UTILIZING BIG DATA, AI AND ML TO BETTER UNDERSTAND CUSTOMERS

40%

Reduction in fraud

Impact

- Enhanced fraud detection, reducing the rate of fraud by 40% to record low levels, versus other banks.
- Improved relationship manager productivity by 2.5 fold jump with Agen BRIlink -- equivalent to US$36 billion.
- Improved credit scoring system to cut down on micro-financing loan processing times from two weeks to two days for BRISpot and two minutes for Pinang.

PT Bank Rakyat Indonesia (Persero) Tbk (BRI) is one of the largest and oldest banks in Indonesia and engages in the provision of general banking services. Headquartered in Jakarta, Indonesia, BRI is well-known for its focus on microfinancing initiatives, and serves over 75 million customers through its above 11,000 offices, units, and rural service posts.

BRI is closing Indonesia's financial inclusion gap by harnessing the power of advanced analytics, artificial intelligence (AI), and machine learning (ML) to improve its credit scoring and fraud detection capabilities to deliver new, enhanced, and secure banking services.

Unlocking the Unbanked Potential

"BRI has always been committed to serving the financial needs of Indonesians across the country, regardless of their socio-economic status, and this focus has guided us throughout our journey in Indonesia," said Kaspar Situmorang, EVP Digital Center of Excellence at BRI.

According to The World Bank's Global Financial Inclusion Index, half or approximately 56 million Indonesians do not have a bank account. With Indonesia in the bottom four countries for financial literacy, and an estimated $8.3 billion of its currency held outside the banking system, there is both a challenge and opportunity for BRI.

"To reach and unlock the unbanked potential in Indonesia, we needed a solid foundation that allowed us to leverage the power of advanced analytics, artificial intelligence (AI), and machine learning (ML) to gain a better understanding of our customers and market, while allowing for more efficient operations. With these capabilities, we should be able to grow the business by deploying new, reliable, and speedy financial services for our target customers while minimising our business risks," said Kaspar.

Developing Real-time Fraud Detection

By replacing its legacy systems with a modern data platform, BRI was able to analyse 124 years' worth of historical financial data and use those insights to enhance its operations and deliver better services to the underserved and unbanked in Indonesia.

BRI used Cloudera's Enterprise Data Platform to build an agile and reliable predictive augmented intelligent solution to enhance its credit scoring system. The solution analyses customer transaction data and predicts the probability of customers defaulting on payments the following month. It also alerts BRI's loan officers to at-risk customers, prompting them to take the necessary action to reduce the likelihood of net profit loss.

"Cloudera has been -- and will continue to be -- key to achieving our goal of improving financial inclusion in Indonesia. With Cloudera, we're able to harness 3 PB of internal and external data using AI and machine learning to uncover never-before-seen insights. Those insights not only helped boost the efficiency of our operations, but also empowered us to offer new services that address the needs of the unbanked and underserved while lowering business risks."

Kaspar Situmorang, EVP Digital Center of Excellence, BRI

To address the rising concern around data security from regulators and consumers, BRI developed a real-time fraud detection service, BRIForce, powered by Cloudera and Kafka. BRI's data scientists developed a machine learning model for fraud detection by creating a behavioral scoring model based on customer savings, loan transactions, deposits, payroll and other financial data. With Hbase as the model's backend data store, BRI managed to automate the processing of data from multiple customer touch points such as ATMs, electronic data capture, and internet banking channels. This also enabled BRI to identify anomalies (which could potentially be fraudulent transactions) in real time.

Additionally, BRI improved the accessibility of banking services through its branchless banking network, BRILink. BRILink appoints individuals or merchants as agents who offer banking services to the underserved and unbanked without the presence of a branch. BRI aggregates and analyses four sets of data: the potential customers who can be turned into BRILink Agents, the distance between agents in a specific area, the nearest agent to BRILink offices, and the nearest agent to markets. By doing so, the bank could determine which individuals are the most ideal to recruit as a BRILink agent, which helps to expand and optimise the network's reach.

The combination of the above-mentioned capabilities empowered BRI to confidently develop and roll out two products that significantly reduced the loan origination to loan disbursement times. One of those products is BRISpot, a micro loan processing mobile app that expedites credit score profiling by connecting BRI's customer databases with the central bank network. The other is Pinang, a mobile-first, self-service, end-to-end digital microfinancing product that allows many underserved and unbanked consumers to effectively finance their loans quickly, reducing reliance on illegal moneylenders.

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Implementing a New IT Architecture

Recognising the need to overhaul its operations from the ground-up to meet the changing consumer demands, BRI started by implementing a new 'Digital as our DNA' working culture, which involved reinventing internal processes and team structures to better leverage scalable technologies and data.

On the technical front, the bank built a five-layer IT architecture to increase operational efficiency and allow developers to leverage AI and ML technologies. The new IT architecture allows BRI to store, consolidate and process information from multiple data streams on a single platform. This led to improvements in its fraud (i.e. reduced 40%) and credit scoring (i.e. AUC increase 8%) capabilities, as well as the development of a new, digital microfinancing product.

Results

BRI has leveraged AI and ML to offer new and enhanced services while lowering business risks in the following ways:

• Enhancements of its credit scoring system with predictive financial analytics and early warning system. "With the ability to better predict the likelihood of a customer defaulting on a loan, we have reduced the likelihood of non-performing loans by 1.15% in specific segments. Overall, it has helped account officers in the field to preemptively manage high risk customers using precise data-driven prediction."

• Enablement of real-time fraud detection through BRIForce. "We used to take up to two months to detect fraud. Since BRIForce is a machine learning model trained with various datasets, it allows us to quickly automate the process of highlighting anomalies found in the stream of events coming from multiple customer touch points to a few seconds."

• Using predictive merchant assessment analytics for BRILink to analyse distance data between existing and potential BRI agents, offices and markets. With the ability to better identify the ideal individual to recruit as a BRILink Agent, BRI has seen a 2.5 fold jump in Agen BRIlink transactions, which is equivalent to US$36 billion, since its launch in 2017. Given the effectiveness of BRILink, BRI has stopped building new branches since 2018, which has helped it to greatly reduce its overhead costs.

• Speeding up loan originations to loan disbursement times from two weeks to just two days for BRISpot and two minutes for Pinang, through vast improvements of digital micro-loans. "Not only has this improved cost-efficiency of the Pinang service, the digital lending scoring has also been using advanced machine learning to instantly score customers with zero non-performing loans so far."

"Although we were sitting on a goldmine of data, we weren't able to fully benefit from it as our previous IT systems limited us from effectively managing and making sense of it," said Kaspar. "With Cloudera providing a strong IT backbone, we've gained the ability to make strategic, insight-driven decisions to manage risks better and operate more efficiently. This gives us the confidence to offer banking services to our customers – including the underserved and unbanked – in new ways and accelerate financial inclusion."