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The efficiency of current regulations to protect consumers from adopting AI in e-commerce in Saudi Arabia

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Abstract:

This study examines the effectiveness of Saudi regulations in protecting consumers from risks linked to artificial intelligence (AI) in e-commerce. It analyzes existing legal and regulatory frameworks, highlights gaps in consumer protection, and evaluates mechanisms for data security and dispute resolution. Findings reveal shortcomings in current laws, weak enforcement capacities, and limited consumer awareness. The study recommends updating regulations, strengthening data protection measures, enhancing transparency in AI use, and adopting best international practices to align with Vision.

The study includes two main sections. The first section addressed the conceptual and regulatory framework for AI and e-commerce, where basic concepts were defined, the legal and regulatory framework in Saudi Arabia was reviewed, the

risks and challenges associated with the use of AI in this field were identified, and best international practices were reviewed. The second section focused on analyzing the efficiency of current regulations in protecting consumers, by evaluating the extent to which the regulations cover risks, studying available consumer protection mechanisms, analyzing data protection issues, and conducting a case study of the application of AI in e-commerce in Saudi Arabia.

The study concluded that there are gaps in the current legal texts and their inadequacy in dealing with the risks arising from the use of AI, in addition to shortcomings in some consumer protection mechanisms, and challenges facing consumers in protecting their personal data in light of these developments. Based on these findings, the study recommended the need to update and develop the legal and regulatory framework, including amending some existing legal texts, and enacting new legislation to regulate the use of AI in e-commerce.

Keywords: Artificial Intelligence, E-commerce, Consumer Protection, Legal Systems, Personal Data, Legal Responsibility, Algorithms, Saudi Arabia.

Introduction:

The world is witnessing an unprecedented digital transformation, driven by rapid developments in the field of technology, most notably artificial intelligence (AI) technologies. This development has brought about radical transformations in various aspects of life, including the e-commerce sector, which has become increasingly dependent on AI applications to improve the user experience and enhance operational efficiency. These technologies, ranging from smart chatbots to advanced recommendation systems and big data analysis, have become an integral part of online business operations, providing consumers with wider choices and more seamless and interactive shopping experiences (Nassar, 2023).

However, this rapid technological development is not without challenges and risks, especially with regard to consumer protection. With the increasing reliance on AI in e-commerce, serious concerns are emerging about the privacy and security of personal data, the possibility of discrimination and bias in the algorithms used, the possibility of manipulation and deception through smart marketing techniques, and the challenges related to legal responsibility in the event of damage resulting from AI applications (Ahmed, 2024). These new risks require a careful evaluation of the existing legal and regulatory systems, and ensuring their adequacy in providing the necessary protection for consumers in this changing digital space.

This issue is of particular importance in Saudi Arabia, which is witnessing significant growth in the e-commerce sector, and an increasing adoption of AI technologies in various sectors. In light of the Kingdom's Vision 2030, which aims to enhance digital transformation and diversify the economy, it is necessary to assess the effectiveness of the current legal and regulatory framework in dealing with these technological developments, and to verify the adequacy of existing legal

texts to protect consumer rights in this new context. It also requires identifying legal and regulatory gaps that may impede this protection, and proposing recommendations and best practices to enhance consumer protection in this vital area (Ghadaouia & Slimane, 2018).

It has become clear that traditional consumer protection regulations may not be sufficient to deal with the unique challenges posed by AI in e-commerce. Complex algorithms, big data, and automated decisions made by these systems require a new and comprehensive approach to consumer protection, taking into account the nature of these technologies and their potential impacts on consumer rights. This requires a deep understanding of the nature of AI, a careful assessment of the risks associated with it, and continuous development of legal and regulatory systems to keep pace with these rapid developments (Gharbi, 2020; Al-Salamat, 2018).

Based on the above, this study seeks to assess the efficiency of current regulations in Saudi Arabia in protecting consumers from the risks and challenges associated with the adoption of AI in the e-commerce sector. The study aims to analyze the current legal and regulatory framework, identify gaps that may impede consumer protection, and propose recommendations and best practices to enhance this protection in this vital and growing area. This study comes in light of the urgent need to develop consumer protection regulations that keep pace with rapid technological developments and ensure consumer rights in the digital age.

Research Problem:

In light of the aforementioned rapid developments in the field of artificial intelligence and its increasing impacts on the e-commerce sector, and the accompanying challenges and risks that threaten consumer rights, there is an urgent need to assess the effectiveness of the current legal and regulatory systems in Saudi Arabia in providing the necessary protection for consumers in this new context. The research problem is embodied in the following main question:

To what extent are the current legal and regulatory systems in Saudi Arabia efficient and effective in protecting consumers from the risks and challenges associated with the adoption of artificial intelligence in the e-commerce sector?

The main question is further divided into a set of sub-questions that the study seeks to answer, which are:

1. What is the current legal and regulatory framework governing e-commerce in Saudi Arabia, and how comprehensive is this framework in dealing with AI applications and their associated challenges?
2. What are the main risks and challenges facing consumers as a result of the use of AI in e-commerce, and how do these risks affect their rights?
3. What are the legal and regulatory gaps currently existing in the Kingdom that impede consumer protection from the risks of AI in e-commerce?

4. What consumer protection mechanisms are currently available in Saudi Arabia, and how efficient and effective are they in dealing with complaints and disputes arising from the use of AI in e-commerce?
5. How are personal data protection issues for consumers handled in light of the use of AI in e-commerce, and how confident are consumers in the current systems and their ability to protect their data?
6. What are the best practices and international experiences in regulating AI in the e-commerce sector, and how can they be utilized in the Saudi context?
7. What recommendations and proposals can be made to develop the current legal and regulatory systems in Saudi Arabia, to ensure better protection for consumers in light of the use of AI in e-commerce?

Objectives of the Study:

This study primarily aims to evaluate the effectiveness of current systems in Saudi Arabia in protecting consumers from the risks and challenges associated with the adoption of AI in the e-commerce sector. To achieve this main goal, the study also seeks to achieve the following sub-objectives:

1. Review and analyze the current legal and regulatory framework governing e-commerce in Saudi Arabia, and determine the extent to which this framework is comprehensive in dealing with AI applications and their associated challenges, including identifying responsible government agencies and their roles.
2. Identify the main risks and challenges facing consumers as a result of the use of AI in e-commerce, and analyze how these risks affect their rights, including risks related to data privacy, algorithmic discrimination, manipulation, and legal liability.
3. Identify the legal and regulatory gaps currently existing in the Kingdom that impede consumer protection from the risks of AI in e-commerce, and propose solutions to address these gaps.
4. Evaluate the consumer protection mechanisms currently available in Saudi Arabia, and determine their efficiency and effectiveness in dealing with complaints and disputes arising from the use of AI in e-commerce, and analyze the ease of access for consumers to these mechanisms.
5. Analyze personal data protection issues for consumers in light of the use of AI in e-commerce, and assess the level of consumer confidence in current systems and their ability to protect their data from misuse.
6. Review and analyze best practices and international experiences in regulating AI in the e-commerce sector, and identify lessons learned that can be applied in the Saudi context to enhance consumer protection.
7. Provide practical recommendations and proposals for developing the current legal and regulatory systems in Saudi Arabia, to ensure better protection for

consumers in light of the use of AI in e-commerce, and to guide future research in this field.

Significance of the Study:

This study is of great importance due to the rapid developments in the field of AI and its increasing impact on the e-commerce sector, and the resulting challenges and risks that threaten consumer rights. The importance of this study is manifested in the following points:

1. This study comes at a time when the world is witnessing an unprecedented digital transformation, driven by AI, which makes it necessary to assess the extent to which current legal and regulatory systems can keep pace with these developments and provide the necessary protection for consumers in this changing digital space.
2. This study contributes to highlighting the risks and challenges facing consumers as a result of the use of AI in e-commerce, including the risks related to data privacy, algorithmic discrimination, manipulation, and legal liability. It also aims to propose solutions to enhance the protection of consumer rights in this context.
3. This study contributes to identifying the legal and regulatory gaps currently existing in Saudi Arabia that impede consumer protection from the risks of AI in e-commerce, and to providing practical recommendations for developing this framework to ensure better protection for consumers.
4. By evaluating the effectiveness of available consumer protection mechanisms and analyzing personal data protection issues, this study aims to enhance consumer confidence in e-commerce, encourage them to benefit from its many advantages while ensuring the protection of their rights.
5. This study aims to review best practices and international experiences in regulating AI in the e-commerce sector and identify the lessons learned that can be applied in the Saudi context, which will contribute to the development of relevant policies and strategies.
6. This study provides a theoretical and methodological framework for researchers interested in the field of AI, e-commerce, and consumer protection, which will contribute to guiding future research in this vital and growing field.
7. This study is aligned with the Kingdom's Vision 2030, which aims to enhance digital transformation and diversify the economy, by providing a legal and regulatory framework that protects consumers in light of rapid technological developments and contributes to building a sustainable digital economy.

Section One: Conceptual and Regulatory Framework for Artificial Intelligence and E-Commerce:

1. Concept of Artificial Intelligence and E-Commerce:

1.1 Definition of Artificial Intelligence and Its Main Types Used in E-Commerce:

The term "artificial intelligence" (AI) refers to the ability of machines and computer systems to simulate human cognitive abilities, such as learning, understanding, reasoning, and problem-solving. AI goes beyond simply executing programmed commands and seeks to give systems the ability to adapt and self-improve through data analysis and pattern extraction. AI has become a driving force for digital transformation in various sectors, including e-commerce, where it contributes to enhancing operational efficiency and improving the user experience (Russell & Norvig, 2021).

AI applications in e-commerce vary, including key types such as chatbots, recommendation systems, and data analysis. AI-powered chatbots are used to interact with customers online, answer their inquiries, provide technical support, and solve problems quickly and effectively. These chatbots rely on natural language processing techniques to understand user queries and provide appropriate responses (Dale, 2016).

Recommendation systems analyze user behavior and preferences and offer personalized suggestions for products and services that may interest them. These systems rely on complex algorithms to analyze data, identify patterns, and predict user needs. Recommendation systems play a crucial role in improving the online shopping experience, increasing sales, and enhancing customer loyalty (Aggarwal & Aggarwal, 2016).

In addition, AI-powered data analysis techniques are used to analyze vast amounts of data related to customer behavior, purchasing patterns, market trends, and other important information. These analyses contribute to a deeper understanding of customer needs and expectations, enabling companies to make more informed decisions, improve marketing and sales strategies, and develop new products and services that meet market needs (Provost & Fawcett, 2013).

These different types of AI applications in e-commerce are integrated to provide a unique and personalized shopping experience for consumers, and contribute to improving the efficiency of business operations, increasing profits, and enhancing the competitiveness of companies in the digital market. With continued development in AI technologies, its importance in the e-commerce sector is expected to increase, and its applications will expand to include other aspects of this industry (Brynjolfsson & McAfee, 2017).

2.1 Definition of E-Commerce, Its Different Types, and Its Importance in the Saudi Economy:

E-commerce embodies a modern model of commercial transactions, which relies on the use of the internet and digital technologies to conduct sales, purchases, and exchange of goods and services. E-commerce transcends traditional geographical

barriers, allowing companies to reach wider markets and providing consumers with diverse and convenient shopping options. E-commerce has become an integral part of the global economy, and a major driver of growth and innovation in many countries (Laudon & Traver, 2021).

There are many types of e-commerce, differing according to the nature of the transactions and the parties involved. Among the most prominent of these types, we find Business-to-Consumer (B2C) commerce, where companies sell their products and services directly to individual consumers online. This type of e-commerce is the most common and includes many platforms and online stores that offer a wide range of products and services (King et al., 1999).

In addition, there is Business-to-Business (B2B) commerce, where companies sell their products and services to other companies online. This type of e-commerce includes commercial transactions between suppliers, manufacturers, and distributors, and relies on specialized systems for managing supply chains and procurement. B2B e-commerce plays a crucial role in improving the efficiency of business operations between companies (Chaffey & Ellis-Chadwick, 2019).

There is also Consumer-to-Consumer (C2C) commerce, where consumers sell their products and services to each other online, through online buying and selling platforms. This type of e-commerce includes online auctions, classified ads, and other platforms that allow consumers to buy and sell used or new goods (Rayport & Jaworski, 2001).

E-commerce is gaining increasing importance in the Saudi economy, where it contributes to diversifying sources of income, promoting economic growth, and providing new job opportunities for Saudi youth. The e-commerce sector in the Kingdom has witnessed remarkable growth in recent years, driven by increased use of the internet and smartphones, and the trend of consumers towards online shopping. The Saudi government is working to support this sector by providing the necessary infrastructure, launching initiatives to encourage e-commerce, and facilitating regulatory procedures (CITC, 2023).

E-commerce plays an important role in achieving the goals of Saudi Vision 2030, which seeks to build a strong digital economy and enhance the role of the private sector in economic development. The e-commerce sector is expected to continue to grow and expand in the coming years, which will strengthen the Kingdom's position as a regional hub for digital trade and contribute to achieving sustainable development ("Growth of E-Commerce," 2025).

3.1 The Complementary Relationship Between Artificial Intelligence and E-commerce and the Impact of Each on the Other:

The relationship between AI and e-commerce is embodied in a close integration, where each enhances the other, and contributes to the development and improvement of the performance of both fields. AI has revolutionized the e-

commerce sector by providing innovative solutions to improve the online shopping experience, increase the operational efficiency of companies, and provide customized services to customers. In return, the e-commerce sector provides fertile ground for the development and application of AI technologies, by providing the data and opportunities necessary to develop algorithms and smart models (Kaplan & Haenlein, 2019).

AI contributes to enhancing the user experience in e-commerce by providing customized services specifically designed to meet the needs and preferences of each consumer. AI-powered recommendation systems are used to analyze user behavior and preferences and offer personalized suggestions for products and services that may interest them. Smart chatbots are also used to interact with customers and provide technical support and solve problems quickly and effectively. These applications contribute to improving customer satisfaction and increasing their loyalty (Pokharel, 2024).

AI technologies play an important role in improving the efficiency of business operations in the e-commerce sector. AI-powered inventory management systems are used to analyze sales data and forecast demand, helping companies manage their inventory efficiently and avoid shortages or excess inventory. AI-powered data analysis systems are also used to analyze customer behavior and market trends, helping companies make more informed marketing and sales decisions (Davenport & Ronanki, 2018).

In return, the e-commerce sector provides AI with huge amounts of data that is used to develop and improve algorithms and smart models. By analyzing data on customer behavior, purchasing patterns, and market trends, AI technologies can learn and develop continuously, and provide more accurate and effective solutions in e-commerce. This mutual interaction between AI and e-commerce is considered a driver of innovation and growth in both fields (Jordan & Mitchell, 2015).

2. The Regulatory and Legal Framework for E-Commerce in Saudi Arabia:

2.1 Regulations and Laws Related to E-Commerce in Saudi Arabia:

Saudi Arabia regulates the e-commerce sector through a set of regulations and laws that aim to organize this sector, protect consumer rights, and encourage economic growth. The Electronic Commerce Law issued by Royal Decree No. (M/126) and dated 7/11/1440 AH is the main legal framework that regulates this sector, and includes provisions related to consumer rights, the obligations of online stores, and procedures related to electronic transactions (Electronic Commerce Law, 2019).

In addition to the Electronic Commerce Law, there are other relevant laws that regulate various aspects of this sector, such as the Cybercrime Law (Cybercrime Law, 2007), which includes provisions related to cybercrimes and electronic fraud, the Personal Data Protection Law (Personal Data Protection Law, 2021), which regulates the processing of consumers' personal data and protects their privacy,

and the Trademarks Law (Trademarks Law, 2002), which protects the trademarks of online stores.

2.2 Identification of Government Agencies Responsible for Regulating E-commerce and Consumer Protection and Their Roles:

Several government agencies in Saudi Arabia are responsible for regulating the e-commerce sector and protecting consumers. The Ministry of Commerce is the main government agency responsible for regulating this sector, as it undertakes the responsibility of issuing licenses for online stores, monitoring their compliance with regulations and laws, processing consumer complaints, and developing relevant policies and strategies (Ministry of Commerce, 2023).

In addition, the Saudi Standards, Metrology and Quality Organization (SASO) plays an important role in ensuring the quality of products and goods sold online and their compliance with standards. The Saudi Authority for Intellectual Property also contributes to protecting trademarks, patents, and intellectual property rights of online stores. The National Cybersecurity Authority participates in protecting electronic systems and data from cyber breaches and threats (Abha Chamber, 2023).

The efforts of these government agencies are combined in regulating the e-commerce sector, providing a safe and reliable environment for consumers and companies operating in this sector, and contributing to achieving the goals of Saudi Vision 2030 in building a sustainable digital economy. These efforts reflect the Saudi government's interest in developing this sector and encouraging innovation and growth in it (OECD, 2020).

2.3 Assessing the Comprehensiveness of These Regulations and Laws in Dealing with AI Applications and Their Associated Challenges:

A review of the regulations and laws related to e-commerce in Saudi Arabia shows that they mainly focus on regulating traditional electronic commercial transactions and protecting consumer rights in this context. However, these regulations and laws may not be sufficient to deal with the new challenges posed by AI applications in e-commerce.

These regulations and laws lack explicit provisions that regulate the use of AI in e-commerce and deal with the potential risks resulting from this use, such as algorithmic discrimination, price manipulation, and violation of data privacy. There are also no clear mechanisms for legal liability in the event of damage resulting from AI applications. This requires developing current regulations and laws and enacting new legislation to regulate the use of AI in e-commerce (Kordi, 2022).

Therefore, there is an urgent need to develop the regulatory and legal framework for e-commerce in Saudi Arabia, in a manner that is commensurate with rapid technological developments, ensures the protection of consumer rights in light of

the use of AI, and promotes the sustainable growth of this vital sector. This includes amending some existing legal texts, enacting new legislation to regulate the use of AI in e-commerce, and establishing clear mechanisms for legal liability in this context (Al-Shahrani, 2024).

3. Risks and Challenges of Using Artificial Intelligence in E-Commerce:

3.1 Risks Related to Data Privacy and Security and How They Affect Consumers:

Concerns about data privacy and security are increasing with the expansion of AI use in e-commerce, as these technologies rely on collecting and analyzing vast amounts of consumers' personal data, including their demographic information, purchasing behavior, and personal preferences. Misuse of this data may lead to a violation of consumer privacy and expose them to the risk of fraud and manipulation (Solove, 2012).

Consumers' personal data is at risk of being hacked and stolen, which could lead to its use for illegal purposes, such as financial fraud, identity theft, or spying on consumer activities. Companies may also use this data to target consumers with misleading or unwanted ads, which annoys consumers and violates their privacy (K., 2024).

Protecting data privacy and security in e-commerce requires strict controls on data collection and use, granting consumers the right to control their personal data, providing effective mechanisms to protect data from breaches and information theft, and educating consumers about their rights and how to protect their privacy in cyberspace (Al-Shamsi, 2022).

3.2 Challenges Related to Discrimination and Bias in Algorithms and Their Impact on the Fairness of the System:

Algorithms used in AI applications in e-commerce pose challenges related to discrimination and bias, as these algorithms may contain unintentional biases resulting from being trained on biased or incomplete data. This may lead to unfair treatment of some consumers or deprive them of equal opportunities to obtain products and services (O'Neil, 2016).

These biases may manifest in offering different prices to consumers based on their personal data, or denying certain groups access to certain products or services, or targeting them with misleading or unwanted advertisements. Addressing these challenges requires developing more transparent and fair algorithms, conducting periodic evaluations of the performance of these algorithms, and providing mechanisms for submitting complaints and appeals against algorithmic decisions (Sowa, 2014).

3.3 Risks of Manipulation and Misleading Using Artificial Intelligence Techniques in Marketing and Promoting Products:

Some companies use AI technologies in marketing and product promotion in ways that may be misleading or unethical, such as using chatbots to pretend to be real consumers, or creating fake images and products using deepfake technologies, or targeting consumers with personalized and misleading ads. This may lead to deceiving and misleading consumers and harming their financial interests (Cotton, 2014).

Combating these unethical practices requires strict controls on the use of AI technologies in marketing and promotion, educating consumers about potential risks, and providing effective mechanisms for submitting complaints and appeals against these practices (Al-Asdoudi, 2023).

3.4 Challenges Related to Legal Responsibility in the Event of Harm Resulting from Artificial Intelligence Applications:

AI applications pose new challenges with respect to legal liability, as it is difficult to determine responsibility in the event of harm resulting from these applications, given their complex nature and ability to make decisions independently. This may raise questions about who is responsible for this harm: the programmer, the manufacturer, or the user? (Lauwaert, 2021).

Determining legal liability in this context requires clear standards of liability for the actions of AI, providing effective mechanisms for compensating those affected, and conducting periodic evaluations of potential risks resulting from these applications (Abdelrazek, 2024).

3.5 Ethical Aspects of Using Artificial Intelligence (Transparency, Accountability, Fairness) and the Importance of Adhering to Them:

AI technologies raise important ethical issues related to transparency, accountability, and fairness. The algorithms and intelligent models used in e-commerce must be transparent and explainable. There must be mechanisms for accountability in the event of harm or violations and all consumers must be treated fairly and equally (Mittelstadt et al., 2016).

Adhering to these ethical aspects requires developing ethical guidelines for AI, educating companies and consumers about the importance of adhering to these principles, and conducting periodic assessments of the impact of AI technologies on society.

3.6 The Impact of Artificial Intelligence on Competition in the E-Commerce Market and Its Implications for Consumers:

AI affects competition in the e-commerce market, as it can lead to increased market concentration in the hands of a few large companies that have the technical and financial capabilities to develop and use AI technologies. This may lead to reduced competition, increased prices, and reduced options available to consumers (Birch & Bronson, 2022).

Addressing these challenges requires establishing controls to ensure fair competition in the e-commerce market, encouraging innovation and competition among companies, and protecting consumers from monopolistic practices.

4. Best Practices in Regulating Artificial Intelligence in the E-Commerce Sector:

4.1 Review of International Experiences in Regulating Artificial Intelligence in the Field of E-Commerce:

Recent years have witnessed a significant increase in the use of AI technologies in the e-commerce sector, which has led to the emergence of new challenges that require careful regulation to protect consumers and promote fair competition. In this context, various international experiences emerge that can be learned from. In the European Union, for example, work is underway to develop a comprehensive regulatory framework for AI, which aims to ensure trustworthy and ethical AI systems, with a particular focus on data protection and privacy. This framework sets clear standards for transparency and accountability and requires companies to assess the potential risks of AI technologies before deploying them (DOWN & ACT, 2021). In the United States, the regulatory approach tends to be more flexible, focusing on high-risk sectors, such as healthcare and finance, while encouraging innovation (White House, 2023). In addition, countries such as Singapore are seeking to adopt a risk-based approach to AI regulation, focusing on promoting responsible innovation and identifying areas of use that require closer scrutiny (Singapore's Personal Data Protection Commission, 2020).

4.2 Identifying Lessons Learned from These Experiences and Applying Them in the Saudi Context:

International experiences in regulating AI in e-commerce provide us with a set of important lessons that can be utilized in the Saudi context. First, there is a need to adopt a comprehensive and integrated approach to regulating AI, which covers all aspects of use and ensures consumer protection. Second, it is important to focus on transparency and accountability in the operation of AI systems, so that consumers are aware of how these systems work and their impact on purchasing decisions. Third, it is necessary to establish effective mechanisms for assessing the potential risks of AI technologies before their release in the market, to ensure that consumer rights are not violated or that no harm is caused. Fourth, it is important to enhance cooperation between the public and private sectors in developing and implementing regulatory frameworks for AI, taking into account the specificity of the Saudi market and its requirements. Fifth, there is a need to invest in building national capacities in the field of AI and to develop the competencies necessary to regulate and monitor these technologies effectively. Applying these lessons in the Saudi context requires formulating clear and detailed legislation and regulations

that are appropriate to the nature of the local market and take into account the interests of both consumers and companies (Muafa & Al-Obadi, 2024).

4.3 Suggesting Best Practices That Can be Applied in Saudi Arabia to Enhance Consumer Protection in Light of the Use of Artificial Intelligence.

A set of best practices can be applied in Saudi Arabia to enhance consumer protection in light of the use of AI in the e-commerce sector. First, a clear legal framework must be established that defines the rights of consumers in dealing with AI systems, including the right to know how these systems work and their impact on purchasing decisions, and the right to object to decisions made based on inaccurate or biased data. Second, it is necessary to require companies to provide transparent information about the uses of AI and to disclose any biases or potential risks that these technologies may entail. Third, an independent regulatory body should be established to monitor the uses of AI in the e-commerce sector and verify companies' compliance with standards and regulations. Fourth, effective mechanisms should be established to receive consumer complaints and investigate them fairly and quickly. Fifth, public awareness about the uses of AI and consumer rights in this context should be enhanced through the organization of awareness campaigns, workshops, and training programs. Sixth, companies should be encouraged to adopt responsible and ethical AI practices through the provision of incentives and facilities for good practices and the imposition of penalties for violations. These practices, taken together, contribute to building a safe and fair e-commerce environment that relies on AI and serves the interests of both consumers and companies (Alqahtani & Alqahtani, 2022).

Section Two: Analysis of the Efficiency of Current Systems in Protecting Consumers:

1. Assessing the Extent to Which Current Systems Cover the Risks of Artificial Intelligence:

1.1 Analysis of the Adequacy of Current Legal Texts in Dealing with the Risks of AI in E-Commerce, with a Focus on Their Clarity and Comprehensiveness:

A careful review of the current legal texts in Saudi Arabia, which regulate the e-commerce sector, reveals a deficiency in dealing with the unique risks posed by AI applications. While the Electronic Commerce Law and its implementing regulations provide a general framework for consumer protection in digital transactions, they do not directly or specifically address the challenges arising from the use of AI. For example, there are no explicit texts regulating the use of algorithms in pricing or recommending products, nor do they address the liability of service providers for decisions made by AI systems. This absence of clear and detailed legal texts creates a state of legal ambiguity and makes it difficult for consumers to claim their rights if they are harmed by AI applications. The current texts also lack sufficient provisions to deal with the challenges related to

algorithmic discrimination and violation of privacy that may result from the use of these technologies (Alhejaili, 2024).

1.2 Identification of Legal Gaps That Need to Be Addressed and Modified to Keep Pace with Technological Developments in the Field of AI:

Analysis of the current legal texts reveals clear gaps that need to be addressed and modified to keep pace with technological developments in AI. Among the most prominent of these gaps is the absence of a clear legal definition of AI and its applications in the context of e-commerce, which makes it difficult to apply existing laws to these technologies. In addition, current laws lack provisions regulating legal liability for the actions of AI systems and determining who bears the responsibility in the event of damage to consumers, whether such damage results from errors in algorithms or misuse of data. There is also a need to establish new mechanisms to ensure transparency in the operation of AI systems, obligate companies to disclose how these systems work and their impact on purchasing decisions, and give consumers the right to object to decisions made based on biased algorithms. Addressing these legal gaps requires amending some existing texts and enacting new legislation to regulate the use of AI in e-commerce in a detailed and comprehensive manner, which is commensurate with the nature of these technologies and their potential effects (Zuboff, 2019).

1.3 Assessing the Ability of Regulatory Bodies to Apply Laws and Monitor Their Implementation Effectively to Ensure Consumer Protection:

Regulatory bodies in Saudi Arabia face major challenges in applying laws and monitoring their effective implementation, given the rapid developments in the field of AI. Although there are government agencies specialized in regulating e-commerce and protecting consumers, such as the Ministry of Commerce and the Saudi Standards, Metrology and Quality Organization (SASO), these agencies may not possess the necessary technical capabilities and specialized expertise to deal with the complexities of AI technologies. In addition, the lack of awareness among consumers of their rights in light of the use of AI, and the difficulty of tracking the activities of companies that use these technologies, limits the ability of regulatory bodies to protect consumers effectively. Enhancing the capacity of regulatory bodies requires investing in building the technical capacities of their employees, developing the tools and technologies necessary to monitor and track AI activities in e-commerce, and increasing public awareness of consumer rights in this area. There must also be greater cooperation and coordination between the various government agencies concerned with consumer protection to ensure the comprehensive and integrated application of laws (Mökander, 2020).

2. Study of Available Consumer Protection Mechanisms:

2.1 Analysis of Mechanisms for Handling Complaints and Resolving Disputes in E-Commerce, and Assessment of Their Effectiveness:

Mechanisms for handling complaints and resolving disputes are the cornerstone of any consumer protection system. In the field of e-commerce, these mechanisms are particularly important due to the nature of digital transactions that can lead to complex disputes. In Saudi Arabia, the Ministry of Commerce is responsible for receiving and investigating consumer complaints in the e-commerce sector. The Ministry provides various channels for submitting complaints, including the online portal, the smart application, and the unified call center. However, an analysis of these mechanisms reveals some challenges that limit their effectiveness. In many cases, consumers have difficulty submitting complaints effectively due to complex or unclear procedures, and the investigation process may take a long time, which negatively affects consumers' confidence in these mechanisms. In addition, consumers' lack of awareness of their rights and complaint channels limits their use of these mechanisms. Improving the effectiveness of complaints handling and dispute resolution mechanisms requires simplifying procedures, speeding up the pace of investigation of complaints, increasing awareness of consumer rights and complaint channels, and providing alternative dispute resolution mechanisms, such as mediation and conciliation, to expedite dispute resolution and reduce the burden on the judiciary (OECD, 2020).

2.2 Assessment of the Effectiveness of Compensation Mechanisms Available to Consumers Harmed by Unfair or Misleading Practices:

Compensation mechanisms are an essential part of the consumer protection system and aim to redress the damage that consumers may suffer as a result of unfair or misleading practices by companies operating in the e-commerce sector. In Saudi Arabia, the Electronic Commerce Law entitles consumers who are harmed to claim compensation for the damages they have suffered, but the effectiveness of these mechanisms may be limited in some cases. In many cases, consumers face difficulty in proving the harm they have suffered, or in determining who is responsible for it, especially in cases involving the use of AI. In addition, the procedures for claiming compensation may be lengthy and complex, which discourages many consumers from claiming their rights. In addition, the amounts of compensation obtained by consumers may not be sufficient to fully cover the damages they have suffered. Improving the effectiveness of compensation mechanisms requires simplifying the procedures for claiming compensation, providing effective mechanisms for assessing damages, determining liability, and ensuring that consumers receive fair and adequate compensation for the damages they have suffered (Howells & Twigg-Flesner, 2017).

2.3 Studying the Ease of Access for Consumers to These Mechanisms and Awareness of Them:

The ease of access for consumers to consumer protection mechanisms and their awareness of them is crucial to the effectiveness of these mechanisms. If consumers are unable to access these mechanisms or are unaware of their existence, they lose much of their value. In Saudi Arabia, the Ministry of Commerce is making efforts to raise awareness of consumer rights and complaint channels by organizing awareness campaigns and publishing information through various media outlets. However, many consumers are still unaware of their rights and available consumer protection mechanisms, especially in remote areas and among less educated groups. Some complaint submission channels may also be unavailable or difficult for some consumers to use, limiting their ability to claim their rights. Enhancing consumers' ease of access to and awareness of these mechanisms requires expanding the scope of awareness campaigns, using a variety of communication channels, providing easy-to-use channels for submitting complaints, and ensuring that information reaches all categories of consumers, including the most marginalized (Ramsay, 2007).

3. Analysis of Consumer Data Protection Issues:

3.1 Identifying the Concerns and Challenges Facing Consumers in the Field of Personal Data Protection in Light of the Use of Artificial Intelligence:

The concerns and challenges faced by consumers in the field of personal data protection are increasing with the steady expansion of the use of AI in the e-commerce sector. AI systems rely heavily on collecting and analyzing vast amounts of consumers' personal data, including their demographic information, purchasing behavior, personal preferences, and even their biometric data in some cases. This expansion in data collection raises serious concerns about consumer privacy and the possibility of misuse of this data. Among the most prominent of these concerns is the risk of collecting data in an opaque manner or without obtaining the explicit consent of consumers, and the possibility of using this data for unauthorized purposes, such as misleading marketing, price discrimination, or even manipulating public opinion. Consumers also fear the risk of data leaks or hacking by unauthorized parties, which exposes their personal data to danger and threatens their financial and personal security. In addition, the use of complex algorithms to analyze data makes it difficult for consumers to understand how their data is processed and its impact on purchasing decisions or other services. These concerns and challenges require strict controls on the protection of consumers' personal data, and enhanced transparency and accountability in the use of AI (Lyon, 2018).

3.2 Analyzing the Level of Consumer Confidence in the Current Systems and Their Ability to Protect Their Personal Data from Misuse:

The level of consumer confidence in the current systems and their ability to protect their personal data from misuse reflects the effectiveness of these systems in providing the necessary protection. In Saudi Arabia, despite the issuance of the Personal Data Protection Law, many consumers still feel concerned about the privacy and security of their data in light of the use of AI in the e-commerce sector. This concern is due to several reasons, including the lack of awareness among consumers of their rights in data protection, lack of confidence in companies' ability to comply with legal controls and concerns about data leaks or hacking by unauthorized parties. The lack of effective mechanisms for accountability and compensation in the event of data breaches further erodes consumer confidence in current systems. Enhancing consumer confidence requires making greater efforts to effectively implement the Personal Data Protection Law, promoting transparency and accountability in data processing, providing effective mechanisms for oversight and compensation in the event of breaches, and increasing consumer awareness of their rights and how to protect their personal data in the digital space (Acquisti et al., 2015).

4. Case Study of the Application of Artificial Intelligence in E-Commerce in Saudi Arabia:

4.1 Selecting a Case Study That Represents a Typical Application of AI in E-Commerce in the Kingdom:

AI-powered product recommendation systems, which are used by many e-commerce platforms in Saudi Arabia, are a prominent example of the application of AI in this sector. These systems work by analyzing user behavior data, such as browsing and purchase history and ratings, to provide personalized suggestions for products that may interest them. These systems have become an integral part of the online shopping experience, helping to guide consumers toward products that match their preferences and increase the likelihood of purchases. This application provides a typical case study for a deeper understanding of the impacts of AI on consumers in the e-commerce sector and identifies areas that require special attention in terms of consumer protection (Ricci et al., 2011).

4.2 Analyzing How This Application Affects Consumers, Whether Positively or Negatively, with a Focus on Consumer Rights:

AI-powered product recommendation systems have multiple effects on consumers. Positively, these systems save consumers time and effort by helping them quickly and efficiently find products that match their needs and preferences. They also help in discovering new products that consumers may not have known about, thus expanding their options. However, there are potential negative aspects to this application. These systems may narrow the range of choices available to consumers by focusing on products that match their previous preferences only and ignoring other products that may be of higher quality or better price. There is also a

risk that these systems may be used to influence consumers' purchasing decisions by presenting products in a biased or misleading manner. In addition, these systems may involve privacy risks, as they rely on collecting and analyzing large amounts of consumers' personal data, raising concerns about the potential for misuse of this data. Analyzing the impact of this application on consumers requires focusing on the extent to which their rights are respected, including the right to freedom of choice, transparency, and protection of privacy (Ekstrand & Riedl, 2012).

4.3 Evaluating the Effectiveness of Current Systems in Protecting Consumers in This Case and Identifying Strengths and Weaknesses:

When evaluating the effectiveness of current systems in protecting consumers in the case of using AI-powered product recommendation systems, clear strengths and weaknesses emerge. On the one hand, the e-commerce system in Saudi Arabia provides some protection for consumers by obligating online stores to disclose basic information about products and services and providing channels for submitting complaints and objections. However, there are clear weaknesses in the ability of current systems to deal with the unique challenges posed by product recommendation systems. In many cases, consumers are unable to understand how these systems work and how they affect purchasing decisions, and they do not have effective mechanisms for objecting to biased or misleading recommendations. In addition, current legal texts do not include explicit provisions regulating the use of algorithms in recommendation systems, nor do they specify responsibility in the event consumers are harmed by these systems. Enhancing consumer protection in this context requires developing existing legal and regulatory systems, enacting new legislation to regulate the use of algorithms in e-commerce, providing effective mechanisms for transparency and accountability, and enabling consumers to understand and easily access their rights (Yeung, 2018).

Conclusion:

This study has examined the crucial issue of the efficiency of existing systems in the Kingdom of Saudi Arabia to protect consumers from the risks and challenges associated with the adoption of artificial intelligence (AI) in the e-commerce sector. The study has sought to evaluate the effectiveness of the current legal and regulatory framework in addressing the growing applications of AI in the sector, and to assess the adequacy of existing legal texts to protect consumer rights in this new context.

Results:

The study has reached a number of important findings, which indicate a gap between the rapid developments in the field of AI and the ability of existing legal and regulatory systems to keep pace with these developments. The most prominent findings are:

1. The study revealed that existing legal texts regulating e-commerce in Saudi Arabia do not adequately address the risks and challenges associated with the use of AI, such as algorithmic discrimination, price manipulation, and violation of data privacy. These texts also lack explicit provisions regulating legal liability for the actions of AI systems.
2. The study found that the mechanisms for handling complaints and resolving disputes available to consumers in the field of e-commerce may be inadequate or ineffective in some cases, due to complex procedures, long investigation times, and lack of awareness among consumers of their rights.
3. The study revealed serious concerns among consumers about the protection of their personal data in light of the use of AI, due to the collection and analysis of vast amounts of data and the lack of transparency and accountability in the use of this data.
4. The study showed that regulatory authorities face challenges in applying laws and monitoring their effective implementation, due to a lack of specialized technical capabilities in the field of AI, and the difficulty of tracking the activities of companies that use these technologies.

Recommendations and Proposals:

Based on the findings of the study, it recommends the following:

1. There is a need to update and develop the legal and regulatory framework for e-commerce in Saudi Arabia to keep pace with the rapid technological developments in AI. This includes amending some existing legal texts and enacting new legislation to regulate the use of AI in e-commerce in a detailed and comprehensive manner.
2. There is a need for a clear legal definition of AI and its applications in the context of e-commerce to facilitate the application of existing laws to these technologies.
3. There is a need to establish legal texts that regulate legal liability for the actions of AI systems and determine who is responsible in the event of damage to consumers.
4. New mechanisms should be established to ensure transparency in the operation of AI systems, obligate companies to disclose how these systems work and their impact on purchasing decisions, and give consumers the right to object to decisions made based on biased algorithms.
5. It is necessary to simplify complaint submission procedures, accelerate investigation processes, provide alternative dispute resolution mechanisms, such as mediation and conciliation, and raise awareness of consumer rights and complaint channels.
6. There is a need to establish strict controls on the collection and use of personal data, grant consumers the right to control their data, provide effective

mechanisms to protect data from hacking and information theft, and raise awareness of privacy rights in cyberspace.

7. It is necessary to invest in building the technical capacities of regulatory staff, developing the tools and technologies necessary to monitor and track AI activities in e-commerce, and strengthening cooperation and coordination between various government agencies concerned with consumer protection.
8. Companies should be encouraged to adopt responsible and ethical AI practices by providing incentives and facilities for good practices and imposing penalties for violations.
9. The study recommends that future research should focus on specific impacts of AI applications on consumers, and evaluate the effectiveness of the proposed regulatory mechanisms in protecting consumers. Implementing these recommendations and proposals would contribute to building a safe and fair e-commerce environment based on AI, serving the interests of both consumers and companies, in line with Saudi Vision 2030 and its ambitious goals for digital transformation and building a sustainable digital economy.

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