Case Study

Percipient.
Connecting the world's data

MIZUHO

Corporate Time Deposit Customer Profiling and Analysis of Customer Stickiness

By achieving integrated access to multiple sources of data, a Percipient and HPE Proof of Concept demonstrated how Mizuho Singapore's Innovation team could forecast and predict customer cash flow and improve stickiness

Executive Summary

The Business Need:

- Track behaviour patterns within Time Deposit customer segments
- Incorporate market news and events into customer analytics
- Forecast potential for customer attrition

The Tech Challenge:

- Aggregate and store fragmented customer data
- Ingest third party data in real time
- Make available business-specific information

The Solution:

- Unify the bank's multiple databases
- Deploy a firm level Datalake platform to host logical Datalake/Datamarts
- Integrate with the bank's analytics and machine learning code

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Guru S. Anand,
Vice President from the Innovation Team,
Asia and Oceania Department,
Mizuho Bank Singapore.

MIZUHO

Focussed on customer retention

Mizuho Bank Ltd is the banking subsidiary of Mizuho Financial Group of Japan, one of the world's largest financial service providers. The Singapore branch of Mizuho Bank commenced operations in 1974 and now has staff strength of more than 800.

Mizuho Bank Singapore currently provides banking services to more than 2,000 Japanese and non–Japanese corporate customers, and is highly focused on retaining and expanding its market share, especially in the face of revenue growth pressures within the global industry. According to a McKinsey report, corporate-banking ROEs in developed economies averaged just 8% in 2016, and just 5% in Developed Asia. To stay ahead of its competitors, Mizuho plans to leverage customer analytics and machine learning for business insight, improve its customer services and enhance its risk management and processes.

A key example of this is the work being done by SG Mizuho's Asia and Oceania Administration Department -Innovation team to track and forecast customer cash flows, thereby predicting the likelihood of large deposit withdrawals and customer stickiness. If unforeseen, such large withdrawals can have a knock-on effect on many other bank departments. On the other hand, accurate cash flow forecasts offer the potential for a range of important benefits:

Early Alerts

- Provide RMs with likely-to-attrite customer contact lists
- Allow for pre-planning of sales and marketing campaigns to address potential of withdrawals

Identify Trends

- Detect specific drivers for cashflow behaviour
- Detect relationships between cashflow patterns, customer stickiness and customer attrition

Customer Segmentation

- Identify most/least affected customer segments
- Identify courses of action most relevant to specific customer segments

Liquidity Management

- Allow pre-planning to manage tight liquidity situations
- More efficient and timely asset liability management

However, these exercises are currently performed by manually extracting data from a variety of internal databases. Using spreadsheets, the data is then mapped and aligned to the prevailing analytical model, a process that is cumbersome, slow and resource-intensive. Factoring in external data adds further complexity and as a result, is not routinely done.

As a result, forecasts can only be updated monthly or quarterly, rather than on a more impactful weekly cycle. It is also impossible to continuously back-test and refine the forecast model.

Driving Greater Accuracy

To address these challenges, Mizuho engaged integration software provider, Percipient, for a trial of the latter's flagship UniConnect platform. A key requirement for this Proof Of Concept (POC) was for structured and unstructured data to be delivered to a single end-point, paving the way for easy discovery and consumption by various business, technology and analytics teams.

In particular, for the purposes of customer cash flow forecasting, the POC enabled the streaming and aggregation of large amounts of external data, including:

- Historical daily SGX prices from Yahoo finance
- Historical daily Nasdaq Exchange Price from Yahoo finance
- Historical daily S&P Exchange Price from Yahoo finance
- Historical daily Nikkei Price from Yahoo finance
- Customer Equity price from Bloomberg terminal for available customers

Besides these structured datasets, the bank also sought unstructured data in the form of:

- News items related to the selected customers from newsapi.com using API call from python and Kafka(Hadoop)
- Top 100 news headlines worldwide from the website Kaggle.

The POC also required this third party data to be unified with the bank's own millions of rows of transaction data stored over the last five years in a variety of repositories and formats, including:

- Oracle
- SQL Server

Based on the above specifications, Percipient proposed a solution comprising a number of elements central to meeting the bank's needs. To start with, it was vital for UniConnect Connectors to be deployed in order to automatically ingest data from the multiple sources outlined above.

Given the bank's requirement for some data persistence, and tight controls on cloud usage, a Hadoop Datalake was built on premise, thereby enabling both structured and unstructured data to be securely stored. The UniConnect platform was used to migrate some existing data and persist new data to the Datalake.

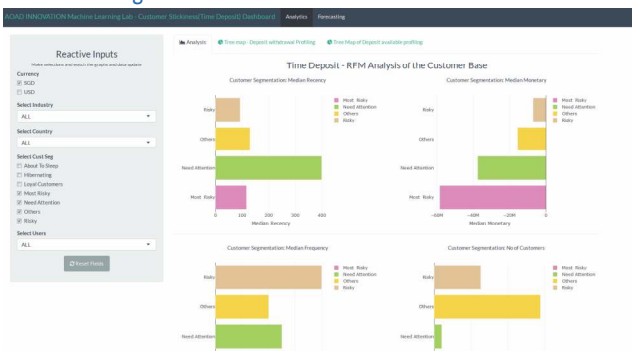
To provide hardware support for this POC deployment of the UniConnect and datalake platforms, Percipient and Mizuho partnered with leading IT infrastructure and services company, HPE. Based on the SLAs defined for the trial, HPE were able to supply a pair of DL380 servers for the Uniconnect and Hadoop Datalake processing.

Armed with this software and hardware, data from the datalake and/or existing databases could then be queried as and when required by the analytics team, by simply using UniConnect's SQL interface. The

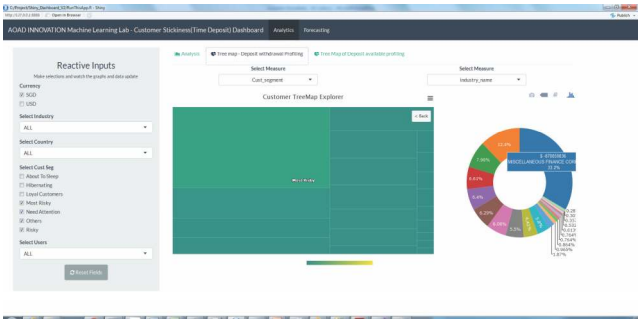
UniConnect platform was able to transform the data to align with the banks forecast models that were built using Python. Mizuho's queries, typically involving 30 million records, were processed by UniConnect in micro-seconds or seconds, depending on the complexity of the query.

Leveraging UniConnect's integration capabilities, Mizuho's SG Asia and Oceania Department's Innovation team built dashboards as shown below:

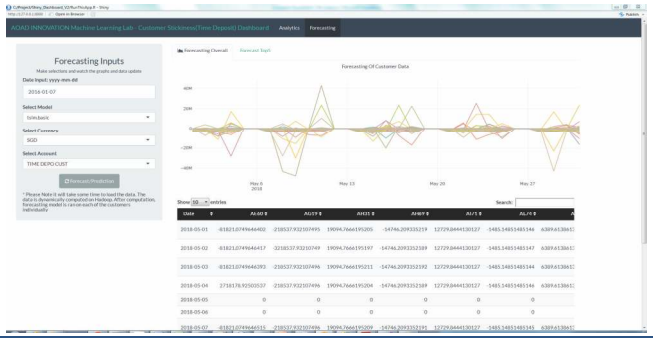
RFM - Profiling



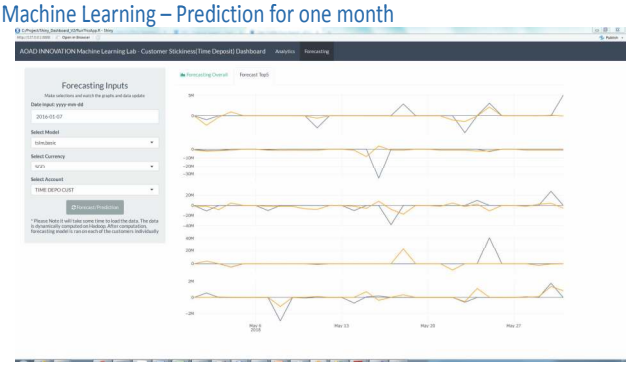
Customer Profiling



Machine Learning - Forecasting



Machine Learning – Prediction for one month



Analytical Outcomes

Using a series of traditional and advanced techniques to analyse this data, the bank was able to demonstrate the power of its forecast models and predictive capabilities. These models could be easily back tested, given the accessibility of historical data.

Analysis of the customer profiling and stickiness patterns allowed the team to determine that stickiness indicators have the following desirable properties:

1. Individual stickiness positively correlates with stickiness at an aggregate level
2. Stickiness increases with time, but slower than at a linear rate
3. At the individual level, future stickiness can be predicted by stickiness in the past.

As a consequence, stickiness can be regarded as a stable customer variable and relates closely to withdrawals. These results can be used to drive new analytical models and customer retention strategies.

Guru S. Anand - Vice President, from the Innovation Team, Asia and Oceania Administration Department, Mizuho Bank Singapore, said, "We are very pleased with the insights and forecasting we have been able to achieve, underpinned by the UniConnect platform. It is only with data breadth and depth that accurate predictions can be made about how companies will react given certain industry conditions and market events. And it is only with high speed and high volume data processing that it is possible to refine our analytical models to reach meaningful levels of accuracy. We believe the solutions that Percipient has introduced to us will substantially lift our analytical capabilities and correspondingly, our productivity, in today's hyper-competitive corporate banking sector."

About Mizuho Bank

Mizuho Bank Ltd is the banking subsidiary of Mizuho Financial Group of Japan, one of Japan's three mega-financial groups. The Singapore branch of Mizuho Bank holds a Full Bank License and its principal business lines are corporate finance, trade finance, cash management, funds transfers, project finance and

treasury. The Singapore branch also serves as a regional office for bank's Asia & Oceania (excluding East Asia) operations.

About Percipient

Percipient is a data technology company founded in December 2014. The company helps enterprises integrate their data across both traditional and modern systems. The company's flagship platform, UniConnect, is designed to facilitate the development of high performance applications by enabling connectivity to disparate data sources. The platform supports both on-cloud and on premise deployments and is API-enabled. Percipient is a Global Top 30 high growth startups named to the 2018 EY Accelerating Entrepreneurs program.

About HPE

Hewlett Packard has been in the innovation business for more than 75 years. We help customers use technology to slash the time it takes to turn ideas into value. In turn, they transform industries, markets and lives. Our vast intellectual property portfolio and global research and development capabilities are part of an innovation roadmap designed to help organisations of all sizes – from global enterprises to local startups – transition from traditional technology platforms to the IT systems of the future.