

# **DAYANANDA SAGAR COLLEGE OF ENGINEERING**

(An Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE & ISO 9001:2008 Certified)

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## **Minor Project Report**

on  
**“AUTOMATION OF ATTENDANCE DURING  
ONLINE CLASSES”**

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**Emerging Technologies  
18CS5DMETG**

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## ABSTRACT

This project is made to reduce the burden on teachers during online classes. We look into the various aspects of how to automate the attendance and came up with the idea of attendance bot. Basically, the manual method to take attendance of students is of monotonous. This also waste of time and energy of teachers and may lead to human errors instead we can use the attendance bot which use of reliable source. It is an zoom app, which is designed especially for students and lecturers. In the system, lecturers can easily track attendance without calling the name of the students. When the students attend class, the lecturer can give time sensitive information, and then the attendance will be calculated automatically. Time can be saved and accuracy can be improved.

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# CHAPTER 1

## INTRODUCTION

Emerging technologies are technologies whose development, practical applications, or both are still largely unrealized, such that they are figuratively emerging into prominence from a background of nonexistence or obscurity. These technologies are new, such as various applications of biotechnology including gene therapy. Emerging technologies are often perceived as capable of changing the status quo. [1]

### 1.1 Introduction to RPA

Robotic Process Automation (RPA) is a software program that imitates human actions while interacting with a computer application and accomplishing automation of repetitive, rule-based processes.

Robotic Process Automation (RPA) is software technology that's easy for anyone to use to automate digital tasks. With RPA, software users create software robots, or "bots", that can learn, mimic, and then execute rules-based business processes. RPA automation enables users to create bots by observing human digital actions. Show your bots what to do, then let them do the work. Robotic Process Automation software bots can interact with any application or system the same way people do—except that RPA bots can operate around the clock, nonstop, much faster and with 100% reliability and precision. [2] In other words, we can say that RPA is a software program that imitates human actions while interacting with a computer application and accomplishing the automation of repetitive and rule-based processes. RPA can be used to automate the labor intensive tasks such as back office processes, data entry, data validation etc. In today's scenario of typical enterprises, RPA can be used to fill the gap between systems and process. A typical enterprise is having the following scenario – The typical PROCESS in business scenario is rapidly changing due to competition, can be understood with the help of following diagram –

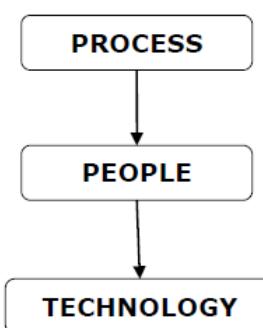


Figure 1.1: PROCESS in business scenario

If we talk about TECHNOLOGY in the business scenario, a typical enterprise uses multiple and disconnected IT systems to run its operations. But due to lack of updating, these technical processes cannot help business at required extent. It can be understood with the help of following diagram –

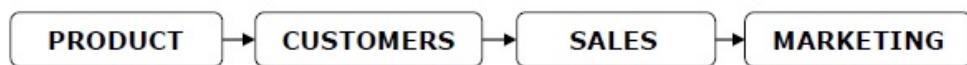


Figure 1.2: TECHNOLOGY in business scenario

If we talk about PEOPLE in business scenario, a typical enterprise hires human workforce to fill the gap between systems and processes.



Figure 1.3: PEOPLE in business scenario

A challenging issue in a business enterprise is change. Why challenging, because with any change in business process, enterprises either need to hire new employees or train its existing ones. Both solutions are costly as well as time consuming. Another solution is RPA with which company can deploy virtual workers imitating human workers. Now if any change happens, only change in few software code lines would be required which is much cheaper and faster solution than hiring employees. It basically maps digital workforce and human workforce with PROCESS and TECHNOLOGY in a business enterprise. [3]

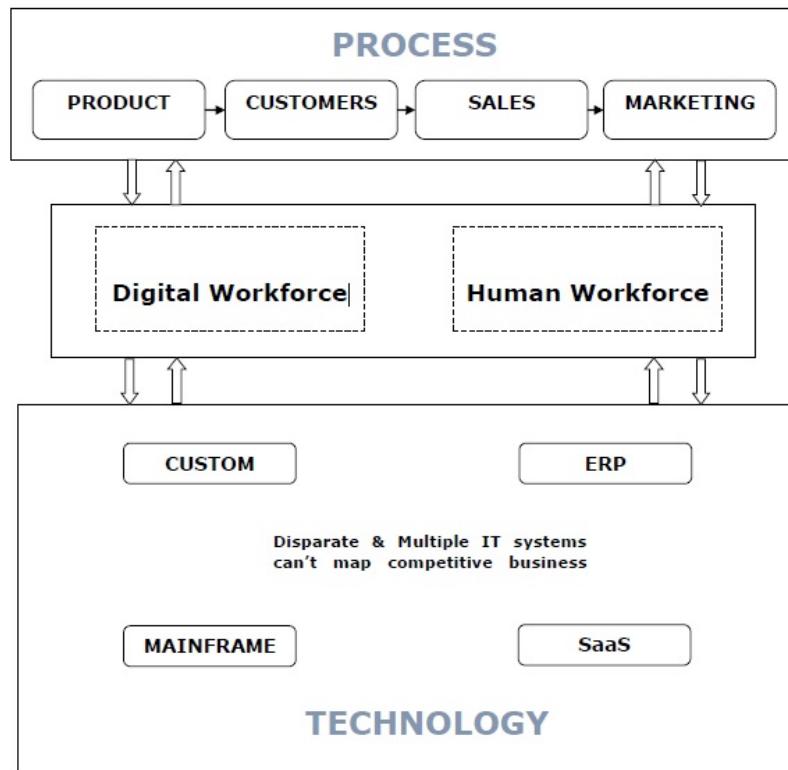


Figure 1.4: PEOPLE in business scenario

### 1.1.1 Introduction to AA

Automation Anywhere is one of the popular RPA tools that provides powerful features to automate complex business tasks. It is used to automate such processes that are repetitive, rule-based, and manually performed by humans. It offers end to end automation strategy for organizations.



Figure 1.5: Automation Anywhere Logo

Automation Anywhere is a web-based management system. It has a Control Room that helps in managing automated tasks. It is mainly used at the enterprise level and changes the way the enterprises operate. The primary aim of Automation Anywhere is to offer scalable, secure, and resilient services to its users.

### 1.1.2 About RPA on AA Platform

Automation has been into existence since the 1920s but it has only gained popularity in the early 1990s. As the word automation suggests, this software provides assistance to various kinds of daily tasks such as Data Entry, Invoice Processing, etc. To perform such kinds of tasks we need robotic process automation. Robotic Process Automation(RPA) is a new age technology that helps you perform tedious tasks with ease. Automation Anywhere is one of the leaders in the RPA market and in this RPA Automation Anywhere article, you will learn all the concepts of the popular RPA tool, Automation Anywhere and learn how it can be used for automation.

Automation Anywhere is an RPA Tool whose motive is to provide its users scalable, secure and resilient services. This tool offers a 30 Day free trial to let you first explore the tool and automate tasks, and then provides you with an enterprise service.

Automation Anywhere offers better performance as it has the ability to integrate to different platforms and also scale simultaneously. This tool is meant to be used in the enterprise level and is mainly designed for solving complexity issues. [4]

## 1.2 Objectives

The objective of this project is to help those who take attendance during online classes as it is a tedious task accompanied by other factors such as connectivity issues, hardware failures like microphone malfunctioning, absence, etc.

## 1.3 Problem Statement

Automatic attendance manager that saves attendance of students.

## 1.4 Scope of the work and its importance

The traditional method of taking attendance by calling out names of students is a cumbersome process. This led to the wastage of time and energy for teachers to mark attendance of students. There are also chances of human errors while taking attendance. All these problems can be solved by automating the process using bots. It is beneficial to teachers as it's time consuming to call out the names of each and every student and mark their attendance accordingly. It eases this burden and teachers can use this time for better use.

## 1.5 System Requirement Specifications

### Automation Anywhere Architecture

Automation Anywhere has a distributed architecture. It offers a centralized management system by using its control room. Automation Anywhere Architecture has 3 primary components

1. Control Room
2. Bot Creator
3. Bot Runner

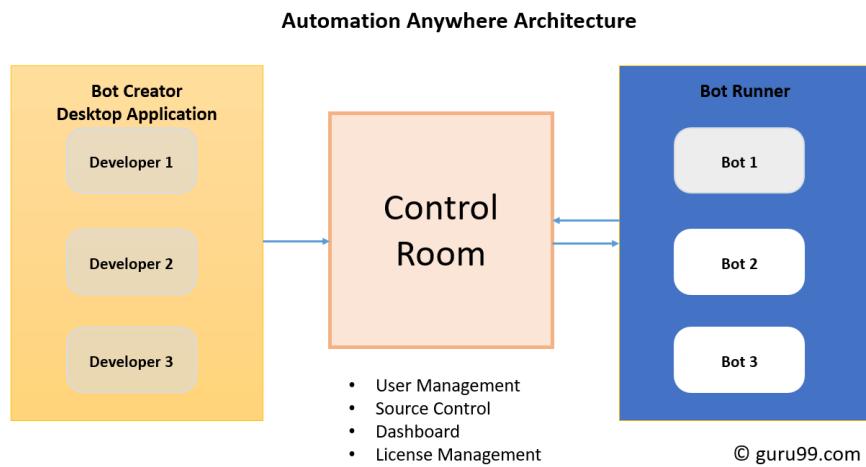


Figure 1.6: Automation Anywhere Architecture

- Control room- is a web-based platform that controls the Automation Anywhere. In other words, it's the Server that controls Automation Anywhere bots.

Apart from that the control room deal with

1. User management
2. Source control : code for the bots is managed by the control room. So it becomes easy to share the code across different systems.

3. Dashboard- It gives complete analytics/results of Automation Anywhere bots. You can see how many bots are runs and how bot failed/passed etc. is controlled.
4. License Management: The purchased licenses for Automation Anywhere are configured in the Control Room.

There are 2 types of Licenses in Automation Anywhere

1. Dev License: If you got this license, you can create a bot, edit bot and run a bot.
  2. Run License: If you have this kind of license you can run the bot and, you will not make any changes.
- Bot Creator- Developers use Desktop based applications to create bots. Their dev licenses are checked with that configured in the control room. On authentication, the code of the bots they create is stored in the control room. Different developers may create individual tasks/bots. These bots could be merged and executed at once.
  - Bot Runner - The Bot Runner is the machine where you run the bot. You could have multiple bots running in parallel. You only need the Run License to run the bots. The bots report back the execution logs/pass/fail status back to the control room. [5]

### System Configurations [6]

- OS: Windows Server 2012, 2008 R2, 2003; Windows XP, 7, 8, 8.1
- Processor: 3 GHz or higher
- RAM: 4 GB or higher
- ROM: 200 MB of free hard disk space for installation
- Browser: IE v10 or higher, Chrome v49 or higher etc.
- Resolution: 1024\*768 or higher screen monitor.

### Speed Required

8 GB RAM

### AA Versions [7]

Table 1.1: AA Versions

Major Release	Minor Release	Patch Release
Version 11.3	Version 11.3.5	Version 11.3.5.1
	Version 11.3.4	Version 11.3.4.4
		Version 11.3.4.3
		Version 11.3.4.2
		Version 11.3.4.1
	Version 11.3.3	Version 11.3.3.3

		Version 11.3.3.2
		Version 11.3.3.1
	Version 11.3.2	Version 11.3.2.4
		Version 11.3.2.3
		Version 11.3.2.2
		Version 11.3.2.1
	Version 11.3.1	Version 11.3.1.8
		Version 11.3.1.7
		Version 11.3.1.6
		Version 11.3.1.5
		Version 11.3.1.4
		Version 11.3.1.3
		Version 11.3.1.2
		Version 11.3.1.1

## Installation

Installation of Automation Anywhere mainly includes the configuration of different software, such as IQ Bots, Automation Anywhere extension, and Automation Anywhere Bot Agent. Automation Anywhere has different versions such as Cloud Starter Pack, Advanced Pack, and Community Edition. We can choose as per our requirements. It is better to try all of them before you decide which one is right for you. Automation Anywhere allows us to try a full-featured version for 30 days. So, once we fill-up the form given on the official website, we are given a chance to take a trial with the instructions on how to set it up. We don't need to download anything to check the trial version. It is based on the cloud so we can test it directly from our [web browser](#). However, we need to download and install "Automation Anywhere Bot Agent", "Automation Anywhere Browser Extension", and connect our machine with the control room to implement the software bots.

Follow the steps given below to install or configure products of Automation Anywhere:

**Step 1:** First, we need to navigate to the official site here: <https://www.automationanywhere.com/>

**Step 2:** Then, we need to click on the "Start Free Trial" button, as shown in the following image:

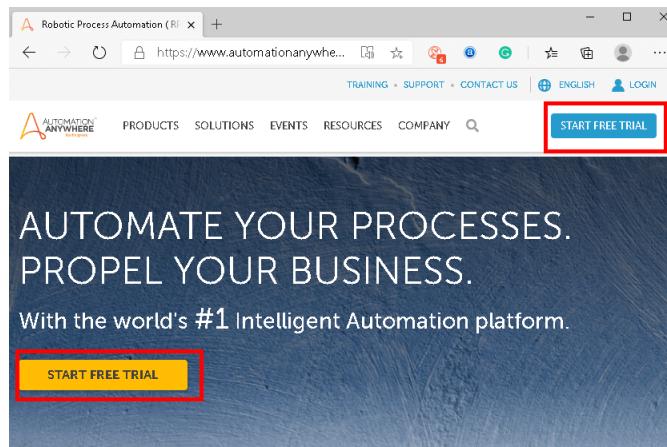


Figure 1.7: Start Free Trial

**Step 3:** On the next screen, we will see different versions of Automation Anywhere and their features. Again, we need to click on a button "Start Free Trial".

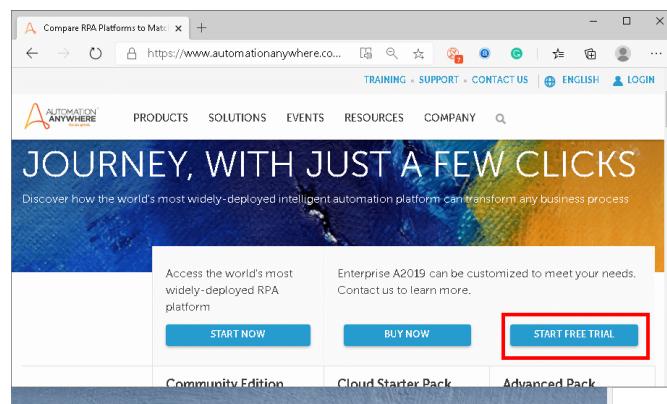


Figure 1.8: Start Free Trial

**Step 4:** On the next screen, we will see a form asking several details from our side. We need to fill all the details and submit the form to get the trial of Automation Anywhere.

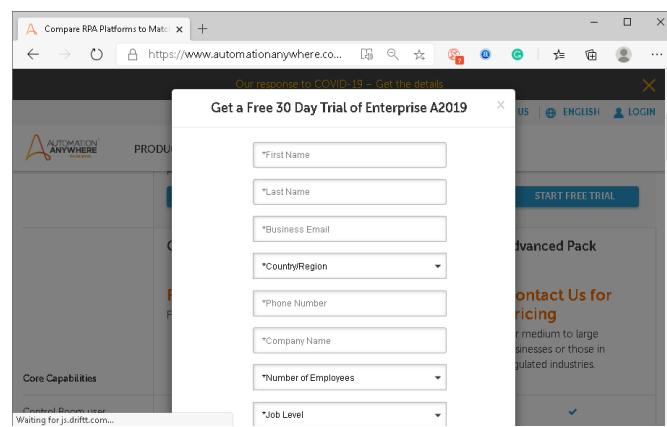


Figure 1.9: Filling &amp; submitting form to get trial of AA

Once we submit the form, we receive the confirmation of the submission, as shown below:

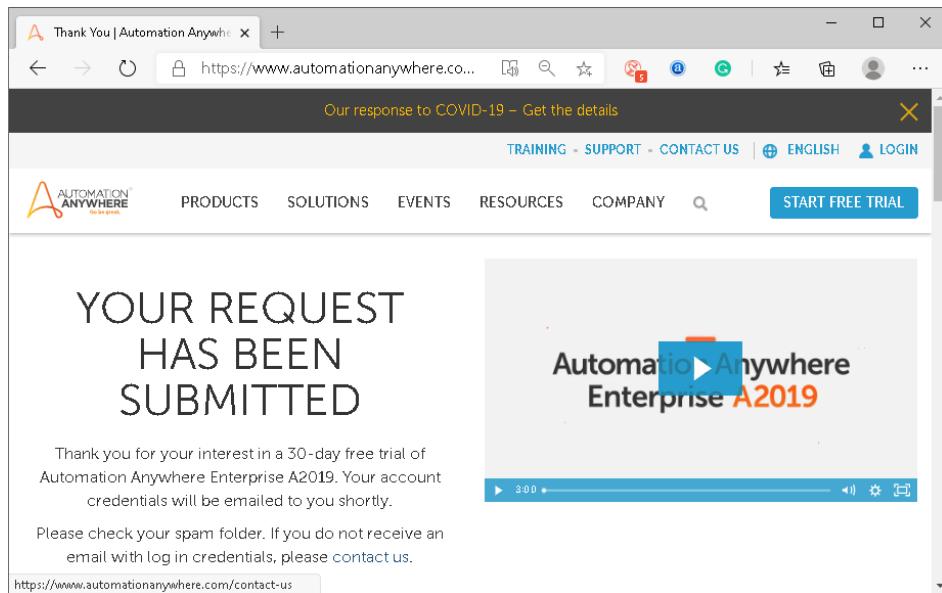


Figure 1.10: Confirmation of the submission

The login details and a link are sent over the mail that we used while filling up the form.

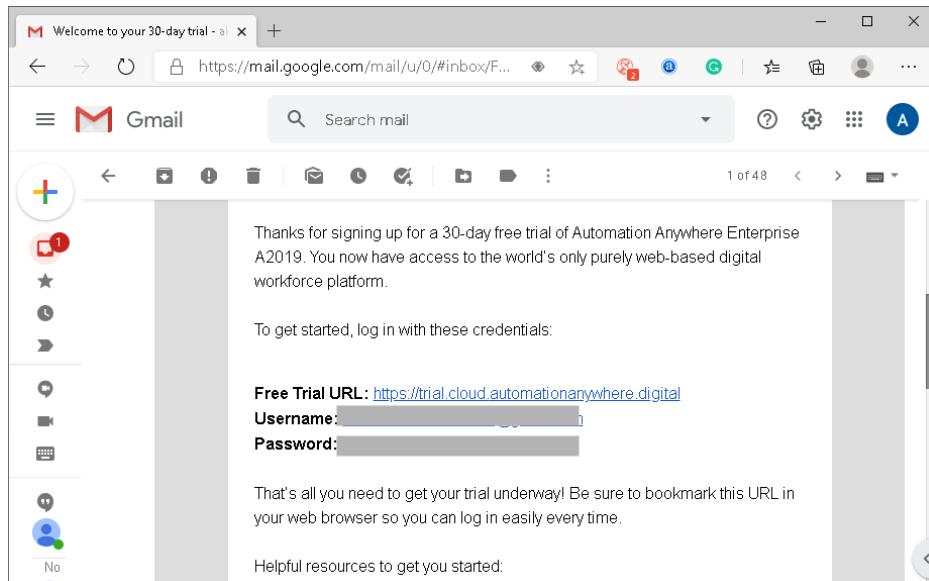


Figure 1.11: Login details and link in Gmail

**Step 5:** Next, we are required to open a link and sign-in with the credential given in the email. As soon as we log in, we get a screen asking us to set a new password rather than using the default one sent over mail.

Also, we need to set up some security questions required to recover our account if we forget the login credentials.

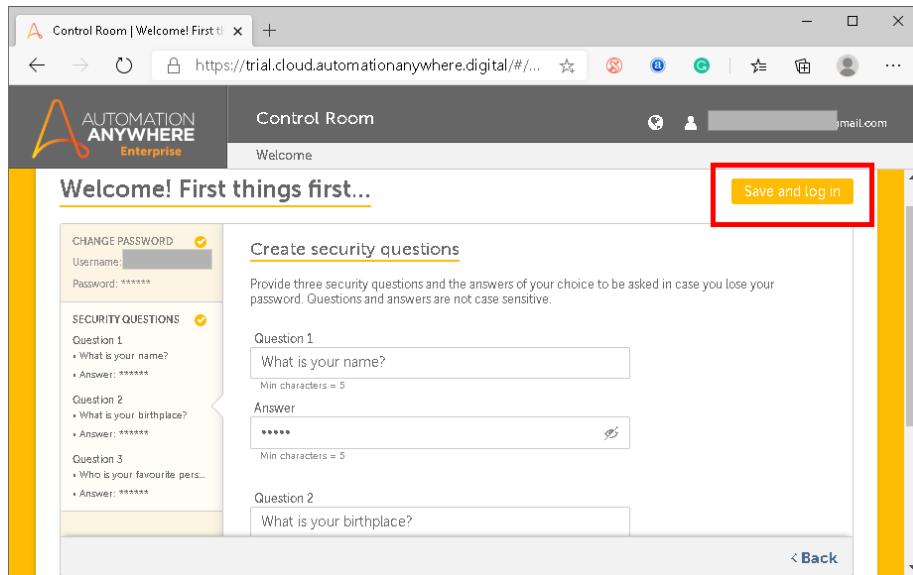


Figure 1.12: Create security questions in Control Room

Once we have configured all these steps, we will get to the Control Room (dashboard) of Automation Anywhere.

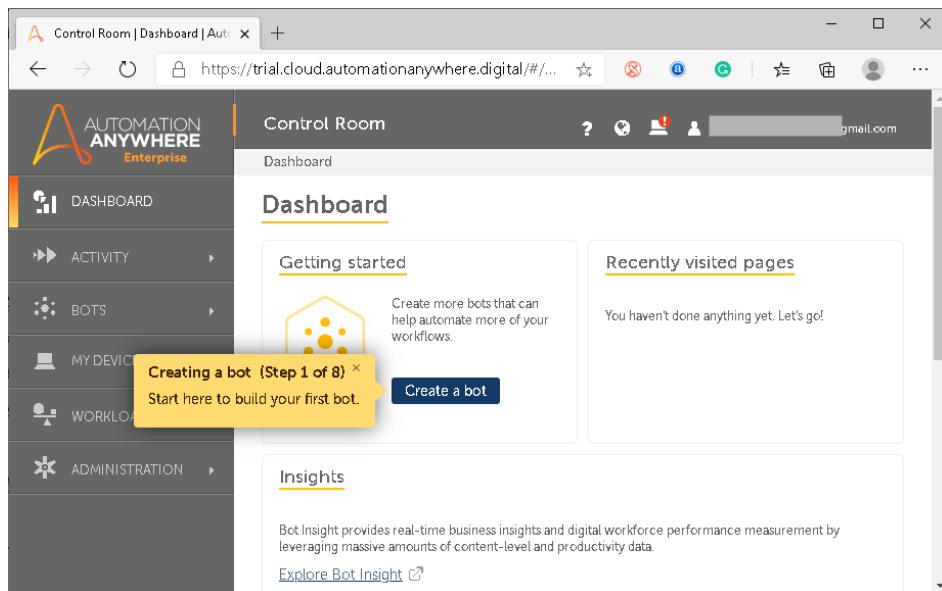


Figure 1.13: Control Room Dashboard

**Step 6:** At last, we need to connect our local machine by following on-screen instructions and installing some packages to implement IQ Bots into our machine.

That is how we can configure/install Automation Anywhere. [8]

## CHAPTER 2

# DESIGN/IMPLEMENTATION

### 2.1 Flow Diagram with Brief Explanation

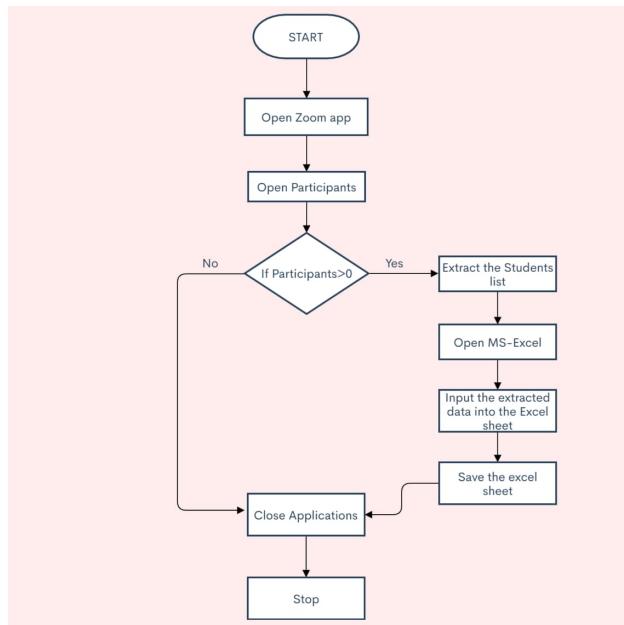


Figure 2.1: Flow Diagram

- **Opens Zoom App:** The bot opens the zoom application once it starts running.
- **Open Participants Tab:** After opening the zoom app, the bot opens the participants tab to check the number of participants attending the meeting. If the number of participants is 0, then the application closes. Otherwise it continues with the next process.
- **Extract the Student List:** The names of the participants attending the meeting is captured and extracted.
- **Open MS-Excel:** The bot opens the MS-Excel application and proceeds with the next command.
- **Input extracted data into Excel sheet:** All the data that is captured in the participants tab of the Zoom application is printed onto the Excel sheet. The names get printed.
- **Save the excel sheet:** Once all the data is entered in the excel sheet, the file is saved.
- **Close Applications:** Once the file is saved, the two applications are stored and the bot stops running.

#### 2.1.1 About Process to be Automated

Capturing and Extracting the student list of those attending online classes in Zoom app. Inputting the data extracted into an Excel sheet and saving the file.

## 2.1.2 Why it should be automated?

If the above processes is done manually, it would require tremendous amount of time for the teacher to record the attendance of each student. Also the teacher might leave out attendance for one student due to human error. In order to prevent wastage of time and improve the accuracy of taking attendance, these processes need to be automated. The Attendance can be recorded and sent to the principal without any involvement of the teacher..

Thus our bot can improve the efficiency of the Attendance Management.

## 2.2 Implementation Step by Step Procedure

- **Zoom Meeting Application: (Steps 1-4)**
  - Opening the zoom application and maximizing the window using the Mouse Click function.
  - Simulating keystrokes Alt+U to open the participants tab on Zoom and Mouse Click for maximizing the participant window.
- **OCR capture of the participants tab: (Step 5)**
  - The data present in the participant tab i.e. Name and USN of the students are captured and the text is assigned to a variable \$out\$.
- **Log to Text file: (Steps 6-7)**
  - The text assigned to variable \$out\$ is logged into a text file.
  - A delay of 3 seconds is given for ensuring the data is logged properly.
- **Loop: (Steps 8-12)**
  - Repeats the same steps mentioned above 3 times.
- **Excel Sheet: (Steps 13-15)**
  - Opening the Excel sheet and maximizing the window.
  - Loading the text data into the excel sheet, Column 1 is selected.
- **Excel Sheet implementation: (Steps 16-44)**
  - Data is sent to Excel Sheet.
  - Selecting 1st and 2nd cell renaming the columns as E section and Date respectively.
  - The names of the participants is segregated according to the USN, therefore we make use of fixed width-10 since the width of the USN is constant.
  - The Duplicate entries have to be deleted, the duplicate entries occur sometimes when the bot tries to scroll down in the participants tab in order to capture every participants name.
  - Even when there are less participants, the bot tries to scroll 3 times to prevent any mistakes.
- **Saving the file: (Steps 45-49)**
  - Once all the above steps have been implemented successfully the Excel Sheet is saved and recorded.

## CHAPTER 3

# TESTING/RESULT AND ANALYSIS

### 3.1 Bot Execution Procedure, Dataset Information

#### Bot Execution Procedure

Since our project is designed to be automated only for zoom application users, we need to follow some steps before we automate,

The steps are:

- Create an empty excel file and save it in the required directory (ex: Desktop) as "Zoom attendance.xlsx" and a text file as "attend.txt".
- Ensure that the above mentioned files are empty, saved in the respective directory and kept closed.
- The zoom application pop ups a floating window when it is minimised, so we need to Run the bot without minimising it, let the zoom meet run in the background window of a chrome application in which the control room of Automation anywhere is opened.
- As soon as we run the bot, firstly it maximises the zoom application and opens the participants tab, and captures all the participants through OCR capture area command, and stores the captured data into a variable called "out".
- Thus the captured data is extracted using "Log to file" command, and stored into the "attend.txt" file.
- Finally by using the “Universal recorder” the participants list in the "attend.txt" file is imported into the excel file sheet i.e. "Zoom attendance.xlsx", then the list is Delimited, and the duplicates are removed and the attendance for the day is saved along with the date.

#### Dataset Information

The only data set used in this project is the participant tab from the zoom meeting

Application, all the participants who are present in the meet are captured using the “OCR capture area” Command, further a loop command is introduced for scrolling the participants tab through a mouse scroll to ensure none of the participants are missed.

### 3.2 Screenshots of Instructions on Control Room, dataset & results

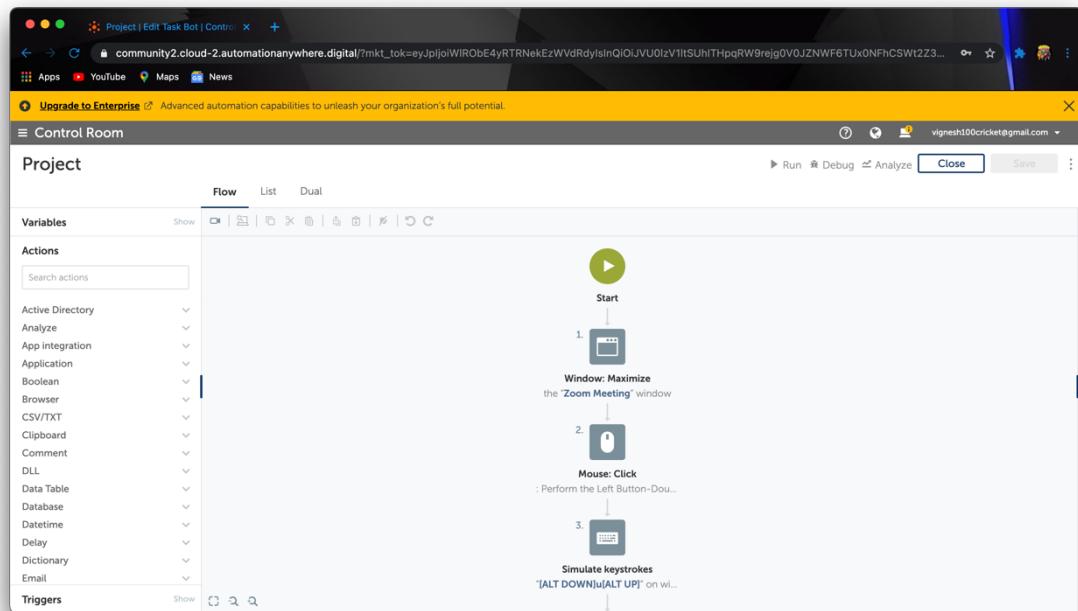


Figure 3.1: Control Room Flow View Instructions

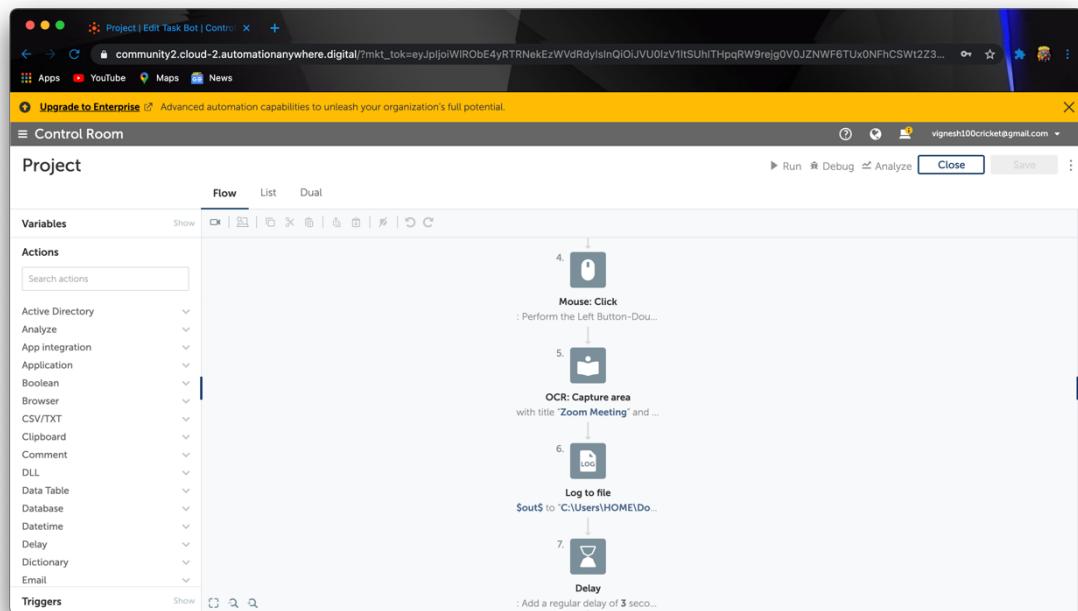


Figure 3.2: Control Room Flow View Instructions

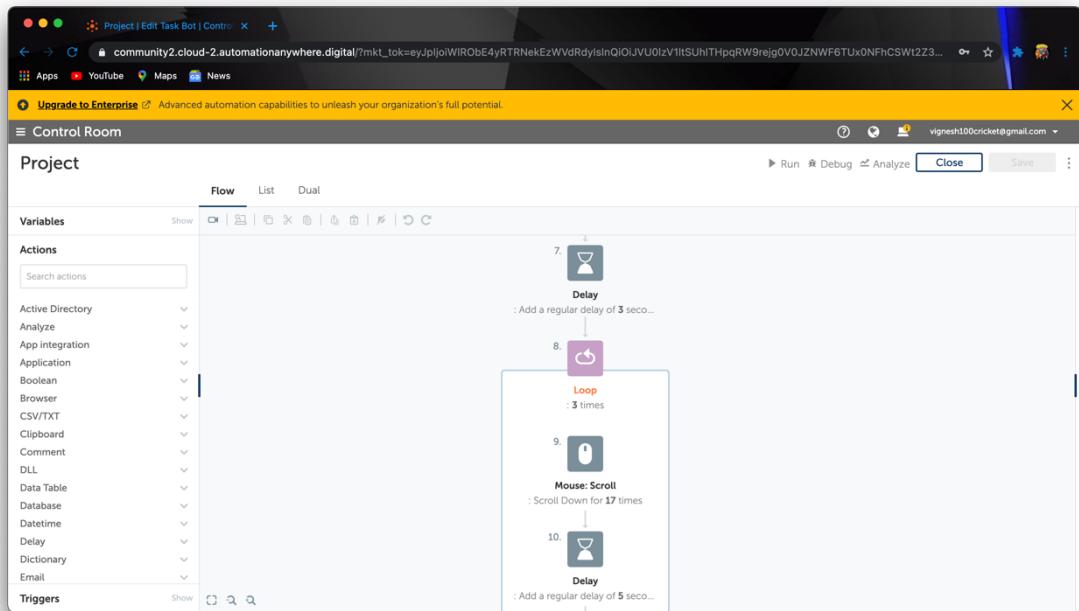


Figure 3.3: Control Room Flow View Instructions

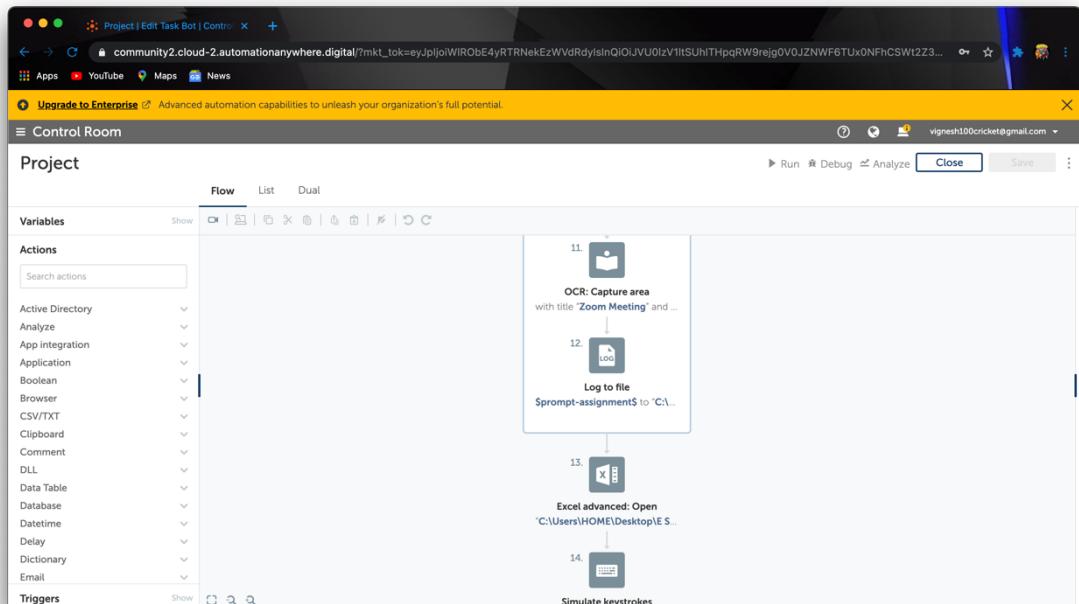


Figure 3.4: Control Room Flow View Instructions

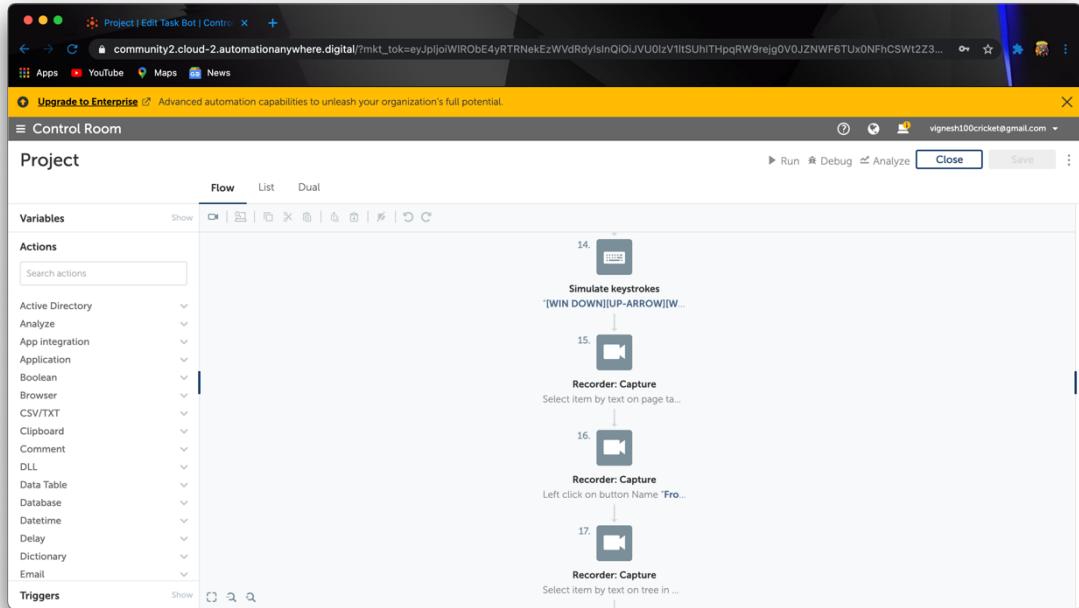


Figure 3.5: Control Room Flow View Instructions

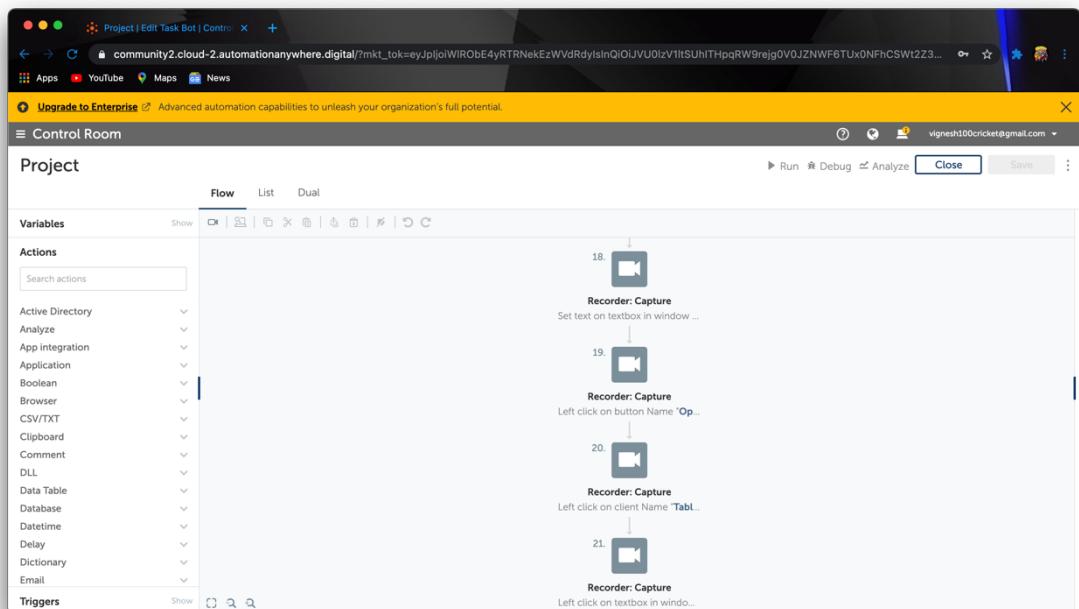


Figure 3.6: Control Room Flow View Instructions

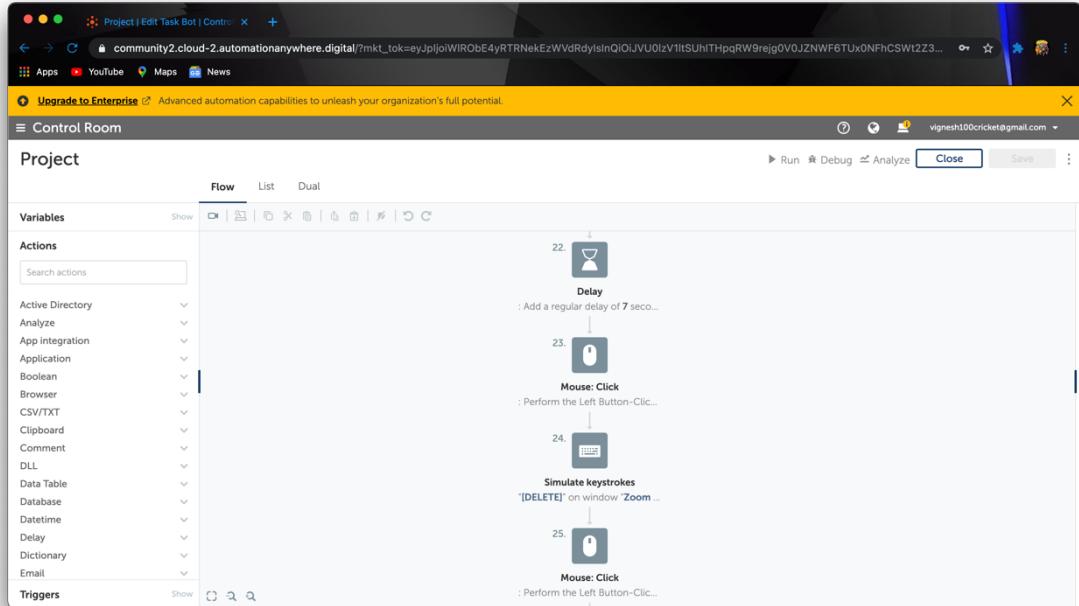


Figure 3.7: Control Room Flow View Instructions

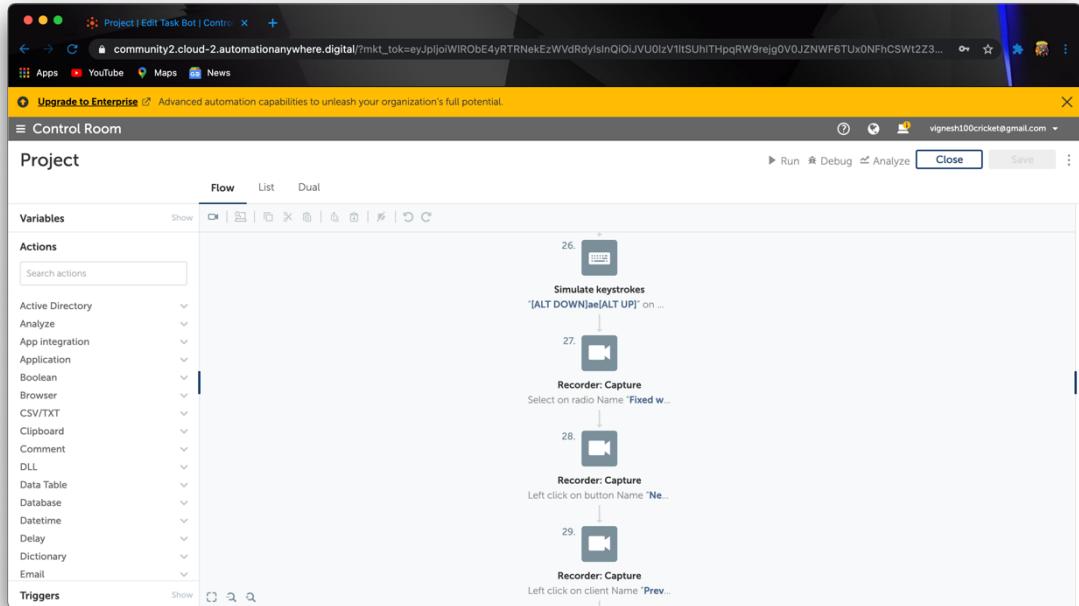


Figure 3.8: Control Room Flow View Instructions

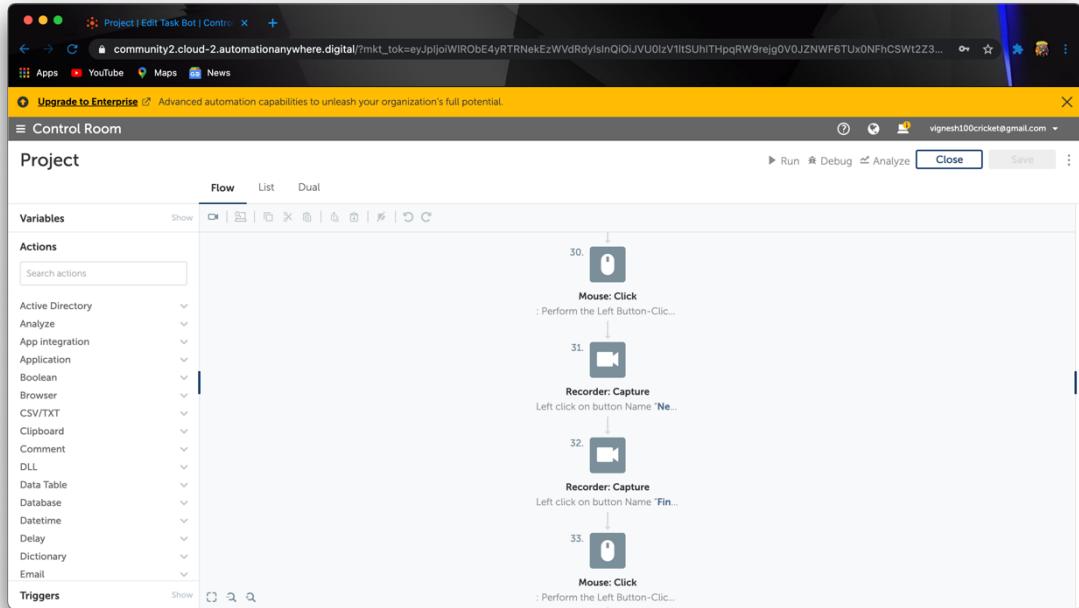


Figure 3.9: Control Room Flow View Instructions

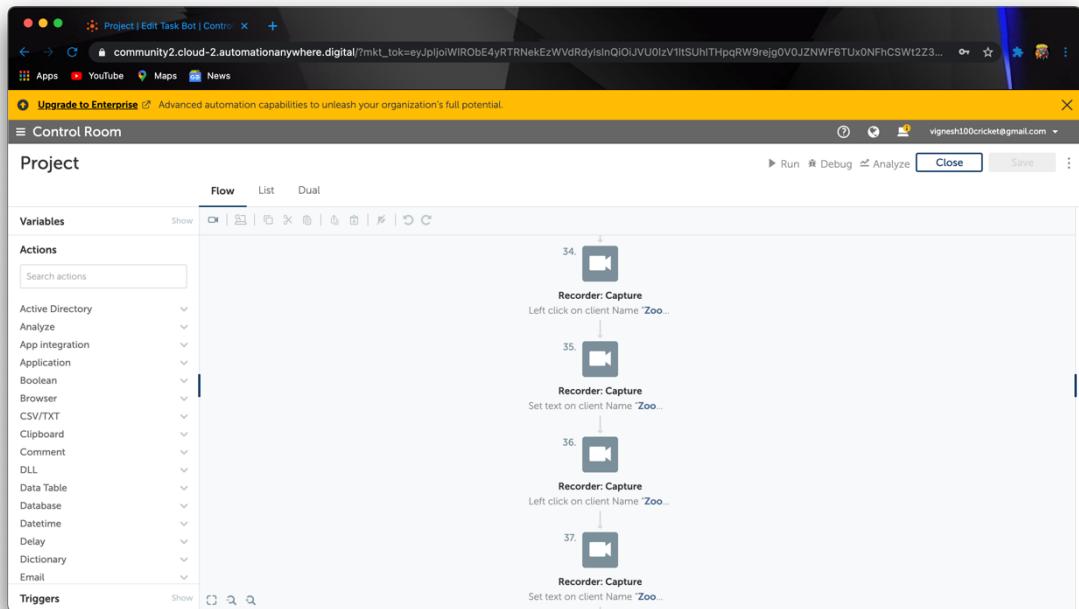


Figure 3.10: Control Room Flow View Instructions

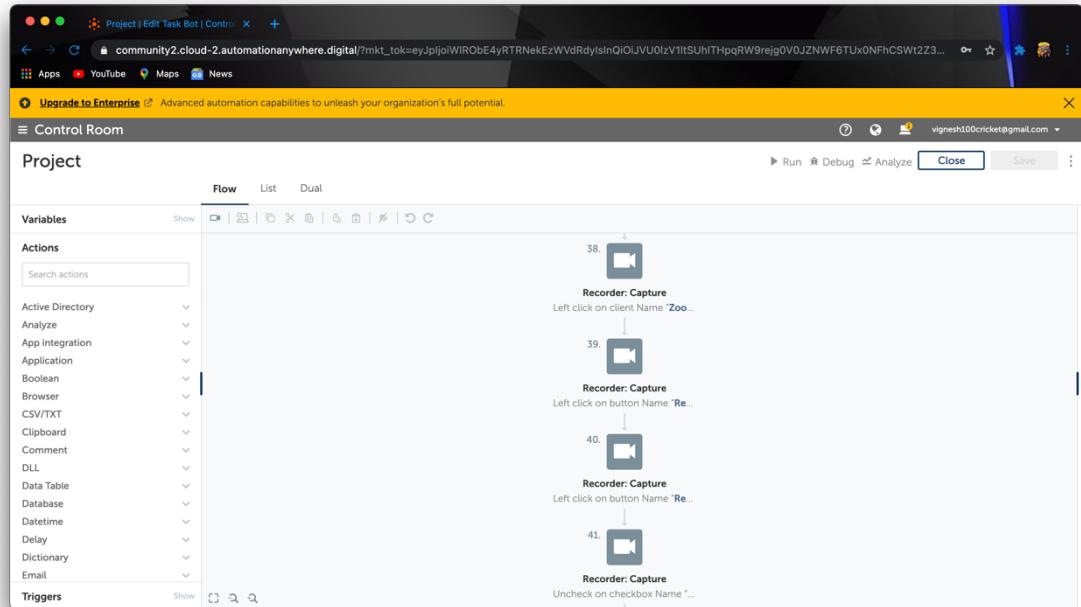


Figure 3.11: Control Room Flow View Instructions

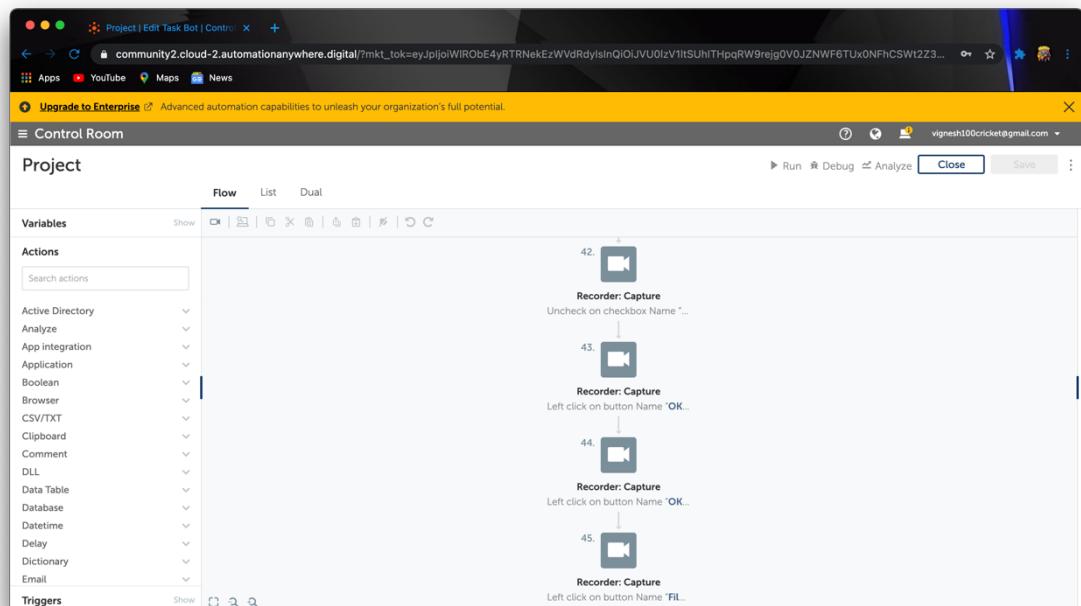


Figure 3.12: Control Room Flow View Instructions

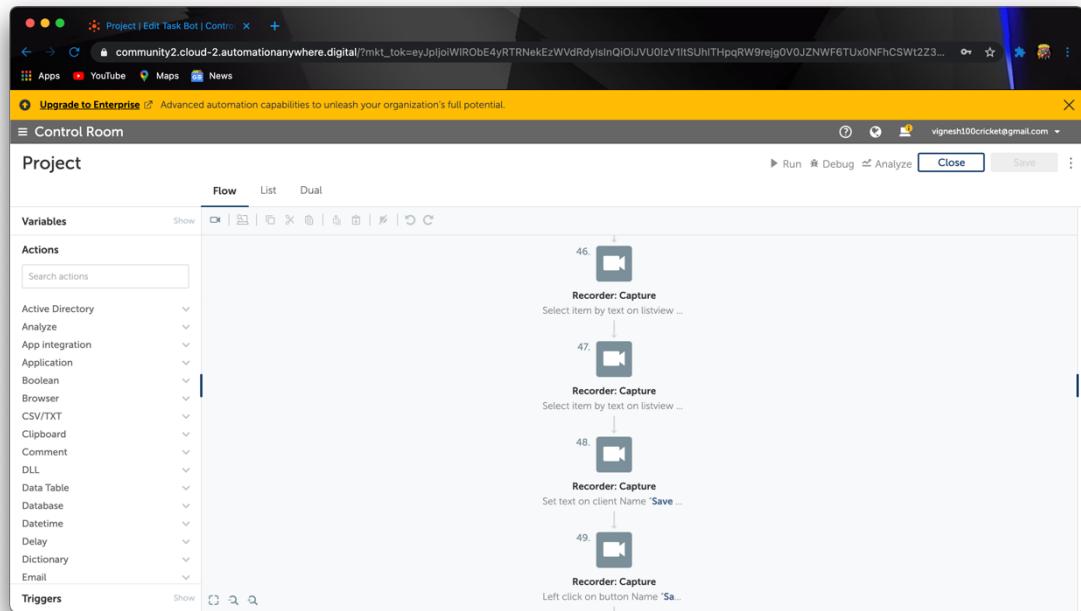


Figure 3.13: Control Room Flow View Instructions

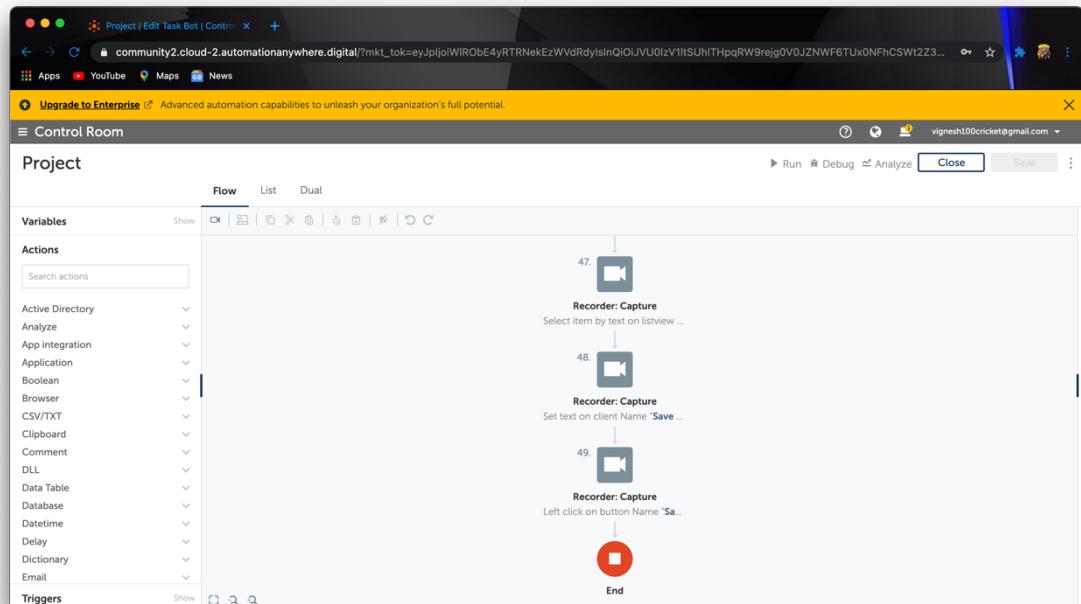


Figure 3.14: Control Room Flow View Instructions

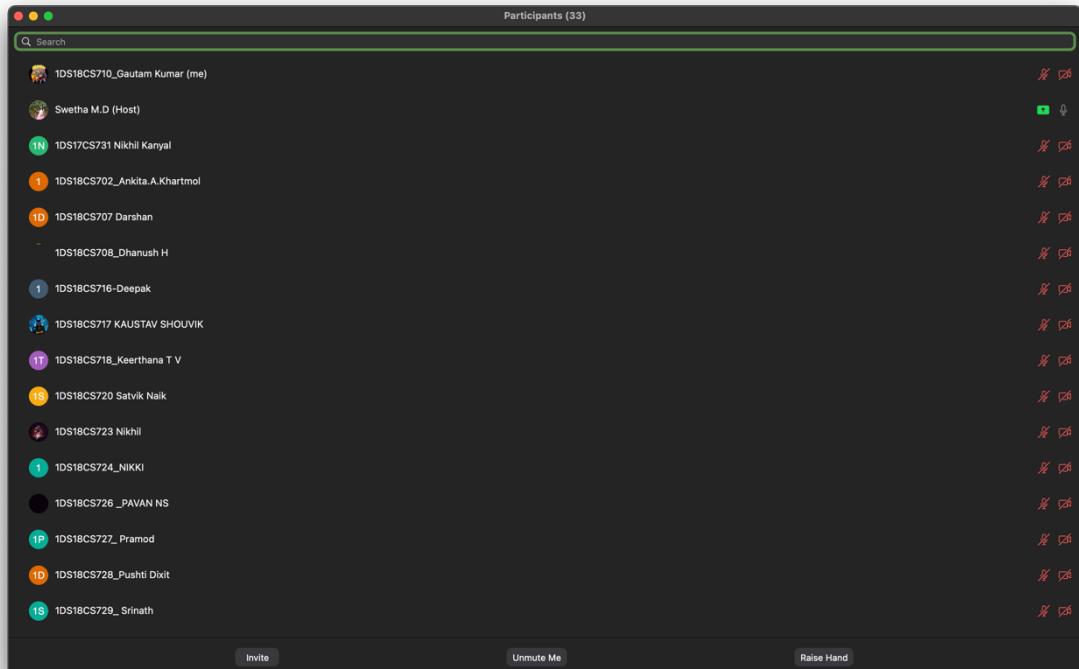


Figure 3.15: Zoom Participants

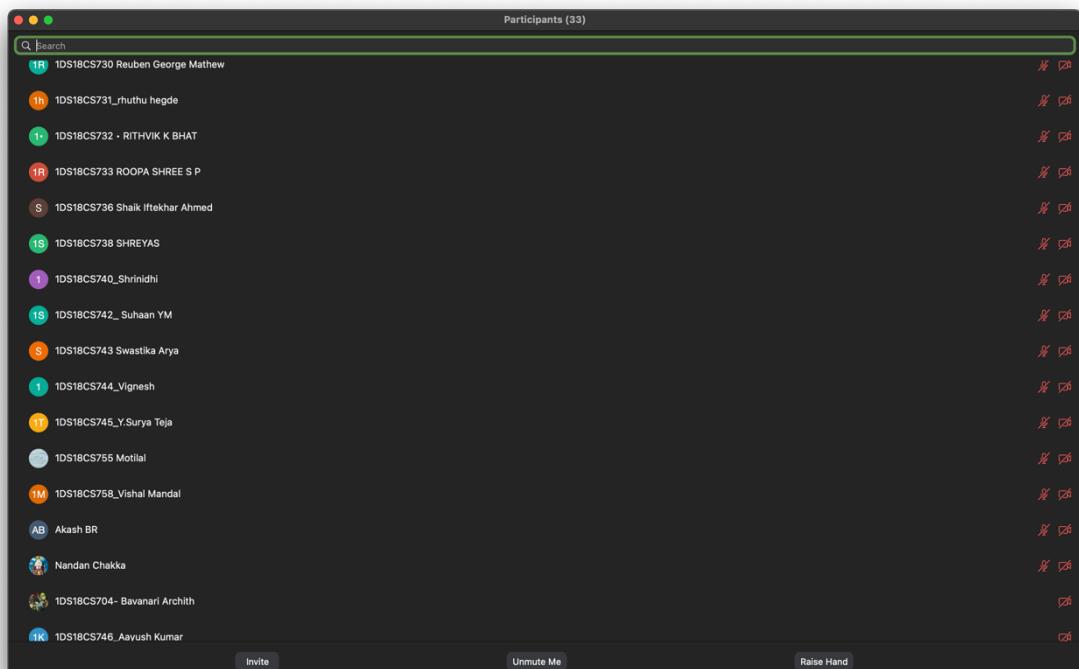


Figure 3.16: Zoom Participants

## Output

```

attend - Notepad
File Edit Format View Help
Swetha M.D (Host)
1DS18CS726_PAVAN NS
1DS17CS731 Nikhil Kanyal
1DS18CS702_Ankita.A.Khartmol
1DS18CS704_Bavanari Archith
1DS18CS707 Darshan
1DS18CS708 Dhanush H
1DS18CS710_Gautam Kumar
1DS18CS715-Shriya
1DS18CS716-Deepak
1DS18CS717 KAUSTAV SHOVIK
1DS18CS718_Keerthana T V
1DS18CS720 Satvik Naik
1DS18CS723 Nikhil
1DS18CS723 Nikhil
1DS18CS724_NIKKI
1DS18CS726_PAVAN NS
1DS18CS727_Pramod
1DS18CS728_Pushti Dixit
1DS18CS729_Srinath
1DS18CS731_rhuthu hegde
1DS18CS732_RITHVIK K BHAT
1DS18CS733 ROOPA SHREE S P
1DS18CS736 Shaik Iftekhar Ahmed
1DS18CS738 SHREYAS
1DS18CS740_Shrinidhi
1DS18CS742_Suhaan YM
1DS18CS743 Swastika Arya
1DS18CS745 Y.Surya Teja
<

```

Figure 3.17: attend.txt file

```

attend - Notepad
File Edit Format View Help
1DS18CS728_Pushti Dixit
1DS18CS729_Srinath
1DS18CS731_rhuthu hegde
1DS18CS732_RITHVIK K BHAT
1DS18CS733 ROOPA SHREE S P
1DS18CS736 Shaik Iftekhar Ahmed
1DS18CS738 SHREYAS
1DS18CS740_Shrinidhi
1DS18CS742_Suhaan YM
1DS18CS743 Swastika Arya
1DS18CS745_Y.Surya Teja
1DS18CS746_Aayush Kumar
1DS18CS755 Motilal
1DS18CS758_Vishal Mandal
Akash BR
Nandan Chakka
1DS18CS731_rhuthu hegde
1DS18CS732_RITHVIK K BHAT
1DS18CS733 ROOPA SHREE S P
1DS18CS736 Shaik Iftekhar Ahmed
1DS18CS738 SHREYAS
1DS18CS740_Shrinidhi
1DS18CS742_Suhaan YM
1DS18CS743 Swastika Arya
1DS18CS746_Aayush Kumar
1DS18CS755 Motilal
1DS18CS758_Vishal Mandal
Akash BR
Nandan Chakka

```

Figure 3.18: attend.txt file

This part can be considered as 50% output of our project, this screenshot is an output what we get when the bot logs the captured data from the “OCR capture area” command into the “attend.txt” file. Generally we know that a class strength doesn’t exceed more than 80 in number, we have implemented a loop command (that scrolls the participants tab) which runs 4 times that is capable of capturing all the 80 participants/students who are present in a meet. When it does, there may be a situation where the participants are less in number, so for the loop to get completed the participants are captured multiple times, thus the duplicates are formed as shown in the “attend.txt” file’s screenshot. Later the contents of this “attend.txt” file are imported into the “Zoom attendance.xlsx” Excel file sheet, and from there, using the excel commands the final result of our project will be rendered.

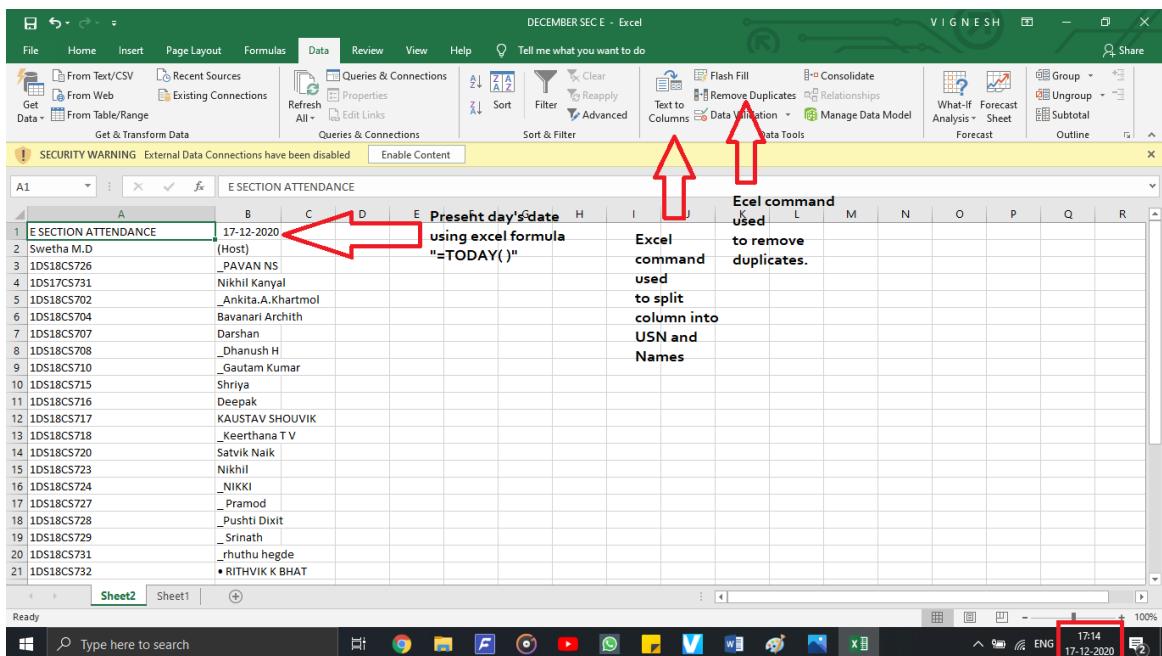


Figure 3.19: Zoom attendance.xlsx

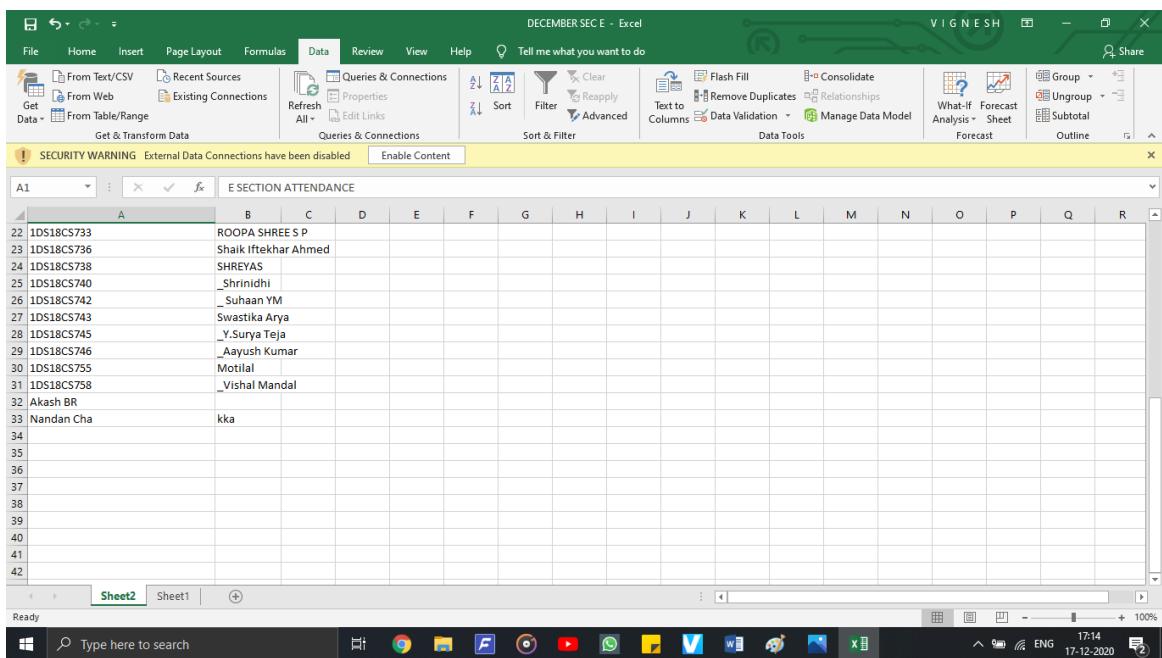


Figure 3.20: Zoom attendance.xlsx

This screenshot will be the final result of our project, when the participants list is imported from the “attend.txt” file into the excel sheet, using the “Universal recorder” command: firstly, the list is delimited: that is the data present in each cell is split into USN and names and placed into two different columns, this is done using some sequence of inbuilt excel commands such as “text-into-columns”, and delimited by fixed width for 10 characters, since the first 10 characters of a participant will be USN.

Later, after generating the two columns we need to remove the duplicates which are imported from the text file, this is done by just selecting any one of the columns and clicking on the “Remove duplicates” excel command, which removes the duplicated data present on the participants list.

Further, the first column header is renamed as that particular section’s attendance, example: “E SECTION ATTENDANCE”.

and the second column header will be renamed with the present day’s date using the excel formula “=TODAY()” and finally the file is saved and the attendance for the day is documented.

## **CHAPTER 4**

### **CONCLUSION/FUTURE ENHANCEMENT**

We proposed a new system for monitoring attendance of the students using Zoom platform. The results showed improvements in accuracy as compared to using user-based paper-based approach. The proposed technique provides an easy way for generating reports. Object takes out any plausibility of proxy also keep record of attendance of students in a well viable way. The general project is in charge of attendance of students. The attendance is set apart on the premise of in and out times record. The future work which can be incorporated is that the notice for attendance at the time of effectively catching picture. We use the Zoom application for extracting data of attendees (students) and finally Microsoft Excel for documenting the attendance of students. We implemented our project with Zoom meeting and will further enhance it by incorporating our project with other meeting applications such as Cisco WebEx, Microsoft Teams, etc.

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