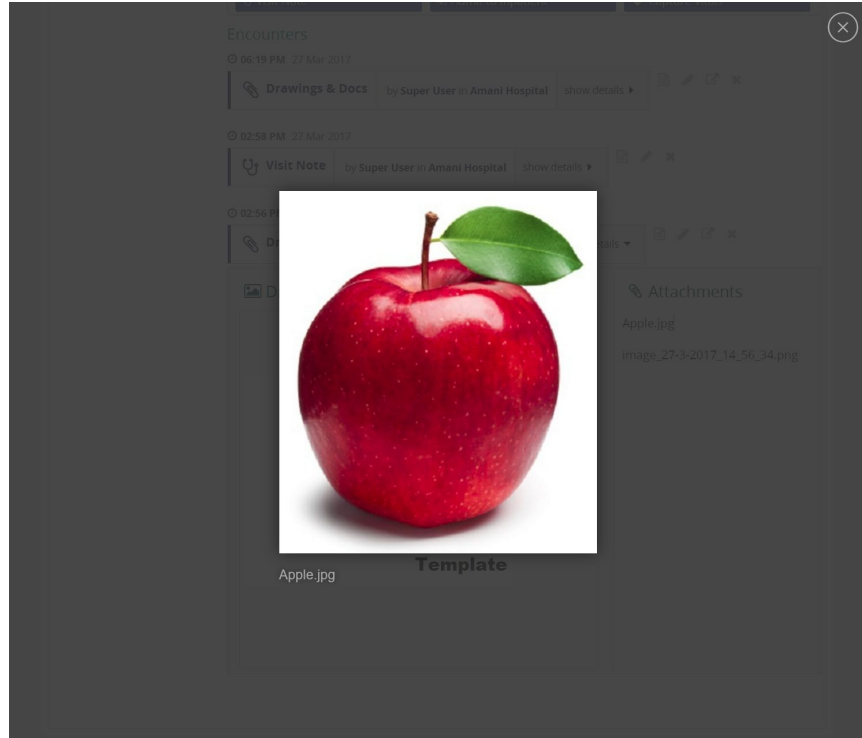


Fig 44 Full-Screen view of attachment associated with the encounter

View Encounter

To view encounter in the editor, user can use the view button. User is navigated to a new page where the canvas is recreated along with attachments.



Fig 45 Encounter Details - View

The icon next to the encounter (shown in above screenshot) is used to navigate to view drawing page.

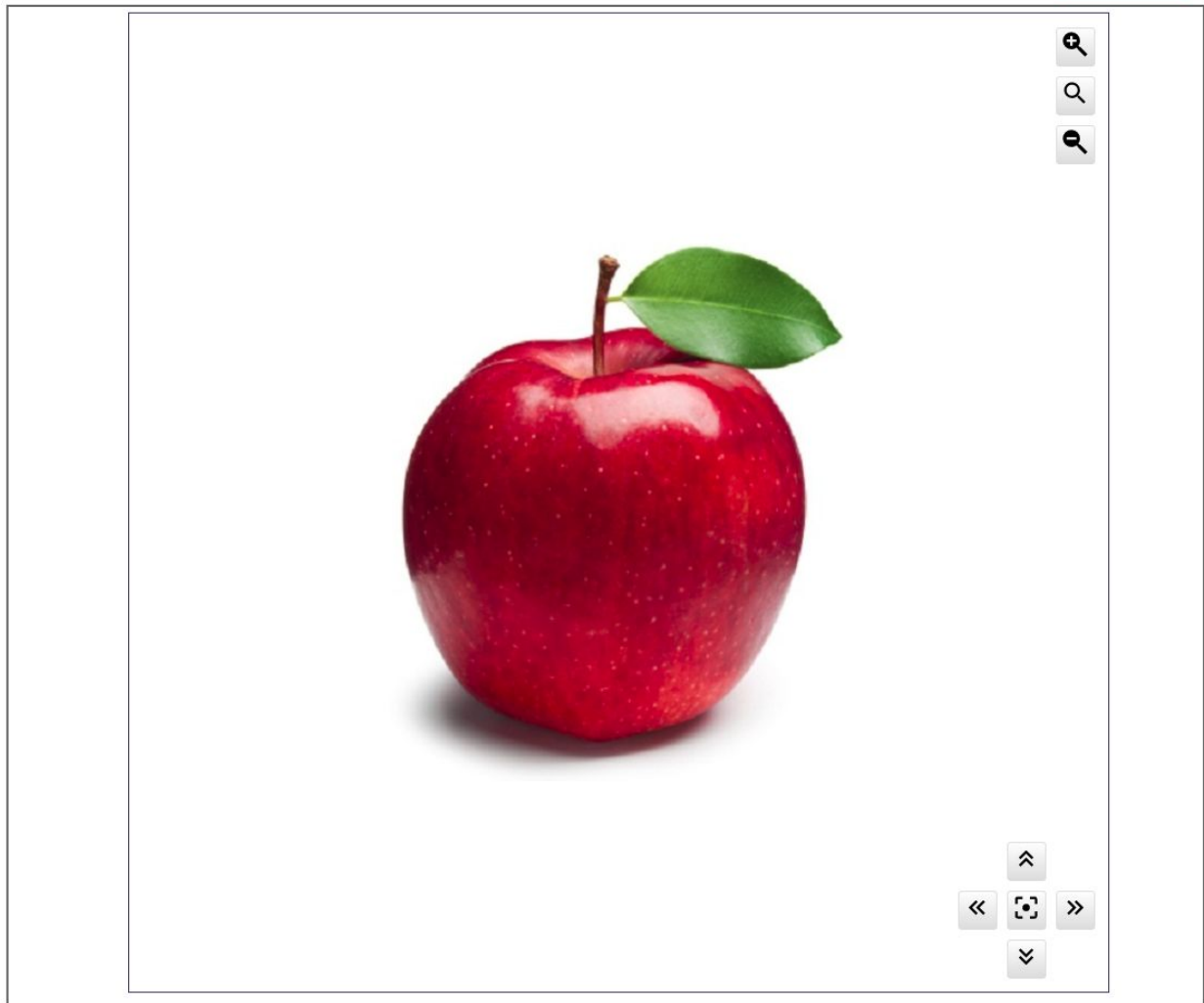


Fig 46 View Encounter

The attachments can be viewed using the attachment button which creates a dialog with the list of attachments. There are two icons next to filename, "Preview" and "Download". Preview - opens the attachment in new tab/window and browser handles how to preview them. If the browser is not able to create the preview for the attachment, it would be downloaded. Download - simply downloads the attachment.

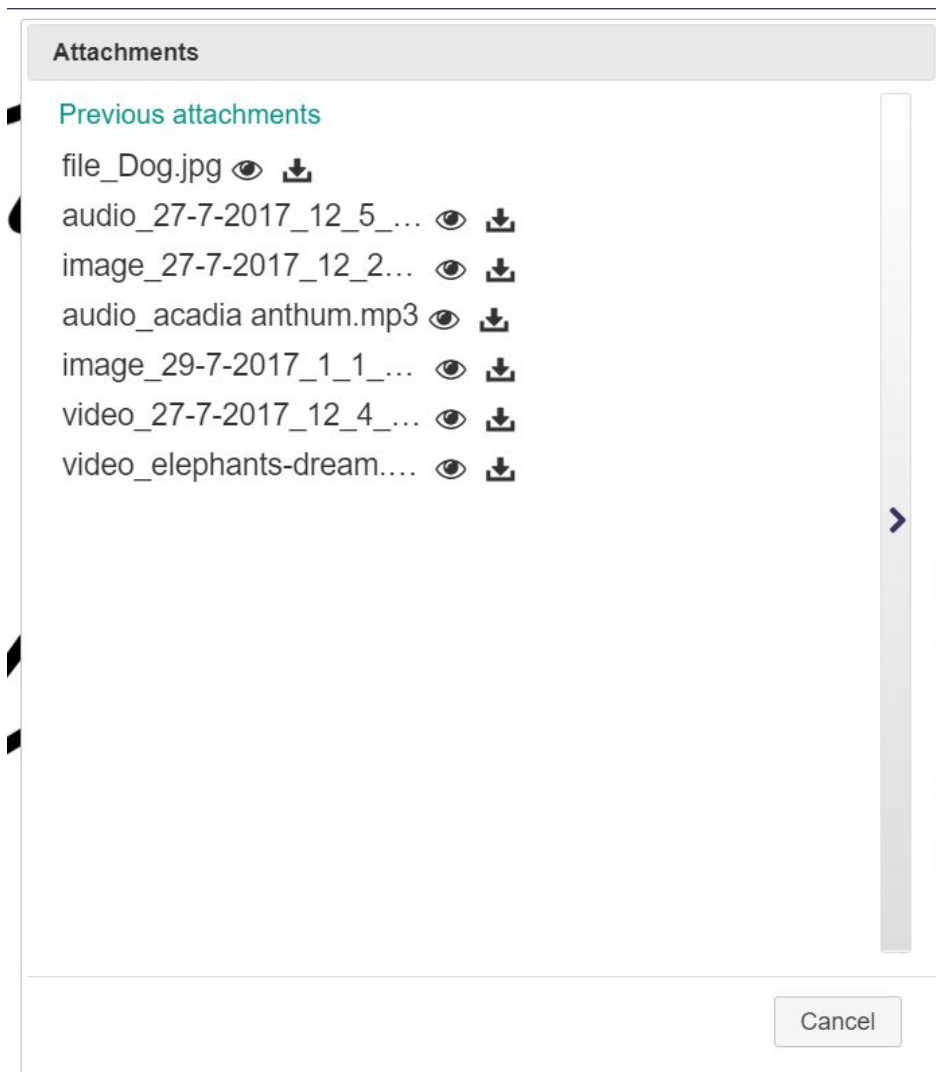


Fig 47 View Encounter - Attachments

As you can notice, 'Save' button is missing, which is because, this page allows only to view the encounter but not modify it.

Edit Encounter

The edit function for the encounter works little bit different than most of the other encounter types. On clicking the edit encounter icon, the user is directed to a similar page to 'View Encounter' page with a save button.



Fig 48 Encounter Details - Edit

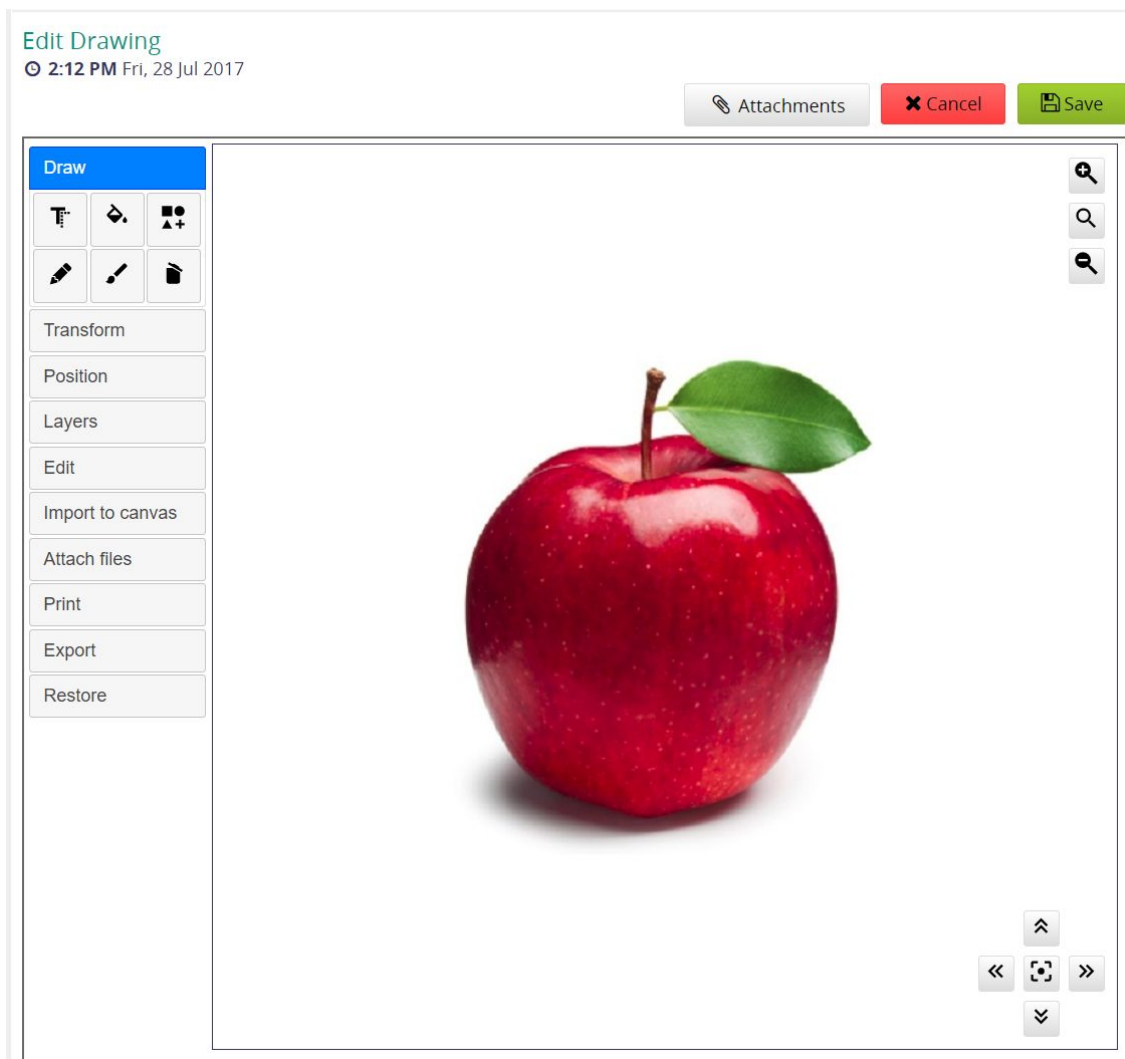


Fig 49 Edit Encounter

The edit basically recreates the editor from the current encounter and user and modify and add observations on top of the current encounter. On saving, new encounter is created with updated observations.

View Drawing in new popup window

To view encounter drawing in a new window, by clicking the icon in the red square.



Fig 50 Encounter Details - Pop-up View

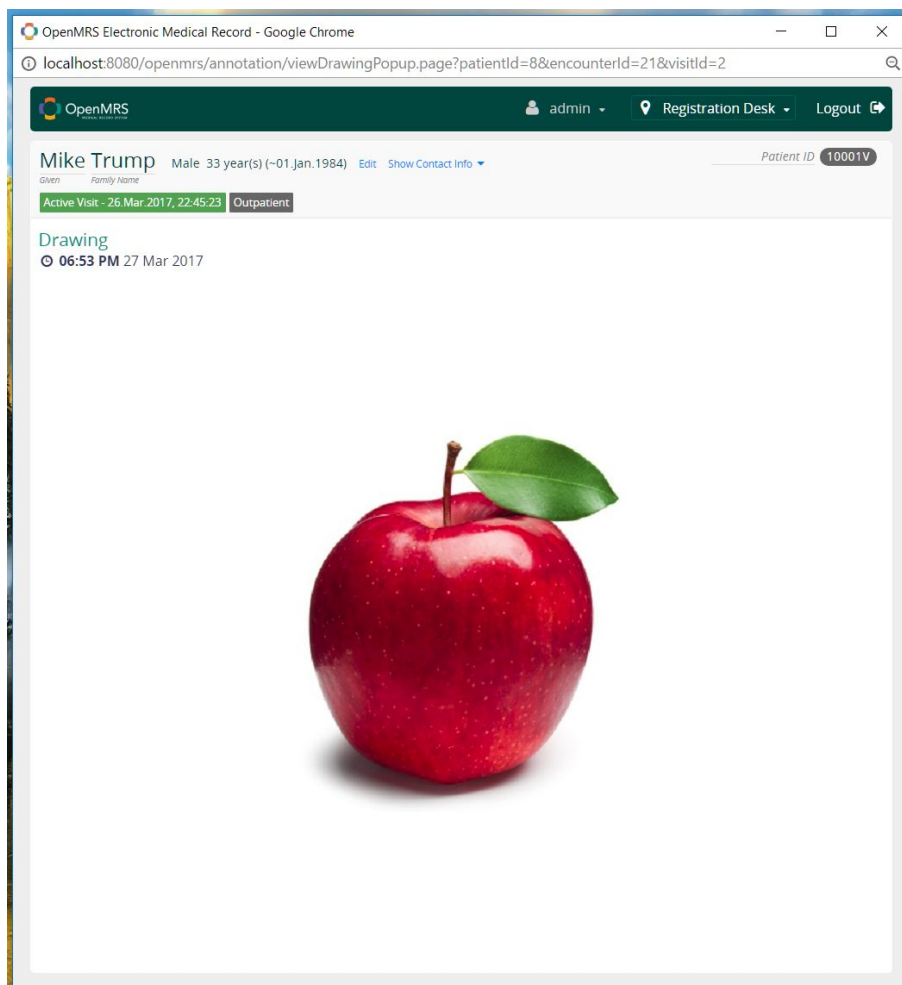


Fig 51 Pop-up View Encounter

This window can be used to print the drawing / sketch.

Backup Encounter

To backup the encounter, click on backup icon.



Fig 52 Encounter Details - Backup

A backup file will be downloaded. The file has “.drw” extension but under the hood it's a simple zip file. The drw file can be ported to other systems and can be restored later if needed.

Delete Encounter

To delete the encounter, click the delete icon.



Fig 53 Encounter Details - Delete

A confirmation dialog will appear. On clicking 'Yes', the encounter is deleted and page is reloaded.

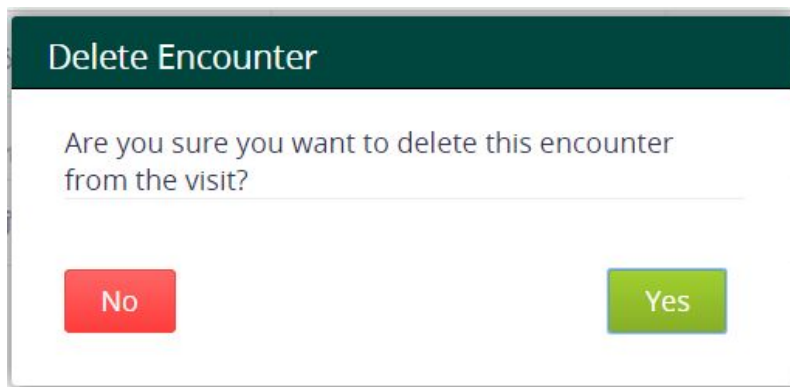


Fig 54 Encounter Delete - Confirmation