

# Fraud Detection

Comprehensive Approaches to Fraud Prevention

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Sofia Divija Devi

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## Definition of Fraud:

- Intentional deception to secure unfair or unlawful gain.

## Importance of Fraud Detection

- Financial impact on businesses and individuals.
- Maintaining trust and credibility

# Types of Frauds

- **Financial Fraud:** Embezzlement, money laundering, insider trading.
- **Identity Theft:** Phishing, social engineering, account takeover.
- **Corporate Fraud:** Accounting fraud, corruption, asset misappropriation.
- **Cyber Fraud:** Hacking, ransomware, online scams.

## Traditional Methods

- Audits and inspections.
- Manual reviews.

## Technological Methods

- Data Analytics: Pattern recognition, anomaly detection
- Machine Learning: Predictive modeling, supervised/unsupervised learning.
- Artificial Intelligence: Real-time monitoring, adaptive algorithms.

- **Example 1:** E-commerce platform's AI-driven approach to identifying fake accounts and transactions.
- Chat gpt link

- **Descriptive Analytics:** Identifies what happened (e.g., trends, patterns).
- **Diagnostic Analytics:** Determines why it happened (e.g., root cause analysis).
- **Predictive Analytics:** Forecasts future fraudulent activities (e.g., risk scoring).
- **Prescriptive Analytics:** Recommends actions (e.g., fraud prevention strategies).

- **Example 2:** Insurance company's analytics-driven fraud prevention strategies.
- Chat Gpt Link

# Implementing Fraud Detection Systems

- **Data Collection:** Gathering relevant and high-quality data
- **Feature Engineering:** Selecting and transforming data features.
- **Model Training:** Developing and testing models on historical data.
- **Deployment:** Implementing models in live environments.
- **Continuous Monitoring:** Regular updates and performance tracking.



# Challenges in Fraud Detection

- **Data Quality:** Inconsistent, incomplete, or inaccurate data.
- **False Positives/Negatives:** Balancing detection accuracy and minimizing errors.
- **Privacy Concerns:** Ensuring compliance with data protection regulations.

- **Example 3:** Bank's use of machine learning to detect credit card fraud
- Collab Notebook Link

- **Regular Audits:** Frequent checks and balances.
- **Employee Training:** Educating staff on fraud prevention.
- **Advanced Technologies:** Leveraging the latest tools and techniques.
- **Multi-Layered Security:** Combining various methods for robust detection.

- **AI Advancements:** More sophisticated AI algorithms.
- **Blockchain Technology:** Enhancing transparency and security.
- **Biometric Authentication:** Improving identity verification.
- **Regulatory Developments:** Adapting to new laws and regulations.

- Importance and impact of fraud detection.
- Techniques and technologies used.
- Challenges and future directions.

# References

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# Thank You

## Questions?

Backup slides go here

