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CAPSTONE PROJECT

Predicting Employee Financial Behaviour Through Digital Payment Usage Analysis

PRESENTED BY

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OUTLINE:

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References

PROBLEM STATEMENT:

- With the rapid adoption of digital payment platforms such as UPI, mobile wallets, and online banking, employees increasingly rely on digital transactions for financial activities. However, organizations lack analytical systems to evaluate how digital payment behavior reflects an employee's financial stability and management patterns.
- There is a need for a predictive system that can analyze digital payment usage patterns and classify employee financial behaviour as Good or Bad for better financial awareness and decision-making support.

PROPOSED SOLUTION:

- The proposed system uses machine learning techniques to analyze digital payment dataset and predict employee financial behaviour.
- **Key Components:**
- **1. Data Collection**
- Digital transaction behavior dataset
- Spending frequency
- Payment mode usage
- Savings and budgeting indicators
- **2. Data Preprocessing**
- Removal of irrelevant fields (Timestamp)
- Encoding categorical variables
- Target variable transformation (Good vs Bad)
- **3. Machine Learning Model**
- Multinomial Naïve Bayes classifier
- Binary classification (Good = 1, Bad = 0)
- **4. Evaluation**
- Accuracy Score
- ROC-AUC Score
- Confusion Matrix
- Classification Report

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SYSTEM APPROACH:

- **System Requirements**
- Python 3.x
- Jupyter Notebook / VS Code
- CSV Dataset

- **Libraries Used**
- Pandas
- NumPy
- Matplotlib
- Seaborn
- Scikit-learn

- **Workflow**
- Load Dataset
- Clean Data
- Encode Features
- Train-Test Split (Stratified)
- Train Multinomial Naïve Bayes Model
- Evaluate Performance

ALGORITHM & DEPLOYMENT:

- **Algorithm Selection:**
- **Multinomial Naïve Bayes**
- Selected because:
- Suitable for categorical features
- Works well with one-hot encoded data
- Fast and efficient for classification problems

- **Data Input Features:**
- Digital payment frequency
- Online transaction behavior
- Spending categories
- Budgeting indicators

- **Training Process:**
- 80% Training Data
- 20% Testing Data
- Stratified Sampling
- Laplace Smoothing (alpha = 0.5)

- **Prediction Output:**
- 0 → Bad Financial Behaviour
- 1 → Good Financial Behaviour

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RESULT:

- The model successfully classified employee financial behaviour using digital payment data.
- **Evaluation Metrics:**
- Accuracy Score
- ROC-AUC Score
- Precision, Recall, F1-Score
- Confusion Matrix Visualization
- The model demonstrated reliable prediction performance in distinguishing between financially stable and unstable behavioural patterns.

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RESULT:

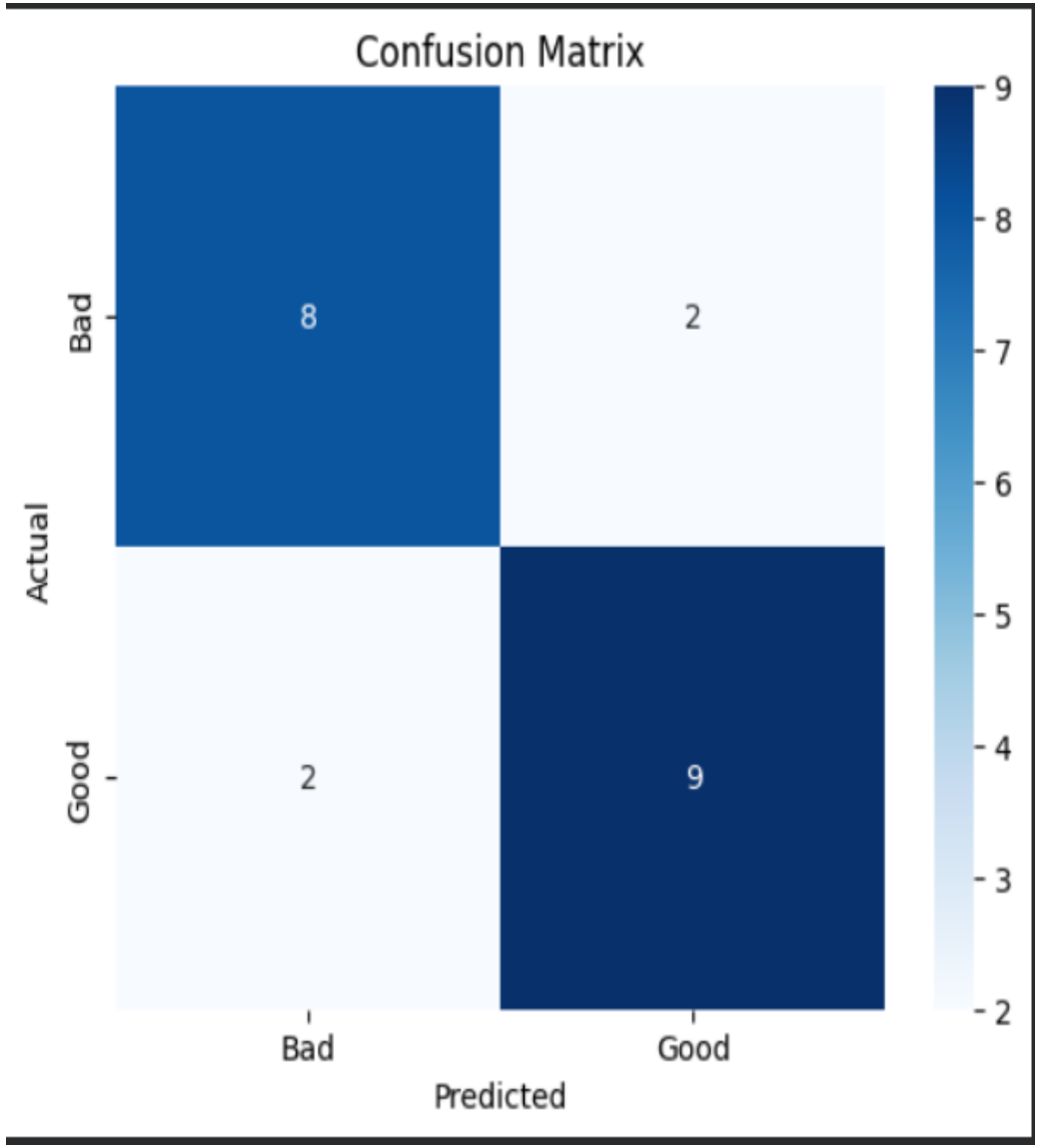
```
Final Model: Multinomial Naïve Bayes (Binary Classification)
Accuracy: 0.8095238095238095
ROC-AUC Score: 0.8272727272727273

Classification Report:

              precision    recall  f1-score   support

           0       0.80      0.80      0.80        10
           1       0.82      0.82      0.82        11

    accuracy                           0.81        21
   macro avg       0.81      0.81      0.81        21
weighted avg       0.81      0.81      0.81        21
```



CONCLUSION:

- The project successfully developed a predictive model to classify employee financial behaviour based on digital payment usage patterns.
- The Multinomial Naïve Bayes algorithm effectively handled categorical financial features and provided accurate classification results.
- This system can assist organizations and financial analysts in understanding behavioural patterns and promoting financial awareness among employees.

FUTURE SCOPE:

- Implement Logistic Regression and Random Forest for performance comparison
- Use larger real-time financial datasets
- Integrate with HR analytics systems
- Deploy as Web Application using Flask or Django
- Develop Financial Risk Scoring Dashboard
- Apply Deep Learning for advanced behaviour prediction

REFERENCES:

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- **Sharma, R., & Patel, K. (2023).** Predicting consumer financial behaviour using machine learning techniques. International Journal of Data Science and Finance.
- **Kumar, S., & Rao, P. (2024).** Digital payment usage classification using supervised learning approaches. Journal of Applied Artificial Intelligence Research.

GitHub Link: Link

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Thank You