

A Study to Identify the Possibilities of Implementing Robotic Process Automation for the Processing of Loans in Banks

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Abstract

Today, various studies are going on in every part of the globe to minimize operational costs, increase efficiency, and improve the Return on Investment by almost all organizations. Technology is one of the key factors that aid in the change process happening all over the world. Today, organizations are ready to implement any technology to help them maintain their market position in this highly competitive environment. Robotic Process Automation is a technology that could be considered of prime importance. It can solve these issues in an organization once it is implemented efficiently.

RPA finds use in those organizations. The amount of manual processes is more, and the works are repetitive and time-consuming. Financial institutions are among those organizations that can take advantage of having RPA improve their operational efficiency. Financial institutions contain a lot of manual and repetitive tasks in several departments. This paper is based on the study conducted to find out the key areas in which RPA can be implemented so that it helps the financial institutions to make their lending process easier.

Key-words: Robotic Process Automation (RPA), Banks, Loan Processing, Return on Investment, Efficiency, Time Consumption, Repetition of Tasks.

1. Introduction

Financial Institutions are said to be a part of human life from the period of valley civilizations itself. Trading was an integral part of those civilizations for which they had used coins as well. Historical evidence shows that temples and the houses of the rich were used to store the surplus cash, which was used to distribute to the needy [1]. Later, they started developing more systematically by providing more services other than lending money and storing cash. Along with these developments

in forming a proper banking structure, digitization of the banks also began, but its growth had been gradual. The first form of digitization of banks was through Digital Accounts followed by Automated Teller Machines, Trading Systems, Global Payments Networks, Internet Banks, and Mobile Payments [2].

The second wave of digitization has already hit the world. In this phase, organizations aim to use technologies such as Artificial Intelligence, Machine Learning, Virtual reality, etc., in order to enhance their operational efficiency and attract customers [3], which has created many tensions among the organizations. They are competing with each other in the implementation of new and better technology. An increase in the no: of organizations is also one of the major reasons for this. Like other organizations, banks face much competition, customer retention, etc [4]. Optimization of costs, rising personnel costs, scarcity of skilled resources, and increased productivity are also to be addressed. Banks have to focus on transforming their modes of business operations into a more customer-friendly, reliable, and consistent economic mechanism. One way of this type of transformation is by the adoption of Robotic Process Automation. The robots are ideal for doing repetitive tasks with no error, and they can deal with a large volume of data. Moreover, banks are governed by a set of statutory and regulatory norms, which can also be easily handled by automation. There are some managerial, behavioral, technical, and economic considerations to be considered while adopting automation. Security and compliance are also two major factors affecting the process. However, a systematic and smooth transition will ensure risk failure [5].

1.1. Objective of Paper

There has been much research on the use of Robotic Process Automation in various fields, mainly concerned with its technological aspect. There are various industries, which find the application of RPA as it reduces the workload of their employees and helps to improve their operational efficiency. Banks are one such integral part of the economy without which a country fails to have a strong financial position [6]. With the advancement of technology, RPA has been implemented in different parts of the world in various financial institutions. Even in India, with the increase in no: of competitors and improving the efficiency to attract more customers, banks are forced to bring changes to their previous modes and styles of operations. This paper aims to identify the key areas where RPA could be implemented in banks to simplify loan processing [7].

2. Literature Review

2.1. Robotic Process Automation

As defined in their whitepaper, RPA can be used as a technique that performs simple rule-based processes and thereby mimics the actions of humans. RPA interacts with the application layer of any application and has the potential to work across multiple applications. "RPA is the natural evolution of labor arbitrage; it takes the Robot Out of the Human." The distinct features such as its cost-effectiveness, scalability, and ease of implementation make it more useful [8].

As obtained from the whitepaper, "RPA is the application of technology that allows employees in a company to configure computer software or a 'robot' to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses, and communicating with other digital systems. RPA is all about assigning a software robot to perform any work process that is rule-based, workflow-driven, and repeatable [9]."

As obtained from the whitepaper, "RPA conceives a virtual workforce with skills comparable to that of human beings." In such a competitive world, to retain the market position, organizations cannot ignore the need for having a virtual workforce, which can provide better results in a lesser time [10].

According to the comparison with other automation tools, the three most important features that make it unique are: (I) The ease of configuration and implementation of RPA, suggests that the developers do not require any programmable capabilities, (II) RPA software being non-invasive suggests that it works similar to humans just by sitting on top of the existing systems and accessing them, and (III) The enterprise safety of RPA suggests that all the IT requirements such as scalability, security and audit ability are met with ease.

All the literature mentioned above indicates that the RPA will be a better option for organizations, which will help them reduce the workload on the employees and help them maintain their market position in the competitive environment. Thus, to facilitate economic gains, all the repetitive and unstructured tasks, which help reduce the human workload, can be done with the help of software robots [11].

2.2. Importance of RPA in Banking

As per implementation of robots in banks for the operations will have a huge impact on the sector, as it improves banks' but also help to increase the efficiency of operations. These will aid in

getting more business opportunities for the banks. Other than savings, "RPA in banks will result in an improvement of 21% due to more efficiency in the management of repetitive tasks, standardization of all workflow procedures will result in an increase in efficiency by 19%, by the reduction of dependence of work completion on multiple systems, the efficiency increases by 14% and RPA also reduces all the other bottlenecks by 11%."

The article suggests that RPA or robotic software agents have a greater potential for frequent and rule-based repetitive processes. On the implementation of RPA, banks would also be able to answer the queries 24*7, which will also have a considerable effect on the economic gains than on the remuneration of the employees.

According to robots in various financial sectors such as banks, insurance companies, and capital markets were identified. A study was conducted in secondary research based on the use cases of Robotics in HDFC Bank, ICICI Bank, and SBI. The study concluded that the advent of Robots would help financial institutions attain a better quality of services within a minimum time and with minimum wastage of resources [12].

The use of RPA among Artificial Intelligence was identified. They have suggested new capabilities that can be considered using both technologies by analyzing all the possibilities and considering all the aspects of robotics. In order to take automation to the future level, "RPA uses sophisticated software and techniques along with the help of most recent technologies such as artificial intelligence, machine learning, voice recognition, and linguistic communication process." Thus, there is a requirement for combining all the technologies in the digital transformation journey.

Anuja conducted a study to determine the impact of the implementation of robotics in banking for lockers considering the case of Smart Vault used by the ICICI Bank. It also checks whether robotic consultants supported by a human-like interface could be a better option than humans by themselves for solving the issues faced by customers. They used quantitative tools in the form of a questionnaire and qualitative tools consisting of an interview for the study. They concluded that human touch would be required for the activities performed in the banking sector, even if the implementation of robots will reduce the daily workload and make almost all possible processes relatively easy and simple. Moreover, even when the future of robotics is highly promising, it might take more time to implement as change takes place gradually [13].

Kamat conducted a study to find out the challenges of adopting automation in banking and financial services. Through the conceptual model, they were able to arrive at the benefits of automation, the possible challenges to implementation, and build a 7 step RPA Adoption model for the banking and financial services sectors. Even though there might be some negative impacts and

challenges, all these effects are to be minimized as automation technology adoption is the need of the hour.

As per, Robotic process Automation is suitable for every organization, which involves completing various easy and complex tasks with the help of computer systems, and they have conducted a study based on the e-commerce industry. The first and foremost thing to be considered in the assessment of their RPA capabilities, be it any industry, it should be done beforehand, even previous to finding out whether to automate a certain process or not. The launch of RPA tools saves employers money and brings a rise in the productivity and security of employees. It has even drawn new helpful opportunities for many highly skilled workers and apprentices in their various respective industries in certain cases [14].

Robotics surely can shape the future of banks, and from all the literature above, we see that the banks will be under pressure shortly to bring in innovative ideas to survive in the highly competitive environment. As we see, robots are being used by certain banks for customer services in selected branches. Robotics can also be used in back-office operations, reducing manual errors and enhancing operational efficiencies. These works of literature give a thorough understanding of an RPA process, the major application area of RPA, the benefits of RPA, and its importance in banking. By keeping these points in mind, we aim to understand whether these benefits will aid in using RPA for loan processing in banks [15].

3. Research Methodology

The study has been conducted so that primary data was collected through a questionnaire survey conducted among 70 bank employees working in different banks all over India. As there are different types of loans available in the banks, and most of them have different steps involved in processing, thorough learning was conducted to determine the most important steps involved in loan processing. These steps were included in the survey to identify the most time-consuming step among these from an employee perspective. They were also asked to suggest areas in which they required assistance using the RPA technology by identifying a set of possible areas in which RPA can be implemented. The survey was also used to identify the employees' views towards the implementation of RPA in banks [16]. All the data thus collected were categorized for the analysis in three stages. The first stage of analysis consisted of finding out whether there is a correlation between the age of the bank employees and their attitude towards the implementation of RPA for loan processing in banks. The second stage of analysis consisted of finding out the most time-consuming part of loan processing and identifying the areas in which the employees require the assistance of RPA as

suggested by them. In the final stage of analysis, a regression model was also used to determine the relationship between the location of the banks and having a separate loan processing department along with the frequency in the arrival of requests so that the importance of having RPA could be figured out [17].

4. Modeling and Research Questions

Day by day, there are new changes in almost all fields, and technology plays a major role in this change process. As the organizations find means to sustain their market position in this highly competitive environment, it is for sure that RPA, Artificial Intelligence, Blockchain technology, etc., will soon be a part of these organizations. Along with understanding the possibilities of RPA implementation in the banking sector, it is also important to find out the stand of the employees on the introduction of these techniques. As a result, as mentioned above, the study is divided into three stages so that the first stage of analysis will be useful to identify the opinion of the employees, the second stage can be used to identify the key areas for implementation of RPA and the third stage to identify the advantage of the implementation of RPA for the identified key area [18].

The research questions to be addressed through the study are:

- Which are the major steps involved in the processing of loans?
- What is the attitude of the bank employees towards the implementation of RPA for loan processing in Banks?
- Is there a correlation between the age of the bank employees and their attitude towards the implementation of RPA?
- Which is the key area of loan processing in which RPA assistance is required?
- What are the possible advantages of the implementation of RPA in the processing of loans?
- Through the analysis of data obtained from the questionnaire survey, an overall understanding of the possibilities of RPA implementation for the processing of loans in banks will be obtained.

5. Data Analysis and Findings

5.1. Major Steps Involved in Loan Processing

The banks usually provide different types of loans such as Educational Loans, Business Loans, Personal loans, Vehicle Loans, Gold Loans, Home Loans, Loan against Insurance Policy, and

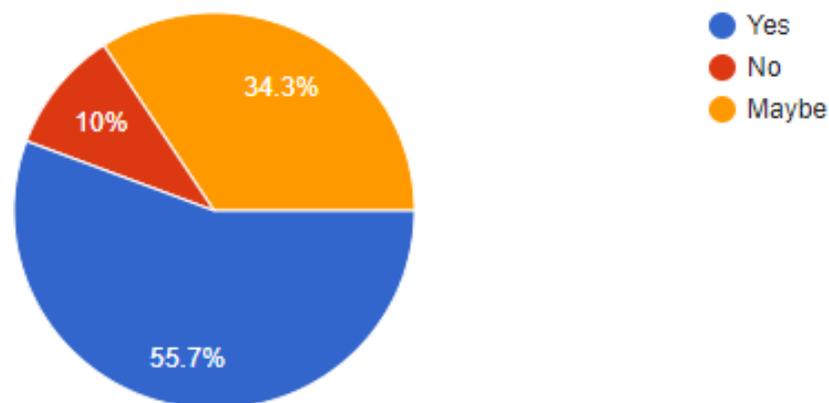
Loan against PPF. All these types of loans have different procedures for the application. There are certain differences in the steps involved in the processing of loans. There are certain pre-qualification steps to be taken while considering an application for a loan process. However, only after a loan proposal is accepted are the major steps taken into consideration in our study. Taking all these factors into account and taking the expert opinion of 5 bank employees, the major steps of loan processing considered for the study includes Data Entry Process, Documentation Process, and Sanction Process [19]. The analysis consists of understanding the most time-consuming process out of the three steps mentioned above.

5.2. Attitude of the Bank Employees towards the Implementation of RPA for Loan Processing

The survey was done among 70 bank employees working in different banks all over India. The attitude of the bank employees towards RPA implementation was found out through two questions.

The Ability of RPA to reduce the workload of the employees.

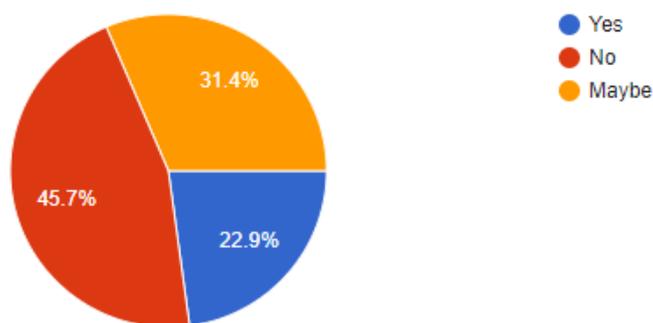
Figure 1 - Pie Chart Indicating the Employees' Responses on the Implementation of RPA to Reduce their Workload



The data obtained is represented in the form of a pie chart, as shown in Figure 1. The chart indicates that 55.7% of the employees think that the implementation of Robotic Process Automation for loan processing will reduce their workload. Even though 34.3% are not sure of whether their workload will be reduced, only 10% are not happy with the implementation of RPA.

The Potential of RPA to replace the working skills of the employees.

Figure 2 - Pie Chart Indicating the Employees' Responses on the Potential of RPA to Replace their Working Skills



From the data shown in Figure 2 obtained, it is understood that 45.7% of the employees are confident that the implementation of RPA will not affect their employment, but 31.4% of the employees are not highly confident on how the implementation of RPA is going to affect their employment, which does not indicate that they are unhappy with the implementation of RPA.

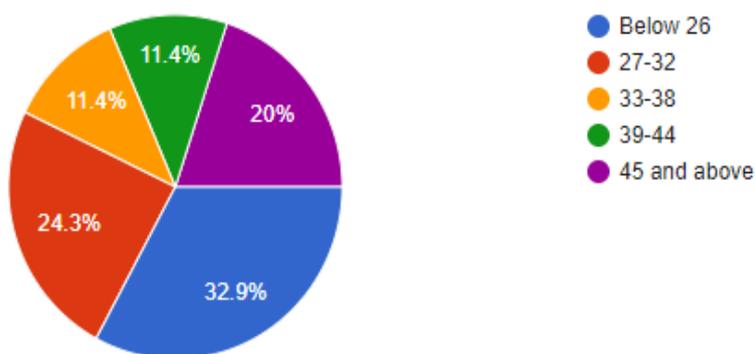
By combining the results obtained from both the questions, most of the employees think that the implementation of RPA can reduce the employees' workload. They are not worried that RPA can replace their employability roles because employees are aware that RPA alone will not be able to do all the processes, but a human touch will be required [20].

5.3. Correlation between the Age Group of Bank Employees and their Attitude towards RPA Implementation

Through the second part of the analysis, it was found out that most of the bank employees have a positive attitude towards the implementation of RPA. In this part of the analysis, we analyze whether the employees' attitude differs depending upon their age group.

The pie chart representing the age group of the employees is shown in Figure 3, which indicates that the data is collected considering the employees of all possible age groups.

Figure 3 - Pie Chart Indicating Age Group of Employees



For the analysis, a null hypothesis and an alternate hypothesis were considered to determine the correlation between the age group and the attitude of the bank employees.

H0: There is no correlation between the age group of the employees and their attitude towards the implementation of RPA for the processing of loans.

H1: There is a correlation between the age group of the employees and their attitude towards the implementation of RPA for the processing of loans.

From Table 1 indicating the Pearson Correlation, it is found that the significance values are greater than 0.05 in both the cases, and as a result, we accept the null hypothesis, i.e., there is no correlation between the age of the employees and their attitude towards the implementation of RPA for loan processing in banks.

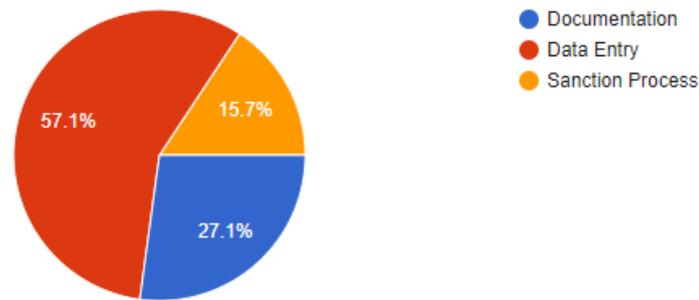
Table 1 - Correlation between the Age Group of the Employees and the Factors such as Implementation of RPA for the Reduction of Workload of Employees and the Potential of RPA to Replace their Working Skills

Correlations				
		Age_Group	RPA_aiding_Reduction_of_workload	Potential_of_RPA_to_replace_Employability_Skills
Age_Group	Pearson Correlation	1	.098	-.073
	Sig. (2-tailed)		.420	.549
	N	70	70	70
RPA_aiding_Reduction_of_workload	Pearson Correlation	.098	1	.110
	Sig. (2-tailed)	.420		.363
	N	70	70	70
Potential_of_RPA_to_replace_Employability_Skills	Pearson Correlation	-.073	.110	1
	Sig. (2-tailed)	.549	.363	
	N	70	70	70

5.4. Key Area in which the Assistance of RPA is Required

In order to find out the key area in which the assistance of RPA is required, the major steps involved in processing a loan request, found out in the first part of data analysis was considered. Of the three options, as indicated in the pie chart in Figure 4, 57.1% of the employees suggested that, from an employee point of view, the most time-consuming process was the data entry process.

Figure 4 - Pie Chart Indicating the Most Time-consuming Steps Involved in the Processing of Loans in Banks

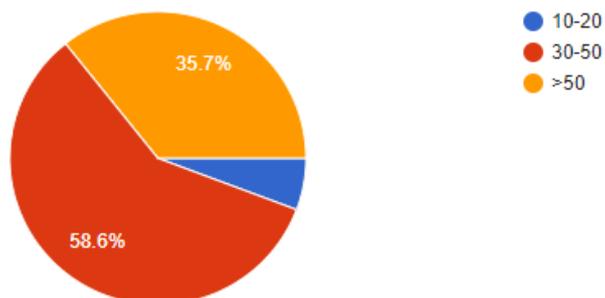


The time taken for the most time-consuming process is around 30-50 minutes, which is shown in the pie chart Figure 5.

So, from both the findings obtained, we can understand that an employee takes about 30-50 minutes for the data entry process for a single loan request, which is a repetitive task.

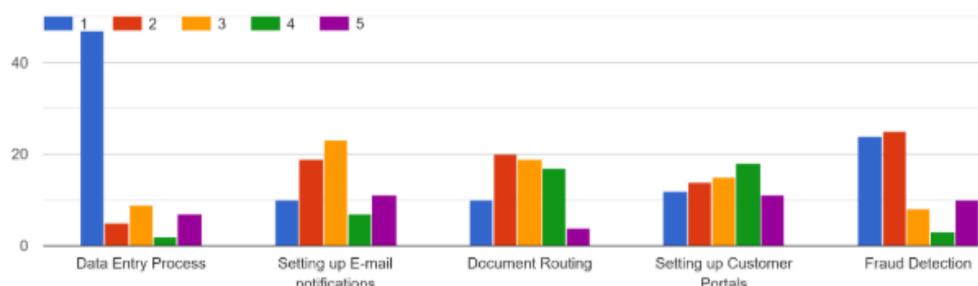
The employees were also asked to suggest the areas of loan processing in which they require assistance on the implementation of RPA. As indicated in the graph below, five areas in which RPA could be implemented for processing loan requests were given to the employees. They were asked to suggest the areas based on the importance. The five areas are Data Entry, setting up Email notifications, Document Routing, Setting up Customer Portals and Fraud Detection. A scale of 1 to 5 was set up in which 1 represented the most important process and 5 represented the least important process.

Figure 5 - Pie Chart Indicating the Time Consumption of Major Steps Involved in Processing Loans in Banks



From the graph in Figure 6, it is clear that 47 of the total respondents selected Data Entry as the most important process in which they require the assistance of RPA.

Figure 6 - Graph Indicating the Areas of Loan Processing where the Assistance of RPA is Required



5.5. Advantages of the Implementation of RPA for Loan Processing

In order to find out the possible advantages of the implementation of RPA, there are some more major factors to be considered. They are the location in which the banks are situated, whether there is a separate loan processing department in their banks, and the frequency of the arrival of requests.

A multiple regression analysis was conducted to determine whether there is any significant impact on having a separate loan processing department and the frequency of the arrival of requests on the location of a bank.

Table 2 - Model Summary of Multiple Regression Analysis

Model Summary									
Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.560 ^a	.313	.293	.59097	.313	15.279	2	67	.000

a. Predictors: (Constant), Seperate_Dept, Freq_of_Arrival_of_request

From Table 2, it is clear that the significance value is less than 0.05; hence there is a significant relationship between the location in which the banks are situated and of having a separate loan processing department and the frequency of arrival of the requests.

The survey found out that the banks located in the urban areas and semi-urban areas have separate loan processing departments. The requests for loan processing frequently occur in those banks.

Combining all these results, if, on an average, 20 requests are arriving in a bank for loan processing, and if an employee takes around 30-50 minutes for the data entry process of a single loan request, then the total time taken for processing all the requests will be around 10-16 hours, it is evident that an employee has to spend a lot of time and energy on this repetitive task, which will

consume only very few minutes once RPA is implemented for the data entry process, which can be illustrated using an example.

5.5.1. Pre-RPA Case

Consider an employee receiving a loan request. Then the first step will be to conduct a credit check to find the customer's eligibility, which is done by the manual transcription of data from the system in which the loan is processed to a website, which is external to the initial system. Thus, the result obtained in the form of a report is saved in a document file and copied to the credit score column in the loan processing system. After completing this process, the data has to be transcribed to separate systems, which are part of the core banking systems. Then by logging into a website owned by the government, the validity of the customer details and the documents provided are to be checked. Once the results are obtained, a printout of this will also be attached to the initial loan processing system. All these together take more than 30 minutes to complete data entry for a single loan request. Moreover, on a single day, if there are more requests, more time and energy are wasted in this manner [21].

5.5.2. Post-RPA Case

Once a Robot is implemented for this process, after the arrival of a loan request, the robot itself logs on to the loan processing system and automatically pulls out the required data for a credit check from the credit reporting website and then forms a document file of the report showing credit details by itself and attaches it to the system in which loan is being processed. The credit score is also copied to the loan processing system by the robot. These results generated are then transferred to the core of the banking systems. The robot itself logs on to the website owned by the government for the verification of customer details and the documents submitted. The results are also then attached to the loan processing system.

Thus from the example, it is clear that instead of running all the checks manually, the employee will have to give a mouse click once the RPA is implemented, which will also reduce the time taken for this process. By saving enough time, the employees can concentrate on other operations of the banks and can also provide better customer service to their clients.

6. Conclusion

Adoption of technology is the need of the hour. The search of man for easier and quicker solutions for improving their operational efficiency has led to the development of several new technologies and their adoption in the organizations on a wider scale. Banks being a vital part of the economy, has to also adapt to this change process shortly. Several use cases of the use of RPA in the banking sector are already being seen. In this research paper, we have tried to figure out the possibilities of implementing RPA for processing a loan request considering the employee's point of view. As we have seen through our research, the banks can take into consideration the location of their banks, the frequency of arrival of requests and then implement RPA for the data entry process, which will reduce the workload of the employees at a considerable rate and will help in improving the overall efficiency of operations, which will help the banks not only in increasing the Return on Investments but also helps them to maintain their position in the highly competitive environment.

7. Managerial Implications

Technology has been showing its impacts in almost all the sectors of our economy. Being an important part of the economy, the banking sector has its roles in this fast-changing world. This study will be helpful for the banks while considering the implementation of RPA for their operations as the factor of time consumption is taken into consideration. Banks can also use this study to know the attitude of the employees of different age groups towards introducing new technology. Even though several research papers on the RPA technology, only a very few papers are based on its implementation in banks. The studies conducted are mostly secondary and based on the use cases. Hence, this primary research paper will also be useful for the researchers, engineers, and students who would like to learn more about introducing RPA in banks and suggesting a model for a key area by analyzing the results.

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