**DATA MINING IN FINANCIAL BANKING.**

**INTRODUCTION.**

In the banking sector, data mining techniques are used for a variety of purposes such as identifying potential customers, detecting fraudulent activities, and improving customer service. Banks usually have a large amount of data that is generated from various sources such as customer transactions, loan applications, and credit card usage. Data mining techniques can be used to analyze this data and extract useful information that can be used to improve the bank’s operations. The financial banking is producing huge amounts of data. Analyzing these data, explaining valuable information and helping to make financial decisions are great opportunities and challenges for data mining. The essence of many financial theories is to study how to construct a prediction model which is in line with the reality and minimize the prediction error.

**A: Application of Data Mining in Financial Banking**

* 1. **Customer segmentation and targeted market:**

This is the process of identifying a company’s potential customers, choosing the customers to pursue, and creating value for the targeted customers. It is achieved through the segmentation, targeting, and positioning (STP) process. Knowing the needs of customers is an important part of marketing where financial and banking officers should be simply able to discover the loyalty of customers in this heterogeneity. It is a systematic review of supervised, unsupervised and other data mining techniques used in customer segmentation and targeted market.

* 1. **Cross selling and upselling:**

Both cross-selling and upselling can take place during the initial sale, or further down the track, once the customer relationship has been established. Cross-selling involves additional product recommendations: “If you like this, you might also like this.”. Data mining is crucially in financial banking to analyze customer behavior, preferences, and transaction data to identify opportunities for offering additional products or services.

* 1. **Risk Management and Default Detection:**

Quantifying this risk can make the risk management process easier and limit the risk of financial loss customer

This is illustrated by deny lending the peoples or customers who seems to have low salary income. In turn data mining will be conducted to analyze the customers salary payment details and other financial information so as to prevents risk by prevents bad debtors.

* 1. **Investment Banking:**

Investment is an action of investing money into an asset or item for profit/income. Banks often offer investment services to their customers. There are a vast number of financial instruments in the market. Data mining like K-means clustering can be applied to choose the best investments based on customer’s profile ***(Ingle and Meshram, 2012).*** Capability to predict asset prices (for example stock prices) from historic prices can increase returns from investment tremendously

1. **Challenges facing financial banking sectors: -**

**1. Data Security and Privacy:**

***Challenge****:* The extensive data handled by financial institutions exposes them to heightened risks of cybersecurity threats. Protecting sensitive customer information is paramount.

***How Data Mining Helps****:* Data mining technologies, such as anomaly detection algorithms and pattern recognition, play a pivotal role in fortifying cybersecurity. By identifying unusual patterns indicative of potential security threats, financial institutions can proactively respond, minimizing the impact of cyber-attacks and enhancing overall data security.

**2. Data Quality and Integrity:**

***Challenge*:** Poor data quality can lead to flawed analyses, impacting decision-making processes. Ensuring data quality, management, and integrity is a constant challenge, particularly in the context of big data.

***How Data Mining Helps:*** Data mining techniques, including data cleansing, validation, and normalization, address the challenge of maintaining data quality. By rigorously validating and cleaning data, financial institutions can ensure the accuracy and reliability of analytical outcomes, facilitating more informed decision-making.

**3. Regulatory Compliance:**

***Challenge***: Adhering to various data storage, usage, and sharing regulations is a complex task. The financial sector must navigate a constantly evolving regulatory landscape.

***How Data Mining Helps:*** Data mining technologies contribute to regulatory compliance by automating compliance monitoring systems. Tailored algorithms identify and assess compliance risks, allowing financial institutions to adapt to regulatory changes in real-time and avoid severe penalties associated with non-compliance.

**4. Fraud Detection and Prevention:**

***Challenge*:** The financial sector faces continuous threats of fraud, requiring proactive measures to detect and prevent fraudulent activities.

***How Data Mining Helps:*** Advanced analytics and data mining techniques are instrumental in fraud detection and prevention. By analyzing patterns and anomalies in transaction data, financial institutions can identify potentially fraudulent activities and take immediate preventive actions.