

Big Data Analytics for Financial Risk Management

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TALENT NETWORK



Big Data reporting on key risk elements real time

In the world of Finance, information has always been a decisive factor of production, and success. And, as we know, all information begins with data collection and interpretation. Now, today, the amount of available financial data – which has always been massive – is growing exponentially. Terabytes have turned into Petabytes and then into Exabytes.

The challenge of today is centered around the idea of [applications](#). How can this data best be deployed to change the financial industry in a positive way? Traditional applications, such as remote account access, event logging and reporting, and security are certainly basic blocking and tackling functions in this sector, but what other uses of this giant pool of data, both internally and externally sourced, can be ideated to transform financial markets to increase overall company and client value?

One major opportunity exists in the area of [risk management](#). Among other things, the use of Big Data can be deployed to enhance model creation, which can lead to better risk management strategies. These can significantly impact and influence not only instrument pricing, but fraud detection and prevention, systemic modelling, market exchanges, product customization, and audit and compliance practices, for regulatory requirements.

Labor Force Takeaway

Big Data is similar to classic data processing and management, but differs significantly in three ways; volume, velocity, and variety. The advent of newer data collection and transmission capabilities, most significantly IoT (the internet of Things) and 5G wireless technology, has enabled the capture, transmission, bundling, transmission and reporting of huge amounts of data (volume) data in real time status (velocity), and from multiple data types and sources, such as numbers, alpha, and pictures (variety), thus enabling immediate and significantly impactful reporting, and, ultimately, increased and immediate decision making capabilities for business not previously experienced in history.

The Labor Force accordingly needs to ensure the associates of the future now coming available to fill the positions in the near and long term are both data and reporting literate, in order for business to take full and immediate advantage of the data mining opportunities that can be transformative to their business decision making ability.

CompTIA A+, and Fundamentals certifications, aimed at the IT beginner, are an excellent starting point for associates to gain knowledge in the area. Intermediate associates can delve deeper into the discipline with certifications in Cisco Network Administration (CCNA), CompTia Server+, IBM Certified Specialists credentials, and others like OCA, OCP, VCP, and MCSA. Advanced certifications like MCSE and CCNP prove valuable for associates running a data shop full time, and expert level certifications like ASE/CSE and OCM render associates fully capable of not only gathering, concatenating and interpreting data, but also managing large network installations as well. In-state major universities like NJIT and Rutgers also offer advanced degrees in Big Data Science for intensive practitioners.

Models Used to Anticipate Market Behaviors

Financial risk management is the practice of adding economic value to a firm by using financial instruments to manage risk exposure. This risk comes in several forms such as: operational, credit, market, foreign exchange, shape, volatility and liquidity. Financial risk management requires identifying risk sources, measuring them, and mitigating them.

The methodology for it is fairly straightforward, and has been used by financial managers for many years, to develop **risk mitigation strategies**. There are three basic steps involved in gathering and analyzing data for management purposes:

- Collection of internal data to evaluate instrument attributes, and to determine other usable data sources;
- Collection of external data, to augment attributes for analysis, and;
- Analysis process, to determine market movement potential

Obstacles that impact this analysis process includes, but is not limited to data protection, lack of knowledge, budgetary restrictions, and immature technology. Lack of industrywide standards is also an impediment to cross-institution interactions, which limits external data acquisition, and must be addressed.

Big Data in the financial world includes, but is not limited to, (internally generated) things like customer specific data, financial filings, employee data, and operational data, and also (externally generated) things like regulatory filings, social media, and other competitive bank information.

The use of Big Data for information acquisition and mining will speed up this process exponentially, and allow for real time data management and manipulation, for real time risk management. The following areas are areas where big data can have a considerable impact:

- **Scenario Simulation:** The construction of real life scenarios using real data inputs and potential actions will allow financial institutions to see potential outcomes that can identify possible risks. Risk strategies can then be developed and implemented to offset;
- **Fraud Identification:** Can be conducted faster through the use of Big Data. By taking internal information (account and client info) and comparing to counterpart external data (applications, logs and access attempts) on each account can not only yield number of fraud attempts, but, using geolocation and time of day for establishing origin of fraud attempt, can be used to block and even prevent future attempts;
- **Anticipate Market Exchanges:** Data attributes on instrument pricing, environmental influences, and client profiles can be combined and analyzed for patterns, to see if any intel can be gleaned regarding interbank exchanges. This information can ultimately lead to tighter safeguard development geared to optimize pricing and funds availabilities, in order to better streamline transactions and thereby minimize overall financial institution risk;
- **Product Customization:** Data from client clickstreams and searches, on all products across all financial institutions, can be combined and analyzed to determine optimal product mixes for targeted client base;
- **Systemic Risk Modelling:** Estimating the interrelationships between institutions using Big Data is also key to security and privacy initiatives. By gathering and analyzing data trails from multiple financial institutions, it can be determined which sources are more central to traffic, and therefore are more subject to contamination threats, much like a virus, and finally;
- **Compliance Audit for Risk Assessment:** The use of Big Data is ideal for compliance management. Ongoing regulatory changes and concomitant audit requirements necessitate regular information reviews – the gathering and parsing of this data is fundamental to this mandatory review. Through reporting engines outliers can be easily identified for isolation and treatment. Big Data makes the capture and analysis of these large volumes of client information both manageable and fast.