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Robotic Process Automation in Banking and Finance Sector for Loan Processing and Fraud Detection

Mohammed Shijas Thekkethil
Bachelor of Information Technology, Amity University
Dubai, United Arab Emirates
mohammedT2@amitydubai.ae

Vinod Kumar Shukla
Department of Engineering and Architecture
Amity University
Dubai, United Arab Emirates
vshukla@amityuniversity.ae

Fatima Beena
Department of Business
American College of Dubai, Dubai
United Arab Emirates
fatima.beena@acd.ae

Ashok Chopra
Department of Management and Commerce
Amity University
Dubai, United Arab Emirates
achopra@amityuniversity.ae

Abstract: **The world is evolving into a digitally advanced environment. Transformation is a constantly evolving process where Robotic Process Automation or RPA came into the process of renovation. RPA has recently become a valuable tool in banking and financial institutions. RPA has shown a lot of various benefits for different organizations. The primary intention of Robotic Process Automation in banking is to reduce repetitive tasks in the bank. In banking and various other organizations, RPA has helped reduce the operational costs by 30% - 70%; RPA helps reduce the workforce by employing Bot workers in charge, which later saves the operating costs and increases efficiency and accuracy of the tasks. Lenders are regularly facing pressure to reduce the prices as well as to reduce and save time. Lender hence switches into automation for better efficiency and accuracy of service. With automation bots, lenders can automate loan processing by collecting customer information, loan approval, loan monitoring, and automatic loan pricing. This can be achieved with the help of rule-based software bots. Also, many of the lenders do some part of the process partially automated and some part manually. Banks and financial institutions are switching to automation and training to stay on top of the latest security developments. This helps to keep an eye on the evolving trends in the payment space. Fraud for instance, is an ongoing threat. All major finance domain are looking forward to implement the concept of RPA technologies. Which help in preventing the possible frauds and also helps in mitigating the other human errors. The paper talks about how RPA can mitigate fraud risks through various methods such as reassessing current processes, eliminating human errors, enhanced trade monitoring, automated threat detection, and searching for anomalies and much more.**

Keyword(s): Automation, Robotic Process Automation (RPA), Banking Sector, Loan Processing, Fraud Detection, Digital Transformation

I. INTRODUCTION

Advancement in technology has changed the way organizations operate. Business processes have been transformed into a more efficient and enhanced manner to improve customer experience and save operational costs. Robotic Process Automation (RPA) helps to achieve these needs of organizations. RPA is a tool that works on the user interface of computers, just like how human workers do. The Prime sectors that welcome Robotic Process Automation implementation consist of banking and financial services, health and insurance, telecommunication and utilities, and retail and commercial. The market opportunity for automation is vast throughout the world.

Bots can work 24/7 [1], which is another benefit where human workers cannot do. RPA shifted tedious manual tasks from humans to bots, which helped banks reduce the workforce and avoid human involvement. With Robotic Process Automation (RPA), we can prevent manual human errors. RPA hence can provide a better customer experience. It is very important to invest in new technoliges which can help to stop / prevent the possible frauds, as this is important because the fraudsters /hacker always keep on challenging the security system. Leading banks in India, including Federal Bank, ICICI Bank, Axis Bank, and HDFC, also implemented Robotic Process Automation for faster and more effective service. [1]

II. MOTIVATION AND CHALLENGES

Following are the strong motivation for the implementation of robotic process automation.

A. Cost-effectiveness

Successful implementation of RPA helps banks to reduce operational costs. Studies done by various researchers show that implementation of RPA in banking institutions helps banks minimize operating costs and save time and expense by around 25-50%.

B. Improved operational efficiency

Banks that employed RPA bots experience better operational efficiency. RPA makes the operations faster and makes the processes productive and efficient.

C. Availability and Reduction in Manual errors

RPA bots can work 24/7 without breaking and completing all the assigned tasks on time. Further, they can reduce manual errors caused by human workers and can

achieve high accuracy. For instance; Account closure in banking institutions is a very time-consuming process. Banks need to check the customer's outstanding loans, communicate with them, request necessary documents, and cancel the direct debits and pending orders. This is a very lengthy process and takes a lot of time to accomplish this task. Moreover, it can cause human faults. RPA bots can be used in this case to work efficiently.

D. Easy implementation and No maintenance cost

Implementation and Maintenance of RPA need no coding/minimal coding. Employees can be trained to build, run and manage RPA bots. RPA in banking institutions does not need any changes because of its user-interface automation capabilities. Cloud-based RPA further reduces the hardware costs.

E. Improved Customer experience

RPA improve the customer experience by responding to customer requests and queries immediately and with better quality with the help of RPA chatbot or automatic email communication. RPA allows the employees to know the customers well and build good and productive communication with customers.

III. Literature Review

Mary Lacity of the University of Missouri-St. Louis conducted a survey (2015) where they talked about the journey of RPA in Telefónica O2. They configured the robot for pilot tests with the help of Blue prism's (Multinational software corporation which makes enterprise Robotic process Automation) Consultants. The trials in Telefónica O2's systems were very effective. With the help of RPA the robots executed innumerable transactions and raised alarms in the IT security system to detect frauds. [2] Yara Rizk of IBM Research AI, Cambridge, MA, USA discussed in their research paper (2020) about implementation and the use cases of RPA. This shows the loan application process where the customer submits the loan application while a bank officer processes this request and decides whether to approve or reject the loan application. The customers input the information and advocate whether to approve or reject the loan application as per the business rules. [3] Sandeep Vishnu did studies – Partner, Capco, (2017) clarifies how RPA solutions can fit several needs of bank industry over several stakeholder interactions, like Bank- Bank, Bank-customers, Bank-government and Bank-Employee. Various leading banks have already taken steps to employ RPA in their organizations. [4]

Kevin C. Moffitt, on their research paper (2018) shows automation of audit tasks using RPA. Several RPA implementation stages should be reviewed that audit firms have to look into, including identifying the audit process that should be automated, how the process can be fragmented into small steps for automation, and the result of the audit with the help of RPA. [5] Public Company Accounting Oversight Board (PCAOB) inspection briefings (2017) show that Robotic Process Automation for revenue testing has high potency to enhance the audit quality. Revenue is the main area of audit, which is regularly audited. [6] Appelbaum et al. (2017) proposed that the operating potency of auditing could be used to validate the total population of sales with the help of Robotic Process Automation. This will help the auditors to terminate various risks in the auditing process and evaluate risks more accurately. [7]

Annette Stolpe studies (2017) shows automation of the interaction. The bots work just like human and able to any kind of workload. [8] Devarajan, Y (2018) in their research mentions about enormous amount of data banks deal every day. It is very tactful for banks to deal with very confidential data with high accuracy and in quick time. Robotic Process Automation can cut down manual errors in data processing by automating process. Which includes different type of financial services. [9]

Wasique Ali Ansari, on their research paper (2019), mentions that RPA is directing towards Intelligent Robotic Process Automation (IRPA). It unwraps different technologies of RPA like machine learning, data analytic voice recognition, intelligent optical character recognition, pattern analysis, and so on... It mentions that the establishment of IRPA will dismiss low-value jobs and help launch new careers for creating and managing bots. [10] Karippur Nanda Kumar, in his study (2018), conveyed the challenges to strengthen various customer experiences by implementing RPA in the banking industry. The elements are mentioned as security privacy, reliability, and human-like interaction. The research model and Hypothesis section has covered the paper. He proposed four hypotheses regarding security and privacy in the banking industry. [11]

According to PwC (2017), only 5% of industries regarded themselves as mature in their AI operation and 15% in their use of Robotic Process Automation. Very less number of organization are confident on their implementation of AI and RPA and its uses. [12]

The survey conducted by PwC (2019) in the fourth quarter of 2018 gives us a brief overview of the current state of Robotic Process Automation technology. Around fifteen questions were asked, covering exploration and adoption, various risks and challenges, governance and controls, and use area. From the survey, 80 percent of companies were aligned with the actuarial function; others were from mix of different business domains. [13]

Max Gotthardt conducted a study (2020) about UiPath Studio, where the invoice processing is done with automation. In this scenario, the client faced various challenges such as reading, verifying, validating, registering and posting the invoices. Two thousand invoices are processed per day and hence they decide to automate this process by using the RPA method to register and post the invoices. They saved time of manual work done by 65% to 75%. [14] According to Gary Barnett (2015), Barclays, one of the world's largest banks, has implemented RPA in their back offices that process customer requests as per various customer demands in a rapid manner. With the help of Blue Prism Barclays has automated numerous processes for almost a decade, such as fraud detection, automation of account opening, etc. Various other financial organizations and banking sectors have automated around 130 processes with the help of Blue Prism with RPA technology. [15]

In a banking institution security and privacy is the main concern they are extremely vulnerable to a breach of security. Blockchain technology is playing a vital role in auditing and privacy, especially when it comes to exchanging money or contract more securely. [16][17] With the help of continuous involvement of technology in the banking and finance sector, it is also possible to minimize the frauds in various types of loan processing [18]. Robotic

processes are not only limited to banking, rather now on tourism and hospitality [19] [20], healthcare [21] is becoming one of the leading domains to adopt this technology.

Skoller, Andrew R (2020) identifies that Robotic Process Automation helps to generate reports when any analyst or financial center officer wants to start with any of these reports. RPA exhibits positive benefits in the generation of reports. The automated program helps to produce the data for the analyst to verify without even having the analyst searching for the needed information. [22]

According to the study done by Carmo, Gonçalo Pires de Carvalho Mota (2020), Banks in Portugal did not enact Robotic Automation in their back offices even though most of them are aware of the concept of RPA. Most of them have RPA, as their main strategy, for the future but has not been implemented yet. Even though a few banks have already started adopting automation in their offices. The studies show that the front office has seen more digital transformation than the back offices. [23] According to the studies done by Hannah Valgaeren (2019), the banking industry is one of the crucial markets for the implementation of Robotic Process Automation. It was predicted that this industry would expand up to 34 percent of the worldwide Robotic Process Automation market by 2022. An example is given in the paper about a British Bank that has implemented RPA in its accounting and financial processes. It was found that earlier, when RPA was not implemented, each transaction took almost thirty minutes. The bank then employed a Bot developer to program and execute the robot to reduce the transaction time. After implementing RPA, the transaction time in the bank has been minimized to ten minutes per transaction. [24]

According to Dipak Pimpale (2019), Robotic Process Automation products generally consist of few fundamental elements, developer tools to model the business processes, Bots controller to operate all kinds of workflows and direct the bots, software boys to handle any kind of tasks [25].

IV. Loan Processing in Banks

The loan processing kicks off from collecting the application form and the paper documents such as ID card details emails, and so on from the customers (Fig.1). The lender's role comes here where the application is being processed to go for the approval process.

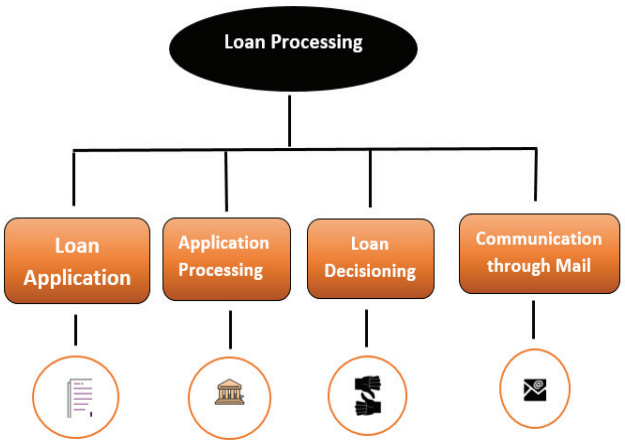

Fig. 1. Loan processing

The bank then decides whether to approve or refuse the loan application according to the risk evaluation. After the decision-making phase, the bank then sends mail to the customer regarding the decision.

A. Robotic Process Automation

RPA bots operate precisely like humans, and they possess the same skillsets as human beings. These bots perform as a digital workforce where they can interact with several systems and applications. RPA bots can perform tasks such as performing various complex calculations, open a specific folder or file located in the design, parse emails and connect to APIs and various other tasks. In Robotic Process Automation, bots are easy to configure, operate and share.

V. Robotic Process Automation in Fraud Detection

RPA bots can reduce Fraud risk by revaluating the current process. The RPA bots review and evaluate the current and previous transactions made by the customers up to date and pick out uneven and suspicious patterns specifying fraudulent activities. If the bots find out such suspicious events, they send the notifications to banks. Automation bots can assess possible fraudulent activities and flag high-value transactions into vulnerable sections. RPA bots can identify disorganized and unstructured data. Hence, they can handle such kinds of critical situations with more excellent reliability and accuracy, which is better than any employee.

Banks can handle and operate numerous accounts simultaneously. Many of the stores are inactive for long periods of time, and when banks detect any anomalous behavior with such accounts, they are temporarily blocked. These temporary blockages will not be removed until bank staff personally remove them. [26] Robotic Process Automation bots are used in this case where they can identify accounts that are placed under temporary blocks, acquire their previous activities and remove the temporary blocks and restrictions. However, it is possible only if the account activities are respected with the criteria and rules of banks to remove the obstruction.

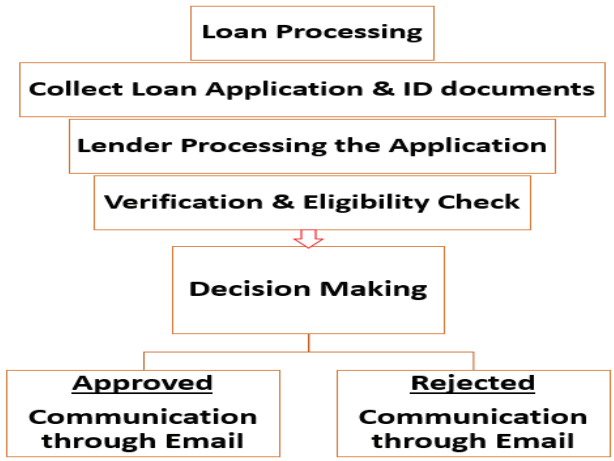

Fig. 2. Stages in Loan origination Process

A. Loan Processing Using Robotic Process Automation

The primary step in originating the loan process is collecting the Application form, ID documents, and pre-

qualification details. In this step, the applicant needs to submit various information such as the applicant's employment information, salary, bank statements, household income, and tax returns. Earlier, loan application was submitted as paper application, but today's technology allows to apply electronically through forms or mobile applications. Once the bank department obtains the application, they review it for reliability and completeness of the application. If the required fields are not filled, the application is reverted to the applicant or the concerned bank department (Fig.2).

Once the application process is done, the bank passes the application through various components of loan origination, such as risks and credits. This process can be entirely or partially automated. As per the verification and eligibility check, the bank can now approve or deny the application process and the decision, as well as additional information regarding the decision such as loan amount; interest rates can be sent via email to the loan applicant.

B. RPA software

Loan processing using Automation Bots can be automated by various bots, which can help in automating the process. Various web-based tools help to automate business processes for different organizations. The control room will be cloud base, or it is going to be locally installed in a server. The bots that we create will be uploaded and live in the control room, and from the control room, we send them to Bot Runners. A Bot Runner is where the RPA code gets executed. Automation can be attended as well as unattended.

The attended automation process is the collaboration of bots and humans while unattended Automation bots work independently. In Attended automation, the bots get together with employees to assist with front-office tasks. In the automation control room all we have to do is create a bot and configure them by giving them appropriate commands as per our needs in business.

RPA bots are commonly developed on top of an application's Graphical User Interface (GUI), while traditional software development depends on the application's Application Programming Interface (API). Automation of loan processing, where the lender uses automation to extract the loan application form, has been submitted by the customer and stored in a data (excel/CSV) file. The technology used here is OCR technology. The bot read the scanned image using OCR; after reading the scanned image, the details are automatically saved to an excel file. RPA is rule-based i.e. we are telling the bots precisely what they have to do. We are giving instructions to bots on what to do in each step. We can still have deviations, such as having conditional statements.

In automation, with the help of a control room, we can access all the tools for administering, creating, recording, modifying/updating, and deploying automated processes. Before making automation, one needs to download and install the bot agents into his/her device, register the device and update respective credentials. A bot agent is lightweight software that lives on your device after installation, allowing the device to directly connect and communicate with the RPA control room. Once registered, the device can directly communicate with the control room without any user interventions. In the control room dashboard, creating the bot can be available for smooth operation.

Commands to extract loan form and store it in a data file: The OCR command in automation anywhere is used to extract the required information from the loan application form, which is stored in a specific folder of the registered device. The OCR package in automation anywhere enables us to extract images with formats, .jpeg, .jpg, .bmp, .gif, .png. It also allows us to extract text from a window of an application, extract text from a specific area of an application, and filter extracted text and store it as a variable.

With Robotic Process Automation, it is possible to automate a large chunk of the loan processing from collecting the application form from the customers to sending emails to the customers regarding the loan acceptance or rejection according to bank rules and regulations. Thus, Loan processing is favorable for RPA and can show significant outcomes for banking industries.

VI. Fourth Industrial Revolution (FIR) and RPA

FIR also popularly known as Industry 4.0 technologies are also frolicking a very important role in automation in approximately in all domains. Internet of Things (IoT) and FIR automation is playing a very important role in real time data analysis, in almost all the field such as, transport management [27] [28] [29], tourism [30], smart agriculture management [31] [32], healthcare management [33] [34] [35], home automation [36] [37] [38], supply chain management [39] [40] [41], education management [42] [43] [44], teaching and learning [45] [46] [47] [48] [49] and many other domains too. Time to come the RPA process and many other process in loan processing will be more refined and better, with the use of these technologies in banking and loan processing in a big way. This is especially required for the developing nations and remote places, where mobility is a challenge. There with the help of these technology benefit can be provided to a large population.

VII. Conclusion

Banking Institutions still proceed with implementing RPA technology in almost all of their organizations. RPA is a recently initiated technology. It continues to traverse and outgrow its technology to enhance the customer experience and expedite the operational efficiencies and minimize the cost where the whole of this can be achieved with the help of RPA. Many of the banking and various other organizations continue to implement RPA to accomplish the vast benefits of implementing RPA, including enhanced data quality, faster and secure services, reduced manual human errors, improved business outcomes, and reduced fraud risks.

Implementing RPA in banking institutions for loan processing and fraud detection is very well successful. Its implementation has evolved the banking processes into a very advanced approach. In the current era of technologies, organizations aim to reduce operational costs and provide better services to their customers. Hence, in the next few years, we will see the implementation of RPA in most of the business sectors in the world where automation bots take charge of office works instead of human workers.

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