


# Chapter 2

## Forecasting UPI Transaction Value in India:


### A Machine Learning Regression Approach to Customer– Initiated Payments

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#### **ABSTRACT**

*The Unified Payment Interface (UPI) has revolutionized the landscape of digital payment in India by facilitating seamless real-time transactions across multiple banks and financial institutions. This study investigates the impact of customer-initiated transactions and total transactions value in India's UPI ecosystem using machine learning regression.*

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*learning regression model. The study utilizes data set of 1811 (n) obtained from the NPCI website. For the analysis of the data received researcher adopted comparison of Linear Regression, Random Forest (RF), XGBoost algorithm to predict total transaction value-based customer-initiated transactions. The finding reveals that RF model achieves the significant as compare to the other models in terms of R2, RMSE, and MAE. The study contributes to the understanding of digital payment ecosystem that provide empirical evidence for the effective UPI retail sales growth of ensemble learning models in financial transaction predictions.*

## **INTRODUCTION**

The Unified Payment Interface (UPI) has revolutionized India's digital payment landscape by facilitating seamless and real time transaction across multiple banks and Financial Institutions. Indeed, the launch of UPI, a digital platform system by the National Payment Corporation (NPCI) by the government of India in the year 2016, has boosted significantly digital transaction between people to people / peer to peer (P2P), and customer to business (P2B) specially in retail sector (TET 2024; EPC 2024). With the exponential growth in transaction volumes and values it is required to understand the predictive relationship between the various transaction parameter (TET 2024). The understanding of this (UPI) exponential growth in the digital payments, is very vital for the academicians and practitioner. In fact, the use of UPI platforms as significantly impact the economy by bridging the digital divide (Patra & Sethi, 2023; Patnaik, 2019).

The digital payment ecosystem generated vast amount of transactional data which consists of valuable insight on the consumer behaviour, market Trends, and ecosystem performance. The ability to understand accurately and predict total transaction value based on the customer-initiated parameters can facilitate and support to make informed strategic decision. This studying of the UPI transaction behaviour helps to make better risk management decisions and resource allocation in financial technology firms (FinTech). The consumer behaviour is dynamic in nature (Kotler et al., 2014) and influenced by the payment behaviour of individual is nudged on prevailing ecosystem and subtleties of Economy. Understanding of dynamics and facets the digital transaction has become very crucial for financial institution, policy makers and Fintech companies to make strategic decisions.

The financial ecosystem prevailing in developing Nations such as in Indian subcontinent is important and with high volatility. It includes demographic features, technological advancement, digital infrastructure, and regulation imposed by the government agencies (Heji et al., 2024; Thapliyal et al., 2025) . On the prominent payment system in the developing economy is digital wallet which is based on the

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