PROJECT REPORT

ON

EXCEL

AUTOMATION

USING BLUEPRISM RPA SOFTWARE

Done By :

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INTRODUCTION :

Robotic process automation (RPA) allows using software robots instead of people to drive the business. It is used to automate regular tasks so the user can concentrate on accomplishing complex tasks rather than routine work manually. This would in turn reduce the human errors.

BENEFITS OF RPA :

The following are the advantages of RPA –

- Building a unified view of the customer
- Increased customer satisfaction
- Increased employee productivity
- More accuracy and quality
- Cost effective
- Up to 80% reduction in AHT (Average Handle Time)
- Up to 90% reduction in ART (Average Resolution Time)
- Increased ROI (Return on Investment) within 3 months on an average.

Blue Prism : Blue prism is a UK-Based Software Company and is one of the leading robotic process automation tools. It is used to automate mundane tasks such that they could operate without any manual intervention. Blue prism has gained edge over its competitors as it has better security, flexibility, scalability, compliance, and resilience.

Project Overview :

This project work on Grade Calculation Excel Automation involves the use of Blueprism Robotic Process Automation software to build a process flow which reads the marks of students from an Excel sheet and calculates the Grades of the student based on the conditions provided and then makes/creates a new excel sheet which contains the students' marks and details along with the calculated grades.

Purpose of the Project :

The process of calculating grades of many students in schools and colleges can be a tedious task for anybody. By using Robotics Process Automation, we can reduce the tediousness of this task and make it easier to calculate the grades of the students in schools and colleges more accurately and by providing the correct set of conditions. We can also reduce the possibilities of human errors in tedious tasks like these and make results more efficient and trustable. This project was also aimed to look at the possibilities of learning and applying the features of Excel Automation and MS Excel VBO in BluePrism Robotic Process Automation Software.

LITERATURE SURVEY :

Grading Process in Education Industry Using RPA (6 April 2020 - Written by Aishwarya Kannan)

Repetition begets boredom! Like in other fields, a majority of the teaching professionals are succumbing to the epidemic of classroom boredom, and more often than not, complain, procrastinate and dread grading mark sheets. In this huge education spectrum of students, staff, and administrators, grading often overloads their already-full schedule.

'Schooling' must be distinguished from 'learning': While schooling happens within structured learning environments contained within a fixed time and place, learning occurs in a continual fashion, regardless of time and place. With the existence of mobile technologies, for instance, it has even become more apparent that learning can occur well outside the bounds of traditional, brick-and-mortar educational institutions (Woolf et al., 2013), extracted from UNESCO's report on *Artificial Intelligence in Education*.

Technology in education is often-spoken but how far is it adopted? While transforming from pen and paper approach to automation, there are many fears in the minds of academicians, the top being: Is security ensured? How far do the students have access to technology and can be automated? Is a fair grading system possible with an AI-powered bot? How effective and accurate is the grading and feedback to the students? Is AI a luxury?

Automatic easy scoring

There is a rapid change in learning and evaluation patterns around the world. With the inclusion of machine-learning algorithms, thousands of essays, home works, quizzes and tests, papers, and projects can be graded with a click of a button. By the application of

machine learning, in combination with natural language processing (NLP) and Crowdsourcing, grading short answers, coding exercises, and vocabulary, and answers to 5 W's and 1 H (who, what, when, where, why, and how) are generated.

Student-centric feedback

RPA also extracts students' grades from the database, enters it into relevant forms, and sends reports to parents. Individual student progress and tailor-made student-centric feedback are enabled through a chatbot. A spaced internal learning that reminds the students of forgotten information and guides them through a ladder of proficiency ladder is acquired.

With the use of AI and RPA by teachers, there is an increase in the quality of the students' work, and time is saved resulting in the lesser possibility of burnout, leading towards superior learning! Furthermore, with RPA, save cost, increase compliance, manage better, increase customer satisfaction in most sectors, and simplify life for you and those around.

Some other challenges of RPA :

There are a number of challenges related to RPA, which have limited its use.

- **Scalability :** Enterprises have struggled to scale RPA automation initiatives because, although RPA's software bots are relatively easy to implement, they can be hard to govern and manage and therefore hard to scale.
- **Limited abilities :** While its name includes the words "process automation," many critics have pointed out that RPA software tools automate tasks. More work is often required to stitch multiple tasks together into a process. Craig Le Clair, an analyst at Forrester Research, has cautioned enterprises to observe the "rule of five" in building RPA applications because they tend to break when a bot must make more than five decisions, manipulate more than five apps or make more than 500 clicks.
- **Security :** RPA bots sometimes need to access sensitive information to complete their tasks. If they are compromised, they pose an additional security risk for users.
- **Limited resiliency :** RPA Failures can occur when applications change in ways that are not anticipated by developers.

- **New QA issues :** Bots require a variety of new QA practices to ensure they continue to work as intended.
- **Privacy :** Bots may be involved in working with personally identifiable information governed by privacy requirements. Teams need to ensure this data is processed in conformance with local data protection laws such as GDPR.
- **Efficiency :** RPA bots manually plod through an application in the same way a human does. This may not be as efficient as automating applications through APIs or workflow automations that are included in the application itself.

Solutions to Existing Problems :

As we have seen and learnt from the above article that repetition begets boredom and like in other fields, a majority of the teaching professionals are succumbing to classroom boredom, and more often than not, complain, procrastinate and dread grading mark sheets. In this huge education spectrum of students, staff, and administrators, grading often overloads their already-full schedule. Thus, to prevent and help in this repetitive task of grading, Robotic Process Automation can be beneficial for everyone whether it be teachers or students. The increased use and application of Robotic Process Automation softwares in various sectors will be successful if proper implementation is done. With proper implementation, the trust of the people and the system regarding the use of this technology can be earned.

Selecting RPA platforms that can be centrally managed and scaled from a central control panel is very important instead of deploying and scaling on each desktop.

There should be the ability to design and test new robotic processes in a few hours or less, as well as the ability to optimize the bots to work quickly.

As companies launch robots to automate hundreds or even thousands of manual tasks, they should look for tools with built-in monitoring and analytics that enable them to monitor the health of their systems.

Organizations and Institutes should look for products that are simple enough that employees in the business can build and use them to handle various kinds of work, including collecting data and turning content into information that enables teachers, leaders and almost everyone

to make the best decisions.

The best RPA tools should be able to support simple task-based activities, read and write to any data source and take advantage of more advanced learning to further improve automation.

Schools, institutes, companies and organisations should look for tools that are built from the ground up for enterprise-grade scalability, reliability and manageability.

Moreover, the schools, institutes and organisations also need to look at the various security and governance capabilities that can help manage bot security credentials, assess any privacy issues and flag any issues.

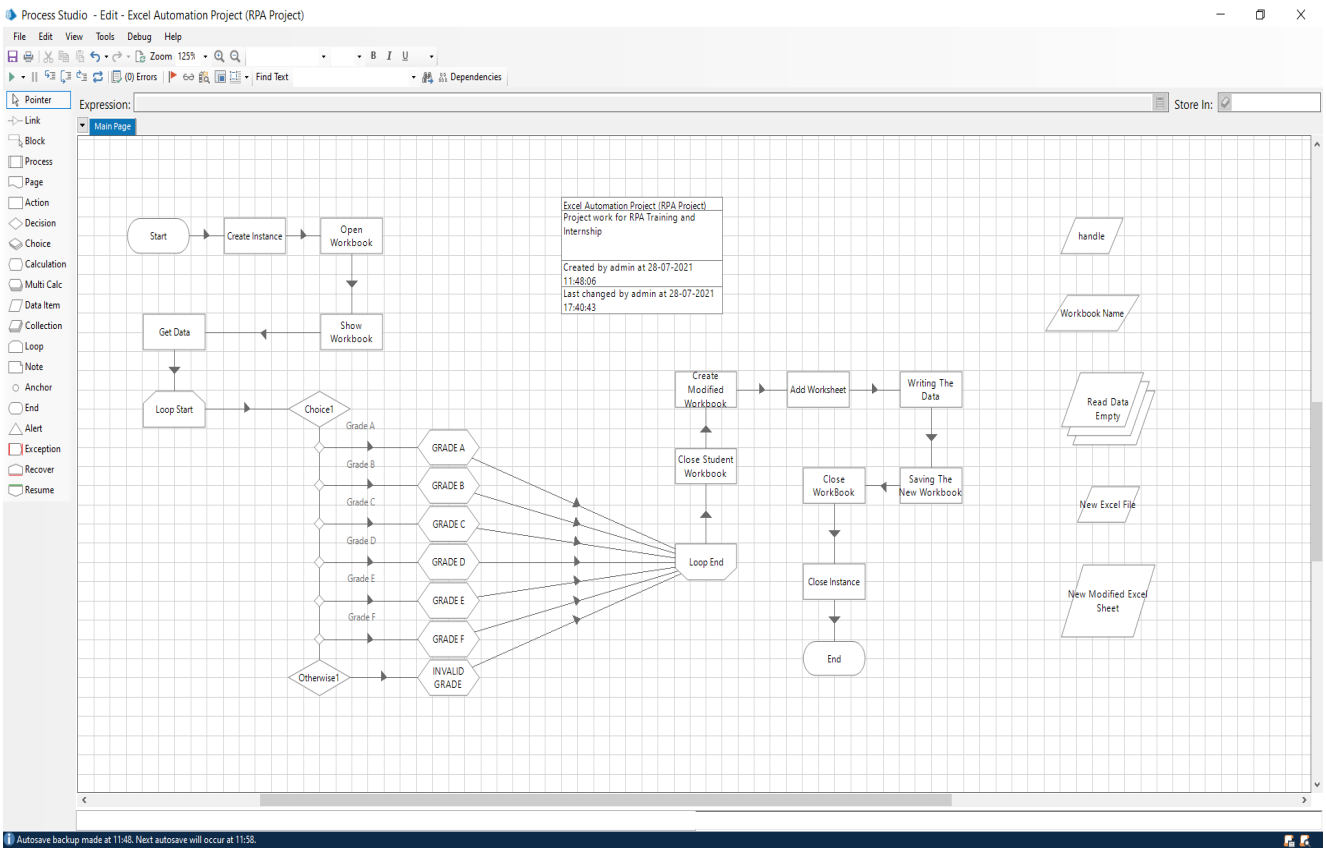
Also, tools for logging bot usage can help teams assess the ROI of existing bots and prioritize opportunities for new automation based on estimated value.

THEORITICAL ANALYSIS :

Hardware and Software Requirements of the Project :

- Windows Operating System 64-bit (XP, 7, 8, 8.1, 10)
- Microsoft .NET framework
- Microsoft SQL Server Database
- BluePrism Installation Software
- BluePrism Licence File
- Internet connection to download and activate
- Administration access to install and run Blue Prism
- Minimum 10GB free Disk Space

Block Diagram Overview of the Project :



EXPERIMENTAL INVESTIGATIONS :

The analysis or the investigation made while working on this project are as follows -

- The use of Excel automation using BluePrism Robotic Process Automation to calculate grades can be very useful if the correct set of conditions and flow is provided.

- The process of calculating the grades can be modified and set according to the needs of the situation and individuals by providing the correct set of expressions or conditions.

- The process flow will give incorrect output if the conditions or expressions for calculating the grades is not properly defined and mentioned.

- One must make sure while building a flow like this for calculating grades that the MS Excel VBO is imported. If it is not done, then one will not get the desired outputs as the automation functions will not work.

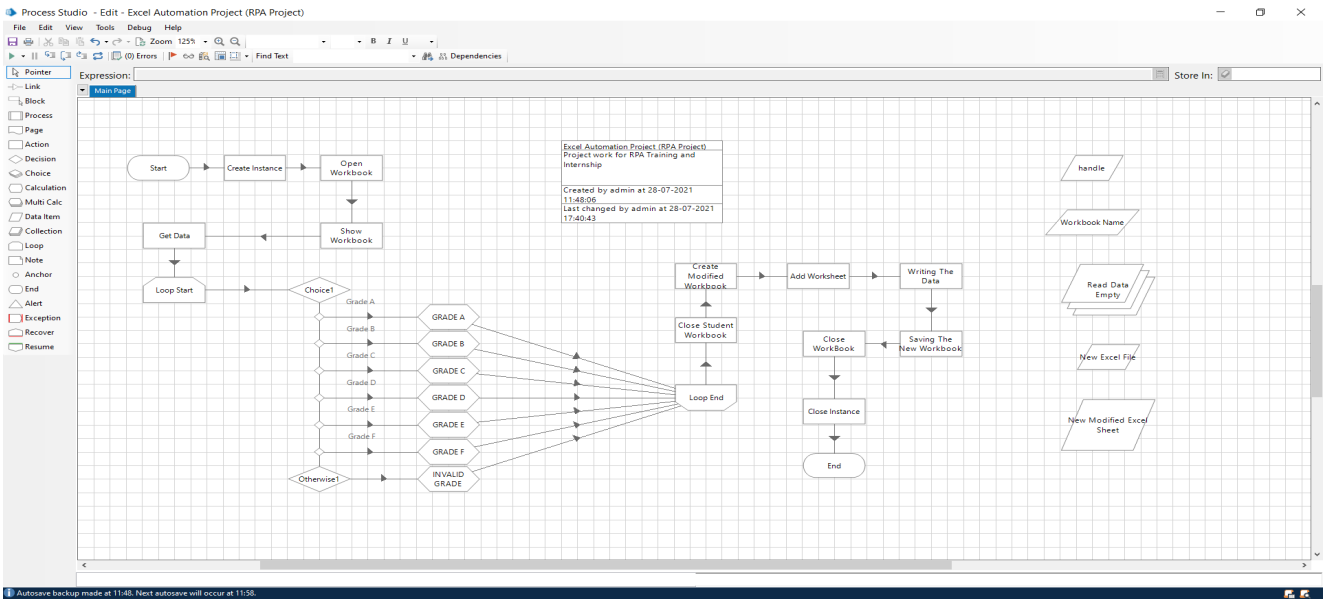
- While defining the actions, one must make sure that the proper handle, workbook name, worksheet name and the right collection data and data item is used in the input fields as well as in the output fields.

- The process flow in the above Grade Calculation Excel Automation that works over Microsoft Excel can be made to give the final output in two different ways. Firstly(The first way), we can get the calculated grades in the original mark sheet excel file itself on the Grades column. Secondly(The second way), we can get all the data, i.e., the calculated grades along with the data in the original mark sheet excel file, and create a new excel file and save the results in it.

The second way was preferred by me in the process flow that I created because by creating a new excel file and storing the original and the calculated data in it, we are not tempering with the original data that is provided and needed. If any changes are made in the original excel file, then it will be easier to modify and get the correct results if the original excel sheet is not fed with the calculated results. If the original data and the calculated data is stored in a newly created excel file by the automation process, we can easily discard the Excel file and create a new excel file by the automation process if any changes are made in the original excel sheet.

- Specifying the Blue Prism stages to work on MS Excel workbook in Blue Prism is very important as well.

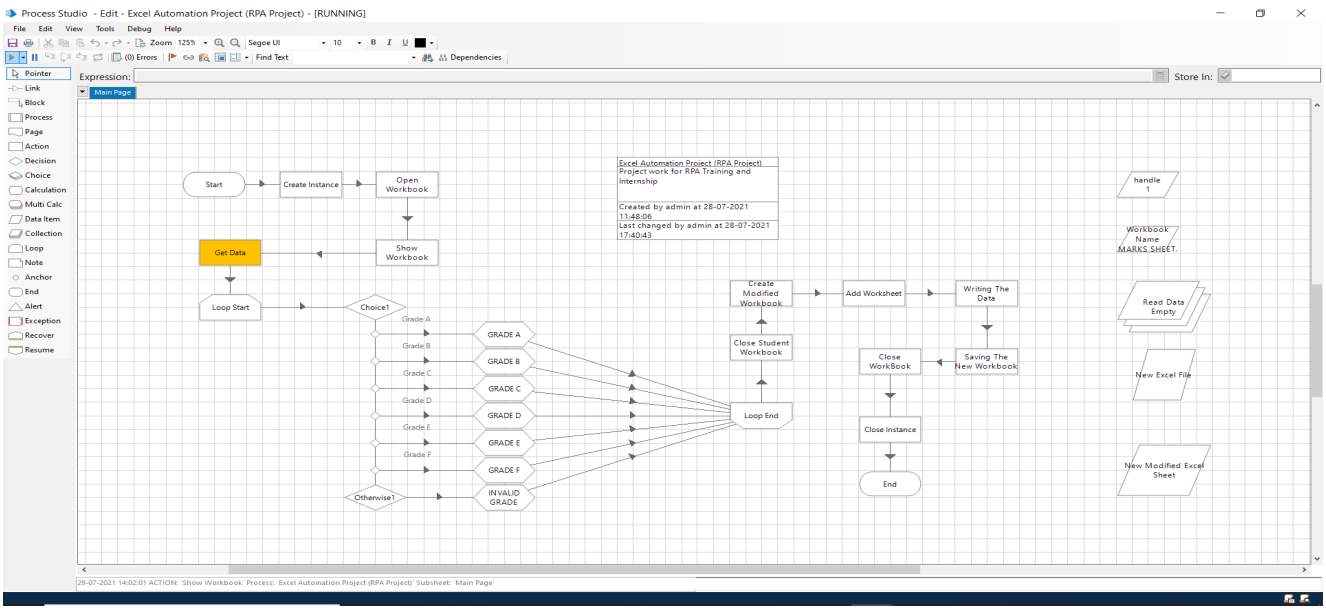
FLOWCHART :



The above screenshot shows the process flow created for automating the Grade Calculation process that works over Microsoft Excel using BluePrism RPA Software.

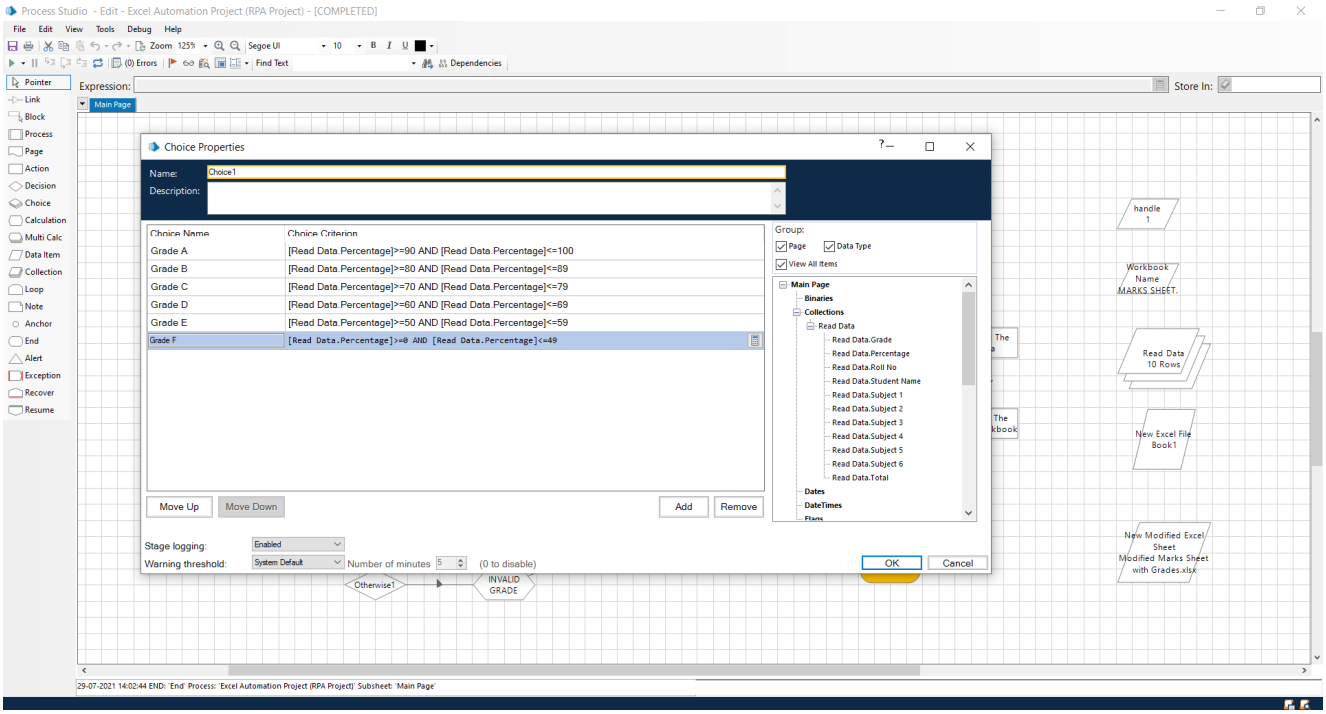
RESULT :

Few screenshots of the process flow

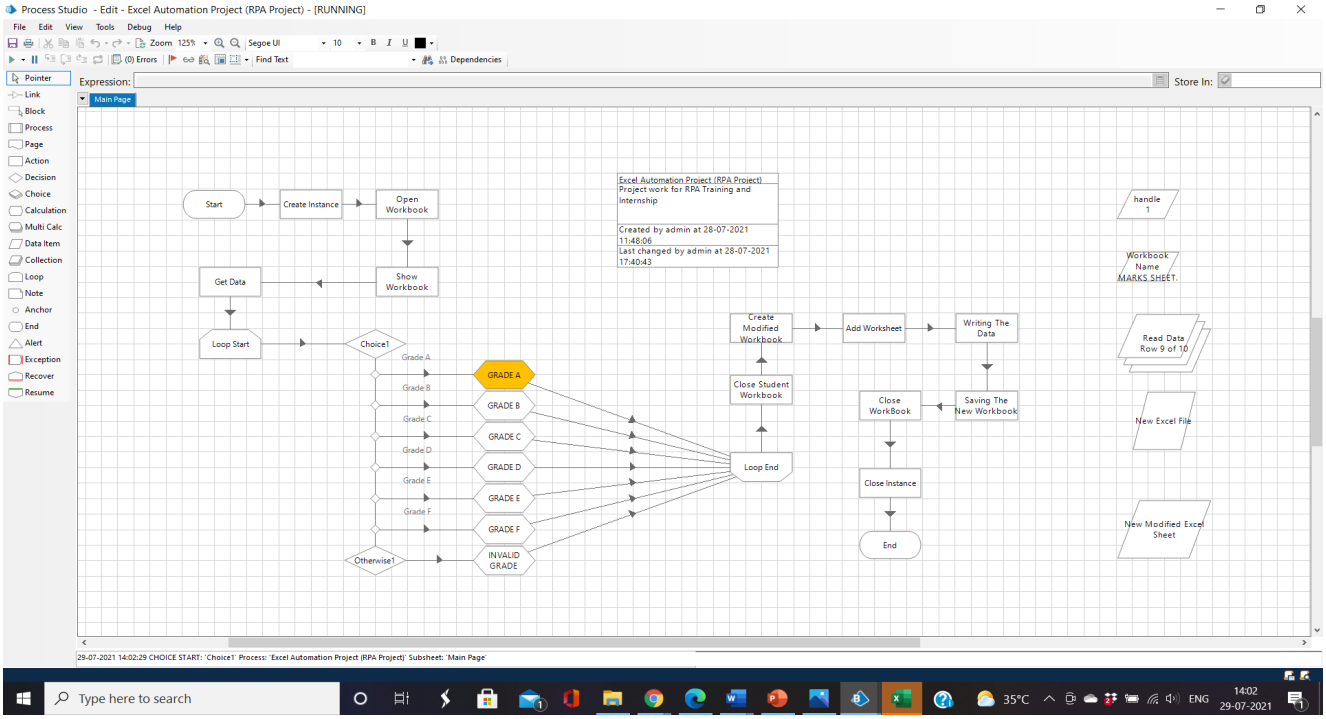


SPANDAN BORGOHAIN - (Excel Automation Project Work)

Conditions given for grade calculation :

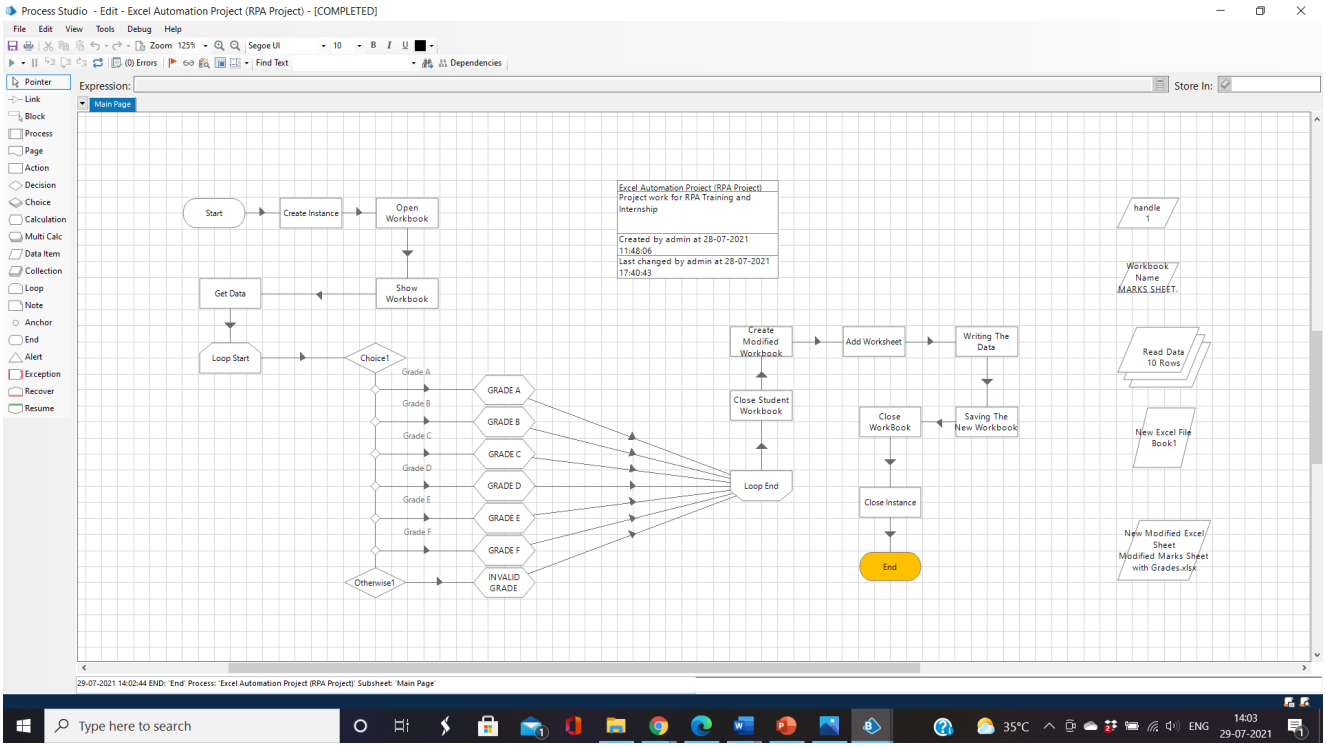


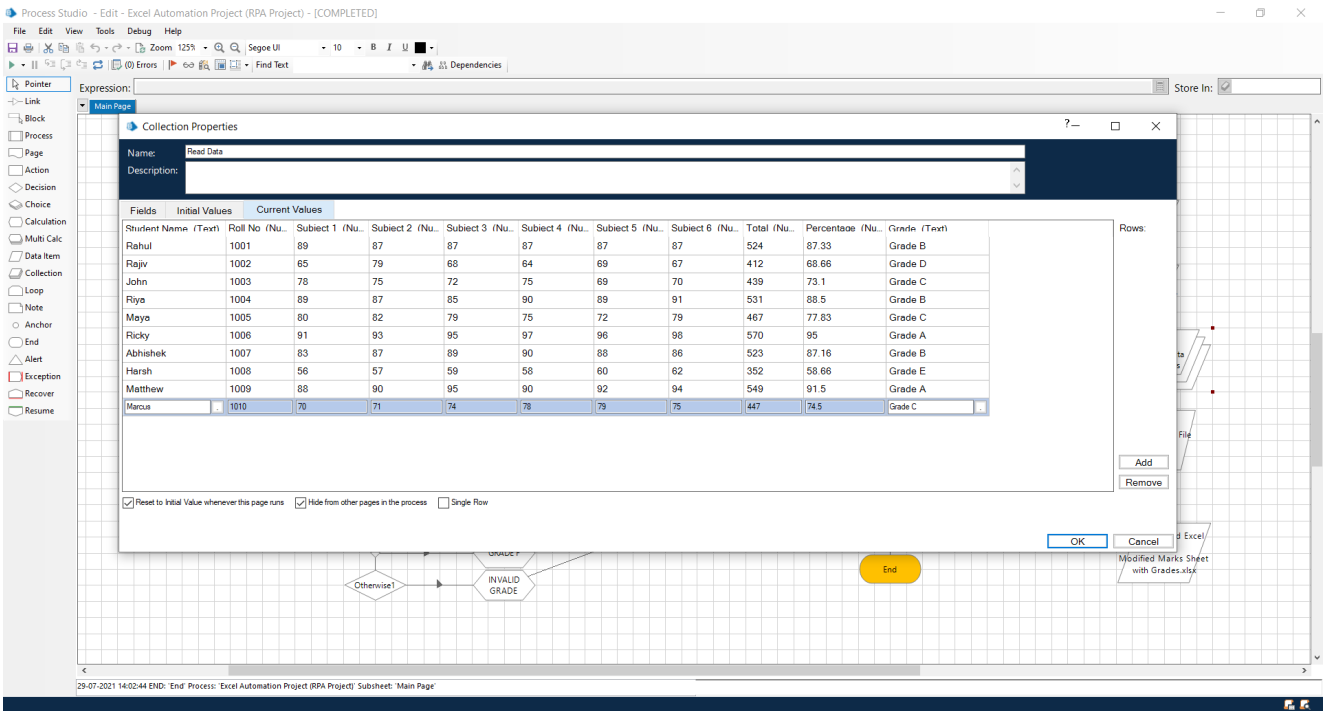
Grade calculation :



SPANDAN BORGOHAIN - (Excel Automation Project Work)

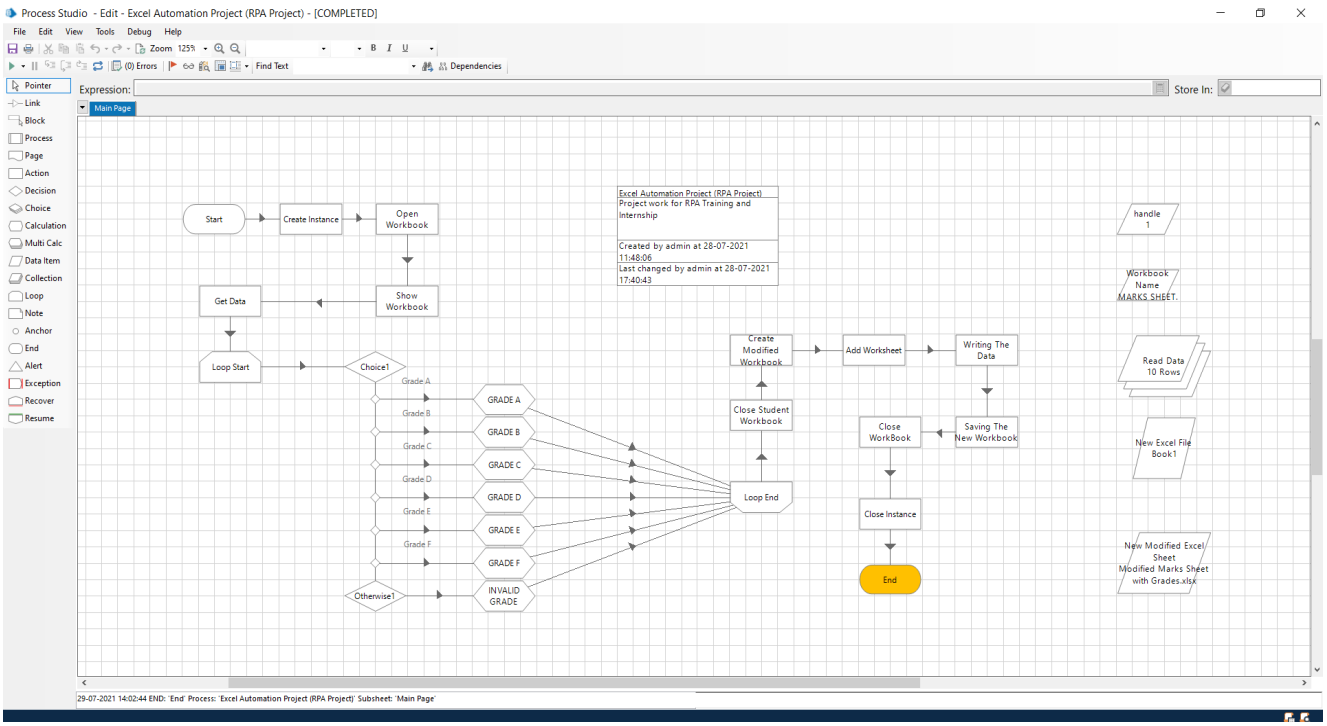
Process flow end and RESULTS :



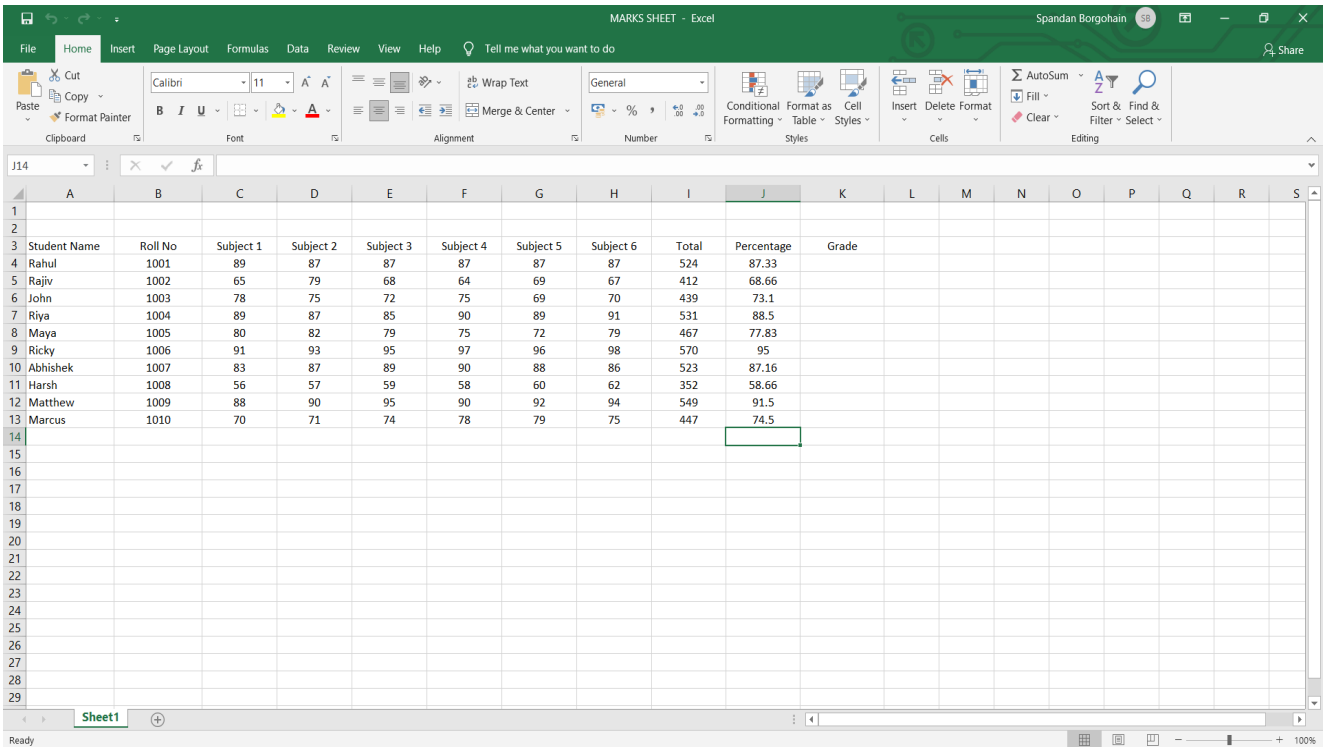


Student Name (Text)	Roll No (Nu...	Subject 1 (Nu...	Subject 2 (Nu...	Subject 3 (Nu...	Subject 4 (Nu...	Subject 5 (Nu...	Subject 6 (Nu...	Total (Nu...	Percentage (Nu...	Grade (Text)
Rahul	1001	89	87	87	87	87	87	524	87.33	Grade B
Rajiv	1002	65	79	68	64	69	67	412	68.66	Grade D
John	1003	78	75	72	75	69	70	439	73.1	Grade C
Riya	1004	89	87	85	90	89	91	531	88.5	Grade B
Maya	1005	80	82	79	75	72	79	467	77.83	Grade C
Ricky	1006	91	93	95	97	96	98	570	95	Grade A
Abhishek	1007	83	87	89	90	88	86	523	87.16	Grade B
Harsh	1008	56	57	59	58	60	62	352	58.66	Grade E
Matthew	1009	88	90	95	90	92	94	549	91.5	Grade A
Marcus	1010	70	71	74	78	79	75	447	74.5	Grade C

SPANDAN BORGOHAIN - (Excel Automation Project Work)



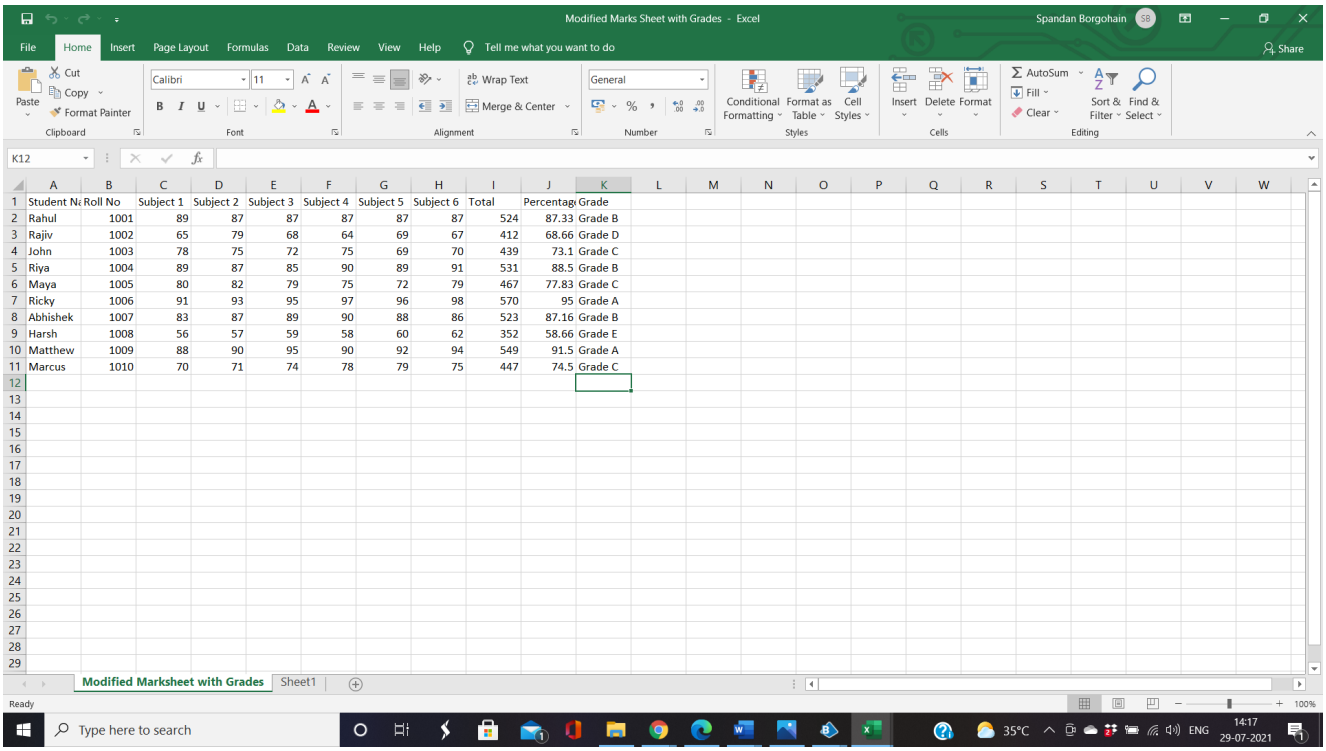
Original Excel Sheet :



Student Name	Roll No	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Total	Percentage	Grade
Rahul	1001	89	87	87	87	87	87	524	87.33	
Rajiv	1002	65	79	68	64	69	67	412	68.66	
John	1003	78	75	72	75	69	70	439	73.1	
Riya	1004	89	87	85	90	89	91	531	88.5	
Maya	1005	80	82	79	75	72	79	467	77.83	
Ricky	1006	91	93	95	97	96	98	570	95	
Abhishek	1007	83	87	89	90	88	86	523	87.16	
Harsh	1008	56	57	59	58	60	62	352	58.66	
Matthew	1009	88	90	95	90	92	94	549	91.5	
Marcus	1010	70	71	74	78	79	75	447	74.5	

SPANDAN BORGOHAIN - (Excel Automation Project Work)

Modified Marks Sheet Excel file with Grades that was created and saved after Automation :



Student Na	Roll No	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Total	Percentag	Grade
Rahul	1001	89	87	87	87	87	87	524	87.33	Grade B
Rajiv	1002	65	79	68	64	69	67	412	68.66	Grade D
John	1003	78	75	72	75	69	70	439	73.1	Grade C
Riya	1004	89	87	85	90	89	91	531	88.5	Grade B
Maya	1005	80	82	79	75	72	79	467	77.83	Grade C
Ricky	1006	91	93	95	97	96	98	570	95	Grade A
Abhishek	1007	83	87	89	90	88	86	523	87.16	Grade B
Harsh	1008	56	57	59	58	60	62	352	58.66	Grade E
Matthew	1009	88	90	95	90	92	94	549	91.5	Grade A
Marcus	1010	70	71	74	78	79	75	447	74.5	Grade C

ADVANTAGES AND DISADVANTAGES :

Advantages of Using RPA Software :

Some of the significant advantages of Excel Automation using Robotic Process Automation software are given below:

Code-Free

- RPA doesn't require any coding or programming knowledge.
- The modern RPA tools are used to automate applications in any department where the clerical work is performed across an enterprise.
- Hence, Employees only need to be trained on how RPA works, and they can easily create bots, just through **GUI (Graphical User Interface)** and different intuitive wizards.

- Moreover, this platform reduces the initial cost of installation, training, and deployment.

Non-Disruptive

- The transformation process in RPA is very simple and straightforward.
- The RPA software robots follow the existing security, quality, and data integrity standards to access the end-user system in the same manner as human beings.
- These software robots also prevent disruption of any kind and maintain functionality and protections.

User-Friendly

- RPA does not require a special kind of knowledge, such as coding, programming, or deep IT skills.
- RPA software is user-friendly, easy to understand, and easy to use.
- RPA tools allow users to create bots quickly and effortlessly.

Rich-Analytical Suite

- RPA software contains an in-built analytical suite that evaluates the performance of the robot workflows.
- RPA analytical suite also helps in monitoring or managing the automated functions from a central console, which can be accessed from anywhere.
- It offers basic metrics on robots, workflows, and more.
- The analysis performed by the analytical suite helps users to track the operations and determine issues.
- There is no need for any integration since everything is inbuilt and set right out of the box.

Security

- When an organization is running on automation, more users will demand access to

RPA products.

- Therefore, it is important to have robust user access management features.
- RPA tools provide options to assign role-based security capabilities to ensure action specific permissions.
- Furthermore, the entire automated data, audits, and instructions which can be accessed by bots, are encrypted to avoid any malicious tampering.
- The enterprise RPA tools also offer detailed statistics of the logging of users, their actions, as well as each executed task.
- Thus, it ensures the internal security and maintains compliance with industry regulations.

Rule-based Exception Handling

- RPA system allows users to deploy bots using rules-based exception handling.
- This feature proactively handles the exception.

Hosting and Deployment Options

- The RPA system provides deployment options across virtual machines, terminal services, and cloud.
- Cloud deployment is one of the best among all the other deployment options, which attracts most of the users due to its scalability and flexibility.
- Therefore, businesses can install RPA tools on desktops and deploy it on servers to access data for completing repetitive tasks.
- RPA systems can automatically deploy robots in a group of hundreds.
- Similarly, multiple bots can be used to run different tasks within a single process while processing a high volume of data.

Actionable Intelligence

- This RPA feature refers to the ability to gain and apply knowledge as skills.
- Robots first obtain the data and then convert it into information and transform the

information into actionable intelligence for the users.

- Artificial intelligence and cognitive intelligence are the common features of RPA solutions that help bots to improve decision making over the period.

Debugging

- One of the biggest advantages of RPA from a development perspective is debugging.
- Some RPA tools need to be stopped running while making changes and replicating the process.
- The rest of the RPA tools allow dynamic interaction while debugging.
- It allows developers to test different scenarios by changing the values of the variable without starting or stopping the running process. This dynamic approach allows easy developments and resolution in a production environment without requiring changes to the process.

Disadvantages of Using RPA Software :

Some of the major drawbacks of Robotic Process Automation software are as follows :

Potential Job Losses

- If a robot can work faster with a more consistent rate, then it is assumed that there will be no need for human input.
- It is the main concern for the employees, and this results as a major threat to the labour market.

Initial Investment Costs

- RPA is still in the stage of innovation, and so it can present challenges that may result in unwanted outcomes.
- Therefore, it isn't easy for organizations to decide whether they should invest in robotic automation or wait until its expansion.
- A comprehensive business case must be developed when considering the implementation of this technology; otherwise, it will be useless if returns are only

marginal, which may not worth taking the risk.

Hiring Skilled Staff

- Many organizations believe that to work with RPA, the staff must have significant technical knowledge of automation as robots may require programming skills and an awareness of how to operate them.
- It further forces organizations to either hire a skilled staff or train existing employees to expand their skills.
- The skilled staff can adopt and manage the robots in the long-term.

Employee Resistance

- People are usually habitual, and any change in the organization may cause stress to the employees.
- People who are involved in new technology will get new responsibilities, and they will have to learn new concepts of a specific technology.

Process Selection

- It is always best to choose tasks that are repetitive, rules-based, and do not require human judgement.
- The non-standard processes are difficult to automate, and human interaction is required to complete such processes.
- So, there are limited tasks that you can automate with RPA.

APPLICATIONS :

Some of the applications of Excel Automation using RPA software are :

- It can be used in reading and writing data in various scenarios
- Data extraction and migration is possible

- Sorting data and deleting duplicate rows is possible
- Comparing columns and rows for user purpose
- Integrating with other applications and databases
- It can be used in retrieving and creating workbooks
- It can be used in running analysis reports
- It can be used in filling forms with data from Excel spreadsheets
- Can also be used in maintaining information of everyone involved with the school, institute or organisation.
- The usage of the benefits of this automation process is possible across various fields and scenarios, wherever Excel sheets are used.

CONCLUSION :

The main objective of this project work was to build a process flow for Grade Calculation Excel Automation using the Blueprism RPA Software. The aim of reducing the human effort in repetitive tasks such as calculating grades was successfully implemented in this project work by building a process flow that was able to read the marks of the students from an Excel sheet, then calculate the grades of the students based on the conditions given and then finally writing the data and marks of the students along with the calculated grades onto a new Excel sheet that was also generated and saved through the Excel Automation process.

The other objectives of this project work like developing the skills and learning about the Blue Prism Robotic Process Automation software was also successful. The process and aim of importing Blueprism MS Excel VBO and binding Process Studio with MS Excel VBO was also implemented successfully. Automating the process of opening the MS Excel Workbook through Blueprism and then specifying Blueprism stages to work on MS Excel Workbook and tuning process flow with Blueprism actions was successful.

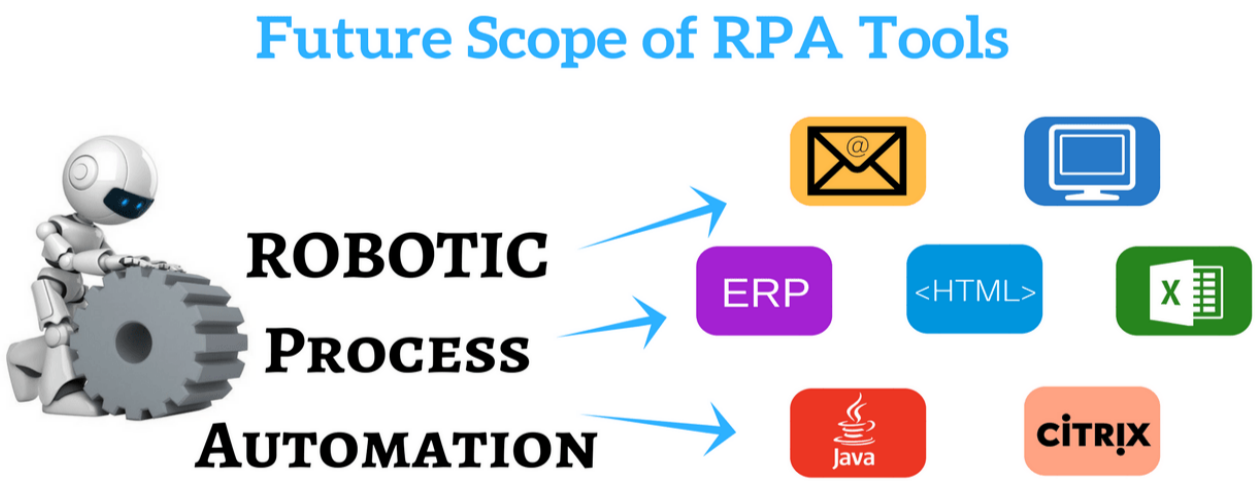
Finally, the idea and concept of implementing Robotic Process Automation in day to day repetitive tasks can be very efficient and successful if it is done in the right way. Through this project work, I have learnt that RPA softwares have an important role to play in the future and easing the tasks and workload on human beings. Moreover, the idea of implementing Excel

Automation using Blueprism RPA software to ease the task of calculating grades was successful implemented and shown through this project work. By implementing better techniques and ideas, we can definitely make a better and more robust version of automation processes such as this Excel Automation process and make the system more simplified and efficient.

FUTURE SCOPE :

There are anticipations of high scope of RPA in the near future and some of them are :

- It is considered to replace the data entry and the data rekeying jobs with its automated tools and techniques.
- Also, repetitive jobs of data assembling, formatting tasks that use a set of rules to follow the process can be easily performed using RPA
- Almost every type of computer-aided process that uses a set of protocols for its operations can be performed using RPA.
- Further with the advancements of the tools and techniques of robotics science, it is expected that during some point of time RPA will be able to perform all those operations that a human does today.
- The growth in the field of RPA is sure shot and thus will provide higher technological potentials towards significantly reducing the risk of inaccurate regulatory reporting along with improvised analytics and higher data accuracy.



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