Chapter 1
AI-Driven Product Recommendation Systems for Participation Banking Enhancing Customer Engagement Within Islamic Finance Principles

Pelin Nazlı Ezber
Turkish Airlines, Turkey

Ersin Namli
https://orcid.org/0000-0001-5980-9152
Istanbul University-Cerrahpasa, Turkey

ABSTRACT

ABSTRACT This study explores the application of artificial intelligence (AI) in participation banking to enhance customer engagement and satisfaction through targeted product recommendations, aligned with the principles of Islamic finance. A random sample of CRM data was analyzed using clustering through the K-Means algorithm, followed by association analysis with the FP Growth algorithm.. This model enables participation banks to provide

DOI: 10.4018/979-8-3693-8079-6.ch001

personalized, compliant product recommendations that increase customer activity and loyalty. Results indicate that machine learning techniques can offer valuable insights into customer behavior patterns, allowing banks to enhance their service offerings while adhering to Islamic finance principles. By supporting customer-centered service delivery, this AI-driven approach contributes to sustainable growth within the participation banking sector.

INTRODUCTION

Participation banking emerged to meet the needs of individuals and businesses seeking interest-free financial solutions, providing an alternative for savers who want to avoid interest-based systems and for business owners seeking ethical financing options. This sector has not only integrated idle resources into the economy but has also expanded banking's scope by diversifying fund collection and distribution through innovative, compliant products. Unlike conventional banks, participation banks operate under stricter limitations due to adherence to Islamic principles. The Participation Banks Association of Turkey and the International Islamic Financial Market (IIFM) establish and publish standardized agreements on Islamic financial instruments, guiding these operations and emphasizing ethical compliance. However, within these frameworks, customer acquisition remains a significant challenge.

Despite extensive customer-focused efforts within bank departments, machine learning offers a powerful and efficient means to enhance prediction and recommendation capabilities, achieving highly accurate outcomes. Machine learning, a branch of artificial intelligence, uses data and algorithms to replicate human learning processes, enabling patterns in customer behavior to be captured and analyzed for future predictions. Maintaining customer engagement requires delivering tailored product recommendations aligned with customer needs, which machine learning facilitates effectively.

This study applies the K-Means clustering algorithm followed by FP Growth association analysis on randomized CRM data in RapidMiner. This approach aims to keep customers active by offering optimized product recommendations within the context of participation banking, contributing to customer satisfaction and loyalty through advanced, AI-supported personalization.