What are the example data analytics applications in finance?

1. Find at least 10 different applications.
2. For each application, discuss the followings.
   1. The technology
   2. Advantages

Finance is one of the vast domains which utilizes & generates huge amount of data. Here we see how various industries are using data analysis & data science to manage their finances

Finance industry were the earliest users of data analytics. Lets discuss the various applications of Data Science in Finance

1. **Risk Analytics & Management**

Risks originate from competitors, investors, regulators or customers. They differ based on their importance & the impact/loss they incur.

Identifying, prioritizing & monitoring risks are some crucial tasks solved through machine learning.

Risk management measures the frequency of loss & multiplies it with the gravity of damage.

There is a huge amount of data generated by customers, financial lending & insurance. Training on these data help to increase risk scoring models & optimize costs for organizations

Another application of Risk management is to identify the creditworthiness of customers. ML algorithms can analyze customer’s past spending habits & patterns. This is quite useful to understand the credit history of new customers or those with short credit history

Advantages:

* It enables organizations to plan strategies, make decisions, increase company’s security & trustworthiness.
* ML algorithms can generate reports quickly, enables users to evaluate risks in real time & mitigate them while avoiding costly delays
* Create alerts to monitor any anomalies in real time & know when a discrepancy arises. Timely identification of problems can be fixed sooner avoiding extra costs to the organization
* Identify high risk customers & risky deals
* Track real time credit breach

1. **Customer Data Management**

Customer data is called the ‘oil of digital era’ which explains its usefulness in today’s world.

Proper Data collection & management is crucial to ensure that any data breaches are avoided which can have a huge negative impact on an organization & its customers.

Efficient management of data is the key for growth & success of an organization. There is a huge amount of data generated through social media & transactions. This data can be structured or unstructured. The unstructured data is very difficult to process manually & make sense of.

ML techniques have been used to manage these huge volumes of data & extract knowledge from it. NLP, data mining, text analytics help in transforming the data to information which lead to better data governance & business solutions which thereby increase profits.

ML algorithms analyze the impact of any financial trend & changes in the market values by analyzing users’ past financial data.

Advantages

Analysis of customer data through dashboards assist in determining every aspect of the financial operations of an organization like sales, risk rate, transactions. This helps in making conclusions & right decisions.

Customer data & performing segmentation enables analysts to create complex trend profiles, understand their interests & buying patterns.

An organized view of the old & current data makes it easier to make comparisons. It empowers companies to know if they are heading in the right direction, if they are satisfying the objectives that had been preset.

1. **Fraud Detection**

Security of user data is the highest priority for any organization in today’s times. There has always been a need for advanced fraud detection systems as criminals are able to find loopholes & set new traps. Anomaly detection & prevention is possible due to the growth of big data & analytical tools. The detection alerts enable companies to block accounts where fraudulent transaction might have occurred thus minimizing losses.

Machine learning tools can detect unusual patterns in transactional data & trigger alerts. Using clustering algorithms, companies can segregate & cluster suspicious data patterns.

Descriptive analytics, predictive analytics & social network analytics can be applied to Fraud applications like insurance fraud, credit card fraud, anti money laundering, healthcare fraud, retail fraud etc.

Data mining is used to classify, cluster & segment data, find associations & rules in data that signifies fraud patterns

Advantages

Analytical tools enable companies to identify scenarios, track patterns & hidden problems much faster than humans. This is useful for timely action to minimize losses

As data is combined from various sources, fraud analytics simplifies the process of integrating data into a model.

Most fraudulent activities take place within the unstructured data. Text analytics can be useful to review this unstructured data to detect & prevent frauds

1. **Predictive Analytics**

It is the science of using data to find patterns & offers insights to business problems and potential improvement areas. Right from revealing what a customer will buy to how long an employee will last.

Predictive analytics involves statistical modeling, data mining & various other analytical techniques

Predictive models use known results to train/develop models that are used to predict values for a new data. Results are predictions that represent the probability of target variable based on estimated significance of a set of input variables.

Classification models predict class membership. For instance, you try to classify whether someone is likely to leave, whether he’s a good or bad credit risk.

Regression models predict a number – for example, how much revenue a customer will generate over the next year or the number of months before a component will fail on a machine.

Other predictive analytical techniques are decision trees, regression and neural networks

Advantages

* Customer navigation data on a website enable retailers identify the path that leads to sale or abandoned cart. Marketing, sales & customer behavior data enable finance teams to forecast revenue & identify future demand for products.
* In supply chain, leaders use predictive analytics to maximize efficiency by ranking vendors to see who is most vulnerable to fraud, identifying equipment failure, using data from POS systems to make real time forecasts of when & where products are likely to sell out or not.
* Identifying trouble spots or loss points. Identifying customer churning & providing real time information on how to prevent it.
* Detecting potential fraud