

# Robotics Process Automation for Banking

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Every industry whether its product industry or service industry tries to deliver the quality services to their customer as there is huge competition in the market. So every industry tries their best to upgrade their self technically with the minimum cost so that ROI can be achieved. Robotics process automation is tool used to achieve ROI for goods and services industry. Robotics process automation is software developed which resides on the other software which is used to deliver the goods or services. Robotic process automation (RPA) is technology in which its very easy to develop and create software bot that replicate the human work. Our proposed solution is for specifically for the banks where customers get many requests from their customers related to their accounts, like statement of account, interest certificate, account closure request etc., all such requests are handled by the human physically but these requests process are repetitive in nature and fixed in method of processing so such a request can be processed by the bots. Bot is available 24\*7 and its working is error free.

**Keywords:** Robotics, ROI.

## 1. Introduction

Now Days technology changes rapidly. Before 2000 computer is capable only to take input from keyboard or CD or floppy, now computer can listen and speak. In business customer demands has increased due to new changes in technology. So, organization need to be competitive in providing services to the customers. Organizations can automate repetitive and laborious operations using robotic process automation (RPA), which lowers operating expenses (Forrester Research, 2014). In addition to experiencing significant full-time equivalent (FTE) cost savings, organizations that have adopted RPA technology have also benefited from increased service, quality, and speed, a decreased error rate, and staff satisfaction. Now have robots that can accomplish inaccurate activities that are now performed by humans and computers that have begun listening and communicating. Businesses must respond to the growing demands of their customers in order to stay

competitive.

A system that uses automation doesn't require any engagement from people. The most unreliable aspect (human error) is eliminated by automated technologies, boosting precision, quality, and accuracy. Alan Turing, a computer scientist, originally proposed the idea of utilizing software to automate activities in 1935. He explained how a methodical algorithm could streamline processes. His theories on automation and algorithms have a long-lasting effect. Patric Geary, the director of marketing at the RPA software provider Blue Prism, coined the term "Robotic Process Automation" (RPA) in 2012[2]. Since RPA is a relatively new technique, there hasn't been any thorough research done on it. In 2014 and 2015, RPA began to gain popularity. When businesses first began to mention significant savings brought on by automation. By the beginning of 2016, the RPA back-office automation market had grown somewhat, although it was still only a tiny one [1]. The global RPA market, which includes both RPA services and RPA software, rose by around 64% from 2016 to 2017 (from \$271 million to \$443 million), per Horses for Sources study (2017) and Everest Group study (2017) [3].

Robotic process automation (RPA) is a technique that involves using computer software to finish a particular task that was previously carried out by a human. System replacement by robotic automation software is not possible. Instead, it cooperates with the system and carries out a certain duty exactly as instructed [6]. RPA communicates with a computer system in the same way that a human would, but considerably more quickly and inexpensively. RPA can be used to carry out computer procedures that need repeated typing and clicking in the same way that a human would. This saves on payroll costs. RPA does not call for updating outdated systems. RPA is adaptable to any software used by organization and its implementation time is short [4]

This paper introduces the way to automate the task which are repetitive in nature having fixed algorithm to carry such task in banking sector. Banks gets many requests by their customers. Some times customers want to close their saving account as he or she is moving to other city or customers want to convert their saving account to current account.

## **2. Literature Survey**

The introduction of new technologies and research has changed our economic and business sector, the current business or industry sector wanted to incorporate and exploit these new digital solutions and innovations. As the result of this industry and business sector is having tremendous pressure to take digital investment on priority and use these innovation in their day to day business [10]. To become competitive and maintain the position in the market, whatever the digital investment is done by the organization need to make the difference in the current business processes. Digital technologies has potential to change the business practices which is beneficial to the organizations [11]. Since most of the business processes are already using computer and digital technologies to perform their operation so it has opened lots of opportunities for optimization the current processes using new innovation done in the technologies like artificial intelligence (Robotics process automations). Robotics Process Automation represent, Robotic: The machine who do the human actions, Process:

Sequence of steps to perform any activity. Automation: Act done without human efforts. Performing human task by executing the sequence of steps without human interventions is known as robotic process automation.

Robotics Process Automation (RPA) system provide organization to automate huge volume data, repeatable task or the operations just like the human user do across the applications and other allied services, even when employee of any organizations perform the task on graphical user interface, RPA do the same task without human[12]. The objective of robotics process automation is replace or substitute the human by virtual workforce. The task which is handled by human is doable by virtual force or BOT, same human workforce can focus on the more complex valuable operations and problem solving. RPA can be defined as a tool to enable human user to specify the used routines involved structured or dynamic data with rules like if then-else, graphical user interface interactions steps and operations access via API or third party software. RPA reduce human efforts by simulating human actions, it speed up the execution of high volume transactional data. Example HR see the email comes from the employees for their queries and create ticket for them, same task can be done by RPA by automating the process like read email automatically and go to ticket management system and create ticket for the query or complaint.

RPA is new form of process automation technology, previously automation was used only for the automation testing like automating the test cases for huge web application. But now days RPA is one of the most known Artificial Intelligence application as it allow organizations to automate their legacy applications and achieve high productivity. RPA Bot interact with third party applications and APIs also screen scraping this allow RPA bot to perform actions like a white collar employee [13].

#### Current trend of RPA

The RPA market is growing with high speed and it is expected to cross 15B Doller by 2030, it was 2B Doller in 2021 [14]. RPA uses cases or processes are expanding in different industries and business and their verticals, this has created the new opportunities for most popular legacy applications. The RPA use cases are expending to HR, IT, customer service, business, accounts and finances etc. to move their current processes to RPA. The different customer facing technologies enable RPA to do end to end automation tasks. Like RPA bot can be integrate with the customer face like chat bot and take the conversational data from there and automate the relevant tasks for the customer without human support between customer and bot. RPA is not restricted to the banking, insurance but it is going to make big impact in the manufacture industry where lots of man power is doing the repetitive work. Work like automating administrative tasks. Administrative tasks in the manufacturing industry are labors management, Inventory Management. Invoice Processing. Customer Support and Service Desk. Strategic Management of IT Operations. Proactive Risk Management.

### 3. Findings of the survey

RPA is growing fast because the processes which is done by the human are not very efficient. Manual processes are time consuming, particular skilled person dependent which

has high risk of error which lead employee and employer dissatisfactions and can damage organizations reputation. Whereas RPA can bring following benefits as following:

Greater Return on investment, 100% accuracy, improvement of turnaround time, reduction of operational risk, save time, flexibility, scalability. Still while implementing RPA processes, organization faced many challenges in technical prospective, financial, regulatory perspective and organization perspective.

To make their factories and companies into smart factories and businesses, organizations place a

high premium on the digitalization of the processes associated to those organizations. How well they manage their processes and how adaptable they are will determine whether they are successful in accomplishing their aim. It is not possible to digitalize an organization's operations in a timely manner. Implementation is a lengthy, deliberate process that could take several years, but once it is done, the system will profit from it for a considerable amount of time.

We have observed how automated equipment and tools entered the manufacturing processes and how nearly smoothly they were incorporated into the framework. The production processes have been transformed by IoT and cloud-based manufacturing, and with the aid of CPS, the machines may interact with one another to make the best use of the resource.

As a result, we can define automation as an invention where there is little need for human involvement in tasks carried out within an organization. Automation can be divided into two types: automation of software-based systems and automation of physical systems. Examples of physical systems include CNCs, industrial robots, and Automated Guided Vehicles (AGVs). IoT, BPA, and RPA, on the other hand, are considered to be software systems or can alternatively be referred to as software automation systems.

There are two types of automation: hard automation and soft automation. A robot or machine performing industrial and manufacturing tasks is referred to as hard automation, also known as fixed automation. While "soft automation," also known as "flexible automation," refers to the process's programming component, which may be altered to meet the needs of the client. As vital as automating manufacturing and production processes is automating techniques for processing transactions, adding and removing information, retrieving data, setting response triggers, and communicating. The most recent Industrial Revolution that encourages the development of automation is Service Automation, which is a subset of Soft Automation. The most recent technical advancement, called "service automation," strives to provide the best possible customer experience by automating repetitive work, there are various tools for the same Artificial Intelligence, BPM, Machine Learning (ML) and RPA.[9] .

### Problem Definition

Many customers of banks closes their account for purpose of switching from one type to other (Savings to Current), some want to close account with clearance of balance, closure charges, fines if any. This is the back office activity in office for which teams work to read closure request, perform validations, perform closure steps in respective applications, calculating clearance, closing request and respond to request. As Banks has over thousands of branches and crores of customers this task has turnaround time (TAT) and it is repetitive

and ruled based task. It take banks cost in terms of infrastructure, people and time to perform such operations, also needs accuracy and speed to perform such work.

Proposed System: Robotics Process Automation based Account Closure process.

Robot in manufacturing industry creating more production rate and with good quality, in robotics process automation the bot/Agent are revolutionizing the way we all thing about business processes, IT support like ticket raising for software and hardware problems, back office work etc. RPA provides the advance improvement in accuracy and turn around time, and more productivity in transaction processing and this way bot can remove the people from dull and repetitive task, so people can concentrate towards more complex task.

Robots is considered in automobile or manufacturing sector to create the high production rate and avoid the human error but RPA robots is revolted the thinking and perform the business activities, IT support process, infra structure and other back-office work. RPA provides the drastically improvement in accuracy and turn around time and high improved quality also relief from the from dull, repetitive tasks

We propose RPA based more technologically -advanced solution to business around the world models that adopt automation, whether in-house or offshored, will cut costs, drive efficiency and improve quality. In proposed technique, the concept of robotics process automation is used to perform for processing a transaction, manipulating data, triggering responses and communicating with other digital systems used in account closure process.

Any company that uses labor on a large scale for logic based process work, where people are performing high-volume, rules driven, highly transactional process functions, will boost their capabilities and save money and time with robotic process automation software.

Just as industrial robots are remaking the manufacturing industry by creating higher production rates and improved quality, RPA provides dramatic improvements in accuracy and cycle time and increased productivity in transaction processing while it elevates the nature of work by removing people from dull, repetitive tasks.

Advantages:

- Good Efficiency
- High Productivity
- Remove Human Error
- Cost Savings
- Good turnover around time

Algorithm

In this section, we introduce algorithms for account closure process using RPA. These algorithm initially uses common steps used by manual user and evolves in phases, for any phase of process one part is chosen with lower complexity and once automation completes for decided part it is released for user acceptance testing (UAT), as per feedback existing

phase is modified with addition another task. This iteration continues until the all the features are automated for chosen process. System flow diagram is shown in fig.3.1.

It consist of following steps.

- 1] Start.
- 2] Read request(s) data from the source system.
- 3] If request found processed go step 9 and step 10. Otherwise goto step 5.
- 4] Store data in staging table
- 5] Apply validation on data.
- 6] If not valid goto step 9 and step 10. Otherwise goto step 7.
- 7] Perform closing operation as per specified rules.
- 8] Perform verifier steps.
- 9] Respond in source system according request.
- 10] Stop

In step 2 accessing of one application ileverage for reading and capturing the fields Account No., CVS Score, Customer Name, A/c closure reason code, Lien/ Closure fee waiver requested, a/c no. for fund transfer, Scheme code, Account Type from pending request for processing is coded.It is then stored in staging table along with additional flags for sub steps are marked for processing step 7 also validations for example Check the length of account if the transfer to is "A/c no" in request and if length not equal to 15 digit, log the process exception updating staging table with status = "Hold, Incorrect account number". Send the request to originator with remarks "Transfer to account number in i-Leverage is incorrect, please correct and confirm. and processed request is responded as per step 9.

Process validations in step 5 are applied on captured fields by applying predefined rules as when "Closure fee waiver requested" = "Yes" then "Deferred Charges to be recovered" should be "No" and if "Closure fee waiver requested" = "No" then "Deferred Charges to be recovered" should be "Yes". If this rule doesn't satisfy process exception is raised and request is returned to originator with remarks "Treatment for deferred charges and closure charges needs to be consistent. Kindly update the request and resend". Update the table with the status "Hold, treatment for deferred charges and closure charges needs to be consistent".

When the value of "Closure fee waiver requested" is consistent with "Deferred Charges to be recovered" and the request is for waiver of charges, the request is returned to originator for nullification of balance with the remarks "Waiver of closure and deferred charges has been requested. Kindly nullify the balance and re-send the request ". Update the table with status "Hold, waiver of closure and deferred charges has been requested. Kindly nullify the balance"

In steps 7 closure steps are coded according to rules and validations in finacle application all the processing is based on the captured fields and newly populated data by using provided data for example account number provided in request used for validating name of customer

to get the name specified menu “HACI” is accessed in finacle by robot and given account number is entered in account number text box and “TAB” key is pressed to get name to be populated another validation When account date opened is less than 6 months, closure charges are must, unless branch not requested for waiver of closure charges . Figure 3.1 shows system flow diagram.

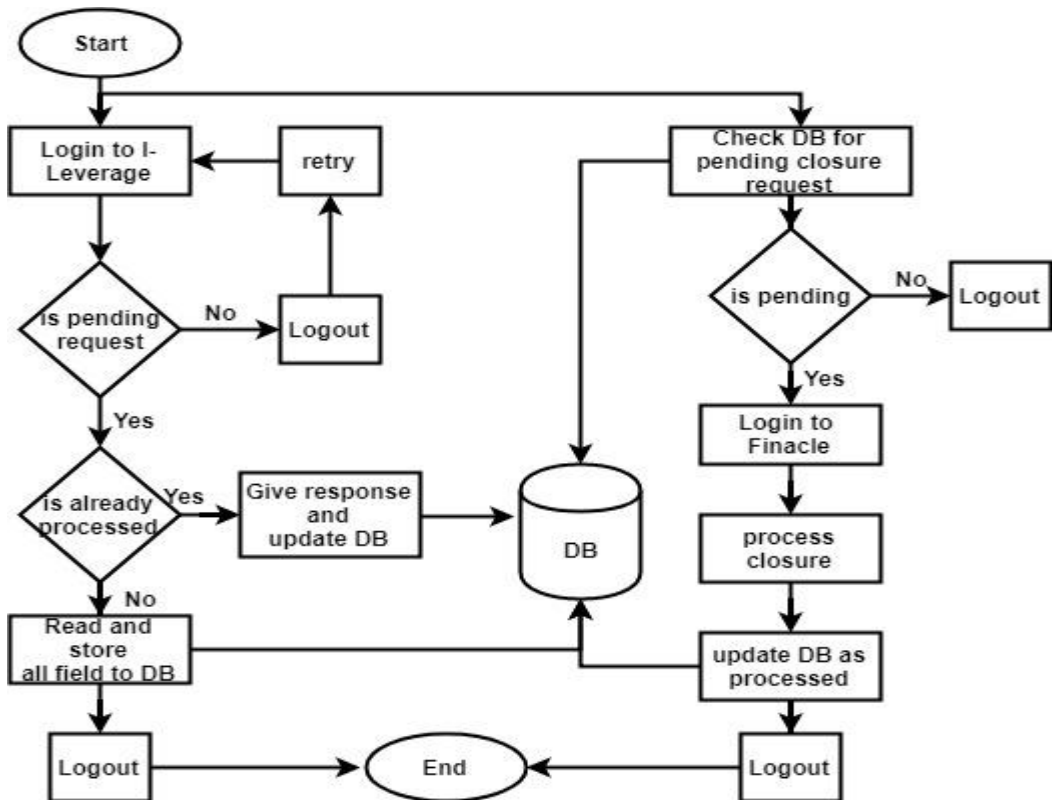


Figure1: Saving A/C closure system flow diagram

In step 8 verification steps are performed by robot for reconfirmation of steps performed like account number entered, amount to be transferred after closure, transfer to account name, pan. In step 9 response is given as per final status in database it may as processed successfully or need to push it to checker verification or required to forward to CLH\_Maker for manual handling Process or the forward request as below to “Central Liability Hub” Team member name designated to do verification.

### 3.3.1 Authentication, Start and Stop Robot:

Authentication is a crucial identification process to eliminate attacks targeting data integrity. The initialization process for each time is carried out with new login and updating logging details like use rid, login time in client db by robot before initialization of actual process. Starting the robot is handle with tool named batch executer this batch is scheduled for every 15 min from 8 am to 9 pm, batch is .bat files which calls .jar project file.

Stopping robot is either of two ways, table contains column stop time whis is validated each



time at the time of login for closure process also holiday list is checked in table and second fourth Saturday working also handled in code it is as shown below;

```
if ( database date= = today's date){  
    stop execution=true;  
    System.exit(0)  
}  
else if ( database time<current time){  
    stop execution=true;  
    System.exit(0)
```

### System Implementation

Account closure robotics process automation system is designed and implemented using Java SE, Selenium, PostgreSQL and Batch Executor tool. In subsequent section we list different system requirement and algorithm used for implementation.

### Requirements

#### Hardware Requirement:

System : dual core or above.  
Hard Disk : 160 GB  
RAM : 4 GB  
Monitor : Any  
Mouse : Any.  
Keyboard : 110 keys enhanced

#### Software Requirement:

O/S : Windows XP/7.  
Language : Java.  
Library : Selenium.  
IDE : Eclipse- Mars

### 4. Conclusion:

Implementation of robotics process automation process is designed and implemented for account closure process using java and automation library software. Most of the organizations are already implementing the RPA technology, as it optimizes the cost and frees the other resources. It is a cost-effective technique and also has non-financial benefits such as it consists of more accurate and consistent processes, which are less prone to errors.

With the rapidly changing customer requirements and the ever-increasing industrial



developments, the organizations are considering different approaches in which they can accomplish the maximum number of processes and while consuming a minimum amount of time. This leads the organizations to the technology of RPA. RPA is considered a software tool that imitates the human action which performs tasks that are repetitive in nature and does not add much value to the organization. The tasks can be as simple as copying and pasting data from one place to another, recovering information from the system or merging various sets of data. The primary advantages of RPA are; reduction in expenses, increasing throughput time, increasing efficiency and increasing productivity. Account closure gives advantages to bank as workers can now focus to more important human doable task.

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