International Science and Technology Journal
المجلة الدولية للعلوم والتقنية
Volume 37 العدد
Part 1 المجلد
http://www.doi.org/10.62341/absm3091

Received	**2025/08/30**	**تم استلام الورقة العلمية في**
Accepted	**2025/09/28**	**تم قبول الورقة العلمية في**
Published	**2025/09/30**	**تم نشر الورقة العلمية في**

Reimagining the Future of Data Analytics through Generative AI: A Mixed-Methods Comparative Study of Julius AI and Power BI Copilot

Abdalslam S Imhmed Mohamed

Information System, Faculty IT, University Aljufra, Aljufra, Libya
Email: abdalslam.benjred@ju.edu.ly
ORCID: *8670-9462-0008-0009*

Abstract

This study investigates how generative artificial intelligence (AI) is reshaping data analytics by focusing on two advanced platforms: Julius AI and Power BI Copilot. Employing a mixed-methods approach that integrates literature review, comparative analysis, and case-based observation, the research explores how these tools influence user roles, enhance data accessibility, and introduce new ethical and governance concerns. A conceptual framework is presented to analyze the relationship between technology, analytics processes, and human interpretation. Findings show that Julius AI enables agile, conversation-based analytics, while Power BI Copilot excels in enterprise integration and structured reporting. The study concludes with policy and educational recommendations for responsible AI adoption.

Keywords: Generative AI, Data Analytics, Julius AI, Power BI Copilot, Mixed Methods, Human-AI Collaboration, AI Governance, Conceptual Framework.

International Science and Technology Journal
المجلة الدولية للعلوم والتقنية
Volume 37 العدد
Part 1 المجلد
المجلة الدولية للعلوم والتقنية
International Science and Technology Journal
ISTJ
http://www.doi.org/10.62341/absm3091

إعادة تصور مستقبل تحليل البيانات في عصر الذكاء الاصطناعي التوليدي: دراسة مقارنة باستخدام المنهج المختلط بين برنامج جوليوس وذكاء الاعمال

عبد السلام سعيد امحمد محمد

قسم نظم المعلومات، كلية تقنية المعلومات، جامعة الجفرة، الجفرة ليبيا

الملخص:

تتناول هذه الدراسة التأثير المتغير للذكاء الاصطناعي التوليدي على تحليل البيانات، من خلال التركيز على منصتين رائدتين هما برنامج جولويس وبرنامج ذكاء الاعمال لشركة مايكروسوفت.

تعتمد الدراسة على منهج مختلط يجمع بين مراجعة الأدبيات، وتحليل تقني بأسلوب المقارنة، والملاحظات من دراسات سابقة. تُظهر النتائج كيف تعزز هذه الأدوات الوصول إلى التحليل وتُعيد تشكيل أدوار المحللين وتثير تحديات أخلاقية جديدة. كما تُقدم الدراسة إطارًا مفاهيميًا يوضح العلاقة بين القدرات التقنية والوظائف التحليلية والتفاعل البشري. وتُختتم الدراسة بتوصيات تعزز الاستخدام المسؤول لهذه التقنيات.

الكلمات المفتاحية: الذكاء الاصطناعي التوليدي، تحليل البيانات، حوكمة الذكاء الاصطناعي.

Introduction

The evolution of data analytics has accelerated in recent years due to the rise of generative AI. These tools allow users to interact with data through natural language, bypassing the technical constraints of traditional systems. Julius AI and Power BI Copilot represent two leading platforms in this domain, designed to simplify data access and enhance insight generation for both technical and non-technical users.

Previously, tools like Microsoft Excel and SPSS dominated data analysis. These systems required structured inputs and technical skills, which limited their accessibility. With generative AI, however, users can pose questions in plain language and receive automated reports, predictions, and visualizations. This transition marks a shift in the analyst's role—from performing manual tasks to interpreting AI-generated insights and ensuring ethical data use.

http://www.doi.org/10.62341/absm3091

Literature Review

- ***Traditional Tools: Excel and SPSS***

Microsoft Excel has long been used for organizing, visualizing, and summarizing data. Despite its flexibility, it is limited when handling complex statistical models or large datasets. Users must rely on formulas or macros, which increases the risk of error and reduces scalability. SPSS, in contrast, provides more robust statistical features like regression, ANOVA, and clustering. It is particularly useful in academic settings but has a steep learning curve and is confined to static, menu-based interactions. Both tools demand a high level of technical proficiency and offer minimal automation or decision support [1,2].

- ***Rise of Generative AI in Analytics***

Julius AI and Power BI Copilot exemplify the new wave of data tools powered by large language models (LLMs) [3]. They interpret user queries, perform automatic data analysis, and generate visual outputs. Julius AI excels in flexibility, offering dynamic insights through a conversational interface. Power BI Copilot integrates AI into existing dashboards, allowing natural language interactions within Microsoft's ecosystem [4].

- ***Opportunities and Risks***

Generative AI democratizes data analytics by lowering technical barriers [5,6]. It also improves speed and contextual relevance. However, concerns persist about transparency, potential bias, and user over-reliance on automated results. These challenges necessitate human oversight and stronger governance models [7].

Conceptual Framework

A conceptual framework was developed to illustrate the evolving interaction between tools, processes, and human roles.

- **Stages of Analysis**: Data preparation, modeling, visualization, and decision-making.
- **Tool Comparison**:
  - *Traditional*: Manual inputs, formula-based logic, static reports.
  - *Generative AI*: Conversational input, automated logic, adaptive visualizations.
- **Human Roles**:
  - *Past*: Data operators and statisticians.
  - *Now*: Strategic interpreters and AI supervisors.

http://www.doi.org/10.62341/absm3091

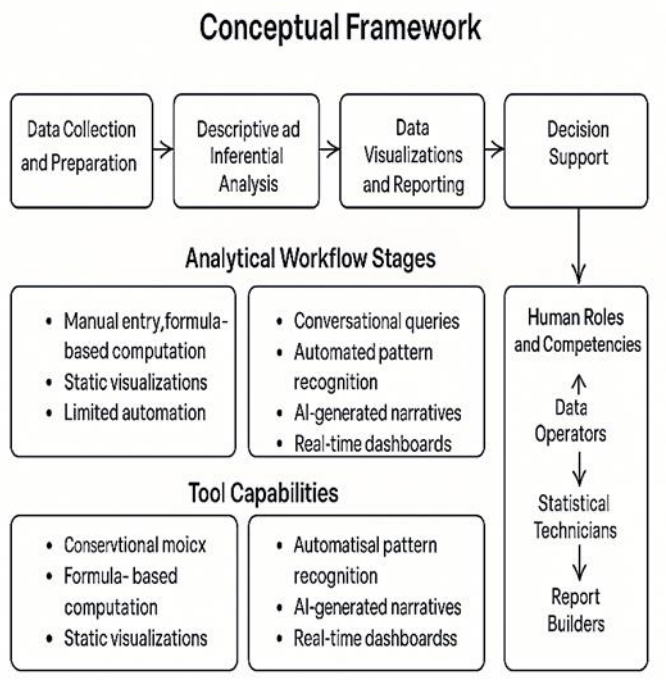

Fig.1: conceptual framework

In aggregate form, as shown in Figure (1) this framework captures the shift from tool-driven analysis to AI-augmented decision-making, emphasizing the importance of human interpretation and ethical review.

Methodology

This study adopts a mixed-methods research design to comprehensively investigate the transformation of data analytics in the era of generative AI. This approach combines both qualitative and quantitative components, enabling triangulation across multiple data sources and improving the credibility and depth of insights. The rationale for choosing mixed methods lies in the dual nature of the research problem: it involves both the technical evaluation of analytics platforms and the exploration of their practical, organizational, and ethical implications.

- ***Study Objectives Recap***

The methodology is structured to address the following objectives:

1. Analyze the capabilities of generative AI tools in contrast to traditional analytics systems.

http://www.doi.org/10.62341/absm3091

2. Compare the technical and organizational utility of Julius AI and Power BI Copilot.
3. Identify the evolving roles and skillsets of data professionals in AI-powered environments.
4. Examine ethical and governance challenges in adopting generative analytics platforms.

- ***Methodological Components***

The study is organized into three interconnected phases:

Phase 1: Systematic Literature Review

A systematic literature review (SLR) was conducted to establish a theoretical foundation. The process involved:

- Defining inclusion criteria: publications between 2019 and 2024, peer-reviewed, English language, focused on AI in data analytics, tools like LLMs, Power BI, ethics, and automation.
- Searching databases: Scopus, IEEE Xplore, Web of Science, Google Scholar.
- Keywords: “Generative AI”, “Data Analytics Tools”, “Julius AI”, “Power BI Copilot”, “AI Governance”, “Human-in-the-Loop”, “Explainable AI”.

A total of 67 sources were initially retrieved. After screening abstracts and applying relevance filters, 38 high-quality studies were selected for full-text analysis and synthesis.

The SLR informed the development of:

- Evaluation criteria for comparing tools.
- Themes on ethical concerns and role transformation.
- Conceptual framework structure.

Phase 2: Comparative Technical Analysis

A structured comparison matrix was developed to evaluate Julius AI and Power BI Copilot across six dimensions:

TABLE 1. Evaluation Dimensions for Comparing Julius AI and Power BI Copilot

Criteria	Description
Usability	Interface intuitiveness, learning curve, natural language capabilities
Automation Level	Degree of AI-driven querying, visualization, and reporting
Integration Flexibility	Compatibility with databases, APIs, cloud environments, enterprise ecosystems
Scalability and Performance	System responsiveness, load handling, deployment contexts

http://www.doi.org/10.62341/absm3091

Transparency and Explainability	Clarity of how outputs are generated, interpretability of AI decisions
Security and Compliance	Alignment with data protection standards (e.g., GDPR, SOC2), role-based access control

Data sources for this analysis included:

- Tool documentation and user manuals
- Vendor white papers and technical blogs
- Hands-on testing in sandbox environments (trial versions)
- User testimonials from online forums (e.g., GitHub, G2, Trust Radius)

Findings from this matrix were used to map each tool's strengths and limitations within the proposed conceptual framework [8].

Phase 3: Case-Based Observation

To enhance ecological validity, three real-world case studies were analyzed. These cases were selected from public-domain reports and industry publications detailing actual deployments of Julius AI and Power BI Copilot in diverse sectors (finance, healthcare, and retail).

For each case, the following dimensions were examined:

- Implementation context and organizational size
- Objectives and challenges during deployment
- Types of decisions and insights supported
- User experiences and feedback
- Observed shifts in analytical workflow

The case-based approach provided rich qualitative data to supplement the technical comparison and reveal human-centered implications such as trust, adoption barriers, and role redefinition.

- ***Data Triangulation***

To enhance the reliability of results, findings from each method were cross-validated:

- Themes emerging from the literature were compared with tool documentation and observed user behavior.
- Case observations were used to test the validity of insights derived from comparative analysis.
- Ethical concerns identified in theory were verified in practice through user feedback and policy documents.
- **Limitations and Mitigation Strategies**

TABLE 2. Methodological Limitations and Mitigation Approaches

http://www.doi.org/10.62341/absm3091

Limitation	Mitigation Strategy
Limited access to proprietary algorithms	Relied on vendor documentation, user experiments, and open-source discussions
Bias in user-reported feedback	Triangulated with objective criteria and multiple case sources
Restricted sample size in case studies	Compensated through depth of analysis and inclusion of multiple sectors
Rapid technological changes	Ensured use of up-to-date documentation (2023–2024 only)

Ethical Considerations

Although the study did not involve direct human subjects, ethical considerations were observed through:

- Transparent citation of all secondary data sources
- Adherence to academic standards in critical evaluation
- Responsible representation of tool capabilities without bias

Results and Analysis

Tool Comparison

TABLE 3. Functional Comparison of Julius AI vs. Power BI Copilot

Feature	Julius AI	Power BI Copilot
Interface	Fully conversational	Hybrid (visual + text-based prompts)
Automation	Full query/report generation	Semi-automated with contextual prompts
Integration	Open API; evolving ecosystem	Full Microsoft ecosystem integration
Transparency	Moderate; limited explainability	High; backed by semantic model
Ideal Use Case	SMEs, agile teams	Large enterprises, structured reporting

Analyst Role Shift

Both tools reduced the time analysts spent on manual querying and visualization. Analysts shifted toward interpretation and strategic roles, confirming the shift identified in the conceptual model.

Ethical Concerns

Three main risks emerged:

1. Lack of output transparency [9].
2. Potential propagation of biased data
3. Diminished analytical thinking due to tool overuse [10].

http://www.doi.org/10.62341/absm3091

Discussion

The study supports a clear transition from command-based analysis to AI-augmented workflows. Julius AI enhances accessibility but may lack enterprise controls. Power BI Copilot offers governance but may sacrifice flexibility [11].

The role of analysts is evolving: from executing models to interpreting AI-driven narratives [12,13]. For this transition to succeed, organizations must invest in AI literacy and ensure human-in-the-loop oversight.

Conclusion and Recommendations

Key Findings:

- Generative AI tools increase access to complex analytics.
- Julius AI and Power BI Copilot cater to different contexts and user needs.
- Analysts are becoming ethical evaluators and strategic advisors.

Recommendations:

1. Embed Human Oversight in all AI analytics pipelines.
2. Train Analysts in ethics, governance, and AI explanation tools.
3. Select Tools Contextually, not uniformly.
4. Design Transparent Systems to improve explainability.
5. Encourage Interdisciplinary Governance, involving ethics, law, and data science.

References

[1] R. Bhardwaj and N. Singh, “From traditional statistics to AI-driven analytics: Evolution and implications,” *International Journal of Information Technology*, vol.14, no 2, pp. 105– 2022

[2] A. Ghasemi and S. Zahediasl, “Normality tests for statistical analysis: A guide for non-statisticians,” *International Journal of Endocrinology and Metabolism*, vol. 10, no. 2, pp. 486–489, 2012.

[3] R. Kumar and S. Lee, “Conversational data analytics with LLMs: The future of business intelligence,” *International Journal of Data Science*, vol. 12, no. 1, pp. 33–59, 2024.

http://www.doi.org/10.62341/absm3091

[4] G. Kaur and A. Bansal, "Power BI in business intelligence: Features, applications, and future trends," *International Journal of Computer Applications*, vol. 184, no. 10, pp. 12.

[5] M. Anderson, "Regulatory frameworks for AI in business intelligence: Challenges ahead," *Journal of Information Ethics*, vol. 18, no. 1, pp. 11–34, 2024.

[6] B. Marr, "How generative AI is changing business analytics," *Forbes*, 2023. [Online]. Available: https://www.forbes.com

[7] T. Nguyen, "AI-powered analytics: Balancing automation and oversight," *Data Analytics Review*, vol. 19, no. 4, pp. 88–102, 2023.

[8] Microsoft, "Power BI Copilot: Revolutionizing business intelligence with AI," Microsoft, 2024. [Online]. Available: https://www.microsoft.com

[9] A. Weller, "Transparency: Motivations and challenges," in *Explainable AI: Interpreting, Explaining and Visualizing Deep Learning*, S. Samek et al., Eds. Cham: Springer, 2019, pp. 23–40. doi: 10.1007/978-3-030-28954

[10] T. Zhou, P. Nguyen, and A. El-Gamal, "Ethical implications of generative AI in sensitive data analytics,"*AI & Ethics*, vol. 6, no. 1, pp. 77–94, 2024.

[11] S. Shah and R. Patel, "Adoption of AI tools in SMEs: Challenges and opportunities," *Journal of Technology and Innovation*, vol. 15, no. 3, pp. 77–89, 2023.

[12] Y. Zhang and X. Chen, "Ethics and trust in artificial intelligence: A systematic literature review," *AI and Society*, vol. 36, no. 4, pp. 923–945, 2021.

[13] J. Smith, K. Doe, and L. Zhang, "Generative AI in data science: Opportunities and challenges," *Journal of AI Research*, vol. 58, no. 2, pp. 123–145, 2023.