SYNOPSIS

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Project Title: Identifying Risk through Customer Transaction: XGBoost Technique in Supply Chain Finance

Name of the Guide: R. Saravanan, Assistant Professor 1, School of Computing

Abstract:

SCF is a type of supplier finance that enables the supplier to serve their receivables earlier than the actual payment date, thereby freeing up its working capital and also benefits the buyer as the buyer can obtain short-term credit at a lesser cost. Delayed payments by buyers pose a significant threat to supply chain stability. Thus, identifying potential supplier liquidity is crucial. This work addresses this issue by developing a finance risk prediction model using XG Boost and examining customer transaction behavior. The single and hybrid models are constructed for a comparative analysis of their performance using ROC, area under the ROC curve (AUC), and F1-Score. Feature importance and partial dependence plots (PDPs) are applied to interpret the model's predictions. The model's effectiveness and accessibility are further explored by a web-based tool, enabling users to directly interact with the model and obtain personalized risk predictions. The single models to be implemented are XG Boost, Random Forest (RF), Gradient Boosting Decision Tree (GBDT), and Light GBM. Hybrid models are made by combining these single models with Linear Regression (LR). Among all the above-mentioned models, the XG Boost model demonstrates superior performance, effectively predicting potential risks and uplifting managerial payment practices. This clear understanding is revolutionizing risk management strategies and fostering more robust supply chains. This study opens new paths for future exploration of practical models for financial risk assessment within SCF.

Specific Contribution:

- Data Pre-processing, Single models like XGBoost, GBDT, LightGBM, Random Forest and Analysis over various Risk Proportions.

Specific Learning:

- Learnt how to pre-process data in several methods, parameter tuning for single models and analysis over different proportions of target variable.

Keywords: *Supply chain stability, Delayed Payment, Buyer transaction behavior, Financial risk prediction, XGBoost model.*

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