

**“Examination Department Bot”**

**Major Project Report**

*Submitted by*

**Piyush Agarwal**

*In partial fulfilment for the award of the degree*

*of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE & ENGINEERING**

**At**



**JECRC UNIVERSITY, JAIPUR**

**December 2020**

### **CANDIDATE'S DECLARATION**

I, **Piyush Agarwal**, bearing roll number **17BCON173**, hereby declare that the work, which is being presented in the Major Project, entitled “**Examination Department Bot**” in partial fulfilment for award of Degree of “**Bachelor of Technology**” in Department of **Computer Science Engineering** is submitted to the Department Computer Science & Engineering, JECRC University is a record of Major Project work carried under the Guidance of Mrs. Surbhi Sharma, Department Computer Science & Engineering.

I have not submitted the matter presented in this work anywhere for the award of any other Degree.

Piyush Agarwal  
Computer Science  
17BCON173

## **JECRC UNIVERSITY JAIPUR**

Ramchandrapura, Sitapura Industrial Area Extn., Jaipur-303905(Raj.) India  
www.jecrcuniversity.edu.in

Date:23rd May,2020

### **CERTIFICATE**

Certified that the Project Report entitled “**Examination Department Bot**” submitted by **Piyush Agarwal** bearing roll no.17BCON173. In partial fulfilment of the requirements for the award of the degree of Bachelor of Technology of JECRC University, Jaipur is a record of the student’s own work carried out under my supervision and guidance. To the best of our knowledge, this Major Project work has not been submitted to JECRC University or any other university for the award of the degree. It is further understood that by this certificate the undersigned does not endorse or approve of any statement made, opinion expressed, or conclusion drawn therein but approve Minor Project for the purpose for which it is submitted.

(Mrs. Surbhi Sharma)

(Dr. Naveen Hemrajani, CSE)

## **ACKNOWLEDGEMENT**

Many people have supported me, in different ways, during the work with the thesis and projects. I'd like to thank my guide Mrs. Surbhi Sharma & HOD Dr. Naveen Hemrajani for their kind and active support and valuable guidance during the work process. My family has as always offered me their unconditional support, thank you! I have taken efforts in the Major Project. However, it would not have been possible without the kind support and many individuals and organizations. I would like to extend my sincere thanks to each and every member related to JECRC University.

Piyush Agarwal

17BCON173

## **ABSTRACT**

The first purpose of assessment is to determine if a student has got any back examination logged in any subject throughout his college semester and check with the Account Department for the verification of the payment and generate an admit card for the student listing the subject with fees paid to re-appear for the exam.

### **Purpose of an Examination Department**

The Examination Department mainly deals with the appointment of paper setters, Examiners, Moderators, senior supervisors, preparation and publication of schedule of examinations, conduct of examinations, to get performance of the candidates at the examinations properly assessed and timely declaration of results and awarding degrees, diplomas and certificates. For the purpose of simplification, smooth and easier functioning the work of Examination.

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## 1. INTRODUCTION

### 1.1 Background

In today's scenario of typical enterprises, RPA can be used to fill the gap between systems and process. 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. This chapter will give a brief historical evaluation and introduction to RPA.

Robotic Process Automation (RPA) is the technology that allows the automation of the task in exactly the way a human does. A robot in robotic process automation does not mean that literally robots are going to replace human beings, but it means a computer program that imitates human actions.

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. The typical benefits of robotic automation include reduced cost; increased speed, accuracy, and consistency; improved quality and scalability of production. Automation can also provide extra security, especially for sensitive data and financial services.

### 1.2 Statement of the problem

There is one input excel file which contains details of backlog information deposited by students respective to their branch, semester, and subject. Following points are worth noticing about the input excel file:

There can be multiple rows for one student

There can be empty rows or garbage values present in the excel

(C) The headers position of the excel are not static and prone to changes

(D) There can be any number of sheets with any name

The output admit card file is required to be prepared with the following conditions:

(A) The image of the student should be in proper place and if no image exists in system, a blank image should be used

(B) All the subject details (Name, Subject Code, Time of Exam, Date of Exam) should be listed in a tabular manner

(C) The evaluation date for the mark-sheet should be self-calculated based on the last date of exam

(D) Every admit card should be saved in the defined folder (tend to change) with the registration number as the filename

All the output files should be in the PDF format only

Sample : [Input File](#) & [Output File](#)

### **1.3 Scope**

Of course, RPA has good scope. The future is already automating. You can see how the market is changing to Automation. RPA projects also have good scope too. The scope of RPA is huge and wide. Undoubtedly, this will be the most important thing in the coming years because it will replace the data entry which will be helpful to the beginners a lot. Further, with the advanced tools and techniques, RPA is expected to perform all the operations just like a human does today.

## **REVIEW OF LITERATURE**

Document generation is considered to be one of the most time-consuming, repetitive and tedious tasks that requires a great deal of cautiousness and an ample amount of patience.

A lot of the other work can be considered fuzzy classification problems but although this itself is difficult to solve, actually getting the AI to pick up information from a huge variety of different digital and non-digital sources is an even bigger problem.

If governments were to get involved and force business to use standardised systems for bookkeeping (as I believe they do in some Scandinavian countries like Estonia) and force the banks to adopt a standard API format for bank feeds then reaching this 70-90% level of automation would be possible for far more business than is currently possible.

In the meantime it seems likely there will continue to be a small chipping away here and there at the accountants job but with a few front runners racing ahead and showing how it should be done.

Just in the last few years, the emergence of advanced technologies, like RPA and AI, has had a huge impact on making Accounting completely automated.

Currently, automation techniques like Robotic Process Automation (RPA) are playing a dominant role in taking accounting to the next level.

Almost 80% of the complicated accounting works can be managed easily, efficiently and automatically with the help of RPA. Moreover, the results that it brings out are top-notch.

The benefits of accounting automation should be reaped by both organizations as well as the individual professionals. From invoicing to accounts receivable, automation can boost up the entire process, keeping it error-free, leading to rapid success and exceptional growth of your business.

### **2.1 Advantages**

Significant labour savings. The first benefit of automating this processing is that it can decrease manual tasks and labour costs. ...

Increased productivity. Another benefit of automating this processing is that it can increase productivity. ...

Faster cycle times. ...

No wastage of paper. ...

Time saving.

### **2.2 Disadvantages**

As such there are no disadvantages of this and many errors and issues can be solved with error handling and making the bot ROBUST.

## **SOFTWARE REQUIREMENT ANALYSIS**

### **3.1 Problem statement**

In any university, a support team has to deal with generation of back exam admit cards and managing students data generated on a semester basis. This could raise various issues. Now Obviously, a manual employee cannot rely on himself and needs to check again and again for all the data of students and fill in the admit card with proper information. This would be quite tiresome and will cost a good amount of money and wastage of time and paper. Instead we can automate this task. Our task is to process the students back log data and generate the admit cards for them and send them on their respective emails

### **3.2 Modules**

Administrator Module

#### **3.2.1 Administrator Module**

This functionality provided:

1. Processing of Student data for file verification
2. Processing of College time table
3. Generation of Admit Cards
4. Sending Admit cards as attachment to individual student by email

## 4.SOFTWARE AND HARDWARE REQUIREMENTS

### 4.1 Requirement specifications

#### 4.1.1 Hardware specification

Table 1.1 Hardware specification

	Minimum	Recommended
CPU	2x1.8GHz 32-bit(x86)	4x2.4GHz 64-bit(x64)
RAM	4 GB	8 GB

#### 4.1.2 Software specification

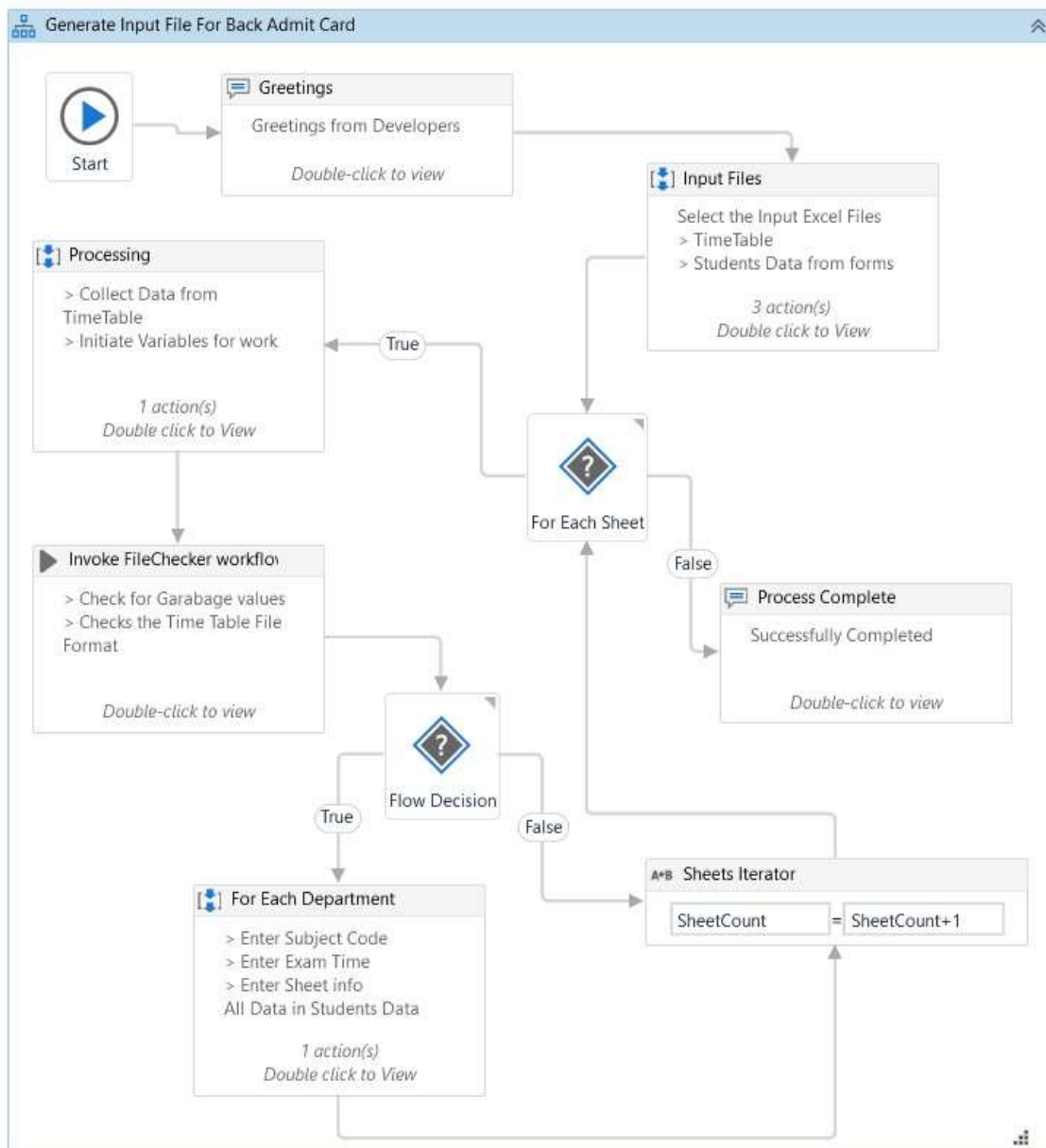
Table 1.2 Software specification

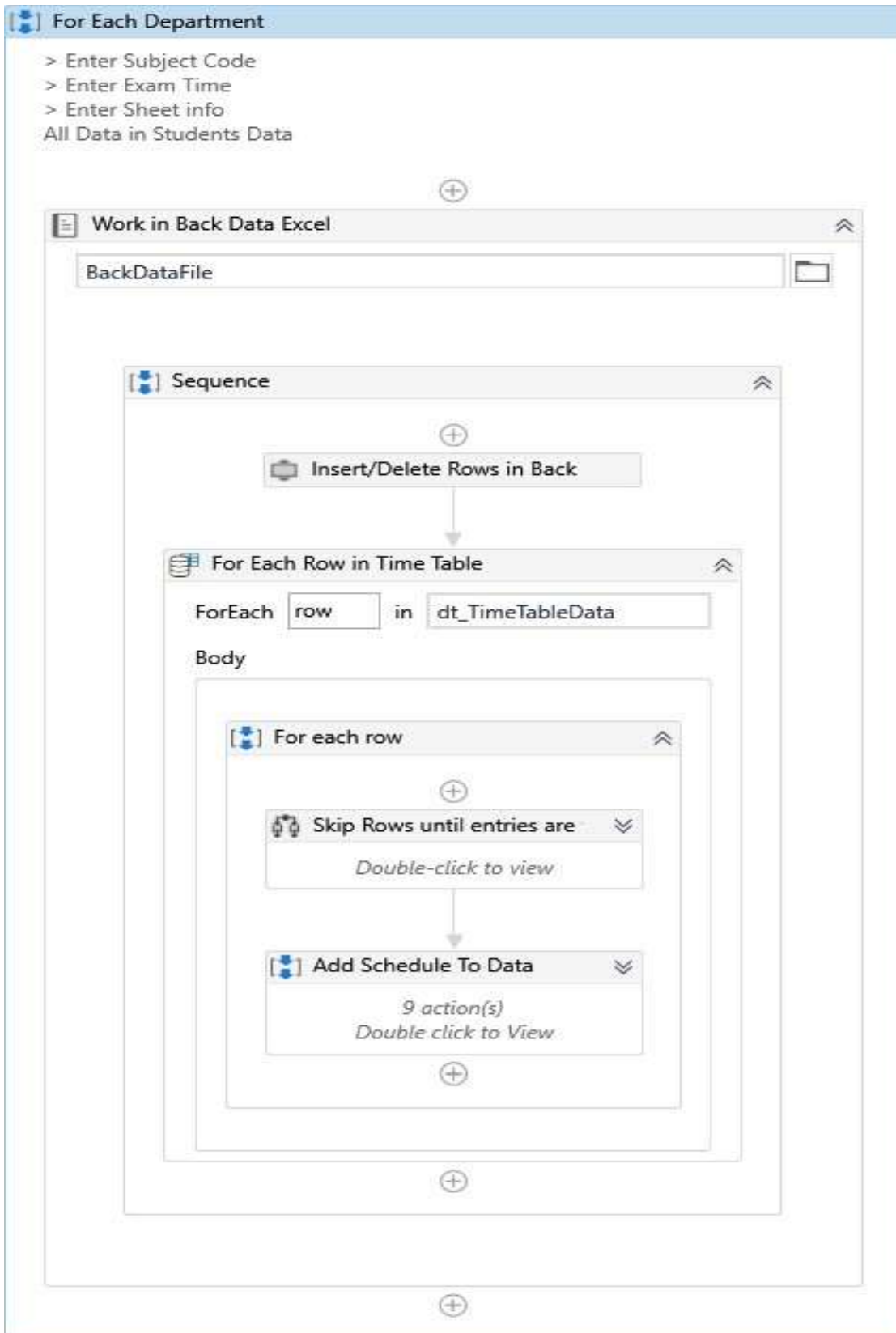
Supported Versions	Particularities
Windows 7	Update KB 2533623 (required by OCR and Computer Vision activities)
Windows 7 SP1	Update for Universal C Runtime Microsoft Visual C++ 2015 Redistributable Update 3 (required for GIT source control functionality)
Windows 10	Microsoft Visual C++ Redistributable for Visual Studio 2015, 2017 and 2019 (required for SVN source control)
XenApp v6.5 or greater (citrix environment)	
XenDesktop v7.0 or greater (citrix environment)	
Version 4.6.1 or greater (.NET Framework)	If your machine runs Windows OS in a language other than English, install the corresponding language pack for the Net framework version you are using. This is required for running Studio in any of the available languages.
Internet Explorer v8.0 or greater	
Google Chrome version 64 or greater	Automated with the extension for Chrome or the Web driver protocol.
Mozilla Firefox version 52.0 or greater	Automated with the extension for Firefox or the Web driver protocol.

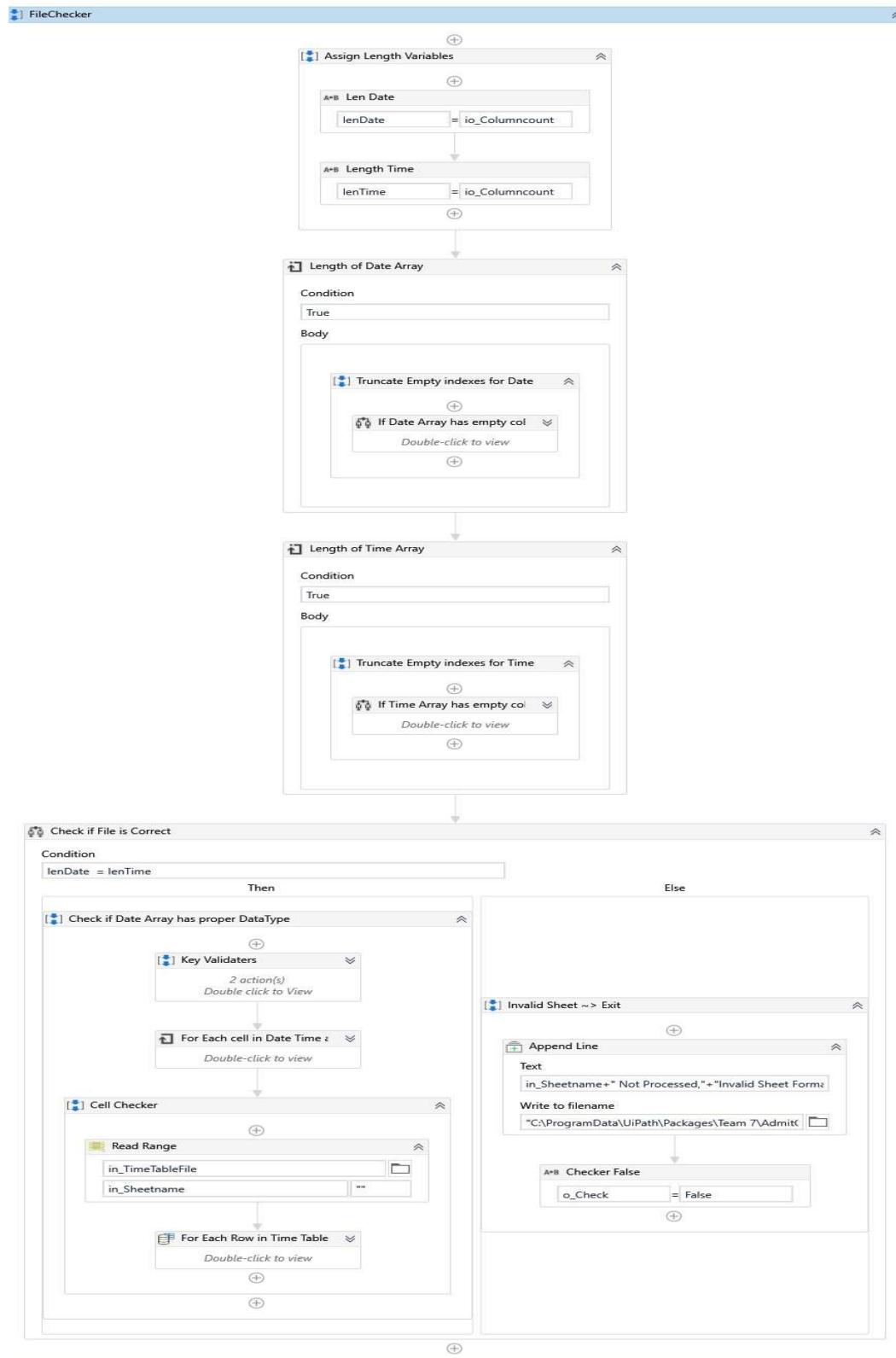
## 5. CODING/CODE TEMPLATE

### 5.1 Proposed system

To Replace the old tedious task of checking the student details and exam time table created for each department and generating the back-admit card for the student, An automation bot is to be processed which can do all the repetitive task in similar fashion as of human with higher accuracy and efficiency









## 5.2 How Our Bot Works

### Working / Overview of ALGO:

1. Greetings from Bot Developers
2. Reading Input Data
  - a. Select Input File and store the output in a variable (String datatype)
  - b. Check if File is .xlsx only else re-select the input file
  - c. Read System Path for Output, Image Folder and Word application file
  - d. Get Sheets Name available in given input workbook and store in a variable (list of string)
  - e. Extract Filename of workbook and store in a variable (String datatype)
  - f. Create Output Folder

Iterate Over the number of Sheets

3. Pre-Processing
  - a. Find Cell Addresses for given headers (Time/Date/Sub Code/Name/Subject name)
  - b. Create Folder inside Output Folder with Specified Sheet name
  - c. Read Sheet and store in a variable (Table datatype)
  - d. Initialize some required variables

4. File Checker Workflow
  - Validate the file for proper formatting

5. Generate the Admit Card

End Process

## 6. TESTING

### 6.1 Stress Testing

It is a type of Software Testing that verifies the stability & reliability of the system. This test mainly measures the system on its robustness and error handling capabilities under extremely heavy load conditions.

In Software Engineering, Stress Testing is also known as Endurance Testing. Under Stress Testing, AUT is stressed for a short period of time to know its withstanding capacity. A most prominent use of stress testing is to determine the limit, at which the system or software or hardware breaks. It also checks whether the system demonstrates effective error management under extreme conditions.

#### How to do Stress Testing?

Stress Testing process can be done in 5 major steps:

1. Planning the Stress Test. Here you gather the system data, analyse the system, define the stress test goals
2. Create Automation Scripts: In this phase, you create the Stress testing automation scripts, generate the test data for the stress scenarios.
3. Script Execution: In this stage, you run the Stress testing automation scripts and store the stress results.
4. Results Analysis: In this stage, you analyse the Stress Test results and identify bottlenecks.
5. Tweaking and Optimization: In this stage, you fine-tune the system, change configurations, optimize the code with a goal that meets the desired benchmark.

### 6.2 Unit Testing

It is a level of software testing where individual units/ components of a software are tested. The purpose is to validate that each unit of the software performs as designed. A unit is the smallest testable part of any software. It usually has one or a few inputs and usually a single output. In procedural programming, a unit may be an individual program, function, procedure, etc. In object-oriented programming, the smallest unit is a method, which may belong to a base/ super class, abstract class or derived/ child class.

#### 6.2.1 Unit Testing Method

It is performed by using the White box Testing method.

##### 6.2.1.1 When is it performed?

Unit Testing is the first level of software engineering and is performed prior to Integration testing

#### **6.2.1.2 Who performs it?**

It is normally performed by software developers themselves or their peers. In rare cases, it may also be performed by independent software testers.

#### **6.2.2 Unit Testing Tasks**

1. Unit Test Plan
2. Prepare
3. Review
4. Rework
5. Baseline
6. Prepare
7. Review
8. Rework
9. Baseline
10. Unit Test
11. Perform

#### **6.3 What is dependency testing?**

Dependency Testing is a software testing technique in which application's requirements are pre-examined for an existing software in order to achieve desired functionalities. The impacted areas of software are also tested while testing new or existing features. The examination takes care of two major factors; faults and defects existing in the application. Just like other applications or tools, software has some impacted areas such as compatibility; user-interface and most importantly there should be no such vulnerability for information breach.

## 7.Input / Output SCREENS



### 7.1: Input

Excel file (.xlsx)

B.Tech (CSE)														
B.Tech (CSE)														
BACK EXAM														
Jan-May 2018														
				Date	03-12-2019	05-12-2019	07-12-2019	10-12-2019	12-12-2019	10-12-2019	05-12-2019	12-12-2019	14-12-2019	16-12-2019
				Time	9-12 PM	9-12 PM	9-12 PM	9-12 PM	9-12 PM	9-12 PM	9-12 PM	9-12 PM	9-12 PM	9-12 PM
				Sub. Code	BCA101A	BCA102A	BCA103A	BCA104A	BCA105A	BCA015A	BCA002A	BMC114A	BCA070A	BCA055A
S. No.	Roll No.	Name	Batch	Form No.	Fundamental of Computer System	Programming in C	System Analysis & Design	Digital Electronics	Communication Skills	Digital Electronics	Programming & Fundamental in C++	Communication Skills-I	Basic Math	Seminar - I
1	17BCON000	Ritik Sharma	2014-2017	22			Yes				Yes			
2	17BCON001	Piyush Agarwal	2015-2019	34	Yes									
3	17BCON002	Deepak Yadav	2015-2019	13	Yes						Yes	Yes		
4	17BCON003	Hemant Goyal	2014-2017	82	Yes					Yes	Yes			
4	17BCON004	Jai Gupta	2014-2017	104	Yes								Yes	
5	17BCON005	Divyam Goyal	2015-2019	70	Yes					Yes			Yes	
6	17BCON006	J. Vamsi Ganesh	2015-2019	71	Yes					Yes	Yes		Yes	
7	17BCON007	Rohit Tripathi	2014-2017	31						Yes				
8	17BCON008	Khushant Sharma	2014-2017	53										Yes
9	17BCON009	Naresh Kumar Aechra	2014-2017	28					Yes					
10	17BCON010	Suhas Suthar	2014-2017	92		Yes			Yes					
11	17BCON011	Saksham	2014-2017	91										

- Input file path is browsed by the user at run time
- First line will contain "Program Name"
- Second line will contain "Back Exam" keyword
- Third line will contain Session Name
- The Following keywords should be used without space
  - Name
  - Date
  - Time
  - Sub. Code
  - Roll No.
  - Batch
- **Date, Time, Subject, Subject Code** should be well defined in the same column ( i.e., All should start from same column like column 'E')

## Template\_Admit-Card.doc

		<b>JECRC University</b> Jaipur - 303905, Rajasthan, India			
<b>End Semester Examination</b>					
<b>Hall Ticket</b>					
Reg.No: StudentRollNo		Program: Department		Session: 2017-2018	
Name: StudentName		Back		Batch: 2014-2018	
DATE	TIME	SUBJECT		INVIGILATOR Sign	
<ul style="list-style-type: none"><li>All Students are advised to see their copies after evaluation by 04/06/2018 as no re-evaluation is permitted after declaration of results</li></ul>					
<b>DCoE</b> JECRC University, Jaipur				Student's Signature	

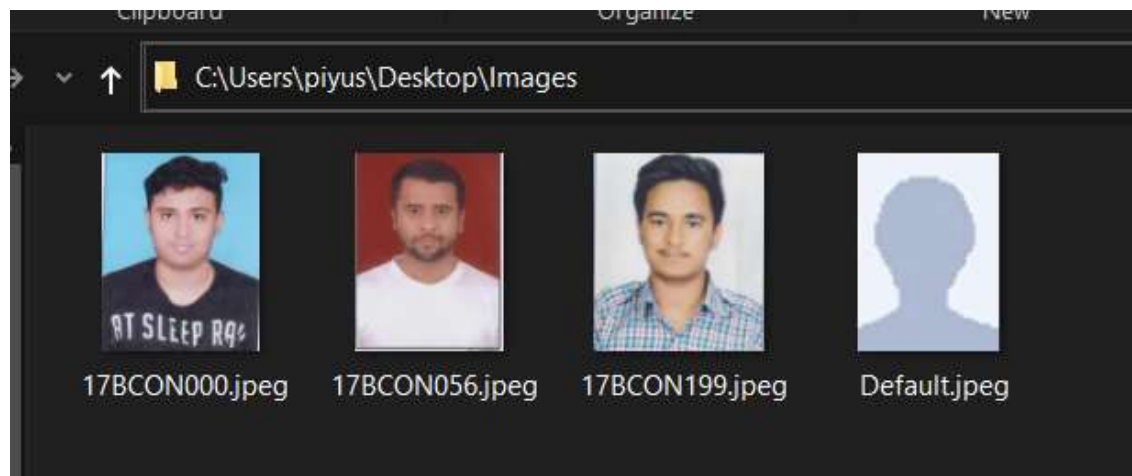
### Description :

Base Template that will be used by the Bot to generate the Back Admit Card

### Assumption :

Format of the template or it's filename should not be changed

### folder 2 - Images



Description: This folder will contain the Student's images

### Assumption:

1. The name of files will be same as the registration number (same as in Excel) of students and with .jpeg extension
2. Blank image, named Default.jpeg should always be present in the specified Images Folder.

### **7.2: Processing**

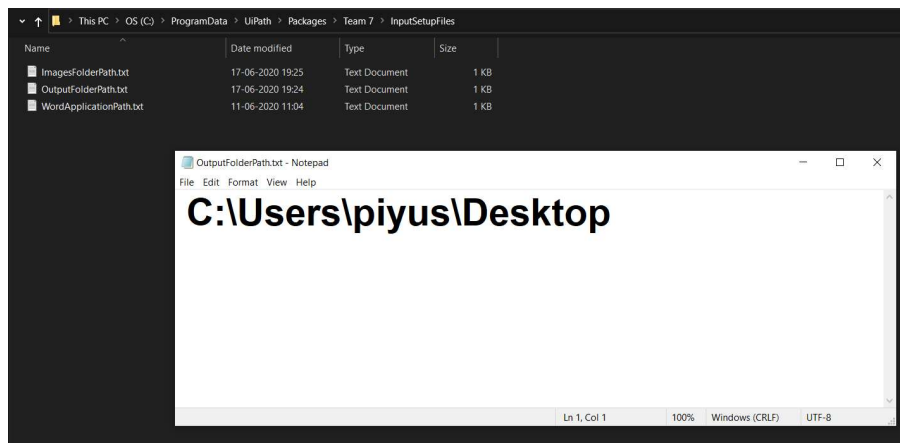
1. Assume that the setup has been done successfully
2. Open UiPath Assistant, click on play button.
3. Select the input (with only .xlsx format )

### Important Note:

1. Do not touch the mouse/keyboard after selecting the input file as that can create problems while executing.
2. During Installation, pause button can be configured (Optional)  
~ > This will help user to pause/resume the bot as per his requirement

### **7.3: Outputs**

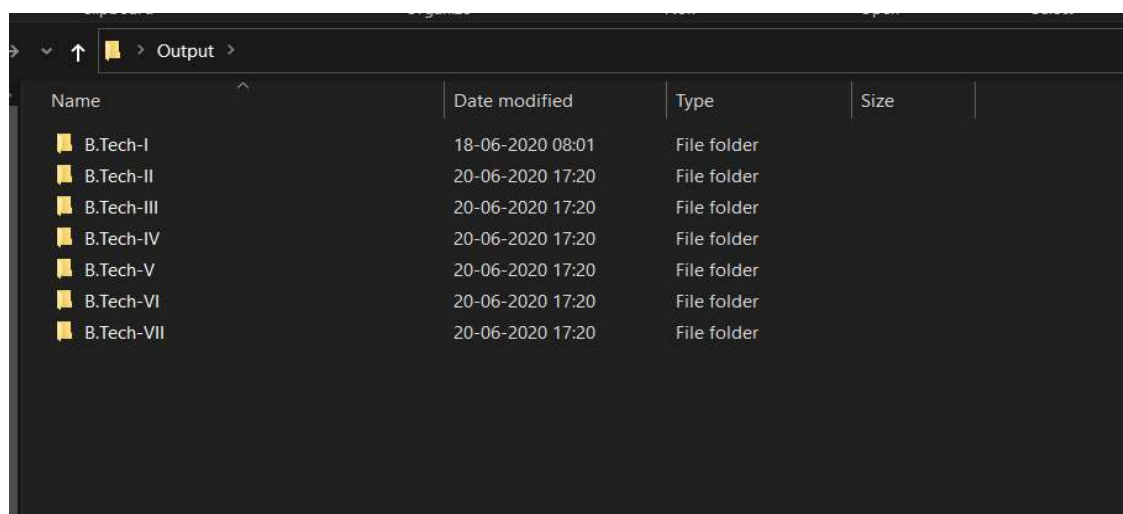
- Output folder will be created at the specified path given in the "OutputFolderPath.txt" file



(The path of the Output folder can be changed by the user )

- This Folder will further contain subfolders with name as "workbookname-sheetname" (B. tech-I)
- The above folder will contain the generated back admit card with ".pdf extension"
- The namespace of the pdf file is given as per the specified Registration number of each student in the given .xlsx file

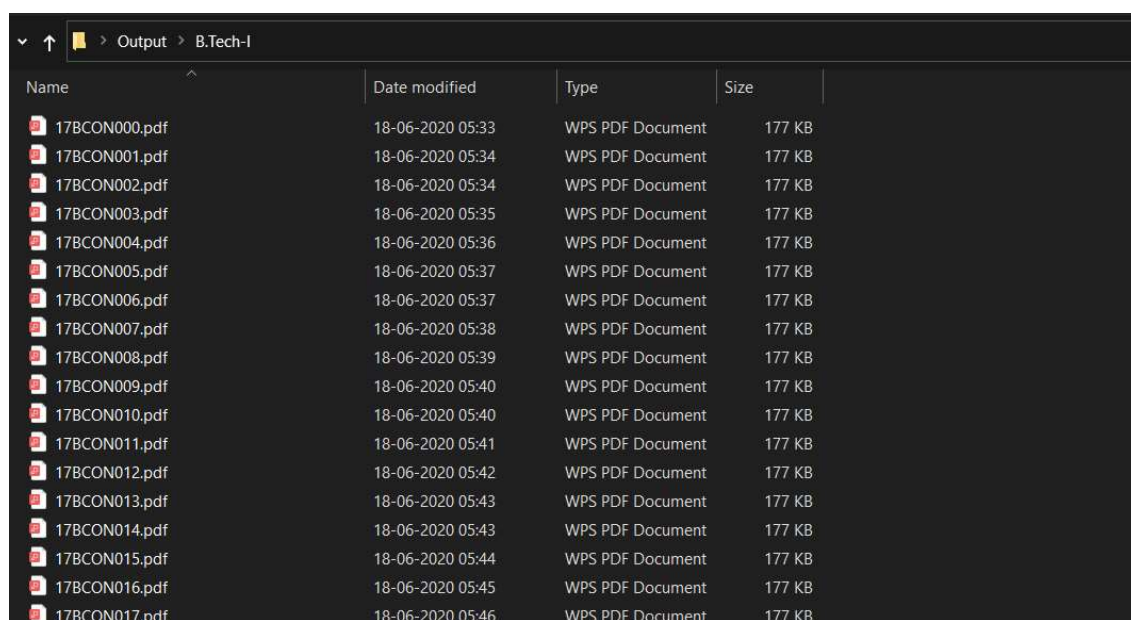
### Sample of Output and Sub-folder generated



A screenshot of a Windows File Explorer window showing the 'Output' folder. The address bar indicates the path is 'Output'. The main pane displays a list of sub-folders named B.Tech-I through B.Tech-VII. Each folder is represented by a yellow folder icon. The columns are 'Name', 'Date modified', 'Type', and 'Size'.

Name	Date modified	Type	Size
B.Tech-I	18-06-2020 08:01	File folder	
B.Tech-II	20-06-2020 17:20	File folder	
B.Tech-III	20-06-2020 17:20	File folder	
B.Tech-IV	20-06-2020 17:20	File folder	
B.Tech-V	20-06-2020 17:20	File folder	
B.Tech-VI	20-06-2020 17:20	File folder	
B.Tech-VII	20-06-2020 17:20	File folder	

( A )




A screenshot of a Windows File Explorer window showing the 'Output > B.Tech-I' folder. The address bar indicates the path is 'Output > B.Tech-I'. The main pane displays a list of PDF files named 17BCON000.pdf through 17BCON017.pdf. Each file is represented by a red PDF icon. The columns are 'Name', 'Date modified', 'Type', and 'Size'.


Name	Date modified	Type	Size
17BCON000.pdf	18-06-2020 05:33	WPS PDF Document	177 KB
17BCON001.pdf	18-06-2020 05:34	WPS PDF Document	177 KB
17BCON002.pdf	18-06-2020 05:34	WPS PDF Document	177 KB
17BCON003.pdf	18-06-2020 05:35	WPS PDF Document	177 KB
17BCON004.pdf	18-06-2020 05:36	WPS PDF Document	177 KB
17BCON005.pdf	18-06-2020 05:37	WPS PDF Document	177 KB
17BCON006.pdf	18-06-2020 05:37	WPS PDF Document	177 KB
17BCON007.pdf	18-06-2020 05:38	WPS PDF Document	177 KB
17BCON008.pdf	18-06-2020 05:39	WPS PDF Document	177 KB
17BCON009.pdf	18-06-2020 05:40	WPS PDF Document	177 KB
17BCON010.pdf	18-06-2020 05:40	WPS PDF Document	177 KB
17BCON011.pdf	18-06-2020 05:41	WPS PDF Document	177 KB
17BCON012.pdf	18-06-2020 05:42	WPS PDF Document	177 KB
17BCON013.pdf	18-06-2020 05:43	WPS PDF Document	177 KB
17BCON014.pdf	18-06-2020 05:43	WPS PDF Document	177 KB
17BCON015.pdf	18-06-2020 05:44	WPS PDF Document	177 KB
17BCON016.pdf	18-06-2020 05:45	WPS PDF Document	177 KB
17BCON017.pdf	18-06-2020 05:46	WPS PDF Document	177 KB

( B )

## Sample of Back Admit Card generated



**JECRC University**  
Jaipur - 303905, Rajasthan, India  
**End Semester Examination**  
**Hall Ticket**



Reg. No: 15BCAN040  
Name: Ritik Sharma

Program: B.Tech(CSE)  
**BACK**

Session: Jan-May 2018  
Batch: 2014-2018

DATE	TIME	SUBJECT	INVIGILATOR Sign
05.06.2020	9-12 PM	Fundamental of Computer System (BCA101A)	NOF
05.12.2019	9-12 PM	Programming in C (BCA102A)	NOF
07.12.2019	9-12 PM	System Analysis & Design (BCA103A)	NOF
10.12.2019	9-12 PM	Digital Electronics (BCA104A)	NOF
12.12.2019	9-12 PM	Communication Skills (BCA105A)	NOF
12.12.2019	9-12 PM	Digital Electronics (BCA015A)	NOF
05.12.2019	9-12 PM	Programming Fundamental in C++ (BCA002A)	
12.12.2019	9-12 PM	Communication Skills-I (BMC114A)	NOF
14.12.2019	9-12 PM	Basic Math (BCA070A)	NOF
18.12.2019	9-12 PM	Seminar-I (BCA055A)	NOF

\* All Students are advised to see their copies after evaluation by 25/12/2019 as no re-evaluation is permitted after declaration of results

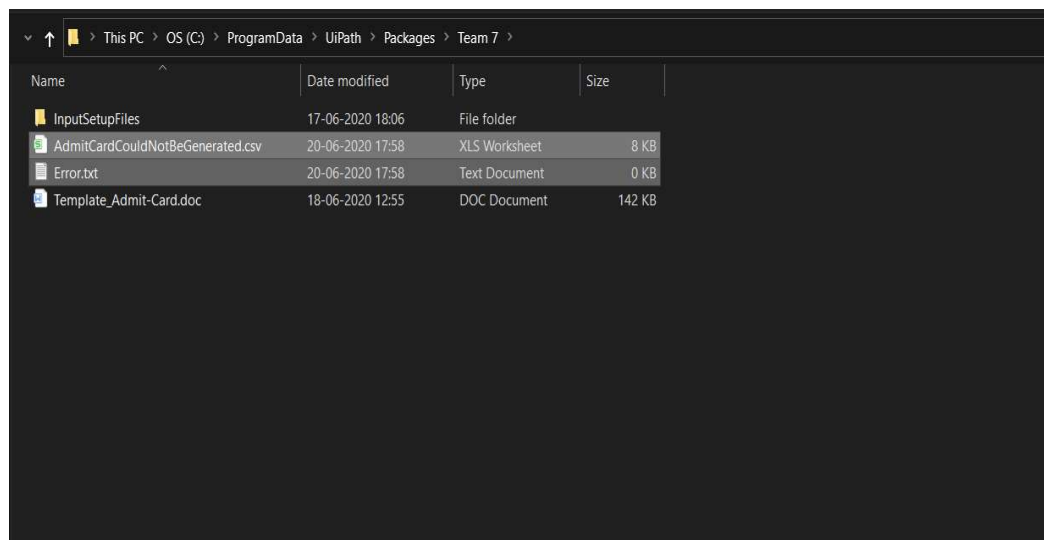
DCE  
JECRC University, Jaipur

Student's Signature

NOF specifies that student has not opt to give back exam for that particular subject

### ERROR FILES

These files are generated inside the path “C:\ProgramData\UiPath\packages\Team7”





### **Error.txt**

1. Made only for Bot Developer
2. Generated in Case of “Unknown System Error”

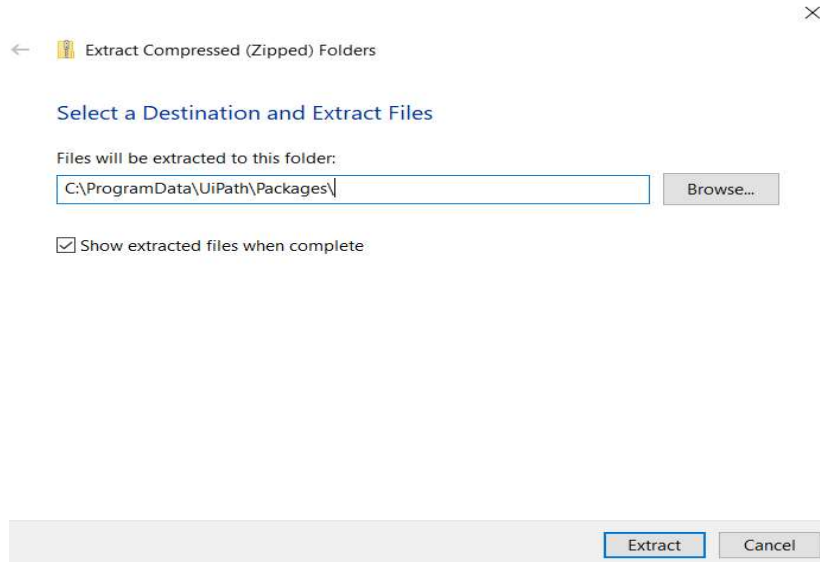
### **AdmitCardCouldNotBeGenerated.csv**

1. Generated for the User
2. This file is generated, if
  - a. In case, either Registration Number or Student Name in any cell is not mentioned in the Input Excel file.
  - b. Invalid Date format (should be dd-mm-yyyy or dd/mm/yyyy)
  - c. Date, Time, Subject, SubjectCode are not starting from same column (i.e., All should start from same column like column 'E')

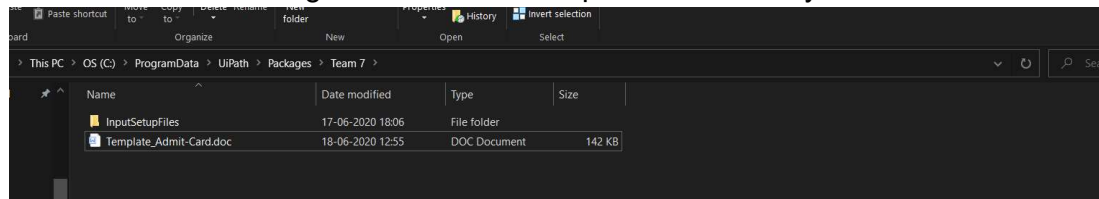
## 8. Bot Installation

### Setup (One time)

1. Unzip the “Team7” folder in the path **C:\ProgramData\UiPath\Packages\**

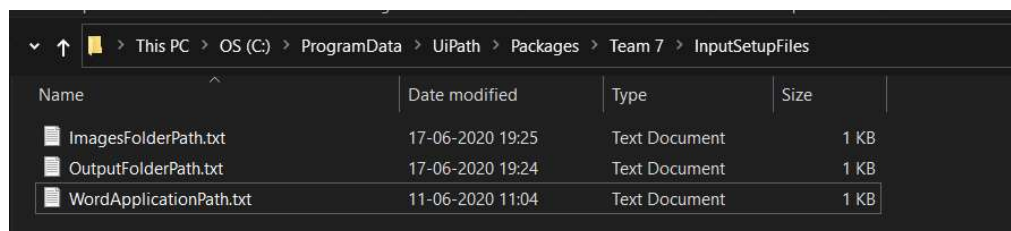


Assuming similar screen and path is visible to you



And, Inside the InputSetupFiles folder, following files will be visible

- ImagesFolderPath.txt ~> Set the path to the folder from where Images will be read by Bot
- OutputFolderPath.txt ~> Set the path to the folder where Output will be saved
- WordApplicationPath.txt ~> Application path for Word application to be used



2. Paste the “.nupkg” file at the path **C:\ProgramData\UiPath\Packages\**
3. Open UiPath Assistant and click on the install button
4. Assumption: User will not change name or extension of any file provided by Developers

## 9.CONCLUSION

This project has given me an ample opportunity to design, code, test and implement my work on this project. This has helped in putting into practice various principles. As you've seen, email is a wonderful channel that can drive tons of revenue for your business.

I thank my guide for his invaluable contribution in guiding me throughout the project. I also thank my parents and friends who have supported and motivated me to complete this project successfully.

## 10. FURTHER ENHANCEMENTS

Better Data and Secure development is the Future of Examination Automation. It's hard to imagine a world without it. With such a large user base, it only makes sense that teams try to capitalize and need faster service.

1. Automate report generation and receipts allotment,time-table generation, etc.
2. Use artificial intelligence right now to save you loads of time
3. Automate the verification of data quality
4. Become an automated fully outsourced accounting department for your clients

## 11. REFERENCES

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