Merrilton Bank Case Study

Overview

Merrilton Bank provides lending and insurance services to approximately 25,000 commercial and individual customers. Its main mission is to provide a wide spectrum of financial products tailored to the needs of diverse populations and small businesses. The bank was established in 1972 and has accumulated various data sets on the lending, repayment, and fraudulent behaviors of customers. These data have been used to develop various risk models assessing the likelihood of loan repayment, expected loss, and risks related to the company's products. The credit assessment, risk prediction, and fraud detection models are valuable data assets of the organization that are used to automate parts of or entire business processes. These models comprise prominent data-driven decision tools behind the cloud-native mobile app that Merrilton is developing to provide its services to all customers anywhere and anytime.

Before the statistical scoring models were used for automatic loan decisioning, the bank used subjective scoring that relied on the input of experts. When the first predictive models were built, experts were also used to train these machine-learning-based models. The current automated application scoring models are deemed empirical and statistically valid. They have undergone rigorous statistical analyses that derive empirical ways to evaluate the credit worthiness of consumers using data from applicants within a reasonable preceding period, and the models have been developed and validated based on generally accepted statistical practices and methodologies. All models that are in use are reevaluated for statistical soundness on a periodic basis and adjusted, as necessary, to maintain or increase their predictive power.

The application scoring models focus on selecting borrowers for approval from a pool of applicants. The bank has found that the automated application scoring solution has several benefits, including operational efficiency gains, improved accuracy of decisions, the establishment of an objective and standardized data-driven decision-making culture, and customer satisfaction improvement, to name a few.

The implementation of the automated application scoring models was not without challenges. The process has been a costly and complicated undertaking and initially required data scientists with specific technical skills, who were not easy to find. The bank needed to revisit how its data was stored and managed to support the models under development. The model's prediction capabilities were based on historical data with the stipulation that the future will be based on and will look like the past.

At present, the models are managed by the Business Analytics department, and the historical data are managed by the Data Warehousing department. The IT department supports the various technical needs of both the Business Analytics and the Data Warehousing departmental silos but does not influence the policies and procedures of these two departments, as they each have their own sets of policies and procedures. Merrilton currently operates in departmental silos as well, using a highly centralized data warehouse with several data marts supporting specific departments, including one for Business Analytics. Issues in integrating data from various sources continue to present impediments to data integration and model development and calibration. Elements of data governance related to people, processes, content, and technology exist across many of these departments but do not appear standardized or synchronized and experience frequent ad-hoc changes. Furthermore, these departmental silos also provide centralized services, such as IT,

professional development, accounting, and human resources (HR), but they are rarely used in decision - or policy making at the enterprise level.

Current Crisis

During the past few weeks, an economic downturn affected many of the bank's commercial customers, causing some businesses to temporarily close. As a result, Merrilton bank was entrusted by the Department of the Treasury to administer an expedited portion of a federal loan program, the Small-Business Assistance Program (SBAP), to support affected small businesses. The Department of Treasury will be supported by several oversight organizations in ensuring transparency and accountability of the program spending. Standardized data from loan operators are being collected and published on a government website.

Merrilton Bank is still assessing the specific needs for people, technology, processes, and data to support this loan program and ensure that the bank will remain compliant with the requirements of the Department of Treasury so that it can be eligible to administer any future portions of the federal loan program and to avoid consequences from mismanagement of the federal program.

To apply for a SBAP loan, a business is required to apply for the loan directly at a bank operating a portion of the loan program using a paper form or via a web portal and provide a small set of operational indicators, including industry sector, income lost per day due to closure, number of employees affected, years in business, and annual profits from the past calendar year. Traditionally when a loan application is submitted, 20 questions are included in the data collection process; however, the federal data for this emergency loan product only requires five of these questions. While the credit models that Merrilton currently uses require the same federal data as the emergency loan product, they also rely on additional variables that the emergency loan program does not require.

The Department of Treasury requires that the loan operator ensures the confidentiality of the data collected about the loan, maintains systems for data preservation and potential audits, and ensures compliance with all applicable laws and regulations.

The SBAP is a renewable program. Should the situation continue to affect businesses, Merrilton would be able to administer successive rounds of the loan program provided that the bank satisfies specified thresholds regarding service levels, engagement, diversity in the spectrum of small businesses awarded, and initial repayment levels, as well as compliance with associated rules and requirements. One of the requirements specifies the level of the two-month repayment rate and for the bank to give out loans equitably. The bank is expected to provide periodic reporting to the Department of Treasury by sharing data on the operations of these loans using open data standards as defined by the National Institute of Standards and Technology (NIST) and make additional data available for ad hoc audits.

Merrilton Bank is expected to report the number of SBAP loans in default status, a default rate threshold across business size or earning bands, and a diversity distribution profile on the small businesses that have been issued a loan. To meet some of those requirements, the bank will need to collect data available only at local offices and from different local offices and establish key performance indicators to share with the Department of Treasury periodically when audited. The bank is considering using cloud computing to increase

storage efficiency and availability of large spending data sets.

Merrilton is responsible for discovering and mitigating fraud and abuse and reporting such instances to the loan originator. Fraud detection tools have already been constructed and are in use by the bank, but they require the collection of multiple additional data on the history and the behavior of the loan recipients.

A small business will be eligible for another round of SBAP loans if it does not default on the initial two-month repayment of the current round of loans and when it has rehired at least 50% of laid-off employees.

Next Steps

Merrilton's leadership has asked a group of employees to survey the people, procedures, technology, and processes they use in their respective departments for possible deployment in support of the new SBAP program. The executives are meeting tomorrow to agree on the next steps in the establishment of the new unit. The following agenda items will be discussed:

1. Whether to establish a new unit that specializes in SBAP only or to assign a current unit to support the program
2. Which unit will handle reporting to the Department of Treasury and validate reports
3. Reuse of existing infrastructure to support SBAP-related activities
4. The need for additional infrastructure to support the new loan program
5. If current tools for data collection, storage, and analytics should be used to support the operation of SBAP
6. Updating current loan application evaluation models
7. Risks from updating existing models on default rate and eligibility for the next round the federal program
8. The criticality of SBAP data and storage modality solutions
9. Disaster recovery consideration of SBAP-related data
10. Applicable laws around the collection and use of SBAP data and compliance
11. Other observations