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Implementation of Technology in the Marketing Management using IoT based reduces Manpower Improves Customer Service

Pooja Giradkar*
Department of Master of Business Administration (MBA)
VNS Group of Institutions, Bhopal (Madhya Pradesh), India.

(Corresponding author: Pooja Giradkar)*
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ABSTRACT: Technology has nearly complete control over the modern world. People's routine jobs have been drastically changed by it, becoming more efficient and simpler. In the food industry, it is less noticeable, especially in the ordering and serving areas of hotels, restaurants, and cafes. Pen and paper is still used by most Indian hotels to order meals and serve them, which takes time and contributes to customer dissatisfaction and business losses. This issue is resolved by providing a touch-based digital smart system to manage the entire meal ordering and serving procedure. By providing time-saving tools like computerized food ordering and a vacancy list at the front desk, the restaurant hopes to increase customer satisfaction and income. This strategy benefits both the patron and the business by reducing staff expenses, eliminating thoughtless mistakes, and improving customer service. The companies exaggerate their traffic wars just by bringing up the names of the visible light dishes. The requests for major league data analysis, gross data supplies, construct data analysis application in possession owned business supplies, and the start of build data analysis resource utilization in quality owned enterprise supplies for advertisement will all be fulfilled by this unique item.

Keywords: Business Environment, management, intelligent, IoT, customer service, digital food.

INTRODUCTION

The use of Internet of Things (IoT) technology has greatly improved corporate marketing management's sustainability. For the aforementioned organizations, digital marketing and the Internet of Things, in general, suddenly exploded potential. The way that commerce is carried out may be significantly impacted by the adoption and application of IoT by numerous industries. IoT applications support sustained corporate growth. An analysis of the original data from a quantitative marketing study utilizing a questionnaire found that while a considerable majority of firms use advanced marketing technology, only a small fraction of them have implemented IoT solutions thus far due to specific cost constraints. The findings, however, demonstrate that businesses fully understand the benefits of IoT and prioritize implementing these solutions in order to achieve long-term commercial success. The primary recommendations for the business environment, based on the findings, are to create marketing plans that these companies can implement and set aside money for business development so they can use IoT to efficiently handle specific internal and external tasks in order to attain sustainable growth. To enable consistent data flow and transmission, satellite systems, ground networks, and air networks are combined into the Space-Air-Ground Integrated Network (SAGIN). SAGIN's integrated networks provide more coverage than traditional ground networks in many cases. For commercial and industrial activities conducted in space, the air, on land, and at sea, SAGIN can provide a secure information infrastructure. The SAGIN design allows its three network tiers to function independently or in concert, combining heterogeneous networks into a multilayer broadband wireless network. Satellites can successfully cover remote and rural locations, resulting in a significant cost reduction for terrestrial fifth-generation (5G) networks. In the meanwhile, some of its benefits include coverage, throughput, reliability, and flexibility, making it suitable for a range of next-generation network applications. Next-generation networks have a variety of potential uses. The Industrial Internet will find great use for SAGIN as well.

Fig. 1. IoT based smart applications.

The Internet of Things, or IoT, has already shown promise in a variety of fields, and marketing management, or MMgnt, has been using it extensively for growth that is safe, efficient, and optimal. The influence of IoT on three management domains—product life cycle (PLC), advanced business process modeling (BPM), and customer relationship management (CRM)—is explained in this chapter through a case-based qualitative analysis. This descriptive study compares numerous real-world retail company examples from before and after the use of IoT to highlight the impressive success of IoT classification. This study proposes five IoT plans to evaluate the effectiveness of IoT for the three MMgnt sections that rely on data gathering and sharing from both internal and external contexts. The results show that IoT is critical to three important MMgnt for growth and development areas and to the entire marketing strategy. Businesses have generated a huge amount of useful data in the preceding few decades due to developments in information technology and the rapid expansion of the Internet; nonetheless, we still don't know how to use it Hu *et al*. (2018); He *et al.* (2015). The data needs to be transformed into knowledge and information that can be applied as tools in order to help organizations make better decisions Alom *et al.* (2018). In this way, businesses may provide worthwhile results faster and with less work thanks to machine learning (ML), which is being used more and more in marketing research (Liang and Hu 2015; Azad *et al.,* 2019). To name a few applications, machine learning is utilized in direct marketing, customer lifetime value, marketing campaigns, market segmentation, travel, and client and loyalty groups (Greff *et al*., 2016). Computers can now understand and interpret data and experiences in a manner akin to that of the human brain thanks to machine learning techniques (Song *et al.,* 2018). ML models are applied to data because they are capable of addressing a broad variety of problems, from those that can be managed by traditional statistics and scientific procedure management to complex difficulties that require a more in-depth examination. This enables machine learning to tackle issues faster and more efficiently than with conventional techniques. Consequently, machine learning (ML) techniques are used to help people make judgments or predict the results of new data, classifications, and projections. Enterprises consistently need to acquire further knowledge regarding their clientele, products, media promotion strategies, and the efficient planning of forthcoming events through historical data analysis (Oktay *et al.,* 2018). As we shall see, machine learning (ML) has been widely used to determine the most relevant needs of customers and their relationship with products and their attributes (Mnih *et al.,* 2014; Bahdanau *et al.,* 2014), segment satisfaction, identification or recommendation, selection of new products, or reaction to advertising (Xu *et al.*, 2015; Yin *et al.,* 2016; Li *et al.,* 2020; Lin *et al.,* 2017). There are numerous data sources, including 46 sources that are organized and unstructured (Çiçek *et al.*, 2016; Metwaly *et al.,* 2014; Adil *et al.,* 2021). Some of the sources used to predict consumer demand are websites, social media, and blogs (YouTube, Twitter Tweets, Google Trends, Wikipedia visits, IMDB ratings, restaurants, travel, hotels, and Huffington Post news). Retail scanners, information from online purchases, location data (including GPS, GSM, and contact center information), and search engine results containing personal information are further sources (Adil *et al.,* 2021; Adil *et al.,* 2021; Adil *et al.,* 2021). Included are deliberate sources of data production through user and internet usage (web cookies, for example). It is expected that in situations where entities or organizations have control over their boundaries, machine learning (ML) will offer a dependable, better way to develop techniques that facilitate rapid innovation (Farouk *et al*., 2020). Businesses can utilize machine learning (ML) to improve their market strategy, launch new products, and evaluate the ever-changing market landscape, consumer segmentation, brand or product commitment or renunciation, and brand or product loyalty (Elhoseny *et al.,* 2018). All of this could help firms improve their products and services and influence how decisions are made. However, there is a challenge with these methods as they are applied to memory-based algorithm models (item-oriented, user-oriented, and product-oriented), latent factor models, learning models (such as Doc2Vec,

Product2Vec, or Item2Vec), and finally deep learning models. Consequently, companies must know which model to use, how to use it, and what advantages and disadvantages it provides. We sought for scientific articles published between January 2000 and March 2022 in order to acquire a full grasp of the most prevalent ML methodologies and strategies in marketing. We employed keywords related to machine learning (ML) from the top journals in the field of marketing, as retrieved from the databases of Journal Citation Reports (JCR) and Scopus. 320 scientific articles were located after a thorough investigation, giving us insight into the problems in marketing that are solved and the strategies used to achieve them. We provided the reader with more than just an overview of the methods and ways that machine learning impacts; we also demonstrated to them how to use machine learning strategies to real-world marketing problems. In this article, we covered the techniques' advantages and disadvantages as well as which marketing problems specific algorithms are more suited to solving.

METHODOLOGY

There has been a steady rise in the application of ML techniques in marketing research (Lv, Zhihan, and Amit Kumar Singh 2020). To provide the reader with an overview of the techniques used in the marketing scientific literature and marketing problems they can answer, we took a number of steps. summarizes the methodology that we employed. The first step was to look for scientific journals whose main theme was marketing by searching the "Scimago Jour98 nal& Country Rank" (SJR) database for journals in the "marketing category". Subsequently, the search was restricted to journals that were found in the Q1 quality quartile (SJR). To ensure that the journals were highly ranked within the same SJR database, we further filtered the journals indexed in the Web of Science (WoS-JCR). This filter only accepts journals that fall under SJR Q1 and JCR Q1, JCR Q2, JCR Q3, or JCR Q4, as JCR indexing is generally believed to be more strict than SJR. The final selection made by this filter generated journals like J. of Marketing, J. of Market108 ing Research, and Marketing Science. Journal of Public Administration Research and Theory, Public Administration Review, Journal of Supply Chain Management, Journal of Retailing, International Journal of Marketing Science, Journal of Consumer Studies J. of Industrial Marketing Management, J. of Consumer Psychology, J. of International Marketing, J. of Interactive Marketing, and Governance J. of Marketing Research, Academy of Management Perspectives, Quantitative Marketing and Economics, J. of Advertising, American Review of Public Administration, Sport Management Review, and Marketing Theory Journal of Travel and Tourism Marketing, Journal of World Business, Journal of Purchasing and Supply Management, International Business Review, International Marketing Review, International J. of Advertising, Journal of Hospitality Marketing and Management, Journal of Psychology and Marketing, Journal of Destination Marketing and Management, Business Horizons, Journal of Public Policy and Marketing, Journal of Retailing and Consumer Services, Journal of Electronic Commerce Research and Applications, Consumption Markets and Culture, Journal of Services Marketing, Public Relations Review, Journal of Marketing Management, Administration and Society, Journal of Advertising Research, European J. of Marketing J. of Marketing Letters and Business Research. The second step was to search the Web of Science (WoS) database for particular articles that these journals had produced over the almost 22-year period from January 2000 to March 2022. We conducted experiments using different keywords associated with real-world machine learning applications. The information we were looking for was present in only a small percentage of the published publications that our initial search turned up. Finally, we decided to search for a list of specific machine learning techniques in step 3. The most recent search result is shown in the Using the function "TS," we looked for theme phrases in the following fields of the WoS database: Title, Abstract, Author Keywords, and Keywords Plus. This allowed us to access journal publications. In the fourth phase, we reviewed each article separately and then used a filter to determine the total number of articles. Among these requirements were the following: Machine learning should have been the article's main methodology, and the authors should have shared their ML techniques. The essay must provide adequate specifics regarding the methodology used. The articles should also define machine learning (ML) and show how to use it in a real-world scenario utilizing real data from credible sources (instead of using simulated or experimental examples). A few research that showed how semi-supervised learning was used in the actual world were disregarded. Our database does not contain articles on subjects unrelated to marketing, such financial credit ratings. Ordinary regression (OLS), hierarchical regression, and traditional grouping (clustering) were disregarded if the subjects failed to exhibit any indications of learning. Articles that only showed how to use software and did not provide intermediate results were also excluded (Lv *et al.*, 2020). Articles that explained software but did not include the application logic or parameters were not included. To enable consistent data flow and transmission, satellite systems, ground networks, and air networks are combined into the Space-Air-Ground Integrated Network (SAGIN). SAGIN's integrated networks provide more coverage than traditional ground networks in many cases. For commercial and industrial activities conducted in space, the air, on land, and at sea, SAGIN can provide a secure information infrastructure. The SAGIN design allows its three network tiers to function independently or in concert, combining heterogeneous networks into a multilayer broadband wireless network. Satellites can successfully cover remote and rural locations, resulting in a significant

cost reduction for terrestrial fifth-generation (5G) networks. In the meanwhile, some of its benefits include coverage, throughput, reliability, and flexibility, making it suitable for a range of next-generation network applications. Next-generation networks have a variety of potential uses. Additionally, SAGIN will be very beneficial for the Industrial Internet.

CONCLUSIONS

As technology develops, the idea of the Internet of Things (IoT) is becoming more and more popular as augmented reality, high-definition video, driverless cars, intelligent settings, and other innovations are integrated into everyday life. IoT-based technology offers several advantages, such as higher throughput, wider bandwidth, better capacity, lower latency, and improved data rates. Intelligent production and the industrial internet will advance more faster thanks to the Internet of Things (IoT), which makes communication across different industrial settings easier. The next evolution of communication is represented by the Internet of Things (IoT). Physical items may easily generate, receive, and share data thanks to the Internet of Things. Certain Internet of Things (IoT) applications aim to automate certain procedures and make inanimate things capable of self-operation, hence removing the need for human involvement.

Examining IoT's use in the business sector is essential given its broad adoption of ubiquitous IoT. Using IoT technology to analyze data transactions and identify optimal solutions is made possible by the application of IoT in marketing management and innovation. For example, the development of R&D goods and innovation are influenced by wage and R&D subsidy regimes. Data from the payroll system and the possibility that new goods will be produced in each company are gathered by the IoT infrastructure. Using Internet of Things technology, it makes data transfer between devices easier, examines the most effective payroll solution, and assesses how the solution affects the company's profit. There is no need for human involvement because this procedure is entirely automatic. Only IoT technology is used to obtain the findings. SAGIN also possesses the ability to improve wireless network efficiency. It is an essential component of many smart manufacturing industries, such as industrial cyber security, cloud computing, job automation, and big data in industry. in order to meet the demands in many complex industrial production and business management scenarios. When there are natural disasters or public emergencies, it can be difficult to fulfill communication requirements due to the unavailability of critical communication infrastructure. Fast networking and flexible deployment are made possible by SAGIN, ensuring the stable and secure functioning of the industrial internet—an emerging trend in the field of intelligent manufacturing. As the country's new infrastructure strategy moves forward, the development of the industrial Internet sector for intelligent manufacturing is now looking optimistic. Building security capabilities is a crucial goal to guarantee the Industrial Internet's continuous growth. Through the integration of the digital and physical domains, the Industrial Internet enables more intimate communication between humans and machines. The secure running of organizations can be impacted by the thorough application of resources, laws, and environmental factors. Therefore, safety should be the first priority when developing the industrial Internet platform for intelligent manufacturing.

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