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Automation of Secured Business Loan through a Digital Platform

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Abstract - *Credit is important for any business to run. It forms a major part of any country's economy. Organizations can avail credit in many forms, one of the most common methods is by taking loans from banks or NBFCs. These loans can be further categorized as Term loans, MSMEs loans, Equipment loans, Invoice Financing, Inventory Financing. In this paper, we talk about automating the complete loan journey which is beneficial to both the bank and to the applicant in terms of efficiency and disbursal lead time. Process automation can be done by using BPMN/CMMN tools which gives a low code platform to create digital processes. There is no doubt that risks are always associated with these loans, with an efficient Rule Engine, backed by machine learning tools, can help in optimizing the risk. Robotic Process Automation (RPA), Optical Character Recognition (OCR) are some techniques which when integrated and properly defined can reduce manual tasks to a large extent.)*

Key Words*: *Secured Business loan Automation, BPMN, CMMN, Optical Character Recognition, Rule Engine, Robotic Process Automation, Rule Engine, Neural Network

1. INTRODUCTION

Secured Business loans help companies/firms to avail credit for their business operations whenever they are short of cash or capital by giving a lien as collateral. Currently the banking sector has a hybrid process comprising of manual and digital steps, because of a semi-digital platform few information is in digital format and few is on paper-forms, this results in extension of manual tasks to get this distributed information on a single platform, this results in increased turnaround time for disbursal of loan amount. Because of high complexity of deals in commercial loans, these are least automated (Pinckney, 2006). Even if a bank has a digital platform, User Experience has not been good for many applicants hence they are more comfortable with offline process for loan application. The goal is to reach complete level of automation, by a complete automated process we mean complete automation from filling of Application Forms to Loan Processing and finally to disbursal of loan.

A complete automated process and with a low code platform can be achieved by making use of BPMN/CMMN modeler which allows to lay down various activities involved in a loan journey. Further integrating Robotic Process Automation (RPA) technique to well defined process can reduce manual tasks to a large extent, hence reducing manual biases. Applying Optical Character Recognition (OCR) can reduce the effort extracting information from various forms that is otherwise a manual process. Also, with a proper UI/UX assessment, can make the platform more user centric improve the complete experience of the journey.

2. BUILDING UP THE AUTOMATED PLATFORM SELECTING A TEMPLATE

Step1: Understanding the Secured Business loan process. The process starts by gathering basic information about the loan requirements and few basic information about the company, based on which initial eligibility is checked. These factors may include asking information like Business Vintage, Years of Experience in business industry, reason for loan, number of pasts years of profitability. Based on these factors Banks may decide the initial eligibility. Further banks may ask for detailed information about the company and upload documents such as Balance sheet, Bank statements and Income tax Returns (ITRs). Bank also asks for KYC details and checks for credit score of the company. Based on these details Bank further filters out the applications.

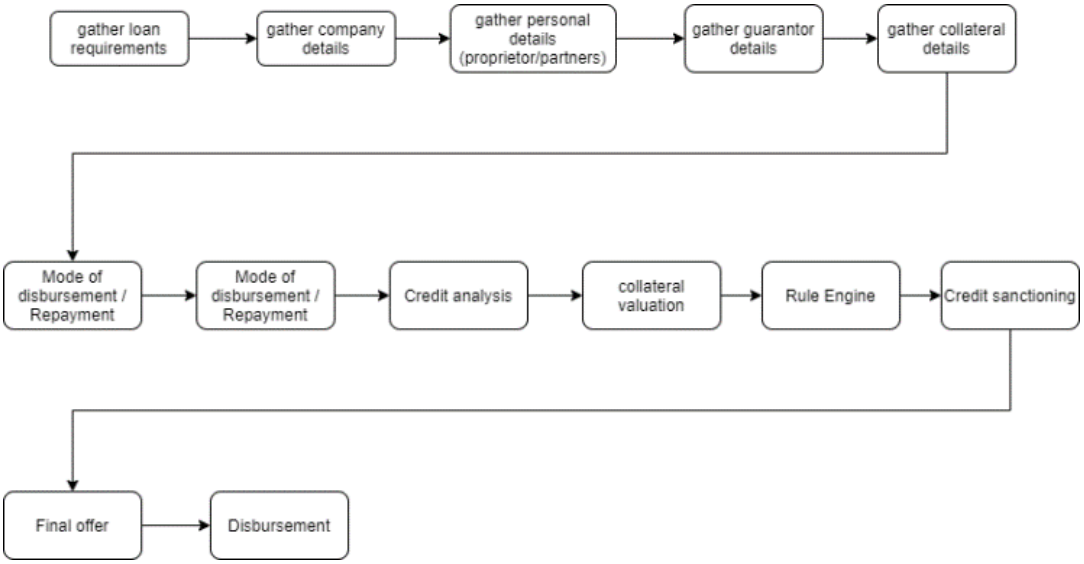

Fig -1: High level flow of a Secured Business Loan

Step2: In order to ensure that the users of the platform are satisfied with the experience it offers, a complete UI/UX assessment is done which involves following steps:

1. Defining Scope.
2. Preparing assumptions, hypothesis and questionnaires.
3. User Survey.
4. Making personas.
5. Creating User Stories and Task Steps.
6. Designing an Information Architecture.
7. Making low and high-fidelity wireframes.

The result of this complete UI/UX assessment helps us clearly define how the experience of the user should be, what features need to be incorporated to deal with the current shortcomings in the present process and platform.

Step3: The next step involves laying down all the activities on the BPMN model incorporating all the use cases and possibilities. The Business Process Modelling and Notation lets user build a standard flow involving various tasks, broadly classified into User Tasks, Script Tasks, Service Tasks, Mail Tasks, Timer Tasks, Gateways. In a BPMN model the whole journey can be divided into two major processes, a) The Front-office journey, b) The Back-office journey.

Front-office journey includes activities which involves the applicant's interaction like filling up of Application forms, screens involving messages that need to be conveyed to the applicant.

Back-office journey on the other hand involve activities like processing the information, running APIs, processing conditions, making decisions based on inputs, in other words processes which do not require any applicant's interaction is a back-office activity.

3. CASE MANAGEMENT MODELLING AND NOTATION (CMMN)/BUSINESS PROCESS MODELLING AND NOTATION (BPMN)

Case Management Modelling and Notation (CMMN) is an extension to BPMN, it supports feature of decision making in the flow, instead of creating a separate module as in BPMN. Based on business conditions cases can be made and flow conditions can be set.

BPMN/CMMN all together supports a low code environment i.e. configuration of elements can be done by drag and drop and very minimalistic code is required if necessary. These can be further configured to a complete no code platform in ideal conditions.

One major difference between BPMN and CMMN is that CMMN supports nonlinear movements whereas, BPMN supports linear flow format. Hence this difference in functionality gives CMMN an upper hand in widely used flowable platform.

De-duplication abbreviated as Dedupe is one of the major checks that performed in a loan application. Dedupe basically checks for existing information regarding any user. This information includes existing account, existing loans, collateral that are kept for running loans, collateral kept for past loans. One major concern that Dedupe deals with is that whether an applicant has kept a collateral form multiple loans or not, hence can prevent case of any fraudulent

In case of a Secured Business Loan application DeDupe check is generally done in two stages, one to check whether the applicant has an existing account in the bank or not and another Dedupe check is done on the collateral he has provided. Collateral Dedupe basically checks whether the same collateral is being used for some other loan product also or not.

4. APPLICATION PROGRAMMING INTERFACE (API)

Application Programming Interface (API) is a communication protocol that lets two system transfer information to each other. The basic structure of any API has two major components (i) Request body, which has all the request parameters. Basically, request body contains all the parameters that goes as request in calling of an API. (ii) Response body, which includes parameters that we get from the other side. API technology can be used to achieve certain level of automation like, prepopulating information fields (Name, Address, etc) from Aadhar Number or in case of Business loans, prepopulating company's information from GSTIN number. Now taking example of prepopulating address from Aadhar number, in the request body goes the Aadhar number and in the response, we get parameters like address, name and date of birth. The request parameters can be controlled as in whichever are required but they should be a part of the database of the API.

5. OPTICAL CHARACTER RECOGNITION (OCR)

Optical Character Recognition (OCR) is another useful technique which when implemented can improve level of automation. OCR can extract string values from any field, or it can also read handwritten words and statements. OCR is extensively used in barcode scanning. However, the efficiency of OCR is still a subject of improvement. One very good example for OCR technology is the Google Lens, which can extract letter from any text document and then can be copied to the required destination.

Now there are companies that provide real time accessibility to the OCR technologies and can extract information from documents. To include this, in BPMN a service task must be included just after the form which has the request field in it. The API URL is called and then the value of the request field is compared and then a suitable response based on field mapping the response goes to the response parameters of the body. Hence OCR and API goes hand in hand and complement each other capabilities.

6. ROBOTIC PROCESS AUTOMATION (RPA)

Robotic Process Automation (RPA) is another technology that can be applied with proper definition, will improve the automation level. RPA converts basic manual tasks to configurable machine tasks. RPA, based on some condition or criteria fires a certain element, which is fully configurable by a human. Automatically sending mail as soon as a conditional flag is encountered is one of the few examples where RPA have been implemented. Specific to banking sector RPA are used to detect for any fraudulent condition by checking historical data. Employee with relevant access can configure RPA to access folder/file with historical data and search through it. With certain rule-based algorithm, RPA automatically shows the results.

7. APPLYING NEURAL NETWORKS TO RULE ENGINE

Nowadays, even the lending sector is experiencing high competition due to flexibility provided by the RBI to the banks and highly competitive NBFCs which aims to provide new customize loan products that best suits for the applicant.

Hence it is very much necessary to have a balance between customer happiness in terms of interest rate, eligible loan amount and the risk factor associated with the loan that the bank take while giving a loan.

In an automated platform Rule Engine is one of the many core engines that enable complex decisioning based on certain rules and conditions. Currently weightage to factors is given based on experience of high-level managers, thus there are possibility of human bias.

Neural Network technique, when properly integrated with the Rule Engine can make it more efficient and bias free. Neural Networks has a complex structure of number of neurons that adjusts weights to the most optimal level by considering the error factor, which further acts as input to other hidden layer of neurons, further which optimises the error to further extent. The

output node in a neural network gets the most optimal weight. Hence weightage to any number of attributes, considered to take any decision, can be set to the most optimal level with neural networks.

Now for any Banks or NBFCs or any other lending institute, they all have a Credit Policy with them. This policy comprises of certain set of absolute and derived parameters that are either asked directly from the applicant (absolute parameter) in the application forms and some parameters are derived from the absolute parameters. For example, applicant salary, existing EMIs, Number of dependents are absolute parameters, and FOIR (Fixed Obligation to Income Ratio) is a derived attribute that is calculated based on monthly income and monthly obligations of the applicant.

FOIR= [(sum of existing obligations)/Income]

Now in the policy itself their certain weightage linked to these parameters. These weightages can be best decided using Neural Network Programming that, with the help of historical data can give the most optimal weightage to the parameters and hence provide with a Eligible Loan amount and Interest Rate that is most optimal for the applicant and to the lending institute.

8. CASE STUDY (SECURED BUSINESS LOANS)

Let us understand this scenario with a case study of a Bank (say ABC Bank) which provides Secured Business Loans to SMEs for their daily operation.

Problem Statement: Now considering the present scenario of Banks and NBFCs where the loan disbursal process is completely manual, i.e. from filling up the application form, collecting the required documents, analysing them, and then passing the loan to the customer. This complete process will at least take 3 weeks to the final disbursal of the loan amount.

Now considering the application of technologies discussed above and ABC Bank creates a digital platform as:

A. Using BPMN and CMMN the ABC Bank creates a Straight Through Process, which invloves all the forms which are required by the end users to fill in the information required by the ABC Bank to assess them. Now anything that requires the end user to interact with (example filling up the application forms, uploading the documents, etc.) is done by using User Task in the BPMN platform.

B. Now to improve the User Experoence further, ABC Bank makes use of API to prepopulate most of the end user information from the KYC details provided by the end user. For instance, Name, Date of Birth, Address can be prepopulated by using Aadhar Number then hitting the UIDAI API and then recording the required response from the API. Similarly using the CIBIL API, user's CIBIL score can be prepopulated (concent of the user is necessary), using the PAN number.

Talking about the APIs, there are many such companies that allow Banks and NBFCs to use their services and provide information in real time. For example, Perfios is one such company which allows Banks and NBFCs to verify financial documents, like Balance Sheets, Bank Statements, P&L Statements and provide information in real time.

Now in our case ABC Bank implements API services like KARZA (to verify KYC details), Perfios, NSDL to automate the assessing process of the documents of the customer.

C. Now once all the required information and documents have been collected by the Bank from the user. Then this application, containing all the information about the user then moves to, what is called as back office of the Bank. This can be handled efficiently with CMMN where applications can be assigned to various roles of the bank to verify the information.

Now in our case the ABC Bank has two role, OPS Maker and OPS Checker, where OPS Checker fiannally approves the loan. Now scince all the information and documents are available digitally then the application moves from one role to another digitally and required respective actions can be taken quickly. Here, the OPS Maker checks for all the documents and then moves the case to OPS Checker where the Checker initiates the RULE Engine.

D. Now comes the Rule Engine where the eligible amount and rate of interest are decided based on certain parameters. These parameters can be absolute parameter or derived parameter (calculated based on absolute parameter). Now the ABC bank considers parameters like Business Vintage, ITRs available, Sector of business, Collateral Type and Valuation of Collateral, FOIR (Fixed Obligation to Income Ratio), CIBIL Score of the company and the Owner. These all parameters are given to the rule engine as input parameters and based on a rule policy (rule policy is internal information to the banks), the eligible amount and rate of interest is decided.

Now the final offer is generated based on the output of the rule engine and contract is created by the OPS Checker and then given to the user. When the user accepts the offers and signs the contract (is done digitally using a Digital Signature) the loan amount is disbursed, and the application moves to LMS (Loan Management System).

E. Loan Management System is yet complete separate module which takes care of process after the loan disbursal. LMS basically takes care of repayments and EMIs for the Banks. Along with the LMS comes in picture the Collection Modules. The collection module is something that takes care of acquiring assets (in case of a secured loan, i.e. in presence of collateral). One most common term that is very frequently used in this module is DPD (Days Past Dues). DPDs are basically the number of days by which the applicant has delayed clearing his/her EMI or remaining dues. The collection module tracks the DPDs and based on a pre decided threshold value starts the process of acquiring the assets of the applicant. By process we mean, a case file is created which includes all the information about the applicant and DPDs.

9. CONCLUSION

It is clear that there are ample of technologies that can be integrated to a digital platform and create a straight through processes for as complex loans as Secured Business Loans and this can be beneficial to both the Banks/NBFCs and to the Applicants. Leveraging these technologies and thoughtfully integrating these with BPMN/CMMN can create an automated platform, capable of improving the user experience in terms of flexibility, smoothness and delivery time (turnaround time).

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