



BIG DATA, DIGITAL TRANSFORMATION AND MARKETING ANALYTICS FOR BUSINESS INTELLIGENCE

Dr Ashish Ranjan Sinha, Dr Pratibha Vijay Jadhav, Dr. Ravindra Kumar ,

Dr Memon Ubed, Dr R Nithya, Dr. Jagendra Singh,

Designation: Associate Professor

Department : Department of Humanities and Social Sciences

Institute: National Institute of Technology Patna

District :Patna,City : Patna,State :Bihar

Designation: Assistant professor,Department: Applied Science and Humanities

Institute: School of Engineering and Science MIT-Art Design and Technology

District: Pune,City:Pune,State: Maharashtra

Email [id.-pratibhajadhav1@gmail.com](mailto:pratibhajadhav1@gmail.com)

Designation: Professor ,Department: MBA

Institute: Centre for Management Development Modinagar

District: Ghaziabad ,City: Modinagar ,State: Uttar Pradesh

Designation: Associate professor ,Department: Commerce

Institute:Sir Sayyed College of Arts Commerce and Science

District: Aurangabad ,City: Aurangabad ,State: Maharashtra

Designation: Assistant ProfessorDepartment: School of Computing Science

Institute: KPR COLLEGE OF ARTS SCIENCE AND RESEARCH

District: Coimbatore ,City: Coimbatore ,State: Tamilnadu

Email: nithya5790@gmail.com

Associate professor,School of computer science engineering and technology,

Bennett University, Greater Noida, Great Noida, Uttar Pradesh

Abstract

Digital technology must be integrated into every part of a company in order to revolutionize how it runs and provides value to customers. Starbucks is a prime example, as it launched mobile ordering and payment features via their app. This change not only improved customer service but also produced a wealth of information about demographics, preferences, and spending patterns. Starbucks can customize marketing efforts and roll out personalized offers thanks to the analysis of this data, which boosts app sales by 15%. Businesses can track, manage, and analyze marketing

performance to improve strategies and increase ROI with the help of marketing analytics. Automation, artificial intelligence, and cloud computing are being adopted by businesses to improve customer experiences, streamline processes, and gain a competitive edge.

1. Introduction

The fusion of big data, digital transformation, and marketing analytics has emerged as a formidable triumvirate driving business intelligence in today's quickly changing corporate environment. An unprecedented flood of data has been released by the digital age, changing how businesses operate, make decisions, and interact with their customers. Through case studies and statistical analysis, this article examines the complex interactions between big data, digital transformation, and marketing analytics while underlining their importance in advancing business intelligence.

2. Background analysis

Big data is the term used to describe the enormous amounts of organized and unstructured data that are produced from a variety of sources, such as social media, IoT devices, online transactions, and more. IDC predicts that by 2025, the world's data sphere would have grown to a startling 175 zettabytes. In order to properly collect, store, process, and analyze this information, new technologies and tactics are now required (Miklosik and Evans, 2020). The integration of digital technologies into all facets of an organization results in substantial changes to its value offering and operational model. According to a McKinsey poll, the COVID-19 pandemic has caused 70% of businesses to speed up their digital transformation initiatives (Božič and Dimovski, 2019).

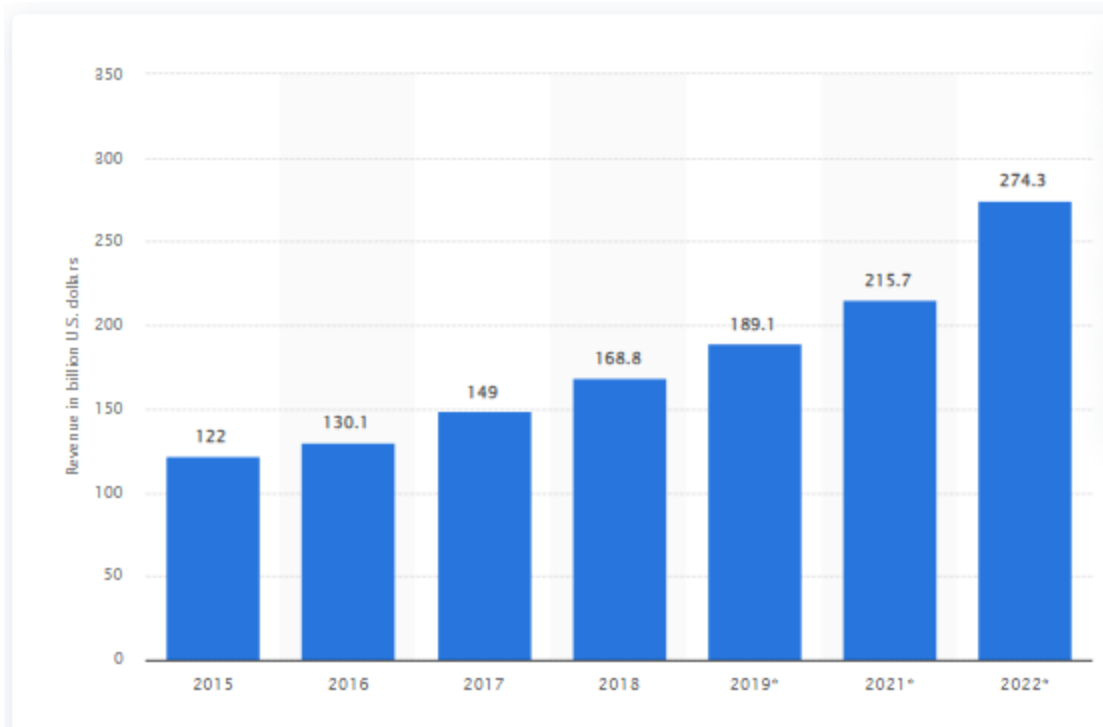


Figure 1: From 2015 to 2022, global big data and business analytics revenue

(Source: Statista.com, 2023)

As per the above figure 1, it is seen that there has been significant rise in revenue of businesses where in 2022 the revenue touches 274.3 billion using big data. Measure, manage, and analyze marketing performance by using data-driven strategies in marketing analytics. Businesses are able to improve their strategies thanks to the actionable data it offers into customer behavior, preferences, and trends (Lutfi *et al.* 2022). Advanced analytics technologies enable businesses to personalize offers, improve marketing efforts, and forecast future market trends. The world's largest online retailer uses big data analytics to study the purchasing habits and behavior of its customers (Ahmad and Mustafa, 2022). Amazon can offer customized product recommendations, improve its supply chain, and predict demand precisely thanks to this data-driven approach. As opposed to that, Starbucks collects information on customer preferences and purchase history through their mobile app and reward programme. This data is utilized to personalize services, provide focused marketing, and increase client retention.

3. Research aim and objectives

Aim

The goal of this study is to find out how the combined use of these technologies can lead to strategic advantage in the areas of marketing and business operations.

Objectives

- To investigate how Big Data affects business intelligence and enables data-driven decision-making in the context of marketing and digital transformation.
- To analyze how digital transformation has affected marketing plans and tactics, as well as how it has increased corporate understanding and client engagement.
- To assess the success of marketing analytics in utilizing data from digital platforms to produce useful insights, enhance marketing initiatives, and establish long-term competitive advantage.

4. Research questions

- What benefits does using big data analytics provide to the creation of thorough business intelligence for well-informed decision-making in marketing and digital transformation contexts?
- What are the main ways that digital transformation affects marketing tactics, procedures, and consumer interactions, and how does this help create a more intelligent and adaptable corporate framework?
- How can patterns, trends, and customer behaviors emerge through the use of data from digital sources in marketing analytics, and how do these insights inform strategic marketing choices and help businesses gain an advantage over their competitors?

5. Rationale

Organizations are constantly looking for ways to acquire a competitive edge in today's hyper connected and data-driven business environment. Due to this, big data, digital transformation, and marketing analytics have all come together, resulting in a potent synergy that powers business intelligence (Chan, 2020). This confluence is justified by the enormous opportunity to gain insightful information, make wise choices, and enhance marketing tactics.

There is now an unheard-of amount, speed, and variety of data thanks to the growth of digital interactions, social media, and IoT devices. Businesses have the chance to take use of this plethora of information by using big data to find previously unnoticed patterns, trends, and correlations (Feroz *et al.* 2021). For instance, by examining sales, projections for the weather, and past trends, retail behemoth Walmart uses big data analytics to optimize inventory management.

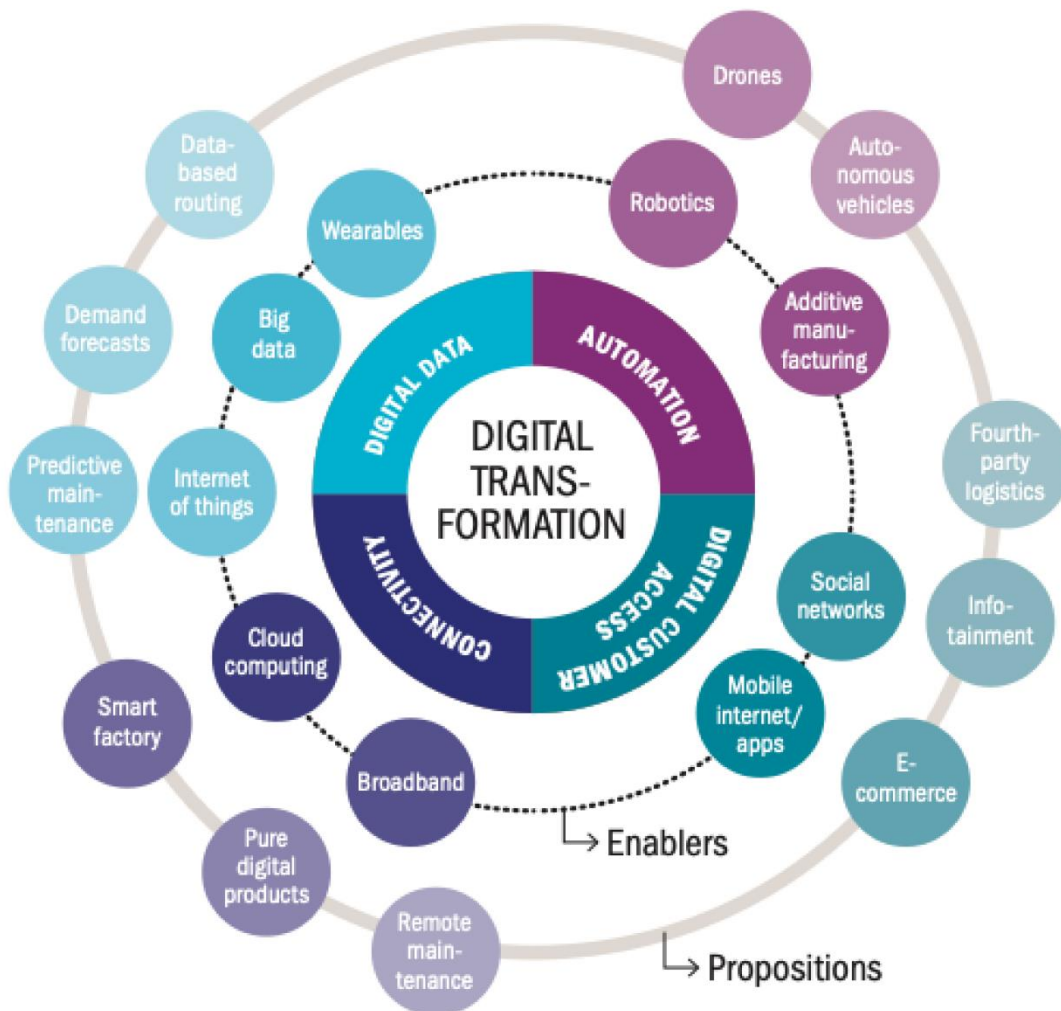


Figure 2: Big data, digital transformation

Procter & Gamble (P&G), a household name in consumer goods, adopted marketing analytics to improve its online advertising strategies. P&G improved its campaigns by using real-time data on customer response and ad interaction, which resulted in a 30% boost in sales and a 20% decrease in ad spending (Yukhno, 2022). Big Data and marketing analytics work together to produce strong business intelligence, which is the process of turning raw data into useful information. In order to recommend material, Netflix, a leader in data-driven decision-making,

uses algorithms that study user behavior. This has proven essential to their strategy, increasing subscriber numbers by 25% and boosting consumer satisfaction.

6. Literature review


The intersection of Big Data, digital transformation, and marketing analytics has transformed traditional business structures and practices in the information age (Moumtzidis *et al.* 2022). This analysis explores how digital transformation affects marketing strategy, how Big Data affects business intelligence, and how well marketing analytics can use digital data to its benefit.

Big data and business intelligence

Big Data has become a key engine for business intelligence because of its volume, velocity, variety, and authenticity. Today, businesses may collect enormous volumes of data from a variety of sources, including customer interactions and market trends (Papachristou *et al.* 2023). This abundance of data enables data-driven decision-making, in which strategic decisions are influenced by insights from data analysis. For instance, the world's largest online retailer, Amazon, uses big data to tailor recommendations for its consumers based on their past browsing and purchasing behavior (Mahraz *et al.* 2019). Amazon's business intelligence system forecasts client preferences using advanced algorithms, which boosts revenue and improves customer satisfaction.

Digital Transformation and Marketing Strategies

Marketing strategies and methods have been drastically changed by the digital transformation wave. Digital platforms, social media, and e-commerce have replaced traditional marketing channels. These platforms are being used by businesses to contact consumers directly with consumers, resulting in a more individualized and participatory approach (El Khatib *et al.* 2022). Take Nike, for example, which has embraced digital transformation by using apps and social media to build a community around its brand in addition to selling things online. Interactive training apps are now a part of Nike's marketing strategy, allowing for real-time customer connection and encouraging brand loyalty.



| Planning and Governance | Goals and Measurement | Media | Content | Experience | Conversational Messaging |
|---|---|--|--|--|--|
| <ul style="list-style-type: none"> • Strategic initiatives • Marketing integration • Digital transformation • Business and revenue models • Budgets and ROI • Systems, structures and processes • Resources and skills • Marketing technology | <ul style="list-style-type: none"> • Forecasts • Digital KPIs • Digital dashboards • Customer profiles • Attribution | <ul style="list-style-type: none"> • Paid media • Owned media • Earned media • Offline/online integration • Always-on and campaign investment | <ul style="list-style-type: none"> • Content marketing strategy • Top-of-funnel (TOFU) • Middle-of-funnel (MOFU) • Bottom-of-funnel (BOFU) | <ul style="list-style-type: none"> • Website customer journeys • Landing pages • Multichannel path to purchase • Conversion Rate Optimization • Personalization | <ul style="list-style-type: none"> • Email marketing • Mobile messaging • Human-assisted chat • Automation and CRM |

Figure 3: Digital Transformation and Marketing Strategies

Enhanced Corporate Understanding and Client Engagement

Businesses now have a never-before-seen opportunity to better understand their customers and interact with them. This is thanks to the digital transformation. For instance, social media sites offer a gold mine of information about customer preferences and sentiments. Starbucks, a large chain of coffee shops, uses tools from the digital transformation to interact with its customers (Mubarak, *et al.* 2019). Users of the Starbucks mobile app can place orders, pay for them, and get incentives. Starbucks may use the data generated by this digital engagement to better understand consumer buying habits, hone marketing tactics, and improve customer experiences.

Marketing Analytics and Long-term Competitive Advantage

The conversion of unstructured data from digital platforms into useful insights depends critically on marketing analytics. Businesses may better understand consumer behavior and market trends by utilizing statistical analysis and predictive modeling, which enables them to make wise decisions. The online streaming service Netflix mainly relies on marketing statistics to suggest material to its viewers (Fernández-Rovira *et al.* 2021).

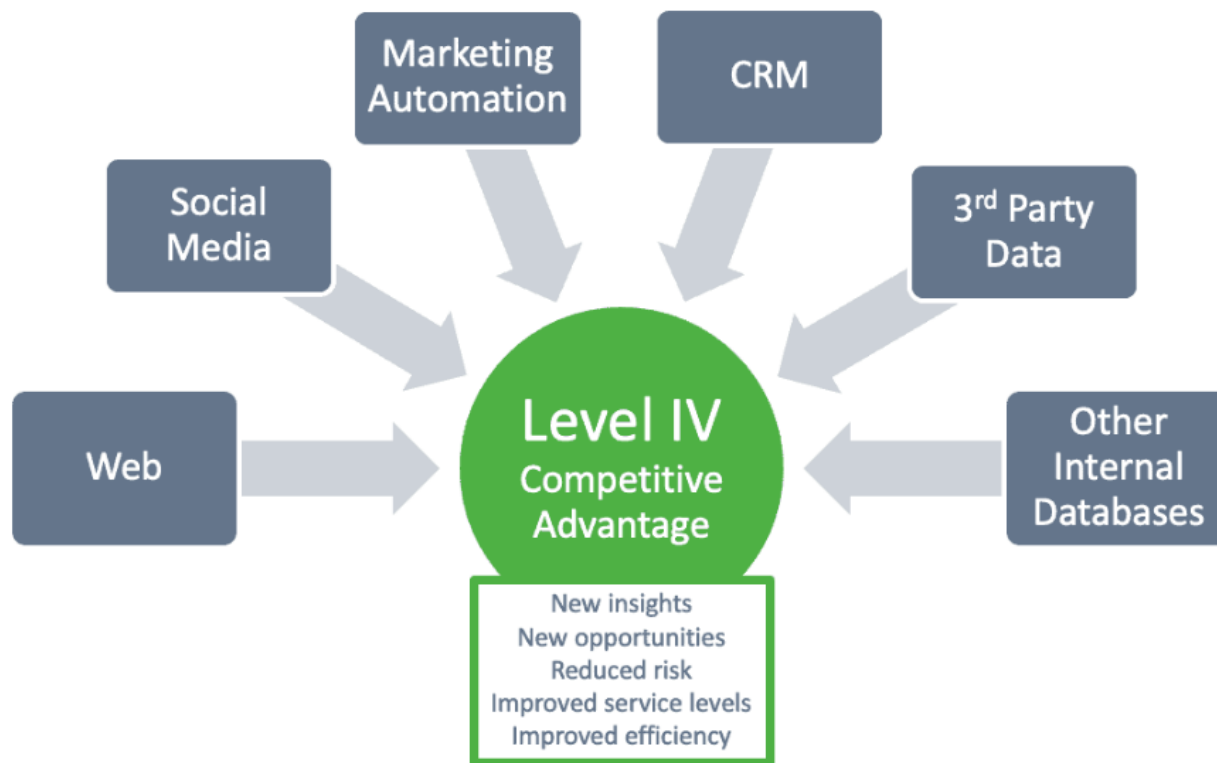


Figure 4: Marketing Analytics and Long-term Competitive Advantage

To provide personalized recommendations, the software examines viewing patterns, preferences, and even how much time is spent on each episode. This data-driven strategy has helped Netflix to dominate the streaming market.

Challenges

Big Data, digital transformation, and marketing analytics combined bring enormous possibilities but equally difficult obstacles. Due to the ethical challenges raised by the acquisition and use of such large volumes of personal data, privacy and data security issues are of utmost importance. Additionally, the quick rate of technological advancements demands ongoing adaptability (Bist *et al.* 2022). To make sure that their workforce is capable of efficiently utilizing the power of these tools, businesses must engage in continual training and development.

Theoretical implications

This approach, often known as the "3Vs," emphasizes the three main aspects of big data: volume (huge volumes of data), variety (various forms of data, both organized and unstructured), and velocity (speed at which data is generated and processed) (France and Ghose, 2019). It highlights the difficulties and possibilities brought about by the amount and variety of data.

Framework for Technology, Organization, and Environment (TOE): The TOE framework examines how organizational variables, external environmental impacts, and technology innovation interact in the context of digital transformation (Aljumah *et al.* 2021). It aids organizations in comprehending how these elements interact and influence transformational initiatives.

ADKAR Model: During the digital transition, this change management model focuses on both individual and organizational change. It provides an organized method for handling the human element of transformation (Shao *et al.* 2022). Its acronym stands for Awareness, Desire, Knowledge, Ability, and Reinforcement.

7. Research methods

The study used a secondary data gathering technique and gathered all the data from online sources, including journal publications and a few websites. On Transformation and Marketing Analytics for Business Intelligence, all of the journal papers are based. The journal articles have been incorporated and carefully chosen using resources like Google Scholar. A broad understanding and description of Transformation and Marketing Analytics for Business Intelligence have been provided through the qualitative data analysis with explanatory design (Kamble & Shaikh, 2022). The study has been conducted with inclusion and exclusion criteria using a random simple sampling method. Only 17 of 35 journal articles were used in the study; the remaining 18 articles were removed since they didn't match the knowledge requirements and offered alternative business analytical applications. In accordance with the ethical guidelines for study that have been supplied, ethical considerations have been adequately followed.

8. Limitations

Big Data offers a tonne of information, but the accuracy and dependability of that information might vary. Data that is inaccurate, lacking, or inconsistent might produce false insights and poor business judgments. Significant privacy problems are raised by the growing data collecting and use (Tong-On *et al.* 2021). It can be difficult to strike a balance between using customer data for insights and upholding their right to privacy. Unauthorized access to data and data breaches can have serious legal and reputational repercussions. It can be expensive to gather,

store, and process massive amounts of data. To properly manage and analyze the data, organizations must make investments in a strong infrastructure, qualified employees, and cutting-edge tools.

9. Significance

The fusion of Big Data, digital transformation, and marketing analytics has emerged as a crucial focal area for organizations looking to acquire a competitive edge in the quickly changing business landscape of today (Cao *et al.* 2022). Due to its potential to disrupt conventional company structures and strategies, this research is extremely important since it will allow businesses to leverage the power of data-driven insights and turn them into useful business intelligence.

10. Summary

For firms looking to succeed in today's changing market environment, research on the integration of Big Data, digital transformation, and marketing analytics for business intelligence is of utmost importance. The research equips organizations to make informed decisions, improve customer experiences, achieve operational excellence, and gain a competitive advantage in a world that is becoming more and more data-driven by offering practical insights into exploiting these technologies.

References List

- Ahmad, H. and Mustafa, H., 2022. The impact of artificial intelligence, big data analytics and business intelligence on transforming capability and digital transformation in Jordanian telecommunication firms. *International Journal of Data and Network Science*, 6(3), pp.727-732.
- Aljumah, A.I., Nuseir, M.T. and Alam, M.M., 2021. Traditional marketing analytics, big data analytics and big data system quality and the success of new product development. *Business Process Management Journal*, 27(4), pp.1108-1125.
- Bist, A.S., Agarwal, V., Aini, Q. and Khofifah, N., 2022. Managing Digital Transformation in Marketing:" Fusion of Traditional Marketing and Digital Marketing". *International Transactions on Artificial Intelligence*, 1(1), pp.18-27.
- Božič, K. and Dimovski, V., 2019. Business intelligence and analytics use, innovation ambidexterity, and firm performance: A dynamic capabilities perspective. *The Journal of Strategic Information Systems*, 28(4), p.101578.
- Cao, G., Tian, N. and Blankson, C., 2022. Big data, marketing analytics, and firm marketing capabilities. *Journal of Computer Information Systems*, 62(3), pp.442-451.
- Chan, J.O.P., 2020. Digital transformation in the era of big data and cloud computing. *Int. J. Intell. Inf. Syst*, 9(3), p.16.
- El Khatib, M.M., Alzoubi, H.M., Ahmed, G., Kazim, H.H., Al Falasi, S.A.A., Mohammed, F. and Al Mulla, M., 2022, February. Digital Transformation and SMART-The Analytics factor. In *2022 International Conference on Business Analytics for Technology and Security (ICBATS)* (pp. 1-11). IEEE.
- Fernández-Rovira, C., Valdés, J.Á., Molleví, G. and Nicolas-Sans, R., 2021. The digital transformation of business. Towards the datafication of the relationship with customers. *Technological Forecasting and Social Change*, 162, p.120339.
- Feroz, A.K., Zo, H. and Chiravuri, A., 2021. Digital transformation and environmental sustainability: A review and research agenda. *Sustainability*, 13(3), p.1530.
- France, S.L. and Ghose, S., 2019. Marketing analytics: Methods, practice, implementation, and links to other fields. *Expert Systems with Applications*, 119, pp.456-475.
- Lutfi, A., Alsyof, A., Almaiah, M.A., Alrawad, M., Abdo, A.A.K., Al-Khasawneh, A.L., Ibrahim, N. and Saad, M., 2022. Factors influencing the adoption of big data analytics in the digital transformation era: Case study of Jordanian SMEs. *Sustainability*, 14(3), p.1802.

- Mahraz, M.I., Benabbou, L. and Berrado, A., 2019, October. A systematic literature review of digital transformation. In *Proceedings of the International Conference on Industrial Engineering and Operations Management* (pp. 917-931). IEOM Society.
- Miklosik, A. and Evans, N., 2020. Impact of big data and machine learning on digital transformation in marketing: A literature review. *Ieee Access*, 8, pp.101284-101292.
- Moumtzidis, I., Kamariotou, M. and Kitsios, F., 2022. Digital transformation strategies enabled by internet of things and big data analytics: The use-case of telecommunication companies in Greece. *Information*, 13(4), p.196.
- Mubarak, M.F., Shaikh, F.A., Mubarik, M., Samo, K.A. and Mastoi, S., 2019. The impact of digital transformation on business performance: A study of Pakistani SMEs. *Engineering technology & applied science research*, 9(6), pp.5056-5061.
- Papachristou, N., Kotronoulas, G., Dikaios, N., Allison, S.J., Eleftherochorinou, H., Rai, T., Kunz, H., Barnaghi, P., Miaskowski, C. and Bamidis, P.D., 2023, May. Digital Transformation of Cancer Care in the Era of Big Data, Artificial Intelligence and Data-Driven Interventions: Navigating the Field. In *Seminars in Oncology Nursing* (p. 151433). WB Saunders.
- Shao, C., Yang, Y., Juneja, S. and GSeetharam, T., 2022. IoT data visualization for business intelligence in corporate finance. *Information Processing & Management*, 59(1), p.102736.
- Statista.com, (2023). Revenue from big data and business analytics worldwide from 2015 to 2022(in billion U.S. dollars). Retrieved from: <https://www.statista.com/statistics/551501/worldwide-big-data-business-analytics-revenue/> Retrieved on: 03/08/2023.
- Tong-On, P., Siripipatthanakul, S. and Phayaphrom, B., 2021. The implementation of business intelligence using data analytics and its effects towards on performance in the hotel industry in Thailand. *International Journal of Behavioral Analytics*, 1(2).
- Yukhno, A., 2022. Digital Transformation: Exploring big data Governance in Public Administration. *Public Organization Review*, pp.1-15.