

Detailed Investigation of Influence of Internet of Things (IoT) and Big Data on Digital Transformation in Marketing

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Abstract: With the creation of novel business models based on the ideas, procedures, and resources of the digital environment, digitization blurs the distinctions between technology and management. The firms manage their digital transformation in relation to the Internet of Things and big data. Organizations now face enormous potential and considerable barriers as a result of the development of digital technology. The purpose is to bring out the current condition of corporate digitization in addition to existing theories given the increased awareness of big data and IoT. Cloud Platform, Big Data, and the Internet of Things all present potential for marketing to use technologies to change their tactics, notably in the use of “new service-oriented marketing strategies.” Managers in marketing generally have the ability to update outdated procedures with new technology or improve the technical quality of services and goods. Businesses can obtain, analyze, and examine data and information, which enables them to create pertinent marketing plans. The roots of the current technological landscape and the drivers of the ensuing corporate shift are a collection of inventions. The Internet of Things technologies are essential for helping businesses increase the utilization of their machinery and develop service-based goods in manufacturing enterprises. The primary goal of this study is to examine how IoT and big data have affected the digital revolution in marketing.

Keywords: Internet of things, Big-data, Digital transformation

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1. Introduction

Utilizing digital technology for development is referred to as digital transformation of new processes” and adaptation of current business, customer experiences, and culture for the requirements of the market” to satisfy the business shift. Digital transformation is also known as the reinvention of the digital age in companies. The level of digital transformation goes beyond the conventional job functions that include customer service, marketing, and sales. The way we think and the customer interaction are the beginning and end of digital transformation. By keeping the digital technologies to one side, we should have the ability to rethink how we do business and engage with clients during the transition from paper to spreadsheets and smart applications to manage our business. There is no requirement for building up the business processes and then modifying them for the small enterprises that we are starting up. The companies are future-proofed through digital transformation. Running a company in the 21st century is simply unsustainable in the digital transformation through handwritten ledgers and sticky notes. It is being adaptable, nimble, and ready for growth by knowing all the benefits of constructing, planning, and thinking in a digital way.

The digital revolution has an impact on corporate operations. To analyze the general changes brought on by digital technologies in the idea of marketing, its tools, and activities in small enterprises, as well as the influence of digital transformation on the operations of marketing in small and medium-sized businesses. The primary study question focuses on how marketing activities carried out by organizations nowadays develop. Analyses and concerns are supported by a critical literature assessment, an examination of empirical study findings, and the author’s observations of the market. Analyses carried out have shown that, although they frequently fall under the category of traditional tools, firms covered by the study use digital technology in marketing. IT and digital tools have an impact on marketing as well, fostering client relationships and enhancing the value of each organization (Ziółkowska, M. J., 2021).

In digital transformation, emerging technologies were propelled by business transformation and sorting. The program of digital transformation has greater potential for maximum growth and minimum savings than other initiatives of transformation. The changes in the fundamental functions of technologies within the organization are propelling the digital transformation. Technologies are now capable for longer runs, and the only support role that makes operations in business possible is support. The promotion of modern technologies, growth in sales, and enabling of new business models have even more potential to provide the organization with this competitive edge. The forces that drive the transformation are at different levels of raising the trends in technology. The most recognizable examples of digital transformation include big data and analytics, the Internet of Things, robotic process automation, mobility, cyber security, social media, blockchain, and cloud computing. Organizations and industries have major influences on this technology’s usage. All the businesses are equipped with the potential for full digitization, alteration, and growth of the companies, which are very thankful for the advancement in technologies (Tang D., 2021).

Ecosystems for businesses are constantly changing. Businesses are progressively altering their business operations with cutting-edge digital technology. The time for debating and testing the effects of Industry 4.0 and digital transformation is over; now is the time for concrete initiatives. The effect of technologies in marketing that incorporate interoperability, digital actual frameworks, enormous information, and the Internet of Things on the execution of medium and little-estimated undertakings that have been recognized Interoperability, cyberphysical systems, and big data were found to have a considerable beneficial influence on improving business performance after employing multiple regression approaches, but the internet of things had a negligible impact. Additionally, it will support managers in their efforts to defend the expenditure of funds on the expansion of their companies’ technological infrastructure. Finally, it will be useful for policymakers to design appropriate policies for growing human capital and improving its capacity for absorption (Mubarak et al., 2019).

2. Materials and Methods

2.1 Components of IOT

In business, the Internet of Things is considered the main key pillar of Industry 4.0 in enhancing and strengthening their competitiveness in the market and has a significant influence on the development of the modern economy. The perception layer, transmission layer, computational layer, and application layer are the four layers of IoT that make up the IoT architecture. Each layer has built-in security problems that are related to it. Each layer’s components and purposes are shown in Fig. 22.1.

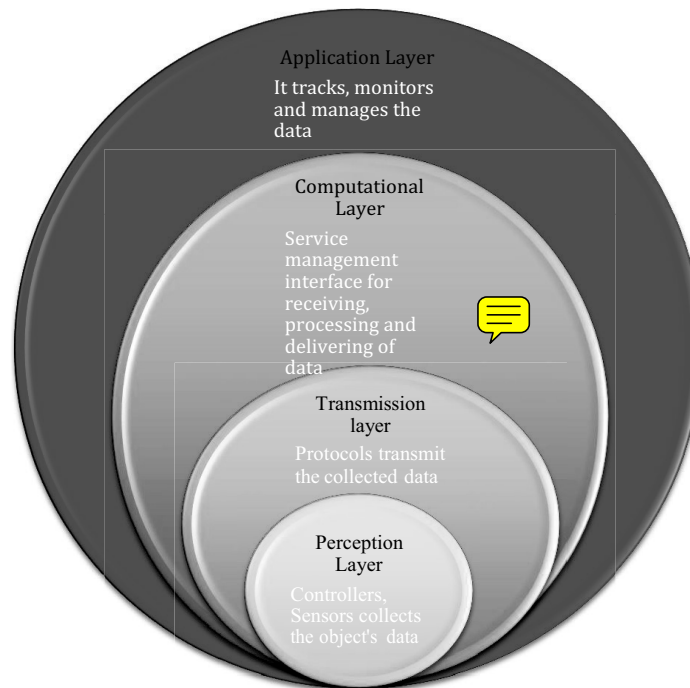


Fig. 22.1 Components of IoT in digital marketing

The insight layer, otherwise called the sensor layer, is responsible for distinguishing proof, gathering information, and following objects with the assistance of an assortment of innovations, including RFID labels, remote sensor organizations, and activators, which are utilized for checking and following the situation with the articles. The information gathered is then sent to the transmission layer.

The transmission layer acts as a conductor for data to go through the organization from the items to the cloud. This layer utilizes different conventions that incorporate low-power remote individual region organizations, which offer superb correspondence with insignificant energy use and self-association. Wi-Fi, 3G, and Zigbee are other remote organization innovations that can be utilized. Zigbee is a remote organization innovation that has the advantages of minimal expense, low energy utilization, negligible intricacy, unwavering quality, and security. The transmission layer and the application layer get proficient and secure administration from the process layer. This layer uses interface technologies to guarantee the effectiveness and security of the data transferred. Additionally, service management is in charge of functions including storage, exchange, and data gathering. The application layer, which comes last, is where data management takes place. The choice of the appropriate protocol for network management is crucial.

2.2 Big Data in Digital Transformation

The last decade has seen a rise in interest in big data analytics. There aren't numerous scholarly examinations in that frame of mind in the business sectors of ventures, in spite of the way that it is featured as a promising instrument for the B2B areas. While it is feasible to gather and investigate both purchaser information and machine-produced exchange information at the interorganizational level, current big data analytics place a greater emphasis on the marketing element of consumers. Therefore, it is necessary to focus more on stakeholder engagement and the components of big data analytics. As a result, this study explores and offers a conceptual framework for the digital transformation of industrial markets made possible by big data analytics. For identifying the collection of big data and its uses for creating value, it seeks out research publications that offer insights into diverse industrial settings (Wang, W. Y. C., & Wang, Y., 2020).

Data was assembled from organizations that had executed maintainable methodologies. 316 answers from Indian expert specialists are investigated using a cross-breed primary condition displaying counterfeit brain network strategy. Huge information investigations and supportability rehearsals are fundamentally impacted by the board and initiative style, state and national government strategy, provider coordination, inside business interaction, and client reconciliation, as per the consequences of a component examination. Also, the fake brain network model got the results of the underlying

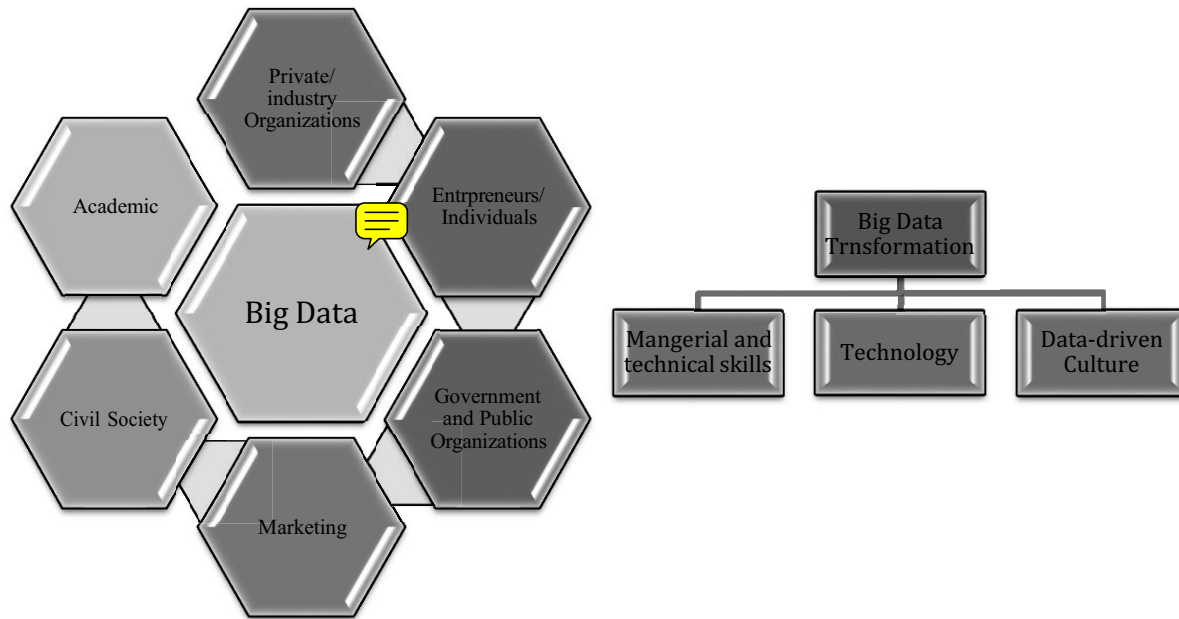


Fig. 22.2 Big Data transformation in digital marketing

condition displayed as information. The review's discoveries show that the two most critical indicators of large information investigation and maintainability rehearsal are the board and authority style and state and national government regulation. From the perspective of operations management, the results offer special insights into how manufacturing companies can enhance their performance in sustainable business. The study offers theoretical and practical insights into the challenges associated with using big data to implement sustainable practices in businesses in emerging economies (Raut et al., 2019).

3. Results and Discussion

Table 22.1 Value chain analysis influenced by IoT and Big data in digital transformation

S. No	Value Chains	Transformation
1	Vendors	Providers of software Providers of custom Software
2	Integration of System	Providers of professional service Integrators of system
3	Buyers	Banking and Financial institutes Industries and manufacturing plants Power and utility industries Construction companies Transportation and Logistics
4	Sales Report in Marketing	Maintenance and Software support

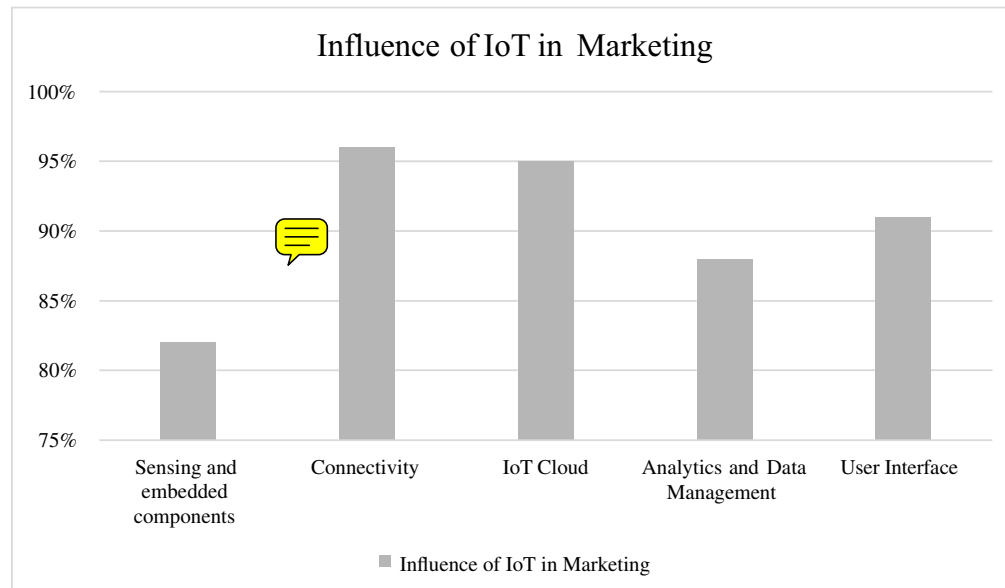
By reducing human intervention, the suggested framework is anticipated to have a major positive impact on warehouses and supply chains. Among the expected advantages is increased productivity.

- The protection of both commodities and workers.
- Cutting down on operation time.
- Minimizing accidents
- Reducing the number of employees.
- Increasing the picking and packing procedures' precision and dependability.

- Reducing theft, fraud, and counterfeiting
- Because of the accessibility of precise facts, assisting businesses in anticipate improvement.
- Making accurate decisions is facilitated by real-time data.
- Improving a company's overall success.

Table 22.2 Influence of IoT in Digital transformation

Components of Marketing	Influence of IoT in Marketing
Sensing and embedded components	82%
Connectivity	96%
IoT Cloud	95%
Analytics and Data Management	88%
User Interface	91%

**Fig. 22.3** Influence of IoT in Marketing

The most recent technological development, big data, has broad applications across practically all industries, including manufacturing. Although this technology presents commercial opportunities, several industries have not yet fully adopted it. The exploration concentrates on the half-and-half methodology for dynamic path and lab assessment of DEMATEL for versatile neurofuzzy surmising framework for ID and positioning of the huge variables affecting the reception of large information understudies for the creation of the effect of the enormous information reception in the organizations for assembling and execution. From a survey of the literature, this study identified the crucial adoption elements and divided them into three categories: technological, organizational, and environmental.

The five Vs—velocity, volume, variety, veracity, and value—characterize big data and how Hadoop and different arrangements are utilized to satisfy its needs, alongside circulated handling power. The review frames the abilities expected to assess large amounts of information, as well as the standards of data mining and how results are created. It also offers suggestions. Data scientists can be used by doctors to provide their patients with the greatest care possible, and by meteorologists to foresee the range of regional meteorological occurrences. Even the prediction of natural catastrophes like earthquakes and tornadoes can be done using data science. Data collection is a great place for firms to start when pursuing data science. As soon as they have the data, they can start assessing it. The following are a couple of instances of how people create information and how organizations like Netflix, Amazon, United Parcel Service (UPS), Google, and Apple utilize this information. At the point when an information science project is done, the eventual outcome ought to be utilized to inform critical leaders about new information and experiences found through the data analysis (Adusumalli, 2016).

In order to meet client needs, warehouses, which might hold thousands of products, should be used as efficiently as possible to ensure precise and quick performance in all activities. Since IoT can be utilized to screen different distribution center cycles progressively and can lessen manual obstructions, utilizing it in warehousing promises to have a major effect (Mostafa et al., 2019). In the examination, 15 tests in view of the impact of machining boundaries, including shaft speed, feed rate, and removing expansiveness, were conveyed related to the Box-Behnken architectural matrix. The use of the response surface technique in this study was made possible by its advantages over alternative methodologies, including the requirement for fewer tests to analyze the impacts of all the components and the ability to identify the best possible combination of all the variables. To wrap things up, a hereditary calculation was utilized to recognize the ideal interaction boundary setting that boosts the pace of content expulsion. 1.19 m was the best surface unpleasantness reaction esteem tracked down utilizing a single objective hereditary calculation (Panwar et al., 2021).

It might be difficult to use traditional drilling techniques to create small holes in various materials. However, these kinds of holes could be created using sophisticated machining techniques. Electrical discharge drilling is a type of advanced machining technique that has several advantages over other techniques. The discharge of electricity in the drilling of the alloy of titanium was carried out using well-planned orthogonal array L27 experiments (grade 5). The dielectric pressure, pulse off and on times, and discharge current are chosen as the experiment's input parameters for the process, while hole circularity and hole taper have been chosen as the experiment's output process characteristics. Utilizing the experimental data, the creation of multi-regression models withholds paper and holds circularity. The generated models' statistical analysis demonstrates their suitability and reliability, indicating that they can be utilized to accurately forecast certain quality features. Utilizing a MATLAB program with a genetic algorithm, these quality characteristics have been improved (Jain & Pandey, 2019). The objective functions of the regression model are taper and circularity, which are taken into consideration in genetic algorithm optimization. The results of the genetic algorithm's multi-objective optimization demonstrate improvements in both quality attributes (Jain & Pandey, 2017).

The focus of the current research is on employing electric discharge drilling to machine titanium grade 5 alloys. Through studies, the process response parameters known as hole taper and hole dilation have been computed. A brass electrode was used as a tool, and titanium alloy grade 5 was used as the workpiece during the trials. Utilizing gray relational analysis, the experimentally estimated process parameters have been improved. The major goal of this study is to choose the best input parameters to optimize hole circularity while minimizing hole taper and dilation (Jain et al., 2020).

4. Conclusion

Organizations now face both enormous potential and considerable barriers as a result of the development of digital technology. The motivation behind the review is the current state of corporate digitization and to add to the current hypotheses that have given rise to the expanded consciousness of the Internet of Things and big data. Big data, cloud platforms, and data analytics have the potential to change how businesses operate, particularly when it comes to the adoption of new service-oriented marketing techniques. Managers in marketing generally have the ability to update outdated procedures with new technology or improve the technical quality of goods or services. Businesses can obtain, analyze, and examine data and information, which enables them to create pertinent marketing plans. The roots of the current technological landscape and the drivers of the ensuing corporate shift are a collection of inventions. The "Internet of Things," in particular the "Industrial Internet of Things," is one of these technologies that is essential for helping businesses increase the utilization of their machinery and develop service-based goods in manufacturing enterprises. The prospects, challenges, and anticipated benefits of big data analytics (BD) have become more and more popular in theory and practice. Despite the fact that it has been constantly battling the obstacles preventing its acceptance, emerging economies in particular consider big data analytics to be of utmost importance.

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