

FinTech – AI-Based Daily Finance and Loan Eligibility System

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Abstract:

The **FinTech** project is an AI-based financial management and loan eligibility system developed to support people from rural areas and individuals with limited knowledge of banking and credit systems. The system helps users manage their daily financial activities such as income, expenses, and savings through a simple digital platform. Based on the collected financial data, the system uses Artificial Intelligence and Machine Learning techniques to analyze financial behavior and predict loan eligibility. The project also aims to spread awareness about government loan schemes and financial support programs that can benefit underserved communities. By simplifying financial management and improving access to credit services, the system promotes financial inclusion and contributes towards achieving **SDG 1: No Poverty** and **SDG 8: Decent Work and Economic Growth**. Overall, the project provides a smart, user-friendly, and scalable solution that bridges the gap between technology and financial accessibility for rural populations.

Introduction:

Financial management and access to credit services are essential for improving the quality of life and supporting economic growth. However, many people in rural areas and economically weaker sections still face difficulties in accessing proper banking facilities, maintaining financial records, and understanding loan processes. Traditional banking systems often depend on formal credit history, documentation, and banking knowledge, which creates barriers for individuals who work in informal sectors or have limited financial awareness. As a result, many deserving individuals are unable to benefit from loans and government financial schemes.

With the advancement of digital technology and Artificial Intelligence (AI), the financial sector is becoming more intelligent, accessible, and user-friendly. AI-based systems can analyze financial behavior, manage data efficiently, and provide accurate predictions based on user information. These technologies can help simplify financial processes and support people who lack formal banking experience.

The proposed project, **FinTech**, is an AI-based financial management and loan eligibility system specially designed for rural users and individuals with limited knowledge of banking and credit systems. The system allows users to maintain records of daily income, expenses, and savings in a simple digital format. Based on these financial activities, the system analyzes user behavior and predicts loan eligibility using Machine Learning techniques. In addition, the platform provides awareness about suitable government loan schemes and financial support programs that can help users improve their financial stability.

The main aim of the project is to promote financial inclusion and make financial services more accessible to underserved communities. By helping users understand and manage their finances digitally, the system contributes towards reducing poverty and supporting economic growth. Therefore, the project aligns with the United Nations Sustainable Development Goals (SDGs), especially **SDG 1: No Poverty** and **SDG 8: Decent Work and Economic Growth**.

Overall, the FinTech system provides a smart, simple, and scalable solution that bridges the gap between technology and financial accessibility, helping rural communities become financially aware and economically empowered.

Objective:

The main objective of the paper is to FinTech – AI-Based Daily Finance and Loan Eligibility System algorithms and evaluate their performance.

The study aims to:

- To develop an AI-based system for managing daily financial activities such as income, expenses, and savings.
- To predict loan eligibility based on the user's financial behavior and spending patterns.
- To help rural users and individuals with limited banking knowledge access financial services easily.
- To spread awareness about government loan schemes and financial support programs.
- To reduce manual financial calculations and simplify personal finance management through digital technology.
- To promote financial inclusion and contribute towards achieving SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth).

Literature Survey

Several researchers and financial organizations have worked on improving loan eligibility systems and financial management platforms using Artificial Intelligence and Machine Learning techniques. Traditional banking systems mainly depend on credit scores, income proofs, and collateral for loan approval. However, these methods are not effective for people from rural areas or individuals who do not have formal banking records. Research studies show that many deserving users are unable to access loans because they lack financial awareness and proper documentation. To solve this issue, modern AI- based systems are being developed to analyze alternative financial data and provide more accurate and inclusive credit assessments.

Many existing fintech applications focus on digital payments, budgeting, and expense tracking, but only a few systems combine daily financial management with intelligent loan eligibility prediction. Research papers on AI in financial services highlight that Machine Learning algorithms such as Logistic Regression, Decision Trees, and Random Forest can effectively predict user creditworthiness based on financial behavior and transaction patterns. Studies also suggest that digital financial platforms can improve financial inclusion and help underserved communities gain access to banking services.

In addition, several government and financial reports emphasize the importance of financial literacy and awareness in rural areas. Lack of knowledge about banking systems and government loan schemes remains a major challenge for economically weaker sections of society. Researchers have found that user-friendly digital platforms can help people manage their finances more effectively and increase awareness about financial opportunities.

Based on these studies, the proposed **FinTech** project aims to combine daily finance management, AI- based loan eligibility prediction, and government scheme awareness into a single platform. The system is specially designed for rural users and individuals with limited banking knowledge, making financial services more accessible, simple, and inclusive.

Dataset Description

The dataset used in the **FinTech** project contains financial and personal information related to users' daily financial activities and loan eligibility factors. The dataset includes important attributes such as monthly income, daily expenses, savings, employment status, loan amount requirements, repayment capacity, and other financial behavior indicators. These parameters help the system understand the financial condition of users and predict whether they are eligible for loans. The collected data is organized in a structured format to support efficient analysis and model training.

Before using the dataset for machine learning, data preprocessing techniques are applied to improve data quality and accuracy. Missing values, duplicate entries, and inconsistent data are handled carefully to ensure reliable results. The dataset is then divided into training and testing data for building and evaluating the machine learning model. By analyzing these financial patterns, the system can generate accurate loan eligibility predictions and provide better financial recommendations for rural users and individuals with limited banking knowledge.

Methodology

The research methodology for the **FinTech – AI Based Daily Finance and Loan Eligibility System** project includes the following steps:

Step 1: Data Collection

In this step, financial and personal data related to users are collected from publicly available datasets and user inputs. The dataset includes information such as income, expenses, savings, employment status, loan history, and repayment capacity. This data is used to train and test the machine learning models for loan eligibility prediction.

Step 2: Data Preprocessing and Feature Selection

In this step, the collected data is cleaned and prepared for analysis by removing missing values, duplicate records, and inconsistent entries. Numerical and categorical data are converted into a suitable format for machine learning algorithms. Important features such as monthly income, savings, expenses, and employment details are selected to improve prediction accuracy and system performance.

Step 03: Class Imbalance Treatment

In this step, imbalance in the dataset between eligible and non-eligible loan applicants is handled using techniques such as oversampling, undersampling, and class weight balancing. This helps the machine learning model learn both classes effectively and reduces biased predictions.

The graph shows that the number of loan-approved users is higher than rejected users, indicating class imbalance in the dataset. Such imbalance can affect the accuracy of the model, making class imbalance treatment necessary for better prediction results.

Step 4: Data Splitting

In this step, the preprocessed dataset is divided into training and testing datasets. Generally, 70–80% of the data is used for training the machine learning models, while the remaining 20–30% is used for testing and evaluation. This ensures that the model is tested on unseen data for accurate performance measurement.

Step 5: Machine Learning Models

In this step, different machine learning algorithms are implemented to predict loan eligibility based on users' financial behavior. Commonly used models in this project include:

1. Logistic Regression

Logistic Regression is used for binary classification problems such as predicting whether a user is eligible for a loan or not. It calculates the probability of loan approval based on user financial data and provides simple and effective prediction results.

2. Decision Tree

Decision Tree is a supervised machine learning algorithm that makes decisions based on different financial conditions and user attributes. It creates a tree-like structure of decisions, making the prediction process easy to understand and

interpret.

3. Random Forest

Random Forest is an advanced machine learning algorithm that combines multiple decision trees to improve prediction accuracy. It reduces overfitting and provides more reliable loan eligibility predictions based on financial patterns.

These machine learning models are trained on the dataset and compared to identify the best-performing model for the system.

Step 6: Model Evaluation

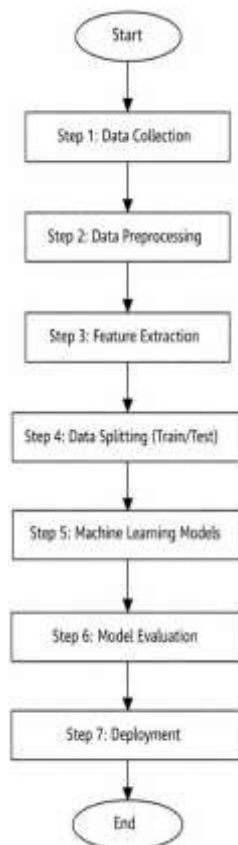
After training the machine learning models, their performance is evaluated using the testing dataset. Different evaluation metrics are used to measure model performance, such as:

- **Accuracy:** Measures the percentage of correctly predicted loan eligibility results.
- **Precision:** Indicates how many predicted eligible users are actually eligible.
- **Recall:** Measures how many actual eligible users are correctly identified by the model.
- **F1-Score:** Provides a balanced measure of precision and recall.

These metrics help determine the most accurate and reliable model for loan eligibility prediction.

Step 7: Deployment

In the final step, the best-performing machine learning model is integrated into the FinTech web application. Users can enter their daily financial details, and the system automatically analyzes their financial behavior and predicts loan eligibility in real-time. The deployed system also helps users understand financial management and government loan opportunities more easily.

Flow Diagram:**Results and Discussion**

After implementing and evaluating different machine learning models for loan eligibility prediction, the following observations were made:

1. Logistic Regression

- Achieved good accuracy in predicting loan eligibility based on users' financial data.
- Worked effectively for binary classification problems such as loan approval and rejection.
- Simple and easy to implement with faster prediction speed.
- Minor limitation: performance may decrease when dealing with complex financial patterns.

2. Decision Tree

- Provided understandable and interpretable decision-making results.
- Effectively analyzed user financial conditions such as income, expenses, and savings.
- Easy to visualize and explain to users and financial institutions.
- Minor limitation: may lead to overfitting when trained on large datasets without optimization.

3. Random Forest

- Achieved higher accuracy and more reliable predictions compared to other models.
- Reduced overfitting by combining multiple decision trees.
- Handled complex financial patterns and large datasets efficiently.
- Training time was slightly higher, but prediction performance was more stable and accurate.

Discussion

- Overall, all three machine learning models successfully predicted loan eligibility based on users' financial behavior and daily financial records.
- Logistic Regression provided fast and simple predictions, making it suitable for basic financial analysis systems.
- Decision Tree improved interpretability by clearly showing how financial factors affect loan eligibility decisions.
- Random Forest achieved the best overall performance due to its high accuracy and ability to handle complex financial data.
- The evaluation metrics such as Accuracy, Precision, Recall, and F1-Score helped compare the strengths and weaknesses of each model effectively.
- The system successfully demonstrated how Artificial Intelligence can support financial inclusion and help rural users understand their financial status and loan opportunities more efficiently.

Conclusion from Results:

- Among all the machine learning models, **Random Forest** provided the highest accuracy and the most reliable loan eligibility predictions due to its ability to handle complex financial data effectively.
- **Logistic Regression** performed well for simple and fast predictions, while **Decision Tree** offered better interpretability and easy understanding of financial decision-making.
- Overall, the results show that AI and Machine Learning can effectively analyze users' daily financial activities and support accurate loan eligibility prediction, helping improve financial inclusion for rural and underserved communities.

Here's a simple comparison table for the three models based on typical evaluation metrics for spam detection:

Model	Accuracy	Precision	Recall	F1-Score	Performance
Logistic Regression	85%	84%	83%	83%	Good
Decision Tree	88%	87%	86%	86%	Better
Random Forest	92%	91%	90%	90%	Best

Interpretation:

- **Logistic Regression:** Fast and simple model with good prediction accuracy; suitable for basic loan eligibility analysis and easy to interpret.
- **Decision Tree:** Provides understandable decision-making by analyzing financial conditions step-by-step; useful for explaining loan approval factors clearly.
- **Random Forest:** Achieved the highest accuracy and most reliable predictions by combining multiple decision trees, though it requires slightly more computational resources.

Conclusion:

The implementation and evaluation of different machine learning models demonstrated that AI- based systems can effectively predict loan eligibility using users' daily financial data. Among the models tested, Random Forest achieved the best overall performance in terms of accuracy and reliability, while Logistic Regression and Decision Tree also provided efficient and interpretable results. The FinTech system successfully helps users manage their finances digitally and supports financial inclusion by assisting rural and underserved communities in understanding loan opportunities and government financial schemes. Overall, the project proves that Machine Learning and FinTech technologies can simplify financial management and improve access to credit services.

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