

The Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation

R. Hazanal Rashid Khan

St Teresa International University Lecturer, Faculty of business administration Email:
rashieedkhan@gmail.com

Received:
30/09/2025
Revised:
07/10/2025
Accepted:
22/10/2025
Published:
30/10/2025

ABSTRACT

In this research study the researcher proposed a generative AI and big data integration using factors such as Data Infrastructure Readiness, Generative AI Capabilities, Integration Architecture, Strategic Business Alignment, Organizational Readiness and Culture, Governance and Ethical Compliance, Innovation and Competitive Advantage, Cost-Benefit Analysis, Risk Management and Security, and Scalability and Sustainability towards the strategic transformation of business value. The researcher used the primary and secondary data to provide a complete structure of this research study. In primary data researcher used the structure questionnaire to collect some unseen data from the AI based Industries. The researcher circulated 120 questionnaires using Google form, received the 110 response from different Industries. Out of 110, five were not relevant so the researcher used only 105 data to compile using SPSS software and interpreted the inferences at 0.05 significant levels. The probability of statistics P-Value is less than 0.05 significant levels. During research study the researcher found that Data Infrastructure Readiness is the significant factor and have a high impact on Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation.

Keywords: GenAI, Artificial Intelligent (AI), Big Data, Machine Learning, Strategic Management.

INTRODUCTION:

The world is moving rapidly evolving digital technology user constant pressure to innovate and enhance the operational efficiency to deliver personalized customer experience in business Industries. The GenAI rapidly changing the business and human value towards business transformation using Artificial Intelligent(AI) and GenAI.. The Big data reshaping the current business Industries model with all possible steps. The research identifies the current research issues on “Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation” not only enhances data-driven decision-making but also enables the automated generation of content, products, and strategies at scale.

Generative AI the capacity to produce novel content including text, code and images from the related data patterns and beyond the traditional automation creativity. The big data analysis gives the way of understanding AI generated concept to produce novel level text and information. It is more feasible with structured and unstructured datasets. The convergence of factors such as Data Infrastructure Readiness, Generative AI Capabilities, Integration Architecture, Strategic Business Alignment, Organizational Readiness and Culture, Governance and Ethical Compliance,

Innovation and Competitive Advantage, Cost-Benefit Analysis, Risk Management and Security, and Scalability and Sustainability allows extracting deeper insight, accelerating innovations cycles and optimizing the information in real time mode.

The is research study is divided into five segments, chapter 1 given the strong background of GenAI and its all possible approach in business Industries to enhance the data which are more relevant towards the novel documents and close to human being. Chapter II describes the different current research study and gap in among them. Chapter III gives the problem statement and identifications of research problems which are properly stated by the researcher scholars. Chapter IV defines the research methodology and statistical tools which are used in this research study. And finally Chapter V and Chapter VI give the data interpretation and analysis, summary and conclusion. This research study presents a comprehensive framework for strategic transformation through the integration of Generative AI and Big Data. It explores how this integration can be aligned with organizational goals to drive innovation, improve decision-making, streamline operations, and ultimately deliver competitive advantage.

LITERATURE REVIEW

How to cite: R. Hazanal Rashid Khan. The Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation. *Advances in Consumer Research*. 2025;2(5):550–556.

The research study based on convergence of Generative Artificial Intelligent(GenAI) and big data represent a transformative way of controlling the business value of any organizations or enterprises. The literature survey gives the comprehensive research study on GenAI and its supporting factors such as Data Infrastructure Readiness, Generative AI Capabilities, Integration Architecture, Strategic Business Alignment, Organizational Readiness and Culture, Governance and Ethical Compliance, Innovation and Competitive Advantage, Cost-Benefit Analysis, Risk Management and Security, and Scalability and Sustainability. Recent literature underscores the growing significance of this integration in driving strategic transformation, operational efficiency, and competitive advantage.

Bommasani et al. (2021) proposed a foundation to describe the large scale pre trained models to extract information which are more relevant for business intelligent and transformation. The researcher identifies the significant factors which are more relevant to handle complex data and advance tools to map the data to generate GenAI more novel documents as per user's requirements. Manyika et al. (2011) provided the new opportunity for value creations and productivity enhancements for data driven decision making process. The researcher used the strategic transformation to enhance the results with more accurate performance. Gartner (2023) predicts that by 2025, over 30% of outbound marketing messages from large organizations will be synthetically generated.

Accenture (2023) stated that GenAI turning the big role in data integration and creation of business value to optimize the data and its significant approach towards decision making process. AI Maturity Model (McKinsey, 2022) proposed a experiment adoption to full strategic integration and realizing higher ROI, Authors like Binns et al. (2018) and Jobin et al. (2019) stress the importance of explainable AI (XAI), ethical governance, and regulatory compliance in deploying GenAI solutions. The researcher use the generative AI and Big Data is shaping the landscape the modern enterprises to robust and scaling to map the large data. Tornatzky & Fleischer (1990) provided the understanding the technological approach in environmental factors such as Data Infrastructure Readiness, Generative AI Capabilities, Integration Architecture, Strategic Business Alignment, Organizational Readiness and Culture, Governance and Ethical Compliance are the high significant and useful to produce accurate and novel information. Teece et al. (1997) emphasized that the GenAI capabilities to integrate , build and reconfigure internal and external competence to produce accurate and significant information to create a business value towards fast decision making process. Lal, Bechoo et.al.,(2025) proposed business model which are more relevant to

produce accurate and novel data towards decision making using GenAI technology. The researcher used the multiple machine learning approach and Big data to extract valuable information towards decision making process.

Bommasani et al., (2021) proposed the content generation such as text, images and video which are more relevant and valuable for decision making and produced some similar tools. Chen et al., (2021) proposed the design and product innovation and prototype design of business value in decision making process. Haefner et al., (2023) stated the GenAI ability to learn on massive data sets and providing velocity and huge amount of data. Laney(2001) emphasized on Big Data analytics refers to processing and analyzing extremely large datasets for business insights (McAfee & Brynjolfsson, 2012) generated the business value using GenAI and big data analytics. The researcher used the machine learning approach and natural language processing to generate accurate and more relevant information .

Wamba et al., (2015) used the GenAI and Big data for enabling the more novel and valuable information and text data towards decision making process including structured and unstructured data. Bose (2022) proposed an Automated decision support systems (Dwivedi et al., 2023), Real-time business model innovation (Chui et al., 2023), Healthcare: GenAI-based diagnostics using big medical datasets (Esteve et al., 2019), Finance: Fraud detection, customer profiling, and automated reporting (Tang et al., 2022), Retail: Chatbots and dynamic pricing models (Lee & Suh, 2021).

Brock & von Wangenheim (2019) proposed GenAI Tools and Big Data for fostering and prototyping customer driven design and decision making process. The researcher used the short coming data which are structured and unstructured that would be more valuable and more significant towards decision making process. (Haefner et al., 2023) used the machine learning – natural Language Generators to deeper insight data , (Jarek & Mazurek, 2019) stated that data privacy and bias training model (Binns et al., 2018) proposed the GenAI decision making process and its more relevant information (Doshi-Velez & Kim, 2017) propose the GenAI model to provide more accurate and relevant information (Strubell et al., 2019) proposed the Generative AI and Big Data transformation opportunity to create business value and more accurate and predictive model to generate information towards decision making process.

RESEARCH OBJECTIVE

PRIMARY OBJECTIVE: The researcher stated the primary objective on “ To develop a strategic framework that demonstrates how the integration of Generative AI

How to cite: R. Hazanal Rashid Khan. The Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation. *Advances in Consumer Research*, 2025;2(5):550–556.

and Big Data can drive business value and enable enterprise-wide transformation”.

3.2 SECONDARY OBJECTIVES:

1. To study the current research issues on GenAI and Big Data approach towards more novel approach for generative business value.
2. To identify the factors on GenAI and Big Data approach in Business Industries.
3. To collect data based on primary data approach based on questionnaire and generates inferences.

4. To assess the impact of such integration on innovation, decision-making, productivity, and customer experience.

3.3 HYPOTHESIS:

H01: There is no significant relationship between business value of Industries transformation and GenAI and Big Data.

HA1: GenAI and Big Data have a significant impact on business value of Industries transformation and novel representation of data.

RESEARCH METHODOLOGY

This research study is based on primary and secondary data and mixed approach of research design in quantitative and qualitative ways. The researcher used the SPSS software and statistical tools Chi-square to test the hypothesis and check the variability among results.

4.1 Primary Data

1. Survey: Structured questionnaires will be distributed to mid and senior-level managers in sectors like IT, healthcare, manufacturing, and finance.
2. Interviews: Semi-structured interviews with 15–20 industry experts, CIOs, data scientists, and digital transformation officers to gain qualitative insights.

4.2 Secondary Data

1. Academic journals, white papers, industry reports (e.g., McKinsey, Deloitte, Gartner).
2. Company case studies and press releases illustrating real-world implementations.

Apart from descriptive analysis the researcher used the principal components analysis (PCA) to reduce the dimensional of data, reliability test to verify the internal consistency between factors of Generative AI, ANOVA and Chi-Square statistical tools to test the hypothesis at 0.05 significant levels.

4.3 Measurement Scale: The researcher used the Likert scale to measure the quality parameters of Generative AI factors and its significant approach towards this research study.

Table 1.1: Measuring Scale		
S.No	Likerts Scale	Value
1	Strongly Agree	5
2	Agree	4
3	Neither Agree nor Disagree	3
4	Disagree	2
5	Strongly Disagree	1

RESULTS AND DISCUSSION

Research Statement: Statistical analysis of factors on the Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation.

Table 1.2: Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Data Infrastructure Readiness	100	1.00	5.00	3.6000	1.35587
Generative AI Capabilities	101	1.00	5.00	3.0792	1.36882
Integration Architecture	102	1.00	5.00	2.9804	1.48910

Strategic Business Alignment	101	1.00	5.00	2.9208	1.42607
Organizational Readiness and Culture	101	1.00	5.00	3.0594	1.43403
Governance and Ethical Compliance	102	1.00	5.00	2.9020	1.49924
Innovation and Competitive Advantage	102	1.00	5.00	3.0588	1.37750
Cost-Benefit Analysis	98	1.00	5.00	3.1429	1.47138
Risk Management and Security	102	1.00	5.00	3.0980	1.43168
Scalability and Sustainability	102	1.00	5.00	3.1569	1.39124
Valid N (listwise)	87				

Data Analysis

The above data analysis report is the descriptive statistics of Generative AI factors which is compiled by SPSS software based on 105 datasets. The analysis report showing that Integration Architecture, Strategic Business Alignment, Governance and Ethical Compliance mean value is 2.9804, 2.9208, and 2.9020. which are showing the minimum value from the other factors and showing the minimum variability between variables (Table 1.2).

Table 1.3: Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.985	.985	10

The reliability analysis showing the internal consistency of attributes which is used to measure the reliability of a summated scale where several items are summed to form a total score. This measure of reliability in reliability analysis focuses on the internal consistency of the set of items forming the scale. The key strategies for Generative AI and Big Data Integration: A Framework for Strategic Transformation which significantly enhance the business value and played a significant role to organized a business value in organization. The reliability score 0.985 which is showing the strong internal consistency between variables (Table 1.3).

Table 1.4: Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.798	87.980	87.980	8.798	87.980	87.980
2	.426	4.263	92.243			
3	.345	3.446	95.689			
4	.159	1.591	97.280			
5	.111	1.110	98.390			
6	.074	.744	99.134			
7	.049	.487	99.622			
8	.026	.257	99.878			
9	.011	.108	99.986			
10	.001	.014	100.000			
Extraction Method: Principal Component Analysis.						

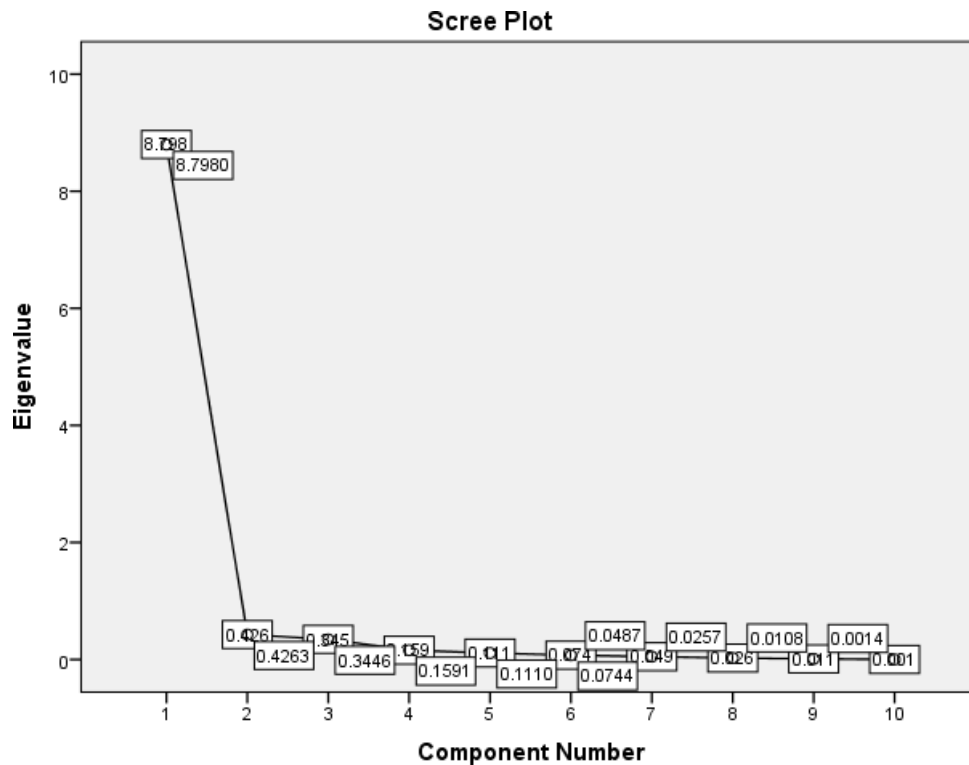


Fig.1.1: Extraction Method: Principal Component Analysis

The above data analysis report showing the Eigen Value and Eigen Vector based on principal components analysis at 95% class interval and 0.05 significant level. The researcher used the 10 factors such as Data Infrastructure Readiness, Generative AI Capabilities, Integration Architecture, Strategic Business Alignment, Organizational Readiness and Culture, Governance and Ethical Compliance, Innovation and Competitive Advantage, Cost-Benefit Analysis, Risk Management and Security, and Scalability and Sustainability based on Eigen Value and Eigen Vector which are subsequently decreasing and make a shape like Elbow which are showing a perfect relations between dependent and independent variables(Fig 1.1).

Table 1.5: KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.676
Bartlett's Test of Sphericity	Approx. Chi-Square	1979.365
	df	45
	Sig.	.000

INFERENCE

The above data analysis report is compiled by SPSS software on Significant factors on “The Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation” such as Data Infrastructure Readiness, Generative AI Capabilities, Integration Architecture, Strategic Business Alignment, Organizational Readiness and Culture, Governance and Ethical Compliance, Innovation and Competitive Advantage, Cost-Benefit Analysis, Risk Management and Security, and Scalability and Sustainability at 0.05 significant levels. The probability of statistics P-Value is 0.000 which is less than 0.05 significant levels, so the null hypothesis is rejected and result is significant. At this level the researcher concluded that the factors of Generative AI is significant and have impact on strategic transformation towards this research study based on Generative AI and Big data integration (Table 1.5).

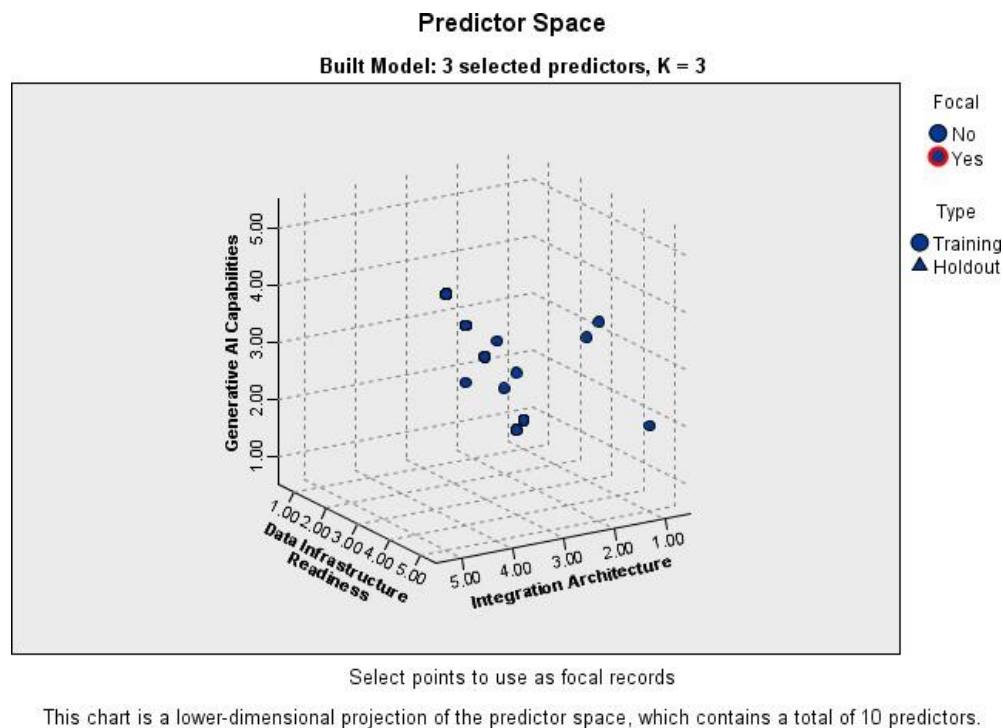


Fig.1.2: Statistical Analysis of Lower Dimensional Projection

The above data analysis is showing the lower dimension of Generative AI factors and its components. The research used the 10 parameters such as Data Infrastructure Readiness, Generative AI Capabilities, Integration Architecture, Strategic Business Alignment, Organizational Readiness and Culture, Governance and Ethical Compliance, Innovation and Competitive Advantage, Cost-Benefit Analysis, Risk Management and Security, and Scalability and Sustainability on “The Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation”. The statistical analysis shows that data infrastructure readiness and integration architecture are more significant towards GenAI and Big Data driven approach to generate more relevant and novel information towards decision making process.(Fig.1.2).

SUMMARY AND CONCLUSION

The research paper explored how the integration of Generative Artificial Intelligence (GenAI) with Big Data can create significant business value and serve as a foundation for strategic transformation across industries. It highlights that while Big Data provides vast volumes of structured and unstructured information, Generative AI brings the ability to create new content, insights, and solutions from this data—enabling organizations to move beyond traditional analytics. The integration of generated AI and big data represents the power of change in modern business strategies. In this context, how do the combination of AI generation skills, such as creating new content, simulations, and solutions, examine the enormous analytical strength of big data innovation, efficiency, and competitive advantage? Essentially, this research study highlights a data-controlled Strategic Transformation process in which generative models use structured, unstructured data to automate complex tasks, improve personalization, and support business knowledge in real time. The most important value areas include process optimization,

product innovation, customer loyalty and predictive intelligence.

REFERENCES

1. Bommasani, R., et al. (2021). On the Opportunities and Risks of Foundation Models. Stanford CRFM.
2. McAfee, A., & Brynjolfsson, E. (2012). Big Data: The Management Revolution. Harvard Business Review.
3. Wamba, S. F., et al. (2015). Big data analytics and firm performance. *Information & Management*, 52(1), 1–20.
4. Teece, D. J., et al. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
5. Tornatzky, L. G., & Fleischer, M. (1990). *The Processes of Technological Innovation*. Lexington Books.
6. Laney, D. (2001). *3D Data Management: Controlling Data Volume, Velocity, and Variety*. META Group.

How to cite: R. Hazanal Rashid Khan. The Business Value of Generative AI and Big Data Integration: A Framework for Strategic Transformation. *Advances in Consumer Research*. 2025;2(5):550–556.

7. Zhang, J., et al. (2023). The Role of Generative AI in Business Content Automation. *MIS Quarterly Executive*.
8. Chen, M., et al. (2021). Evaluating Large Language Models Trained on Code. arXiv:2107.03374.
9. Haefner, N., et al. (2023). Generative Design in Product Innovation. *Journal of Product Innovation Management*.
10. Brock, J. K.-U., & von Wangenheim, F. (2019). Demystifying AI in Business. *Business Horizons*, 62(6), 765–775.
11. Bose, I. (2022). Personalized Marketing Using Big Data and AI. *Journal of Business Research*, 142, 175–188.
12. Chui, M., et al. (2023). The Economic Potential of Generative AI. McKinsey & Company.
13. Esteva, A., et al. (2019). A Guide to Deep Learning in Healthcare. *Nature Medicine*, 25, 24–29.
14. Lee, D., & Suh, A. (2021). Chatbot Adoption in E-commerce: A Big Data Perspective. *Journal of Retailing and Consumer Services*.
15. Dwivedi, Y. K., et al. (2023). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 57.
16. Jarek, K., & Mazurek, G. (2019). Marketing and Artificial Intelligence. *Central European Business Review*.
17. Lal, Bechoo et.al.,(2025). Elevating intelligent voice assistant chatbots with natural language processing, and AI technologies, *Indonesian Journal of Electrical Engineering and Computer Science*, Scopus – Q3, Volume 37, Issue 1, Pages 507 - 517 January 2025, ISSN: 2502-4752, DOI:10.11591/ijeecs.v37.i1.pp507-517.
18. Tang, C., et al. (2022). AI in FinTech: Case Studies and Implications. *AI & Society*, 37, 111–124.
19. Binns, R., et al. (2018). ‘It's Reducing a Human Being to a Percentage’: Perceptions of Justice in Algorithmic Decisions. *CHI*.
20. Doshi-Velez, F., & Kim, B. (2017). Towards a rigorous science of interpretable machine learning. arXiv:1702.08608.
21. Strubell, E., et al. (2019). Energy and Policy Considerations for Deep Learning in NLP. *ACL*.
22. Ghasemaghaei, M. (2019). Does data analytics use improve firm decision making quality?. *Information & Management*, 56(8).
23. Akter, S., et al. (2016). How to improve firm performance using big data analytics capability and business strategy alignment. *International Journal of Production Economics*.
24. Mariani, M., & Borghi, M. (2023). Big Data Analytics in Hospitality and Tourism. *International Journal of Hospitality Management*.
25. Benbya, H., et al. (2021). From reactive to proactive AI in digital transformation. *MIS Quarterly Executive*.
26. Bawack, R. E., et al. (2022). Generative AI: A research agenda and implications for digital business strategy. *Journal of Strategic Information Systems*.