Research document

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Date: 13 Sep 2023

Semester: 5

Project: Video call system

Contents

1. Introduction

The purpose of this document is to conduct research to address the problem within the project, specifically, finding a solution for the video call system. To tackle this problem, I will formulate a primary research question and several related sub-questions. These sub-questions will be explored through interviews, internet research, prototyping, and other methods.

The challenge in this project revolves around developing a video call system within the PRAS system. This document will provide a detailed account of the steps taken to address each sub-question and the overall problem-solving process.

2. Research questions

Main question:

What possible solutions are there, to create a video call facility to implement in the PRAS system?

Sub-questions:

The strategy and methodology for the FHICT can be found at this link: https://ictresearchmethods.nl/Methods and https://cmdmethods.nl/ .

1. **How should the video call facility work in the PRAS system?**
   o **Strategy: Field**
   o **Methods: Document analysis, interview**

2. **What video call systems are there?**
   o **Strategy: Library**
   o **Methods: Available product analysis, Literature study**

3. **Which video call system can be implemented based on the requirements?**
   o **Strategy: Workshop, Stepping Stones**
   o **Methods: IT architecture sketching, Prototyping, Requirements list**

4. **Which video call system benefits a better user experience?**
   o **Strategy: Lab, Stepping Stones**

3. Sub-questions result

3.1.   How should the video call facility work in the PRAS system?

Currently the video call occurs on a tablet using WhatsApp. Normally the SVb employees would check the daily agenda to determine if there are any appointments scheduled. If there are, they have to look at what type of appointment it is and with whom. They have to first double click on the appointment box to see all the information of the appointment. See figure 2. Due to sensitive information, I have made a wireframe and dummy data of the user interface.
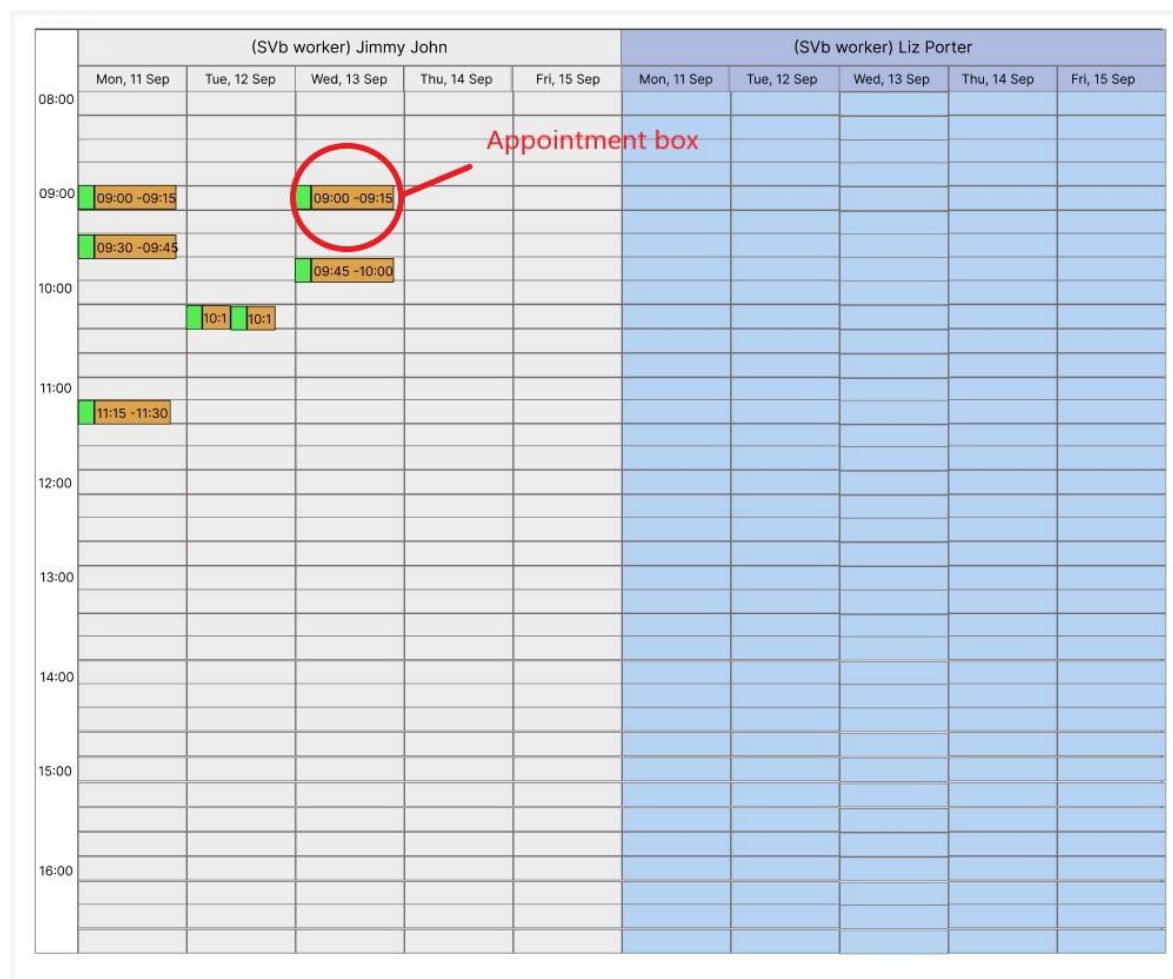

Figure 1: Overview of the agenda.

Figure 2: Information of the appointment.
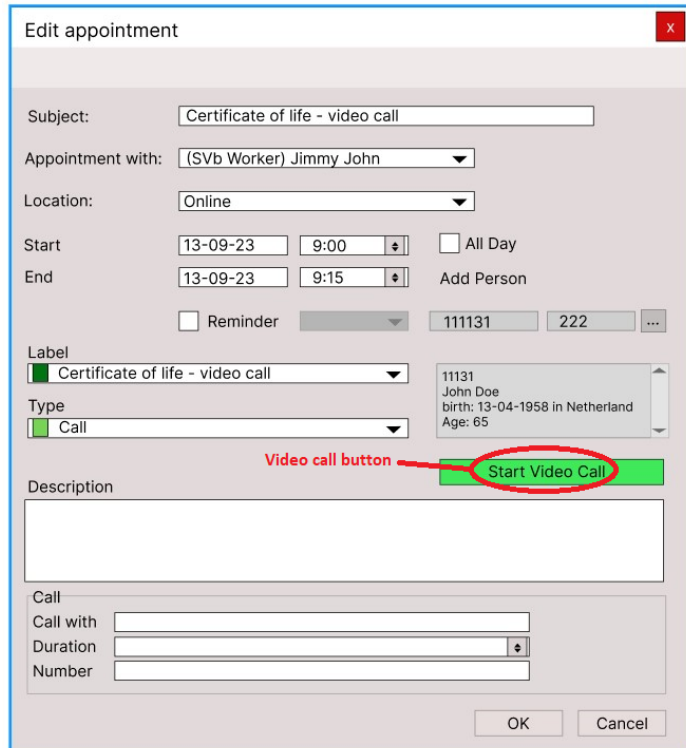
After looking at the information the SVb employee would use the company tablet to contact the retirees on WhatsApp video call. They would need to have the retiree's information saved in order to make a WhatsApp video call.

SVb now wants to eliminate the process of using a tablet to make video calls. They want video calls to be made through the PRAS application, which serves as the central hub for managing all pension client information. There are two concepts/ ideas to address this problem. The concepts can be found in the **Concept Document**. For the full, detailed process, please refer to the "**Wireframe**" document. Here is a summarized process for both ideas.

First Idea

The first idea is to add a "Start Video Call" button to the appointment box. Clicking this button will initiate a video call with the retiree through WhatsApp. A video call interface will appear when the button is clicked, allowing the SVb employee to contact the retiree. After the video call, the SVb employee can end the call using the video call interface, and it will log the start and end times of the call,

as well as the date. Figures 3 to 7 depict the process of initiating and ending the video call with the retiree.

Figure 3: "Start Video Call" button for the first idea.
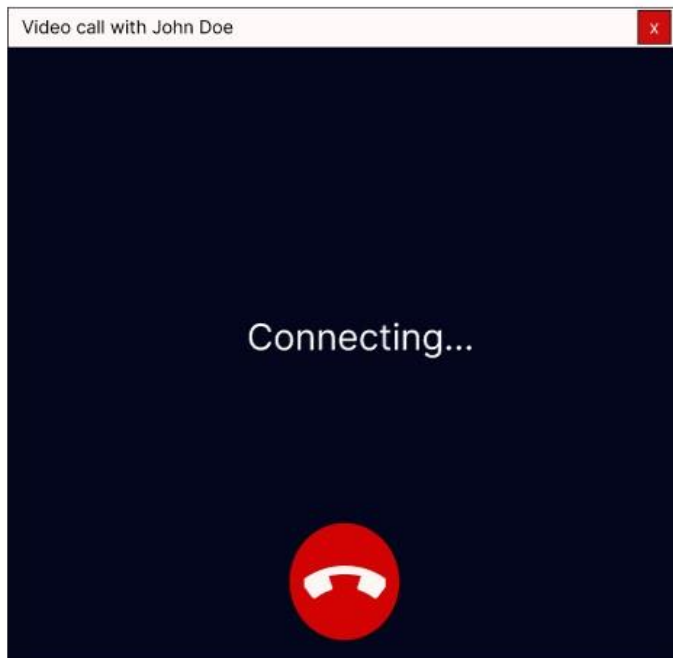
Figure 4: Connecting to retiree's phone.

Figure 5: Connected to the retiree.
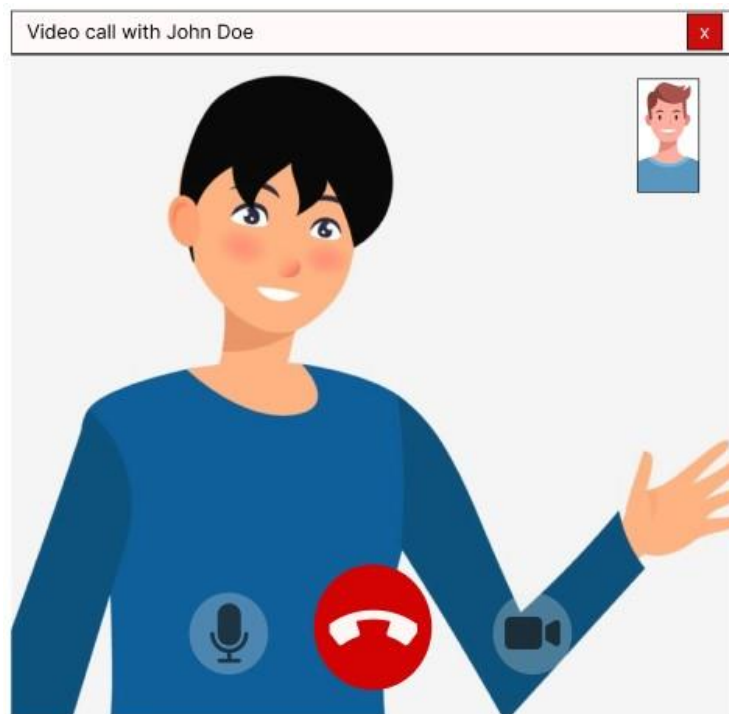
Figure 6: In a video call with the retiree.
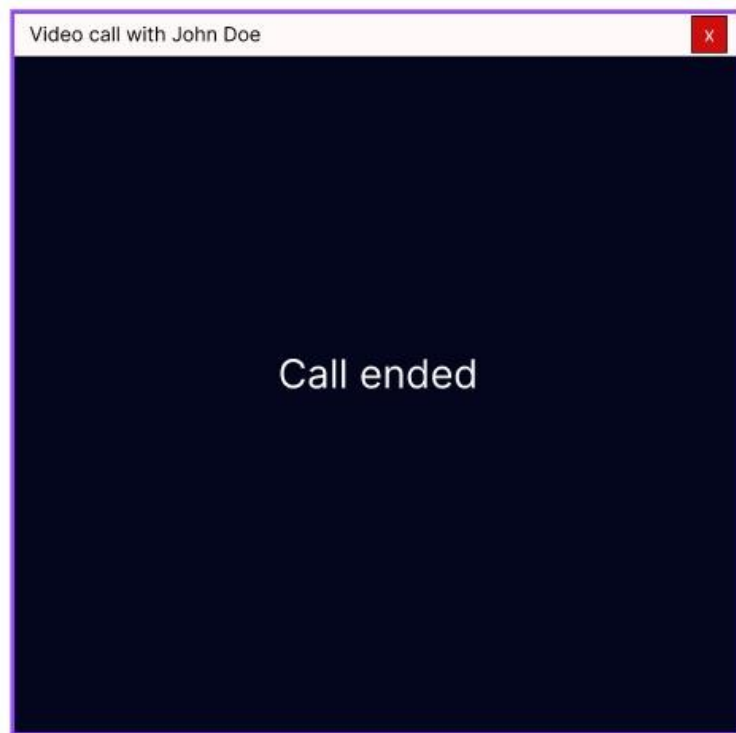
Figure 7: End video call.

Second Idea

The second idea, in the initial part, is the same as the first idea: adding a "Start Video Call" button to the appointment box. After clicking the "Start Video Call" button, the video call interface will display and place the SVb employee into a video call meeting. The SVb employee has to admit the retiree into the call when they join the meeting. The retiree can join the call through a link sent by email, SMS, or WhatsApp. After the meeting is finished, the SVb employee can end the call, and the system will log the start and end. times of the call. Figures 8 to 12 depict how the video call process should work.

Figure 8: "Start Video Call" button for the second idea.
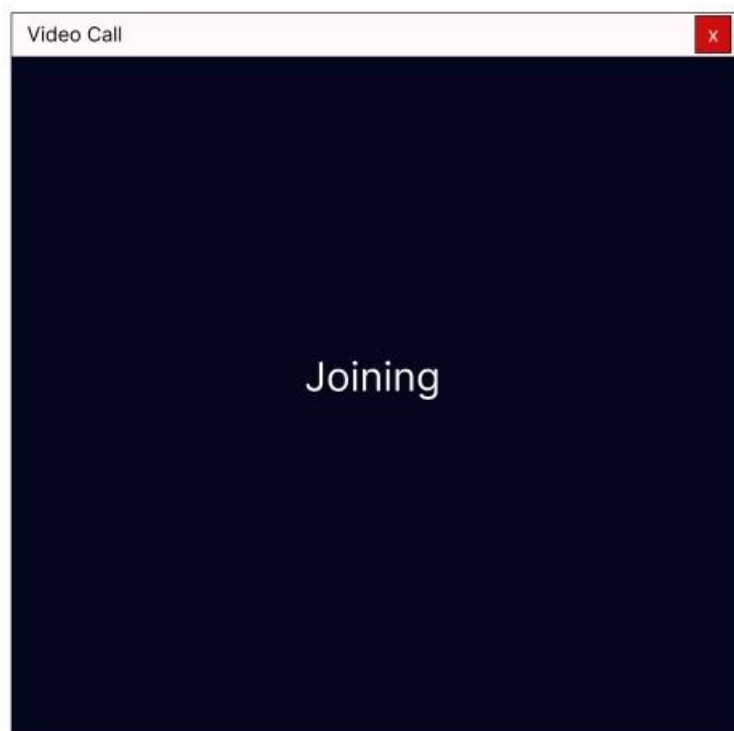
Figure 9: Joining the meeting.
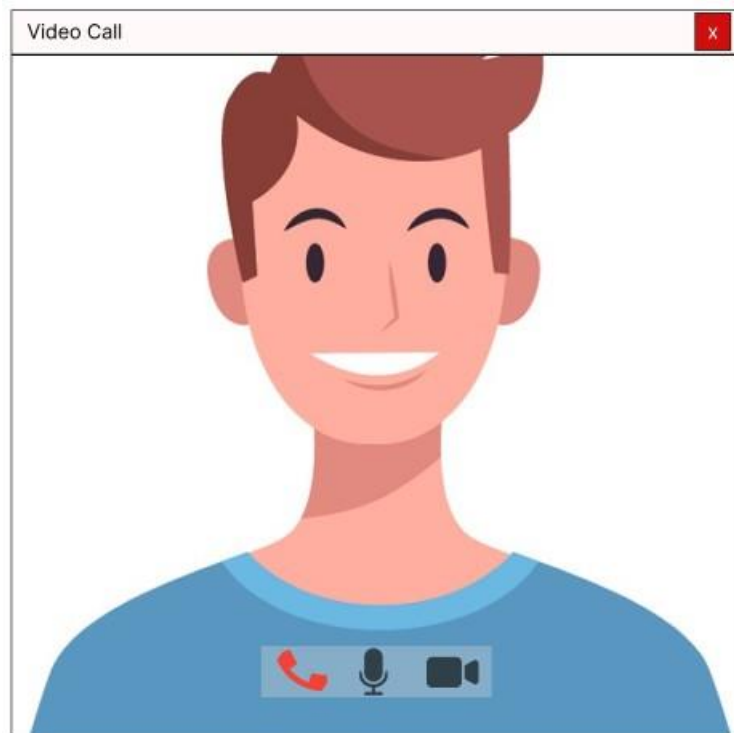
Figure 10: SVb employee joined the meeting.
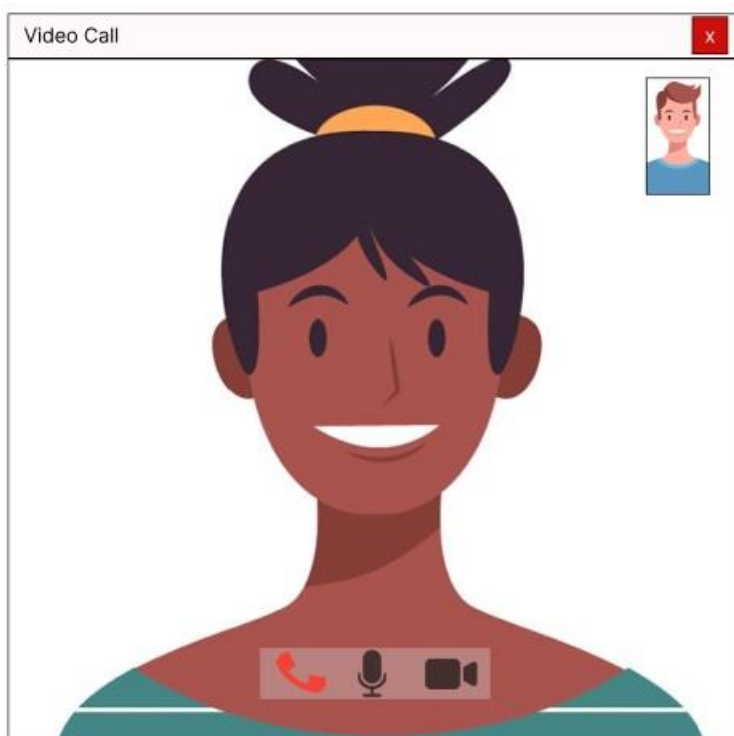
Figure 11: Retiree joined the meeting.
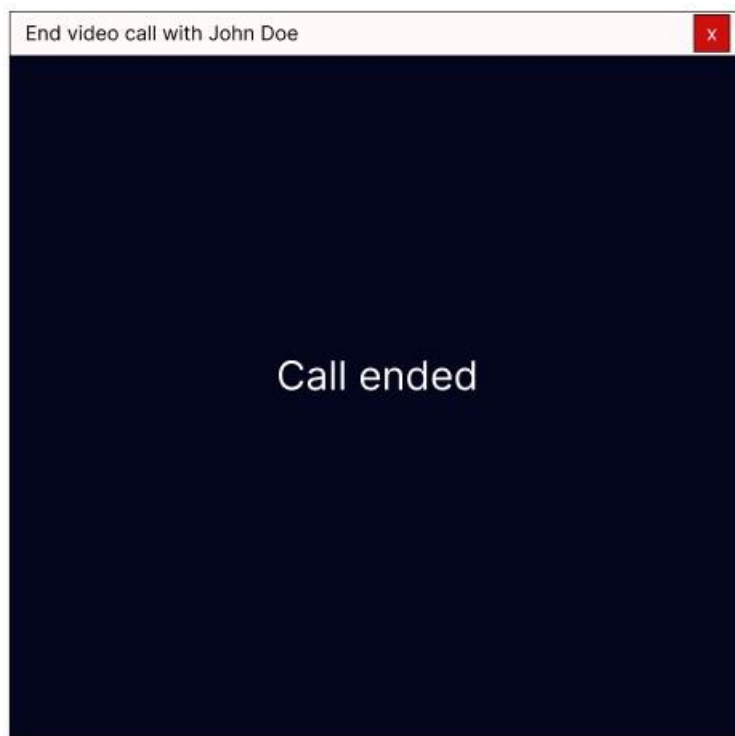
Figure 12: End video call meeting.

3.2.   Which video call systems are there?

There are all sorts of video call systems, it depends on what type of video call system you want. There are free versions of the video call systems and there are paid versions of it. I won't go through all of them, but I will mention some of them based on what I saw on the internet, or have tested out, or having used them before. I'll also provide the type of features they offer. Please note that there might be some missing information that I couldn't find. I will categorize the findings for each video call system into description, pros and cons. Neutrals represent features that adds no values and doesn't hinder the main concepts of the video call system on the PRAS app. Pros represent added benefits that we can use to enhance the current prototype or for future prototypes. Cons represent challenges that would hinder the concept of the prototype or the future prototype.

Acronyms

In here we will give the full name of the acronyms/ abbreviations and describe what it is and what it does. This is mostly use as reference for the video call systems if they have these acronyms.

SDK:

SDK stands for software development kit. Also known as devkit, the SDK is a set of software-building tools for specific platform, including complier, code samples, documentation, debuggers and, often a framework or group of code libraries such as set of routines specific to an operating system (OS).

WebRTC:

WebRTC is real-time communication for web. It supports video, voice, and generic data to be sent between peers, allowing developers to build powerful voice- and video-communication solutions.

API:

API stands for Application Programming Interface. It's a way for two or more computer programs to communicate with each other. Application refers to any software with distinct function. Interface is like contract of service between two applications. This contract defines how the two communicate with each other through requests and responses.

The free version of a video call system is:

Zoom (Tested)

Here is the link to zoom.

Neutrals

- You have to create an account to host the meeting.
- You can use some of the features of Zoom API for free.
- It has a chat box.
- You can add emoji reaction.
- You can make use of white board.
- You can add break rooms.
    - *To separate people and put them into other calls.*
- You can show captions in the call.
- Can share screen.
- You can schedule a Zoom meeting on a calendar.
- Can be live streamed.

Pros

- You can download the app, or you can use the browser-based video call on the desktop.
- You can join the call through an invite link.
- Host has to admit the guest to join.
    - *It's a good thing, so that no one can join the call randomly.*
- Won't let you join an old link.
    - *This is to prevent the retire from accidentally joining the old video call or start a new call.*
- Can add virtual background.

Cons

- It force you to download the app on desktop.

- You have to download Zoom on your mobile phone to join the call.
  - *Bad, because the retiree need to download extra applications to join the call.*
- It gets a bit easy to use once you get used to host the call or be a guest of the call.
  - *It needs to be easy to understand and use.*
- For the free version, the call is capped at 40 minutes long.
  - *Maybe in the future SVb wants to make a longer call like 1 hour, then this won't work.*

WhatsApp Messenger (Still testing)

Here is the link to the web browser version.

Neutrals

- You need to download the app on mobile.
- You need to scan the QR-code on the web version and desktop app from the mobile WhatsApp to use the web version or desktop app.
- Can message someone
- Can send voice notes.
- Can send videos.
- Can make phone calls.
- Can send files.
- You can share screen when you are in a video call.

Pros

- It's free
- You need to have a phone number to use this.
  - *You can call the retiree by their number if they have the app.*
- You can use the web version or desktop app.
- You can make a video call on the desktop app.
- Everyone has it.
- End-to-end encryption for messages, photos, videos, voice messages, documents, status updates and calls.
  - *Encryption is to convert string of items like message and etc. into special code so that no one can read it. You need special key or password to decipher it.*
- You can make an invite link on desktop app to join the video call or voice call

Cons

- You can't make a video call on the web version.
- The web and desktop app version stays active as long as you keep using the mobile WhatsApp.

> *After 14 days straight of inactivity on the mobile WhatsApp, it will log the user out of the web and desktop app. That's for not using the WhatsApp on your mobile phone.* (**Still testing**)

- You have to log in with your mobile WhatsApp every time you are logged off from the web or desktop.
- WhatsApp account can be connected to max to 5 devices.
  > *Counting the main mobile device, you have WhatsApp on.*

WhatsApp Business (tested)

It is the same link as WhatsApp Messenger
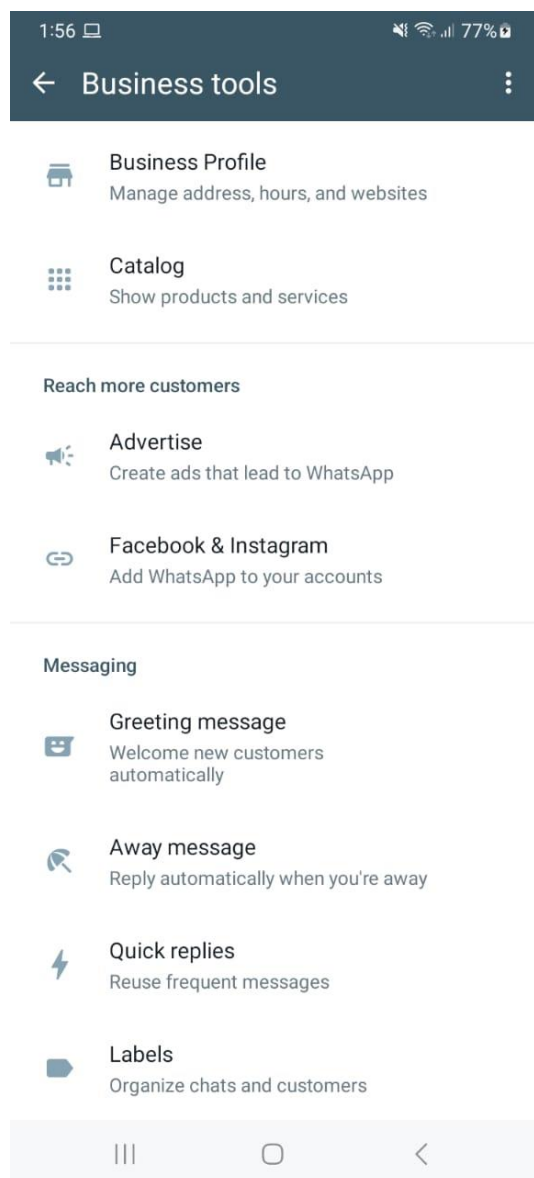
Figure 13: WhatsApp Business on mobile with additional features.

Neutrals

- This is kind of the same as the WhatsApp messenger but for small business.
    - *Has the same features as WhatsApp messenger and additional features.*
- You can add opening hours to your profile. (**Tested**)
    - *You can't do this on the desktop app* (**Tested**)
- You can add company website on your profile. (**Tested**)
- You can add company address on your profile. (**Tested**)
- You can add company email on your profile. (**Tested**)
- Can do quick replies. (**Tested**)
    - *They are customized messages that you create and use for frequently asked questions.*
    - *You can create quick replies on mobile only. You can use them on all the other devices.*
- Can make automatic greeting messages.
    - *For client initiating a conversation or 14 days of inactivity. You can create it only on mobile devices.*
- Can see message statistics (**Tested**)
    - *Can see how many messages were send out, read, and delivered.*

2:34 · 83%

← Statistics

Messages sent:
17 messages

Messages delivered:
17 messages

Messages read:
0 messages

Messages received:
7 messages
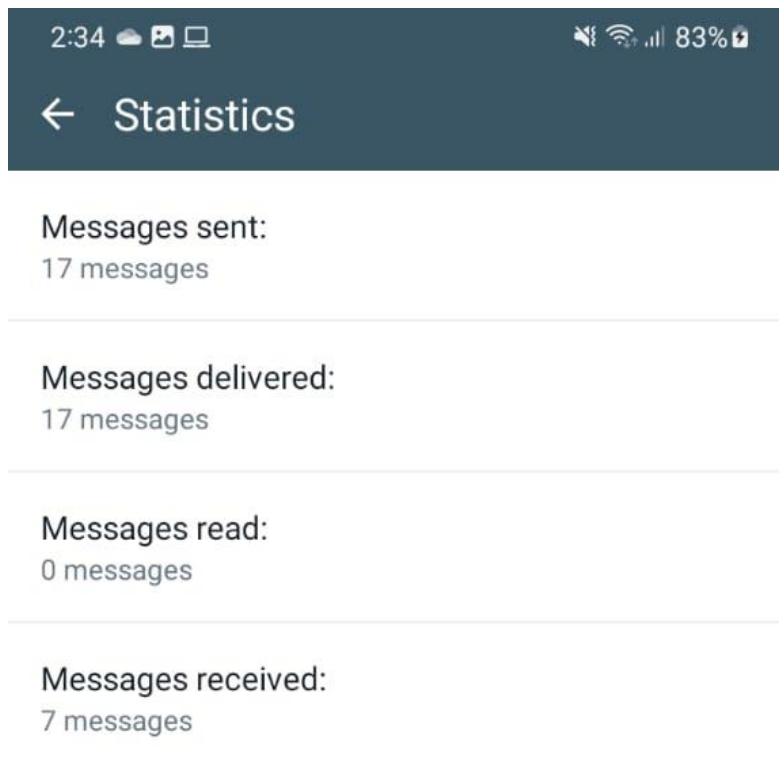
Figure 14: Statistics

- You can make labels. (**Tested**)

Label your customer to keep track of them. Additionally, you can label the messages between you and your customers. You can create it only on mobile devices, but you can add labels on mobile and the web browser.

- Can create catalogues (**Tested**)

  Show case your products. It needs to be approved first before showing it to the customer. You can find the policy of the catalogs [here](). Approval may take 5 to 10 min. You can't create and you can't see the catalogs on the desktop app.

- Can link your WhatsApp business to your Facebook and Instagram. (**Tested**)

- When sending a message to WhatsApp messenger user, they would be notify that it's a business account user. (**Tested**)

- You can make advertisement about your catalogs. (**Tested**)

  It will be advertised on Facebook. There is payment involve when making the ad. It will consider in how many people you want the ad to reach to and for how many days. This can only be done through mobile.

- Customer can add the products in catalog to the cart and send them to business. (**Tested**)

  The business can see the cart items that the customer has send. You can't see the cart items in the desktop app.
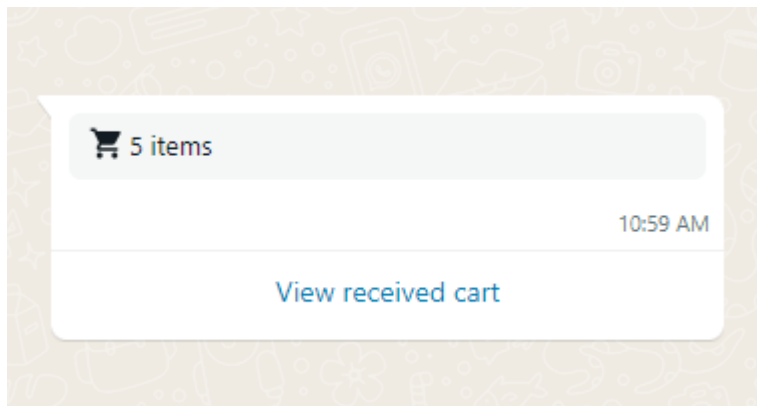
Figure 15: Customer send cart items.
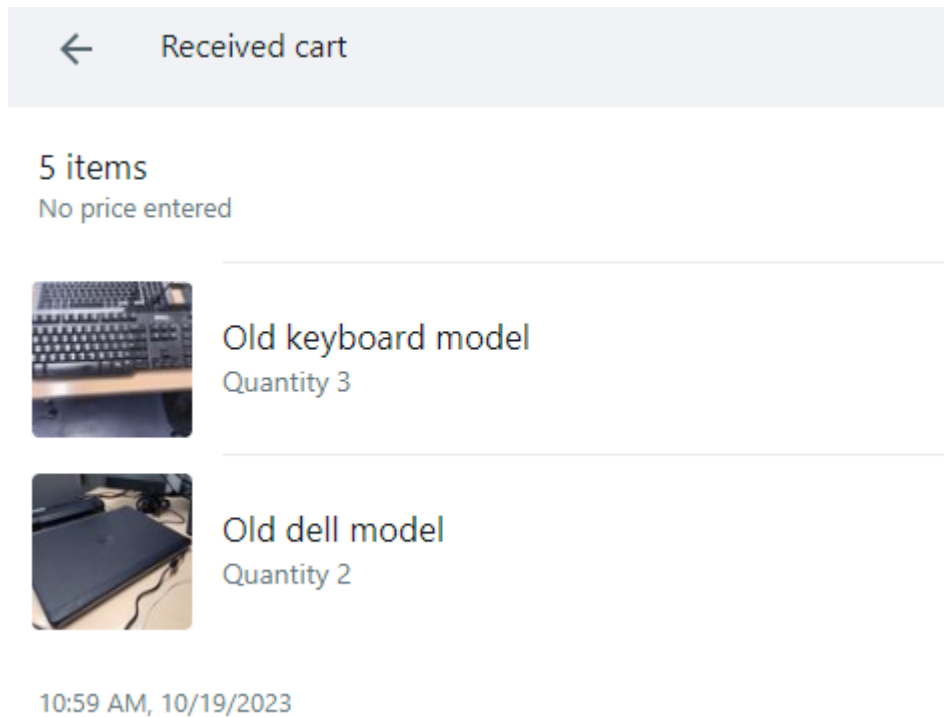
Figure 16: See items in the cart.

Pros

- You can use the same web and desktop app as WhatsApp Messenger. (**Tested**)
- You need to have a phone number to use this. (**Tested**)
- You can easily change your WhatsApp Messenger to WhatsApp Business. (**Tested**)
  - *All the information would carry over to WhatsApp Business.*
- You can send unlimited messages to your customers. (**Tested**)
- You can make away massages. (**Tested**)
  - *To let the customer know when you're away or unavailable. We can use this if the retiree message the SVb employee at night or on the weekend.*
- Video call works from WhatsApp Business to WhatsApp messenger and the other way around on mobile. (**Tested**)

Cons

- After 14 days of not using the mobile WhatsApp Business, the web and desktop app will log you out.
- You can only log onto 5 devices.
  - *Same as WhatsApp Messenger.*
- Can broadcasts messages up to 256 contacts.
  - *Customer must save you as contact to receive the broadcasts message.*
- The away massages can only be created on mobile devices.

(Hess, 11 October 2023) (Carter, 25 August 2023)

Skype (Tested)

Here is the link for skype browser.

Neutrals

- You can use Skype without creating an account.
- There is a chat box.
- You can share your screen.
- You can raise and lower your hand.
- You can share files.
- Can schedule meeting.
- Can be live streamed.

Pros

- On desktop you can use the browser or app.
- Invite to call with link.
- Easy to use and understandable.
- Can track how long the call is.
- You can record the call.
  - *Good to have, maybe in the future SVb wants to record the call.*
- You can call international phone number.
  - *You have to pay a flat fee per month.*
- You can use Skype API for free.
- You can change the background of the camera.

Cons

- You need to download the app on mobile to use Skype.
- Can join through an old invite link.
  - *The retiree may accidentally join an old call with knowing.*

Microsoft teams (Tested)

Neutrals

- You have to have an account to receive video calls and to make video calls.
- You can join the call without an account, but you have to create a name.
- More for organizing company and educational meetings.
- There is a chat box

- You can create channels for groups.
- You can lower and raise your hand.
- You can screen share.
- You can react to a message.
- Can be live streamed.

Pros

- On desktop you can use the browser or the app.
- The video call can be scheduled or directly called.
- You can invite people to a video call meeting with link.
- You can join the call through link or meeting ID.

Figure 17: Enter meeting ID

- The meeting scheduler has to admit people to the video call.
- You can record the call.
- You can change your background.

Cons

- You have to download the app on mobile to use it.
- You have to schedule a date to create a meeting link.
  - *Extra steps in creating an invite link.*
- You have to be an organizer to create a meeting link without making a schedule link.
  - *This is mostly to invite someone who doesn't have an account.*

Jitsi Meet (Tested)

Here is the link to Jitsi meet on browser.

Neutrals

- Need to have an account to make the video call.
- Need to name the room meeting.
- Room name needs to be unique.
  - *To prevent anyone from joining.*
- Can join the call with or without inputting your name.
- API free to use, depending on active monthly users.
- Can share screen.
- You can share files.
- Can make use of chat box.
- You can schedule a meeting on google calendar.
- You can lock the meeting with a password.
- You can show a white board and write or draw on it.
- You can change the background of the video.
- You can create a poll to vote.
- You can start a live stream in the call.
- You can share your audio.
  - *Share the music or audio you are listening to with others.*
- You can raise/lower your hand for attention.
- You can toggle push to talk with space button (not on mobile).
  - *Instead of muting yourself over and over again, you can make use of the push to talk. You have to push and hold the button, in this case, the scape bar, to talk. When you are done speaking, release the button.*
- Mobile can add emoji reactions.
- Can adjust screen view.
- Can has maximum 200 attendees.
  - *However, when there are more than 75 attendees, the quality of the meeting and connection process start to deteriorates.*

Pros

- It has open-source video conferencing API.
- Track how long the call is going.
- Can invite through link.
- On desktop you can use the browser or the app.
- Mobile can join the call via browser or app.
- You can record the call.
- No app required.

Cons

- Self-hosted option can be complex.
- You need an account to start the video call.
- Can rejoin the video call through an old invite link.
- Not for large business.
- The meeting is not fully encrypted.
- Low audio and video quality.

(Panchal, 8 October 2020)

Talky.io (Tested)

Here is the link to Talky.io on browser.

Neutrals

- You don't have to have an account to make the video call.
- You need to choose a unique name for the video call meeting.
- You can lock the room.
  - *To prevent strangers from joining the room, they need a code to join.*
- You can play a mini game while waiting for people to join the call.
  - *If you are the only one in the call you can play the game, it's similar to google web browser when you don't have internet.*
- You can toggle push to talk (not on mobile).
- Max 6 people in call.
- There is a chat option.
- You can share your screen.
- You can integrate their SimpleWebRTC to website.
- *It's their version of WebRTC (see the acronyms section for definition). There is a free trail period. After that you have to pay monthly depending on the plan and pricing you choose.*

Pros

- You can join through link with mobile phone on browser.
- You don't have to download any apps.

Cons

- Interface of the browser version is a bit wonky on mobile.
  - *Everything on the interface is compact, on each component.*
- Everyone can kick each other from the video call.
- Can join old invite link.
- On the phone you have to manually set the audio and camera before entering the call.

JumpChat (Tested)

Here is the link to the web browser.

Neutrals

- You don't have to create an account.
- It auto generates a room code for you.
- You can use the browser on the phone to video call, <u>but it won't work on iPhone</u>.
- There is an app version on mobile.
- You can chat.
- You can share files.
- You can share screen.
- You can lock the room.
- JumpChat is built on top of WebRTC.

Pros

- It is browser based on desktop.
- All communications are encrypted in the video call.
- No limits to the number of people, except for bandwidth.
- You can admit the guest to join the call if the room is locked and the guest doesn't know the code.
- You don't have to download any apps.

Cons

- You have to click I'm ready to join the call.
- You can reuse the old invite link.
- Anyone that knows the room code can join.
- The video on the phone is wonky.
  - *Sometimes the video of the other person in the call is too big to fit the screen or it fits right at the top. If you rotate the phone horizontally, it will be exactly right.*

WebRoom (Tested)

Here is the link for the web.

Neutrals

- The email address can be a fake address.
- You can keep trying the free session with the same email address.
- Tracks how many minutes you have left before the session ends.
- The guest can't have the same email address as the host.

- Can file share.
- Can share screen.
- There is an interactive white board.
- There is a chat box.
- Can create polls.
- It has notes that you can write on.
- You can switch screen view.
- You have to enter a name and an email address to start the video call.
- The free session can hold up to 12 people in the call.

Pros

- The email is just to get the log of the session.
- Can't use the old invite links.
- No download required.

Cons

- The free session is only 20 minutes long.
- The guest also has to provide a name and an email address to join the call.
- You have to do a lot of checks before you join the call.
  - *Like microphone check etc.*

Google meet (Tested)

This is the link for the web.

Neutrals

- You need to make an account to logged in before starting a meeting.
- The guest needs to provide a name before entering the meeting.
- You can schedule a google meeting on google calendar.
- You can add emoji reaction.
- You can share screen.
- You can raise and lower your hand.
- There is a chat box.
- You can make use of a build in white board.
- Can support 100 participants for no cost.
- It has live video call subtitle.

Pros

- Can join through a link invite.

- Can join with the code provided by the host of the meeting.
- Android users have Google meet pre-installed.
- Before joining the host must admit the guest first, when joining the meeting.
- The guest can rejoin the call.
    - *They only have 60 seconds to rejoin.*
- Google API is free to use.
- You can remove user.
    - *Can use this for retiree, who doesn't know how to end the call.*
- You can change the background of your camera.
- Easy to use.

Cons

- You have to download the app on the phone to join the call.
- Meetings last for 60 minutes for free.
- Buy plans to extend the meeting minutes and extend the maximum participant.
    - *The plans can be found here.*
-

The paid version of a video call system is:

Vonage meeting API (Information online)

Neutrals

- You can try a free trial version.
- It is hosted on the Vonage Video API cloud.
- Support all video use-cases
    - *1 on 1 video, group video chat or large-scale broadcast sessions.*
- It has messaging
- It's built in WebRTC.
- Can screen share.
- This is best suited for company that is seeking to add SMS API.
- It offers a chat box.

Pros

- Offers guide on building the API.
- You can integrate the API into your app.
- It offers virtual backgrounds filters.
- It can be created on the web, windows, android, macOS, iOS(Obj-C), iOS(Swift) and Linux.
- It has audio and video recording.

<center>**Cons**</center>

- The pricing plans for video API start at $9.99 per month (plus taxes & fees applicable) with 2000 minutes.
  - *The pricing can be found [here](#)*
- Has steep learning curve.
- Documentation is unclear and all over the place.
  - *It's hard to find something and unclear writing.*

(Webb, 22 November 2022)

WhatsApp Business API (Information online)

<center>**Neutrals**</center>

- Doesn't have an interface and app.
- This is for medium to larger companies or large enterprises.
- It has the same features as WhatsApp Business but with additional features.
- There is an on-premises API and cloud API.
  - *On-premises API are hosted on your own server or WhatsApp solution providers. Cloud API are hosted on Meta's cloud server. Cloud API is very new currently.*
- Can integrate various customer relationship management (CRM) systems.
  - *CRM system is a tool designed for efficiently managing relationships with your customers. It stores and organizes valuable information about customer interactions and helps enhance communication between your business and each customer.*
  - *One of its key features is automating communication messages, particularly in customer support scenarios. It's often impossible to respond to all the customers instantly, and this is where a CRM system comes into play. It enables you to be efficient and automate communication tasks, ensuring that no customer query or request falls through the cracks. With CRM, you can provide more personalized and timely responses, improving the overall customer experience.*

<center>**Pros**</center>

- You need to have a phone number.
- Can manage thousands of customer interactions with your team.
- Can send notification and promotional messages
  - *Notifications need to be approved by WhatsApp. Notifications are mostly alerts, no promotion of product.*
- You can add multiple devices.
- Can get verified badge.
  - *Gives the account credibility.*

Cons

- You need to follow certain business terms and conditions before applying for the API.
- You can sign up for Facebook Business Manager to get approved to use the API.
    - *Need to provide acceptable document to get approved on the business name and business address, which you can look at how the process is* <u>*here*</u>*. After that you can start on the labor-intensive programming.*
- You can apply for WhatsApp solution providers or WhatsApp partners to get access to API.
    - *There are third-part company that help you get access to WhatsApp API. They are approved by WhatsApp and can help and guide you in integrating the API or provide an already build application for you.*
- Customers need to initiate the conversation before you can start messaging them.
- Charge per conversation.
    - *Must pay a fee if initiate a conversation**.** Not per individual message. Conversations are 24-hour message threads between you and your customer. There are criteria to the conversation, and you can find it* <u>*here*</u>*.*
- You have 24 hours to respond to your customers message.
    - *After 24 hours you must use a message template.*
- Not recommend for small business.
    - *Small business doesn't receive daily more than 20 messages.*

(Gupta, 16 September 2023) (AiSensy, 08 August 2023)

MirrorFly Video Call API (Information online)

Neutrals

- Can upload large file sharing.
- Can schedule a meeting.

Pros

- They have pre-built UI kit.
- Unlimited video calls.
- Can video recording.
- Add video calls on any platform or any device.
- It's easy to integrate into desktop app, web application and mobile.
- Can do 1 on 1 video call or group call.
- Real-time call logs.
- Has flexible hosting.
    - *Can host on your own server or MirrorFly's private cloud.*
- Can join via link.

- Easy to follow documentation.
- End-to end support.
  - *Easily get support from their experts anytime.*
- You can request a demo on it.
- You can choose your preferred SDK platform to build the video calls on Android, iOS, JavaScript, React, Angular, or Flutter.
  - *You can find the meaning for SDK in the Acroyms section.*

Cons

- There are 2 plans you can buy.
  - Essentials (for 5k monthly active users): $399 per month.
  - Premium (for 5k monthly active users): $999 per month.
    - *The price also depends on the monthly active users. 5k is the lowest option. Each plan has different features. The pricing can be found here.*

Cometchat Video Call API (Information online)

Neutrals

- Has interactive whiteboard.
- Share documentation.
- You can share screen.

Pros

- There is a free trail option.
- Frameworks that they support: Android Java, Agular, Flutter, iOS, React, Android Kotlin, Laravel, PHP, React Native, Vue, and WordPress.
- You can invite or direct dial.
- You can record the call.
- Easly integration.
- Pre-built UI kits.
- It has active community support.

Cons

- There are 3 plans that are priced as follows:
  - Essentials (for 26 to 1000 monthly active users): $109 per month.
  - Pro (for 26 to 1000 monthly active users): $509 per month.
  - Custom: Need to contact them.
    - *The pricing depends on monthly active users and each plan has different features. You can find the more information about the pricing here.*

- Slow customer support.
- Limit support for back-end integration.
    There is no SDK for back-end languages such as java and .NET.

(Ably, 21 Jul 2023)

Twilio Video Call API (Information online)

Neutrals

- It's built on top of WebRTC.
- Has group video interactions that support up to 50 participants.
- It offers interactive whiteboards.
- It offers chat box.
- It offers video animation.
- It offers customized and branded video layout.
- It offers video lobby.
- There are 4 plans that are priced as follows:
    o For one-on-one: start for free.
    o For peer-to-peer: $0.0015 per participant per minute.
    o For group video call: $0.004 per participant per minute.
    o High volume: custom, need to contact person.
        Each plan has different features. More information on the pricing can be found here.

Pros

- It has a free trail.
- It has a free version for one-on-one video call.
- It has documentation guide for developer tools, SDKs, sample code and video insights.
- Has one-on-one video interactions.
- Has peer-to-peer video interactions.
- It offers noise cancellation.
- It offers meeting recording.
- It offers screen filters, including virtual backgrounds and background blurring.
- Offers tutorials and guides.
- The application it can be built on are: Node.js, Python, C#, Java, Apex PHP, Ruby and Twilio-CLI
- For the web-base it can be built on JavaScript SDK, Android SDK, and iOS SDK.

Cons

- Required advance coding knowledge
    Developers without experience will have difficult time incorporating Twilio's APIs.

- It has bad customer service.

(Webb, 22 November 2022)

QuickBlox Video Call API (Information online)

Neutrals

- Built on WebRTC.
- You can build a chat box.
- You can make use of voice calling.
- You can make use of file sharing.
- Can share screen.

Pros

- There is a free trail period.
- There is a push notification.
- It supports both peer-to-peer and multi-party use.
- Flexible data storage.
  - Dedicated.
  - On-premise.
  - Own virtual cloud.
- You get customer support to help you if you have any problem.
- Easy and quick integration.
- Customizable UI Kits.
- It has documentation guide.
- It can be built on website, iOS, Android, and desktop app.

Cons

- There are 5 plans that are priced as follows:
  - Basic: for free for 500 users that is registered in your app database.
  - Starter: for $99 per month for 10,000 users.
  - Growth: for $249 per month for 25,000 users.
  - HIPAA Cloud: for $399 per month for 20.000 users.
  - Enterprise: for $599 per month. Custom need to contact them.
    Each plans has different features. For more information on the pricing can be found here.

Agora Video Call API (Information online)

Neutrals

- Offers voice calling.
- Offers chat box.
- Offers Interactive whiteboard.
- Can share screen.

Pros

- Can record call.
- There is UI kit
- It offers in Android, iOS/macOS, Windows, Web, Electron, Flutter, React Native and Unity.
- Can add extensions.
- There is documentation guide.
- It offers app builder.
- Every month you get 10,000 minutes free.

Cons

- Learning curve for developers new to Agora's SDK.
- It takes significantly more time to integrate.
- Concerned about privacy, security, and data.
  - *Because Agora is based in China and follows local data privacy laws.*
- Price for video call starts at $3.99/1,000 minutes for HD video.
- Price for video call starts at $8.99/1,000 minutes for FULL HD Video.
  - *The pricing for both can be found here.*

(S, 4 Oct 2023)

EnableX Video Call API (Information online)

Neutrals

- Can add screen share.
- Can have 100 participants.

Pros

- You can try it for free.
- Can build on any platform, browser, and coding language.
- There is UI kit.
- Can integrate into a 3rd party application.
- Can add virtual background.
- Can have live recording.
- You can monitor video call.

- It has less features compared to other video call API.
- Not enough UI customization for video call API.
- Documentation may take a while to understand.
- May have compatibility issues with older or less common web browsers.
- The pricing is $0.004 per participant per minute (max 50 participants in a room).
  Here you can find more information on the pricing.

Sendbird Video Call API (Information online)

Neutrals

- It has a shared screen.
- It can share file and multimedia.

Pros

- Direct video call.
- Group video call.
- It has a call history.
- It has call muting.
- It can be built on iOS, Android, JavaScript, React native and Unity.
- It has call recording.
- There is a free trail.
- It has a UI kit.

Cons

- It may take a while to implement for new developers.
- There is limit customization option.
- Does not provide professional services support.
- This is the 4 plan pricing overview:
  - Developer: is free for max 100 monthly active users.
  - Starter 5K: $399 per month for 5K monthly active users.
  - Pro 5K: $599 per month for 5K monthly active users.
  - Enterprise: custom pricing with millions of monthly active users.
    Each plan has different features. Here you'll find all the information about the pricing.

(Cemazar, 15 June 2023)

3.3.   Which video call system can be implemented based on the requirements?

The requirements that need to be adhered to are:

- Eliminate the use of table.
- Integrate the video call on the PRAS desktop.
- No special equipment or software required at the recipient's end of the call.
- Log the start and end time of the call.

The video call system must adhere to these requirements. I will categorize the video call systems into two sections. The first section is for systems that fulfill all the necessary requirements and will be labeled as "Compliant." The second section is for systems that align with most of the criteria and will be labeled "Mostly Compliant." I will also provide explanations for the reason why they are placed in the "Mostly Compliant" section.

Compliant

Jitsi Meet

Vonage meeting API

MirrorFly Video Call API

Cometchat Video Call API

Mostly Compliant

WhatsApp Messenger:

It adheres to most of the requirements. The only thing that is missing is the ability to track the call log. SVb employees can have WhatsApp on their desktop, and retirees don't need any special software or application. Since WhatsApp is their current video call platform, the integration with the PRAS app is designed to be seamless. The idea is, when they click "Video call retiree's mobile phone number" (for detailed reference, see section 3.2.1 of the wireframe document), WhatsApp will open, and they'll be directed to the retiree's messenger page, where they can initiate the video call from the top right corner.

WhatsApp Business:

This is the same idea as WhatsApp Messenger but with additional features. These features can be used for future implementation if needed.

3.4.   Which video call system benefits a better user experience?

4. Conclusion to the main questions

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