Bilkent University

Department of Computer Engineering

Senior Design Project

Interly.ai

Analysis and Requirement Report

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1. Introduction

With the entrance of Covid19 into our lives, a lot of companies switched to online interviews [1] and even though the outbreak has diminished, online interviews are still in use for companies [2]. There are several advantages of online meetings such as easy access between the interviewee and the interviewer, or a faster recruitment process. However, there are also some disadvantageous sides of online meetings. Since the meeting is not as strong as a face-to-face interview, interviewers might not analyze the personality of the interviewees well enough to make sure that s/he is the right person to employ.

Interly.ai aims to transform the way of interviews bringing a new dimension to online meetings. It will help human resources see the characteristic features of the applicants by providing a live video conference environment and analyzing their facial expressions, and gestures using visual data. The interviewee's personality, current mood, level of anxiety, and self-confidence are presented to the interviewer's screen real-timely.

In this report, an analysis of the system is explained under the current system, proposed system, and other analysis elements sections. In the current system section, what is on the market and how Interly.ai will bring a new breath of fresh air to the market are discussed. In the proposed system section, functional-nonfunctional requirements, pseudo requirements, and system models are explained. Finally, in the other analysis elements section, the project management plan and management are discussed.

2. Current System

Companies use existing video conferencing applications in their recruitment processes, and the analysis of the interviewees is done by the interviewers' own human vision and perceptions. Interviewers examine the behavior of the candidate by considering the candidate's responses to the questions. They sometimes take notes for the candidate's analysis. Interly.ai will bring a new innovation to the market through enabling real-time behavioral analysis of the candidate during video conference. This innovation is an incremental service innovation because it brings

new facilities to an ordinary video-conferencing application in order to better evaluate the candidates during the interview. Hence computer vision technology will replace human vision and perception in the interview analysis through Interly.ai.

3. Proposed System

3.1 Overview

Interly.ai is a web-based online meeting application that companies can utilize in their interview processes with the help of behavioral analysis of the interviewees. Companies' HR managers and interviewers can create an interview session for the candidates in their hiring processes and send the online interview link to them via email. An interviewer does not have to agree to behavioral analysis on himself/herself. In such a case, it is at the discretion of the interviewer whether to continue the interview without analysis. If the interviewer accepts to keep going on with the interview without analysis, the meeting gets started and finished after the session ends. Otherwise, the interviewer can opt to cancel the meeting.

If the interviewee agrees to behavioral analysis as expected, the meeting gets started by the interviewer, the behavioral analysis is done in real time and all the data collected and processed in the interviewee's local environment are sent to the interviewer's side. The analysis data sent to the interviewer's side is projected on the screen with easy-to-understand user interfaces and displayed instantly on graphs. After the interview session ends, the overall and instant results are saved to the Data Hangar, which is a part of the webpage where interviewers can see the interviewees' personal information and analysis results.

Moreover, the HR managers can see the statistics about what types of characteristics the employed interviewees have, and how their behaviors and moods were during their interviews. Therefore, the managers can see the details of employment and analyze the performance of interviewers about how well they eliminated and hired the candidate employees.

3.2 Functional Requirements

3.2.1 Company Specific Requirements

- A company can have a subscription on the website, by making monthly/yearly payments.
- A company can create accounts for the company interviewers who will arrange an interview with candidates applying for a job position for that company.
- A company can allow specific accounts, such as the account of its human resources manager, to access the interviews' data including interviewees' analysis and results so that these managers can inspect the recruitments.

3.2.2 Interviewer Specific Requirements

- Interviewer must be able to login to the website with his/her account information.
- Interviewer can create an interview Data Hangar for a specific interview. A Data Hangar is a page component where the interviewers can see the results of the interviewee's analyzed data and also the general information.
- Interviewer must be able to add the interviewee's general information to the Data Hangar so that s/he can see the analysis data specific to that interviewee.
- Interviewer can indicate the job position that the interview is arranged for when creating the Data Hangar.
- An interview can have more than one interviewer, therefore, all the interviewers will be able to access the interviewee data within this Data Hangar.
- Interviewer must be able to see the analysis of the interviewee in terms of the interviewee's personality, self-confidence, the level of anxiety, and the current mood with visualized graphics.
- Interviewer must be able to see the compared version of all the interviewees for a specific job position.
- Interviewer must be able to enter the interview with a link shared by the Data Hangar or directly enter with a button.
- Interviewer can allow/disallow the person trying to attend the interview.

- Interviewer must be able to indicate the result of the interviewer in the Data Hangar in terms of at what stage the interviewee is in his/her application.
- The interviewer will be able to do basic tasks such as screen sharing, enlarging the participant's display panel, turning the microphone on and off, removing any participant from the room, and muting during the interview.

3.2.3 Human Resources Manager Specific Requirements

- A Human Resources manager can do all the tasks that an interviewer can do.
- In addition to the interviewer role, a Human Resources manager will be able to inspect recruitments through accessing not only the interviews s/he attends, but also all the interviews' data.
- Thus, Human Resources Managers will be able to analyze the recruitment process and evaluate individual interviewers' performances for a period of time.

3.2.4 Interviewee Specific Requirements

- An interviewee must be able to allow the camera and microphone access so that the application can process his/her data in analysis.
- An interviewee must be able to enter the interview with a link shared by the interviewer.
- An interviewee must be able to accept the usage of his/her personal data at the beginning of the interview.
- An interviewee will be able to do basic tasks such as turning on and off the microphone and video, and screen sharing during the interview.

3.2.5 Admin Specific Requirements

- Admin can add companies/interviewers to the application.
- Admin can remove companies/interviewers from the application.
- Admin can delete an interviewee's data if the interviewee demands from the company or directly the admin.
- Admin can approve a company after a company fills a registration form in the application.
- Admin can activate a company whose registration request is approved if this company makes the first payment.

3.3 Nonfunctional Requirements

3.3.1 Reliability

- The application should give analysis data of the interviewee with the highest possible accuracy.

3.3.2 Privacy

- Interviewee's analysis will be stored in a database to make it available to the interviewer should they want to see it again in the future. Hence, this data should be secured by hashing the data.
- Face data of interviewees will be processed by the application. This data should be processed on interviewees' computers before uploading it to the server in order to prevent uploading pure face data.

3.3.3 Efficiency

- The application should analyze the personality of the interviewee in real time. Hence, most of the processing should be done at the server side to be able to make it possible.

3.3.4 Usability

- The application should be easy to use for both interviewee and interviewer. It should be seen by users as a very basic meeting application without complex functionalities to use.
- The application should give analysis data of interviewees with an understandable and easy to read GUI to the interviewers.

3.3.5 Scalability

- As the number of users increase, the more companies utilize Interly, more data will be sent to servers and their final process will happen here. Thus, workload on central servers will increase drastically. Servers should be able to handle these kinds of situations.
- The application should keep the delay as little as possible even when more users are on the calls and should try to provide real-time analysis all the time.

3.4 Pseudo Requirements

3.4.1 Version Control and Project Management
- Github will be used as the main version control system.
- Github also will be used to track the progression of the project. The completed parts and uncompleted parts will be updated once a week.

3.4.2 Target Platform and User Experience
- The part of the program that will do analysis must be a windows plugin.
- The company side of the program will be a web application.
- Accessibility and user friendly approach will be followed.

3.4.3 Testing
- Jest and React Testing Library will be used to test UI components.
- Pytest will be used to test python parts of the program.
- Unit tests will be written for each part.
- Integration tests will be conducted for combinations of modules.

3.4.4 External tools and Technologies
- Whatsapp will be used for main communication as a chatting platform.
- Discord will be used for online meetings.
- Google Docs will be used as the main report writing platform.
- Figma will be used to design the user interface (UI).

3.5 System Models

3.5.1 Scenarios

Use Case: Create Interview

Participating Actor: Interviewer

Entry Condition: Interviewer clicks Create New Interview button.

Exit Conditions:
- Interview is created.
- Interview creation failed.

Flow of Events:

1. Actor presses the Create New Interview button.

2. Actor fills out the Interview and Interviewee information.

3. Actor presses the Create Interview button.

Use Case: Create Data Hangar

Participating Actor: Interviewer

Entry Condition: There has to be at least one interview created by the actor.

Exit Conditions:

- Data Hangar is created successfully.
- Data Hangar creation failed.

Flow of Events:

1. Actor presses the Create New Data Hangar button.

2. Actor selects the Interview to connect to the Data Hangar.

3. Actor presses the Create Data Hangar button.

Use Case: See All Interviewee Analysis of a Job Position

Participating Actor: Interviewer

Entry Condition: There has to be at least one Data Hangar for the given Job Position.

Exit Condition:

- Actor closes the page.

Flow of Events:

1. Actor enters the interview page.

2. Actor clicks See Data Hangars for Same Position.

3. Actor sees the filtered (in terms of Job Position) list of Data Hangars.

Use Case: Join Interview

Participating Actors: Interviewer, Interviewee

Entry Condition: There has to be an interview created by the Interviewer and a link that is sent to the Interviewee.

Exit Condition:

- Interviewer ends the meeting.

Flow of Events:

1. Interviewer clicks the Join Interview button.
2. Interviewee clicks the link sent to them and rejects or approves to be analyzed.
3. Interviewee waits for Interviewer to allow them to the interview.
4. Interviewer allows Interviewee to join the interview.
5. Interviewer ends the interview for all.

Use Case: List Recruitments

Participating Actor: Human Resources Manager

Entry Condition: There has to be at least one Data Hangar created.

Exit Condition:

● Actor closes the page.

Flow of Events:

1. Actor clicks the List Recruitments button.
2. Actor sees all the Recruitments made and details of them.

Use Case: Subscribe to the Interly.ai

Participating Actors: Company, Admin

Entry Condition: Actor clicks the Subscribe to System button.

Exit Condition:

● Company pays for the subscription.
● Admin rejects subscription.
● Company closes the page.

Flow of Events:

1. Company clicks the Subscribe to the System button.
2. Company fills out the information form.
3. Company selects the subscription type (yearly or monthly).
4. Company confirms the subscription.
5. Admin approves or rejects subscription.
6. Company pays for the subscription.

Use Case: See Interviewee Analysis

Participating Actor: Interviewer

Entry Condition: Interview must have ended.

Exit Condition:

● Actor closes the page.

Flow of Events:

1. Actor clicks see Interviewee Analysis button.

2. Interview Data Hangar is shown to the Actor.

Use Case: Delete Interviewee Data

Participating Actors: Interviewee, Admin, Company

Entry Condition: Interviewee requests their data to be deleted from Data Hangar.

Exit Condition:

● Interviewee data is deleted.

Flow of Events:

1. Interviewee requests their data to be deleted.

2. Admin deletes their data.

3. Company is notified that data of the Interviewee is deleted and will no longer be accessible.

Use Case: Manage Accounts

Participant Actor: Company

Entry Condition: There has to be at least one interviewer created by the company.
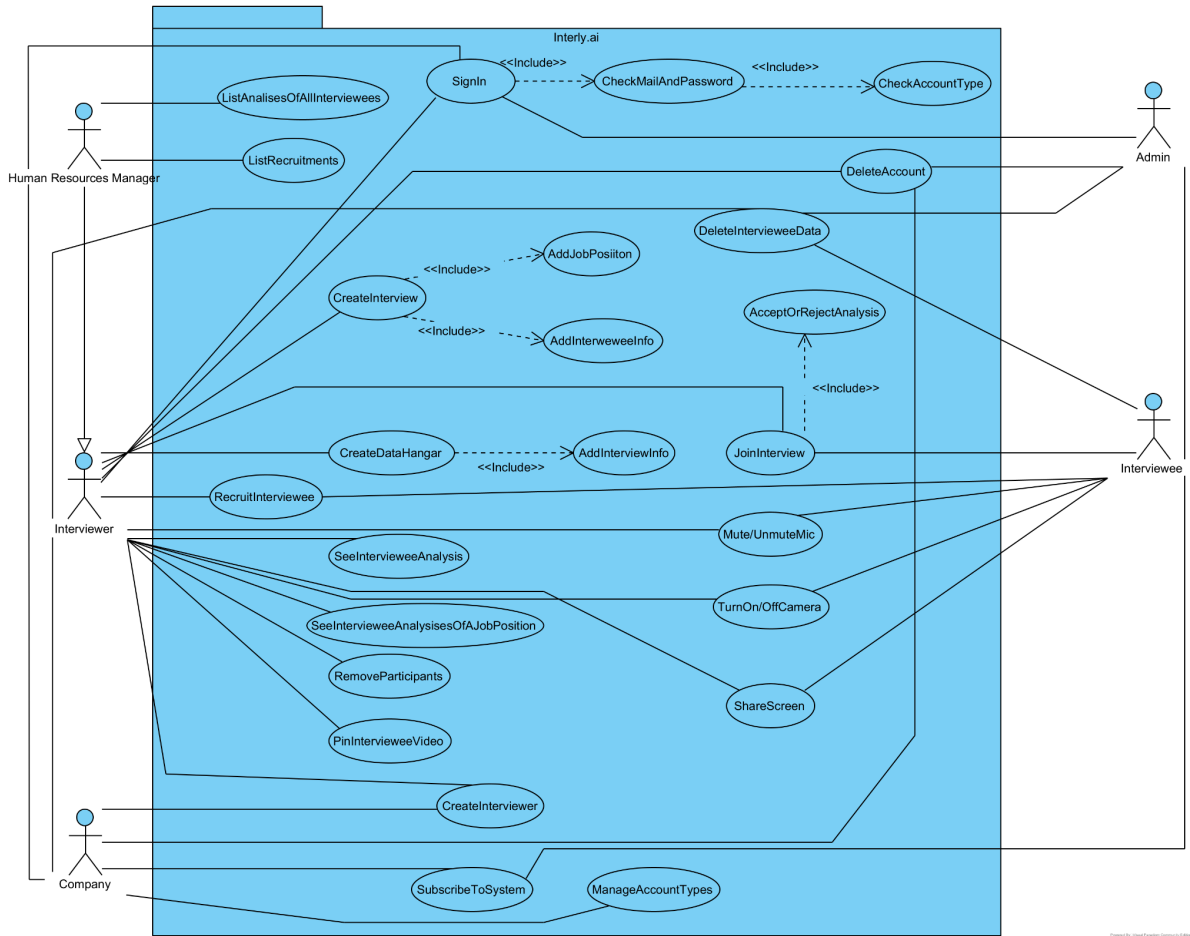
Exit Condition:

● Company exits the page.

Flow of Events:

1. Actor clicks the Update button for any interviewer or HR manager.

2. Actor downgrades HR manager to interviewer or upgrades interviewer to HR manager.

3. Actor exits the page.

3.5.2 Use Case Model

3.5.3 Object and Class Model

SubscriptionInfo
- -type: string
- -startingDate: Date
- -isActive: bool
- -allPayments: Payment [ ]
- -subscriptionId: string
- +getType(): string
- +getStartingDate(): Date
- +getIsActive(): bool
- +setType(type: string): void
- +setStartingDate(date: Date): void
- +setIsActive(isActive: bool): void
- +getAllPayments(): Payment [ ]
- +addPayment(payment: Payment): void
- +getSubscriptionId(): string
- +setSubscriptionId(id: string): void

PersonalityData
- -openness: float
- -conscientiousness: float
- -extraversion: float
- -agreeableness: float
- -neuroticism: float
- +getOpenness(): float
- +getConscientiousness(): float
- +getExtraversion(): float
- +getAggreableness(): float
- +getNeuroticism()
- +setOpenness(value: float): void
- +setConscientiousness(value: float): void
- +setExtraversion(value: float): void
- +setAggreableness(value: float): void
- +setNeuroticism(value: float): void

CurrentMoodData
- -levelOfFear: float
- -levelOfSadness: float
- -levelOfHappiness: float
- -levelOfSurprise: float
- -levelOfNeutral: float
- -levelOfAnger: float
- -levelOfDisgust: float
- +getLevelOfFear(): float
- +getLevelOfSadness(): float
- +getLevelOfHappiness(): float
- +getLevelOfSurprise: float
- +getLevelOfNeutral(): float
- +getLevelOfAnger(): float
- +getLevelOfDisgust(): float
- +setLevelOfFear(level: float): void
- +setLevelOfSadness(level: float): void
- +setLevelOfHappiness(level: float): void
- +setLevelOfSurprise(level: float): void
- +setLevelOfNeutral(level: float): void
- +setLevelOfAnger(level: float): void
- +setLevelOfDisgust(level: float): void

Company
- -companyEmail: string
- -companyName: string
- -companyPassword: string
- -companyId: string
- -subscriptionInfo: SubscriptionInfo
- -interviewers: Interviewers [ ]
- -hrManagers: HRManager [ ]
- +getEmail(): string
- +getName(): string
- +getPassword(): string
- +getId(): string
- +getSubscriptionInfo(): SubscriptionInfo
- +getInterviewers(): Interviewers [ ]
- +getHRManagers(): HRManagers[ ]
- +setEmail(email: string): void
- +setName(name: string): void
- +setPassword(password: string): void
- +setId(id: string): void
- +setSubscriptionInfo(subscription: SubscriptionInfo): void
- +addInterviewer(interviewer: Interviewer): void
- +removeInterviewer(interviewer: Interviewer): bool
- +addHRManager(hr_manager: HRManager): void
- +removeHRManager(hr_manager: HRManager): bool
- +makePayment(): bool

Payment
- -paymentAmount: float
- -paymentTime: timestamp
- -paymentId: string
- +getPaymentAmount(): float
- +setPaymentAmount(amount: float): void
- +getPaymentTime(): timestamp
- +setPaymentTime(time: timestamp): void
- +getPaymentId(): string
- +setPaymentId(id: string): void

DataHangar
- -roomId: string
- -interviewers: Interviewer [ ]
- -interviewee: Interviewee
- -createdTime: timestamp
- -jobPosition: string
- -intervieweeResult: bool
- -analysisData: AnalysisData
- -interviewId: string
- +getRoomId(): string
- +getInterviewers(): Interviewer [ ]
- +getInterviewee(): Interviewee
- +getCreatedDate(): timestamp
- +getJobPosition(): string
- +getIntervieweeResult(): bool
- +getAnalysisData(): AnalysisData
- +getInterviewId(): string
- +setRoomId(id: string): void
- +setInterviewers(interviewers: Interviewer [ ]): void
- +setInterviewee(interviewee: Interviewee): void
- +setJobPosition(position: string): void
- +setIntervieweeResult(result: bool): void
- +setAnalysisData(data: AnalysisData): void

AnalysisData
- -personalityData: PersonalityData
- -currentMoodData: CurrentMoodData
- -levelOfSelfConfidence: float
- -levelOfAnxiety: float
- +getPersonalityData(): PersonalityData
- +getCurrentMoodData(): CurrentMoodData
- +getLevelOfSelfConfidence(): float
- +getLevelOfAnxiety(): float
- +setPersonalityData(data: PersonalityData): void
- +setPersonalityData(data: PersonalityData): void
- +setLevelOfSelfConfidence(level: float): void
- +setLevelOfAnxiety(level: float): void

Admin
- +addCompany(company: Company): void
- +removeCompany(company: Company): void
- +addInterviewer(interviewer: Interviewer): void
- +removeInterviewer(interviewer: Interviewer): void
- +deleteInterviweeData(interviewee: Interviewee): void
- +approveCompany(company: Company): void
- +activateCompany(company: Company): void

Interviewer
- -interviewerEmail: string
- -interviewerFirstName: string
- -interviewerLastName: string
- -interviewerPassword: string
- -interviewerId: string
- -companyId: string
- -interviewsAttended: Interview [ ]
- -department: string
- +getEmail(): string
- +getFirstName(): string
- +getLastName(): string
- +getPassword(): string
- +getId(): string
- +getCompanyId(): string
- +setEmail(email: string): void
- +setFirstName(name: string): void
- +setLastName(name: string): void
- +setPassword(password: string): void
- +setId(id: string): void
- +setCompanyId(company_id: string): void
- +getInterviewsAttended(): Interview [ ]
- +createDataHangar(dataHangar: DataHangar): bool

Interview
- -interviewers: Interviewer [ ]
- -interviewId: string
- -interviewee: Interviewee
- -date: timestamp
- -dataHangar: DataHangar
- -meetingLink: string
- -meetingPassword: string
- -permissionForAnalysis: bool
- -host: Interviewer
- +addInterviewee(interviewee: Interviewee): bool
- +removeInterviewee(interviewee: Interviewee): bool
- +startAnalysis(): void
- +showAnalysis(result: AnalysisData): void
- +saveAnalysisData(data: AnalysisData): bool
- +breakoutRooms(nb_of_room: int): bool
- +getInterviewers(): Interviewer [ ]
- +addInterviewer(interviewer: Interviewer): bool
- +getInterviewee(): Interviewee
- +removeInterviewer(interviewer:Interviewer): bool
- +getInterviewId(): string
- +schedule(date: timestamp): void
- +cancelInterview(): void
- +getDataHangar(): DataHangar
- +setDataHangar(dataHangar: DataHangar): void
- +getMeetingLink(): string
- +setMeetingLink(link: string): void
- +getMeetingPassword(): string
- +setMeetingPassword(password: string): void
- +getPermissionForAnalysis(): bool
- +setPermissionForAnalysis(permission: bool): void
- +getHost(): Interviewer
- +setHost(interviewer: Interviewer): void

Interviewee
- -intervieweeEmail: string
- -intervieweeFirstName: string
- -intervieweeLastName: string
- -intervieweeId: string
- -appliedPosition: string
- -cv: string
- +getEmail(): string
- +getFirstName(): string
- +getLastName(): string
- +getId(): string
- +getAppliedPosition(): string
- +setEmail(email: string): void
- +setFirstName(name: string): void
- +setLastName(name: string): void
- +setId(id: string): void
- +getAppliedPosition(position: string): void
- +getCv(): string
- +setCv(cv: string): void

HRManager
- -allDataHangars: DataHangar [ ]
- +getAllDataHangars(): DataHangar [ ]
- +getAllInterviewers(): Interviewer [ ]
- +removeDataHangar(dataHangar: DataHangar): bool
- +getStatsOfInterviewers(interviewers: Interviewer [ ]): string

This diagram can be viewed via the following link as well: https://imgur.com/a/I95bUdi

Class Descriptions:

Company: An object of this class represents a company that applies to register in the Interly.ai system. An object of this class can create interviewers or human resources managers along with it can delete them. In addition, it has a reference to the SubscriptionInfo object.

Interviewer: An object of this class represents an interviewer that is created by a company in the Interly.ai system. It has a reference to interview and create a Data Hangar.

Interviewee: An object of this class represents an interviewee whose information is added to the system when an interviewer of a company creates an interview.

Admin: An object of this class represents the admin of the Interly.ai system. It can add or remove a company/interviewer object. In addition, it can delete an Interviewee object.

HRManager: An object of this class represents a human resources manager of a company. It inherits all the features of the Interviewer class. It has references to the DataHangar objects.

Interview: An object of this class represents an interview that is scheduled by an Interviewer object. It has a reference to an Interviewee object.

DataHangar: An object of this class represents a Data Hangar that is created by an Interviewer object when an Interviewee object is analyzed in an Interview object. It has a reference to an AnalysisData object.

AnalysisData: An object of this class represents the analysis data of an interviewee. It has references to a PersonalityData object and a CurrentMoodData object.

PersonalityData: An object of this class represents the personality data of an interviewee. It keeps attributes for the levels of five different personality types: openness, conscientiousness, extraversion, agreeableness, and neuroticism.

CurrentMoodData: An object of this class represents the current mood data of an interviewee. It keeps attributes for the levels of 7 different current mood types:
fear, sadness, happiness, surprise, neutral, anger, and disgust.

SubscriptionInfo: An object of this class represents a subscription of a company. It has a reference to the list of Payment objects.

Payment: An object of this class represents a payment made by a company in a time period.

3.5.4 Dynamic Models

3.5.4.1 Sequence Models

3.5.4.1.1 Download and Install Plugins
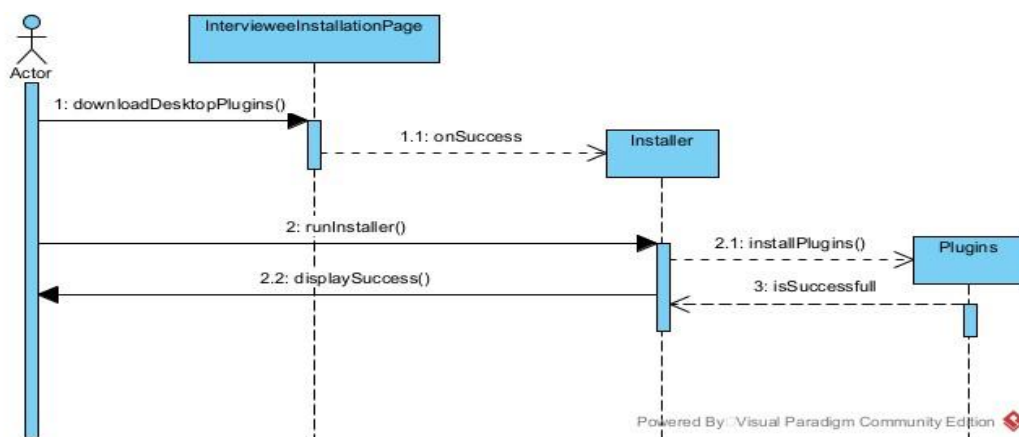
Interly.ai has to run executable plugins in the background to be able to process interviewee video locally, i.e without sending them to cloud and to offer its services to its customers as ethically and accurately as possible. These plugins also decrease the size of data transmitted over the internet, thus increasing the performance of the application drastically. To eliminate the burden of installation of a new executable, Interly.ai design offers a very simplified and ebay installation process. We are planning to set up the environment by just downloading the installer, then running it. The installer will set up everything in the background and will inform the user about the success of installation.

3.5.4.1.2 Create Interview
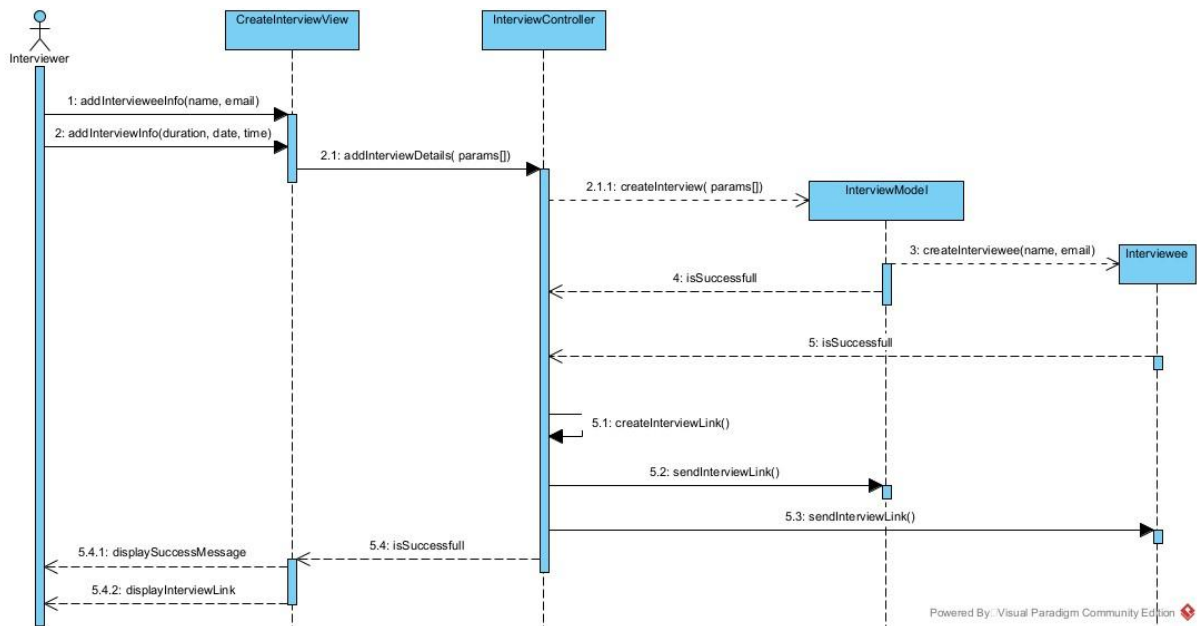
To create an interview, interviewers can set up interviews from a new interview page controlled by CreateInterviewView via sending Interview details like duration, date and general information about interviewee including his/her name, email, cv etc. CreateInterviewView will then send this information to the InterviewController which will then create an instance of InterviewModel. This new model then creates an instance of Interviewee class for each interviewee with its detail. After successful creation, an interview link will be generated and will be sent to each interviewee's email by the controller. From the interviewers' side, if successful, a success message will be displayed along with the interview's link.

3.5.4.1.3 Interviewee Attend Meeting
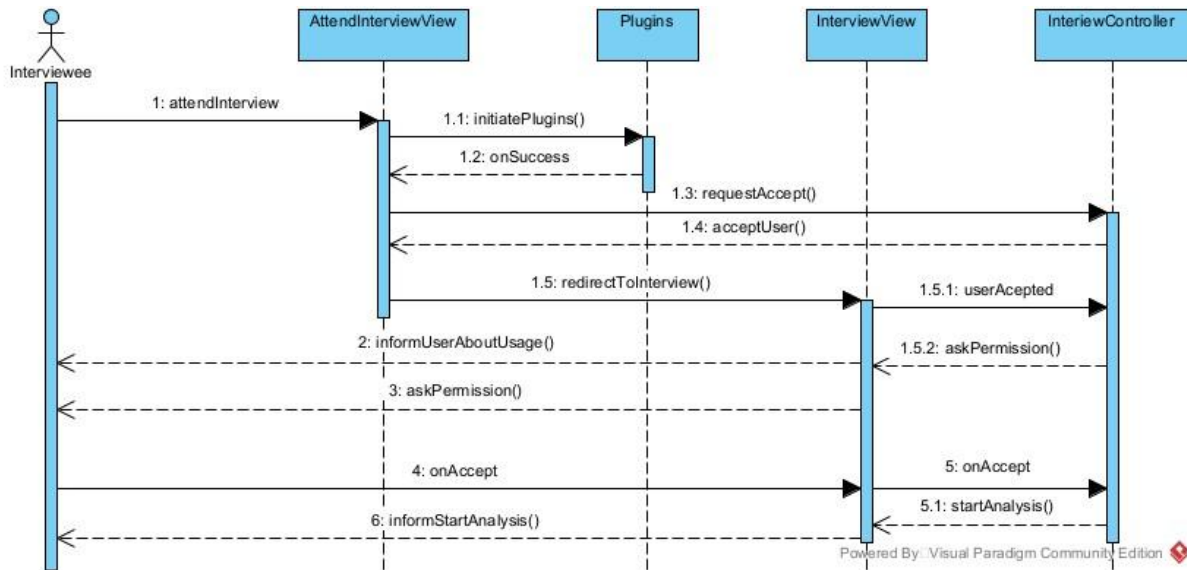
Interviewee's will attend meetings via the link provided by the company. By following that link the attending process will start. This will send interviewee to an interview page, that would initiate Plugins. After that user will be accepted to interview by the InterviewController which would redirect him to the Interview page controlled by InterviewPage. Then the controller will make a call to ask permission. After getting this call, an information prompt about the usage of personal info and how this info will be processed in order to function. Following that, a permission will be asked on screen of interviewee. If the user accepts the prompt, the controller will send a call to plugins to start analysis. Again the interviewee will be informed about the current phase of the interview.

3.5.4.1.4 Interview and Data Hangar
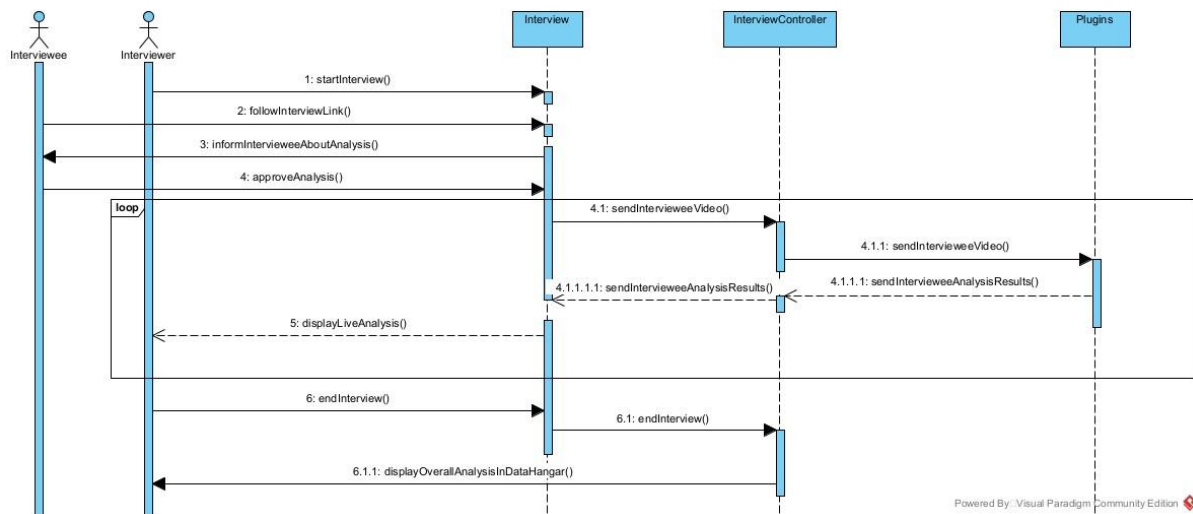
The interview process will begin with the start command from the Interviewer. After that interviewee will be able to join by following the link. The detailed attending process was given in the preceding diagram. After the user is informed about and approves the personal information analysis, the video of interviewee will be directed to plugins by the InterviewController. Plugins will execute on a local machine to extract a live behavioral analysis from the video footage coming continuously from the camera. The pre-trained neural network will make a prediction about the current mood of the interviewee and send these results to the controller which would convert these results into a form that could be interpreted by the interviewer. And the role of the interview object will be displaying these on the screen of the interviewer. These processes will continue to loop until the end of the meeting which. After that, the interviewer could also opt to go to a Data Hangar which is the place where overall analysis of interviewee's characteristics can be seen, with different graphs, tables including various information about the whole interview process.

3.5.4.2 Activity Models

3.5.4.2.1 Interviewer Starts Interview
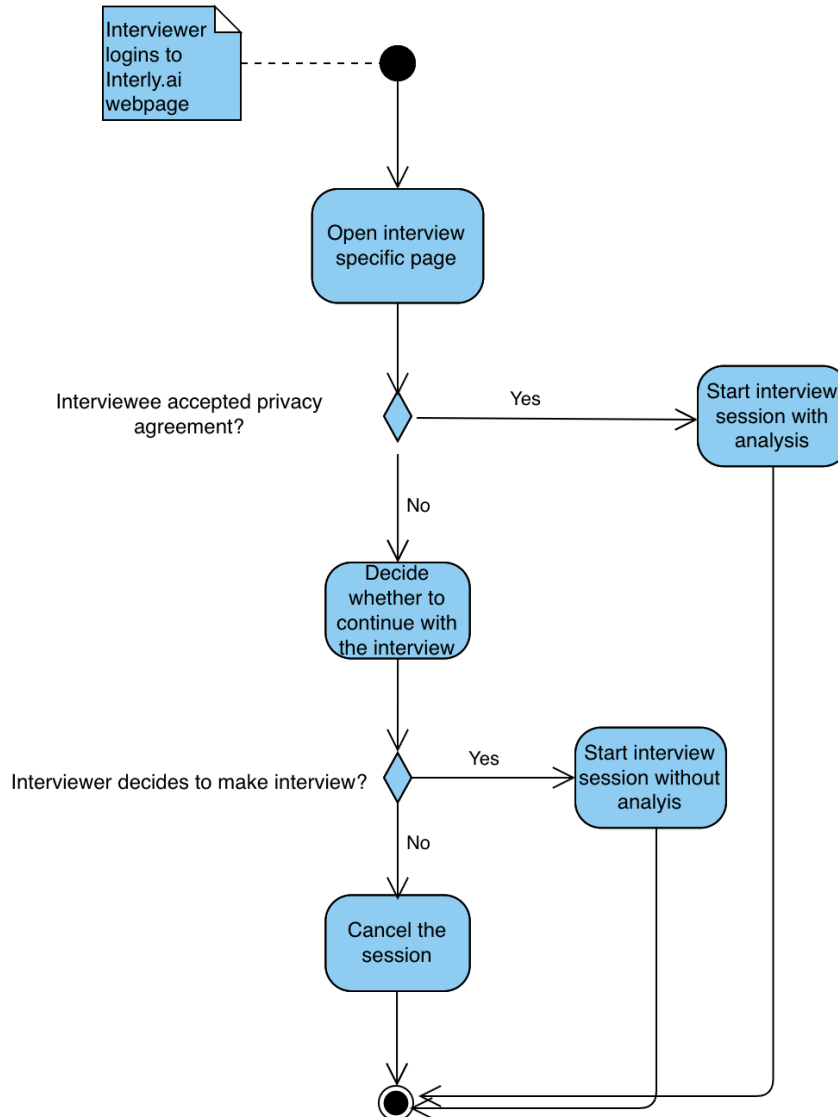
The main flow of the interview process from the interviewer's point of view is shown above. When the interview date and time come, the interviewer opens the related interview page and before starting the interview, s/he can see if the interviewee accepted the privacy agreement or not. If not, it is optional to continue or not. If the interviewer wants to continue without the analysis, the online meeting starts, and no analysis is done. Otherwise, the interviewer can cancel the meeting session. On the other hand, if the interviewee accepts the privacy agreement, the online meeting is done with behavioral analysis as expected.

Interviewee installed the necessary plugins on his/her local

Click on the link sent by interviewer

Read the confidentiality agreement

Accept the agreement

No

Wait for the interviewer to start the interview without analysis

Interviewer started the session?

No

Close

Yes

Yes

Attend the interview with behavioral analysis

Attend the interview without behavioral analysis
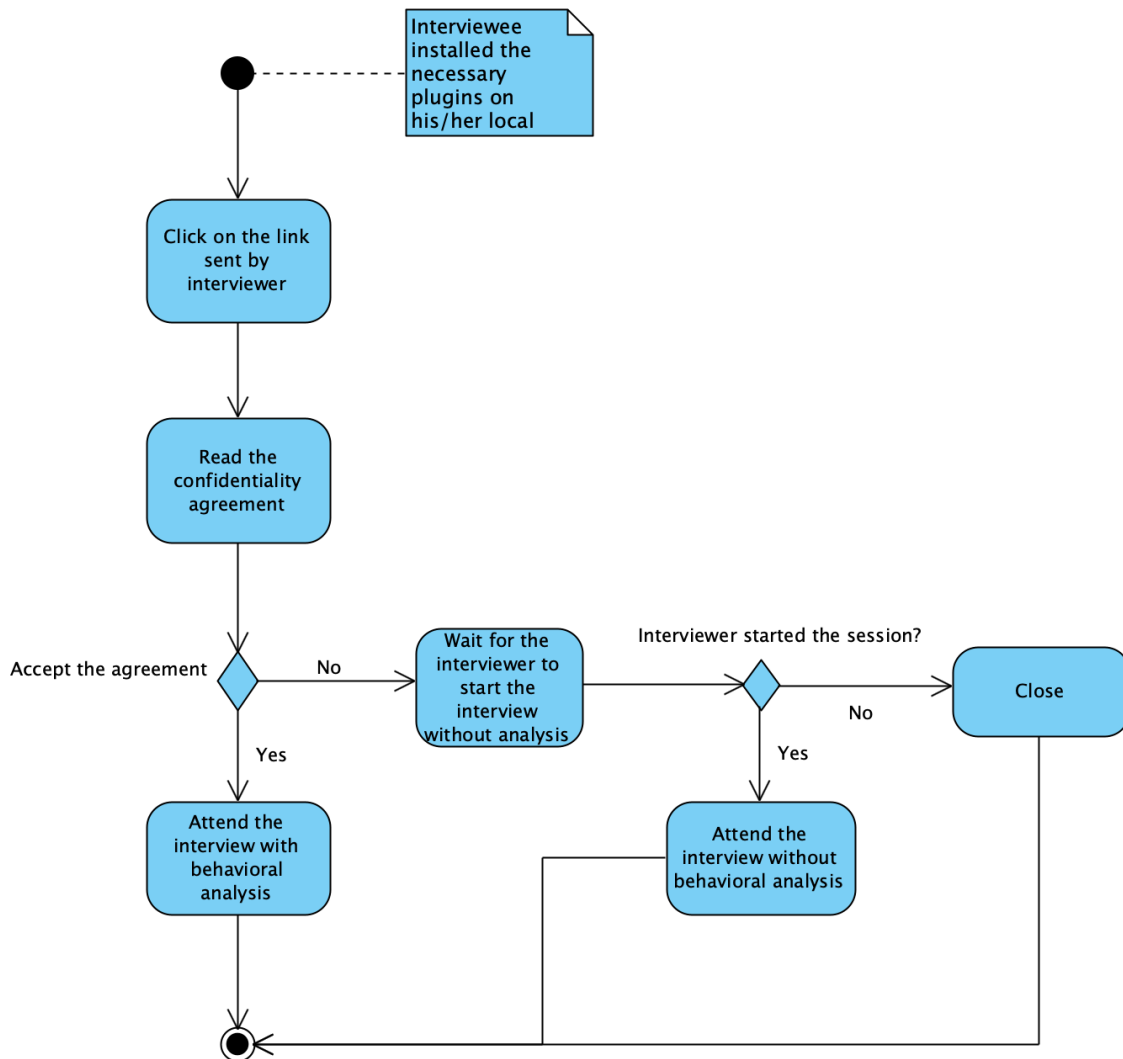
The main flow of the interview process from the interviewee's point of view is shown above. The interviewee is supposed to install the necessary plugins on his/her computer in order to process the visual data in a secure way. In the first step, the interviewee is provided with an email containing the online meeting link. The interviewee clicks on that link and s/he automatically gets directed to the meeting session. When the browser is opened, s/he is required to read the confidentiality agreement stating that his/her visual data will be processed. If the interviewee does not accept, then s/he will be waiting for the interviewer's decision to keep going with the interview without analysis or not. If the interviewer starts the interview, then the interview is done without analysis. Otherwise, the session is canceled and the

interviewee is asked to leave the website. If the interviewee accepts the agreement, then the meeting gets started with analysis.

3.5.4.3 State Diagram

This state diagram shows the lifecycle of an interview. After the creation of the interview, the interview waits until its date has come. After that, when the interviewer starts the interview, a pop-up will be shown to the interviewee asking whether they

accept analysis or not. If the interviewee accepts the analysis, the application will analyze the interviewee throughout the interview and show the results on the screen of the interviewer.

3.5.4.3.2 Creation of a Company Account
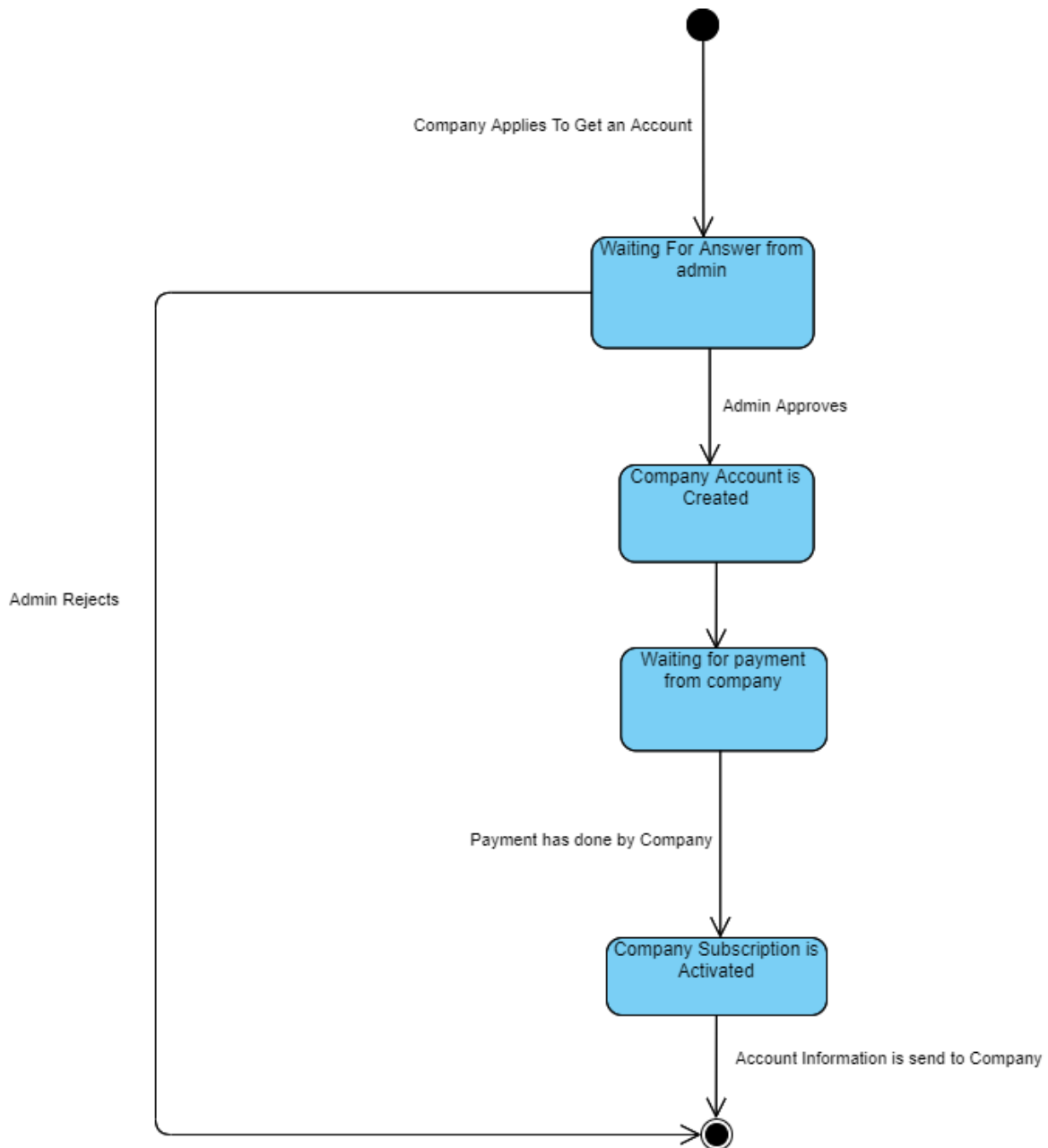
This state diagram shows the creation of a company account. After the company fills the application form and submits the form, the admin must control the information provided by the company and reject or accept it. When the admin accepts, the company must pay the subscription fee to start using the account otherwise the

account information will not be sent to the company and the account will not be active.
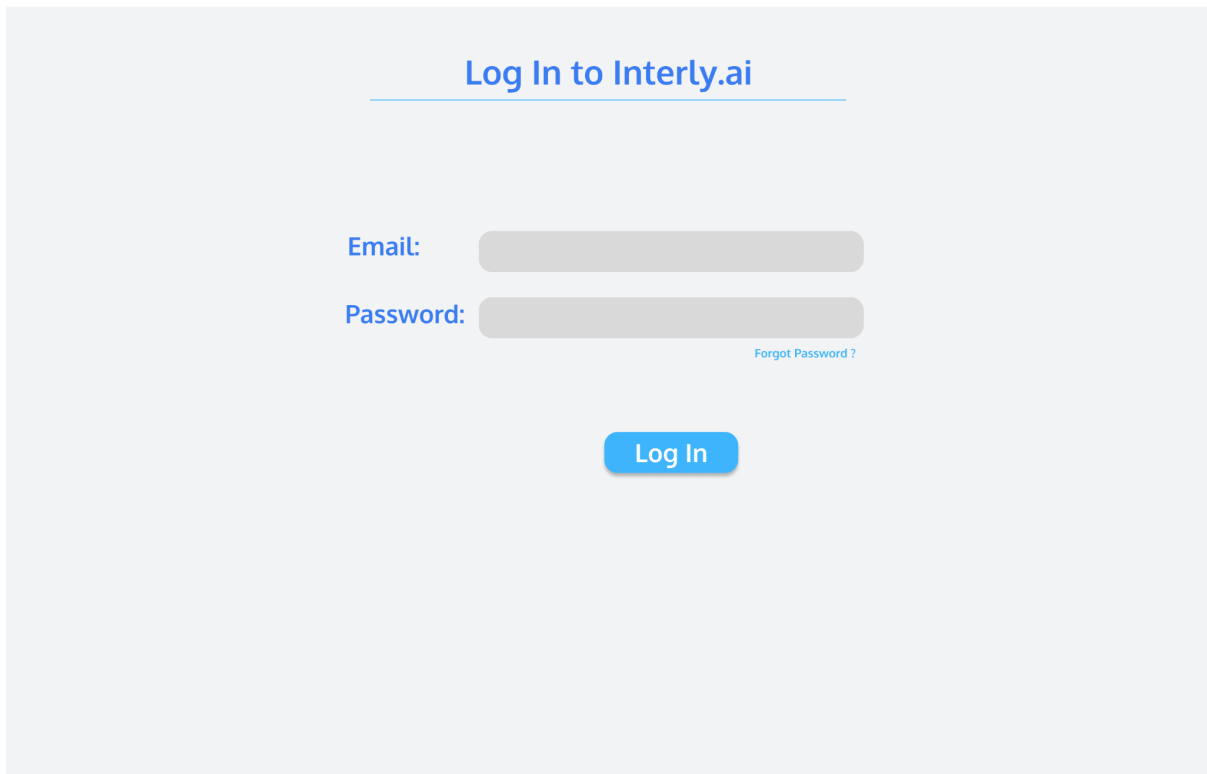
3.5.5 User Interface - Navigational Paths and Screen Mock-ups

Landing Page
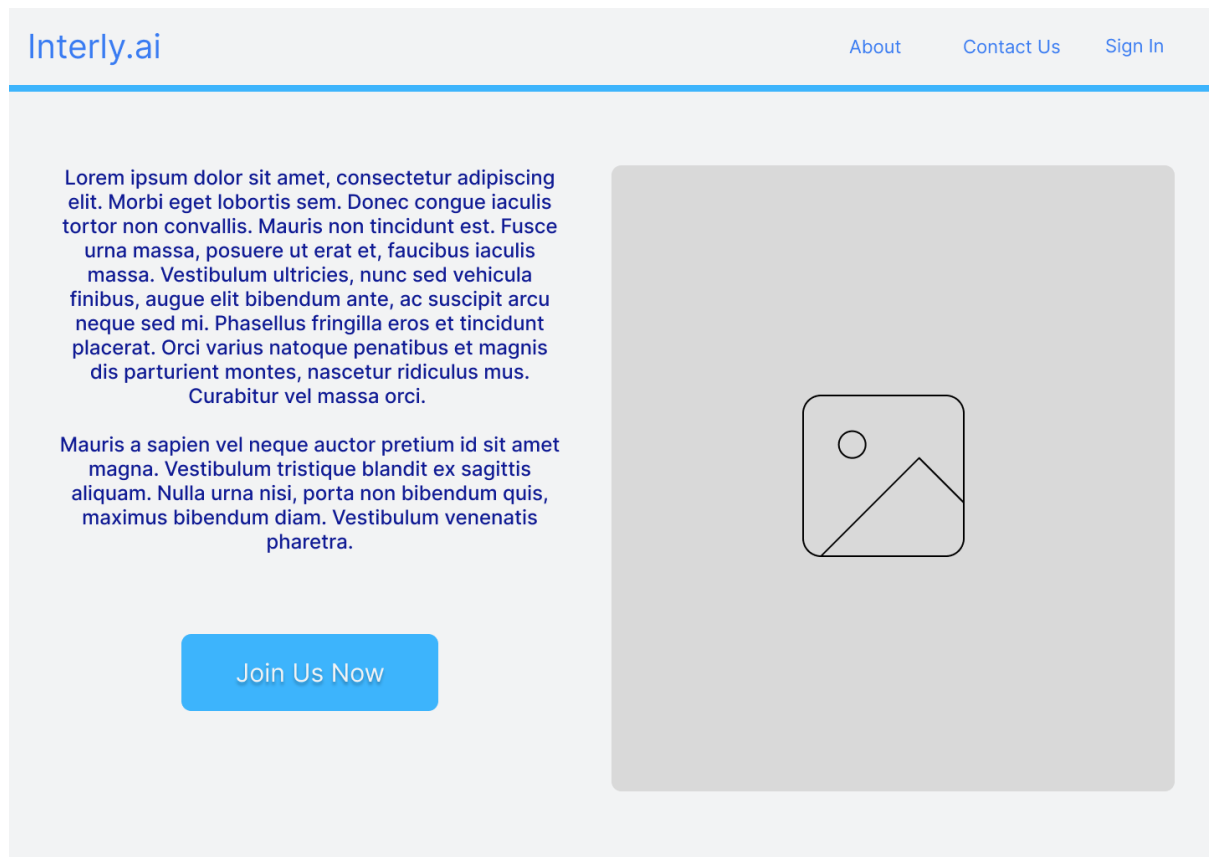
This is the landing page. The landing page contains a brief description of the application. From the navbar, visitors can access the sign in page, about page and contact with us. If the visitor clicks the join us now button, they can access the company approve form page where they will enter the required information of their company to apply.

Login Page

Log In to Interly.ai

Email:

Password:

Forgot Password ?

Log In

This is the sign in page. This page will be the same for all of the users (Admins, Companies, Interviewers and HRMs). Users will enter their emails and passwords. Account types will be decided on the server side after the user clicks the Login button.

HR Manager Main Page

This is the main page of HR Managers. They can see the upcoming interviews on the screen and join them. If the interview date is close, the join button will become active. Otherwise, it will stay inactive. They can also see the data hangars where analysis of the interviews are held. In addition to that, they can also see the interviewers in the company and a simple report about them which tells the number of interviews that person did and how many of them resulted in recruitment. From the navbar, the user can access all upcoming interviews, data hangars and interviewers and settings and the user can also logout from the navbar. The user can also access the create interview page.

Interview Creation

Interly.ai   About   Contact Us   👤

Create An Interview

Position: [   ]

Interviewee Information

Email: [   ] ⚠

Name: [   ]

Surname: [   ]

CV: [Upload   ]

Schedule

| | December | | | | | |
Mo	Tu	We	Th	Fr	Sa	Su
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

🕐 From 18:00   🕐 To 18:30

[Create Interview]

The interview creation screen can be seen by HR Managers and interviewers. The position of the job must be entered. If the email is available in the database which means the interviewee has already done an interview with the company, the other information of the interviewee will be filled automatically. In addition to that, the date and the time can be adjusted on the calendar and time picker. After all necessary information is filled, the interviewer can create the interview.

Data Hangar
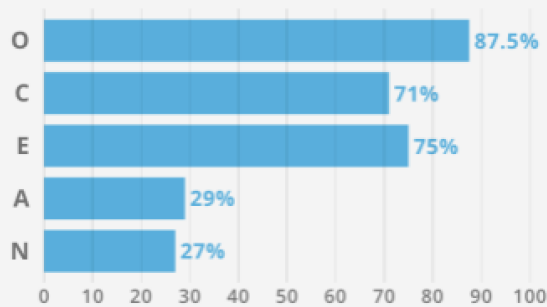
Data hangars are the places where the analysis of the interviews are held. The results are shown bottom with graphics. In addition to that, the general information about the interviewee can be seen on the page and also the information of recruitment can be seen. If the interviewee was rejected, the recruited status will be updated to rejected or no, if it was accepted, the status will be updated to yes or accepted.

Meeting Page:
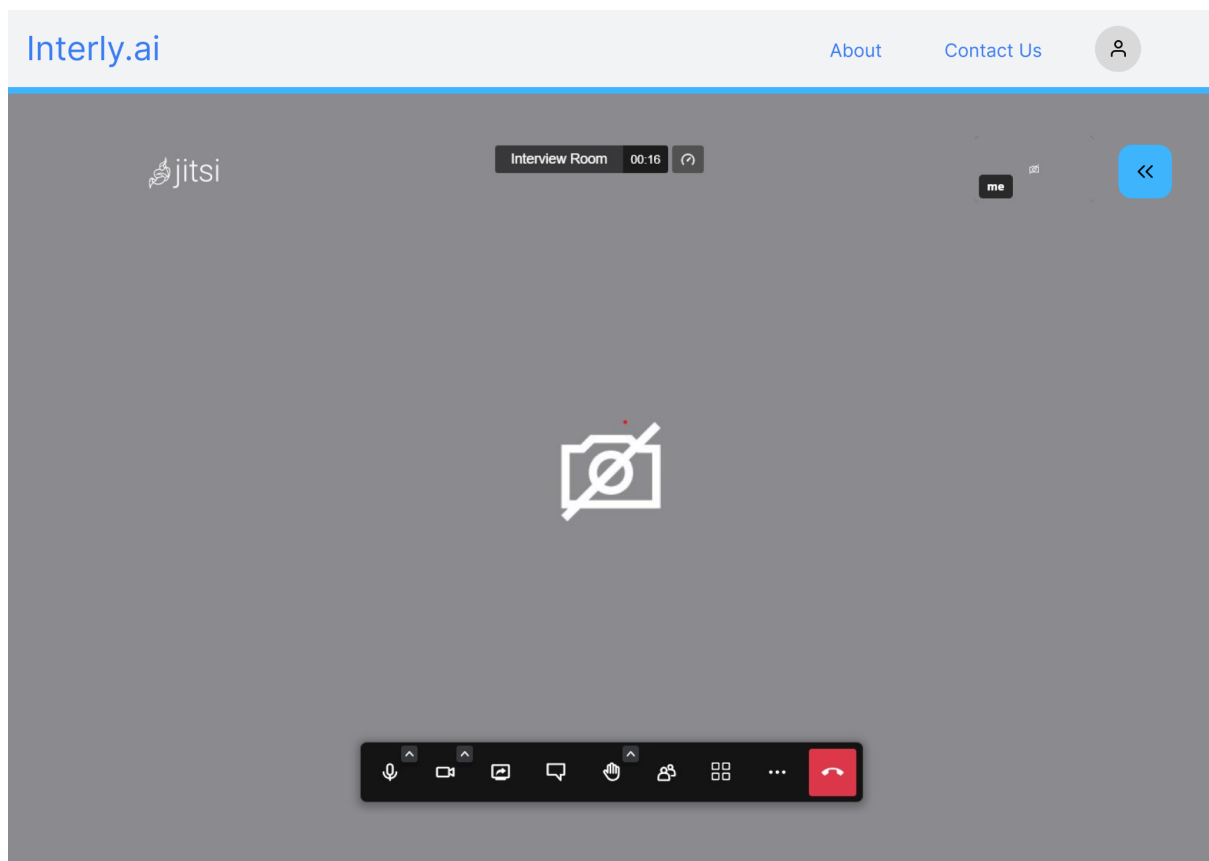
This page is the meeting page. Both interviewers and interviewees can see this page. They can mute/unmute, share screen, turn on/off their camera and leave the meeting. And on the upper right side of the page there is a little blue arrow button. This button is only available to the interviewers. This button makes the interviewer able to see the interviewee's real time analysis data.

Meeting Page with Analysis Data Shown
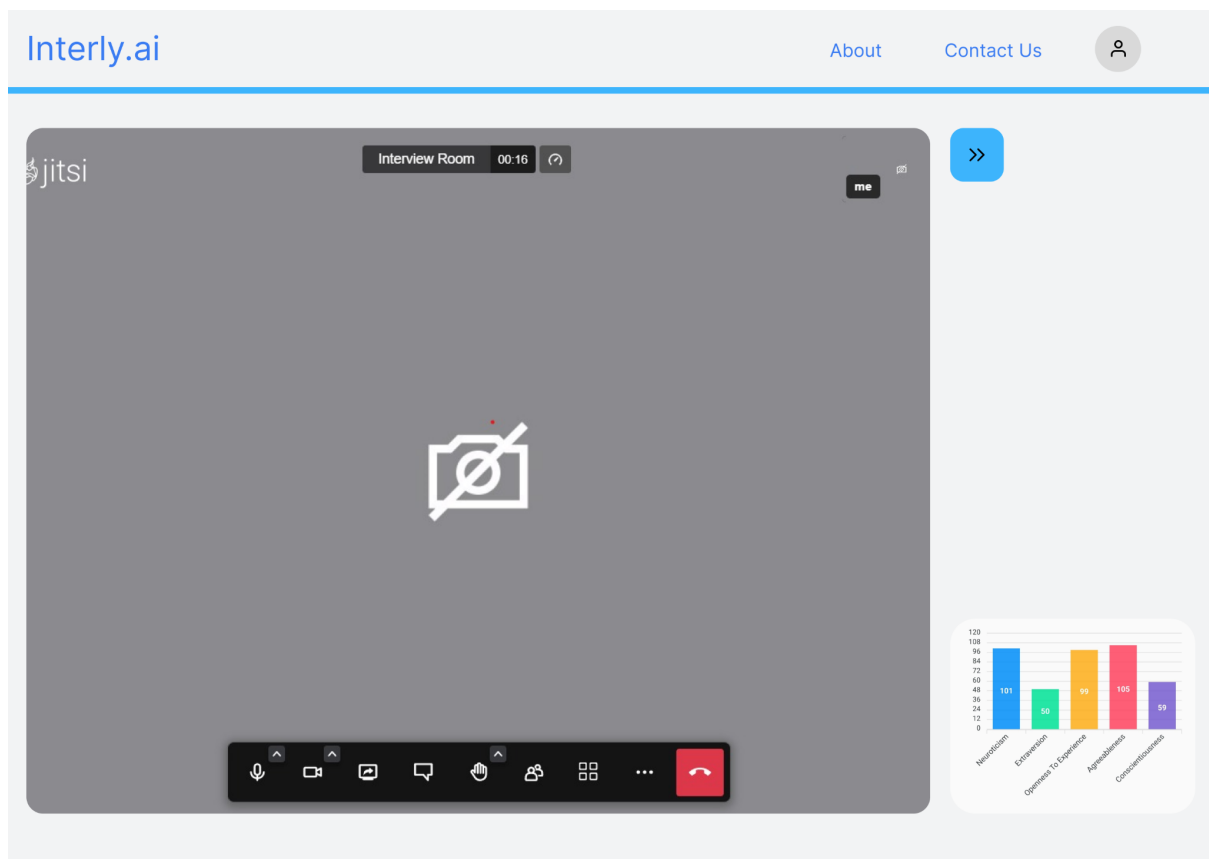
This page is almost the same as the previous page. The only difference is there is analysis data of interviewee, which is calculated and shown in real time.

Interviewee Approval Pop-up

This pop-up is to inform the interviewee and give a chance to allow or reject the analysis to be processed for this interview.

List of HR Managers - Company:

Interly.ai   About   👤

HR Managers

Arda Serim		Arda Serim	Arda Serim
Department: Bravo		Department: Bravo	Department: Bravo
	Fire		
	Downgrade To HR		
Update		Update	Update

Arda Serim	Arda Serim	Arda Serim	Arda Serim
Department: Bravo	Department: Bravo	Department: Bravo	Department: Bravo
Update	Update	Update	Update

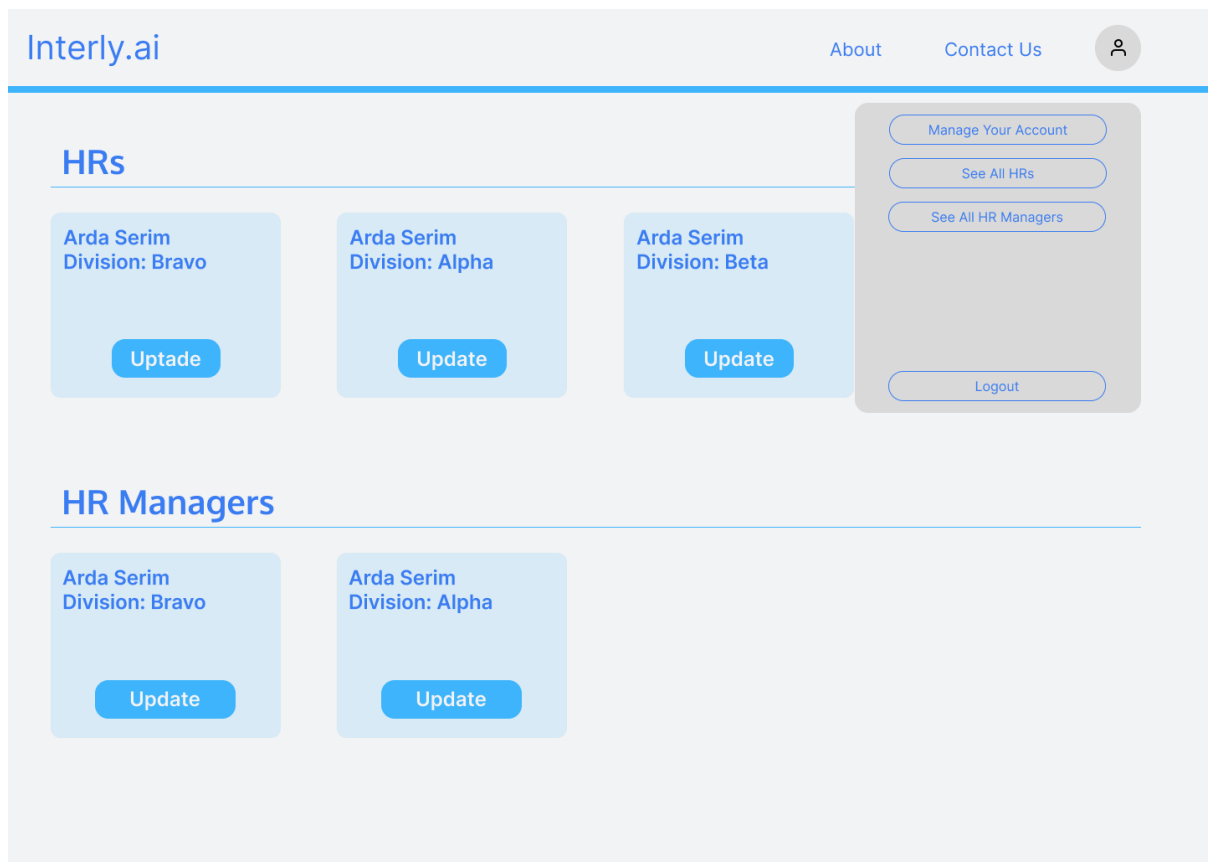| Arda Serim | Arda Serim | Arda Serim | Arda Serim |
| Department: Bravo | Department: Bravo | Department: Bravo | Department: Bravo |
| Update | Update | Update | Update |

This is the main page for controlling operations about HR managers. Only very privileged users like CEO's or general managers who are very high in the company hierarchy will have access to company accounts and view this page. From here, general managers can review all HR managers, a brief information card about their name and department. Also the managers with access to company accounts can update the status of any HR Manager currently working in the company by just clicking the update button. Currently there are two options planned for an HR manager. A CEO can directly fire an HR manager by clicking the fire button. Alternatively, he/ she can change the role of an HR Manager to a normal HR and the system will automatically change the roles and responsibilities of that user with one click to Downgrade to HR.

List of HRs - Company:

Interly.ai   About   👤

HRs

Arda Serim	Fire	Arda Serim	Arda Serim
Department: Bravo	Upgrade To Manager	Department: Bravo	Department: Bravo
Update		Update	Update

Arda Serim	Arda Serim	Arda Serim	Arda Serim
Department: Bravo	Department: Bravo	Department: Bravo	Department: Bravo
Update	Update	Update	Update

Arda Serim	Arda Serim	Arda Serim	Arda Serim
Department: Bravo	Department: Bravo	Division: Bravo	Department: Bravo
Update	Update	Update	Update

Similar to the previous page, the administrators of the company can handle HR operations in a very user friendly way. They can see all human resources workers currently working in the company and perform operations about their role. After clicking update, they can easily disconnect the role of that HR from the company and refrain from doing anything in the name of the company. Also upgrading an HR could be easily done from this page by the general managers via clicking the Upgrade to Manager button. System will automatically change the role and privileges of that user and update his/her role on other pages.

Company - Main Menu

Interly.ai   About   Contact Us   👤

HRs

Manage Your Account

See All HRs

See All HR Managers

Arda Serim
Division: Bravo

Arda Serim
Division: Alpha

Arda Serim
Division: Beta

Uptade   Update   Update   Logout

HR Managers

Arda Serim
Division: Bravo

Arda Serim
Division: Alpha

Update   Update

This is a more general page for a company. The information of two previous pages can be seen here also in a more organized and less detailed way. However, the employer operations can also be performed here by clicking the update button which means the functionality is still preserved. Also from the navbar, List of HR's and List of Manager's can be reached to see all of them at the same time. Also by clicking the manage your account, button company settings page can be viewed.

Company Settings:

Interly.ai   About   Contact Us   👤

Settings

Company Email: arda.serim@random.com   **Change Email**

New Password: New Password
Re-enter Password: New Password   Change Password

Subscription Plan: **Change Plan**

This is the account settings page for a company account. The very top directors of the company can access this page. Company mail or password change requests can be done from here by clicking the change email or change password buttons. Since this is a delicate process, the changes will apply only after the request is coming from valid and trustworthy sources. Changing the subscription package will be handled from this page, by clicking the change plan button.

Company Registration Form:

Interly.ai

Application Details

Company Name:

Company Email:

Name of Applicant:

Surname of Applicant:

Number of Employees:

Country:

State:

Post Code:

Any Other Information

Apply

This page is used by companies that want to use Interly.ai. Companies need to fill this form to be able to use our system. After they fill the form and press the Apply button, Admins will be notified. Only if admin approves companies registration, will companies be able to use Interly.ai.

Interviewer Main Page:

This page is the main page of an interviewer and it indicates the upcoming interviews that the interviewer will attend. Each interview is represented separately and shows the name of the candidate, the position that is applied by a candidate of the corresponding interview along with the date and time when the interview is scheduled. The interviewer can join an interview by clicking the button named Join, which is located at the bottom of an interview component. At the bottom of this page, there is a part that shows Data Hangars which is the analysis data of an interview that the interviewer attended before. Each hangar shows the brief information including the name of the candidate, the position s/he applied, and the result of the interview and more information can be viewed by clicking the button named More Details. An interviewer has other options on the main page. S/he can manage his/her account and create interviews as well.

Interviewer Detailed Page

Interly.ai

About   Contact Us

General Information

Name: Arda
Surname: Serim
Interview Count 10
Total Recruitments: 6

Data Hangars

Arda Serim
Position: Position
Recruited: No

More Details

Arda Serim
Position: Position
Recruited: Yes

More Details

Recruitments

Arda Serim
Position: Position

More Details

Arda Serim
Position: Position

More Details

This page is the interviewer's detailed page and s/he can see the number of interviews s/he attended and total recruitments of these interviews. In this page, the interviewer can see the data hangars and the corresponding recruitments. To get more information about the data hangars or interview results, the admin can click the button named More Details.

Settings Page for Interviewer and Human Resource Manager

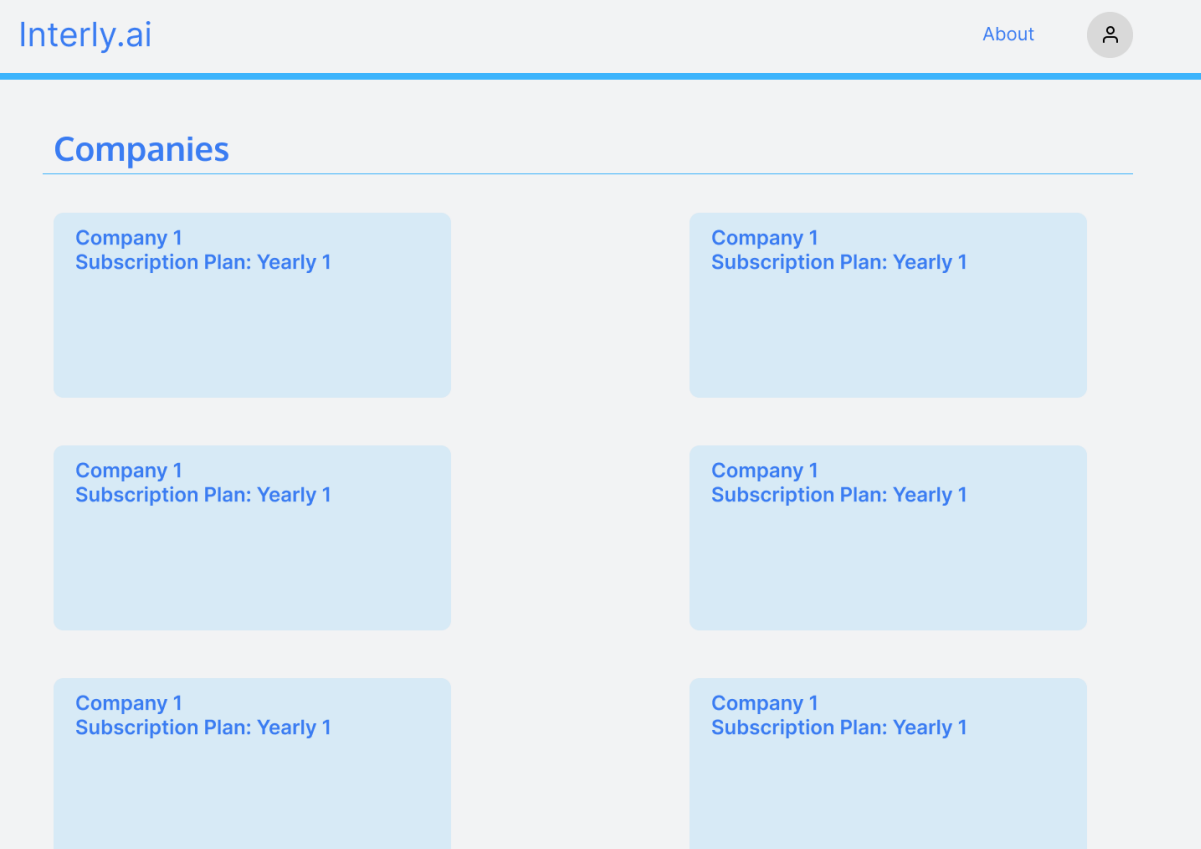Interly.ai   About   Contact Us   👤

Settings

Your Email: arda.serim@random.com   Change Email

New Password: New Password
Re-enter Password: New Password   Change Password

This page is the settings page for both interviewers and human resource managers. Users of both user types can change their emails and passwords from this page.

Company List Page For Admin

Interly.ai   About   👤

Companies

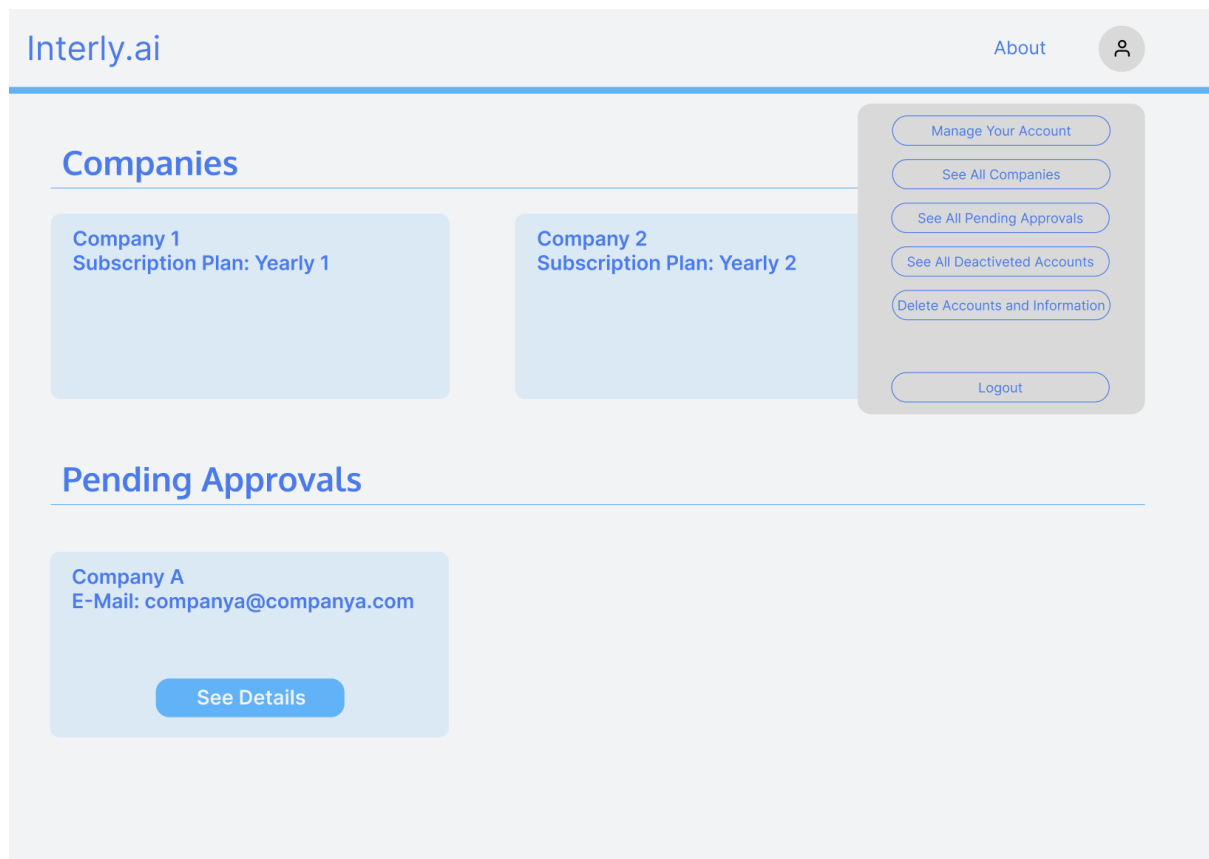|	
Company 1 **Subscription Plan: Yearly 1**	**Company 1** **Subscription Plan: Yearly 1**
Company 1 **Subscription Plan: Yearly 1**	**Company 1** **Subscription Plan: Yearly 1**
Company 1 **Subscription Plan: Yearly 1**	**Company 1** **Subscription Plan: Yearly 1**

This page indicates the companies in the Interly.ai application. Their names and subscription plan can be seen by the admin.

Deactivated Accounts List Page For Admin

Interly.ai   About   👤

Companies

| Company 1 | Company 1 |
| Subscription Plan: No | Subscription Plan: No |

| Company 1 | Company 1 |
| Subscription Plan: No | Subscription Plan: No |

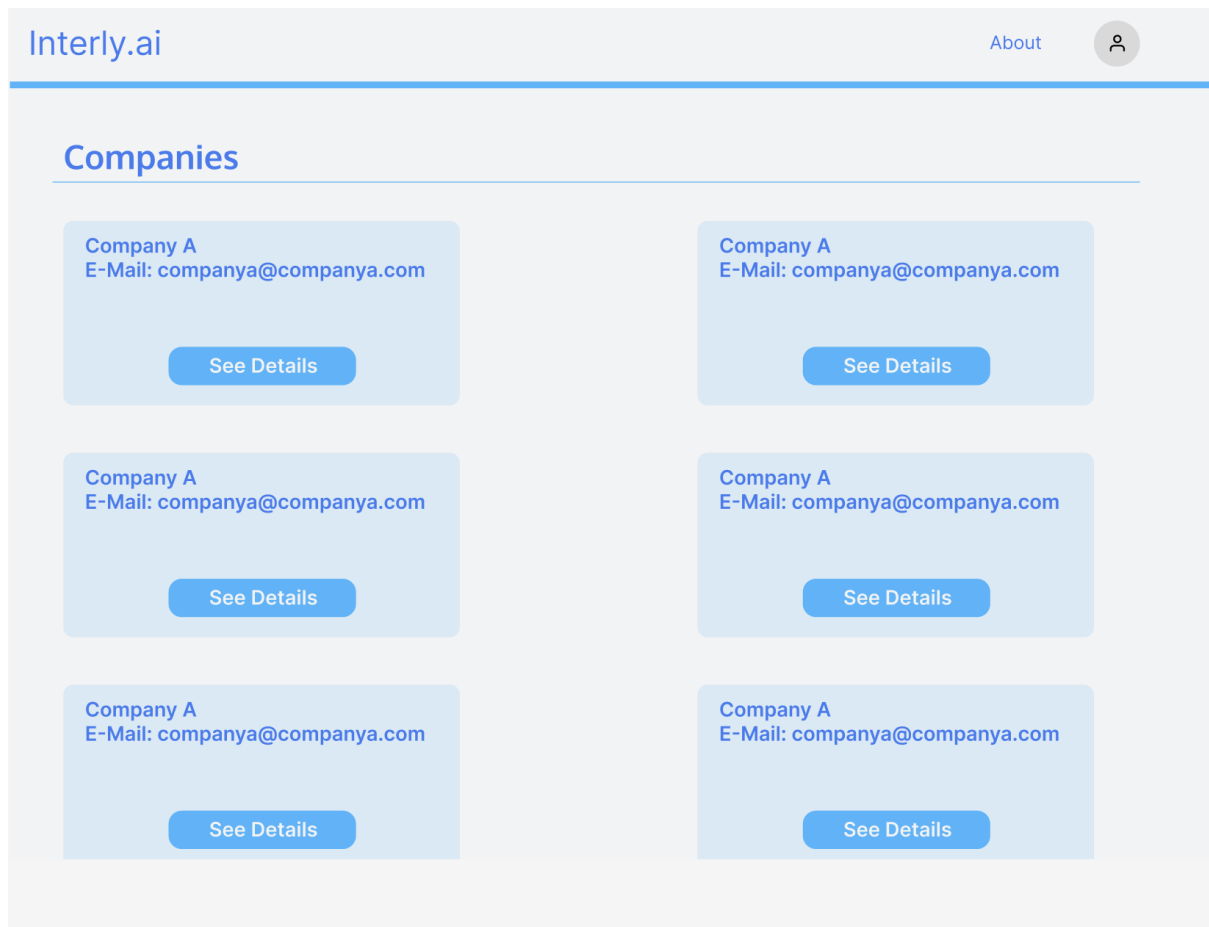| Company 1 | Company 1 |
| Subscription Plan: No | Subscription Plan: No |

This page indicates the deactivated companies list. Name of the company and its subscription plan can be seen in each component by the admin. These companies are the ones that do not pay in the required time period.

Admin Main Menu Page

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Companies

| Company 1 | Company 2 |
| Subscription Plan: Yearly 1 | Subscription Plan: Yearly 2 |

Manage Your Account
See All Companies
See All Pending Approvals
See All Deactiveted Accounts
Delete Accounts and Information

Logout

Pending Approvals

Company A
E-Mail: companya@companya.com

See Details

This page is the main page of admin users. In this page, admins can see the currently subscribed companies, and the companies that are waiting for the approval. This approval stage can be because of that either they are not approved by the admins on purpose or they have not made their payments. Also, admins have shortcut menu items on the top of their screen. When they click on the account button on the top right side of the screen, they can manage their accounts, and see all the companies approved or pending. Moreover, they can reach the related pages to deactivate or delete some accounts.

Pending Approvals Page

In this page, admins see the companies waiting for approvals. In each card, there is a button to see the details of the companies. By clicking this button, admin can go to the create a company account page.
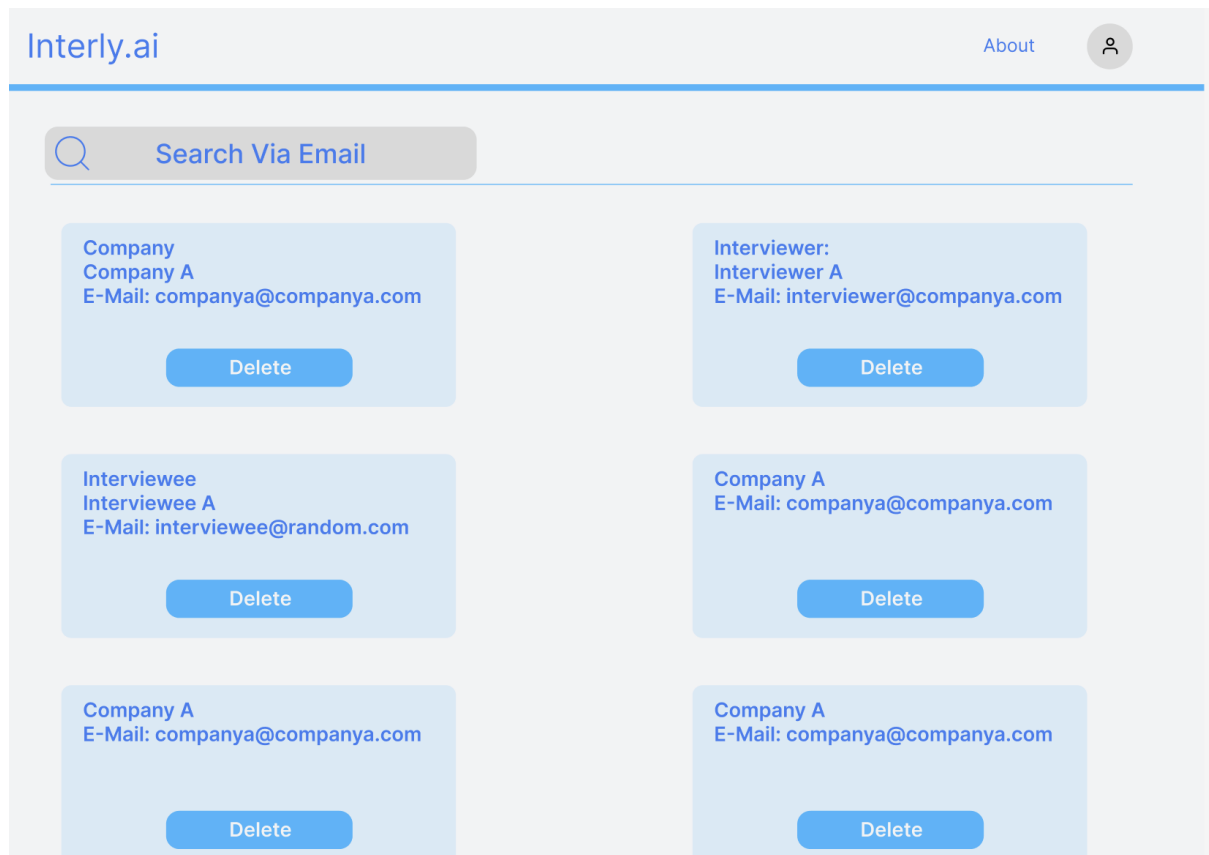
Create Company Account Page

Interly.ai

About

Application Details

Company Name:	Company A
Company Email:	companya@companya.com
Name of Applicant:	Name
Surname of Applicant:	Surname
Number of Employees:	500
Country:	Country A
State:	State A
Post Code:	06000
Any Other Information	Lorem ipsum dolor sit amet,...

Approve Application and Create Account

In this page, admins can approve company accounts. Companies apply for Interly.ai to have an account and make a request for this on the application's website. After a request comes, the company application drops to the pending companies section. By clicking on a pending application card, admin comes to this page and the fields are already filled automatically when the application form is sent. Admin can make some changes if necessary, and can approve the application to create a company account.

Delete Account Page

Interly.ai   About   👤

🔍 **Search Via Email**

Company
Company A
E-Mail: companya@companya.com

Delete

Interviewer:
Interviewer A
E-Mail: interviewer@companya.com

Delete

Interviewee
Interviewee A
E-Mail: interviewee@random.com

Delete

Company A
E-Mail: companya@companya.com

Delete

Company A
E-Mail: companya@companya.com

Delete

Company A
E-Mail: companya@companya.com

Delete

In this page, admins can search accounts and delete an account if needed.

4. Other Analysis Elements

4.1. Consideration of Various Factors in Engineering Design

The right to erasure or right to be forgotten is one of the important constraints on the project [3]. According to this right, an interviewee may want to delete his/her CV and analyses saved in the database. Therefore, an interviewee should be allowed to ask to be deleted. In order to achieve this, admins have the right to delete any information of an interviewee. If an interviewee wants to be deleted, the interviewee must send an email to the companies they have been applied to or to the admins to delete the all information. If they send the email to a company, then the company must send an email to the admins in order to ask them to delete the interviewee from the company's database. After that, admins can delete the information of the interviewee.

In a company, vertical hierarchy is important. Since it increases efficiency by allowing people who are higher in the hierarchy to check whether their subordinates are working efficiently and correctly. Therefore, HR managers should see a report about each human resources staff. The report includes recruitment rate and other statistics. With these reports, HR managers can compare each staff and determine their efficiency.

Factors	Level Of Effect	Effects
Privacy	4	Admins can delete any information of an interviewee.
Economy?	6	HR managers can view statistics of each interviewer and compare them.

4.2. Risks and Alternatives

Interly.ai is aimed to enter a market of online interview applications like Microsoft Teams, Zoom and Google Meets. Even though the market is dominated by these applications, Interly.ai has a unique feature that helps it stand out, which is personal analysis of interviewees using machine learning. However, with each day online

interviews are becoming more and more popular. Hence, there may be new online meeting applications or already existing ones may get updates, which add personal analysis. This is a big risk for Interly.ai. Thus, we have an alternative plan which is to add more competitive functions to the app, such as using a transcript of the interview to give a more detailed analysis of the interviewee.

Another risk that Interly.ai may encounter is problematic real time analysis performance. It is because analysis should be real time to better help interviewers. Analysis of the interviewee will be done on the client side, which may have a slow performance for some users. Even if this is a low risk since many computers can handle the process, we need to have an alternative plan which is moving the analysis process to the server side. In this alternative, the client side will only have a little process to extract necessary data to do the analysis. Then the server will complete the real time analysis.

Risk	Risk Level	Alternative Plan
Competitor application published before Interly.ai	High Risk	Add more competitive features like transcript analysis.
Client side not being able to give real time results	Medium Risk	Move analysis process to server side.

4.3. Project Plan

We are trying to develop a product that has different aspects in terms of implementation and requires various different systems to collaborate simultaneously and smoothly in a timely manner since we are trying to minimize the unavoidable delay of information transmission. Therefore, we identified and determined what we should do for each differentiated system and prepared an action plan that will utilize our time as efficiently as possible to achieve all of the goals we have set to us at the beginning of the project cycle. First of all, we will make literature research to determine tools and techniques that could be used in the implementation and market research to identify our rivals on the market and their features. After that we will try to

develop an app that could at least meet basic requirements of a video call app. After ensuring we can process interviewee video on our product, we will start to capture faces and normalize them to make them interpretable by our machine learning model. Following that we will train our model with the data we found in the literature research phase. After that what is left according to the plan is to show the analysis results on an interviewee screen in real time and optimize the system as much as possible. As a project management tool and version control system we are planning to use github.

Work Packages:

#WP	Title	Leader	Members
WP 1	Project Specification Report	Erhan Er	Osman Semih Tiryaki, Murat Furkan Uğurlu, Arda Serim, Furkan Turunç
WP 2	Analysis Report	Arda Serim	Osman Semih Tiryaki, Murat Furkan Uğurlu, Erhan Er
WP 3	Detailed Design Report	Osman Semih Tiryaki	Murat Furkan Uğurlu, Erhan Er, Arda Serim, Furkan Turunç
WP 4	Final Report	Furkan Turunç	Osman Semih Tiryaki, Murat Furkan Uğurlu, Erhan Er, Arda Serim
WP 5	Presentation & Prototype Demo	Murat Furkan Uğurlu	Osman Semih Tiryaki, Erhan Er, Arda Serim, Furkan Turunç
WP 6	Presentation & Demo	Murat Furkan Uğurlu	Osman Semih Tiryaki, Erhan Er, Arda Serim, Furkan Turunç
WP 7	Server Side	Osman Semih Tiryaki	Murat Furkan Uğurlu, Furkan Turunç

WP 8	Backend	Arda Serim	Osman Semih Tiryaki, Erhan Er
WP 9	Frontend	Erhan Er	Arda Serim, Furkan Turunç
WP 10	UI Design	Erhan Er	Arda Serim, Osman Semih Tiryaki
WP 11	Business Side	Murat Furkan Uğurlu	Furkan Turunç, Osman Semih Tiryaki
WP 12	Deep Learning	Furkan Turunç	Osman Semih Tiryaki, Murat Furkan Uğurlu, Erhan Er, Arda Serim
WP 13	Project Management	Murat Furkan Uğurlu	Osman Semih Tiryaki, Erhan Er, Arda Serim, Furkan Turunç

WP 1: *Project Specification Report*	
Start Date: *Oct 11, 2022*	End Date: *Oct 17, 2022*
Description: *This work package indicates the plan to prepare a specification report.*	
Tasks: ***Task 1.1*** *Description* ***Task 1.2*** *Constraints* ***Task 1.3*** *Professional and Ethical Issues* ***Task 1.4*** *Functional Requirements* ***Task 1.5*** *NonFunctional Requirements* ***Task 1.6*** *Ongoing Discussions* ***Task 1.7*** *Innovation Side of the Project*	
Deliverables: *Project Specification Report*	

WP 2: *Project Analysis Report*
Start Date: *Nov 1, 2022*   End Date: *Nov 13, 2022*
Description: *This work package indicates the plan to prepare an analysis report.*
Tasks: ***Task 2.1*** *Current System* ***Task 2.2*** *Overview* ***Task 2.3*** *Functional Requirements* ***Task 2.4*** *NonFunctional Requirements* ***Task 2.5*** *Pseudo Requirements* ***Task 2.6*** *System Models* ***Task 2.7*** *Other Analysis Elements* ***Task 2.8*** *Ongoing Discussions*
Deliverables: *Project Analysis Report*

WP 3: *Detailed Design Report*
Start Date: *Feb 1, 2023*   End Date: *Feb 13, 2023*
Description: *This work package indicates the plan to prepare a detailed design report*
Tasks: ***Task 3.1*** *Introduction* ***Task 3.2*** *Proposed software architecture* ***Task 3.3*** *Subsystem services* ***Task 3.4*** *Consideration of Various Factors in Engineering Design* ***Task 3.5*** *Teamwork Details* ***Task 3.6*** *Packages* ***Task 3.7*** *Class Interfaces*
Deliverables: *Detailed Design Report*

WP 4: *Final Report*	
Start Date: *Apr 20, 2023*	**End Date:** *May 1, 2023*
Description: *This work package indicates the plan to prepare a final report*	
Tasks: *Task 5.1. Introduction* *Task 5.2. Requirements Details* *Task 5.4. Final Architecture and Design Detail**s*** *Task 5.5. Development/Implementation Details* *Task 5.6. Testing Details* *Task 5.7. Maintenance Plan and Details* *Task 5.8. Other Project Elements* *Task 5.8.1. Consideration of Various Factors* *Task 5.8.2. Ethics and Professional Responsibilities* *Task 5.8.3. Judgements and Impacts to Various Contexts* *Task 5.8.4. Teamwork and Peer Contribution* *Task 5.8.5. Project Plan Observed and Objectives Met* *Task 5.8.6. New Knowledge Acquired and Learning Strategies Used* *Task 5.9. Conclusion and Future Work* *Task 5.10. Glossary*	
Deliverables: *Final Report*	

WP 5: *Presentation & Prototype Demo*	
Start Date: *Dec 15, 2022*	**End Date:** *Dec 23, 2022*
Description: *Presentation of the project is going to be handled and a quick demonstration of the project's main functionality will be presented at the end of the fall semester.*	
Tasks: *Task 5.1 Presentation* *Task 5.2 Prototype Demo*	
Deliverables: *Presentations & Demonstrations*	

WP 6: *Presentation & Demo*	
Start Date: *May 1, 2023*	**End Date:** *May 15, 2023*
Description: *Presentation of the project is going to be handled and a demonstration of the project together with its full functionalities will be presented at the end of the spring semester.*	
Tasks: ***Task 6.1*** *Presentation* ***Task 6.2*** *Prototype Demo*	
Deliverables: *Presentations & Demonstrations*	

WP 7: *Server Side*	
Start Date: *Nov 18, 2022*	End Date: *May 15, 2023*
Description: *Handling API requests, authentication, microservices and calls to backend*	
Tasks: ***Task 7.1*** *API Gateway: Maintaining backend calls to access data, business logic, functionality from microservices* ***Task 7.2*** *Authentication: Authentication and refresh token, intercepting tokens and use of authguards* ***Task 7.3*** *Microservices: Implementation of microservices each having single responsibility* ***Task 7.4*** *Website Maintenance: CORS, cache implementation, request headers and localstorage* ***Task 7.5*** *Test: Testing, unit tests, e2e tests.*	
Deliverables: *Web Services (Node.JS)*	

WP 8: *Backend*	
Start Date: *Nov 21, 2023*	End Date: *Apr 1, 2023*
Description: *Coding the APIs for the usage of frontend and creating the database.*	
Tasks: **Tasks:** ***Task 8.1*** *Identifying the necessary entities for the database.* ***Task 8.2*** *Connecting the backend coding project to the database.* ***Task 8.3*** *Coding the entity and DTO classes.* ***Task 8.4*** *Coding the repository classes.* ***Task 8.5*** *Coding the service classes.* ***Task 8.6*** *Coding the controller classes.*	
Deliverables: *Backend*	

WP 9: *Frontend*	
Start Date: *Nov 14, 2022*	End Date: *Apr 1, 2023*
Description: *Coding the designed pages and incorporating other necessary libraries.*	
Tasks: ***Task 9.1*** *Identifying the reusable components* ***Task 9.2*** *Coding the screens that must be ready before prototype demo* ***Task 9.3*** *Coding the other screens* ***Task 9.4*** *Database Connection*	
Deliverables: *Front End*	

WP 10: *UI Design*	
Start Date: Oct 24, 2022	End Date: Nov 13, 2022

Description: *This work package indicates the plan to prepare a UI design.*

Tasks:
Task 10.1 Landing Page
Task 10.2 Interview Screen
Task 10.3 Interview Screen with analysis question
Task 10.4 Sign in Screen
Task 10.5 Settings
Task 10.6 Admin Main Menu
Task 10.7 Company Account Creation
Task 10.8 Pending Approval List
Task 10.9 Account Deletion
Task 10.10 List of HR Managers
Task 10.11 List of HRs
Task 10.12 Company Main Menu
Task 10.13 Company Settings
Task 10.14 Interviewer Main Menu
Task 10.15 Interviewer Detail Page
Task 10.16 Admin Company List
Task 10.17 Deactivated Accounts List
Task 10.18 HR Manager Main Menu
Task 10.19 Data Hangar
Task 10.20 Interview Creation
Task 10.21 Company Application Form

Deliverables: UI Design

WP 11: *Business Side*	
Start Date: *Nov 14, 2022*	**End Date:** *May 15, 2023*

Description: *Following the dream of establishing our own start-up, the business side of this project is going to be handled.*

Tasks:
Task 11.1 Application to the start-up summits
Task 11.2 Finding investor for financial support
Task 11.3 Release the first version of the application to gain market share

Deliverables: *Operational Business Strategy*

WP 12: *Deep Learning*	
Start Date: *Oct 20, 2022*	**End Date:** *May 15, 2023*

Description: *This work package indicates the plan to implement the deep learning side of the project for the analysis of the interviewee. Convolutional Neural Network models will be built using the training dataset.*

Tasks:
Task 12.1. Literature Research
Task 12.2. Finding Training and Validation Dataset
Task 12.3. Getting real-time frames from the video of the interviewee
Task 12.4. Normalization of the frames
Task 12.5. Applying Convolutional Neural Network Model
Task 12.6. Training dataset for analyzing the personality data
Task 12.7. Training dataset for analyzing the current mood data
Task 12.8. Training dataset for analyzing the level of self-confidence
Task 12.9. Training dataset for analyzing the level of anxiety
Task 12.10. Testing on the test and validation datasets

Deliverables: *Deep Learning Model and Packages*

WP 13: *Project Management*	
Start Date: *Nov 14, 2022*	**End Date:** *May 15, 2023*

Description: *The management of issues such as task distribution within the project, meeting arrangements, adjusting the balances within the team will be handled.*

Tasks:
Task 13.1 Fair task distribution
Task 13.2 Arranging meetings
Task 13.3 Arranging team collaboration
Task 13.4 Adjusting intra-team relations
Task 13.5 Directing project progress
Task 13.6 Leading brainstormings via team discussions

Deliverables: *Interly.ai web application*

4.4. Ensuring Proper Teamwork

Equal distribution of tasks is an important criterion for this project. Therefore, each member of the team should be able to take responsibility when necessary. As a team, we split into two different domains for 3 weeks as an user interface and a deep learning domain. In this way, it was aimed to advance the project from two different branches quickly. At the end of this 3-week process, the teams shared their progress with each other and the people who would take part in the teams were determined again. In this way, the member in one domain will not continue the project in a very disconnected way from the other domain. In addition, if there is an area in which each member in the team specializes, it is planned to take quick action when a job needs to be done in their own field. In this way, each member in the team shares the leadership. These sprints will continue for the rest of the semester for different domains such as backend or server domains. Furthermore, feedback is an important point in the development of this project since it reinforces the positive communication and it enhances the performance of the team. Through feedback, each member feels the strength of being in a team. A team member takes the responsibility of another member for some time if this member is not available to handle his/her task, which is the positive outcome of the proper teamwork.

4.5. Ethics and Professional Responsibilities

Interly.ai aims to help both companies and candidates by automatizing and clarifying hiring processes by utilizing the latest innovations in the machine learning field. While serving our great range of functionality to everyone that wants to benefit from the interly.ai system, we are well aware that the data processed inside the system is very personal, sensitive and should never be leaked. As developers of such a vulnerable application we will always try to prioritize protecting the privacy and safety of our customers' sensitive information. To ensure our customers never have doubts and feel nervous about using our product, we will always make decisions ethically, responsibly and fairly both in design and implementation phase.

Another ethical issue about projects making suggestions about real individuals characteristics and thus recommending hiring managers into a certain direction, even though the last decision is always up to the employees, is treating everyone equally and fairly. Any kind of discrimination could change lives of thousands of individuals and can affect a company's productivity. As engineers we promise to treat

every candidate equally no matter what their race, gender, ethnicity, religion or culture is. Especially, when training our AI model, we will try to train a model that has no biases against any type of minority.

4.6. Planning for New Knowledge and Learning Strategies

In order to accomplish what is aimed in this project, the team gains new knowledge by learning the technologies to be used in this project. Even though team members mainly focus on different aspects of the project, each member should have a basic idea about what others deal with in order not to have a synchronization problem on the development. The main object of this project is deep learning, which is a new concept for all of the team members and each member tries to learn about it. While gaining new knowledge, online resources published on the internet are mainly used. Moreover, academic papers written about similar previous projects are benefitted as a pathfinder for the flow of the project.

5. Ongoing Discussions

- Main focus of the project is to analyze interviewee's facial expression and body language. If we can manage to analyze these visual data, the voice tone and the transcription of the interviewee's speech will also be analyzed for the rest of the semester.
- An interviewee will be analyzed in terms of the personality, mood, anxiety level, and self-confidence. In addition, the interviewees will be examined in order to check whether they are cheating or not during the interview, if a related dataset can be found in the remaining time. However, this is not the main purpose of the project at the moment.
- If there is enough time to implement voice analysis, the Natural Language Toolkit is planned to be used for the language processing after the transcription of the speech of the interviewee. When there is a need to classify the voice from emotional or personality aspects, Multinomial Naive Bayes Algorithms can be applied as well. These are the initial plans for the voice analysis, therefore, the concrete plan is to be prepared after the computer vision part if time allows.

6. Glossary

UI: User Interface
Data Hangar: All data of analysis of an interviewee in his/her interview.

7. References

[1] "How covid-19 has fundamentally changed recruitment," *EURES*, 13-Oct-2021. [Online]. Available: https://eures.ec.europa.eu/how-covid-19-has-fundamentally-changed-recruitment-2021-10-13_en. [Accessed: 13-Nov-2022].

[2] V. Postrel, "Job interviews should stay online after covid," *Bloomberg.com*, 07-Apr-2021. [Online]. Available: https://www.bloomberg.com/opinion/articles/2021-04-07/job-interviews-should-stay-online-after-covid. [Accessed: 13-Nov-2022].

[3] "Right to erasure," *ICO*. [Online]. Available: https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/individual-rights/right-to-erasure/#:~:text=individual%20for%20ID%3F-,What%20is%20the%20right%20to%20erasure%3F,time%20the%20request%20is%20received. [Accessed: 12-Nov-2022].