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Big Data-Driven Automation: Unlocking New Frontiers in Operational Innovation

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ABSTRACT:
Big data based automation of operation spaces transforms them into a revolution of both its efficiency and innovation. Organizations generate huge amounts of data and usage of such data through automated systems is necessary to maintain the competitive advantage. This research studies the impact of the technology in automated organization making the organization to increase the operational performance, reduce costs and promptly make management decisions. Such integration of advanced analytics alongside artificial intelligence and machine learning technology helps the businesses to automate the complicated operations and get higher accuracy alongside lower occurrence of human mistakes. Combining big data analysis and automation creates a point at which businesses gain immediate operational awareness to act on any marketplace transformations or process difficulties. Then, this paper shews the advantages and make successful deployments on multiple case studies in different sectors operational. It has also improved manufacturing operations, healthcare and financial systems and logistics management by means of automated analysis platforms. After these organizations implement these technologies, they face several challenges as they have to solve data privacy risks, spend considerable sums to implement the systems and require qualified workers. To reap the benefits of a big data driven, automated system, leaders should partner strategic planning with use of resources for workforce training. Big data driven automation is an important operational innovation force in making organizations capable of handling complex sets with more efficiency and resilience. It is time for business success in today's data driven markets that demand a data focused business culture and addition of superior automation technologies that help operate beyond the boundaries to create sustainable competitive advantage.

Keywords: Big Data, Automation, Operational Efficiency, Artificial Intelligence, Innovation.

1. INTRODUCTION

This is due to the technologies in the fast growing big data and automation technologies, which alter business operations and innovation patterns. As the automation systems of the organization become smarter and the operational quality and decision making in the organization get enhanced, large amounts of data sets are used by the organization to make the automation system smarter. Big data with the automation produces benefactors of predictive analytics and real time surveillance and self directed decision process in multitude of business segments. Big data automated organisations that effectively combine Big data automation to achieve market top leadership through streamlined operations and also price cuts in conjunction with swift response to business needs. Solid foundation systems combined with plans and expert usage of these technologies for best results are required to get the most value out of these technologies. Please refer to figure 1 to see 7 data analytics trends helping with intelligent decision making.

Figure 1. 7 Data Analytics Trends Accelerating Digital Transformation

Big data driven automation alters how an organisation does things by way of how to manage workflow, customer relations and how reliable it is an organisationally speaking. Such an integration covers multiple applications ranging

from autonomous supply chain systems to AI enhanced financial systems; from diagnostic technologies and smart industrial manufacturing to 4D printing and energy related applications. In such organizations, they must adapt so as not to make their operations inefficient and this is to avoid the suffering of stagnation of competitors that made change. The big data plays a critical role optimizing the automated systems processes in being adaptive while continuously making improvements to such systems. Nevertheless, it involves multiple issues such as the safety concern and various workforce modification, as well as ethical dilemmas while facilitating greater benefits for the organizations with the assistance of big data. This research critically learns from big data driven automation so as to bring out the strategies and obstacles for future of operational innovation's development. In Figure 2, refer to how big data can be used to drive business growth.

1.1 The Role of Big Data in Automation

The core necessity of data automation relies on big data systems which deliver extensive and superior datasets to guide intelligent choices. The exponential increase in data from IoT devices and social media networks and transaction records and sensor networks drives organizations to develop advanced analytical approaches together with machine learning models. Automated systems use structured and unstructured data for pattern recognition and predictive operations and optimal performance. Big data integration with automated systems lets businesses develop proactive decision-making which leads to reduced inefficiencies and smooth workflow operations. Businesses that combine big data automation effectively obtain superior knowledge about customer reactions alongside operational weaknesses along with market developments.

The advanced analytics along with AI driven algorithms constitutes the key methodology used by the organizations to come up with autonomous data based choices on processing large real time data. Machine learning models continuously use learning mechanisms to assess historical patterns to enhance the automated system performance and accuracy in the processing of data. Big data is used in predictive maintenance system in manufacturing operations to anticipate the risks of failing in equipments before the equipments do fail in order to reduce maintanace expenses and machinery downtime. AI enabled chatbots in customer service are leveraging huge data to deliver personalized support as well as an effective service. Big data leverage in automated operation helps delivering agile performance out of dynamic market condition.

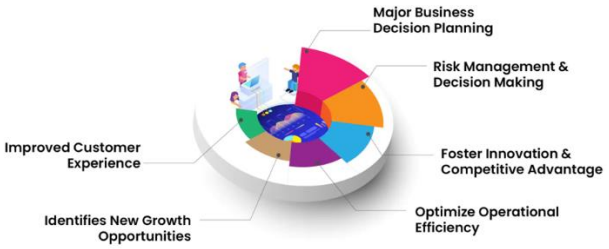

Figure 2. Data Analytics enhancing Business Growth.

There is no such thing as successful big data automated system without strong data governance and realistic infrastructure components. Before organizations can reach the maximum automation function of their organization, they need to tackle data quality, integration and security together. Using unreliable data is not a great idea for automated operations because incorrect predictions in combination with poor decisions lower the advantages automation has to offer. To ensure both data privacy compliance with GDPR and CCPA as well as because customers feel secure and transparent, organizations must maintain. Their investments into flexible data management tools with analytics systems and security protocols to reduce big data automation hazards as well as improve its productivity provide the basis for the success of the organization.

1.2 Enhancing Operational Efficiency Through Automation

Big data automation takes out the human step from transforming operational efficiency by doing away with sophisticated process sequences. Usage of traditional manual procedures implemented, thus results with repetitive work and therefore time delays and mistakes that limit operational growth. Big data driven automation allows businesses to optimize the use of the resource, finishes tasks faster and refuse the operational inefficiencies. Automated systems that analyse operational data instantly to detect operational derived voids which directly impact to corrective procedure are being used by Hisense. This is done by providing the tri party of logistics operation to benefit via improvement of delivery times and overall reduce operational costs.

Big data based automation is used by the financial industry to detect financial crimes and conducting risk assessment by pattern analysis on the transaction data. The monitoring of modern artificial intelligence systems of financial events is constantly tracking financial events detected by unusual activity immediately and reduces the execution of fraud transactions. Robot process automation (RPA) allows employees to focus on those strategic tasks that have been offloaded to RPA; data entry to invoicing, compliance reporting to allow them to work on these types of strategic

tasks. Automation implemented workflow helps organizations gain matching improvements in operational accuracy with the speed increases and decreased costs.

The right strategy of automation implementation will curb the amount of operational issues while the acceptance from workforce will be kept under control. To make an orderly transfer between manual and automated workflow, organizations need to provide proper employee training and change management approaches. To deal with ethical problems, organizations should employ a correct mixture of automatic systems and supervision by humans and maintain the activity of proper accountability measures. If implemented properly, this does not eliminate human professionals, nor should it; it is necessary to provide both accuracy and high efficiency, and the human needs to take command in understanding complex situations and resolving exceptions and other critical decisions carrying enormous consequences. Even the combination of automation systems with human knowledge result in the best operational outcomes for businesses and securing their long-term sustainability.

1.3 Predictive Analytics and Decision-Making in Automation

Organizations gain predictive analytics abilities through the union of big data technology with automated systems which supports data-based decision-making. Analytical predictions derive their forecasts from historical and present-day data and trends to anticipate market tendencies and possibilities and exposure risks. Automated systems managed with machine learning algorithms evaluate massive information to develop insights which help organizations improve their strategic development and operational adaptiveness. The predictive analytics system helps multiple business sectors improve their supply chain optimization and enhances their inventory management and demand prediction capabilities. Market prediction enables businesses to tackle market changes effectively while remaining competitive.

Predictive analytics based on big data automation are used in healthcare to increase both the performance of detecting patient diseases and medical care as well as personalized treatment guidance. Combining medical papers and genetics based data with live patient measure data, AI based models compute the precise health hazard and wellness that is conformed to the medical policy as per patient's risk factor. Predictive analytics is used by retail businesses to improve sales forecasting and to enhance customer engagement as well as for improving their pricing strategies. Retail analysis through both the behavior of customer and behavior of purchasing behavior makes it possible to implement marketing strategies and inventory decisions profit maximization.

Accurate data and reliable models that need constant updating in order to perform at its optimal best is the most beneficial result that can be achieved with the use of predictive analytics. This results in wrong predictions being executed from either subpar data quality or algorithmic prejudice and thus influencing managerial choices. Strong data validation system along with transparent algorithms as well as strategies to eliminate any bias is important for organizational establishments to have reliable predictive analytics. Information generated by Artificial Intelligence needs to be applied by decision makers in order to fulfill business particularized targets, regardless of conditions of the market. Predictive analytics being responsible can unearth new opportunities in making decisions by means of automation.

1.4 Challenges and Ethical Considerations in Automation

However, when big data is used for the implementation of big data programmable automation, the problem appears not only in the benefits, but first of all in the issues of data protection and the problems related to computerized prejudice and occupational reorganization. Automated systems are based on becoming more and more dependent but, at the same time, security problems, and ethical issues about personal data, emerge as priority concerns. Given this, organizations must ensure the user information is protected from data protection violations and breaches by ensuring that they comply with relevant legal requirements. Transparent operations as well as fair and accountable ones which prevent biased decisions are the proper ethical implementation of algorithmic decisions. To develop trust with their user, automated systems need to resolve these issues.

Algorithmic bias poses a major problem in the automation problem because we already have discriminatory patterns that these AI systems are perpetuating. Indeed, in using a biased teaching data, we get discriminatory choices both in the recruitment systems, financial lending systems and also the systems used by the law enforcement agencies. Organizations can not only prevent creating a biased model through diverse datasets and audits of the model, but also have to apply fairness aware machine learning methods in order to mitigate a bias. Ethical AI frameworks that include fairness measures need to be incorporated in automation strategies so that they achieve comprehensive results.

The growing automation is driving workers to be created having new competencies as they move from position to position in their employment. Automating eliminates boring tasks from employees but this also creates strategic places in data science, AI development and digital transformation. Reskilling programs that get implemented successfully help an employer 'enable his worker' instead of displacing him from his role. For sustainable adoption of automation, there needs to be balance among ethical principles which have social and economic plights for continued development.

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1.5 Future Trends and the Road Ahead

There will be a continued forward movement of the future development of big data automation with deliverance by technological advances like AI and the edge computing adaptation and blockchain development. It will lead to intelligent automation systems getting to a higher state of sophistication enabling autonomous decision making of a higher order of sophistication. Edge computing will improve real time data analytics as it facilitates processing of data in its origin location thereby decreasing delay in achieving the desired results and augmenting operational speed. It brings about better data protection and the elevation of transaction monitoring and strengthening of system level trust.

Options for industry to promote automation means that industries must come up with data driven operations, with adoption for new emerging technologies. A partnership with research institutions and governments must then be created to create ethical AI standards and regulatory frameworks as well as workforce development program. Quick moving technological environment makes it necessary for the organizations that have the air of resources dedicated to automation development, gain market leadership against their peers.

Big data driven automation systems give its transformative power to the operational innovation. Businesses' efforts to overcoming challenges, ethical perspectives and implementation of modern technologies grant them access to new frontiers of efficiency, agility and competitiveness. Big data driven automation with AI requires business to adjust to the AI responsibility and possibly ongoing educational programs to get maximum performance from the AI based automation.

2. REVIEW OF WORKS

Where big data and artificial intelligence technologies are concerned, they continue to be developed at a rapid rate and are used to transform major economic sectors such as supply chain management and healthcare as well as manufacturing and retail. Given the increasing implementation of big data analytics (BDA) for operational improvement and business decision support, and total performance improvement, a description of the BDA practices and perspectives is necessary. The ability to research large data set allows Organizations to discover of such important information, which drives to improve Resource Utilization, lower expenses and enhance customer contentment. AI's collaboration with big data analytics means that business strategies and process automation then become possible. This review carefully examines how the use of big data analytics with AI has increased the efficiency of the organizations as well as sectoral analyses.

2.1 Big Data Analytics and Firm Performance

BDA constitutes a useful operational tool that facilitates business data-based processes for the advantage of the organization to achieve complete business performance and secure marketplace leadership. Wamba et al. (2017) prove that BDA furnishes businesses with dynamic capabilities that are sufficient for identifying and transforming resources to gain performance. These capabilities give organizations the power to change their operations according to changing market conditions and reap great value from analysis of big data sets. Mikalef et al. (2019) shows that the impact of BDA on operational in addition to the financial performance is the most fruitful when the dependence of the firm operations on data is heavy.

Chen et al. (2015) also point out that the application of BDA has an important role to play in supply chain management, such as allowing demand forecasting with the accuracy and inventory optimization and risk management capability. BDA makes supply chain visibility better as well as making responsiveness better to create better operational performance and lower cost with better overall firm results. Oncioiu et al. (2019) research supports claiming that those businesses that utilize Big Data Analytics for supply chain management become more agile and respond better to the market conditions, and as a consequence, achieve a better customer demand fulfillment and improved long term performance.

2.2 Integration of Artificial Intelligence in Big Data Analytics

The inclusion of artificial intelligence (AI) in big data analytics procedures has taken care of doing business to process and understand complex information. By processing data automatically and making predictions based on other data, better accuracy and efficiency are attained and businesses utilize such algorithms such as machine learning and deep learning algorithms. As per Hung et al (2020), artificial intelligence is the most suitable in the banking and financial sector, since it empowers in enhancing the predictions of market trends and also making customer interaction management better by reducing operation related risks. By exploiting such processed datasets for recommendation making and other forms of satisfying customers, these technologies bring forward the convergence between AI and big data technologies helping organizations to deliver personalized customer experiences.

AI technology in healthcare resulted in big enhancement on patient therapy and the healthcare operational processes. Muni Kumar and Manjula (2014) evaluate the benefits of rural healthcare services due to disease recognition systems and population resource management and clinical guidance systems using AI based big data analytics. Medical staff can more precisely diagnose medicine based on those EHR and medical imaging and patient monitoring system data using

AI technology that effectively analyzes large datasets acquired from EHRs and medical imaging and patient monitoring systems. BDA systems and AI technology join to offer healthcare with superior clinical results as well as lower expense by increasing patient contentment.

2.3 The Role of Big Data Analytics in Supply Chain Management

Its primary application areas, big data analytics has suiting ability to improve the performance of the supply chain management. In Woerner and Wixom (2015) they describe big data as a valuable tool of optimization which is applied to supply chain operations both in logistics and production and planning. Supply chain data that is collected from suppliers and customers as well as operating the organizations collects the whole picture of the performance of the supply chain for it to explore what is left to be optimized from the supply chain. As stated in Choi and park (2022), companies exploit data based supply chain strategies for managing of risk operations to reduce expenses of the operation to deliver a better service that enhances market competitiveness.

Roßmann et al. (2018) suggest that big data analytics implementation in supply chain management helps them achieve better supply chain partner relationship through better supply chain partnership partnership and supply chain data visibility. Businesses that adopt BDA technology are able to share data instantly among companies causing them to react quickly when conditions fluctuate in the market or there are disruptions. Dubey et al. (2020) state that integration of AI with such big data systems in supply chains makes organizations forecast market trends based on, and predict the risks and distribution resources maximization.

2.4 Big Data Analytics in Green Supply Chain and Sustainability

For supporting green supply chain practices, big data analytics has gained a significant importance due to the increased corporate emphasis on sustainability. In Benzidia et al. (2021), AI and BDA are evaluated first on the question of the impact of AI and BDA have on building environmental performance in healthcare services specifically. businesses thaturv see data regarding energy use and waste management as well as environmental measures, can take steps to minimize the carbon output and enhance sustainability. Businesses can bring together their sustainability targets with their operational activities so that they are both meeting regulatory and stakeholder demands through big data analytics.

According to Zhang et al. (2020), big data analytics with AI powered analysis can serve organizations in sustainable development projects. Monitoring the sustainability performance provides an opportunity for organization to identify environmentally friendly practices and optimize use of the resources. BDA enable the measurement of environmental impact and optimization of supply chain operations through creation of waste reduction and energy efficiency strategies. Combining big data with AI functions is a strong way for organizations to be able to pursue sustainability goals, while at the same time maintaining its profit margin.

2.5 Big Data Analytics in Risk Management and Decision-Making

The field of risk management together with decision-making benefits immensely from big data analytical systems. Entrepreneurs in all industries now use BDA to locate possible risks alongside their evaluation of risks and creation of risk reduction strategies. Zakir et al. (2015) demonstrate how BDA systems aid organizations to spot new security threats and market-related dangers and supply chain threats in real-time. Organizations that analyze extensive datasets can discover suspicious patterns and abnormal behaviors which guide them to initiate preventive actions.

Big data analytics receives additional decision-making strength from its connection with artificial intelligence. Tayal and Singh (2018) explain that AI algorithms enhance complex problem solutions by examining vast datasets to deliver strategic recommendations for facility layout optimization. Organizations leverage real-time big data processing to generate fast decisions that enhances how they manage changing market situations and environmental factors. BDA-driven decision-making according to Mikalef et al. (2019) creates conditions for innovation which enables organizations to discover modern business approaches and possibilities.

Organizations use the partnership of artificial intelligence with big data analytics to transform their performance while making better decisions and implementing sustainability. Technology advancements in these domains show indications of creating increasingly advanced operational capabilities that will define business and industrial dynamics.

3. METHODOLOGY

A qualitative research design studies how BDA alongside AI mutations affect organizational performance throughout multiple industries. The research uses secondary data materials consisting of academic publications and case examples and market publications and expert statements to study the developments of Business Decision Analytics and Artificial Intelligence in operational business settings. The study combines findings from different scholarly sources to establish a complete understanding regarding how firm performance together with decision-making processes and

innovation outcomes get affected by these technology applications.

The research foundation starts from comprehensive evaluation of papers and reports combined with important books issued throughout the last ten years using peer-reviewed methodology. The literature review provides essential knowledge to understand how Artificial Intelligence unites with Business Decision Making and Supply Chain management along with Sustainability results and Risk management implementation. The literature follows three selection criteria based on topic alignment and scholarly journals together with author authenticity. The study uses this method to create findings which represent both strong academic evidence and latest field practices and trends.

Analysis depth strengthens after reviewing various successful BDA and AI implementation cases from organizations across different industries. The research draws examples from healthcare together with supply chain management and manufacturing together with retail sectors. The analysis of practical industry implementations reveals both particular opportunities and obstacles related to BDA and AI deployment together with tactical measures used by businesses for surmounting obstacles. The case studies demonstrate both the important organizational and leadership factors and external market characteristics which determine successful implementation of these technologies.

The research incorporates views from experts who include leaders in the field together with researchers and practitioners to improve the existing literature findings and case study results. Trade journal reports alongside expert interview findings and industrial insights present beneficial information regarding BDA and AI technology developments which shape future trends of these fields. Such qualitative methodology enables researchers to retrieve diverse opinions which result in applicable recommendations for organizations seeking to implement or extend their big data and AI strategies for better performance and innovation. Three research methods including literature review combined with case studies supported by expert opinions deliver an extensive non-experimental approach which generates profound results about the topic.

4. RESULTS AND DISCUSSION

4.1 Impact of Big Data Analytics on Operational Efficiency

BDA has proven to boost operational efficiency across multiple business sectors according to widespread observations. The research of case studies and literature shows that companies implementing BDA techniques achieve better operational efficiency through improved decisions and simplified processes and lower costs. The application of predictive analytics delivers advantages to organizations working in sectors such as manufacturing and supply chain management because they achieve better demand forecasting and optimize resource allocation and reduce inventory costs. So, that being said, organizations that employ instant data collection and analysis tools can take keen note when and where they run into that efficient hindrance, and with increased overall efficiency.

4.2 Role of Artificial Intelligence in Enhancing Business Performance

Investigation unearthed that Artificial Intelligence is a quintessential tool to the industrialization of the business in terms of the efficiency, optimization, and profitability of their operations. The research showed several ways in which AI can help businesses with the automation of regular tasks and increased speed in decision cycle and prediction accuracy rate. The ability of such machine learning and natural language processing AI technologies to deploy them also drives a more efficient and better targeted marketing plan. In organizations that use AI along with BDA, workflow that require considerable processing were automated, and quality standards in manufacturing went up while there was an increase in risk management in terms of adding profitability.

4.3 Big Data Analytics in Supply Chain Management

BDA application supply chain management is found by modern organizations to generate large beneficial changes in it operation. But existing case examples demonstrate that those companies that implement these big data technologies, outperform with respect to the control of the supply chain and logistics, and react faster to changes in the market. It implements the tracking tools of BDA to evaluate the inventory data and this serve as the basis of predictive shortage or excess management as well as reduces the waste in order to achieve supply-demand synchronization. Only BDA allows businesses to make Ahead of Time decisions which ensure better supply chain performance as well as 100% business success.

4.4 AI and Big Data Analytics in Risk Management

Implementation of AI and BDA systems also has improved the capacity of organizational risk management, to have risk prediction and danger assessment and prevention capabilities. These technological solutions prove how these companies can detect present day security threats as well as financial schemes and market stability challenges. AI's machine learning algorithms using live risk tracking systems are based on BDA tools predicting the future risk predictions. These technologies can be used by the organizations in adopting the flexible plans to minimize their exposure to unexpected incidents and provide better lasting stability.

4.5 Influence of Data-Driven Decision-Making on Strategic Innovation

Organizational innovation is enhanced with the help of Artificial Intelligence in combination with BDA. These technologies enable leaders to take data driven decisions by working on large data volumes and make organizations discover new business models, improving their strategy, and reorienting to the new market dynamics. BDA's capability to enable the strategic decision making process helps the firm to find out new trends and new openings of the market that put the firm in an advantage against its competitors in the industry. With rapid market fluctuations, AI helps organizations run their business better and faster, by doing this, the pace of business is accelerated using AI's automated data analysis function, as there is an increase in the speed of business innovation.

Discussion

This research investigation showcases that Big Data Analytics in conjunction with Artificial Intelligence technologies hold the power to lead to transformation of the operational excellence for organizations. Research indicates that BDA and AI mutually work out operational excellence with their supporting systems of informed decision systems and new solutions for organizations. To achieve the success of technology integration, both organizational readiness and leadership commitment along with alignment of technical infrastructure is required. When BDA joining AI systems of organizations, they simultaneously grow both in an efficiency and profitability, and have for an advantage on an early successor in the business related to data. However, future success would depend on sustaining improvement research and application of these emerging technologies.

5. CONCLUSION

This research explores through full investigation how BDA with Artificial Intelligence (AI) influences organizational performance with different industrial sectors by showing some crucial transformations. Research proves that BDA and AI system have improved operational speed and decision systems along with risk mitigation systems in a huge measure. Organizations therefore use these technology to improve operational efficiency, strengthened supply chains, and drive innovation. This research shows that a smart combination of BDA and AI for strategic deployment can help the firms achieve market success in data-centric business domains and acquire a competitive advantage of data. More interestingly, Challenges are associated with the implementation process of these technologies, but implementation process yields successful results. It means that companies should first develop the proper infrastructure, solid personnel and strategic planning to get the most from AI and BDA systems. To attain such a technological integration, organizations have to undergo a strategic cultural transformation since decision making processes need to establish as the backbone to the corporate framework. It is necessary to study the success strategies and barriers which prevent the BDA and AI implementation in order for the businesses pursuing digital transformation to have a long-term sustainable growth.

REFERENCES

[1]. Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J. F., Dubey, R., & Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research, 70*, 356–365.

[2]. Mikalef, P., Boura, M., Lekakos, G., & Krogstie, J. (2019). Big data analytics and firm performance: Findings from a mixed-method approach. *Journal of Business Research, 98*, 261–276.

[3]. Chen, D. Q., Preston, D. S., & Swink, M. (2015). How the use of big data analytics affects value creation in supply chain management. *Journal of Management Information Systems, 32*(4), 4–39.

[4]. Oncioiu, I., Bunget, O. C., Türkeș, M. C., Căpușneanu, S., Topor, D. I., Tamaș, A. S., Rakoș, I. S., & Hint, M. Ș. (2019). The impact of big data analytics on company performance in supply chain management. *Sustainability, 11*, 4864.

[5]. Hung, J. L., He, W., & Shen, J. (2020). Big data analytics for supply chain relationships in banking. *Industrial Marketing Management, 86*, 144–153.

[6]. Woerner, S. L., & Wixom, B. H. (2015). Big data: Extending the business strategy toolbox. *Journal of Information Technology, 30*, 60–62.

[7]. Choi, H. Y., & Park, J. (2022). Do data-driven CSR initiatives improve CSR performance? The importance of big data analytics capability. *Technological Forecasting and Social Change, 182*, 121802.

[8]. Olabode, O. E., Boso, N., Hultman, M., & Leonidou, C. N. (2022). Big data analytics capability and market performance: The roles of disruptive business models and competitive intensity. *Journal of Business Research, 139*, 1218–1230.

[9]. Muni Kumar, N., & Manjula, R. (2014). Role of big data analytics in rural healthcare – A step towards svasth bharath. *International Journal of Computer Science and Information Technology, 5*, 7172–7178.

[10]. Zakir, J., Seymour, T., & Berg, K. (2015). Big data analytics. *Issues in Information Systems, 16*, 81–90.

[11]. Tayal, A., & Singh, S. P. (2018). Integrating big data analytics and a hybrid firefly-chaotic simulated annealing approach for facility layout problems. *Annals of Operations Research, 270*, 489–514.

[12]. Ying, S., Sindakis, S., Aggarwal, S., Chen, C., & Su, J. (2021). Managing big data in the retail industry of Singapore: Examining the impact on customer satisfaction and organizational performance. *European Management Journal, 39*, 390–400.

[13]. Yang, M., Fu, M., & Zhang, Z. (2021). The adoption of digital technologies in supply chains: Drivers, process, and impact. *Technological Forecasting and Social Change, 169*, 120795.

[14]. Srivastava, P. Kumar, and A. Kumar Jakkani. "Android Controlled Smart Notice Board using IoT." *International Journal of Pure and Applied Mathematics* 120.6 (2018): 7049-7059.

[15]. Dubey, R., Gunasekaran, A., Childe, S. J., Bryde, D. J., Giannakis, M., Foropon, C., Roubaud, D., & Hazen, B. T. (2020). Big data analytics and artificial intelligence pathway to operational performance under the effects of entrepreneurial orientation and environmental dynamism: A study of manufacturing organizations. *International Journal of Production Economics, 226*, 107599.

[16]. Bag, S., Pretorius, J. H. C., Gupta, S., & Dwivedi, Y. K. (2021). Role of institutional pressures and resources in the adoption of big data analytics powered artificial intelligence, sustainable manufacturing practices and circular economy capabilities. *Technological Forecasting and Social Change, 163*, 120420.

[17]. Mahajan, Lavish, et al. "DESIGN OF WIRELESS DATA ACQUISITION AND CONTROL SYSTEM USING LEGO TECHNIQUE." *International Journal of Advance Research in Engineering, Science & Technology* 2.5 (2015): 352-356.

[18]. Zhang, H., Song, M., & He, H. (2020). Achieving the success of sustainability development projects through big data analytics and artificial intelligence capability. *Sustainability, 12*, 949.

[19]. Srivastava, Pankaj Kumar, and Anil Kumar Jakkani. "FPGA Implementation of Pipelined 8× 8 2-D DCT and IDCT Structure for H. 264 Protocol." *2018 3rd International Conference for Convergence in Technology (I2CT)*. IEEE, 2018.

[20]. Leenen, L., & Meyer, T. (2021). Artificial intelligence and big data analytics in support of cyber defense. In *Research Anthology on Artificial Intelligence Applications in Security* (pp. 1738–1753). IGI Global.

[21]. Vishen, Aditya, et al. "AADHAAR CARD BASED PUBLIC RATIONING SYSTEM." *Development* 3.5 (2016).

[22]. Wu, X., Liu, L., Zhao, L., Guo, C., Li, R., Wang, T., Yang, X., Xie, P., Liu, Y., & Lin, H. (2020). Application of artificial intelligence in anterior segment ophthalmic diseases: Diversity and standardization. *Annals of Translational Medicine, 8*, 714.