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Unlocking Sustainable Growth: The Role of Artificial Intelligence Adoption in Jordan Retail Sector, Moderated by Entrepreneurial Orientation

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ABSTRACT

Although businesses are under pressure to consistently improve both their capacities and business processes, the artificial intelligence (AI) revolution is seen as an appealing company approach that has attracted attention. By offering improved company structures, the application of AI technology has the potential to significantly alter company procedures while also lessening the impact of outside catastrophes. Additionally, using AI can enhance the socioeconomic circumstances of a particular area and have a positive impact on the social worth and economic sustainability of businesses. Few studies have been conducted recently on the use of AI to support businesses at various stages of development and sustainability. In addition, there isn't much research that shows that the retail sector can benefit from the use of various modern AI technologies. To bridge this gap, this investigation looks into the moderating effect of entrepreneurial orientation. A theoretical framework was established using the assistance of the resource-based view (RBV) and dynamic capability view (DCV) assumptions, in addition to a survey of the available literature. The PLS-SEM method was used in this paper and got 311 respondents from Amman, Jordon retail sector. The findings show that the industry needs to make strategies for social justice and economically favorable approaches that have a beneficial impact by adopting AI approaches. This paper also shows that EA has a moderate impact on performance connections within the industry.

Keywords: Sustainability, Entrepreneurship, Economic Benefits, Entrepreneurship Orientation, Social Benefits
JEL Classifications: L, M

1. INTRODUCTION

The advanced new features of Artificial intelligence (AI) and their implications in Businesses significant impact on the economy and the potential context of Entrepreneurial activities (Alnaser et al., 2023). Current studies on innovation, entrepreneurship, and the development of contemporary technologies have shed illumination on how technology-enabled businesses are attempting to transform their entrepreneurial endeavors and spur their expansion (Aboalganam et al., 2024; Alghizzawi et al., 2024). Studies have shown how contemporary AI may support businesses of every kind, particularly those in the retail industry, in maintaining their development momentum (Omeish et al., 2024) (Abu-Dabaseh et al., 2024; Alghizzawi, 2024), accelerating

their operations, and promoting regional growth (Nazir and Das, 2024). Zhou et al., (2021) demonstrated that the retail industry may face several obstacles, yet remains capable of adapting and enduring disruptions from the outside world. Obschonka and Audretsch, (2023) noted that the unique characteristics of various sizes of businesses have a significant impact on their capacity for innovation and growth. It is discovered that organizational and geographical circumstances influence this kind of growth and innovation (Ozhan et al., 2022). The advantages that of artificial intelligence (AI) technologies, including social networking sites, blockchain technology, augmented reality (AR), and VR to the expansion within the beginning retail industry and associated entrepreneurial activities, are still not clearly understood by academics (Alhanatleh et al., 2024). Researchers and industry professionals are also unsure about the precise circumstances, timing, and means by which newly formed companies can maintain their growth trajectory with the aid of artificial intelligence (AI) technologies (Abu-Dabaseh et al., 2024; Alghizzawi, 2024). The recent development of the COVID-19 pandemic has compounded this conundrum for experts, as startups were uncertain regarding how to reorganize their company's adaptability by employing AI to identify strategies for successfully retaining prospective clients within an especially catastrophic scenario. This dilemma also impacts the retail industry, which must adapt its business practices to incorporate cutting-edge AI technology to forge enduring social and economic benefits (Zhang et al., 2022). The advantages of digital technology use are insufficient to support a "one-size-fits-all" strategy, which encourages academics to conduct in-depth studies of newly formed companies and modifies their understanding of entrepreneurial endeavors. In this scenario, it is suggested that the retail beginning industry, which faces several challenges, must make the greatest use of its assets and possibilities to maximize results through the appropriate application of contemporary digital technologies (Wang et al., 2023). The resource-based view, or RBV, paradigm is supported by this idea (Vrontis et al., 2022). According to perceptions, start-ups in the retailing industry may also become more confident in their capacity to employ AI technology sensibly to identify and exploit possibilities, and then reorganize their existing resources to effectively operate in high-velocity, unpredictable business settings. This idea aligns with the dynamic capability view theory, abbreviated DCV Theory (Xia et al., 2014). According to the current study, new retailers can enhance the broader economic and social standards of their community by acceptably adopting contemporary AI technologies. If start-ups in the retail sector have the right entrepreneurial attitude, they can enhance their performance by generating both economic and social significance. Research on the potential advantages of utilizing AI technologies for the underserved beginning retail industry is scarce and still in its early stages (Sabahi and Parast, 2020). Studies on the impact of contemporary AI technology on generating economic and social significance in a specific area are scarce. There exists a study deficit as a result. The purpose of this investigation is to investigate the relevant research queries within this backdrop.

RQ1: What effects on value creation-both social and economic-can the retail sector expect from the use of various AI technologies?

RQ2: Does the performance of the retail industry depend on generating both economic and social cooperation value?

RQ3: Does entrepreneurial orientation influence the association between value creation and performance in the retail industry in any moderating way?

2. LITERATURE REVIEW

Found that the retail industry effectively contributes to the creation of jobs, exports, and local growth (Al-Gasawneh et al., 2022; Alghizzawi et al., 2023; Alghizzawi et al., 2023; Alhanatleh et al., 2023; Megdadi et al., 2023). Startups within the retail industry are prized for their effects on the economic and social realms (Alghizzawi et al., 2024), in addition to enhancing innovative concepts and advancing the economic well-being of a country (Perifanis and Kitsios, 2023). The retail industry is viewed as a dynamic, thriving engine of economic progress in developing nations (Adel et al., 2023). Research has indicated that the retail industry could be a useful tool in reducing poverty in a certain area (Priestley and Simperl, 2022). The environmental crisis that entrepreneurs confront can be lessened by utilizing various AI technologies, including big-data analysis, blockchain, VR, AR, and AI-enabled business apps (Alnoor et al., 2024). Deployment of AI by the beginning retail industry has the potential to enhance the socioeconomic circumstances in that area and have an impact on economic as well as social values (Xia et al., 2024). The performance of businesses can potentially be impacted by the usage of AI technologies, yet research has shown that the development percentage of businesses using technology applications varies (Upadhyay et al., 2023) have emphasized doing in-depth research to determine how businesses seeking artificial intelligence (AI) might most effectively incorporate these innovative technologies and restore their operational models by utilizing such cutting-edge technology that is the retail Sector may accomplish business within this manner by strengthening their crisis management capabilities and reconsidering the consequences of utilizing AI technology for their performance in the developing digital economy (Ozhan et al., 2022). Rifai et al., (2023) said that to comprehend how the application of AI technologies might encourage relationships amongst economic players and generate value on both an economic and a social level, a thorough and thorough academic investigation is required. The investigation additionally demonstrated that IoT devices possess concerns regarding privacy and security when it comes to authentication, variation, and recognizing something (Sabahi and Parast, 2020). On the other hand, using big data possesses a variety of difficulties, such as low-quality data, information silos, as well as a lack of user abilities. These problems might be solved by hiring the right people and providing them with the training they need to advance their abilities (Vrontis et al., 2022). The retail business sector's AI may be triggered by the use of contemporary AI technology. Artificial Intelligence (AI) represents the process of drastically increasing the social and economic benefits by assisting businesses to operate better (Wang et al., 2023). Artificial Intelligence is poised to transform conventional commercial methods into a digital realm. For instance, the idea of "bricks and mortar" might be transformed into a "clicks and bricks" atmosphere by AI revolutionizing the retail sector (Chae and Goh, 2020). Speaking of the retail industry, even startups in this field are attempting to implement artificial intelligence (AI) into their operations processes by implementing

significant operational changes, guaranteeing enhanced client service, more effective company structures, and electronic transactions using novel methods alongside online interactions through appropriate use of AI-enabled business apps, VR, AR, social networking sites, blockchain, and additional technologies (Dadnath et al., 2022). The perception is that the incorporation of AI technologies enhances social and economic significance, hence improving the retail industry's performance in general via modern business practices. This idea was supported by (Giuggioli et al., 2022), who provided evidence that social networking sites, artificial intelligence (AI), and other technologies are the primary forces behind businesses' use of AI to boost performance, promote social and economic significance, and hasten regional growth.

3. THEORETICAL FOUNDATION AND DEVELOPMENT OF HYPOTHESES

3.1. Theoretical Foundation

This study draws upon the resource-based view (RBV) theory along with the dynamic capacity view (DCV) theory to explain whether the Retail industry, via the use of AI, enhances its social and economic significance. AI must use a technique that is difficult for rivals to imitate to gain an enhanced competitive edge (Nazir and Das, 2024). Professionals and researchers are focusing on how beginning AI might use resources to improve performance and gain and maintain an edge over their competitors (Roundy, 2022). Furthermore, AI differentiates itself from each other in its performance due to its unique assets and competencies, which are valuable, rare, unique, and non-replaceable (VRIN) (Najim et al., 2013). This idea is consistent with RBV theory (Zhang et al., 2022). Social networking and other AI applications are seen as components of beginning companies' resource portfolios; yet, because the hurdles to acquiring these apps are quite low, they rarely satisfy the requirements of Resource-based theory on their own (Vrontis et al., 2022). As a result, using various AI technologies won't be able to fully increase the significance of AI, and it won't be able to properly function within VRIN resources (Rowdy et al., 2022). According to the RBV theory, AI that uses blockchain, AR, VR, and AI at the same time will do better than AI that uses these additional technologies within a comparable market (Rifai et al., 2023). The retail industry must acknowledge the rapid changes in both client demands and the marketplace landscape. To quickly respond to the constantly shifting expectations of their clients, the retail sector must perceive, seize, and adapt to potential opportunities and outside assistance in this ever-changing market context (Ozhan et al., 2022). This helps the industry to survive in critical conditions. AI helps the retail sector to enhance their reliable integration, advancements, and restructuring of their resources handle market issues, and fulfill the gaps (Saddique et al., 2020). The DCV technique is a significant point (Xia et al., 2024). With the help of AI, startups significantly improve their coordinating activities and restructuring capabilities in the current period (Zhou et al., 2021). The SMEs have adopted this technique to operate their services in this situation. This helps Entrepreneurship to adopt them and improve their performance and operational efficiencies (Wang et al., 2023).

3.2. AI-Enabled Applications (AEA)

The retail sector utilizes AI techniques to achieve the different benefits related to their business operations including manufacturing side supply chain and operations management (Vrontis et al., 2022). AI helps retailers adopt them to improve their corporate governance to significantly reduce the maximum costs and wasted time (Zhou et al., 2021). AI through computers with human-like intelligence achievements effectiveness (Wang et al., 2023). AI has been adopted in multinational companies to improve their operations. Such as Bridgewater associates adopt AI to improve their operations while KPMG uses it for their auditing standards (Xia et al., 2024). AI technology is currently utilized by the retailing industry's finance, advertising, and telecommunications specialists to increase their edge over rivals (Sabahi and Parast, 2020). Applications with AI capabilities are regarded as VRIN resources that affect manufacturing processes and increase the competitiveness of the retail industry. RBV theory is an additive to this idea (Kimjeon and Davidsson, 2022). Artificial Intelligence is a technology that can execute complicated jobs with human-like intelligence (Lee, 2020). Applications with AI capabilities are therefore thought to have an impact on how a company creates both social and commercial value (Baldegger et al., 2020). In light of the conversations above, the subsequent hypotheses are put forth.

H2a: The production of economic value (ECV) for the retail industry is strengthened by AI-enabled applications (AEA).

H2b: AI-enabled applications (AEA) have a favorable effect on the retail industry's ability to create social value (SOV).

3.3. Artificial Intelligence

Technology known as artificial intelligence, or AI, makes it possible for computers and other devices to mimic human intellect and problem-solving skills (Khalid et al., 2020). The capacity of a machine to carry out certain cognitive tasks that we typically identify with human brains is known as artificial intelligence (Kisielnicki et al., 2022). Artificial Intelligence (AI) is the capacity of a computer to carry out cognitive tasks that are typically associated with human intellect, including perception, thinking, learning, environmental interaction, problem resolution, and even creative expression (Nazir and Das, 2024). Even if you're not aware of it, you have undoubtedly dealt with artificial intelligence (AI)-voice assistants such as Siri and Alexa, in addition to certain chatbots that appear on websites to aid users with navigation are powered by AI (Mehdi and Singh, 2023). For an event at Dartmouth in 1956, computer engineer John McCarthy first used the term "artificial intelligence." He didn't, however, publish his initial words on the ideas that we today refer to as AI. In a 1950 paper, Alan Turing developed the idea of the "imitation game." That's the so-called "Turing test," which measures a machine's capacity for intelligent conduct. He thought that subjects that need a lot of sensing and activity, such as games and translation of languages, deserve to be the emphasis of study (Najim et al., 2013). Since AI develops and penetrates every facet of the business, it has an influence on almost every industry. Retailers nowadays are utilizing AI technologies in many different ways, such as improving and customizing their stores for customers, streamlining the process of making purchases, and accelerating loss prevention initiatives (Chae and Goh, 2020). Retailers additionally look into how AI may help them simplify internal procedures, support staff

with monotonous work, and uncover fresh perspectives for making decisions based on data (Nazir and Das, 2024). For instance, Lee's Original Recipe Chicken used cognitive AI-based attendants to meet guests, collect purchases, and promote new goods as a way to enhance the drive-through experiences because of a shortage of employees (Wang et al., 2023). Customers were pleased as a consequence of this technological shift, and order precision was up to 95% (Zhou et al., 2021). Retail companies are beginning to wonder whether advanced types of AI, like deep learning, machine vision, or neural networks, could assist businesses to stand out from the competition in saturated markets and more accurately forecast and react to consumer requirements (Upadhyay et al., 2023). Retailers can better estimate demand, set prices, and arrange products to maximize sales with the aid of AI. Customers interact with the appropriate products at the appropriate time and location as a consequence (Mostafiz et al., 2022). To ensure that retailers don't have excessive or insufficient inventory, forecasting can assist you in placing the appropriate number of orders (Chae and Goh, 2020). AI is additionally capable of tracking data from the internet, which helps to improve e-commerce tactics. You may identify customers' desire near the retail border with the use of AI, and then improve the shopper's trip appropriately (Carbonara and Santarelli, 2023). Heat patterning inside the retail environment is one instance. Sensors and computer vision work together to demonstrate which things are taken, which are exchanged, as well as where customers go before exiting the store (Nazir and Das, 2024).

H1a: AI has a favorable effect on the retail sector's ability to create economic value (ECV).

H1b: AI has a favorable effect on the retail sector's ability to create social value (SOV).

3.4. Virtual Reality

Through computer simulation and modeling techniques, virtual reality (VR) allows users to engage within a synthetic three-dimensional (3-D) visual of any other sense world. VR apps use interacting devices-which can be donned either spectacles, earbuds, gloves, or body suits-to transmit and receive knowledge and envelop the consumer in a virtual world created by computers that mimic reality (Sabahi and Parast, 2020). A user sees animated visuals of a simulated setting while donning a headgear equipped with a stereoscopic display in a conventional VR format (Zhou et al., 2021). A person using virtual reality (VR) is fully immersed audiovisually in a three-dimensional digital world. Zhang et al., (2022) stated differently, that the virtual world ensures optimum client involvement by replacing reality entirely rather than just enhancing it. Leveraging sophisticated VR gear and technology for offering a complete online shopping experience represents what virtual reality in retail refers to (Wang et al., 2023). VR technology enables merchants to differentiate themselves from rivals by enhancing conventional relationships with customers and making shopping more enjoyable (Jia et al., 2023). Retailers may increase employee efficiency and purchase productivity with the use of VR and AR (Zhou et al., 2021). For example, consumers don't need to consult an individual expert when using augmented reality apps to swiftly locate goods locations or verify product information (Priestley and Simperl, 2022). Employees at real stores can concentrate on more important duties including advertising and customer service in the interim.VR gadgets, especially when combined with AI, gather huge quantities of data that assist shops in better comprehending their clientele along with their choices (Perifanis and Kitsios, 2023). Virtual advertising is one of the marketing strategies made possible by virtual reality (VR) and it aids businesses in creating memorable and successful advertising initiatives (Amoako et al., 2021). An extra avenue for profits and sales generation may be provided by virtual or augmented reality. Retailers may leverage immersive technology to increase their clientele, encourage sales via the Internet, and guarantee continued economic expansion as the total amount of VR and AR viewers rises annually (Dadnath et al., 2022).

H3a: The generation of economic value (EV) for the retail industry is positively impacted by virtual reality (VR).

H3b: The generation of social value (SV) for the retail industry is positively impacted by virtual reality (VR).

3.5. Augmented Reality

The actual time application of text, pictures, and audio, along with additional virtual upgrades combined with actual items is known as augmented reality, or AR. This "actual world" component sets augmented reality apart from virtual reality. As opposed to a computerized simulation, augmented reality (AR) incorporates and improves human engagement in the actual environment (Carbonara and Santarelli, 2023). An engaging experience called augmented reality adds digitally produced sensory information to the physical world (Dubey et al., 2020). Augmented reality is the process of superimposing digital content-such as programs, applications, and hardware like AR glasses-onto actual locations and things. This improves the user's experience and creates a fun educational setting right in a person's current environment, which is very helpful for Industry 4.0 and production procedures (Hussain et al., 2023). By combining human inventiveness, observation, and imagination with technologies as well as connected devices, businesses may become "one" alongside the devices and networks that they operate with (Jia et al., 2023). In retail, augmented reality (AR) makes it easier to gather buyer demand data. These techniques help brands to engage and provide positive experiences to their consumers through their preferences, purchasing decisions, and activities (Khalid et al., 2020). AR usage in marketing activities enhances customer experiences, enhances sales, and improves connections with consumers (Mehdi and Singh, 2023). The retail sector uses these techniques to get intention in traditional and digital engagements. Marketing-related integration of AR creates relationships between customers through online sources, videos, and services (Jia et al., 2023). AR marketing and the retail sector are considered currently in the first stage of using this technique, but they need several efforts in upcoming years. Retailers adopt these techniques to get results and observe the customer's real numbers, their inputs, and their wide distribution in the wide context (Obschonka and Audretsch, 2020).

H4a: The generation of economic value (EV) for the retail sector is positively impacted by augmented reality (AR).

H4b: The retail industry's ability to create social value (SV) is positively impacted by augmented reality (AR).

3.6. Blockchain

The definition containing a blockchain is "a distributed database that keeps a continually growing collection of organized data,

called blocks."Cryptography is used to bind these pieces together. Every block has transaction information, an expiration date, and an encrypted hash corresponding to the block before it (Ozhan et al., 2022). A blockchain is a dispersed, accessible to everyone, autonomous digital database that records activities among multiple computers. Its purpose was to prevent record tampering without affecting all following blocks and system acceptance (Daradkeh and Mansoor, 2023). Although the majority of blockchain's current applications are limited to keeping track of transactions for cryptocurrencies like Bitcoin, supporters are working through and evaluating additional applications using the network (Ardelean 2021). Blockchain is seen as a suitable option due to the retail sector's rapid expansion and its fast-paced environment of ever-increasing customer demands. The technology tackles several industrial shortcomings, including problems with managing information, safety, and imitation products, as well as a significant drop in operating expenses (Dubey et al., 2020). When blockchain technology is used in retail, each item's movement may be tracked and dealers and wholesalers can keep an eye on such moves. Anyone concerned can access ledgers stored on a network, making system administration simpler and more effective generally (Abdullah et al., 2020). Because it's distributed, blockchain technology becomes preferable. A rewards system built on blockchain technology offers safety and transparency by tracking and storing points inside a distributed database (Baldeggar et al., 2020). Customers can use one electronic wallet instead of several electronic or physical rewards cards thanks to distributed ledger technology. In this instance, this may address the persistent problem that consumers are not using those points for redemption (Amoako et al., 2021). Retailers can maintain balance spreadsheets and consumers are kept informed of their status when there is a "one point of knowledge." Points can be tracked and aren't susceptible to fraud or theft (Adel et al., 2023). The power of blockchain-based technology is rooted in its capacity to manage large amounts of data and enable system safety as well as scalability (Desai, 2019). An ever-expanding collection of confidential data (or block) under an encrypted state is made possible by the distributed ledger (Desai, 2019). Retailers can validate an item's legitimacy by displaying evidence of its travel through data tracking. This is crucial for products wherein security remains a top priority, such as airbags, as well as with the high-end retail sector (Zhang et al., 2022). Retailers can improve their business activities and respond quickly when mistakes are made because of immediately available evaluation and information accessibility (Xia et al., 2024). Additionally, brands may operate together in completely new ways since this information is freely shared throughout an ecosystem. For instance, alluring loyalty schemes utilize various merchants and incentive token types that appeal to a wide range of consumers (Saddique et al., 2020). The vast amount of issue-free material that blockchain technology generates is probably its most remarkable feature. Retailers should investigate this immensely potent resource in the upcoming years, as it guarantees the safety, accessibility, and authenticity of the data through a mix of hourly developments, decentralized management, and cryptography (Nuseir et al., 2020).

H5a: Blockchain has a favorable effect on the retail sector's ability to create economic value (EV).

H5b: Blockchain has a favorable effect on the retail sector's ability to create social value (SV).

3.7. Economic Value (EV)

Economic value (EV) is the value that a business strives to consistently extract from its resources. The generation of economic value via maximizing profits is one of the primary goals of the retail industry. There are various EV consequences for retailers that can help them increase their bottom line. EV is regarded as a gauge of the advantages an item or service provides to the economic force (Mostafiz et al., 2022). Typically, the EV is calculated using monetary units. When buying a thing helps the supplier, it creates economic value (Nazir and Das, 2024). Businesses that turn a profit can add economic benefit. The highest price a person is prepared to pay for an item or service is known as their EV. Various contemporary commercial applications may contribute to the retail sector's improved economic worth. If the cost of the item or service is varied, the economic value also does (Kisielnicki et al., 2022). The retail industry can become more profitable by reducing product expenses with the use of contemporary company tools. If the pricing for a good climbs significantly, an interested party can decide never to buy it. When that occurs, the ECV drops (Jia et al., 2023). EV is therefore thought to affect retail performance. Thus, the following hypothesis is put forth.

H6: Retail performance (RP) is positively impacted by economic value (EV).

3.8. Social Value (SV)

The retail sector's contribution to the production of social values (SV) is regarded as a measure of how well it has served society. The idea of corporate social responsibility (CSR) gives rise to social value (Lee, 2020). consumers may choose to purchase goods or services from retailers who make greater social contributions (Kimjeon and Davidsson, 2022). A variety of applications based on AI may be beneficial to raising the retail industry's social value. It is believed that the idea of social value affects the retail sector's overall achievement. Retail management typically develops social values, which are then embraced and embraced through the workforce (Johnson et al., 2022). Businesses frequently refer to social values as fundamental principles. Social values constitute common qualities among individuals who believe these principles are highly significant (Khalid et al., 2020). Social value is therefore thought to affect the retail sector's productivity. As a result, the following theory is developed.

H7: Retail performance (RP) is positively impacted by social value (SV).

3.9. Moderating Role of Entrepreneurial Orientation (EO)

Entrepreneurial orientation (EO) is regarded as the company's overarching strategic position (Khalid et al., 2020). As it comes to company growth, EO is supposed to help retail shop owners implement contemporary apps sufficiently early to enhance efficiency to be the company climate shifts. The EO is seen as similarly proactive since it assists entrepreneurs in taking the required actions to develop novel goods and services. The retail industry will benefit from benefits associated with seizing high-risk possibilities because of EO (Herve et al., 2020). Research indicates that EO contributes to the expansion of businesses in both developed and underdeveloped nations (Alnoor et al., 2024). Hussain et al., (2023), Additional research has also demonstrated

Table 1: Measurement items

Variables	Statements	Sources
Artificial intelligence		
A1	I believe that AI technologies are crucial for the growth of the retail sector in Jordan.	(Desai, 2019)
A2	I think AI applications can significantly enhance operational efficiency in Jordani retail businesses.	
A3	I believe that entrepreneurial orientation positively influences the adoption of AI in the Jordani Retail sector.	
A4	I think the implementation of AI in retail operations requires strategic planning and investment.	
AI-enabled Applications		
AEAs1	I believe that AI-enabled applications have the potential Tk revolutionize customer experiences in Jordani retail.	(Daradkeh and Mansoor, 2023)
AEAs2	I believe that the integration of AI applications can improve decision-making processes in retail management.	
AEAs3	I think AI-enabled applications facilitate personalized marketing strategies for Jordanian retail businesses.	
AEAs4	I believe that AI applications enhance inventory management and supply chain efficiency in the retail sector of Jordan.	
Blockchain		
B1	I believe that blockchain technology can enhance transparency and trust in transactions within the Jordanian retail industry.	(Carbonara and Santarelli, 2023)
B2	I think the adoption of blockchain in retail operations leads to improved security and reduced fraud risks.	
B3	I believe that blockchain implementation can streamline supply chain processes and reduce operational complexities.	
B4	I think blockchain technology has the potential to revolutionize payment systems in Jordanian retail.	
Virtual Reality (VR)		
VR1	I believe that VR experiences can attract more customers to Jordanian retail stores.	(Dubey et al., 2020)
VR2	I think VR technology enhances the immersive shopping experiences for consumers in Jordan.	
VR3	I believe that integrating VR in retail can differentiate brands and create a competitive edge in the market.	
VR4	I think VR applications have the potential to increase customer engagement and sales for Jordanian retailers.	
Augmented Reality (AR)		
AR1	I believe that augmented reality enhances product visualization and promotes sales in the Jordanian retail sector.	(Chae and Goh, 2020)
AR2	I think AR technology improves customer interactions and brand engagement in retail environments.	
AR3	I believe that AR applications contribute to unique and interactive shopping experiences for consumers in Jordan.	
AR4	I think integrating AR into retail operations can lead to increased customer loyalty and satisfaction.	
Economic Value		
EV1	I believe that the adoption of advanced technologies like AI and blockchain creates economic value for the Jordanian retail sector.	(baldeggar et al., 2020)
EV2	I think investments in AI technologies contribute positively to the financial performance of retail businesses in Jordan.	
EV3	I believe that leveraging AI leads to cost savings and revenue growth for retail companies in Jordan.	
EV4	I think AI innovations in retail operations improve market competitiveness and profitability in Jordan.	
EV5	I believe that embracing AI technologies is essential for the sustainable growth of the retail industry in Jordan.	
Social value		
SV1	I believe that AI technologies in retail contribute to social value creation in Jordanian communities.	(Alnoor et al., 2024).
SV2	I think AI technology adoption in retail promotes inclusivity and accessibility for diverse consumer groups in Jordan.	
SV3	I believe that retail businesses integrating advanced AI technologies contribute to community empowerment and development in Jordan.	
SV4	I think leveraging AI in retail fosters social connections and enhances community engagement in Jordan.	

(Contd...)

Table 1: (Continued)

Variables	Statements	Sources
Retail Performance		
RP1	I believe that entrepreneurial orientation positively influences retail performance outcomes in Jordan	(Abdullah et al., 2020)
RP2	I think the strategic adoption of AI enhances operational efficiency and competitiveness in the retail sector of Jordan.	
RP3	I believe that retail businesses leveraging AI outperform their competitors in terms of sales and customer satisfaction.	

the beneficial relationship between EO and the expansion of the retail industry (Hund et al., 2021). EO effects on industry performance during the effectiveness of connections between value creation and business strategies. Thus, this hypothesis creates.

H8a: There is a significant connection between EV and RP is moderate by EO.

H8b: There is a significant connection between SV and RP is moderate by EO.

4. RESEARCH METHODOLOGY

In this paper, we use PLS-SEM to evaluate hypotheses and confirm the conceptual model (Figure 1). This approach ensures analyze exploratory studies such as this. This approach helps to examine irregularly distributed data sometimes that the co-variance-based approach of structural equation approaches is unable to achieve (Hruby, 2024). To get responses from respondents a questionnaire-based approach is used in this way. After, getting the responses of participants utilize the 5-Likert Scale representing this way (1 strongly disagree and 5 strongly agree respectively.

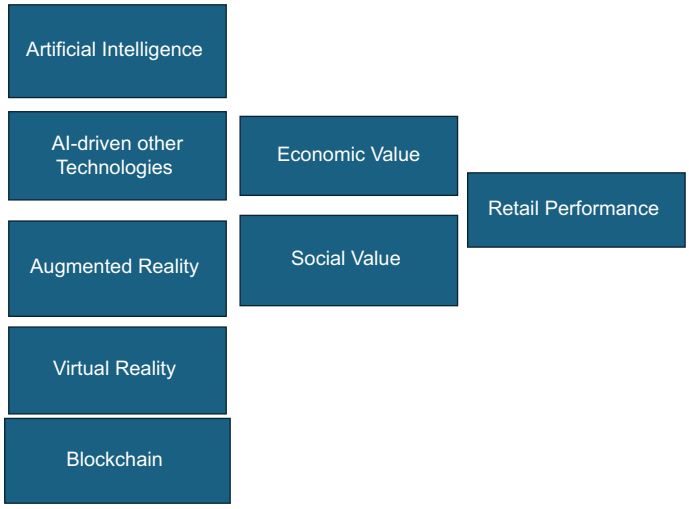
4.1. Research Instruments

We collect a questionnaire-based survey from respondents with the help of previous studies and make adjustments to create queries for this paper (Al-Gasawneh et al., 2024; Albloush et al., 2024; Alghizzawi et al., 2024; Alghizzawi et al., 2024; Alghizzawi et al., 2024; Ghaith et al., 2024). The questionnaire statements were used to prepare queries to apply in the survey, after a sample of 28 participants in a pretest. The statements were revised to improve their comprehensibility based on the initial test results. A pilot test was carried out following the initial test phase to improve the question's intelligibility and determine the intellectual accuracy of the tested questions. Information from participants who received information about the subject matter of the current research but did not take part in the main questionnaire was assessed during the pilot experiment. Through the help of the pilot experiment findings, the writers were able to determine the elements' content validity and improve the intelligibility of the question's recitals to make it easier for potential responders to respond. To improve the completeness of the survey statements, certain professionals with sufficient expertise in the field underlying the present investigation were contacted following the pilot evaluation. These procedures allowed the writers to refine thirty queries. Contains the answers to thirty questions in addition to the sources they used. As previously stated, the appendix's questionnaire could be completed by managers at various levels of the structure, such as senior, midlevel, and junior managers, in addition to non-managerial staff members within the retail industry. It applies to all forms of retail, such as beginning retail businesses.

4.2. Data Collection Strategy

The goal of the current study was to look into how AI technologies affect retail performance. As a result, information for the poll had to come from participants who understood the basics of artificial intelligence (AI) and how it affects the retail industry. Purposive sampling was judged to be the appropriate technique in this situation (Giuggioli et al., 2022). When using this method, the investigators primarily rely on their discretion to identify possible responders. Given that the majority of the research's writers live in Jordon, they thought it was most practical to focus on Jordon participants. As a result, they favored both purposive and convenient sampling. The gathering feedback from the participants, the authors participated in a few conferences and seminars that were conducted in several Jordanian cities between January 2024 and March 2024. The advantages and disadvantages of digital technology adoption by Jordon's retail sector for sustainability as well as value generation were discussed during these meetings and seminars. It was feasible to get in touch with a particular asset person at such meetings and events who assisted in providing the contact information of potential participants who might consent to take advantage of the questionnaire. There were 807 of these possible responders in total. The response sheets containing the 30 statements-formatted queries were given to those possible participants. To respond to the questions, every participant had to check one box for each of the five possibilities. The response sheet was supplied with instructions regarding how to complete it as well. Additionally, the respondents received guarantees that their privacy and confidentiality could be upheld. During the 2 months that were given to those surveyed to answer, 323 outcomes had been received. 41.01% of respondents responded. After these 323 responses were examined closely, it was discovered that 12 of them were missing information and weren't taken into consideration. 311 participants provided data to facilitate the statistical evaluation, which was analyzed across 30 items inside the permissible range (Dadnath et al., 2022). These 311 participants are managers, both male and female, representing various levels within these merchants that either have implemented AI technology or are considering doing so. These SMEs are located in Amman, Jordon. As a result, it is assumed that participants are knowledgeable about how AI adoption could support value generation and sustainability in retail. Table 1 shows the measurements that were relied upon to create the questionnaire and the previous studies that were relied upon and Table 2 provides demographic data for these 311 participants.

Figure 1: Conceptual model



Source: (Desai et al., 2019; Daradkeh et al., 2023; Dubey et al., 2020; Baldeggar et al., 2020; Abdullah et al., 2020; Carbonara et al., 2023)

4.3. Examination of Data and Outcomes

To determine whether each item was content valid, every item's loading factor (LF) was calculated. Next, after Cronbach's alpha (α) was appropriately assessed, its credibility, accuracy, and internal consistency of average variance extracted (AVE), composite reliability (CR), and AVE are examined. It was discovered that the values for these components fell under the acceptable range. Table 2 presents the findings. The square roots for every single AVE have been found to be larger than the corresponding factor correlation values, meaning that the Fornell and Larcker requirements are satisfied (Adel et al., 2023). This validates the concepts' discriminatory validity in Table 3 and Table 4 presents the findings.

4.4. Moderator Analysis (Multigroup Analysis, MGA)

The moderating impact of entrepreneur orientation (OE) upon the two links, EV→RP (H6) and SV→RP (H7) was investigated in the current study. Two types of impacts have been determined during the examination of EO's impacts on H6 and H7: strong and mild EO. Multigroup analysis (MGA) was carried out using the bootstrapping technique, taking into account 5000 resamples, to investigate these consequences. It is established that a moderator's impacts on a particular connection are deemed substantial if the p-value variance among the impacts of its two distinct categories is neither larger than 0.95 nor smaller than 0.05 (Abood et al., 2014). Table 5 presents the findings.

4.5. Hypotheses Testing

Cross-validated redundancy that every dependent component was evaluated by measuring the Q2 value, that turned found to be 0.070 (positive) (Amoako et al., 2021), taking into account distances between them 7. The outcome suggests that there is predictive significance in the framework (Abu-Allan and Alghizzawi, 2024; Al Shibly and Alghizzawi, 2024; Alqurashi et al., 2024; Habes et al., 2024).The standardized root mean square residual (SRMR) was taken into consideration as a standard index during validated models to determine whether the model was fit. The results showed that the SRMR figures for PLS and PLSc were the following: 0.065 and 0.031. Both of these numbers are higher than 0.08 (Arias-Pérez and Vélez-Jaramillo, 2022). This validates the correctness of the framework. This process assisted in estimating R2 values, p-values, and path coefficients of various links. Table 6 presents the findings.

In this study, fourteen hypotheses were developed and statistically verified. Two of these 14 theories deal with moderator EO's impacts on H6 and H7. The findings show that AI has a significant and beneficial effect on both EV and SV (H1a and H1b), with a degree

Table 2: Demographic statistics (n=311)

Constructs	Frequency	Percentage
Gender		
Male	180	57.89
Female	131	42.11
Hierarchy		
Senior Manager	70	22.50
Middle Level Manager	85	27.34
Junior Manager	65	20.90
Non-managerial staff	91	29.26

Table 3: Measurement properties

Constructs	LF	AVE	CR	a	t-value
AI		0.76	0.80	0.84	
AI1	0.85				26.08
AI2	0.83				21.14
AI3	0.92				26.08
AI4	0.85				32.87
AEA		0.86	0.90	0.91	
AEAs1	0.88				32.09
AEAs2	0.90				21.23
AEAs3	0.95				24.14
AEAs4	0.94				27.14
B		0.78	0.82	0.86	
B1	0.91				41.08
B2	0.86				26.27
B3	0.83				23.87
B4	0.94				22.02
VR		0.90	0.92	0.95	
VR1	0.88				25.09
VR2	0.93				27.23
VR3	0.85				32.14
VR4	0.90				26.16
AR		0.81	0.85	0.88	
AR1	0.94				26.03
AR2	0.87				35.28
AR3	0.91				38.08
AR4	0.83				33.41
EV		0.72	0.75	0.80	
EV1	0.88				34.13
EV2	0.75				29.07
EV3	0.83				32.43
EV4	0.85				35.03
EV5	0.88				35.12
SV		0.83	0.86	0.90	
SV1	0.83				25.10
SV2	0.93				23.27
SV3	0.95				38.78
SV4	0.88				26.87
RP		079	0.82	0.87	
RP1	0.92				32.75
RP2	0.78				21.08
RP3	0.92				25.27

Table 4: Discriminant validity test (Fornell and Larcker criteria)

Constructs	AI	AEA	B	VR	AR	EV	SV	RP	AVE
AI	0.86	0.76							
AEA	0.24	0.92	0.86						
B	0.17	0.24	0.87	0.78					
VR	0.29	0.30	0.18	0.94	0.90				
AR	0.15	0.35	0.26	0.30	0.89	0.81			
EV	0.36	0.31	0.21	0.37	0.16	0.85	0.73		
SV	0.30	0.17	0.34	0.36	0.32	0.22	0.90	0.82	
RP	0.32	0.15	0.38	0.27	0.27	0.36	0.20	0.88	0.79

Table 5: Moderator analysis (MGA)

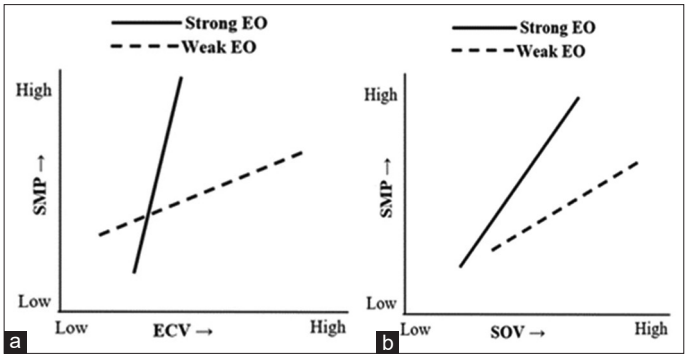
Connection	Moderator	Hypothesis	P-value difference	Remarks
EV>RP×EO	EO	H8a	0.04	Significant
SV>RP×EO	EO	H8b	0.02	Significant

Table 6: Structural equation modeling

Linkages	Hypothesis	Path coefficients	P-value	Remarks
AI>EV	H1a	0.15	P<0.1**	Supported
AI>SV	H1b	0.35	P<0.001***	Supported
AEA>EV	H2a	0.17	P<0.04*	Supported
AEA>SV	H2b	0.35	P<0.01**	Supported
B>EV	H3a	0.27	P<0.04*	Supported
B>SV	H3b	0.31	P<0.01**	Supported
VR>EV	H4a	0.28	P<0.05*	Supported
VR>SV	H4b	0.25	P<0.05*	Supported
AR>EV	H5a	0.23	P>0.05*	Supported
AR>SV	H5b	0.22	P>0.05*	Supported
EV>RP	H6	0.38	P<0.001***	Supported
SV>RP	H7	0.42	P<0.001***	Supported
EV>RP×EO	H8a	0.15	P<0.05*	Supported
SV<RP×EO	H8b	0.15	P<0.05*	Supported

P<0.05 (*); P<0.01 (**); P<0.001 (***); P>0.05 (ns)

Figure 2: Effects of EO on H6 (a) and H7 (b)



of significance at P < 0.001*** and P < 0.01** for the relevant path coefficients of 0.15 and 0.35, respectively. Additionally, as EV and SV (H2a and H2b) have corresponding path coefficients of 0.17 and 0.35 with corresponding degrees of significance of P < 0.05* and P < 0.01**, AEA has a significant and favorable effect on both. Additionally, the results demonstrate that VR has a substantial and beneficial effect on EV and SV (H4a and H4b), alongside concerned path coefficients of 0.28 and 0.25 and specific degrees of significance of P < 0.05* and P < 0.05**. B also has a significant and beneficial effect on EV and SV (H3a and H3b). Using a path coefficient of 0.23 and a significance threshold of P > 0.05*, it is evident that AR had a significant effect on EV (H5a). Nevertheless, given the relevant path coefficient is 0.22 at the threshold of significance set at P < 0.05*, AR has a significant beneficial effect on SV of 0.22 (H5b).As the path coefficients are 0.38 and 0.42, accordingly, with matching degrees of significance as P < 0.001*** and P < 0.001***, the present investigation also suggests that EV and SV may independently have a substantial and beneficial effect upon RP (H6 and H7). With path coefficients of 0.15 and 0.15, respectively, and significance values of P < 0.5* and P < 0.01**, the moderator EO has significant effects on both the connection among H6 and H7 as well as on H8a and H8b. Concerning the coefficients of determination (R2), the findings suggest that EV and SV may be explained by AI, AEA, B, VR, and AR to the extent of 36% (R2 = 0.36) and 36% (R2 = 0.38). The investigation also showed that the predictive capability of the suggested theoretical approach, that is, 66% (R2 = 0.66), could be explained by EV and SV together.

5. CONCLUSIONS

The present research has shown how academics and industry professionals have been paying more attention to digital transformation in the context of beginning retail approaches. The retail industry faces constant pressure to enhance its operational capabilities and procedures. This research has shown that artificial intelligence (AI) can lead the retail sector to develop fresh company values by promoting new forms of connections and activities with prospective clients. The findings demonstrate that the majority of AI technologies, including blockchain-based applications, AI, AR, VR, and social networking apps, can have a major and beneficial effect on the economic and social standards of the retail industry, which in turn affects the profitability of the industry. Notably, the current study has shown that blockchain-based technologies have significant effects on EVs (H5a).In other words, B significantly influences the retail sector's economic development, which runs counter to the conclusions drawn from (Saddique et al., 2020). This is most likely because the current study's findings depend upon an examination of responses from respondents in Jordan, where blockchain technology is being widely applied and has reached maturity within the retail industry. The application of AI must place a strong emphasis on integrating these new technologies with diverse business activities to achieve mixed styles, Recombination, integrating, and converging. According to the current report, artificial intelligence (AI) serves as the fundamental building blocks that businesses need to begin their AI adventure. To maximize

the potential advantages, our research addressed the crucial question of how businesses could build interconnectedness amongst various developing technologies. Furthermore, it is anticipated that the suggested approach will provoke thought in both the retail industry and other business sectors planning to embark upon the road to AI.

5.1. Discussion

Except for B-EV, the current analysis has shown that AI, AEA, B, VR, and AR have an important and beneficial effect on EV and SV. This finding is consistent with an additional investigation by Upadhyay et al., (2023) that examined whether the deployment of various AI technologies might alter company procedures. The important moderating effects of EO upon the associations among RP and its two separate predictors have been taken into account in the current investigation. A further investigation additionally provided evidence of the considerable moderating effects of EO on both of these links (H6 and H7) about MGA. Regarding the two connections represented by H6 and H7, nevertheless, the moderating impacts of High EO and Weak EO are presented herein with graphical representations, shown in Figure 2.

The impact of High EO and Low EO are shown across both graphs by the unbroken and crossed lines, accordingly. Strong EO increases the pace of rise in SMP across both situations to be higher than in contrast mitigating impacts of Weak EO as EV (for H6) and SV (for H7) increase. This is because the inclinations of the lines with dots seem to be smaller similar to the gradient with the straight lines across both graphs.

5.2. Contributions and Implications

5.2.1. Theoretical contributions

The current work has added multiple theoretical insights to the body of existing literature. For instance, the results of this study show that while the retail industry might assist individually with the five different types of technologies, they might benefit greater economically and socially by leveraging their intimate interconnectedness to boost efficiency and business development. The current analysis then shows that those five technologies helped speed up the creation of revolutionary company models, except in one case (H5a). The retail industry may make precise judgments instantaneously, balance demand with availability immediately, and streamline operations with the help of various digital apps. By claiming that a resource combination employed by the retail industry influences its performance, the present research has further expanded the idea of RBV theory. It has additionally been suggested that the retail industry may possess a stronger competitive edge if it possesses resources that are specialized, diversified, and challenging to duplicate. Businesses can outperform their rivals by providing greater value to prospective clients through the use of AI technologies. The variations in resource inventories of different organizations lead to differences in their performance. The five technological tools that were mentioned are rare, valuable, unique, and non-replaceable because they appear to give the retail industry's start-ups the ability to put plans into place that will increase their effectiveness and productivity. There isn't any alternative mixture that within the retail industry might match the beneficial synergies that are created by using these five apps together. Consequently, the retail industry outperforms other industries by generating value, supporting the broader meaning of RBV theory. The retail industry has been digitally revolutionized by the aforementioned technologies, which are also regarded as significant dynamical resources since their concurrent application may enable the industry to recognize possibilities and take advantage of them to achieve the right kind of gains. This has made it feasible to view the technological prowess that characterizes the entrepreneurial retail industry as an evolving capacity by expanding the notion of DCV theory. The new business retailer industry could adapt and respond correctly to the dynamic and fast-paced business climate by combining such applications. Rowdy et al., (2022) illustrated the benefits of AI by looking at several cutting-edge technologies including blockchain, AEAs, VR, and AR. The value arguments for these progressively merging apps and technologies were also examined in this study. The current study expands on this influence by examining whether the retail industry integrates, converges, recombines, and hybridizes 5 AI technologies to guarantee a range of far-reaching outcomes in different operational capabilities. It is argued that this enriches the body of existing literature. Examined how EO affected the retail industry's capacity for sustained development in a nation with a middle-income level that included the West African region (Nuseir et al., 2020). The research discovered a strong relationship between the impact of EO on the expansion of the retail industry through the use of data taken from 320 Ivorian merchants Z. The current study has expanded on this idea by examining how the retail industry in emerging markets may strengthen its adaptability and online business ownership to maintain its expansion continuity by utilizing various AI technologies in conjunction with the moderating effects of EO. It has enhanced the corpus of existing literature.

5.2.2. Implication of practice

Numerous useful implications have been produced by the current investigation. The results offer useful recommendations to retail managers and executives who want to use technological advances like AEAs, blockchain, VR, AR, and more to digitally transform their businesses. Managers and executives of beginning retail businesses must determine and assess if the industry can effectively detect rapid shifts in the setting of shifting internal and external surroundings while making investments in the development of these technology skills. This could assist the newly established retail industry in taking advantage of the benefits and lowering the dangers. Therefore, understanding staff capabilities within the circumstances of a company's digital maturity stage is critical for the digital transformation within the retailing sector's start-ups. The retail beginning industry should work with a tech-savvy partner who can offer assistance and instruction to help them decide upon the best course of action. Retail executives and managers need to determine whether their company is equipped to take advantage of perceived prospects. They must also determine whether their business is capable of creating social and economic benefits by rearranging its intangible and physical assets, both current and obtained, to enhance firm performance. To maximize potential while utilizing AI technologies concurrently, executives and managers within the retail industry need to possess the fortitude and insight to appropriately determine when and where to expand their abilities. Retail managers need to make

plans to ensure that their staff members are driven to follow the industry's environmental standards and are properly trained to use this technology. This would guarantee improved performance by assisting the retail sector in establishing economic and social cooperation values. Stated that consumer confidence in AI-related decision-making methods for businesses like recruitment, money management, and medical treatment is incomplete (Johnson et al., 2022). This sends an email that although people think autonomous systems might eventually replace the workers who provide these services, this hasn't occurred yet. According to Herve et al., (2020), it is preferable to think of AI in this way: as something that will enhance cognitive ability rather than replace it. In this regard, the retail industry's management ought to demonstrate the application of a hybrid structure (individuals and technologies) and the functions that human beings, as well as machines, perform within businesses by developing an entrepreneurial spirit. This is because a great deal of consumers see chatbots alongside other virtual aid technologies negatively (Kimjeon and Davidsson, 2022). Blockchain technology along with additional applications can benefit the retail industry. Considering that the blockchain stores trust, resources, control, agreements, and identities, retailers should focus on figuring out ways to effectively extract value through every one of these elements. The results of this investigation indicate that the retail industry will ultimately do better when analytics based on big data are used. To effectively derive meaning from the enormous amount of data, the retail industry must handle the issues in both technological and management contexts (Ozhan et al., 2022). To improve the retailing industry's total performance, managers and executives should concentrate on how AI can properly combine each of these contemporary technologies.

5.2.3. Limitations and Future Scope

The current study includes a few theoretical and practical ramifications, but it isn't without its limitations. The conclusions rely on similar cross-sectional information, which leads to endogeneity mistakes and flaws that undermine the causal connection among the variables. Longitudinal investigations may be undertaken by researchers throughout the probable future to eradicate these faults. The current research's conclusions were reached through data analysis derived from responses provided by participants in Jordan. As so, the outcomes raise questions about external validity. For broader findings, it is advised that future investigators gather information from participants who are spread out over the globe. The current study analyzed the responses from 311 participants to conclude. It is difficult to extrapolate the outcomes obtained across an extensive population. To ensure that the conclusions gained may be properly extrapolated, subsequent investigators should examine the data from a larger number of participants. The DCV hypothesis has been utilized in this research, yet it possesses the flaw of being insensitive to context. The precise circumstances whereby a retail sector's competence shall be of greatest importance cannot be determined by DCV theory (Rifai et al., 2023). In this regard, it is recommended that future research investigate the ideal circumstances that involve the combined influence of these various contemporary technologies that might potentially produce greater value for the retail industry and guarantee improved performance. The theoretical model that has been suggested has a 66% predictive ability. Future studies are advised to think about incorporating additional border circumstances and structures to see whether doing so could improve the model's capacity for prediction.

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