

EFFECTIVENESS AND SUSTAINABILITY IN MODERN E-TAILING BUSINESS THROUGH APPLICATION OF ARTIFICIAL INTELLIGENCE

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ABSTRACT

Electronic business or technically known as the electronic retailing is a booming sector across the world. E-tailing refers to the various activities related to buying and selling of goods and services to consumers around the world. The global e-tailing business is categorised by types of business, through end-use sector, and also geography. The market business model is categorized as B2B, B2C, C2B and C2C. In this e-tailing business, the emergence of AI component is very significant. It helps to understand the business better, helps to gather data through data mining, helps in human-machine interactions and helps to retrieve data and provide solution for customer related issues. On this backdrop, this study aims to bring out importance of e-tailing industry and also focusses to identify the role of artificial intelligence in the growth of e-tailing. It also aims to reveal the customer satisfaction and operational benefits for the e-tail business enterprises. It also studies the various trends in e-tailing by using AI technology and attempt find out challenges faced by the consumer and business enterprises in e-tailing. This piece of work adopts the descriptive research method to carry out the study. Based on the study, the existing gaps have been identified to provide suggestions for further innovations in e-tail business the AI technology.

Keywords: Modern E-tailing, Business, Artificial Intelligence, and Sustainability.

INTRODUCTION

E-commerce, also be called as electronic commerce, where the goods and services will be traded online through internet. It allows both buyers and sellers to do goods and service transaction at time and anywhere in the globe. It is very evident that e-commerce has been growing enormously in the past two decades (Mishra and Sushantha, 2019). The e-commerce become more significant due to availability of wide range of products, comparatively cheaper cost than the traditional physical stores, consumes very less time, no ques for payment and delivery of goods, easy exchange policies, and it helps to promote the business of the retail organisation. The global e-commerce business follows various nosiness models such as business to business (B2B), business to consumer (B2C), consumer to consumer (C2C), consumer to business (C2B), business to government (B2G), government to citizen (G2C), and government to business (G2B). Artificial intelligence has been deployed to reach a delightful customer experience, effective e-commerce management, state-of-the-art operational excellence, reduced operational cost and improving product quality. In this process machine learning and deep learning has been used as an important tool to enhance sales, cost minimisation, profit maximisation, forecasting, inventory control and fraud detection (Pallathadka, et al., 2021). The effectiveness of modern e-tailing has been done through the internet of things and the application of artificial intelligence in business operation. The artificial intelligence technology has become the ultimate solution for many online business issues in the e-commerce platform. The major role of AI technology is to

analyse data, and helps to take appropriate decision for customer satisfaction and retention (Balapriya and Srinivasan, 2022). Developing economies required to reach a high form of innovation for business enterprises from both public and private owned organisations (Ziyadin, et al., 2020). Business organisations are aggressively adopting innovative digital technologies through social media network applications, mobile applications, big data analytics, Internet of Things and blockchain technologies. This adoption has significantly involved in the core business process and practice (Matt, et, al., 2015). Market segments have started applying the artificial intelligence for sales promotion and post-sales services to sustain their customers (Ebert and Duarte, 2016). The digitalisation and e-tail business plays a key role in reaching the Sustainable Development Goals and achieve the market challenges (UNCTAD, 2021). Artificial intelligence supports many distant exchanges such as online shopping, online educational fee payments, and virtual online courses (Sivasubramanian, et. al., 2022).

On this backdrop, this paper aims to bring out the importance of e-tail business and the significance of artificial intelligence in e-tail business management. This study also aims to emphasize the various economic, financial sustainability of e-tail business through application of artificial intelligence components.

LITERATURE REVIEW

During the last few decades, the world countries have adopted a high level of digital technologies which helps to boost and shift the e-commerce business from traditional to a modern e-tail form (Panigrahi, and Karuna, 2021). AI supports for enhance product and services quality in e-tail business through price forecasting, image recognition, product description, sales analysis and customer tracking. It is also helpful in web designing, adoption of product recommendation system and search mechanism.

Artificial Intelligent refers to predict, measure, search, analyse and evaluate the outcomes accurately. It has the ability to identify, compare and predict customer buying behaviour for future plans of the e-commerce business operations (Zeeshan, and Komal, 2019).

Consumers taste and preferences also changes drastically in recent years. Hence, retailers have also updated their system delivering the products and services. Simultaneously, technological advancement through digitalisation triggered the e-tail growth across many countries (Ersoy, 2022).

The hike of non-traditional modern age changed consumer lifestyle and it influences the retail market to adopt the changes and vice versa. However, the innovative digital advancement, including e-tail and online market exchanges of goods and services become the vital in the retail segment. The growth of retailing begun from location-based to convenience-based e-tail in the modern business. Now in modern retail segment, the e-tail business demonstrates the experienced-based enabled with AI technology (Sheth, 2020).

Due to increase in the concentration of tough competition in the world market, the process and functions of retail segment have changed rapidly. The amount of shift from offline physical store to online e-commerce is inevitable and huge. The emergence of e-tail segment destroyed the physical stores in the market (Rangaswamy and Nawaz, 2022).

OBJECTIVES

- To understand significance of e-commerce in retail industry
- To identify role of artificial intelligence in e-tail business
- To access the economic effectiveness and sustainability of business in e-tailing through application of AI

METHODOLOGY

This piece of work adopts the descriptive research method to carry out the study. Based on the study, the existing gaps have been identified to provide suggestions for further innovations in e-tail business the AI technology. This research work is based on secondary data sources collected from various reports published by government and non-government agencies. This study reviews various existing available literature to identify the significance of artificial intelligence in e-tail business for sustainability.

RESULTS AND DISCUSSION

The main functions of the e-tail are to centralize the process of buying and selling under single online platform. It helps to generate report and analyse the data captured related to business and customers. It supports in customer order management and supply management for better services. Product recommendation system holds significant portion in e-commerce operations through the use of AI component. Product suggestion leaps the portion of e-commerce business with support of big data analytics. Based on these benefits, the e-commerce retail increased exponentially. It has been revealed from the following table 1.

Year	Sales (billion US \$)
2014	1336
2015	1548
2016	1845
2017	2382
2018	2982
2019	3351
2020	4248
2021	4938
2022	5542
2023	6151
2024	6757
2025	7391

Source: Global E-Commerce Retail Sales, Published by Stephanie Chevalier, 2022.

The global e-tail sales have been consistently increased over a period of time. It is evident from the above table 1, since 2014, the value of e-commerce business have hiked from \$1336 billions to \$4938 in 2021. Based on the sales performance, the e-tail sales have been projected as \$5542, \$6151, \$6757 and \$7391 respectively for the year 2022 to 2025. This e-commerce market mainly driven by the factors such as use of internet and smartphones. This tremendous growth of e-commerce the support of social media platforms and omni-channel business models.

Present Status of E-Commerce Segment

E-tail business amounted for \$ 4.9 trillion across the world. It is estimated to grow above 50 percent in the next few years. It is also found that the e-commerce sales have reached to \$3.56 trillion through mobile application. It is identified that 58.4 percent of the people are buying some goods and services from e-commerce business platforms. Among

those shopping, electronics and fashion segments occupy major portion. According to Shopify, e-commerce retail business increased by more than 10 time through use of AI in social media platforms.

Major Players in E-Tail Business

The important players in global e-commerce segment are Amazon, Alibaba, Walmart, The Home Depot, JD. Com, Rakuten, Otto & Co, Zalando, Priceline, B2W, Costco, and Shopify. The e-commerce business model has been classified into two models namely, horizontal and vertical. The horizontal business model in e-tail referred as selling of all commodities in a huge number of categories. On the other hand, the vertical model referred as selling of unique and specialized products. The sellers will focus on a specific product and sell Table2.

E-Commerce Business Model	Browsing Tool	Payment Method	Product
Horizontal	Desktop	Card Payments	Fashion & Beauty
Vertical	Laptop	Bank Transfer	Tour & Travel
	Mobile Phone App	Digital Wallets	Electronic
	Tablet App	Cash Payments	Household
	Mobile Phone Browser	UPI Payments	Pharmaceutical
	Tablet Browser	NEFT/ IMPS/ RTGS Payments	Food & Beverages

Source: <https://www.shopify.com/research/future-of-commerce/future-of-ecommerce>.

It has been observed that e-commerce purchasing done through various browsing tools such as desktop, laptop, mobile phone browser and application, tablet browser and application. In this process of buying of goods and services exchanged by various payments modes. The usual methods of payment transacted are card payments (both credit and debit cards), bank to bank transaction (internet banking payment), payments through wallets, UPI payments, NEFT transfers and cash on delivery. The major products which are capturing the market by fashion & beauty, tours and travel, electronic & household, food & beverages and pharmaceutical.

Significance of Artificial Intelligence Application in E-tail Business

The AI component will ensure the use of cloud by the clients for better online shopping experience and it also useful for the e-tailers to offer a greater number of product images to their consumers. It also provides various navigation facilities to the new customers for easy identification of products from websites. More importantly, the application of AI technology helps to find out new offers, new products, trends and varieties through navigations and search tools. Application of AI technology and automation provides smart shelves, robotic system of inventories and separated area for new arrivals in e-commerce module. It helps the consumer to choose a better commodity on trend. It also ensures the delivery tracking system for the clients to check their status of the product delivery with notification to their mail and mobile device as short messages. Apart from the client side, AI enables the e-commerce enterprises to enhance their business. The application and use of AI innovative technology supports to promote the online sales. It helps to understand the buying behaviour of the customer through data storage system and client control system. It saves all

the activities such as customer log-in to the website or apps, browsing history, product wish list, purchase history, and payment information. AI components helps to promote the sales by suggestive selling while the customer is buying any commodities. The relevant and complementary commodities available in the website will be automatically suggested by the automated system to the buyer. It helps the buyer also to buy the complementary and relevant commodity at one place. It saves time and money where sometime the bundled purchase will offer competitive price to the customers. AI helpful in collecting and storing the data and further it will be used to analyse for the better decision making on accruing goods for refilling. The AI component and cloud systems will enable the e-tailors to upload more product images with high resolution, product videos, description meet existing and future demand of the consumers. On the whole, the use of AI improves sales growth and sustainability in business very effectively in the competitive e-commerce world (Jaheer, et al., 2022) Table 3.

North America	US
	Canada
Europe	Germany
	UK
	France
	Italy
	Spain
	Sweden
	Netherlands
	Norway
	Russia
	Rest of Europe
	Asia-Pacific
India	
Japan	
South Korea	
Australia & New Zealand	
Indonesia	
Vietnam	
Malaysia	
Rest of Asia-Pacific	
Latin-America	Brazil
	Mexico
	Argentina
	Rest of Latin America
Middle-East & Africa	Saudi Arabia
	UAE
	Israel
	South Africa
	Rest of MEA

Source: <https://www.shopify.com/research/future-of-commerce/future-of-ecommerce>.

Major e-commerce captured by North American countries., Europe, Asia-Pacific, Latin America, Middle East counties and Africa. The major portion of the e-commerce sales also done by these countries.

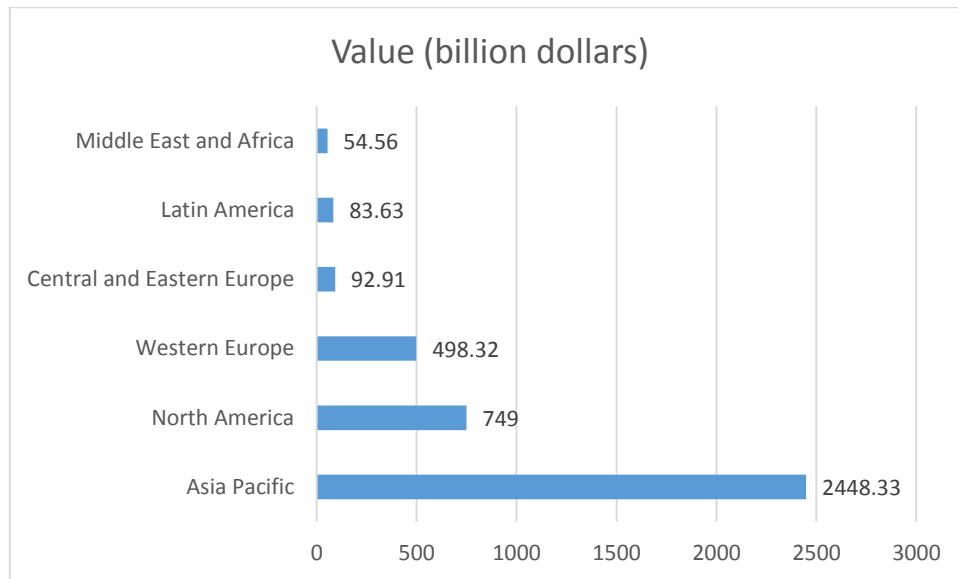


FIGURE 1
E-COMMERCE SALES BY REGION, 2020 (BILLION DOLLARS)

Source: UNCTAD, 2021.

The above Figure 1 exhibits region-wise e-commerce sales in the year 2020 for the major sales contributing countries. In this, the Asia-Pacific countries such as China, India, Japan, South Korea, Australia, New Zealand, Indonesia, Vietnam, Malaysia, Rest of Asia Pacific contributing \$2448.33 billions of sales value. North America and Western Europe contributing 749 and 498.32 billion US dollars value of e-commerce sales respectively. Central and Eastern Europe contributing 92.91 and Latin America with 83.63 billion US dollars in the same year. Middle East and African countries contributing 54.56 billion US dollars value of e-commerce sales Table 4.

Benefits	Percentage Share	Value
Cost Effectiveness	49	
Effective Productivity	44	
Automated Operation	39	
Effective delivery & Services	38	
Effective Innovation	22	
Effective Revenue Generation	16	

Source <https://www.statista.com/statistics>, 2021.

The more effective way of customer experience has been enabled through online chatbots in e-commerce. The cost-effectiveness has significant value with 49 percent for the e-tailors. The productivity and automated efficiency records at 44 percent and 39 percent respectively. The automated and proper delivery of goods and services come next with 38

percent. The other major role and benefit arrived is innovation at 22 percent and revenue generation benefit reached at 16 percent. Perceptibly, these operational benefits support e-tail business to grow further with sustainability Table 5.

Instruments	Using
Touch Screens	5.9
Machine Learning	2.8
Voice Recognition	2.5
Machine Vision	1.7
Robotics	1.3
Natural Language	1.2
RFID	1.1
Augmented Reality	0.8
Automated Vehicles	0.8

Source <https://www.statista.com/statistics>, 2021.

The other crucial implications of AI application in e-commerce such as business integration, systematic website management, auto upgradation, inventory refilling, stock maintenance and all-time virtual customer assistance (Bolton et al., 2019).

Major Findings

The effectiveness of modern e-tailing has been done through the internet of things and the application of artificial intelligence in business operation. The artificial intelligence technology has become the ultimate solution for many online business issues in the e-commerce platform. The major role of AI technology is to analyse data, and helps to take appropriate decision for customer satisfaction and retention. Artificial Intelligent refers to predict measure, search, analyse and evaluate the outcomes accurately. It has the ability to identify, compare and predict customer buying behaviour for future plans of the e-commerce business operations. The AI component will ensure the use of cloud by the clients for better online shopping experience and it also useful for the e-tailers to offer a greater number of product images to their consumers. It also provides various navigation facilities to the new customers for easy identification of products from websites. More importantly, the application of AI technology helps to find out new offers, new products, trends and varieties through navigations and search tools. Application of AI technology and automation provides smart shelves, robotic system of inventories and separated area for new arrivals in e-commerce module. Asia-Pacific countries such as China, India, Japan, South Korea, Australia, New Zealand, Indonesia, Vietnam, Malaysia, Rest of Asia Pacific contributing \$2448.33 billion of sales value. North America and Western Europe contributing 749 and 498.32 billion US dollars value of e-commerce sales respectively. Central and Eastern Europe contributing 92.91 and Latin America with 83.63 billion US dollars in the same year. Middle East and African countries contributing 54.56 billion US dollars value of e-commerce sales.

CONCLUSION

This paper emphasised various significance of artificial intelligence in e-tail segment for sustainable business practice with favourable outcome. Existing research work and related literature evidences the crucial role of AI components in e-commerce segment. It supported

very well in sustainable business development and profit earnings to the retail organisations. The traditional online shopping changed to a vibrant and lucrative shopping experience for the customers too. It also helps to make marketing activities in the website. E-tail business amounted for \$ 4.9 trillion across the world. It is estimated to grow above 50 percent in the next few years. It is also found that the e-commerce sales have reached to \$3.56 trillion through mobile application. It is identified that 58.4 percent of the people are buying some goods and services from e-commerce business platforms. Among those shopping, electronics and fashion segments occupy major portion. Application of AI technology and automation provides smart shelves, robotic system of inventories and separated area for new arrivals in e-commerce module. It helps the consumer to choose a better commodity on trend. It also ensures the delivery tracking system for the clients to check their status of the product delivery with notification to their mail and mobile device as short messages. Apart from the client side, AI enables the e-commerce enterprises to enhance their business. The application and use of AI innovative technology supports to promote the online sales. It helps to understand the buying behaviour of the customer through data storage system and client control system. It saves all the activities such as customer log-in to the website or apps, browsing history, product wish list, purchase history, and payment information. AI components helps to promote the sales by suggestive selling while the customer is buying any commodities. On the whole, the use of AI in e-commerce provides large chunk of avenues for the sustainable business development, effective profit-making and impactful decision-making on business by the e-tailers in the retail business segment.

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Received: 26-Dec-2022, Manuscript No. AMSJ-22-13042; **Editor assigned:** 27-Dec-2022, PreQC No. AMSJ-22-13042(PQ); **Reviewed:** 21-Jan-2023, QC No. AMSJ-22-13042; **Revised:** 24-Feb-2023, Manuscript No. AMSJ-22-13042(R); **Published:** 23-Mar-2023