CHAPTER 1

INTRODUCTION

Robotic Process Automation (RPA) emerges as a software-based solution to automate rules-based business processes that involve routine tasks, structured or unstructured data, and deterministic outcomes. Recent studies report the benefits of the application of RPA in terms of productivity, costs, speed and error reduction. Thus RPA based software comes as a boon to this rapidly urbanizing era. Robotic process automation is an emerging form of business process automation technology based on the notion of software robots or artificial intelligence workers. In traditional workflow automation tools, a software developer produces a list of actions to automate a task and interface to the back-end system using internal application programming interfaces or dedicated scripting language.

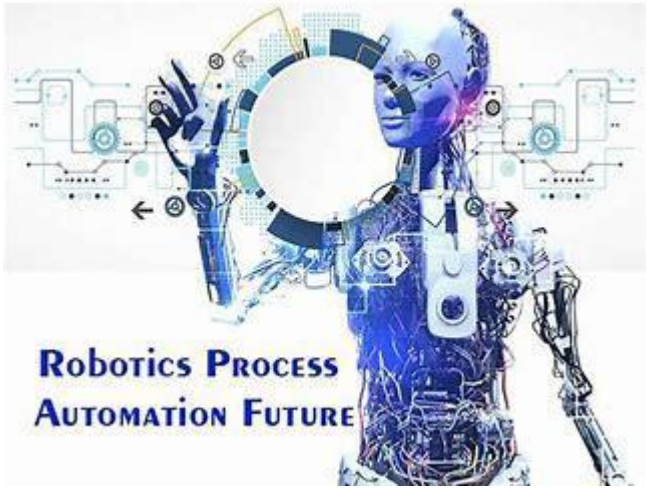

Figure 1.1 Robotic Process Automation

UiPath

UiPath is a leading Robotic Process Automation vendor providing a complete software platform to help organizations efficiently automate business processes. The world's first open online training platform for RPA users.

Figure 1.2 UiPath

UiPath has several features, such as

- Log into any application
- Connect to system APIs
- Copy and paste data
- Move files and folders
- Read and write to databases
- Extract and process structured and semi-structured content from documents, PDFs, emails and forms.
- Open email attachments
- Make calculations
- Scrape data from the web

Uipath help to further build trustworthy workflows along with built-in trust and security from the world's #1 RPA platform. It is founded by Romanian entrepreneur Daniel Dines in the year 2005. UiPath Studio software solution allows automating repetitive office tasks.It converts boring tasks into automation process can work with multiple tools.UiPath studio is available with three different product suite:

UiPath Studio

UiPath Studio is a complete solution for application integration, and automating third-party applications, administrative IT tasks and business IT processes. One of the most important notions in Studio is the automation project.

A project is a graphical representation of a business process. It enables you to automate rule-based processes, by giving you full control of the execution order and the relationship between a custom set of steps, also known as activities in UiPath Studio.Each activity consists of a small action, such as clicking a button, reading a file or writing to a log panel.

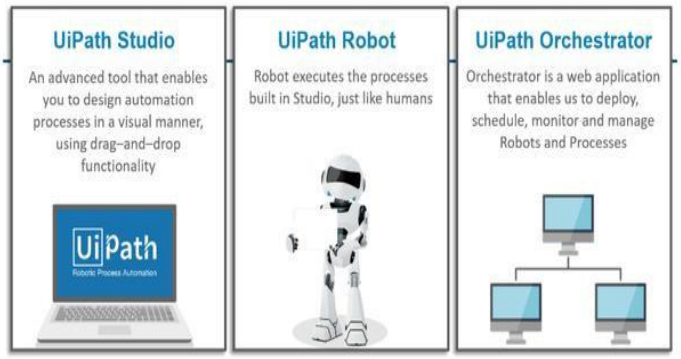

Figure 1.3 UiPath Studio

The main types of supported workflows are:

- **Sequences**
- **Flowcharts**
- **State Machines**
- **Global Exception Handler**

UiPath Robot

The Robot is UiPath's execution agent that enables you to run workflows built in Studio. A Robot is installed as a Windows Service by default. As a result, the Robot can open Windows sessions (interactive or non-interactive), under the Local System account, and has all the rights of a Windows service.

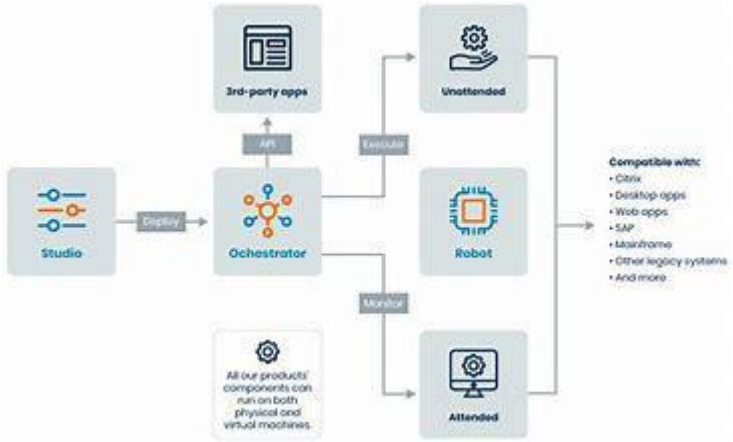

Figure 1.4 UiPath Robot

Industry marketplaces become more connected and complex, the automation solutions necessary to cut through this complexity also take on a more nuanced or intricate approach. This is perhaps evidenced most clearly by the relationship between unattended and attended automation and how these two strains of RPA work synergistically for increased productivity and efficiency across the entire office.While unattended and attended automation do work in concert across a versatile platform, each brand of RPA solution encapsulates different elements of automation for different purposes.

The Robot is split into four components, each being dedicated to a particular task in your automations. The Robot components are:

- **Service** (UiPath.Service.Host.exe):
- **Executor** (UiPath.Executor.exe):
- **Agent** (UiPath.Agent.exe, Robot Tray):
- **Command Line** (UiRobot.exe, Command line):

Having the Robot components split as explained above helps developers, support users, and computers easily run, identify, and track what each component is executing. Special behaviours can be configured per component this way, such as setting up different Firewall rules for the **Executor** and the **Service**.

UiPath Key Features

Open Platform

Our open and extensible platform features hundreds of built-in, customizable, shareable activities, and deep integrations with ERP, BPM and AI technologies. You can develop your own reusable custom activity or shareable automation component in your preferred programming language. Unified search and find across all the automation resources like libraries, activities, projects and open workflows contained within a UiPath Studio process. This significantly accelerates the automation and maintenance of the development process.

High-quality software & robot maintenance features

Tested and proven to deliver 40%+ faster automation design and deployment than competitors, UiPath offers worldwide implementation support, certified training, and a vast network of partner integrators. Specialized workflow recorders for desktop apps, web apps, Citrix environment, and terminal emulators. Simplifies training, makes process modelling and automation faster, and more precise

Scalability

Deploy RPA at enterprise scale. Manage any variety and any number of processes from front to back-office regardless of complexity. Other features of importance include session logs of the software robots' activities and exceptions to allow for debugging by human employees as well as a web-based interface for monitoring the robots.

Security

Defense-grade security and auditing includes RBAC, encryption everywhere, and Veracode certified Code. This technology is trusted as secure by 40+ government agencies. Among the top RPA features for managing security are a robust log of robot activities, detailed audit trails, as well as adherence to the various security standards.

Custom workflows

RPA developers can design powerful and complex automations by incorporating custom VB.Net, Python, Auto hotkey, Javascript, Powershell, and JAVA code directly into an automation workflow. Their work can be stored in the Studio library and shared with other team members across current and future projects.

Leave Automation

Every organization is information driven and it is the staff who drives and carries out day to day activities. This Leave Management System can be used throughout the corporate organization. The staff needs to submit their leaves manually to their respective authorities. This increases the paperwork maintaining the records becomes tedious. Maintaining notices in the records also increases the paperwork. This project system can be used to automate the workflow of leave applications and their approvals in our college. It decreases the paperwork and enables easier record maintenance. It also reduces chances of Data loss. This system has features like notification, leave cancellation, automated leave approval and report generation based on the requested data by the user. Staffs will be empowered and engage with more input and control over their work life. Through LMS one can quickly build the work- flows.

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The powerful flexibility features keep staffs current and compliant, even as rules and regulations change. The Leave Management System is an Intranet based website that can be accessed throughout a college. Since mobile phones are popular and can be used in all walks of life, we have attempted to create an bot that the students can easily access through their smartphones. Although there are many mobile platforms available in the market these days, Android OS is the most user-friendly and programmer friendly platform. Thus reduction of manual and more efficient information system will be achieved through this proposed system. The main advantage of proposed system is that it provides portability and also provides access from anywhere and at any time. Here, both the faculty and the students can make use of this application by installing it in their mobile phone where student is given the authority only to view their record whereas the faculty has the authority to modify and make changes in the record.

CHAPTER 2
LITERATURE SURVEY

A number of applications has been launched in this field with the aim of super improved leave management system, but none of the existing system has the detailed working efficiency. Some of the existing systems are:

2.1 Attendance Management System

The most common problem faced by students these days is related to Attendance[1]. They get short of attendance due to several factors beyond their control as in the case of an emergency, where they might not be able to send their leave application. There are times when due to lack of coordination with the concerned authorities, they miss the attendance of several important in-campus and off-campus activities such as events, workshops, seminars etc. In this paper Biometric scaled up for real time deployment, it provide solution of late coming.

2.2 Online Leave Management System

In some cases, they do not even get the information about the upcoming events which would be beneficial to them. The proposed system automates the existing system[2]. It decreases the paper work and makes the record maintenance process easy by replacing all the traditional methods by computerized techniques. We understand that this project cannot be accomplished with divided thinking.

2.3 Study Paper on Student Leave Management

Keeping these problems in our mind and brainstorming over all the possible solutions, we generated an idea of creating an application which would solve all above stated problems[3]. Through a vast discussion, we came up with the proposal. The idea breaks away from traditional thought and creates a different perspective. Our application mainly focuses on the fair distribution of attendance among students. It provides all the related details of working days, holidays, events & workshops taking place in the college. This project is aimed at developing an online leave management system that is of importance to either an organization. The Leave Management System (LMS) is an Intranet based application that can be accessed throughout the organization or a specified group/Dept. This system can be used to automate the workflow of leave applications and their approvals. The periodic crediting of leave is also automated. There are features like email notifications, automatic approval of leave, report generators etc in this system. Leave Management application will reduce paper work and maintain records in a more efficient way.

2.4 Framework for Staff Management System

Staff and teachers can check their number of leave, leave availed and leave remaining. Staff member can also put a request for a leave to the concerned department head and get approval[4]. Leave request and leave sanctioned to the staff members and teachers can be checked and evaluated online by the administrator. The administrator can approve the leave request and send conformation of the same to the leave applicant.

CHAPTER 3
DESCRIPTION

3.1 INTRODUCTION

The system that is identified, that helps to apply leave through online to the higher authorities which in return sents an SMTP mail message to the applicant regarding the status of the leave. Leave management system makes use of the features of the UiPath to maintain the leave records of the staffs and students updated each and every time. Admin makes some norms that are set for both students and staffs as per the guidelines of the organization. The system would help to make easier maintenance of records and decrease the paper work.

UiPath features included:

- UiPath Studio
- Screen Scraping
- Excel Activities
- Email Activities (SMTP Mail Message)
- Read Line and Write Line Activities

Whenever required any student can upload their leave application on their timeline which would then generate a notification to the parents as well as the faculty about the leave and further the parents can approve the leave there itself which again would notify the faculty about the leave is approved by the guardians or not. This will help to reduce the paper work and loss of students attendance when they are not able to send the leave applications on time.

3.2 BLOCK DIAGRAM

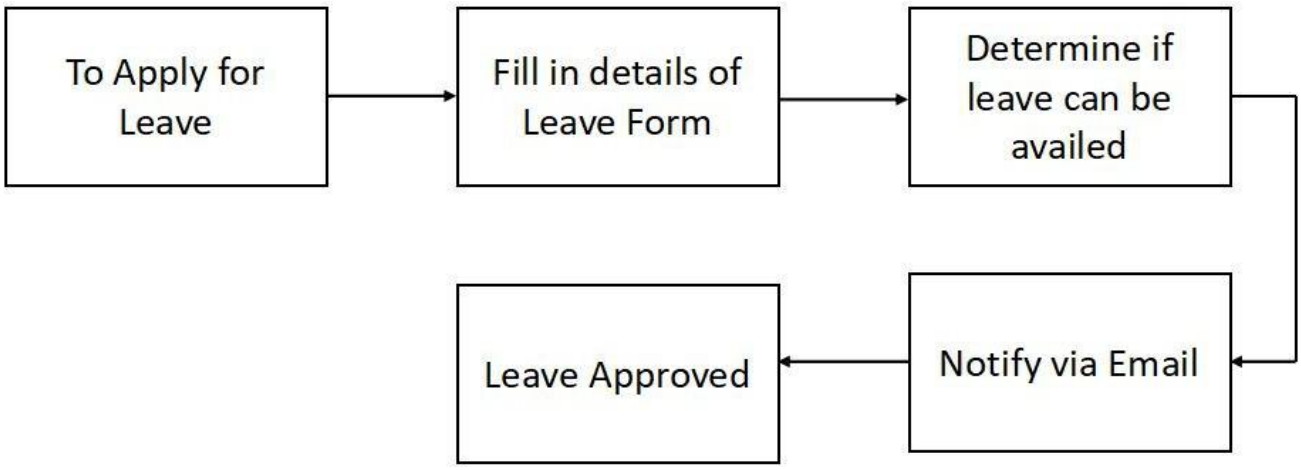

Figure 3.2.1 Block Diagram

The process starts with the login page where the applicant can login into the page where he/she can apply for leave. The next page gives information about the leave and details to be filled out to apply for leave. After the successful submission of the details, the process is carried out to the computation panel. In the computation panel, it calculates the leave percentage of the applicant and it decides whether the leave for the respected individual can be availed or not. If the applicant has leave percentage above 75 he/she can apply for leave, while if it is below 75 he/she cannot apply. After the computational panel, the applicant is notified via email. Although ,the percentage is below 75 he/she can apply for leave with the notification that the percentage is low. This will greatly reduce the paper works and man power thus increasing the accuracy of attendance calculation.

3.2 WORKING PRINCIPLE

Hosting of Website :

Once the website is hosted, it takes to the login page where the applicant can enter the required details and login to apply for leave. Whenever required any student can upload their leave application on the hosted website which would then generate a notification to the parents as well as the faculty about the leave and further the parents can approve the leave there itself which again would notify the faculty about the leave is approved by the guardians or not. This will help to reduce the paper work and loss of students attendance when they are not able to send the leave applications on time.

Screen Scraping

The data that has been entered into the staff / student page is collected and computed for the leave percentage XLSX File that is obtained from the college database has the following details:

- Registration Number
- Applicant Name
- Department
- Reason

XLSX File that is obtained from college database (CSV) has the following sdetails:

- Name of the Student/Staff
- Username /ID
- Department
- Number of days availed
- Number of days already availed leave

Once this process is over, the computed leave records with appropriate applicant details is stored in a XLSX file with .xlsx extension. This can be used for further database records for the particular organization.

Updation of Data

The XLSX File that contains the leave records is updated into the website (i.e) for the college purposes and organizations for further uses. When the data gets updated it can be retrieved it from anywhere easily.

Email Automation

Once the leave gets approved, the leave status is acknowledged to the applicant via an SMTP mail message.

3.4 ADVANTAGES

- The leave management system is fully automated.
- Manage attendance of all the students and staff from one place.
- Simple and easy interface for filling attendance of all students and staffs.
- The administrator can keep a note of staff attendance and keep a record of the same.
- Accuracy is assured as no manual work is involved.
- Changes of any error being made gets eliminated.
- It also reduces manpower and also consumes time.

3.5 APPLICATIONS

An organisation entire attendance log at one-place and tracking all employee attendance and leave activity.The system depicts the attendance percentage calculation for both staffs and students and it also figures out whether the applicant avail the leave or not.To overcome the manipulate ,we have set some norms for both staffs and students.

To calculate the staff's attendance percantage excluding the basic leaves they have such as,

1.CL (Causal Leave)
2.ML (Medical Leave)

Rather than, these kind of leaves,if the applicant takes leaves beypnd the limit allocated,their basic salary gets deducted on basis of their leave count.On behalf of the students,it the attendance percentage goes below 75%,the students are not able to apply leave. In case if the students takes leave beyond the 75% attendance, he/she is not able to attend the particular subject in which his/her attendance percentage is low.students have the eligibility criteria of minimum 75% averall attendance to attend the university exams.

By these application, both staffs and students are aware of their own attendance percentage and they know that they are responsible their leaves.

CHAPTER 4

RESULT

The proposed system is used to read the data that is been entered into the data is been entered into the website page and compute the leave percentage and scrap the data and write the data needed with the CSV file for both the staffs and students and also to send a mail message to the individuals about the leave approval and status .The following snapshots shows the process of leave approval.

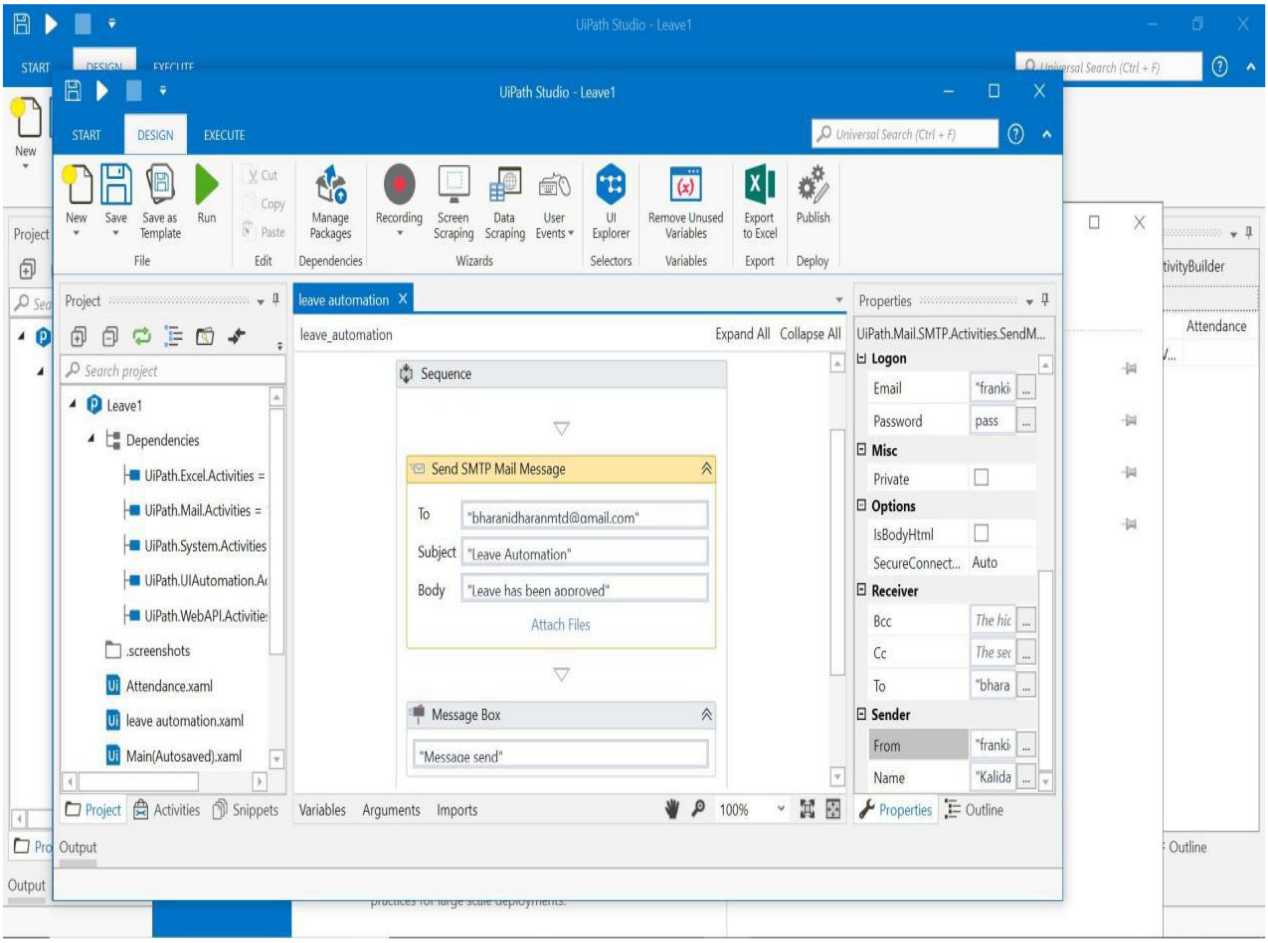

Figure 4.1.1 – UiPath Workflow

The above depicted workflow Fig 4.1.1 describes about the screen scrapping of the website and it also automates the data that it been entered into the leave request page. It also computes the leave percentage of the individuals (i.e) applicants as per the norms placed by the way of conditions and excel activities performed. Finally it also automates the email message to he applicant bu the use email activities.

1	Arunachal	1605008	IT	4	3	Passport	7
2	Bharani	1605009	IT	6	2	Condolen(	8
3	FRANKLIN	1605022	IT	5	2	Bank Loan	7
4	Kalidass	1605034	IT	2	3	Viral Feve	5
5	Franklin	1605022	IT	3	1	Sister Mar	4

Figure 4.1.2 – Scrapped Data

The above snapshot Fig 4.1.2 shows the data that is scrapped by the scrapping method. After the computational panel,the data that is been entered into the leave request page is computed (i.e) the number of leave days availed is calculated and the data that is needed in scrapped into the excel sheet as a CSV file format for the database needs.

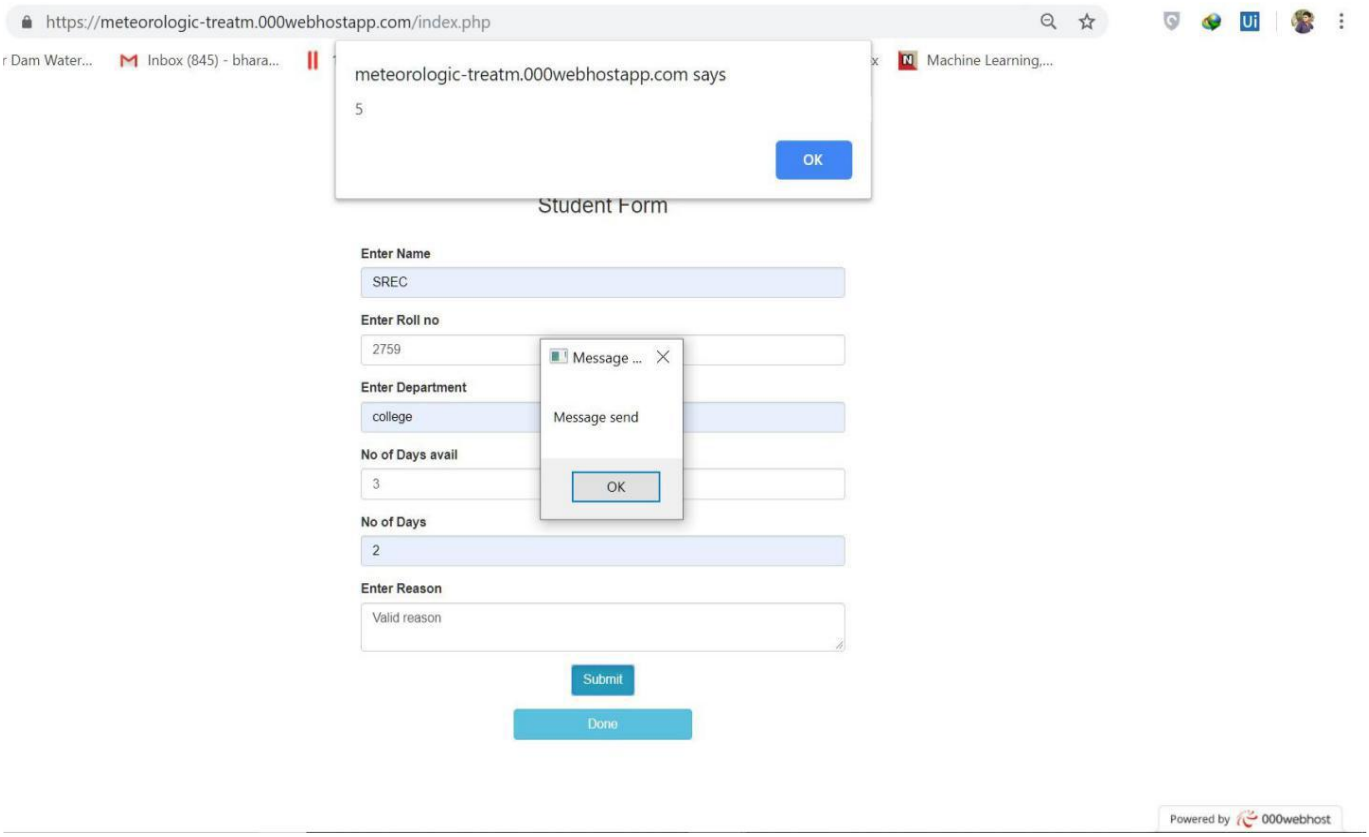

Figure 4.1.3 – Mail Message and Computation

Once the computation and scrapping of the data gets over, the email automation has to be done. An automated SMTP message needs to be sent to the applicant about the status of the leave applied. This can be attained by the use of email activities. The above snapshot Fig 4.1.3 show the message has been sent to the applicant in a message box. It describes the process of the UiPath robot which gives the message box that the message has been sent.

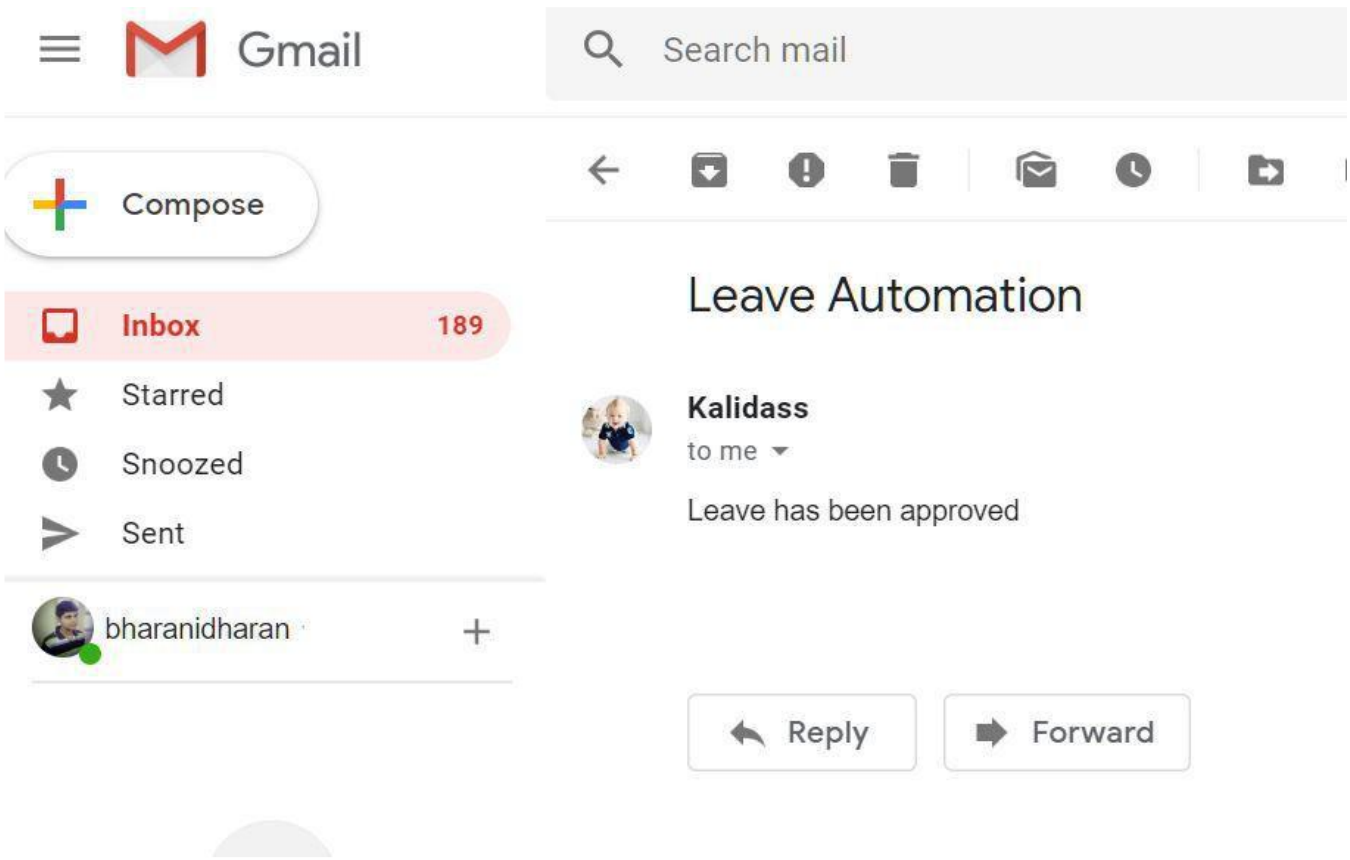

Figure 4.1.4 – Leave Approval Acknowledgement

The above mentioned snapshot Fig 4.1.4 gives the clear picture of the mail message that has been received by the applicant denoting that the applicant denoting that the applicant's leave has been approved on the mail message. Every applicant's are individually acknowledged through the mail message regarding their leave approvals and status of the leave applied.To automate an mail message from one side to another (i.e) from the sender side to receiver side ,the SMTP protocol is used which has the port number to be same int two ends. If the port number matches,the mail message is send successfully.

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

This system can be further developed by making use of new methods to extract the data. This system comes as a great step in improving the era where urbanization is taking place at a rapid scale. RPA technology would help improve the conditions of living and designing for mankind. The identified leave records are scrapped using UiPath workflows. The specified details are sent to the administrator for the operation of approving the leave applications. The system can be further developed by using Google OCR / Microsoft OCR and Machine learning capabilities.

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