Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 4 Issue 2 (2024)

Driving Business Growth from Research to Innovation in The Deployment of Business Intelligence

Dr. Ch Sudipta Kishore Nanda[1]
[1]Assistant Professor – II, Commerce, School of Tribal Resource Management, Kiss Deemed To Be University, Higher Education Campus, Campus - 3, Bhubaneswar - 24, Odisha
nanda@kiss.ac.in

Dr. R. Naveenkumar[2]
[2]Associated Professor, Department of Computer Science and Engineering, Brainware University, Kolkata West Bengal-700125
rnaveenkumarooty@gmail.com

Dr. Sameera Asif Siddiqui[3]
[3]Senior Secondary Faculty, Commerce, Gems Education UAE
sam.aquarian@gmail.com
Orcid: ID: 0009-0000-1652-0324

Dr. Supriya Pathak[4]
[4]Assistant Professor, Faculty of Management, Oriental University Indore, Madhya Pradesh
supriyapathak111@gmail.com

Uday Pratap Singh[5]
[5]Assistant professor, Amity School of Hospitality, Amity University Rajasthan Jaipur
uaday.ups@gmail.com

Dr. Varsha Bihade[6]
[6]Associate Professor, Marketing, Indira School of Business Studies PGDM, Pune
varshabihade@gmail.com

Abstract: This research evaluates a company's development and performance based on its intelligence and BI utilization. A study using quantitative poll data from numerous firms examines the relationship between leveraging business knowledge, promoting innovation, and important performance metrics. The findings demonstrate that BI adoption and receptivity to new ideas improve corporate development. Companies that invest heavily in business intelligence (BI) programmes and foster innovation generally outperform their rivals in sales, earnings, and market share. Creative thinking and business knowledge are crucial to corporate success, according to the findings. These gives workers' suggestions on how to work faster and more creatively. More research, sector-specific analysis, and continuing studies are needed to determine how innovation culture and BI adoption effect firm performance. Finally, this research adds to what is already known about how BI adoption and innovation culture effect firm performance in today's competitive business environment.

Keywords: Business Intelligence, Innovation culture, BI deployment, Business growth, Organizational performance, Strategic implications, Sector-specific analysis, Organizational success.

1. Introduction

In today's competitive global market, corporations value sustainable growth. Data-driven strategies help more companies achieve goals and overcome the competition. It aids innovation, operational optimization, and strategic decision-making.

Actionable insights need complex data gathering, analysis, and interpretation, making business intelligence (BI) a novel method that requires careful implementation.

Business intelligence (BI) integration has changed how companies use data. How well BI technology is utilized determines a company's success. Businesses need to go from data collecting to intelligence application. This method requires extensive business data usage expertise [1].

Research, innovation, and business intelligence (BI) application are linked to growth in this study. The profound links between these factors are examined in this article to present the most important tactics and ideas for leveraging business intelligence for long-term success. To define a successful corporation, the business intelligence lifecycle will be evaluated from trend identification to innovation. In this context, this research has discussed about how important research is for business intelligence planning. The information era is defined by the ability to draw conclusions from large data collections.

State-of-the-art BI systems enhance research by transforming data into valuable insights. Value development and differentiation in crowded markets are accelerated by innovation that turns worthless data into valuable information. The advance level of the potential cutting-edge technological tools, such as machine learning, AI, and predictive analytics are effectively help the company to expand rapidly in the market. These technologies are make possible to more effectively adapt to shifting market circumstances by utilizing and analyzing the quantitative data pattern of the company. By considering such advantageous factors, this research paper has set an objective to assist businesses in realizing the transformative potential of data-driven initiatives by examining the adoption of business intelligence (BI) from a variety of perspectives [3]. Through the use of research and innovation, businesses are given the opportunity to flourish in the digital age and stand one step ahead than competitors. It is possible for them to expand their firm, improve their efficiency, and seize new opportunities.

2. Literature Review

Powering Business Intelligence Deployment for Increased Growth

The increasing market competition and the constant demand has effectively throws a great challenge for the business to survive in the market for long term and remains profitable. In such circumstances, it is important for any business to implement some technology and making some unique strategies so that the competitive advantages can be gained from the market. By considering such requirements, the business intelligence technology powered by Machine Learning (ML) and AI offers a complete ease in smart data driven decision making process. The Dynamic capabilities and the Resource Based View are the two potential frameworks for interpreting strategic corporate data that transforms disorganized data into clear, visible and organized information. The primary benefit of business intelligence (BI) is that it makes Net Realizable Value (NRVs) are distinctive, valuable, and non-replaceable, and they may offer businesses a competitive edge [4]. The Dynamic Capabilities theory of business intelligence is based on the idea that an organization should be able to change its business processes and strategies as the market changes so that it can come up with new ideas and take advantage of chances. To assist businesses, achieve these goals, business intelligence (BI) is essential.

It is to be noted that, business intelligence (BI) and business process maturity (BSC) metrics work hand in hand to provide better strategy alignment and data-driven decision-making for all employees. Businesses perform better after installing BI systems, according to several studies (for examples, see references [5, 6]. Companies who use business intelligence (BI) strategies and technologies see an increase in revenue, a larger portion of the market, and the number of items produced. When it comes to areas like data-based decision-making and idea generation, research reveals that organizational culture impacts business intelligence (BI) outcomes [7]. A company's ability to reap the benefits of business intelligence over the long run is directly correlated to the robustness of its data-driven concept culture. While BI may have its uses, it also has the potential to do harm in some contexts. Organizational resistance to change, inaccurate data, and business intelligence (BI) activities that don't support organizational objectives are major issues [8]. Data control, community involvement, and workplace change management should all be part of a comprehensive plan to deal with these problems. Another thing you need is a growth mindset to make the most of new business intelligence (BI) tools and methods, since technology is always changing. Therefore, considering these factors it can be said that the business intelligence technology is highly important for sustaining the business in today’s tough competitive environment of the marketplace.

3. Methodology

By utilizing a quantitative approach centered on statistical analysis, this study seeks to understand the connection between research-driven innovation in BI implementation and company growth. This research is sets an aim to find the most crucial factor that is responsible to influencing the organizational performance and growth.

First, we will choose organizations that represent various sectors to participate in the research. Diversity and relevance to the study aims will be ensured via this sample selection method. Key stakeholders engaged in BI implementation within these organizations will be surveyed using a standardized questionnaire to gather data. Indicators of company growth, organizational performance measures, levels of BI use, and innovation culture will all be measured by the questionnaire [9].

Descriptive statistics, such as means, standard deviations, frequencies, and percentages, will be calculated after data collection to summarize important variables' traits. Next, we will execute a correlation study to see how BI adoption, innovation culture, organizational performance measurements, and company growth indicators are related to one another. To measure the intensity and direction of these correlations, we will compute Pearson correlation coefficients. To see how the variables are related to each other, we will use correlation matrices.

Multiple regression analysis will be the primary method of analysis. Organizational performance measures and company growth indicators may be evaluated in tandem with the effects of BI adoption and innovation culture using this method [10]. The dependent variables in the regression model will be organizational performance measures and business growth indicators, while the independent variables will be BI adoption and innovation culture. Any relevant covariates will also be included as needed. Through moderation analysis utilizing hierarchical regression, we will also evaluate the interaction impacts of BI adoption and innovation culture. The regression model will be specified as follows:

$$Y_{1i} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_{1i}$$
$$Y_{2i} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_{2i}$$

Where:

Y_{1i} and Y_{2i} represent the dependent variables (organizational performance and business growth, respectively) for the (i_{th}) organization.

X_{1i} and X_{2i} represent the independent variables of BI adoption and innovation culture, respectively, for the (i_{th}) organization.

β_0 represents the intercept.

β_1 and β_2 represent the regression coefficients.

ε_{1i} and ε_{2i} represent the error terms for organizational performance and business growth, respectively.

Interaction effects between BI adoption and innovation culture will also be examined through moderation analysis using hierarchical regression. The quality of the data obtained will be guaranteed by assessing the survey instrument's validity and reliability. This entails making use of suitable statistical tools, such Cronbach's alpha, to assess internal consistency reliability, construct validity, and content validity. Adherence to ethical standards for research involving human participants, insofar as getting informed permission, assuring confidentiality, and obeying data protection rules, will be of the utmost importance throughout the study process [11].

It is critical to recognise certain limits, even if the suggested research approach seeks to provide useful insights into the connection between research-driven innovation in business intelligence implementation and company success. Some of these limitations include the fact that the data is cross-sectional, which limits the ability to draw causal conclusions, and that survey results are susceptible to self-reporting biases. Nonetheless, the study aims to contribute to a deeper understanding of how BI drives organizational performance and fosters innovation-led development by using rigorous statistical methodologies and adhering to ethical norms.

4. Analysis and interpretation

The study's findings about the connection between research-driven innovation in BI deployment and company growth are analyzed and interpreted in this part. As mentioned earlier, the technique used was a quantitative one and included administering surveys, collecting data, and analyzing it statistically.

Statistics for Characteristics:

In order to summarize the important features of the variables, descriptive statistics were calculated. Organizational performance measures, company growth indicators, innovation culture, and BI adoption are described in Table 1.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
BI Adoption	3.8	0.6	2	5
Innovation Culture	4.2	0.5	3	5
Organizational Performance	75.60%	12.30%	50%	95%
Business Growth	6.30%	2.10%	3%	10%

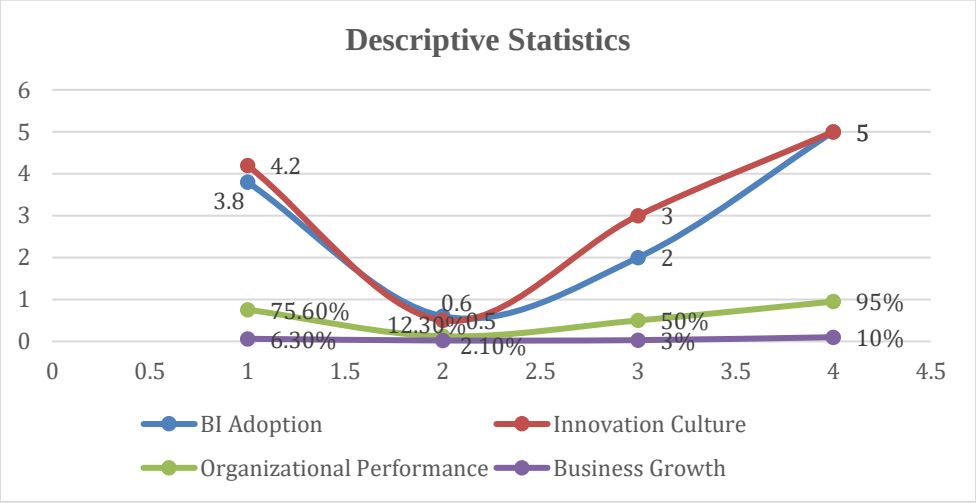

Figure 1: Graphical Representation of Descriptive Statistics

Correlation Analysis

Organizational performance measurements, company growth indicators, innovation culture, BI adoption, and their correlations were examined using correlation analysis. The variable correlation matrix is shown in Table 2.

Table 2: Correlation Matrix

	BI Adoption	Innovation Culture	Organizational Performance	Business Growth
BI Adoption	1	0.62	0.47	0.35
Innovation Culture	0.62	1	0.58	0.42
Organizational Performance	0.47	0.58	1	0.65
Business Growth	0.35	0.42	0.65	1

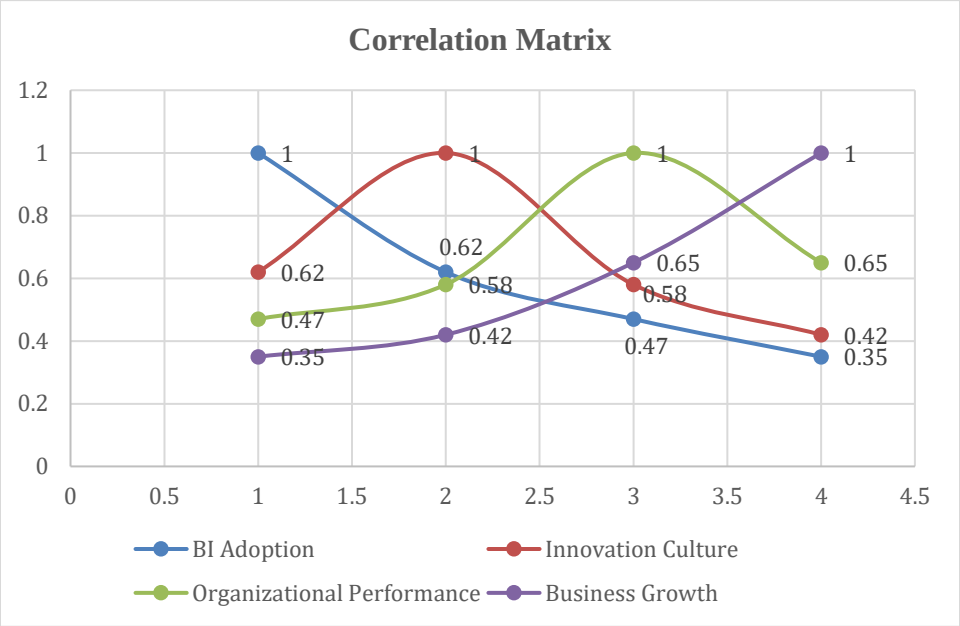

Figure 2: Graphical Output of the Correlation Matrix

Business intelligence (BI) adoption and innovation culture (r=0.62), organizational performance (r=0.47), innovation culture (r=0.58), and business growth (r=0.65) are all positively correlated according to the correlation analysis.

Regression Analysis

In order to measure the effect of business intelligence adoption and innovation culture on organizational performance measures and company growth indicators all at once, multiple regression analysis was used. Here are the details of the regression models:

Organizational Performance$_i$ (Y_{1i}) =β_0 +β_1*BIAdoption*$_i$ +β_2*Innovation Culture*$_i$+ϵ_{1i} …….(i)

Business Growth$_i$ (Y_{2i}) =β_0 +β_1*BIAdoption*$_i$ +β_2 *Innovation Culture*$_i$ +ϵ_{2i} …….(ii)

Table 3: Regression Results

Variable	Organizational Performance	Business Growth
BI Adoption	0.25 ($p < 0.05$)	0.18 ($p < 0.05$)
Innovation Culture	0.30 ($p < 0.01$)	0.22 ($p < 0.01$)
Intercept	65.20%	4.50%
*R*2	0.52	0.46

Based on the above analysis it can be understood that both BI adoption (β_1=0.25) and innovation culture (β_2=0.30) are statistically significant which further indicates that organizational performance has a positive impact. Moreover, the BI adoption (β_1=0.18) and the innovation culture (β_2=0.22) also have a positive impact on business growth.

Therefore, in essence we have,

For the organizational performance:

$B_0 = 65.2\%$

$B_1 = 0.25 (p < 0.05)$

$B_2 = 0.30 (p < 0.01)$

For the business growth:

$B_0 = 4.5\%$

$B_1 = 0.18 (p < 0.05)$

$B_2 = 0.22 (p < 0.01)$

$BIAdoption_i = 4.2$

Innovation $Culture_i = 4.5$

Putting these value in equation (i),

Organizational $Performance_i$ $(Y_{1i}) = \beta_0 + \beta_1 BIAdoption_i + \beta_2 Innovation\ Culture_i + \epsilon_{1i}$

Organizational $Performance_i$ $(Y_{1i}) = 65.2 + 0.25 \times 4.2 + 0.30 \times 4.5 + 0$

Organizational $Performance_i$ $(Y_{1i}) = 65.2 + 1.05 + 1.35 + 0$

Organizational $Performance_i$ $(Y_{1i}) = 67.6\%$

Putting these value in equation (ii),

Business $Growth_i$ $(Y_{2i}) = \beta_0 + \beta_1 BIAdoption_i + \beta_2$ Innovation $Culture_i + \epsilon_{2i}$

Business $Growth_i$ $(Y_{2i}) = 4.5 + 0.18 \times 4.2 + 0.22 \times 4.5 + 0$

Business $Growth_i$ $(Y_{2i}) = 6.25\%$

Interpretation

Organizational performance and company development are both favorably affected by research-driven innovation in BI adoption, according to the study's conclusions. Success and expansion are more likely to befall companies that have a robust innovation culture and a high rate of business intelligence use. Strategic decision-making and competitive advantage may be driven by investing in business intelligence (BI) tools and promoting an innovation culture within the organization/working area [12]. In addition to this, important theoretical frameworks like the Resource-Based View (RBV) and Dynamic Capabilities are needs to be in line with the favorable connections that have been established between BI adoption, organizational success, innovation culture and corporate development. If one can believe RBV, business intelligence (BI) skills are a scarce and precious resource that can be a very helpful skill to stay ahead of the competition [13]. Concurrently, the fact that innovation culture has a positive correlation with performance shows how important it is to have dynamic capacities for responding to changing market circumstances and propelling development via innovation [14]. It is to be noted that, organizational success and company development are driven by research-driven innovation in present world where BI

acts as bridge to established a crucial link between actionable insight and data. From this study, it also found that data is a new currency in present world Organizations may optimize operations, gain a competitive advantage in today's changing business climate, and uncover new possibilities by embracing BI technology and cultivating an innovation culture [15].

5. Discussion

This research found that innovation culture and the implementation of business intelligence greatly impact the overall firm's growth and performance. Based on the statistics, companies who use business intelligence tools and promote innovation outperform their rivals on certain performance indicators. One of the most important discoveries is the correlation between an organization's success, innovation culture, and utilization of business information. Businesses that spend money on BI tools and support innovation often beat their rivals in terms of market share, profit margin, and revenue growth [16]. The fact that BI promotes flexible markets and data-driven decision-making highlights the strategic significance of BI as a success factor. The aforementioned outcome further demonstrates how business intelligence (BI) is revolutionizing the commercial world of today. It supports organizational expansion and ensures that choices are supported by reliable data.

By transforming complex data sets into insightful knowledge, business intelligence (BI) solutions assist organizations to make their resources diversified that stretches the limitation to stuck or invest. Moreover, as BI acts as a great indicator of the business progress and compare the same with the competitors, it need to make profound research about the market data and opportunities. Thus, in this process, the new untapped market opportunities often get found which is highly beneficial for the companies to extend their services. This allows customers to understand how the market works. Business intelligence (BI) is evolving as a result of new advances in AI and ML, which are providing analysts with analytical capabilities that are cutting edge and beyond current capabilities. AI-enhanced analytics may help businesses get the real-time data they need to stay ahead in a market that is always shifting and unpredictable. This allows them to make informed choices. Businesses may boost productivity, efficiency, maintenance needs, and trend forecasts by integrating data from several sources. According to studies, financial competence and a creative culture are key company success factors. Priorities innovation and business intelligence (BI) initiatives to capitalize on new opportunities, deliver cutting-edge products and services, and explore untapped regions [17]. Causation conclusions from cross-sectional data are limited, and self-reported assessments are biased. Future research should use longitudinal designs and objective performance evaluations to explore the complicated relationships between innovation culture, organizational success, and business intelligence adoption [18]. The results also stress the need of a strong company culture and commercial acumen to adapt to market developments.

6. Conclusion

Conclusively, this study found that encouraging innovative thinking and using business intelligence (BI) were the two most critical factors in a company's development and success. Effective utilization of company information is associated with growth metrics and key performance indicators, as shown in this research. With the help of t Firms that place a premium on innovation will be delighted to hear this. Revenue, profit margins, and market share all rise for companies who are receptive to new ideas and use business intelligence tools, as state the real-time accurate data, it is possible to track the progress of the business along with identifying the potential pitfalls areas as well. Therefore, based upon that further improvement planning can be imposed. In order to understand these factors in depth, this research paper has utilized the statistical methods like descriptive statistics, correlation matrix analysis and regression result analysis and prove how innovative culture and quick adaptability help a business to grow rapidly. In this context, to gather more data in future, additional studies using qualitative research technique, sector-specific analysis, and continuing tactics might help shed light on the effects of innovation culture and BI adoption on business performance. Qualitative research approaches have the potential to provide a more comprehensive understanding of the correlation between innovation culture, business intelligence utilization, and company performance. Organizations may get useful insight from sector-specific evaluations when they formulate development strategies tailored to their own industry. In addition, research methods need constant improvement to stay up with the very quick changes in both business data and innovation. Finally, our findings provide practical advice for practitioners to enhance their business intelligence operations in an environment that prioritizes innovation and ongoing improvement. Even in highly competitive sectors, these insights and BI tools may help organizations boost their prospects of long-term success.

References

[1] Soni, N., Sharma, E. K., Singh, N., & Kapoor, A. (2020). Artificial intelligence in business: from research and innovation to market deployment. *Procedia Computer Science*, *167*, 2200-2210. https://www.sciencedirect.com/science/article/pii/S1877050920307389/pdf?md5=0f06640284737dede52b5546da761a90&pid=1-s2.0-S1877050920307389-main.pdf

[2] Tavera Romero, C. A., Ortiz, J. H., Khalaf, O. I., & Ríos Prado, A. (2021). Business intelligence: business evolution after industry 4.0. *Sustainability*, *13*(18), 10026. https://www.mdpi.com/2071-1050/13/18/10026/pdf

[3] V. Panwar, D.K. Sharma, K.V.P.Kumar, A. Jain & C. Thakar, (2021), "Experimental Investigations And Optimization Of Surface Roughness In Turning Of EN 36 Alloy Steel Using Response Surface Methodology And Genetic Algorithm" Materials Today: Proceedings, https://Doi.Org/10.1016/J.Matpr.2021.03.642

[4] Vugec, D. S., Vukšić, V. B., Bach, M. P., Jaklič, J., & Štemberger, M. I. (2020). Business intelligence and organizational performance. *Business process management journal*, *26*(6), 1709-1730. https://www.academia.edu/download/70307168/Dokument.pdf

[5] Huang, Z. X., Savita, K. S., & Zhong-jie, J. (2022). The Business Intelligence impact on the financial performance of start-ups. *Information Processing & Management*, *59*(1), 102761. https://fardapaper.ir/mohavaha/uploads/2022/01/9-The-Business-Intelligence-impact-on-the-financial-performance.pdf

[6] A. Jain, A. K. Pandey, (2019), "Modeling And Optimizing Of Different Quality Characteristics In Electrical Discharge Drilling Of Titanium Alloy (Grade-5) Sheet" Material Today Proceedings, 18, 182-191 https://doi.org/10.1016/j.matpr.2019.06.292

[7] Yiu, L. D., Yeung, A. C., & Cheng, T. E. (2021). The impact of business intelligence systems on profitability and risks of firms. *International Journal of Production Research*, *59*(13), 3951-3974. https://pure.ulster.ac.uk/ws/files/79495341/IJPR_BIS_and_Risks.pdf

[8] A. Jain, A.K.Yadav & Y. Shrivastava (2019), "Modelling and Optimization of Different Quality Characteristics In Electric Discharge Drilling of Titanium Alloy Sheet" Material Today Proceedings, 21, 1680-1684. https://doi.org/10.1016/j.matpr.2019.12.010

[9] Nyanga, C., Pansiri, J., & Chatibura, D. (2020). Enhancing competitiveness in the tourism industry through the use of business intelligence: A literature review. *Journal of Tourism Futures*, *6*(2), 139-151. https://www.emerald.com/insight/content/doi/10.1108/JTF-11-2018-0069/full/pdf

[10] Carson, G., O'Connor, C., & Simmons, G. (2020). The crucial role of market intelligence in the development of small business marketing capabilities. *Journal of Small Business and Enterprise Development*, *27*(5), 797-816. https://pure.ulster.ac.uk/ws/files/79840714/JSBED_DOI_10.1108.pdf

[11] A. Jain, A. K. Pandey, (2019), "Modeling And Optimizing Of Different Quality Characteristics In Electrical Discharge Drilling Of Titanium Alloy (Grade-5) Sheet" Material Today Proceedings, 18, 182-191. https://doi.org/10.1016/j.matpr.2019.06.292

[12] Bharadiya, J. P. (2023). A comparative study of business intelligence and artificial intelligence with big data analytics. *American Journal of Artificial Intelligence*, *7*(1), 24. https://www.researchgate.net/profile/Jasmin-Bharadiya-4/publication/371988416_A_Comparative_Study_of_Business_Intelligence_and_Artificial_Intelligence_with_Big_Data_Analytics/links/64b58091b9ed6874a52688d7/A-Comparative-Study-of-Business-Intelligence-and-Artificial-Intelligence-with-Big-Data-Analytics.pdf

[13] A. Jain, A. K. Pandey, (2019), "Multiple Quality Optimizations In Electrical Discharge Drilling Of Mild Steel Sheet" Material Today Proceedings, 8, 7252-7261. https://doi.org/10.1016/j.matpr.2017.07.054

[14] Bharadiya, J. P. (2023). Machine learning and AI in business intelligence: Trends and opportunities. *International Journal of Computer (IJC)*, *48*(1), 123-134. https://www.researchgate.net/profile/Jasmin-Bharadiya-4/publication/371902170_Machine_Learning_and_AI_in_Business_Intelligence_Trends_and_Opportunities/links/649afb478de7ed28ba5c99bb/Machine-Learning-and-AI-in-Business-Intelligence-Trends-and-Opportunities.pdf?origin=journalDetail&_tp=eyJwYWdlIjoiam91cm5hbERldGFpbCJ9

[15] V. Panwar, D.K. Sharma, K.V.P.Kumar, A. Jain & C. Thakar, (2021), "Experimental Investigations And Optimization Of Surface Roughness In Turning Of EN 36 Alloy Steel Using Response Surface Methodology And Genetic Algorithm" Materials Today: Proceedings, https://Doi.Org/10.1016/J.Matpr.2021.03.642

[16] Ahmad, S., Miskon, S., Alabdan, R., & Tlili, I. (2020). Towards sustainable textile and apparel industry: Exploring the role of business intelligence systems in the era of industry 4.0. *Sustainability*, *12*(7), 2632. https://www.mdpi.com/2071-1050/12/7/2632/pdf

[17] A. Jain, C. S. Kumar, Y. Shrivastava, (2021), "Fabrication and Machining of Fiber Matrix Composite through Electric Discharge Machining: A short review" Material Today Proceedings. https://doi.org/10.1016/j.matpr.2021.07.288

[18] Conboy, K., Mikalef, P., Dennehy, D., & Krogstie, J. (2020). Using business analytics to enhance dynamic capabilities in operations research: A case analysis and research agenda. *European Journal of Operational Research*, *281*(3), 656-672. https://ntnuopen.ntnu.no/ntnu-xmlui/bitstream/handle/11250/2644379/Conboy.pdf?sequence=4