

Chapter 9

The Future of Personal Finance: Artificial Intelligence, Machine Learning, and Big Data

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ABSTRACT

The rise of Artificial Intelligence, Machine Learning, and Big Data has resulted in a revolutionary shift in personal finance. The technologies leading this revolution have the potential to redefine financial strategies, bringing about a new era of accurate decision-making and well-informed decisions. Amid an ever-expanding landscape of data generation and consumption, individuals increasingly seek innovative methods to efficiently manage their finances. These technologies have emerged as powerful tools, providing exceptional capabilities for data forecasting, analysis, and decision-making. The primary emphasis of the paper is to comprehend how these technologies are set to revolutionize personal finance by allowing individuals to make more informed financial decisions, optimize investments, and diminish risks. It adds to the academic literature by synthesizing existing knowledge and provides individuals with helpful recommendations on finances using these technologies. Financial institutions can learn how to enhance customer experiences, streamline operations, and improve security.

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1. INTRODUCTION

Personal finance involves managing an individual's or a household's financial resources to achieve specific financial objectives and maintain financial stability. This includes various aspects such as budgeting, saving, investing, and making wise financial decisions, covering all facets of an individual's financial life, including earning and spending money, as well as planning for retirement and managing debt (Garman & Forgue, 2014). However, personal finance demands critical skills and knowledge to handle financial resources responsibly. Traditionally, consumers lack ample knowledge about financial concepts and resources necessary to make decisions that are best for their financial well-being (Hwang & Park, 2023). In recent research, Xiao and Porto (2022) asserted that consumer financial choices have an impact on a person's or family's current financial well-being and capacity to save for long-term objectives like home ownership, pursuing higher education, or funding retirement (Xiao & Porto, 2022). Additionally, as seen by the economic crisis series, consumer actions significantly impact the nation's overall economic health (Hira, 2009). Therefore, personal finance is the area where ample financial literacy and innovative methods are required to ensure well-being.

Before the growth of the internet and digital technology, personal finance management mainly depended on manual processes and physical interactions. People used to record financial transactions by hand, conducted paper-based transactions, and managed finances through direct, face-to-face dealings with banks and financial institutions (Zhu et al., 2016). For example, before the advent of digital tools and apps, individuals tracked their earnings, expenses, and account balances using physical ledgers, checkbooks, and paper statements. Moreover, access to financial news, interest rates, and stock prices was limited to specific platforms, leaving investors with less real-time information (Wen et al., 2023). Investment options, tax management, transactions, statements, and banking affairs also required labor-intensive manual processes that demanded in-person efforts.

However, in an era of constant technological advancements, personal finance is experiencing a fundamental shift (Prete, 2022). Today, the future of personal finance is closely linked to Artificial Intelligence (AI), Machine Learning, and Big Data. AI assists automated decision-making and personalized financial insights by simulating human cognitive functions. On the other hand, machine learning boosts predictive analytics by identifying complex patterns and continuously improving financial forecasting models. Simultaneously, big data permits the processing and analysis of vast and diverse financial datasets that ultimately elevates risk assessment, fraud detection, and customer-centric financial strategies. Financial management has been transformed by integrating these technologies as they have enhanced efficiency, accessibility, and accuracy, thereby reshaping the landscape of modern finance.

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