

Case Study: Banking

World's largest development bank deploys intelligent audit solution

Automated machine learning revolutionized the way a large financial institution managed its audit review process by delivering speed and quality with intelligent opinion prediction.

The challenge

The world's largest development bank was regularly receiving 4,000 audit reports and 3,000 management letters supporting audit findings. Due to the large volume, length and validation required to review these findings, audit reports were a cumbersome and time-consuming process for the bank. Therefore, the bank needed a comprehensive system to maintain an accurate and up-to-date view of all information, starting at the portfolio level.

The solution

The bank engaged Cognizant to deploy Amazon Web Services (AWS) Machine Learning (ML) Competency to setup an intelligent, automated solution that could enable prediction and identification of audit opinions.

As part of the solution, Cognizant also introduced optical character recognition (OCR) on audit documents by leveraging Amazon Textract to automatically extract data for further processing. We also built an artificial neural network (ANN) so the bank could automatically predict audit opinions and significantly limit human intervention.

Storage and pre-processing

All incoming audit documents were stored on Amazon Simple Storage Service (S3), while AWS Lambda, Amazon Textract and SageMaker were leveraged to extract text from PDFs for relevant cleanup and processing. AWS Translate was also used to translate all documents into English. We further reduced the data onboarding and model processing timelines by building and deploying a feature store, an ML-specific data system, for the client.

Model building, training and serving

Cognizant leveraged Amazon SageMaker and AWS TensorFlow to build and train the ANN for accurate prediction of audit opinions.

Model consumption and governance

Comprehensive security and access authorization measures were incorporated into the continuous monitoring and audit features to ensure ANN performance was consistent. This model was developed for downstream consumption, by further applications at the bank, and deployed in production.

Architectural attributes

The automated ML solution was built in line with an AWS framework and leveraged best practices, such as infrastructure- or configuration-as-code, serverless deployments, continuous agile development: continuous integration (CI), continuous delivery (CD) and continuous testing (CT), collaboration, source (or version) control management (SCM) and comprehensive model and performance monitoring to build a truly differentiated prediction solution. The solution processes audit documents and management letters in the following steps:

- Store audit documents or management letters on Amazon S3
- One PDF document is placed on Amazon S3 to trigger AWS Lambda
- AWS Lambda performs the following tasks:

- > Perform OCR
- > Detect language using AWS Comprehend
- > Use AWS Translate to translate documents into English
- > Deploy custom TensorFlow and Scikit-Learn classification models with Amazon SageMaker
- > Identify the audit document category (qualified or unqualified) and bucket and alert classifications for management letters with Amazon SageMaker
- > Move translated document to Amazon SageMaker endpoint and utilize English-trained model to deliver intelligent audit opinion prediction

Business outcomes

The AWS-powered audit opinion predictions reduced document review time by nearly 90%. This decreased manual efforts from 8 hours to one hour or less. Our solution also enabled the bank's auditors, and other users, to prioritize and target reports without less risk, enhancing the quality and speed of the audit process.

The automated machine learning solution also detected patterns that would otherwise go unnoticed (major contract terms, outliers and trends), so the bank had time to focus on delivering business value through other activities outside of auditing.

About the client

The customer is an international financial institution that provides loans and grants to the governments of low- and middle-income countries for pursuing capital projects. Its mission is to drive developing countries in a bid to end extreme poverty.

About the partnership

Cognizant engineers modern businesses to improve everyday life. Our unique industry-based, consultative approach helps clients transform technology, re-imagine processes and transform experiences ensuring businesses remain agile, relevant and ready to run more innovative and efficient enterprises.

With AWS as our partner, we focus on the outcomes that matter most to businesses and underpin our solutions with deep industry experience and market-leading IP. Cognizant brings more than 6,000 AWS certified professionals, dedicated AWS certified consultants in 43 countries, hundreds of customer launches and successes, and more than 70 transformational blueprints to drive innovation beyond cloud migration.

As a premier consulting partner, Cognizant hold numerous AWS competencies, including AWS Mainframe Migration, AWS SAP, AWS Migration, AWS Financial Services, AWS Healthcare, and AWS Life Sciences. Partner programs include AWS Well Architected, AWS Managed Service Provider, AWS Marketplace Seller, AWS Solution Provider Program, and AWS Public Sector Solution Provider.

About Cognizant

Cognizant (Nasdaq-100: CTSI) is one of the world's leading professional services companies, transforming clients' business, operating and technology models for the digital era. Our unique industry-based, consultative approach helps clients envision, build and run more innovative and efficient businesses. Headquartered in the U.S., Cognizant is ranked 185 on the Fortune 500 and is consistently listed among the most admired companies in the world. Learn how Cognizant helps clients lead with digital at www.cognizant.com or follow us [@Cognizant](https://twitter.com/Cognizant).



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