Chapter 3
AI and Machine Learning Applications for Preserving Privacy and Data Leakage of E-Commerce Data

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ABSTRACT

The e-commerce industry has been expanding at an exponential rate, evolving and adapting even during times of national lockdowns and worldwide pandemics. In a relatively short period of time, the Indian e-commerce ecosystem has grown to be vital to both the country's internet users and economy. The e-commerce industry

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has also seen a rise in cyberattacks. These attacks frequently result in data leaks that compromise data integrity, violate customers' rights and privacy, and foster mistrust between online retailers and their clientele. The roots of e-commerce security problems are highlighted in this paper, along with the potential benefits of several cutting-edge technologies including machine learning (ML) and artificial intelligence (AI) in reducing security risks. To increase e-commerce security, the study suggested a number of methods, including as data encryption, secure payment gateways, multi-factor authentication (MFA), regular software updates and patches, user privacy policies, and compliance.

1. INTRODUCTION

Technology has a huge impact on our daily lives, and one of the biggest ones is seen in the way business is done these days. Electronic commerce, or "e-commerce," became a game-changer with the introduction of the internet. The term "e-commerce" refers to the exchange of products and services via the internet, which has drastically changed the nature of trade and business. With the commercial opening of the Internet in the 1990s, the idea gathered momentum and ushered in a new age for retailers. Leading companies such as Amazon pioneered the creation of online marketplaces that enabled customers to buy a variety of goods directly from the internet. The emergence of e-commerce platforms gave companies a new avenue to connect with customers and began to level the playing field between long-standing retail behemoths and up-and-coming online-only businesses (Saeed, 2023).

E-commerce has a revolutionary impact on conventional brick-and-mortar merchants in addition to helping online-only businesses. In order to sell their products and services, many physical stores opened online platforms in response to the growing digital market. With the help of this hybrid model, businesses were able to preserve their physical locations while increasing revenues and their consumer base. A more flexible purchasing experience might be provided by brick and mortar retailers by combining online and physical sales channels. To combine the usage of online shopping and tactile experience of retail store, consumer may purchase product online and choose its delivery method of whether it is hand over at their door or picked up from a nearest store (Khullar et al., 2023). Some of the mandatory security aspects required for e-commerce data generated during each phase is shown in Figure 1.

Artificial Intelligence (AI) in e-commerce has a major impact on the various modules of online shopping by offering creative solutions for the customers and businesses. Personal and individual user interface is one of the most commonly used case of AI (S. Singh et al., 2023). Artificial intelligence (AI) algorithms are used to provide highly customized product listing for each user by analysing various data

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