Development of a System for Automating the Process of Lending to Individuals in Banks

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Abstract: Numerous software programs are available in the present commercial lending market to meet the needs of both traditional and non-traditional lenders with regard to loan origination and credit assessment. Financial institutions are becoming more conscious of how to improve these aspects of their operations in order to improve client satisfaction and boost productivity, efficiency, and decision-making speed. The newest buzzword in the industry is automation, but what does it really mean? How might automation improve client satisfaction, boost lending officers' efficiency, and expedite the origination of commercial loans?

In order to show how automation may enhance and standardize underwriting methods, we will look at each step of the credit process and discuss the problems with traditional lending techniques.

Introduction

The internet and other technological advancements offer financial institutions enormous opportunity to transform the way they offer their clients goods and services. But neither the supply of services nor the use of technological devices has progressed as anticipated [1]. This especially holds true for the loan industry. We think that if usage processes of these pages are more thoroughly modelled, the amount of technology used at the front end of retail banking can be increased. The potential to automate more processes could aid banks in revamping their marketing strategies and business plans. Overall, we acknowledge that additional factors, such as custom, widely held beliefs about the use of technology in banking, or the specific bank's profile and intended strategic market position, should be taken into account with this redesign issue. But we ignore these in favor of the technical ones; that is, we limit this paper to doability. We think that shortcomings in the applied development methodologies contribute to the poor growth of technology utilization in lending.

Sophisticated development approaches for web-based information systems (WIS) have received a great deal of attention [2]. The difference between applicable and truly applied technology is substantial. Certain development methodologies still fail to provide developers with adequate guidance when it comes to identifying and aligning the business model with the logical model that describes the system that is being developed. Storyboarding was employed for this purpose in [3]. Getting the business model and the procedures that the

WIS will enable are the main goals of storyboarding. It calls for the identification and modeling of the numerous anticipated consumer types for the bank. Lastly, story boarding aids in defining the operations, dialogues that consumers are likely to utilize, and the data (and perspectives). It is obvious that having access to the necessary data is necessary in order to be able to boost automation.

Evaluating a business's creditworthiness can be a difficult undertaking. The instruments a financial institution employs to accomplish this can affect underwriting criteria, prompt approval, expenses, and the amount of any unforeseen losses. Financial organizations are seeking applications that will enable them to overcome these obstacles, improve the quality of the loan portfolio, and satisfy customers by automating and streamlining the lending process.

2 Lending

Lending is generally used to refer to the portion of banking that produces assets that are shown on the balance sheet. Lending, more precisely, is the branch of banking that deals with loans, mortgages, bills of exchange, and the like. Thus, the central function of banking is lending. Therefore, having the ability to potentially increase automation is crucial. As these would be expected to occur in automated business, retail banking in particular, which is bulk business, could benefit from increased availability, correctness, accuracy, precision, and speed. As per reference [4], a loan can be defined as the "relinquishment of money or other fungible properties associated with the debtor's obligation to return the relinquished in equal kind, quality, and quantity." Here, a loan process is defined as an example of how a loan is handled.

2.1 Loan Processes

Many lenders still rely on manual and paper-based loan approval processes, causing delays and internal data management issues. Commercial loans, which vary in size and complexity, often undergo manual underwriting using tools like spreadsheets. However, using spreadsheets for loan underwriting can be cumbersome, leading to time-consuming data entry and potential loss of uniformity. Additionally, the transfer of data from spreadsheets to other core systems may result in duplicate records and storage inefficiencies. Manual underwriting lacks consistency, auditability, and accuracy, posing challenges for bankers and causing opacity for management and external examiners. Automation is proposed as a solution to streamline systems, ensure reliable data flow, expedite the loan origination process, and provide robust audit and control benefits.
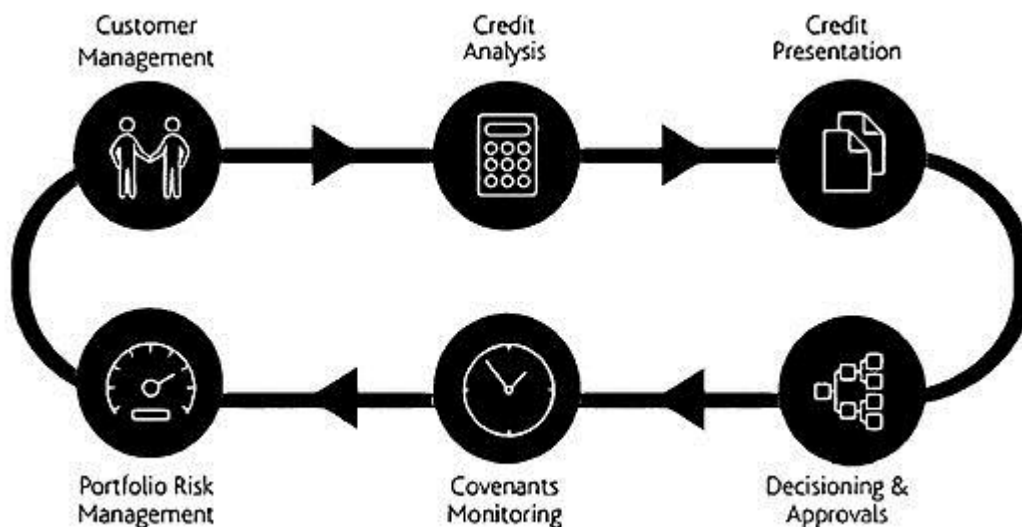

Figure 1 illustrates a typical commercial lending process

Customer Management

Gathering financial and other required information from the customer is the first step in the loan decision process, and it is currently a labor-intensive process that is prone to errors. A Moody's Analytics survey indicates that 56% of bankers who were questioned felt that the manual data collection process and the ensuing client interactions were a major obstacle to starting the loan process. To address the irregularities and delays that come with manual data collection, automation is recommended.

Digital onboarding can be expedited through automation tools, like customer-facing web portals and APIs, which enter prospect and current customer data straight into the lender's loan origination platform. In order to minimize administrative burdens for complicated borrowers, automated loan origination platforms can also receive data feeds that pre-populate customer information fields, such as customer ownership hierarchies. It is suggested to integrate loan application systems with customer relationship management (CRM) systems to ensure smooth data flow between the two and do away with the need for manual data rekeying.

Furthermore, automated credit origination platforms facilitate electronic access to the same customer documents by multiple teams from different departments or locations within financial institutions, thereby enhancing efficiency and accuracy. In order to comply with audit and control requirements, user identity and access protocols are used to preserve data integrity and limit access based on individual privileges. In general, the application of automation is suggested as a way to improve overall efficiency in financial institutions and the loan origination process.

Credit Analysis

Financial data must be manually distributed as part of the commercial risk assessment process, which is frequently done without the use of automation tools. According to a recent survey, only 31% of bankers use automated techniques for credit analysis and decisioning, and 50% of bankers do not use any automation at all. By enabling lenders to communicate with a customer's systems via an online portal and retrieve pertinent financial data from accounting software and other documents, advanced loan origination software can expedite this procedure.

Automated financial spreading maps borrower-supplied financial data into balance sheets, income/expense statements, and tax forms quickly using technologies like optical character recognition (OCR) and machine learning. Within minutes, this automation allows for quick pre-screening, scoring, and in-principle credit decisions. The main advantage is that it frees up analysts' time to concentrate on risk assessment tasks, such as forecasting models, ratio analysis, and data interpretation to assess a borrower's financial risk and ability to repay. In addition, automated tools make risk rating based on loss given default (LGD) and probability of default (PD) models easier and provide instantaneous risk metrics for loan assessment.

Efficiency is further increased by combining automated credit analysis and customer management tools into one origination platform. An automated platform, for example, can assign group ratings in commercial lending for borrower groups based on combined financial strength, thereby saving a significant amount of time during the rating process. All things considered, automation in credit analysis and financial spreading streamlines the loan origination procedure and boosts risk assessment effectiveness.

Credit Presentation & Decisioning

Data collection, analysis, and presentation are all part of the automation process for commercial loan approval, which facilitates quick credit decisions. Benefits of automating the loan process include precision, data that is almost real-time, enhanced productivity, and quicker decision-making.

The next step is frequently a manual credit application process, which comes after gathering customer information, performing financial analysis, and evaluating risk. Automated credit

application solutions incorporate loan structuring tools, collateral management systems, financial analysis, and risk assessment. These solutions can be integrated with current systems and don't always need to be complicated.

Although credit approval all-in-one apps are scarce, origination platforms have the ability to create pre-configured document templates by using stored data. Additionally, there have been innovations in the decision-making process. For example, in high-volume/low-loan-value scenarios, some lenders use auto-decisioning based on policies and rules. Automation helps with pre-screening and proposal preparation, but human judgment still plays a major role in commercial loan decisioning. Decision-making is becoming more and more reliant on mobile enablement, which lets executives decide on loans while they're on the go and expedites approval processes.

Covenants/Monitoring

Effective asset management and risk monitoring following loan origination are essential, and they frequently call for standardized procedures for gathering financial data in order to comply with ticklers, covenants, and policy exceptions. Many banks suffer with risky and inefficient tracking, particularly when using spreadsheets or other manual tools for portfolios with multiple loan covenants. Examiners view this approach with suspicion and recommend the use of more reliable solutions.

Although they can be implemented independently of origination systems, automated covenant solutions work best when they are part of the complete solution. Covenant details are associated with the approval record for audit purposes and rekeying is avoided by recording covenants during the loan application process. With the use of calendar alerts and automated covenant/tickler features, timely data collection is ensured. Notifications are sent for any missing paperwork or unmet covenants. When data is entered, automated testing detects breaches that are either imminent or already occurring and notifies the user through a dashboard. The accuracy, efficacy, and efficiency of covenant tracking are improved by this integrated approach.

Portfolio Risk Management

Lenders have difficulty tracking changes over time and understanding portfolio exposures when using traditional manual, paper-based loan underwriting methods. Lenders set portfolio limits and risk appetite tolerances, but the efficacy of these regulations depends on having a reliable portfolio reporting system.

Data integrity, data lineage, and overall governance are improved by automating the loan origination process, especially when done with a best-in-class origination platform. The debate has focused on how employing different systems to store data jeopardizes integrity and requires laborious reconciliation processes, which postpones the development of a precise portfolio picture. There may be missed opportunities as a result of this delay to promptly address issues.

There are financial benefits to accurately measuring a loan portfolio, particularly with regard to capital usage. Direct costs result from overstating risk-weighted assets on the balance sheet. Using a portfolio data cleansing project as an example, a major European bank was able to save several hundred million dollars in capital. The most important lesson is that these kinds of problems can be avoided by automating the loan origination process. This adds significant value by enabling the creation of important business insights through effective reporting tools and guaranteeing strong governance and control over risk data.

3 An Improved Loan Process

Figure 2 shows an improved loan process model illustrated with a UML sequence diagram. The labels inside the rectangles at the top of the diagram represent the participants in the loan process. The actors' life lines, which increase from top to bottom in the diagram, are represented by dashed lines. A message sent from the source life line actor to the target life line actor is

represented by an arrow joining two of these life lines. Where necessary, the arrow labels list the message names along with their parameters. When an actor's life line segments overlap a certain diagram level between an incoming message and the outgoing message that follows it, the figure shows actor concurrency. The bottom level rectangle with the messages "Payback()" and "CheckPayback()" indicates that these messages should be sent again and again until the stop condition (shown below the rectangle with the asterisk) that reads "debit position balanced" is satisfied. This diagram can be used to classify actors into lending market-related organizations. Sets of actors and cooperation protocols can determine the corresponding business models. It's possible that some of these business models are not financially viable. If all activities within each organization are automated and data is exchanged between them via protocol-compliant messages, then the loan process can be fully automated. This data can then be automatically extracted and utilized as input for the subsequent activity in the receiving organization. For the loan process to be automated, it is necessary to understand the formats of both exchanged and stored data. For this purpose, story boarding can be employed.

3.1 A Loan Application Scenario

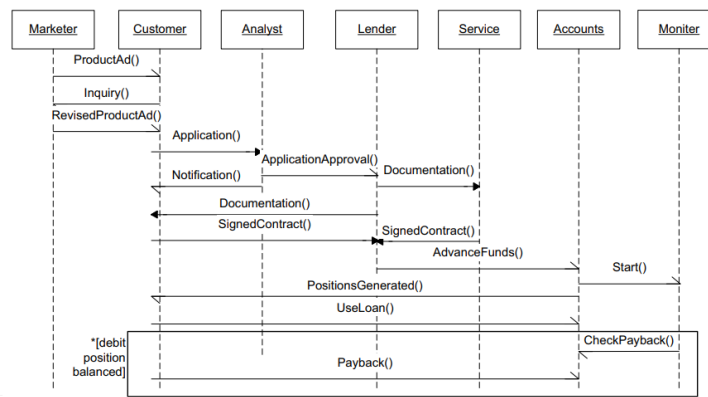The figure shows the online home loan application
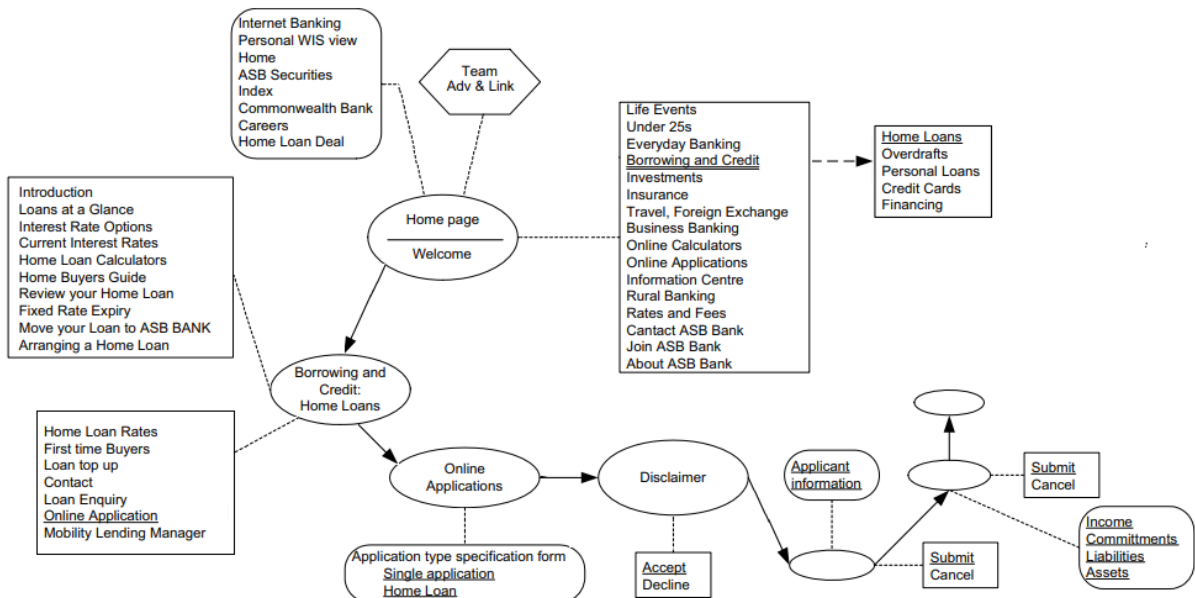

Fig. 2. An improved loan process

Fig. 3. Online home loan application scenario

WIS. Ovals are used to represent the locations within the corresponding application space—referred to as scenes—where significant customer WIS interactions occur. Generally speaking, we label scenes with names, but occasionally we don't. Scene transitions are represented by the arrows between scenes. Scene changes result from maneuvering or carrying out an operation. Representations of navigation functionality, data, operations, and advertisements are item lists within a hexagon, rounded box, or rectangle. The customer's selected link, data, or operation in a scene is highlighted. If performing multiple actions is necessary to move on to the next scene, each of these actions is highlighted. Indicate that list of navigation items N is represented as N J. An arrow with a dash from N J to RJ signifies that a refinement R of I is displayed when one clicks on an item I of N. I am then emphasized twice. The navigation items, data and operations, and advertisements that are accessible at the scene are indicated by the dotted lines that link rectangles, rounded boxes, and hexagons to the corresponding scenes. There is no scene label indicating that the scenario being shown is accessible to all customers. SiteLang enables a clear declaration of the dialogues, navigation features, and content that users of a particular type can access at a scene. As a result, it might contribute to the automation of loan procedures to the point where the only manual process left is identifying the customer-supplied data as legitimate and exceptional payment collection.

This succinct explanation of the use of story boarding in business development demonstrates that, given a business understanding, it is possible to predict customers' requirements for data access, operations, and navigational features. By extending this expectation into a description, it is possible to use schema integration techniques to derive views and access structures that best support users in carrying out their jobs and to obtain a consolidated representation of the data that is needed. We don't go into more detail about this because of space constraints.

Conclusion

We examine the online loan application process in this paper, pointing out a big disconnect between web technology's potential and its actual application. We suggest that the storyboarding technique can significantly boost loan process automation.

Globally, automation has been a major factor in increasing productivity across many industries, with banking being one of the first to embrace new technology. Still, there has been a dated persistence in the origination of small business and commercial loans. Technological competitors are changing the commercial lending landscape, forcing traditional lenders to use automated loan origination processes. Lenders are integrating technology to get more insightful business information because they are driven by competition, efficiency, customer responsiveness, cost savings, regulatory compliance, and data control factors.

Lenders see automation as a tool to help them retain talent, not a way to reduce human intelligence. This is because it frees up bankers to concentrate on important tasks like customer relationship management and risk analysis rather than paperwork. Automating loan underwriting processes may present some difficulties, but it can set the bank apart from competitors and make it a leader in the industry.

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