II. LITERATURE REVIEW

Prior to this study, we conducted a detailed review of the existing literature on the use of machine learning models to analyze and predict financial data. Early research has shown that machine learning techniques can efficiently process and analyze complex financial data sets to improve the accuracy of decisions and the efficiency of operations. For example, algorithms such as random forests and support vector machines have been widely used in areas such as credit scoring, fraud detection, and market trend prediction. Studies have shown that these models can capture complex patterns in trading data and predict future trading behavior and trends [1]. In addition, regarding the processing and forecasting methods of transaction data, various approaches have been adopted to ensure the integrity and accuracy of the data. For example, one study describes the use of data interpolation and anomaly detection methods to clean up financial transaction data, which is essential for subsequent analysis and prediction [2]. In terms of transaction amount prediction, deep learning models such as multi-layer perceptrons (MLPS) have received special attention due to their efficiency in dealing with nonlinear relationships. These models have been successfully applied to predict stock prices and trading volumes, showing better performance than traditional statistical methods [3]. Finally, regarding the recommendation system based on user consumption behavior, there have been many successful cases in the literature. These systems often combine cluster analysis and classification algorithms to identify different groups of consumers and provide personalized product recommendations based on their purchase history and behavior patterns [4][5]. This not only enhances the customer's consumption experience, but also significantly improves the sales efficiency and user loyalty of merchants.

在进行本研究之前，我们对已有的使用机器学习模型来分析和预测金融数据的文献进行了详细的回顾。早期研究表明，机器学习技术能够有效地处理和分析复杂的金融数据集，以提高决策的准确性和操作的效率。例如，随机森林和支持向量机等算法已被广泛应用于信用评分、欺诈检测和市场趋势预测等领域。研究显示这些模型能够捕捉交易数据中的复杂模式，并预测未来的交易行为和趋势[1]。此外，关于交易数据的处理和预测方法，已有研究采用了各种方法来确保数据的完整性和准确性。例如，一项研究介绍了使用数据插值和异常检测方法来清理金融交易数据，这对于后续的分析和预测至关重要[2]。在交易金额预测方面，多层感知机（MLP）等深度学习模型因其在处理非线性关系中的高效性而被特别关注。这些模型已成功应用于预测股票价格和交易量，表现出优于传统统计方法的性能[3]。最后，关于基于用户消费行为的推荐系统，文献中已经有了多个成功的案例。这些系统通常结合了聚类分析和分类算法来识别不同的消费者群体，并根据他们的购买历史和行为模式提供个性化的产品推荐[4][5]。这不仅增强了客户的消费体验，也显著提升了商家的销售效率和用户忠诚度。