II. LITERATURE REVIEW

At the beginning of the study, we reviewed the previous literature on the use of machine learning techniques in banking. Previous studies have shown that complex and variable financial data sets can be well processed and analyzed using machine learning techniques. 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. Some studies have shown that these models can identify trends in trading data to predict future trading behavior. In addition, for real-world transaction data, the pre-processing step before analysis is very important. Various approaches have been used to ensure data integrity and accuracy, such as one study that describes the use of data interpolation and anomaly detection methods to clean up financial transaction data.

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.

在研究开始初期，我们对先前的在银行业使用机器学习技术的文献进行了回顾。之前的研究表明，对于复杂多变的金融数据集，使用机器学习技术可以很好的处理并分析。比如，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。一些研究显示这些模型可以识别交易数据中的趋势，以此预测未来的交易行为。此外，针对真实世界中的交易数据，在分析前的预处理步骤非常重要。目前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。

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。