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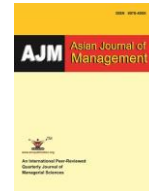
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RESEARCH ARTICLE

Artificial Intelligence in E-commerce: Applications, Implications and Challenges

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ABSTRACT:

Artificial intelligence (AI) is a large subject of computer science devoted to the development of intelligent computers capable of doing tasks that would typically need human intelligence. AI programming focuses on three cognitive processes: learning, reasoning, and self-correction. Many E-Commerce firms today employ artificial intelligence to better understand their customers and meet their expectations. Machine learning, the most popular subset of AI technology, can make sense of all the data that online stores collect and use it to provide insights that improve customer experience, streamline internal business operations, and combat fraud. This paper basically aims to identify some key applications of AI in E-commerce by reviewing research articles from various sources. The study concluded that AI has great impact on improving the efficiency of E-commerce companies and these companies are investing more and more with coming time to help their business to grow and boom in the recent years.

KEYWORDS: Artificial intelligence, E-Commerce, Machine learning, Efficiency and Insights.

1. INTRODUCTION:

E-commerce has changed the way business is done in India, bringing in millions of consumers and millions of dollars in sales. The largest segment of the e-commerce market in India is fashion, followed by electronics and then home and kitchen products. The fastest-growing e-commerce companies in India include Flipkart, Paytm, Amazon and Shop Clues. The e-commerce market will account for 2.5 percent of India's GDP by 2030 and growing 15 times and reaching USD 300 billion¹. E-commerce has revolutionized the way products are bought and sold in India. In the past, consumers had to rely on traditional store-based shopping to buy the products they needed. With the advent of e-commerce, however, consumers now have the ability to purchase products directly from the manufacturer or vendor, at lower costs and with greater convenience.

The Indian e-commerce market is expected to grow to US\$ 111.40 billion by 2025 from US\$ 46.2 billion as of 2020. The e-commerce industry in India is growing at an exponential rate. In 2018, the e-commerce market in India was valued at approximately 22 billion U.S. dollars. This number is expected to reach 200 billion U.S. dollars by 2027, a growth of roughly 96.7 per cent over the period 2016-2027². Image 1 shows visual representation of current trends in market size of E-commerce in India as well as the growth can be achieved by the year 2027.

The Indian e-commerce market is expected to become a major driver of the country's GDP by 2025, contributing to as much as 8 per cent of the GDP by that year. India's consumer Internet economy (e-commerce industry) is set to touch the \$100 billion mark for the first time in 2021 driven by massive growth in consumer adoption across sectors.³

The coronavirus (COVID-19) pandemic continues to have a significant influence on e-commerce and online

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consumer behavior around the world. The outbreak began in September 2018, when the first confirmed case of the virus was reported in a man who had been to Saudi Arabia. Over the next few months, cases continued to be confirmed across the Middle East, Europe, and finally in the United States. The pandemic has had a significant impact on the way businesses operate across the world, particularly in industries that rely on human contacts such as healthcare and public transportation. In 2022, US e-commerce sales are expected to surpass \$1 trillion for the first time. Prior to the pandemic, researchers predicted that e-commerce would not reach this milestone until 2024. Worldwide, e-commerce sales are expected to reach \$5 trillion in 2022 and \$6 trillion by 2024.⁴

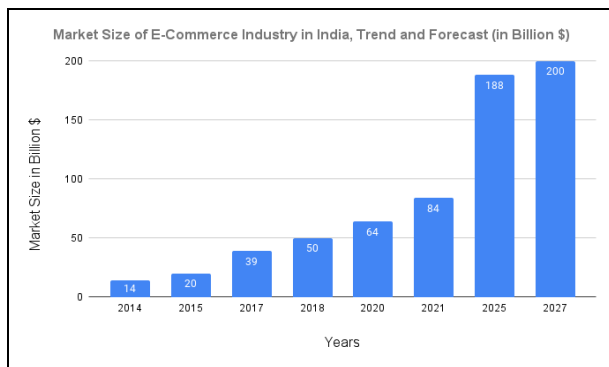


Image 1: Future of E-commerce Industry⁵ – Constructed by Author

1.1 Major Companies in E-Commerce Sector:

The Indian e-commerce industry is booming at a rapid pace. Sale with service is one of the e-commerce companies that fit into the criteria of being one of the best e-commerce companies in India. Sale with service has transformed the way business is done in India⁶. Image 2 presents an analysis of the Top 10 E-commerce sites in India for 2020 as per monthly traffic on each site by the potential leads and customers.

While Amazon is at the top of the list, there are very few other American brands in the top ten. The top ten is dominated by Indian and Asian brands. Furthermore, the Indian e-commerce scene has a good mix of pure e-commerce players and brick-and-mortar retailers turned e-commerce behemoths.

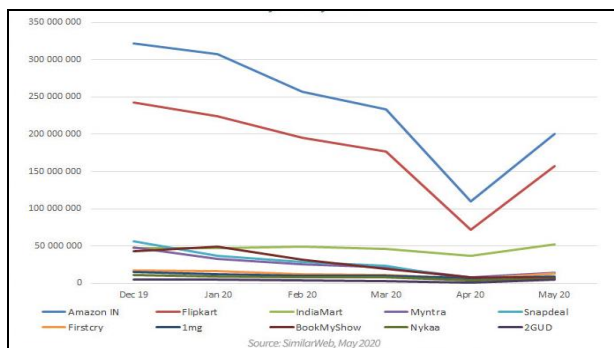


Image 2: Top 10 e-commerce sites (by monthly traffic) – India 2020⁷

While the Indian e-commerce sector is still in its early stages, it is a market rich in opportunity; with so many people comes so much room for major and minor players to take a large slice of the Indian e-commerce pie.

1.1.1 Amazon India:

The biggest e-commerce company in the world is Amazon, which has expanded to include everything from clothing to food to electronics, and it now bills itself as the ultimate provider for AI-as-a-service by giving developers the tools to build applications on Amazon Web Services.

Machine learning algorithms help Amazon's logistics operations run smoothly. When it comes to delivery, artificial intelligence and machine learning (ML) capabilities are used to determine the best route and time to deliver the package. The CEO's letter discussed true customer obsession and how artificial intelligence and machine learning would be the focus as the company continues to fend off rivals. [8]. One of the most important takeaways from the founder's letter was Amazon's ambition to become an AI-as-a-service provider. There have been many developments in this space. In December 2017, AWS announced a flurry of new ML features for AWS customers, putting basic AI tools in the hands of developers and the startup community to implement AI technology. Amazon also hosts The Amazon AI Conclave, which aims to bring together and nurture the AI ecosystem while also showcasing the leading work in AI in India and driving broader awareness and adoption of AI.⁹

1.1.2 Flipkart:

Flipkart is now turning to artificial intelligence (AI) for deeper insights, establishing a separate AI unit called AI for India. The new AI unit will enable the company to mine its consumer data and strengthen its business strategies. Flipkart has reportedly trounced its biggest rival Amazon in the biggest sales battle of the year, in a constant tug of war for e-commerce market share in India. Following a hiccup in Flipkart's growth, several global investors had written off the company's growth storey.

Flipkart has already hired a large number of AI specialists and professionals by forming alliances with top educational institutes in India. The company is going above and beyond to build the infrastructure required to support the massive demand for its services. The company has already established its largest fulfilment center in India, and it intends to expand its presence in other parts of the world, including the United States and the United Kingdom. Flipkart intends to build a strong foundation for its AI platform by leveraging the strengths of its partners.¹⁰

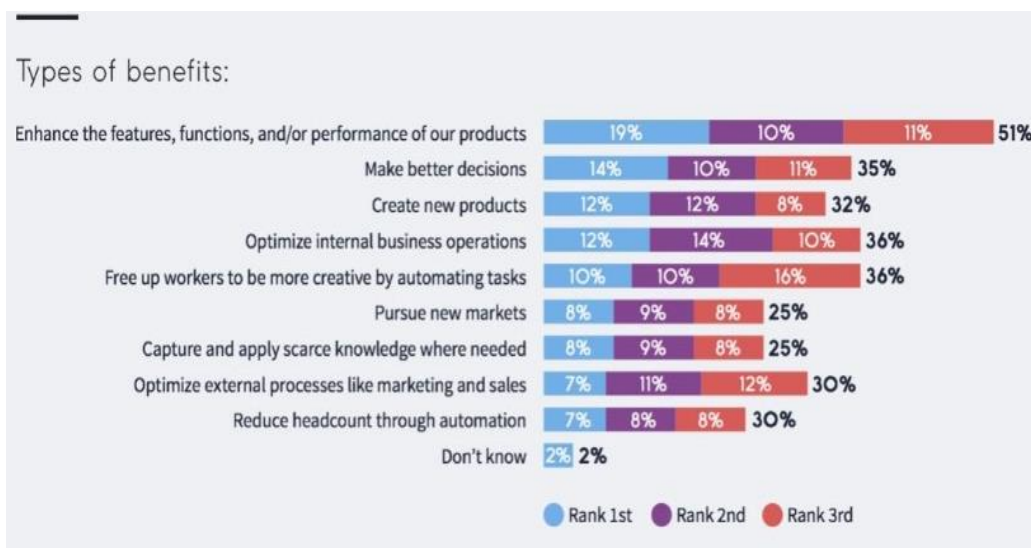
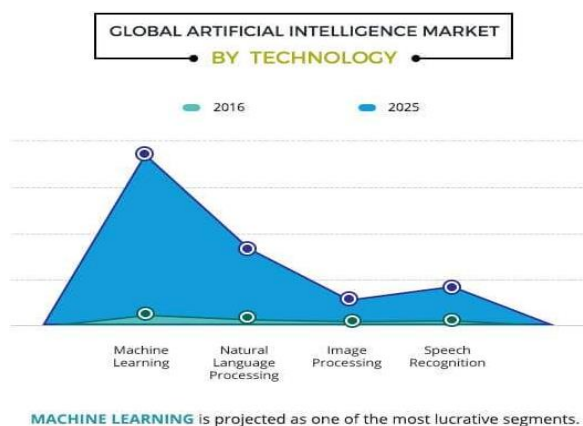


Image 3: AI Primary Benefits to Companies¹¹

AI can be termed as a rapidly expanding technology that has had a huge impact on the e-commerce business by improve customer interactions and expedite business operations, resulting in a better customer experience both on and off the company's website. Artificial intelligence can be used to tailor e-commerce services to the preferences and interests of each individual customer, boosting the value of customer data collection and analysis. Image 3 explains various types of benefits offered by AI to the companies and how companies rank these benefits as per their requirements to grow in the economy. Since the E-commerce compabies usually lack human interaction, AI has covered that gap and made it more easier for companies to serve their customers better than actual physical sales.¹²

Today's online merchants make better decisions by combining artificial intelligence with data from both the company and its consumers to more precisely estimate future events and adjust operations. Apart from product recommendations, online merchants are employing artificial intelligence to deliver chatbot services, evaluate customer feedback, and provide personalised services to online clients. Image 4 explains the grwoth and usage of Atifical Intelligence market in terms of technology being used globally. This also clears the fact that the use of AI is projected to increase tremendously by 2025 than that of 2016 (primarily through Machine Learning). According to a 2019 Ubisend survey, one out of every five consumers is willing to purchase goods or services from a chatbot, and 40% of online purchasers are looking for great prices and offers from chatbots¹⁴.



MACHINE LEARNING is projected as one of the most lucrative segments. Image 4: Global Artificial Intelligence Market¹³

2. LITERATURE REVIEW:

The author with the use of secondary sources in this paper found out that- Deep learning platform, technologies like voice analysis, biometrics, image recognition, video analysis, robot automatic processing system, text analysis and natural language processing (NLP) will develop steadily and AI will continue to promote the development and reform of e-commerce in the future¹⁵. This research stated that AI will include features that drive projected outcomes, allowing for real-time adjustments to major business components to maximize gains and corporate outcomes. The impact of AI in e-commerce is particularly noticeable in terms of client retention and happiness¹⁶. One of the most important applications of AI in e-commerce is to assist specialists in estimating sales and analyzing large volumes of consumer data in order to gain relevant and valuable data for strategic, tactical, and operational choices¹⁷. The author used secondary sources, like articles and blogs, to conclude that Smart services are generated using Artificial Intelligence, in which the

technology asks clients questions and, depending on their responses, provides appropriate and personalized recommendations that are tailored to their expectations¹⁸. The authors made use of secondary sources, like blogs and articles, to sum up that in comparison to previous technological developments, AI/ML systems have emerged as the most crucial component of the e-commerce ecosystem in a shorter time frame. Consumers have well-adapted A.I/M.L systems in their general day-to-day hierarchy, and other Ecommerce operators are farming the benefits of the same.¹⁹

The paper discusses how AI is a blessing in disguise because it will make our lives easier, but every good has its own evil; the algorithms will decide for us everything. The OECD report provided awareness to the designer about all the possible consequences, harm, and biases the algorithm can cause to the market and society everywhere and creation of laws pertaining to those harms²⁰. Artificial intelligence is being used by online retailers in the E-Commerce industry for giving visit bot administrations, analyzing client remarks, and offering customized types of assistance to online customers. Innovative instalment frameworks, for example, advanced wallets, have been developed, and the web, retail, and telecom industries have begun to offer financial administrations²¹. The study relies on secondary data gathered from various databases to illustrate how AI enables large-scale data acquisition, processing, and inference with efficiency and accuracy. E-commerce is one of the industries that makes the most of AI to build a customer-centric search, voice-powered search, increase customer recommendations, and combat fraudulent reviews, among other things²². The paper quotes that lately, AI and E-trade have proven to be mutually beneficial. Customer demands and wants change with time, but with the help of ever evolving AI, creative and new strategies to recognize purchaser purchasing behavior and make things according to their requests were created²³. The article demonstrates that well-established retail businesses are incorporating AI into their manufacturing processes to boost efficiency and revenues. AI systems work by ingesting large amounts of labeled training data, analyzing the data for patterns and correlations, and using these patterns to make forecasts about future states.²⁴

3. RESULTS AND DISCUSSION:

Image 5 holds a snapshot of all the available applications of AI in E-commerce (not limited to) explained in this paper through extensive research. Some Major applications of AI in E-commerce business that can be understood by us after a detailed analysis are as follows:

3.1 Use of Chat bots:

E-commerce companies use chat bots to provide 24x7 services to their customers. Since employees cannot be

available every time to sort out consumers' problems, these chat bots acts as replacements of humans and majorly solve customers' issues at any point of day. AI can handle a variety of data-related activities, enhancing the capabilities of e-Commerce chatbots and allowing users to receive a variety of services.²⁵

Some major ways in which chat bots can be useful are as follows:

- i. Chat bots powered by artificial intelligence can inform your customers when certain products are out of stock and recommend alternatives. They can also notify clients about delivery dates or make product recommendations based on their responses to basic queries.
- ii. According to data, 55 percent of consumers are interested in solutions to simple product concerns, and 64 percent of online client's want 24/7 customer service that humans cannot deliver. Companies may save up to 30% on customer service costs by adding a basic FAQ chat bot to their website and chatbots can even connect clients with real people when they have complex queries.²⁶
- iii. When talking about customers who usually get distracted easily while shopping on online websites and sometime discard items that they put into their cart, in such cases chat bots often remind customers about their discarded cart items and, in some cases, often results in converting them into beneficial leads for the company.
- iv. Sometimes the customers do not really know what things to buy while shopping from an online website, in such cases the AI enabled chat bots can have a normal conversation with the customers about their interests and wants and further guide them with the product choosing decision accordingly giving them a highly professional personalized services without asking them to move from their comfort places. For example, E-Bay shop bots, like an experienced sales representative, consults with customers to determine their needs and then makes specific recommendations. This makes the customers feel heard and wanted which indirectly leads to customer retention for that particular business.²⁷

3.2 Virtual Reality Experience:

With the help of AI, companies can come up with several virtual assistants to act as guide for the customers so that the customers can receive the best facilities throughout their shopping experience. For example, Amazon's virtual assistant Alexa helps customers look for desired products and services just by their voices which eliminate the task of searching down their products or services by typing on net. Moreover E-commerce companies can also come up with a new kind of service using AI where they actually create an environment of virtual shopping mall where customers

just by moving their phones enter into the shopping mall virtually decide on the products they want, try it on them maybe through creation of their avatar accordingly and then buy it. This will give them the feeling of physical shopping just by sitting in their homes. The advancement of AI to act as virtual assistant of customers of e-commerce companies will mainly be because of Natural Language Processing (NLP) that holds the ability of the machine to interpret words and texts that humans put into it and act accordingly.²⁸

The AI powered virtual assistant will hold more power in the future and might be developed in a manner that it would be able to perform complex tasks simultaneously in one time, having built with more advanced computing technologies.

3.3 Image Search and Recognition:

This application of AI is used in situations when customers can come across a product while surfing the net and may not be sure about what to call it. E-commerce companies can use the AI technology and come out with service where the customers need to point out the camera towards a particular product and get its description or similar recommendation which eliminates the need of knowing the keywords to search for the same. Customers can even upload a picture of a product and get relevant information about the same or information of places where they can buy this product from giving them access to quick, practical, convenient and stress-free shopping experience overall.²⁹

According to a Kissmetrics survey, 93 percent of buyers believe visual aids to be important in their purchasing decisions. Companies can use the same visual artificial intelligence assistance to bring potential clients straight to the things they want to buy when they set up their website and online store. Their clients will experience fewer diversions along the process, which means that they will be significantly more likely to make a purchase on companies' site, and far less likely to support companies' industry competitors. Deep learning-based image identification can provide companies with benefits such as consumer analytics, social media commerce features, tailored searches, and more. They may also use the information obtained by image recognition to create successful marketing strategies and campaigns that will help them increase their ROI.³⁰

3.4 Competitive Monitoring:

Competition Monitoring has become essential for every e-business to understand the first-hand insights on how other businesses are operating in the same conditions under the same market, with the same pool of clients. However, it is important to take references from any price variations, as well as other factors, when monitoring if competitors wish to improve the

possibilities of our own brand. When analyzing the competition for a brand or online store, it is critical to understand the customer relationship. After all, it is these people who enable you to survive through their purchases. The presentation of each product, as well as the connection with customers and potential customers, influence this perception.³¹

In fact, according to a recent Intelligence Node study, 94 percent of online shoppers compare prices. As a result, in order to stay ahead of the competition, retailers must invest in smart competitor price monitoring software that can serve as their eyes and ears for price movements across the eCommerce landscape. Competitive Monitoring is a price intelligence tool that analyses various external and internal factors and it gives an insight into daily price changes using Artificial Intelligence. Factors like competitor pricing, market demand and supply of the industry, market positioning etc. Competitive Monitoring induces price optimization as it enables organizations to get dynamic price predictive analysis to help retailers. The most fundamental feature of any price monitoring software should be the ability to automatically monitor price movements of products across competitors in real-time and present this information to businesses in a simple, easy-to-understand dashboard³². Developing Competitive Monitoring necessitates clarifying brand's positioning, identifying competitors' worth monitoring, and employing the appropriate price monitoring tools. With a well-implemented price monitoring strategy, the organization receives weekly, daily, or even real-time updates on significant changes in the competitive landscape. Because of dynamic pricing tools, it is now possible to visualize how competitive pricing strategies work and adapt businesses to organizations that are operating within the same personalized parameters³³.

3.5 Inventory Management:

Inventory management is a process that combines logistics and supply chain management to ensure that the right products are available at the right time in the right place. Artificial Intelligence can be used to automate a significant portion of the inventory management process. Artificial intelligence provides powerful insights for organizations, such as trends identified from large volumes of data analyzed, so that business owners and warehouse teams can better manage the day-to-day tasks of inventory management.³⁴ Aside from the use of new technology, an organization can control and improve its inventories. Implementing inventory management techniques will provide clear benefits such as cost reduction, increased customer satisfaction, improved supply chain, and increased employee knowledge³⁵. According to the numbers of 2020 45.1% of companies have invested capital in automation of their warehouses and 40.1% have invested in developing their AI

solutions for inventory. Inventory Management is not only restricted to delivering and storing, it is also about forecasting, planning and controlling of inventory. Here Artificial Intelligence comes into play and minimizes the risk of over and under stocking of inventory through technological solutions like analyzing and correlating demand insights accurately, detecting and responding to dynamic demand for a specific product, and considering location specific demand³⁶.

3.6 AI Powered Robots to Optimize Warehouse Operations:

The e-commerce industry is changing due to automation. Robots are taking over a wide range of human tasks, from order picking and packing to inventory movement throughout the facility. Instead of simply replacing humans, robots are increasingly being used to supplement and assist human workers, often resulting in increased productivity and efficiency. One of the most exciting applications of robots in the warehouse is the use of AI-powered robots. Warehouse operations can be a major headache when it comes to running a successful e-commerce business. E-commerce businesses must not only worry about efficient order fulfilment, but they must also ensure that inventory is in stock and that they

are making the best use of your warehouse space³⁷. Warehouse operations can be a difficult to manage environment. Keeping track of inventory and ensuring orders are packed and shipped on time can be difficult with thousands of products coming in and out. However, new technology being developed by Amazon is set to make the job much easier. The e-commerce behemoth is developing AI-powered robots capable of optimizing warehouse operations, making the process more efficient and reducing the need for human labor³⁸. New artificial intelligence-powered robots are now being developed to optimize warehouse operations in ways you never thought possible. Robotics are used in today's warehouses. Robots transport products from delivery trucks to shelves and then to pick stations, where human employees select the appropriate items for customers. While this system has significantly increased warehouse productivity and efficiency, there is still much room for improvement. Rather than relying solely on the robotics system to move the products, human employees can also use an aisle-based system, in which employees are in charge of moving the products from one location to another³⁹.



Image 5: Applications of AI in E-Commerce – Constructed By Author⁴⁰

3.7 Predictive Analytics in E-Commerce:

Since e-commerce has evolved globally, the emergence of predictive analytics in e-commerce has aided the development of the global economy. Risk analysis, churn prevention, market analysis, demand forecasting, and other functions are all determined by this technology. Large corporations are now focused on the benefits of predictive analytics in order to grow their businesses and improve operational efficiencies.

In e-commerce, predictive models can be used to identify which products are most likely to sell well, and predict which products may not sell as well. This can help retailers predict inventory needs, and can also be used to identify which products may be selling better online than in a physical store⁴¹.

Predictive analytics has the power to improve the performance and efficiency of virtually any organization, from small startups to global corporations. The applications for predictive analytics are almost endless, from improving the efficiency of supply chains to improving customer service to generating revenue.

Customers resorted to internet retail for security and privacy concerns when the epidemic broke out. To decrease and remove risks, predictive analytics examines browsing behaviors, payment strategies, and client purchasing ways. E-commerce enterprises will be able to set rules and automate risk detection and prevention thanks to the combination of predictive analytics and machine learning capabilities. Machine learning

capabilities will create the most relevant results and recommendations to consumers, while predictive analytics will allow for ongoing review of user data⁴².

3.8 Interpretation of huge Volumes of Data and Website Optimization:

Companies contain huge amount of data be it related to their own customer base or their competitors' customer base or even related to transactions of the industry as whole. Powerful marketing behavioral analytics solutions makes it possible to map the wealth of data from multiple sources in seconds to reveal trends and insights that aren't available via human analysis alone⁴³. This mapping can help companies, at each phase of the journey, plan and predict how a client will act. An outdoor apparel company, for example, can determine where, when, and for what activities a consumer needs a jacket. They can make highly targeted and personalized recommendations based on other criteria like gender and weather. By targeting customers with things they want and giving them email marketing and material they will respond to, this helps to develop a true emotional connection with them. Site optimization, which exposes usability faults like this and allows you to compare portions side-by-side to improve the experience, also benefits from AI. AI allows online stores to customize their layout, offerings, and branding to each customer. It also allows retailers to quickly identify areas where customers are having difficulty⁴⁴.

3.9 The Home Shopping Network using Watson's AI actions:

HSN was able to turn data into actionable customer insights because of Watson AI technology. Customers shopping for specific products, for example, could be targeted with related products and messaging. HSN was able to comprehend not only its consumers' behavior, but also their preferences for products, content, and gadgets. HSN was able to deliver the appropriate message, on the right channel, at the right time, and to the right customer because to this expertise. Where customers believe their power business doesn't care about them in 22% of cases⁴⁵, it is critical to comprehend exactly what its customers wanted in order to determine client preferences by mapping out retail journeys, allowing for the delivery of appealing, personalized, and timely communications at each touchpoint.

3.10 Social Commerce:

The social commerce industry is at a tipping point. Since its inception, the sector has been a catalyst for change in the way businesses operate, with various businesses making a paradigm shift in the social commerce sector. As such, the industry is seeing an upward spiral of growth. The social commerce industry is seeing an upward spiral of growth, as businesses of all sizes realize the benefits of leveraging the power of social networks

to build and expand their customer bases. For the first time ever, social commerce is an industry that can be measured on a global scale, with industry revenue in the US alone projected to hit \$33.2 billion by 2022, up from \$10.6 billion in 2017⁴⁶. The money being spent on social commerce advertising is also being seen by marketers as an investment that pays off in the form of increased sales, with the top-performing social commerce campaigns resulting in a 7x return on investment. The social commerce industry is projected to generate more than \$100 billion in global sales in 2022, with a large majority of that coming from brands investing in the right influencers and creating the right digital content to be shared on the right platforms. Social commerce platforms are making the most of the power of social media by investing in the right influencers and creating the right digital content to be shared on the right platforms.

The next few years will see the focus shift towards large-scale consumer testing, leveraging the power of social media to reach the largest possible audience for the least amount of money. That means a focus on consumer-grade testing rather than industry-exclusive closed-doors tests, with the goal of providing the most accurate portrayal of consumer behavior⁴⁷.

3.11 Cyber security in E-Commerce:

The potential for artificial intelligence in security is enormous. Machine learning can help identify attacks, prevent new ones from happening, and respond more effectively to threats when they do emerge. But the same technology that gives security systems a boost can also give cybercriminals new avenues of attack. If the goal is to secure systems without giving cybercriminals new tools to use, machine learning must be handled with care.

Artificial intelligence (AI) has the potential to make our lives better, but it also has the potential to make our security systems less effective. The same AI that can spot a potential cyber threat can also be used to create new generations of malware that can evade detection. As a result, AI has become a polarizing topic in cybersecurity. . First, machines must be given sufficient training to deploy effective security defenses. Second, machines must not be misused. In other words, machine learning systems must not be used to replace human expertise in finding and correcting vulnerabilities⁴⁸.

3.12 Marketplace Moderation:

The promise of advanced AI was to provide the tools necessary to build the next generation of customer experiences. The promise of moderation was to ensure a pleasant transaction for both the customer and the merchant. Instead of trying to build a system that can sift through every message and determine the "right"

answer, our advanced moderation system automatically filters out the vast majority of messages and ensures that only acceptable messages reach the user. This way, customers are able to focus on the positive aspects of the transaction and receive a pleasant experience, rather than being distracted by the small number of messages that wouldn't be right for the customer⁴⁹. This means that advanced moderation increases the quality of ads and gets them published faster. Unacceptable messages are automatically filtered out. Instead of passively waiting for customers to come to their store, retailers now have the opportunity to onboard them in real-time as they browse online. And instead of sending customers to a page with an error message, retailers can use advanced AI to ensure that ads are only shown to customers who are likely to be interested in them. This way, retailers can reduce the amount of time spent managing customer experience and focus on what they do best: selling products⁵⁰.

3.13 Retail Analytics:

The future of retail is about personalized experiences that anticipate and respond to consumer needs and preferences. It's about the seamless integration of digital and physical shopping, with the ability to try before you buy. It's about the ability to try on clothing, have your makeup applied, or have your home decorated before you commit to a purchase. It's also about the ability to have those experiences in virtual reality, with the option to walk away at any time.

Artificial Intelligence in the Retail Industry uses Machine Learning Models to classify over a million items from various sellers. These systems use advanced algorithms to quickly identify the product category and the subcategory of an item. They are then able to sort those items in different ways, such as by price, size, color, and other product attributes. Some retailers use Machine Learning to automate their inventory management, which can help them stay ahead of demand and reduce the costs of managing their supply chain⁵¹.

4. CHALLENGES IN IMPLEMENTING AI IN E-COMMERCE SECTOR:

4.1 Lack of AI Talents:

In September 2019, IDC forecasted that 97.9 billion dollars would be spent on AI technology by 2023. AI continues to grow at a steady rate as more people accept the concept of AI and recognize its significance in today's digital world. This rising demand for AI also means a rise in demand for AI tech developers. This is supported by reports indicating a 74 percent annual increase in demand for AI talent from 2016 to 2019. However, there aren't enough technically skilled people available to address the increase in demand of AI talent⁵². AI also hasn't been fully accepted by colleges to be provided as a major specialization so that students can be

aware about its importance from the very beginning of their college life and further leading to short of AI talents. With increase in involvement of digitization in our day to day life, AI should be made a compulsory subject in schools and colleges so that the future do not come into a situation where they have abundant scope to go into the next level of digitization but not enough resources to back the development. Moreover, in the AI business, there is a talent shortage at all levels of competence and experience. This creates enormous hiring difficulties⁵³.

4.2 Unstructured Data Processing:

AI can only be useful if it involves proper data being fed into the algorithm. The data is not mere raw information but it requires proper analysis and interpretation before it is fed into the algorithm so that AI can be applied appropriately in right situations resulting in benefit of the company. The capacity to extract insights from massive data is critical to AI success, yet data is an area where businesses continue to struggle. According to an O'Reilly survey, missing or inaccurate data is a concern for 15% to 20% of AI practitioners. The amount of information required is determined on the use case and algorithm complexity. According to some estimation, each parameter in the model requires at least 10 times the amount of data as the number of examples⁵⁴.

4.3 Managing Risks related to implementation of AI and the culture associated with it:

Everyone has a distinct concept of what AI is and what it may assist the organization achieve as a developing technology. To avoid misalignment of expectations, it is important for companies to include all stakeholders in your AI plan and involve them in goal-setting⁵⁵. Algorithm evolution comes with its own set of hazards such as safety, security and privacy of both customers and employees when they interact with each other using the AI technology. Machine learning bias, if left uncontrolled, can result in poor customer service, lower income, or even legal action⁵⁶.

4.4 Future and Scope of AI in E-Commerce:

It is said that the majority of the time of managers of companies will go on monitoring how the technology and algorithm is working for their company and whether it is reaping them good revenue or not; this prediction clearly explains the importance that AI will hold in future of E-commerce sector. After entering into the new normal consumer preferences have shifted drastically from physical format of shopping to digital shopping because of the convenient features it offers such as less money spent on travelling to retail shops, less time and eliminating the geographical boundaries that the customers used to face while shopping through retail shops and clearly these could also be the reason that the shift is irreversible now. As a result, eCommerce

businesses are increasingly focusing on AI projects to improve the whole customer experience. The possibilities for leveraging AI are endless, from managing hundreds of online sale orders every day to processing transactions. AI not only assists and complements businesspeople, but it also speeds up procedures in order to reduce client drop-off rates⁵⁷. The more we dig onto the AI matter, the more application of AI can be discovered in E-commerce thereby making its existence and integration important for the survival of businesses in the near future. Image 6 represents the future of AI and how much revenue AI is expected to generate through its various elements and features i.e. depending upon how they are used by 2025. Since the use of AI has already offered customers a convenient lifestyle and business a way through which they can perform activities effectively and efficiently, the habit of being integrated with AI cannot be reversed now making it important for people to dig onto its matter more to leave a better impact⁵⁸.

Talking about integration of AI with Cloud systems, in today's world, holds plenty of demand. The cloud makes it easier to store data and files on your device. Instead, it permits them to be stored in "clouds," or pools of online data centre. Because AI can sift through and manage the vast amount of data in the cloud, integrating AI with cloud solutions would make the system's operations considerably faster. This permits the system to focus on more vital duties once again⁵⁹. Companies now have integrated AI with Augmented Intelligence to bring out training areas for their employees virtually so that the employees do not miss out any aspect of their physical training experience by sitting in their homes. This has not only benefitted the company with less training and infrastructure cost but also enhanced the work schedule of employees as they can have these training sessions at flexible times because of no geographical restraints often put up by physical training centers. Designers may use augmented intelligence and artificial intelligence to build new methods for people to communicate, collaborate, and even create entertainment tools⁶⁰.

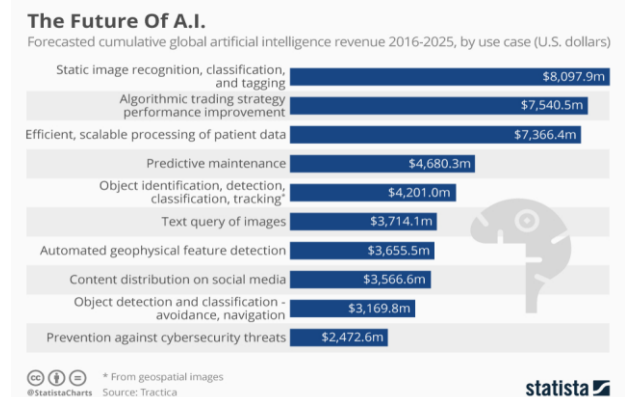


Image 6: The Future of A.I⁶¹

5. CONCLUSION:

The study pertains to understand the applications of AI in E-commerce sectors. The study explored in detail all the applications, major companies, challenges and future scope of AI in E-commerce sectors. The study concludes that AI holds a powerful impact on E-commerce and aims to bring new trends in the near future. AI can change the companies and the framework within which the E-commerce websites work and provides new touch thereby replacing the traditional and physical way of shopping for their customers. The new and upcoming trends in the market, AI powered E-commerce companies can find out new ways to attract new customers and retain the existing ones. AI has widened the scope of conducting business for e-commerce companies and will continue to open a new horizon with passing time. An e-commerce business can use AI to analyse the massive amounts of data it receives every second without breaking a sweat. The demand for such technology in e-commerce will grow even more in the future.

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