Putting the reins on a volatile stock market with Big Data Analytics

A South East Asian stock exchange wanted to improve the monitoring of its data, including stock prices and trading activity. To handle the massive amount of information streaming in, they chose Fusionex Big Data Analytics to not only process around two billion transaction records per day but also to detect trends and patterns within the data.

Overview

Industry

Financial Services
(Stock Exchange)

Profile

The client is an exchange holding company which is one of the largest bourses in South East Asia. It is home to almost 1,000 companies spread out over 60 economic activities. The exchange offers a range of products including equities, derivatives, futures and options, offshore and Islamic assets, as well as services such as listing, trading, clearing, settlement, and depository.

Introduction

The client is an exchange holding company and is one of the largest bourses in South East Asia. As the host of nearly 1,000 public listed companies which come from more than 60 different industries, the client manages a large amount of fast-flowing information – around two billion transaction records per day. As such, the client was looking for an IT solution that is robust and fast enough to not only monitor the transactions as they come in, but also to provide analysis and predict future market movements.

The Challenges

The client did not have Business Intelligence (BI) or Analytics software that ran across the entire organization and instead had individual data silo systems. This meant that they had to look separately at specific markets such as stocks, securities, derivatives, and others. The different markets with their different transaction natures had to be treated singularly.

Additionally, the client's data size is very large as they get two billion transaction records in a day. A data mass of that magnitude could not be processed in one go as it could not be handled using normal transactional or relational databases. The client sought out a solution which could enable it to decrease its latency in data management.

They also needed a platform that enabled real-time reporting of data due to the volatile nature of the stock market which changes constantly. The client needed an overview of each transaction that transpired within the past minute, or even down to 10 seconds. With huge amounts of orders coming in from various parties such as individual investors, brokers, and bankers, the client needed analysis on-the-fly.

The client also did not have its own data analyst and data scientist team that could help them to churn out insights for their business operations. They needed a team who could delve into their data to find out insights such as which their high-risk investors were, which age group transacted more, which participant should they market to more, and should they focus more on males or females?

The Solution

With the deployment of Fusionex Big Data Analytics (BDA), the client has at its disposal a wide range of technology that covers the end to end of data management. Possessing a combination of solutions which include Hadoop and Cloudera technologies, the Fusionex BDA platform is both powerful and flexible enough to connect to the entirety of the client's data sources, process them, and present them in visualizations for user consumption.

The Fusionex BDA platform gave the client the ability to discern how external events affected stock movements. As it includes sentiment analysis technology, the platform could connect to news reports on news or investment websites to see the degree in which reports hosted on those sites affected transactions on the bourse. It can even be connected to online forums to determine the correlation of public sentiment with stock movements, or even latch on to fluctuating currency valuations.

Pulling public information to assess its impact on stock prices on one hand, the platform could also pull in-house proprietary information that the client does not make available to the public. Unable to be discerned before, this information about trading activity and stock market analysis, investor demographics based on age, gender, profession, and others, could now be measured and analyzed.

A real-time analysis mechanism was also put in place where the client could view instant updates to high level key performance indices (KPIs) throughout the trading day, such as trader values, trader volume, and stock movements.

The client could track transactions in a more detailed manner. They could compare activity at the counters based on timeframe – today's activity with the day, week, month, or year before. They can also set thresholds that will send out automated notifications to a power user should falling cash flow be detected. For example, if a drop of 20% is set, a warning will be sent out if that threshold is reached, following which, in-depth analysis can commence. This allows the client to be proactive in finding explanations and solutions to erratic market behavior.

This would also help with detecting and finding the cause of herd behavior. Should a few major institutions quickly sell their stocks and retail investors follow suit, the bourse is able to analyze the situation and find out the strength of the correlation, if any, between specific actions and price movements, and carry out specific forecasting and make recommendations.

The Benefits

Thanks to the implementation of Fusionex Big Data Analytics, the client is able to further bolster their revenue. In search for more investors to trade in their market, they would want to encourage new investors by carrying out new marketing activities and awareness campaigns. These campaigns, using data-driven decisions, can be more effective when they determine the interest of different demographic groups based on interactions mined from public sources online.

To ensure the stock market is in a healthy state and comply with regulatory requirements, the client may use data trends to ensure that institutional investors cannot influence the market adversely. This can be achieved by putting in place monitoring KPI which alerts them to unusual movements in particular stocks or industries.

The stability and longevity of the client's trading system can also be detected and maintained with Fusionex BDA. Preventing the trading system from experiencing downtime is imperative to preserving the integrity of, and trust in, the bourse. In order to ensure the core system is up and continues to run optimally, the BDA platform is able to analyze orders per second.

For example, in the morning when the market opens and activity is at a high, the bourse may experience 10,000 orders per second. If it is determined that the trading engine can only support up to 15,000 orders per second, an alert would be sent out should orders per second grow to about 13,000. This prevents a situation where, orders per second reach 17,000 and a breakdown occurs, leaving the client having to source for IT vendors to solve their system breakdown in a very urgent timeframe at a most likely astronomical cost.

Summary

Fusionex Big Data Analytics provided the client with eyes into their own operations, ensuring no stone is left unturned. With smart data management, decision-makers within the organization are able to carry out their tasks with added productivity and efficiency. They were also given a constantly open window to the world where trends, patterns, and correlations to stock prices can be found, giving them the ability to make informed predictions about trading activity.

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