

Chapter 13

Explainable AI, Federated Learning, and AI Ethics in E-Commerce

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ABSTRACT

E-commerce data security is influenced by the three elements; Explainable AI (XAI), Federated Learning, and Artificial Intelligence (AI) Ethics. The objective of Explainable AI is to enhance the transparency of AI systems and their explainability to promote human oversight and foster confidence. Federated Learning (FL) provides a decentralized approach by training Machine Learning (ML) models to secure user data confidentiality and privacy. Instead of exchanging local data, model constraints from local ML models are pooled and shared as a method of collaborative learning among devices and organizations. The bias, fairness, and the effects on society are a few moral issues surrounding the use of AI covered in AI Ethics. It discusses moral regulations, guidelines, and policies that support the development and application of moral AI. This chapter aims to give insight into the technological and ethical aspects of AI advances concerning AI-ML for data security in E-Commerce, with a

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focus on the importance of privacy, accountability, and transparency in AI systems.

1. INTRODUCTION

AI requires human intelligence like decision-making, language understanding, and problem-solving to carry out tasks via computer programs. In E-commerce, AI means using sophisticated algorithms and ML techniques to collect and analyse data, and gain insights. It automates a lot of the steps involved in online buying. E-commerce companies are now widely using AI technologies in an attempt to increase profitability and productivity. These technologies enable businesses to automate product searches, customize recommendations for clients, and improve pricing tactics. Businesses enhance their marketing campaigns and make them more successful and targeted by utilizing these technologies. AI's implementation in E-commerce raises many moral, ethical, and regulatory issues that must be addressed to guarantee that the positive effects of AI can be achieved without breaching consumer rights or endangering individuals. These challenges need to be handled with caution (Ikhtiyorov, 2023).

Since AI initially emerged, the E-commerce industry has encountered several concerns. These concerns have to do with the moral adoption and use of AI, especially in light of privacy issues. In addition to dilemmas regarding ethics, the E-Commerce industry additionally encounters issues with internet fraud (Saluja, 2024 & Saluja et al. 2022), privacy, and the lack of a cybercrime control structure. Data leak prevention and other privacy-controlling measures (Almuraqab et al., 2023) must be implemented to guarantee the ethical application of AI in E-Commerce. Figure 1 represents the Factors such as Political, Social, Economic, and Technological Issues that influence the development and growth of E-Commerce. In industries including finance, banking, and E-Commerce, this chapter explores at the principles, challenges, and applications of federated learning and XAI for securing data.

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