

Emerging Practices of Digital Commerce Using Artificial Intelligence Techniques in Online Merchandising Business Platforms

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Abstract

The growth of e-business has advanced from enthusiasm and innovation to adoption and application and the educational and business communities have switched in exploring prospects for market monetization of digital business technologies. As a result, discussions over existing e-commerce platforms, as well as how to achieve dynamic capabilities, are becoming more intense. While many specialists are thinking about economic models, there is a distinct dearth of formal conceptual approaches in the existing research to structure and validate the current understanding. There is a considerable deal of variation in the existing research contributions, which is related to the fact that there are a number of reasons and motives for conducting business design research. Therefore, some studies have attempted to define digital capabilities, while others have proceeded further to define their primary business components, providing strategies for constructing, refining, or evaluating marketing campaigns. In this paper, we conduct research in the field of e-business strategies and explore the implications that connect the research areas of digital business and sales in specific marketing sub-domains with the use of an intelligence system. The proposed concept is used to structure and analyze any digital sales and marketing in order to increase profit and manage big data in the present working system.

Key Words: Deep Learning, Expert System, Artificial Intelligence, E-Commerce, Online Trading, Machine Learning, Hybrid Intelligence

Introduction

The world economy has been seeing unprecedented levels of digitization over the half century, necessitating an operational and managerial revolution in enterprises from conventional management methods to digitally driven management approaches in order to maintain stability and longevity. While the economic consequences of inexpensive internet access are widespread, the retail industry has bore the brunt of it in the shape of a quantum shift in customer preferences toward prioritizing convenience and reliability over everything else when it comes to purchasing. Most retail businesses have adopted, either extensively or gradually, the online retailing method (eCommerce) in parallel with offline concrete block shop sales in reaction, and mostly to preserve a competitive advantage in the market.

Artificial Intelligence is gaining popularity in the technology world as one of the most promising next-generation technologies for solving some of society's most pressing financial, cultural, and political issues. AI is an advanced and complex software system that performs areas related to those handled by the human brain. These jobs include things like creative decision-making, data processing, and speech recognition, among others. AI has attracted the curiosity of both capitalists and researchers who want to examine and study its underlying principles as well as the accuracy with which it achieves its objectives.

Artificial Intelligence

Artificial intelligence (AI) is a subdivision of computer science concerned with the design of automating tasks and responding in a manner similar to human intellect. The primary goal of Artificial intelligence is to create expert systems, which are frameworks that show how to conduct, learn, illustrate, clarify, and counsel clients. The next goal is to incorporate human intelligence into technology that create systems for comprehending, reasoning, learning, and responding in the same way that humans do. Artificial intelligence has become a crucial component of the technology industry in recent years.



Figure 1: Computation efficiency

The numerous fields of study of AI, each with its own set of features, have largely enabled AI's predictive behavior. Machine learning, neural networks, and deep learning, as well as cognitive computing, natural language processing, and computer vision, are among these subject areas.

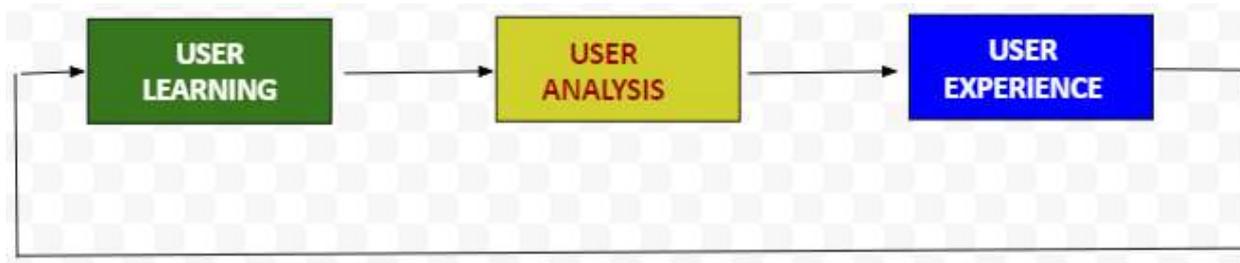


Figure 2: User Perspective

Machine learning is a type of algorithm that learns from data and automatically improves it, most notably records for a long-term update. The neural network is an artificial intelligence component that uses synopsis to link to the neural network of the human brain and transfers messages from one neuron to another. Deep learning is a branch of machine learning algorithms that uses computational models with numerous layers to analyze data with a specific logical structure. Recognition systems, advanced analytics, computer graphics, 3D simulations, VR technology, and mixed reality are all areas where computer vision is applied. These kinds of research can be employed together or separately to provide the eCommerce user with a smooth experience, product search assistance, and sales aid. Customer segmentation, demand forecasting, user behavior analysis, sales help assistance, and decision analysis are some of the deriving benefits to the retailer.

Literature Survey

The present study, insights on the role of artificial intelligence in e-commerce [1]. Last few years can be dedicated to the e-commerce era with its rapid expansion. At the same time the technological advances gave rise to different platforms This study aims at identifying the tools used in e-commerce, able to optimize marketing campaigns [3]. Managerial and marketing processes have been identified in the relevant body of knowledge that can be optimized using artificial intelligence; thus, a questionnaire has been designed within a quantitative research [4].

which can be useful to update the trends and capture the market needs [2]. At the same time, in the process of online shopping, users produce a large number of user access data and transaction data, which seem messy but contain huge commercial value [5]. E-commerce urgently needs to mine its own data information and related data so as to obtain competitive advantage. Web data mining technology has become the focus of research in universities and enterprises [6].

In the field of e-commerce, AI technology has also been well applied and achieved good results. AI has become an important driving force for the development of e-commerce [7]. This described the e-commerce development situation and prospects of AI technology, analyzes the present situation of the application of AI technology in the field of e-commerce, mainly study and discuss in detail from the aspect of assistant of AI, intelligent logistics, recommendation engine and the optimal pricing application through the research of e-commerce intelligent operation instance - Baidu take-away, probes into the important impact and great significance on the e-commerce development of artificial intelligence [8]. Elements designed to deliver positive value to customers within the e-commerce ecosystem and even though the AI/ML systems have proven their hierarchy of benefits within this industry, yet in a significant share of customer are delivering the negative value of such systems as each customer has its own bubble threshold whether its social data, financial data or demographical data each customer is as unique as his/her digital signature [9].

As such, many ecommerce businesses have come up with business engagement strategies that are centered around artificial intelligence (AI) to enhance their productivity and efficiency. Multiple studies have been conducted on the impacts of AI on the operational efficacy of ecommerce business which points to a positive outcome [10]. This describes the implications of artificial intelligence (AI) in ecommerce business in various aspects and holds that AI is indeed an indispensable component for enhancing business engagement in eCommerce [11].

E-Commerce

Electronic commerce has become widely used in the global exchange in general, and in the Indian economy in particular, as a result of the data technology revolution. Changes in the process for conducting business transactions have occurred as a result of technological improvements. India, as a fast-moving technological gadget, is keeping up with the current state of electronic knowledge exchanges and has embraced e-commerce. As a result of globalization and improved technology, India is experiencing remarkable growth in E-commerce. E-commerce is one of the most important components of the internet to arise in this modern era of computers and technology.

Factors, that help in the growth of e commerce are,

1. Provide best customer experiences such as fresh offers, discounts, the highest deal, and doorstep services

2. Guarantee of mutual replacement or exchange within a reasonable amount of time
3. Locality based services
4. Multiple payment options
5. Services and facilities are available 24×7

E-commerce reduces the expense of using middlemen to sell products directly to customers, allowing resources to be shifted to other channels to help the firm grow. Customers can also make safe online payments through the payment portal that has been made available to them. These are extremely reliable websites that may be relied on completely. If someone places an order and then cancels it, the funds will be transferred directly to their accounts. E-commerce has changed the face of the global economy by allowing many more investors and business people to participate. The main objective of an E-commerce company should be to close the gap between online and offline purchasing, which can only be accomplished if the company concentrates on quality and special offers, discounts and innovative schemes to attract customers. As a result, the future of E-commerce enterprises hinges on their ability to provide greater ease and comfort to their customers.

The popularity of e-commerce is at an all-time high right now. When people couldn't leave their houses to buy products for their basic requirements due to COVID-19, E-commerce websites took over and helped the millions of people who were struggling. Electronic commerce, often known as e-commerce, is the practice of conducting business over the internet using computers, commercializing items and services, and transferring payments using digital communications. This enables us to trade goods and services via electronic media and the internet. In the field of e-commerce, India is exploding.

Digital Trading with E-Commerce & Artificial Intelligence

Artificial Intelligence (AI) is a new discipline of technology that explores theoretical approaches, tools, and applications to replicate and extend human intelligence. The official beginning of artificial intelligence is traced back to 1956 in The Dartmouth Summer Research workshop, led by John McCarthy and a group of scientists who explored utilizing machines to simulate intelligence.

The use of the Internet and current communication technology for any type of business operation management or information exchange is referred to as electronic commerce (EC). The business model based on electronic equipment and network technologies is at the heart of E-commerce which includes B2B(Business-to-Business), B2C(Business-to-Customer), C2B(Customer-to-Business), C2C(Customer-to-Customer), G2B(Govt-to-Business), and G2C(Govt-to-Citizen). E-commerce automates all business processes, including not only externally oriented business processes such as network marketing, electronic payment, logistics, and distribution, but also internal business processes such as Supply Chain Management (SCM), Enterprise Resource Planning (ERP), Management Information System (MIS), Customer Relationship Management (CRM), and Human Resource Management (HRM) (HRM).

Application of AI Automation in E-commerce Services

At the moment, the most widely used artificial intelligence technologies are machine learning and interactive learning. Artificial intelligence technology is maturing in tandem with science and technology, and it is radically altering the way people work and live, particularly in the sphere of electronic commerce. Artificial intelligence (AI) has evolved into a strong tool for increasing sales and optimizing e-commerce operations. Ecommerce businesses are currently adopting a variety of tools and approaches, the majority of which rely on artificial intelligence systems to improve their features, making them more efficient and speedier than older tools.

Artificial intelligence is used by ecommerce organizations in products online, cross-selling, and increasing sales, as well as Chatbot services for real-time client service, evaluating client comments, and offering personalized services. A good example is the chatbot service, which assists clients in real time by employing natural language processing techniques and parsing voice and text to respond to their product and service-related questions. Businesses use AI to assess multiple client connections throughout their digital journey and acquire the most valuable customer insights in order to improve their brands as well as their interaction strategy. To establish our hypothetical claims, we addressed some significant approaches and technologies that utilize the power of artificial intelligence in the ecommerce sector, such as machine learning, NLP, and so on.

Artificial intelligence's application in the field of e-commerce is primarily represented in the following aspects:

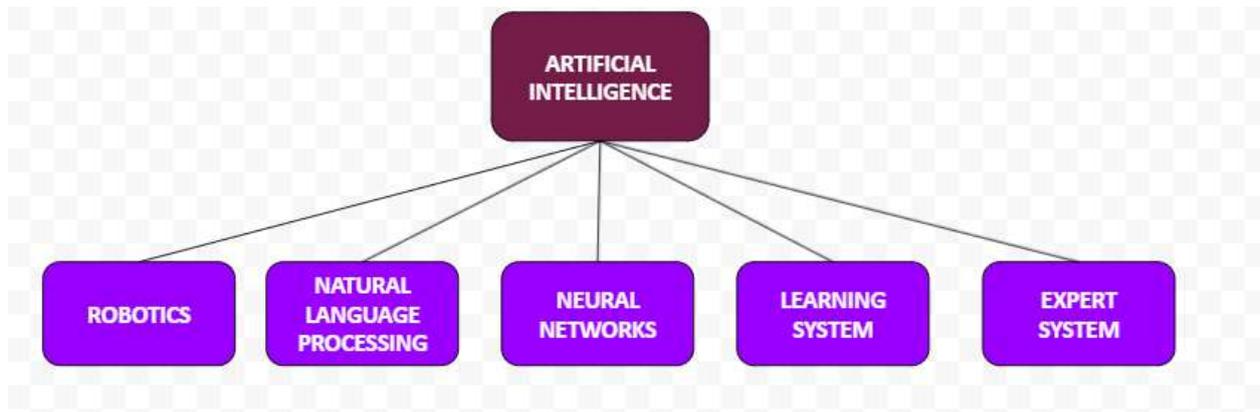


Figure 3: AI aspects

1. Personalization

The more individualized the products are, and the more personal the company is with its clients, the higher the customer commitment and brand loyalty. Big Data is used in e-commerce to calculate consumer purchasing behaviors by collecting data from numerous channels, previous activity, transaction histories, and other sources. AI not only displays tailored products, but it also analyses customer behavior and makes sophisticated predictions about what a buyer really wants. AI may also be used to forecast future purchasing trends and create tailored sales strategies based on existing and future shopping habits. Personalization, on the other hand, allows e-commerce enterprises to ensure that their consumers receive the same level of service and convenience as they would if they were buying in a physical store. AI tracks specific customers' preferences and brand loyalties using face recognition or predictive technologies, and only proposes recommended items based on that information.

2. Virtual Voice Assistance

Virtual shopping assistant is a software application programme that connects and understands natural language voice from consumers using artificial intelligence. They can also multitask and work in numerous areas, such as shopping performers and experiences, and it simply has to recognize the user's voice to process the order. A virtual assistant can be more valuable and adaptive if it incorporates human skills, big data, and artificial intelligence. It can learn and identify customers' actions based on their own preferences, brand consciousness, and preferred shopping locales, and it allows them to provide feedback to the system. The more people who apply it, the better the advice they'll get. Automation is clearly assisting the e-commerce business in getting closer to and better understanding its clients. With artificial technologies, most online retail businesses may now apply significant data science and machine learning to improve customer service and have big impacts on customer retention and satisfaction.

3. Chatbot Services

The biggest benefit of online purchasing is that shops and e-commerce websites can give customer support 24/7 through bots. Chatbots are software applications that employ artificial intelligence (AI) to conduct chat or chats with clients in the form of text or speech to assist them while surfing websites. Chatbots were only deployed a few years ago to give basic consumer responses. However, with the help of AI, it is now possible to assist potential customers in making purchasing decisions by providing responses tailored to their tastes and needs. AI chatbots are used by international e-commerce corporations such as Amazon, eBay, Flipkart, and many others.

4. Visual Search

AI-enabled visual search is the ability to utilize an image to search for similar or related visual artifacts. While shopping online, a customer can enjoy a simple search procedure, but in many cases, searching a product is loaded with obstacles, resulting in failure of a transaction which is attempted. E-Commerce AI has improved visual search capabilities and can help you find things that are related to your search.

5. Customer Relationship Statistics

AI also shares a significant volume of data that helps to observe shopping patterns, forecasts, selections, and other characteristics that help to identify their buying behavior so that long-term relationships with customers can be built and safe participation can be guaranteed. It's critical to ensure that your consumers have the best available facilities and experiences while doing business with you. Artificial Intelligence is one of the solutions that can assist you in doing all of this so that you can always keep your consumers happy. Finally, AI can assist the organization in establishing a road to perfect and spectacular customer service.

6. Product Content Management

Because AI gathers all consumer data, experiences, and forecasts future purchasing patterns, it ensures that every product is designed and customers are delighted with the commodities. Product content management oversees the entire

workflow process, from manufacturing to distribution. Artificial Intelligence assists the ecommerce sector in developing the best and quality Product Content Management, starting with cataloging, designing, and selling products to customers with the best client experience.

7. Fake Promotions

According to recent studies, 90 percent of online buyers think that favorable online reviews encourage them to buy, whereas negative ones discourage them from doing so. This technique is incorporated in machine learning to guarantee that only verified consumer purchases will be promoted. It also increases customer reviews that are recommended by verified or potential buyers.

8. Customer Churn

Customer churn has become a serious challenge for e-commerce organizations in recent years. Increased rivalry, competitors, as well as novel marketing models and upgraded services, are driving up the cost of brand building. In such a short period of time, service providers have realized the importance of retaining the current customer base. As a result, it is critical for service providers to avoid churn, which is defined as a customer's desire to leave a company's service. This customer turnover may be predicted using a machine learning system, and the necessary efforts to reduce customer churn can be done.

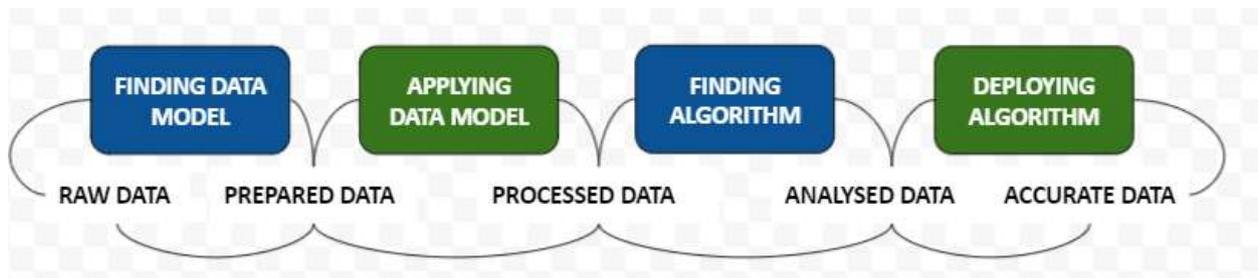


Figure 4: Data Analysis

Integration of AI in Sales and Marketing

Enterprise Resource Planning (ERP) is one of the most important corporate technologies ever devised. ERP software is used by businesses to combine and manage key aspects of their operations, such as banking, marketing, inventories, promotion, and human capital management. The main advantage of employing an ERP computer system is that it improves operational efficiency and lowers costs. This is because integration and automation minimize process redundancies while allowing for work coherence across the entire organization, which helps to increase productivity.

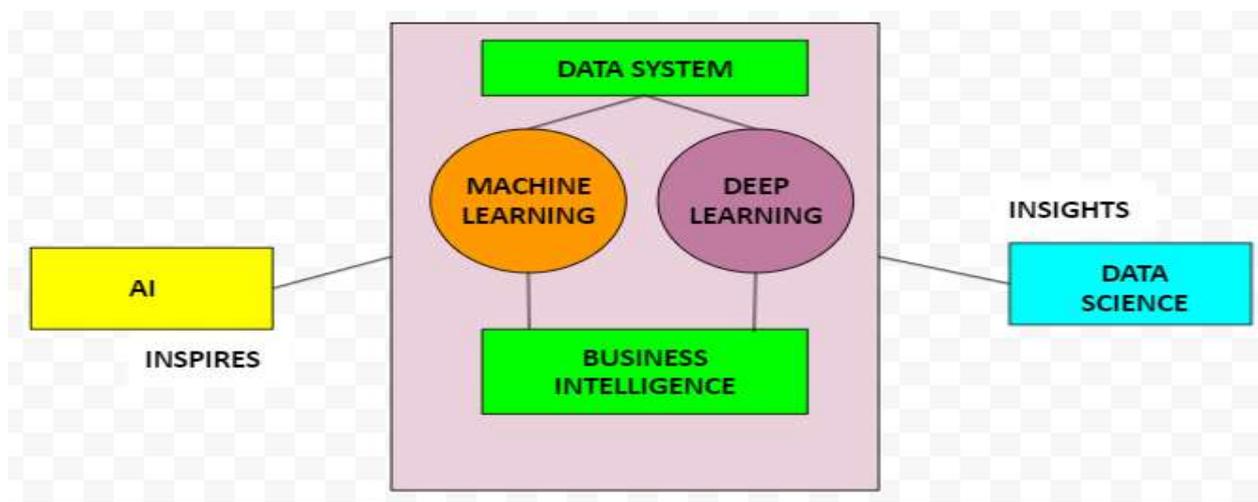


Figure 5: Business Intelligence

Despite the many benefits that ERP software provides to a company, the system has a key flaw that can be costly to the organization at times. The success of implementing the system is dependent on the level of competence of the personnel, which is a major disadvantage. This means the company will either need to pay a network administrator to keep the software up to date or spend money educating its personnel to do so. This issue can be resolved by adding AI into the ERP software system. Customer support, sales automation, stock management, budget reporting, and cognitive technologies are the five components of a standard ERP software system. Using AI to improve ERP's customer experience allows devices to function intelligently and conduct a

thorough analysis of human brain functioning. This is accomplished by embedding chatbots into the ERP system, allowing the management to focus on other tasks while the AI takes care of the consumers.

Intelligence ERP systems can assist in business and consumer response analysis and automate the effective advertising plan in terms of revenue automation. AI may also be embedded into an ERP system to help with inventory control. Inventory management is the process of arranging, organizing, and conserving acceptable stock levels at a low cost in order to meet a customer's demand. In terms of financial management, AI is used in the ERP system to boost productivity and reduce errors. As a result, an AI that can generate bills and pay them automatically might help the company save money and time. Finally, for accurate analysis and forecasting, sophisticated analytics is particularly useful in supply chain management and production. Integrating artificial intelligence (AI) into an ERP system would undoubtedly improve data analysis and prediction.

Understanding the working of Intelligence System in E-Commerce

The following four processes make up the core process of every e-sale business:

1. Selecting the most suitable product
2. Making a purchase.
3. Ensure that orders are dispatched and delivered on time.
4. Using smart technology, to increase the efficiency of delivering service.

In order to incorporate the above processes, an AI system must consist of two components in order to provide the greatest user experience in any online trading:

1. **Machine Scheduling System** (an intelligence to analyze static data like portraits, localization for accurate recommendation)
2. **Expert Recommendation System** (an intelligence to analyze dynamic data like customer transaction log to enable us to choose the best product)

The average waiting time for users can be decreased, and order delivery efficiency can be boosted, using intelligent scheduling and recommendation.

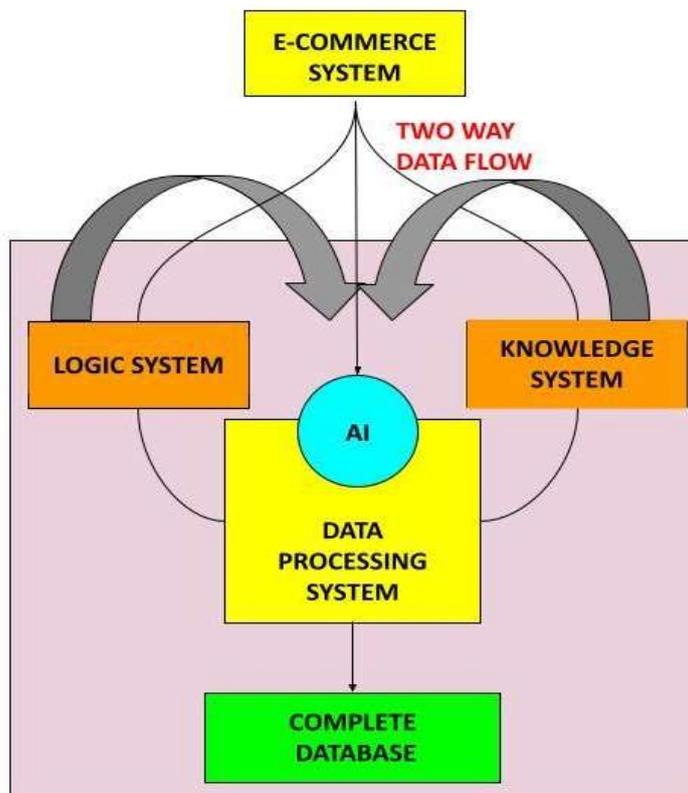


Figure 6: Database management

Machine Scheduling System : The automated scheduling system, which includes intelligent dispatching and path planning, is the most significant aspect of the delivery system. Traditionally, scheduling was the duty of a dispatcher, who was expected to manage around a thousand requests every day. Whereas, the system must cope with a huge quantity of orders and data in the present era of digital trading, which requires an intelligent and completely automated scheduling system. To obtain the best path for the entire system, the scheduling system must choose the proper courier, location, and order tracking and delivery information. To improve real-time scheduling, the system employs off-line monitoring and distribution functions, such as popular destination prediction and transit capacity, to determine the best distribution path. It can also be used to monitor and adapt the distribution network in real time, as well as automate business layer operations such as courier management, merchant administration, scheduling detection, and distribution monitoring.

Expert Recommendation System : For complex scenarios such as diverse locales, time, merchants, interests, and so on, data analysis of user profiles through intelligent recommendation systems can be handled according to the different needs of diverse customers. Personalization requirements open up new chances for enterprises, allowing them to establish a good company growth system, raise user velocity, and greatly improve user conversion rates. The expert recommendation system mainly consists of 2 big data processing layers namely merchant modeling layer and user modeling layer. Merchant and user modeling includes both offline and real-time data. The offline data includes the merchant's label, qualities, and rating, as well as the user's long- and short-term needs and desires. Real-time dataset comprises capacity, inventory, behavior, and operational data, besides other things. Purchase scenario analysis is also included in real-time data. The recommendation system analyses the huge data of merchants and their consumers using a variety of tactics to enhance the click rate, through an efficient real-time computing engine.

Conclusion

Business engagement is a comprehensive collection of value-added practices aimed at enhancing and strengthening socioeconomic success by providing feasible answers to the problems at hand. The effectiveness of internet services is the foundation of eCommerce. As a result, eCommerce enterprises would fail if they were not efficient on the internet. Because every technological system is vulnerable to obstacles at any given time, whether due to software or human resources, a proper set of approaches is required to minimize such hazards while ensuring the system's efficacy.

Artificial intelligence is indeed the grab solution for the most of the efficiency difficulties experienced by most eCommerce systems, according to a systematic examination of the literature. Due to the fact that AI mainly delivers precise, efficient analysis, and effective exploitation of consumer data, which aids in successful managerial decision-making as well as customer happiness and retention. Despite the fact that it is at the heart of business engagement methods for boosting quality and profitability in the eCommerce industry, its functionality is generally additional or complimentary to the already established infrastructure and processes for performance optimization. Adoption of Enterprise Resource Planning is one example of such improvement (ERP).

ERP is a software application that is used to manage complex business operations such as supply chain operations, financial management, and so on, in order to make the business more economical and successful by bringing these functions together on a single system. Artificial intelligence components can be added to an eCommerce system that already has ERP as its quality management technology to improve its potency even further. However, it is not AI's adaptability and agility that makes it the first choice in most eCommerce company interaction initiatives. Rather, it is the technology's ability to match the needs of the client while lowering the cost of doing business.

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