MINI PROJECT FINAL REPORT

On

ROBOTIC PROCESS AUTOMATION (RPA)

Submitted by

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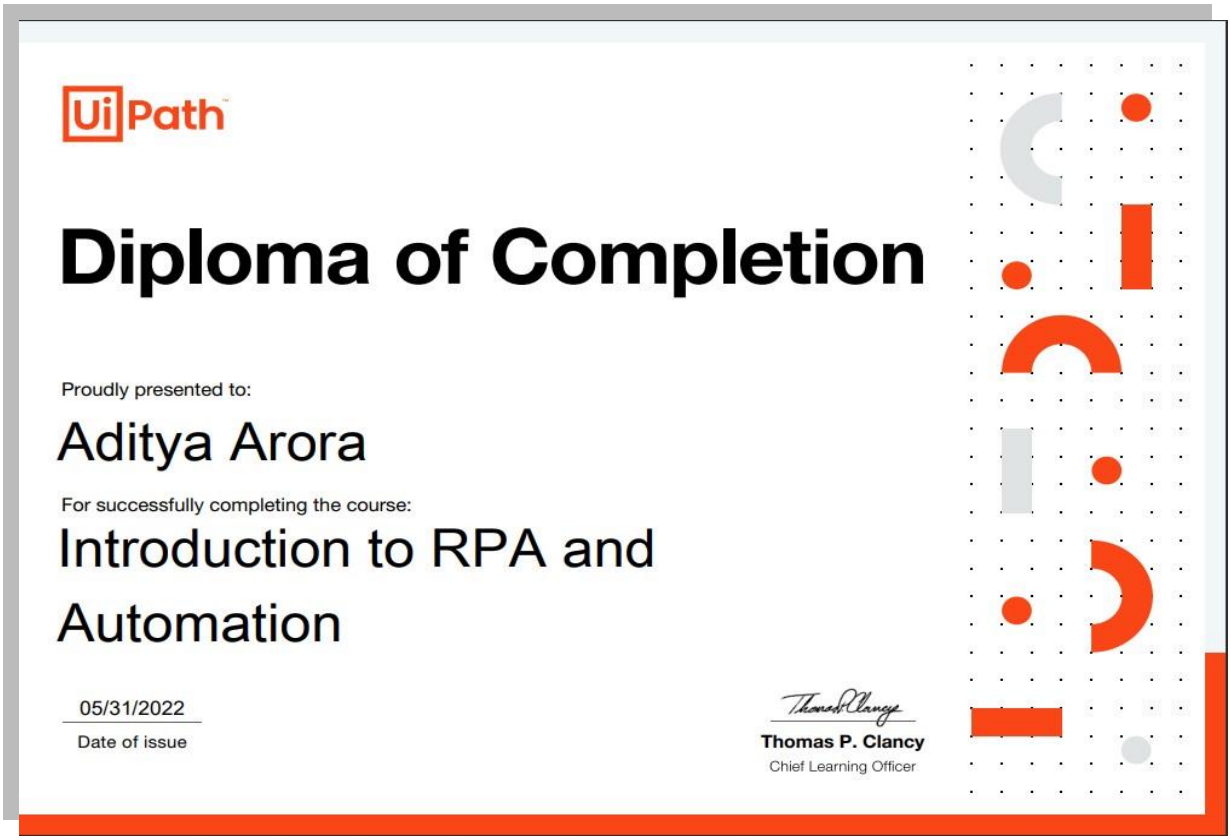
Contents

Certification



UiPath

Diploma of Completion

Proudly presented to:

Aditya Arora

For successfully completing the course:

Introduction to RPA and Automation

05/31/2022

Date of issue

Thomas P. Clancy

Chief Learning Officer

Acknowledgement

It gives us immense pleasure to present the synopsis of our mini-project undertaken during out III year of B.Tech. This project is an amalgamation of the hard work, knowledge and dedication put in by us and our mentor, Dr. Sumit Nagar. he helped us in every possible way to accomplish this constructive goal of ours.

His sincerity, thoroughness and perseverance has been a constant source of inspiration for us. We believe that he will shower us with all his extensively experienced ideas and insightful comments at different stages of the project & also taught us about the latest industry-oriented technologies. We also do not like miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind guidance and co-operation.

We shall remain highly obliged to all the people who helped us in every possible way.

Introduction

Robotic Process Automation can be easily confused with physical robots; however, this does not hold true. RPA is a variety of software's that has the ability to interact with multiple applications in a computer.

It can be programmed to complete basic tasks typically performed by an employee. RPA is considered a type of robot, used to automate repetitive tasks. It can automate activities as simple as generating an automatic response for specific emails, to performing financial tasks such as performing bank statement reconciliations**. RPA tools perform logic [if, then, else] statements on structured data (data in a predetermined format, such as a configured excel sheet),** following an established set of steps. By doing so, it can interact with different computer applications and accomplish activities such as extracting data from a browser and inputting it in a desktop app, clicking or typing where and when indicated.

RPA is ideal for processes, in which employees take inputs from a particular system, such as an email or an Enterprise resource planning (ERP) system. Those inputs can then be modified to follow specific rules and can be recoded as outputs into another system and can be replicated to be performed by BOT to reduce manual labour and increase Efficiency.

1. Email Automation
2. Website Maintenance
3. Shopping BOT/ Compares price History.
4. Stock Market

Companies must constantly adapt to the fast-paced business environment by redesigning their processes and improving their efficiency in today's rapidly changing markets. Nevertheless, there remains significant skepticism related to investing in new technologies. This is partly due to the consideration that there is a large risk of not receiving considerable returns on investment; however, these companies need innovative technologies to increase competitiveness, enhance their reputation, and add non-quantitative values to their brands. Without technology many companies have processes being done manually, lacking structured systems and having repetitive, non-value adding tasks. Those issues account for inefficiency, increase in cost and lack of progress.

The goal of this project was to evaluate the implementation of RPA and lean principles in order to improve and automate Ford Motors webpages worldwide. Its processes and infrastructure, described later in the report, were assessed to determine which specific process would be analyzed for RPA implementation. The company's management has identified several flaws and inefficiencies in their current processes and are considering implementing RPA aiming to increase efficiency and reduce costs. This includes an in depth analysis of the project's feasibility as well as a projected timeline for what the project's implementation would look like. There were three main objectives in order to achieve the overarching goal. These included evaluating and assessing current systems and processes at Wunderman Thompson, developing an action plan and timeline for what RPA implementation would look like at the company and what changes would be necessary. Additionally, we included recommendations and next steps for the company.

SOFTWARE AND HARDWARE REQUIREMENTS

- UI-path studio
- VS code
- Web Extensions
- Task capture
- Jira, Ingest
- Adobe Experience Manager
- Test System
- PDD

Project Description

Domain		RPA
Goal		Automation of existing processes 5. Email Automation 6. Website Maintenance 7. Shopping BOT/ Compares price History. 8. Stock Market
Application		Use of existing applications (UI path studios, Task capture for replication)
Integrating Method		AGILE - Interacts with systems through the presentation layer.
Process Suitability		Suitable for processes that require business and process expertise, reduces manual workforce, saves time, 99.7% efficiency.
Programming Requirements		Programming skills JAVA, UI-path, AEM, INGEST,JIRA.
Development Time		Fast development times – no complex integration required 1 week

Robotic Process Automation (RPA)

BOT checks the previous history of the product on any shopping site and tells the lowest ever price and maximum ever price so that you can buy fair product.

Robotic Process Automation can be easily confused with physical robots; however, this does not hold true. RPA is a variety of softwares that has the ability to interact with multiple applications in a computer. It can be programmed to complete basic tasks typically performed by an employee. RPA is considered a type of robot, used to automate repetitive tasks. It can automate activities as simple as generating an automatic response for specific emails, to performing financial tasks such as performing bank statement reconciliations. RPA tools perform logic [if, then, else] statements on structured data (data in a predetermined format, such as a configured excel sheet), following an established set of steps. By doing so, it can interact with different computer applications and accomplish activities such as extracting data from a browser and inputting it in a desktop app, clicking or typing where and when indicated.

E-mail classifier

The first task I was assigned is an automatic e-mail classifier, using Microsoft Outlook and Automation Anywhere Enterprise, a robotic process automation suite.

Bot's functionalities

The business unit I am part of has a common mailbox, in which all the emails concerning the working group are received. However, many e-mails do not involve all the people that are part of the unit, thus, each of them looses time looking for the right e-mails to be read. A system that automatically categorizes messages in predetermined folders, one for each project, would help the BU very much, The bot, then, should, in order:

1. Open Microsoft Outlook and wait for the mailbox to load.
2. Take all the elements that characterize the first message in the mailbox,
   i.e. subject, sender, receiver, CCed people and the message body.
3. Send a request to a REST API to classify the message and receive the name of the folder to put the message into.
4. Move the message to that folder.
5. Repeat steps 2 to 4 for each message in the mailbox, until it is empty.
6. Close Microsoft Outlook.

Report generator

Looking for other applications for RPA, I was given the task of developing a bot that automatically creates a technical report in form of a Microsoft PowerPoint presentation. Bot's functionalities

One of the services offered by the business unit I worked in is the creation of cognitive search engines that enable customers to build helpful and easy-touse platforms. A customer requires my team to send weekly (seldom daily) reports about their search engine performances. The report is a PowerPoint presentation with some screenshots of statistics and plots about the service performances (e.g. memory heap, CPU usage, number of requests, number of errors etc.) along the period requested by the customer. There are two servers that work as back-end from the same server, thus each slide of the report should include the plots of both servers, in order to be compared. The creation of the report requires the visit of more than 20 web pages. Reaching each page takes many steps, due to the complex design of the monitoring platform, and is highly time consuming. The average time to create manually one complete report is more than 50 minutes. Therefore, since this is a boring and repetitive task, we decided to automate it. As a result, the bot can complete the task in less than 10 minutes, and can work without any kind of supervision on a virtual machine, letting the user to do something more interesting and productive, while the bot generates the report. In order to create the report, the bot should:

1. Ask the user for the time range of the report.
2. Open the template file on PowerPoint.

3. Write the time range of the report on the presentation’s cover.
4. Open a web browser and authenticate into the monitoring platform.
5. Iterate over a list of URLs to be visited and take a screenshot of each plot.
6. Paste each plot (two by two) on the presentation and resize it to fit into the presentation.
7. Save the presentation with a filename that includes the time range.
8. Close PowerPoint and the browser.

CODE

```
{
"name": "gdpr-tbot",
"version": "0.1.0",
"description": "A GDPR Chatbot",
"main": "./js/index.js",
"repository": {
"type": "git",
"url": ""
},
"scripts": {
"tsc": "tsc",
"start": "node ./js/index.js",
"lint-fix": "tslint --fix 'ts/**/*.ts' 'ts/**/**/*.ts'",
"docker-debug": "docker.compose build && docker.compose up",
"debug": "nodemon --watch ./js --inspect=0.0.0.0:9222 --nolazy
./js/index.js",
"postinstall": "tsc",
"watch": "tsc -w"
},
"author": "Edoardo Debenedetti",
"license": "ISC",
"dependencies": {
"@types/mongodb": "^3.1.19",
"@types/node-telegram-bot-api": "^0.30.4",
"@types/redis": "^2.8.10",
"@types/watson-developer-cloud": "^2.40.0",
"mongodb": "^3.1.13",
"node-telegram-bot-api": "^0.30.0",
"nodemon": "^1.11.0",
"redis": "^2.8.0",
"tslint": "^5.13.0",
"typescript": "^3.3.3333",
"watson-developer-cloud": "^3.18.1"
},
"config": {
```

```
"unsafe-perm": true


services:
redis: image: "redis:alpine" container_name: "rediscontainer" volumes:
redis-data:/etc/redisdata/ command: ["redis-server", "--appendonly", "yes"]

db: image: "mongo" container_name: "mongodbcontainer" volumes:
mongo-data:/etc/mongodata ports:
"27017:27017"

chatbot:
build: .
command: "npm run debug" container_name: "gdprbot" ports:
"3000:3000"
"9222:9222" volumes:
/usr/src/app/js:/home/edoardo/Documenti/reply/gdpr-chatbotsl/js environment:
BOT_TOKEN=XXXXX:XXXXXXXXXXX
ASSISTANT_ID=XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXX
ASSISTANT_IAM_APIKEY=XXXXXXXXXXXXXXXXXXXXXX-XXXXXXXXXXXXXXX
ASSISTANT_URL=https://gatewaylon.watsonplatform.net/assistant/api

volumes: redis-data: mongo-data:


```

Typical RPA Implementation Timeline

According to the UiPath for RPA, a typical RPA implementation has six major stages shown in Figure 1. The first focuses on preparing the RPA. In this step, the organization has to prioritize to automate the processes which will provide the best outcome. In order to do so, the organization needs to take metrics or time estimations on their current processes. The following step is to actually design the RPA. For this step, the organization needs developers that can design a proper solution for their process and that can create a test environment where the final project can be tested before it is implemented. The next three steps are to build, test, and stabilize the RPA. During this phase, it is crucial that the test environment assimilates as much as possible to the real-world scenario and that all the possible outcomes are considered when writing the code. By doing so, the developers will be reducing the chances of the RPA failing when implemented. The final stage of the timeline is constant improvement. This step pushes the organization to not only improve the previously implemented system, but to look for new processes to automate and to integrate them together. By doing so, the company would continue to reduce operational costs and it will also spread out the cost of implementing RPA.

In regards to our project, the first step of the timeline has been completed during the Winter Break. Also, the team has a solid design idea for the RPA. The main idea is to automate the selection of pumping systems and sending the budget to the client. Also, it would include automating the creation of a digital database for the company's clients, which will be the company's first step on their transfer from a physical database to a central digitalized one.

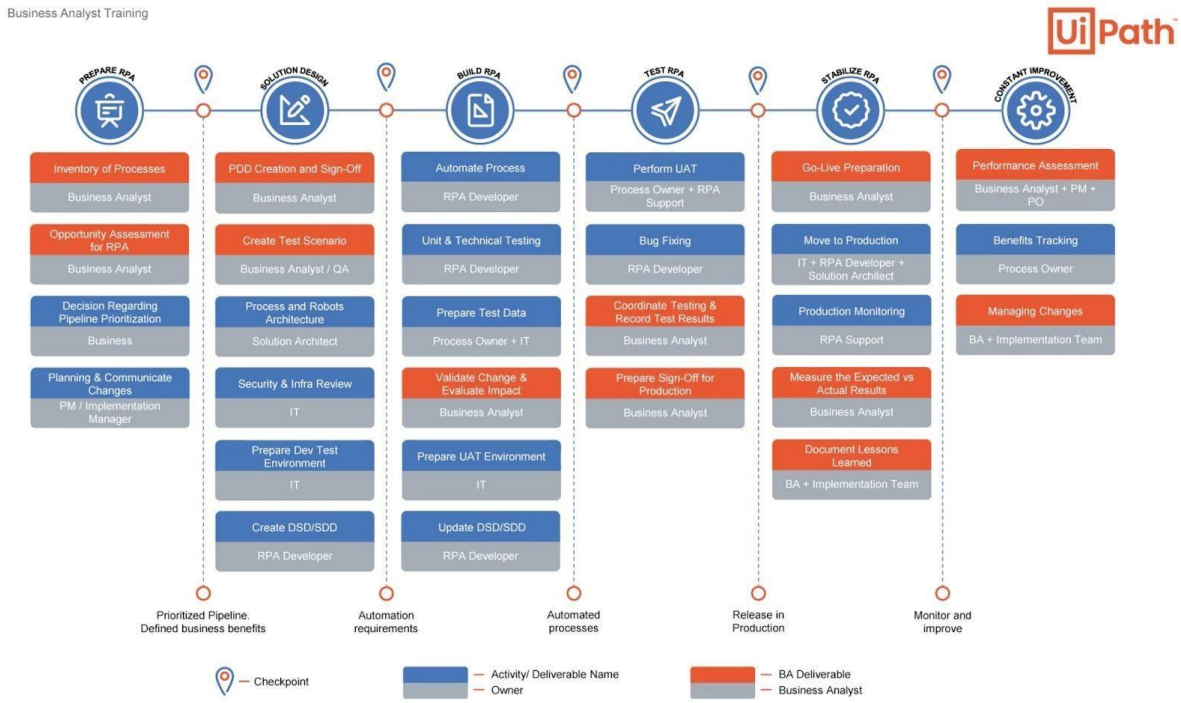


Figure 1: Typical RPA Timeline (UiPath)

UiPath Coding

Typically, the first step on the RPA development phase is to write a document that describes the process from beginning to end. In this document, all the needed requirements for automation are clearly specified. The document should also include a detailed description of every step of the process, such as explaining how the process is currently done manually and describing the logic of every step, as shown in the as-is model. As a result, the RPA developer understands the process thoroughly in order to program the robot to accomplish it.

In order to do so, the team will prepare IDEF models to show the steps of the manual process (As-Is Model), as well as the different steps of the process after RPA implementation (To-Be Model). Besides showing the order of steps, these models will also describe the involvement of the different actors in the

process, whether it’s the secretary, the engineer, or even the RPA. Once these models are done, the team should contact Ford_IMG and get their confirmation that the models are accurate. Once the client signs off the document, he/she is confirming that the models are accurate, and that the process is ready for the development phase.

As previously mentioned, the team relied on UiPath’s RPA Timeline when developing this RPA project (Figure 1). In order to do so, all four members of the group completed the UiPath Business Analyst course, which is offered at no cost in the UiPath Academy website. In this course, the different steps of an RPA project are described thoroughly, and recommendations are given on how to approach different types of projects.

As-Is Process map

High Level As-Is Process Map:

This chapter depicts the As-Is business process at a High Level to enable developers to have a high-level understanding of the current process.


Start
Sequence
1 actions • 4sec
New Tab - Google Chrome
3 actions • 7.5sec
Home Realm Discovery - Google Chrome
1 actions • 11.7sec
Sign In - Google Chrome
1 actions • 2.2sec
Test Page || Aditya - Google Chrome
2 actions • 5.1sec
Test Page || Aditya | AEM Sites | Page Properties - Google Chrome
3 actions • 21.3sec

The analysis of RPA implementation was divided into two main categories: Process and Feasibility. The process analysis portion relates to the break-down and in-depth analysis of the back office process to be automated. Throughout this section, different models are presented that explain the current process and how the process will ideally be after automation. The feasibility analysis, on the other hand, encompasses a larger scope. This section was divided into three parts: technical, economical, and operational feasibility.

Process Analysis

Process Selected

Ford_IMG team focuses on two different product lines. The first line involves pre-set and pre-designed solar systems that include pumping systems and electrical systems for home appliances. The customers that purchase these products are typically farmers who need electricity for their homes or for their ranches. The second product line involves large scale projects under customer specifications. These large projects normally involve government infrastructure projects or large companies whose projects scope are far larger and cannot be covered by the pre-designed systems.

Software Selected

UiPath was chosen over other automation platforms for multiple reasons, including that the team has experience working with UiPath. Additionally, the availability of UiPath's Community Edition offers significant automation capabilities for free. With the Community Edition, the company will have 3 robots available for use. The license also grants the download of two studios for designing automation. This was helpful, considering that the team's developer was able to download one studio, and process manager will be able to download the other.

Design of RPA

UiPath – Robot logic structure

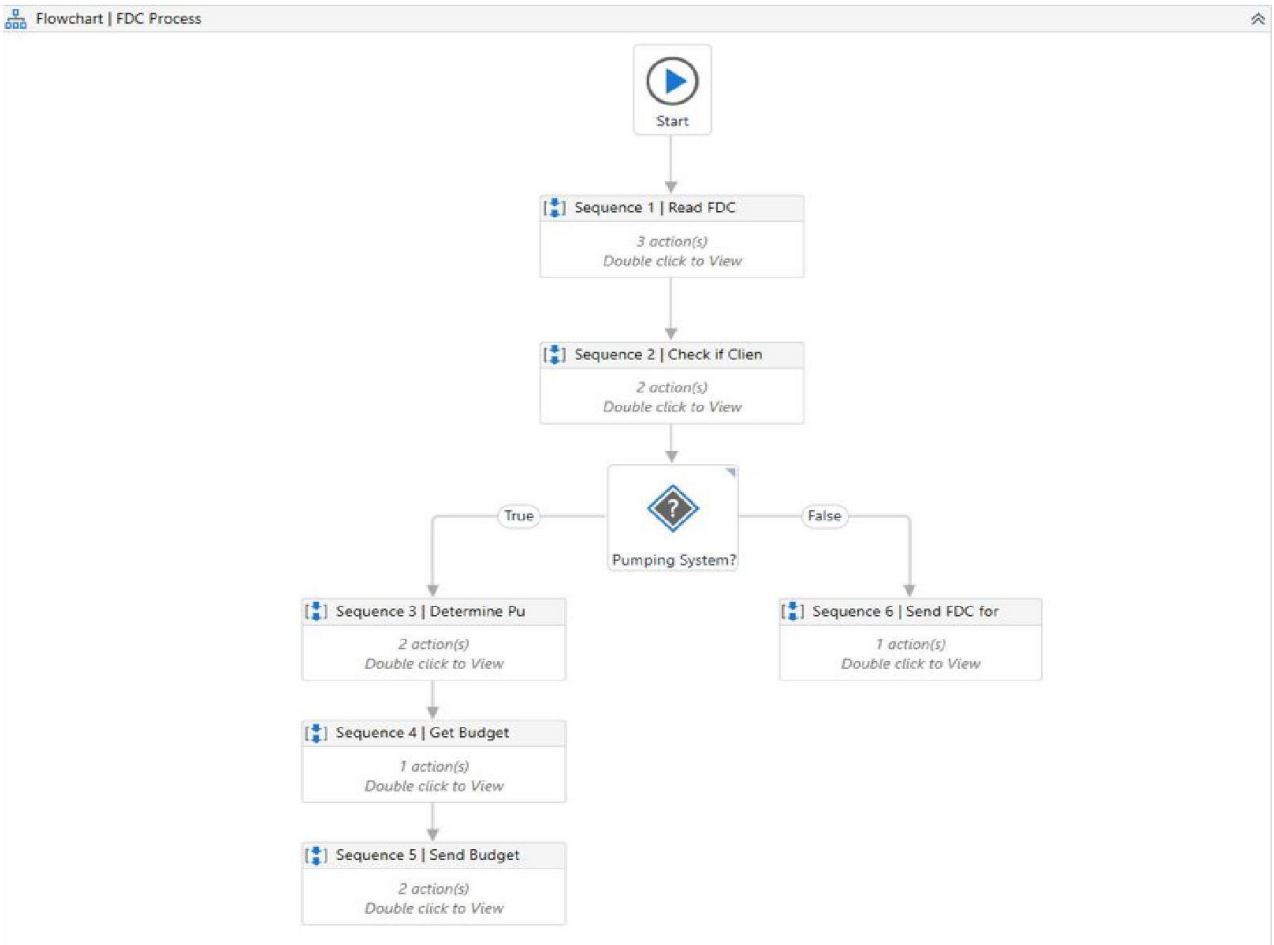


Figure 17: Robot Logic Structure of the “To-Be” process

The robot’s logic structure is shown above in Figure 17. This structure consists of six different sequences which represent the six main steps of the whole business process being automated. Inside each sequence, one can find numerous activities that the robot completes in order to read the FDC, select the ideal system, and then send a budget to the client. Additionally, the robot checks whether the client is a new client or a recurring one, and based on that saves the files (FDC and system budget)

into the existing folder or creates a new one. In the case that the client is new, the robot also adds the corresponding information to a MS Access database, which will serve as a general client database for Wunderman Thompson.

Sequence 1: Read FDC

The first sequence the robot goes through is simple. In it, the robot looks for files in a specific directory where the new FDCs should be stored after receiving a call from a client. The robot is programmed to read over the files using a For Each Loop, where it looks over the files from the following directory: C:\Users\zucco\Desktop\Clients\Unprocessed FDC. Each file that the robot finds is automatically stored as the file's entire path. For instance, the file inside the previous directory might be named "Robot", but the robot stores it as

It is important to note that there must be at least one file in this directory, otherwise an error will occur, and the robot stops since it will not have anywhere to extract data from. In the case that the robot finds more than one file in this directory, the robot will go through the same activities for each file, rewriting the variables every time. Therefore, only the information of the last file will be stored in the variables and only that file will go through the entire RPA process.

After finding a file, the robot opens the excel file using the "Excel Application Scope" activity using the file path. Inside this activity, one can find several "Read Cell" activities. In each one of these activities, the robot is programmed to read specific cells in the FDC and store the data retrieved in different variables

Feasibility Analysis

Technical Feasibility

The technical feasibility allows us to answer the question “Can we build it?”. The analysis is based on the capability of the company to support the technology necessary for the implementation of the project. With that said, It is considered a partially computerized company. The company owns the old versions of Microsoft Office, which can be a problem in the future due to updates in the application. Despite that, the company has the equipment necessary for the implementation of the project; however, they do not utilize the technology in its full capacity. The reason behind it is because management believes that it is difficult to train their employees to accomplish the tasks digitally; therefore, they prefer that the employees manually complete the process. This suggests that the company’s employees may have less familiarity with systems and computers. It might take a small period of time for the employees to adapt to both application and technology. On the other hand, the only system that has to be integrated with the RPA is Microsoft Office, making the compatibility of the new system with the old essential. The table below summarizes the familiarity and risks . Low familiarity means no basic knowledge, medium familiarity somewhat knowledge and high familiarity good knowledge.

	Familiarity	**Risk**
Application	Low	Medium
Technology	Medium	Low
Compatibility	High	Low

Table 2: Technical feasibility risk table

Developmental Costs	
Development Team Salaries	$500.00
Development Training	$50.00
Hardware And Software	$1,500.00
Vendor Installation	$0.00

Benefits

Tangible and intangible benefits were taken into account, which were broken down into increased time for value added tasks and the creation and utilization of the Access database. An improved time allocation for the staff will permit an increased focus on value adding tasks. Although the employees' salaries will not change nor will there be a reduction of staff, the company will spend less money on repetitive, non-value adding activities such as basic data entry and gathering product information for the customer. The database can be used to improve customer retention, serve as a marketing tool to increase sales, decrease non-value time spent searching for past records due to lack of organization and digitalization, decrease materials used for manual record keeping such as paper and ink, and added intangible benefit of increased sustainability and eco-friendliness.

Cost Savings

Net Benefits	$3,970.00	$4,162.44	$4,162.44	$4,162.44
Cumulative Net Cash Flow	$3,970.00	$192.44	$4,354.88	**$8,51700.32**

Table 6: Cash Flow Table

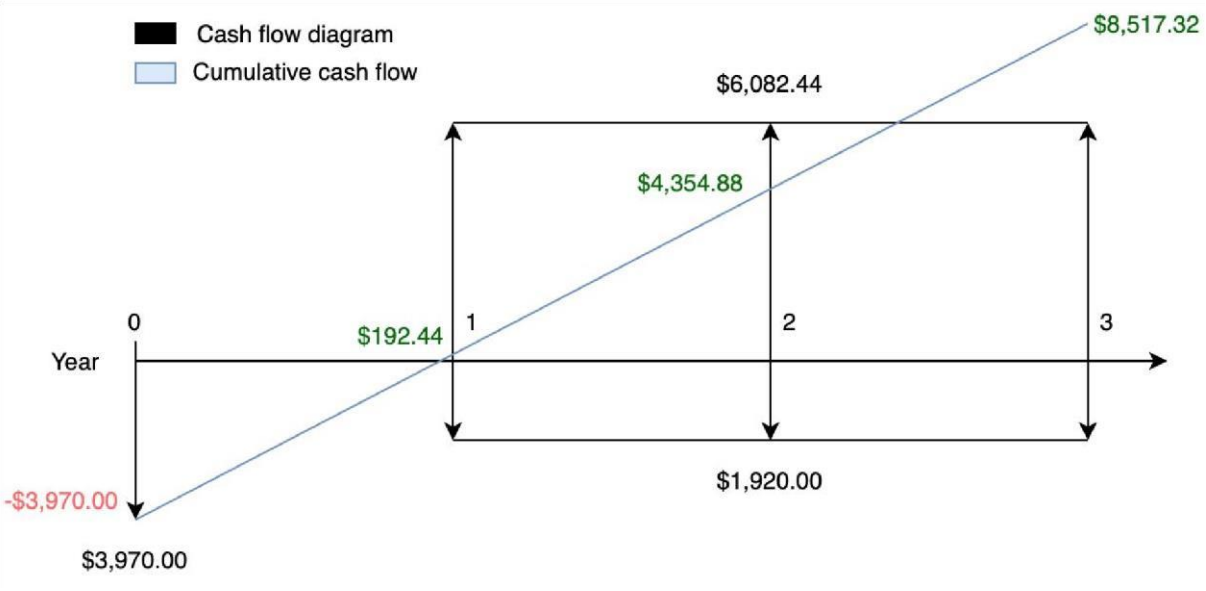


Figure 28: Cash Flow Graph

Analysis		
Stakeholder	**Estimated Project Impact**	**Limitations**
Company	Processes are more efficient, data can be utilized to increase customer retention and profits	Full automation is limited because of company culture
Secretary/ Engineers/Other employees	Increased time for value added work	Adjustment to new process may cause less productivity during transition period
Customers	Better customer experience/satisfaction, less wait time	None

Conclusion and Recommendations

The project evaluated the necessary steps and feasibility of implementing Robotic Process Automation at Heliotec, a solar panel retail company in Paraguay. It proposed RPA as a method that combined with Business Process Reengineering, would offer a modernized approach to decrease process inefficiencies. The process that was selected for this project consisted of inputting client information, determining the appropriate system for the client's needs, and sending the client the budget for it. The successful implementation of RPA for automating repetitive internal processes at BOT would improve efficiency, cost efficiency, and increase time dedicated to value adding tasks. Using UiPath, this selected process was automated and it is able to successfully complete the whole process in about 10 seconds.

To determine the feasibility of implementing RPA , the team started by meeting with company representatives to get a better understanding of the different processes in the company. The team identified the different factors and players involved in every step of each process in order to be able to determine if they were suitable for automation. Once the process was selected, the next step was to begin developing the RPA. The final step was to test the RPA to see if it worked as expected. After testing, the robot performed as it should, and the client was pleased with it.

Through the analysis performed, the team found that implementing RPA would in fact lead to improving efficiency, cost efficiency, and increase time dedicated to value adding tasks.

It was determined that it is feasible to implement, and would significantly reduce yearly costs.

After the completion of the project, the following recommendations can be made:

- Ford_IMG team should implement the RPA developed in the project for the selected process, given it was determined to be feasible.
- The implementation of the Access database should be used as a tool to digitize and automate data collection and storage.
- Customer retention should be increased through rewards and promotions through the utilization of customer data.
- Further automation by planning to automate other suitable internal processes in the future.

It is important to consider what future steps can and should be taken. If the company chooses to go through with the implementation it will need to prepare and plan as its first step, including updating its system and training its employees. That would then typically be followed by the design of the RPA and building the RPA, which has already been completed as part of this project. The RPA would then need to be tested and stabilized. Finally, constant improvement should be a priority and steps necessary to do this should be taken as well. This should include repeating the process for other internal processes suitable for automation. Additionally, as the company grows the process might change as well as other aspects of the company; therefore, the company should be prepared to adapt and change the RPA alongside the changes that come up.

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