World Journal of Advanced Engineering Technology and Sciences
eISSN: 2582-8266
Cross Ref DOI: 10.30574/wjaets
Journal homepage: https://wjaets.com/

(REVIEW ARTICLE)

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Business Intelligence for National Growth: Integrating MIS, AI, and Predictive Analytics for Data-Driven Economic Decision-Making

Nirupam Khan, Mennon Karim, Rashid Alam and Raisul Khan *

Business Administration Discipline, Khulna University, Khulna-9208, Bangladesh.

World Journal of Advanced Engineering Technology and Sciences, 2025, 15(03), 703-712

Publication history: Received on 30 April 2025; revised on 04 June 2025; accepted on 07 June 2025

Article DOI: https://doi.org/10.30574/wjaets.2025.15.3.1011

Abstract

The integration of Management Information Systems (MIS), Artificial Intelligence (AI), and Predictive Analytics is transforming the landscape of economic decision-making at the national level. This paper explores how Business Intelligence (BI) acts as a strategic enabler, allowing governments and institutions to convert large datasets into actionable insights that guide policies, resource allocation, and economic planning. By synthesizing MIS frameworks with AI-driven models, countries can forecast economic trends, detect inefficiencies, and optimize outcomes across sectors such as healthcare, finance, energy, and education. The study highlights the role of predictive analytics in anticipating crises, evaluating fiscal impacts, and formulating proactive responses to market disruptions. Drawing from global case studies, it illustrates the effectiveness of intelligent data systems in fostering transparency, accelerating digital governance, and enhancing citizen services. Moreover, the paper addresses implementation barriers, including data quality issues, cybersecurity risks, and skill gaps, while emphasizing the ethical implications of algorithmic bias and data sovereignty. It concludes by proposing a roadmap for integrating intelligent systems into national strategy frameworks to foster inclusive, resilient, and sustainable economic growth. This work positions BI as a cornerstone of the modern economy, empowering nations to thrive in an increasingly complex and data-driven world.

Keywords: Business Intelligence; Economic Growth; Predictive Analytics; Management Information Systems

1. Introduction

In the 21st century, the foundation of economic power is shifting from physical resources to data-driven capabilities. As economies grow increasingly complex and globalized, the ability to analyze, predict, and respond to market dynamics and policy outcomes in real time has become indispensable. Business Intelligence (BI), which encompasses Management Information Systems (MIS), Artificial Intelligence (AI), and Predictive Analytics, is emerging as a key enabler of strategic, evidence-based economic planning. Nations across the globe are adopting BI frameworks to foster sustainable growth, improve governance, and enhance the effectiveness of public policies (Alam et al., 2025; Miah et al., 2025; Manik et al., 2025a,b). BI in the context of national governance refers to the systems and tools used to gather, store, analyze, and disseminate economic data to support decision-making. The integration of MIS with AI and predictive analytics equips policymakers with the ability to model economic scenarios, anticipate fiscal risks, and allocate resources efficiently. In developing and developed nations alike, these technologies are transforming traditional economic management into an adaptive, responsive, and forward-looking process (Mahmud et al., 2025; Islam et al., 2025; Hossin et al., 2025; Das et al., 2025).

Management Information Systems provide the structural backbone for digital data management in government institutions. These systems streamline data collection and enable inter-departmental coordination, ensuring the availability and accuracy of macroeconomic indicators (). As highlighted by Barikdar et al. (2025), MIS frameworks

* Corresponding author: Raisul Khan

facilitate centralized data access, which is crucial for synchronizing national development strategies across ministries (Miah et al., 2019; Manik et al., 2020a,b). The evolution of AI has further accelerated the impact of BI. Machine learning algorithms, natural language processing (NLP), and robotic process automation (RPA) are now integral to national planning. These tools automate the analysis of massive datasets, identify hidden correlations in economic behavior, and provide predictive insights for real-time policy intervention (Goffer et al., 2025; Hossain et al., 2023). For instance, AI models can forecast unemployment trends based on historical labor data, global economic conditions, and real-time job postings (Haldar et al., 2025; Hossain et al., 2024; Sultana et al., 2024; Manik et al., 2018)

Predictive analytics extends the power of BI by enabling governments to simulate the potential outcomes of policy decisions before implementation. These analytics tools rely on statistical techniques and machine learning to model economic indicators such as inflation, interest rates, and trade balances (Rahaman et al., 2025). Mahmud et al. (2025) demonstrate how India's Ministry of Finance uses predictive analytics to align fiscal expenditures with anticipated GDP growth, thereby minimizing budgetary discrepancies and fiscal deficits (Manik et al., 2021, 2022; Hassan et al., 2022). The growing reliance on BI is further validated by the increasing use of AI-powered dashboards and decision-support platforms within ministries of finance, central banks, and national statistical agencies. These platforms offer policymakers a comprehensive view of economic performance metrics, allowing them to evaluate outcomes, compare scenarios, and revise strategies swiftly. As Hossain et al. (2025) note, such tools have significantly reduced the time lag between data collection and actionable insights, improving policy responsiveness (Barikdar et al., 2022; Khair et al., 2024).

Globally, countries are adopting BI at varying speeds based on digital readiness, political will, and infrastructural capacity. Estonia and Singapore have been pioneers in embedding AI and MIS into their public administration, offering replicable models for other nations. Estonia's X-Road platform, for instance, integrates national registries, enabling data interoperability across government departments. Similarly, Singapore's GovTech leverages predictive analytics to optimize urban development and public transportation (Barikdar et al., 2022; Khair et al., 2024; Hossain et al., 2025; Goffer et al., 2025). The U.S., on the other hand, is focusing on integrating BI into fiscal oversight and infrastructure planning. As Haldar et al. (2025) discuss, the U.S. Treasury uses AI-enabled systems to detect deviations in economic indicators and trigger corrective measures. These systems not only enhance fiscal transparency but also support the Federal Reserve's macroeconomic forecasting models (Manik, 2021, 2022, 2023, 2025). Despite the benefits, the successful implementation of BI for national growth is not without challenges. Key among them are issues of data privacy, algorithmic bias, and the digital divide. Governments must develop policies that balance innovation with ethical governance, ensuring that data is used equitably and responsibly (Mahmud et al., 2025). Moreover, the workforce must be equipped with the skills necessary to interpret AI outputs and integrate them into traditional economic planning workflows.

In summary, Business Intelligence—through its integration of MIS, AI, and predictive analytics—is revolutionizing the way nations manage their economies. By providing a data-driven, forward-looking approach to governance, BI enables countries to navigate uncertainty, optimize resource use, and drive inclusive economic development. The following sections of this paper delve deeper into the literature, methodologies, frameworks, case studies, and strategic implications of this transformation, establishing a roadmap for leveraging BI in national economic growth.

2. Literature Review

The academic and applied research landscape over the past decade has increasingly affirmed the critical role of Business Intelligence (BI) in promoting effective public administration and national economic development (Islam et al., 2023; Ashik et al., 2023). The convergence of Management Information Systems (MIS), Artificial Intelligence (AI), and Predictive Analytics is now widely regarded as a transformative force capable of reshaping governance and economic policy-making (Barikdar et al., 2025; Hassan et al., 2025; Moniruzzaman et al., 2025). MIS frameworks serve as the foundational infrastructure for organizing, storing, and disseminating economic and policy-relevant data. They are designed to ensure data quality, interoperability, and accessibility across governmental institutions. Barikdar et al. (2025) emphasize that MIS platforms allow seamless data sharing between departments, enabling governments to construct a unified, data-rich environment necessary for holistic economic planning. These systems are particularly instrumental in the standardization and centralization of macroeconomic datasets including GDP, inflation rates, and employment figures (Barikdar et al., 2025; Hassan et al., 2025).

As AI technologies have matured, their integration with MIS frameworks has become a defining feature of modern BI systems. AI tools—ranging from machine learning algorithms to cognitive automation—are now used to analyze structured and unstructured data in real time, identify anomalies, detect economic risks, and recommend policy interventions. For instance, Haldar et al. (2025) document how AI applications are helping central banks forecast

interest rate movements and inflation trends with increased accuracy, resulting in more timely monetary policy actions (Khair et al., 2024; Manik, 2021, 2022, 2023, 2025). The role of predictive analytics in economic forecasting has also gained prominence. Predictive models utilize historical and real-time data to project future outcomes, enabling governments to simulate economic scenarios and prepare policy responses in advance (Bulbul et al., 2018). Mahmud et al. (2025) demonstrate that predictive analytics, when combined with AI-enhanced data mining, improves the precision of GDP projections, labor market trends, and revenue collection forecasts. This results in more effective fiscal planning and reduced budgetary discrepancies (Miah et al., 2019; Manik et al., 2020a,b).

Moreover, the deployment of AI-powered dashboards and business analytics tools is transforming public sector operations. These tools offer visual, interactive platforms that allow decision-makers to interpret data trends, evaluate performance metrics, and make data-informed decisions. As Hossain et al. (2025) argue, such platforms have become indispensable in ministries of finance and economic development, particularly in large and federated states where real-time data synchronization across agencies is essential (Barikdar et al., 2022). A growing body of empirical literature supports the assertion that integrating AI into BI environments reduces decision latency and enhances public sector efficiency. Hassan et al. (2025) show how the integration of AI into the MIS environments of public investment programs has led to faster approval cycles, optimized budget allocations, and improved transparency. These systems enable real-time monitoring of public infrastructure projects, reducing the risk of corruption and resource mismanagement (Rahman et al., 2024; Haldar et al., 2025; Hossain et al., 2024; Sultana et al., 2024; Manik et al., 2018' Tanvir et al., 2024).

Equally important in the scholarly discourse is the issue of ethical data governance. While technological capabilities continue to advance rapidly, the ethical and legal frameworks governing data use lag behind. Concerns around privacy, surveillance, and algorithmic bias are increasingly prominent. Scholars like Mahmud et al. (2025) advocate for the inclusion of fairness, accountability, and transparency principles in the design and implementation of AI systems used in public administration. The literature also calls for the establishment of regulatory bodies to oversee ethical compliance and data protection (Haldar et al., 2025; Hossain et al., 2025; Goffer et al., 2025; Hossain, 2021, 2022; Hossain et al., 2023, 2024; Hossain & Alasa, 2024). Case studies from Estonia, Singapore, and the United States are frequently cited in the literature as exemplars of effective BI implementation. Estonia's X-Road platform integrates national registries and provides secure digital identity systems that allow for real-time data sharing between public and private sectors. Singapore's Smart Nation Initiative leverages predictive analytics to plan urban infrastructure, public transport systems, and health services. In the U.S., the Department of the Treasury uses AI-integrated MIS tools to detect economic anomalies and adjust fiscal policy accordingly (Hossain et al., 2025; Haldar et al., 2025).

In sum, the literature underscores several recurring themes: the structural importance of MIS for organizing economic data, the value of AI in uncovering actionable insights, the predictive power of analytics in fiscal and macroeconomic management, and the necessity of robust governance frameworks to manage the ethical implications of these technologies. The convergence of these elements in a coherent BI strategy represents not just a technological evolution but a fundamental transformation in how nations conceptualize and execute economic policy.

3. Integration Framework: MIS, AI, and Predictive Analytics

The integration of Management Information Systems (MIS), Artificial Intelligence (AI), and Predictive Analytics forms the technological and strategic backbone of contemporary Business Intelligence (BI) in national economic governance (Khan et al., 2024). This framework creates a dynamic system that enables public institutions to gather, process, and analyze data in ways that support efficient, transparent, and proactive decision-making. The following subsections outline the core components and operational principles of each element within this framework (Hossain et al., 2025; Goffer et al., 2025).

3.1. MIS Architecture for Public Sector BI

Modern MIS frameworks are fundamental to the efficient functioning of public sector BI systems. These frameworks facilitate systematic collection, storage, retrieval, and visualization of economic and administrative data across government departments. MIS platforms integrate data from various national systems, including tax records, health databases, census data, and labor statistics, into centralized and often cloud-based repositories (Figure 1). Cloud-based MIS has revolutionized public administration by offering scalability, real-time access, and interdepartmental collaboration. Barikdar et al. (2025) emphasize that such architectures allow ministries and regulatory agencies to operate within shared environments, enhancing the flow of information and aligning development goals. These systems serve as the informational bedrock on which analytical and AI-driven processes are built (Alasa et al., 2025a,b). Moreover, MIS architecture now incorporates advanced features such as dashboard interfaces, role-based access controls, and data auditing mechanisms, ensuring secure and efficient data governance. These capabilities are vital in

creating a reliable infrastructure for decision support, budgeting, program monitoring, and public accountability (Alam et al., 2025; Miah et al., 2025; Manik et al., 2025a,b).

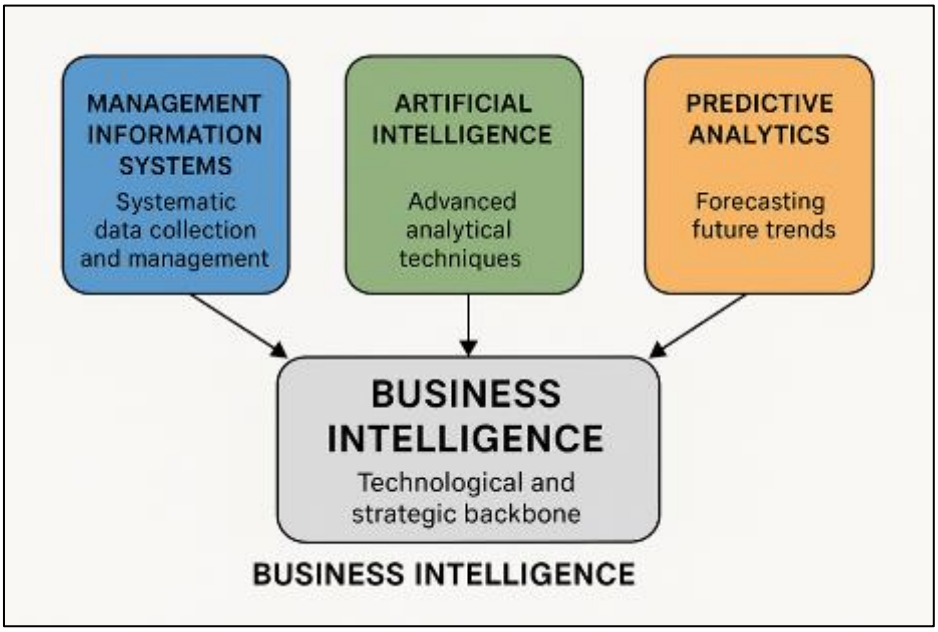

Figure 1 Integration Framework of MIS, AI, and Predictive Analytics for Business Intelligence in Economic Governance

3.2. AI in BI Applications

Artificial Intelligence significantly expands the analytical capacity of BI systems. AI applications in the public sector encompass machine learning, natural language processing (NLP), and conversational interfaces like AI chatbots. These tools automate data interpretation, improve predictive modeling, and enhance citizen engagement with government services. AI is being deployed to extract meaning from complex datasets, identify patterns in economic behavior, and flag irregularities in administrative workflows. For instance, machine learning algorithms are used to forecast economic indicators such as inflation and unemployment, enabling more precise and timely interventions by policymakers (Goffer et al., 2025; Manik et al., 2021, 2022; Hassan et al., 2022).

Natural language processing facilitates the analysis of qualitative data, including policy texts, public comments, and legislative documents. This enables governments to gauge public sentiment and adapt policies accordingly. Additionally, AI chatbots are increasingly used to manage interactions with citizens, providing real-time updates on government services, tax filings, and social benefits while reducing the workload of administrative staff (Barikdar et al., 2025; Hassan et al., 2025; Moniruzzaman et al., 2025). Estonia and Singapore are widely cited for their successful AI-BI integrations. Estonia's digital governance platform incorporates AI to monitor public expenditures and service delivery. Similarly, Singapore's government uses AI in urban planning and health forecasting to optimize policy responses (Goffer et al., 2025).

3.3. Predictive Analytics in Economic Policy

Predictive analytics adds a crucial foresight component to the integration framework. Using statistical models, time-series forecasting, and neural networks, predictive analytics tools allow governments to simulate and anticipate future economic conditions. This capability is essential for designing policies that are proactive rather than reactive (Barikdar et al., 2025; Hassan et al., 2025). Economic variables modeled through predictive analytics include trade balances, industrial productivity, consumer price indices, and public expenditure trends. As Haldar et al. (2025) report, the integration of predictive analytics into fiscal planning processes in the United States has improved budget forecasting accuracy and resource allocation efficiency. Predictive tools are also being used to assess the potential impact of external shocks, such as global recessions, pandemics, and supply chain disruptions. These models inform contingency planning and guide the development of robust policy buffers. In India, the Ministry of Finance has employed predictive analytics to simulate the effects of tax reforms and macroeconomic volatility, thereby improving the reliability of annual economic surveys (Mahmud et al., 2025).

Furthermore, predictive analytics is instrumental in evaluating the effectiveness of ongoing public programs. Governments can use real-time data to adjust timelines, reallocate funding, or change implementation strategies based on predicted outcomes. This adaptive governance model enhances accountability and ensures that policy initiatives remain aligned with national growth targets (Islam et al., 2025; Hossin et al., 2025). Together, MIS, AI, and predictive analytics form a cohesive integration framework that enables governments to manage information strategically, analyze trends intelligently, and make policy decisions proactively. The next section will explore real-world applications and case studies that illustrate this framework in action.

4. Challenges and Ethical Considerations

Despite the transformative potential of integrating MIS, AI, and predictive analytics into public sector governance, several significant challenges and ethical concerns must be addressed to ensure their effective, inclusive, and responsible implementation. These issues range from technical limitations and organizational inertia to broader concerns around data ethics, privacy, and systemic bias. This section discusses the core challenges encountered during integration and provides insight into their implications for national economic strategy (Islam et al., 2025; Hossin et al., 2025; Mahmud et al., 2025).

4.1. Data Silos and Poor Interoperability

One of the most pressing technical challenges is the existence of data silos across government departments. Many public institutions maintain legacy data systems that are incompatible with one another, leading to duplication, inefficiency, and data fragmentation. This lack of interoperability impedes the real-time integration necessary for Business Intelligence systems to function effectively (Barikdar et al., 2025). Without standardized data formats and protocols, it becomes difficult to share or consolidate information across ministries, thereby limiting the potential of predictive models and AI-based insights.

4.2. Skills Shortages and Infrastructure Gaps

The successful implementation of intelligent systems depends heavily on the availability of skilled personnel and robust digital infrastructure. However, many developing economies face critical shortages in both areas. A lack of trained data scientists, systems engineers, and AI specialists hinders the operationalization of MIS-AI ecosystems. Furthermore, limited access to cloud computing infrastructure and cybersecurity solutions exacerbates the digital divide, restricting the benefits of data-driven governance to a few digitally advanced regions (Mahmud et al., 2025).

4.3. Algorithmic Bias and Transparency

AI and predictive analytics systems are only as good as the data they are trained on. Historical data may reflect social, economic, or institutional biases, which can become embedded in predictive models and AI algorithms. This creates a risk of perpetuating systemic inequality, especially in areas such as public service allocation, urban planning, and social protection programs (Goffer et al., 2025). Moreover, the lack of transparency in complex AI models—often referred to as the "black box" problem—makes it difficult for policymakers to understand how decisions are made, challenging both accountability and trust.

4.4. Data Surveillance and Privacy Concerns

The collection and analysis of large-scale citizen data raises legitimate concerns about privacy and surveillance. In countries with weak legal frameworks or authoritarian regimes, these tools can be misused to monitor dissent, suppress civil liberties, or discriminate against minority groups (Haldar et al., 2025). The deployment of MIS and AI systems without robust data protection laws and independent oversight mechanisms poses a threat to democratic governance.

4.5. Ethical AI Design and Governance

To address these issues, governments must invest in ethical AI design and enforce regulations that ensure fairness, accountability, and inclusiveness. This includes conducting regular algorithm audits, publishing model documentation, and enabling public participation in the design and evaluation of AI systems. Hossain et al. (2025) argue for the establishment of national AI ethics boards that oversee system deployment in the public sector and ensure alignment with societal values.

4.6. Policy and Regulatory Alignment

There is also a misalignment between technological innovation and the regulatory environment. Existing laws often fail to address the complexity of digital governance, particularly regarding data sovereignty, intellectual property rights,

and transnational data flows. Updating these policies and creating interoperable legal standards will be crucial to facilitating cross-border collaboration and ensuring secure, ethical AI deployment (Mahmud et al., 2025). In conclusion, while the integration of MIS, AI, and predictive analytics holds immense promise for national economic growth, addressing these challenges is essential to build systems that are secure, equitable, and trustworthy. The next section will offer strategic recommendations to guide policymakers and institutions in overcoming these barriers and fostering responsible innovation in digital governance.

5. Strategic Recommendations

In order to overcome the challenges identified in the previous section and unlock the full potential of MIS, AI, and predictive analytics in national economic development, governments must implement targeted, forward-thinking strategies. The following recommendations provide a roadmap for effective integration and sustained innovation across public administration. All BI initiatives should incorporate ethical design principles from the outset. Independent ethics boards, algorithm audits, and impact assessments can ensure that AI systems are fair, inclusive, and aligned with public values. Transparency measures, such as open-source algorithms and explainable AI frameworks, can further bolster accountability and user trust (Mahmud et al., 2025).

5.1. Develop National AI and BI Roadmaps

Governments should formulate comprehensive AI and Business Intelligence (BI) strategies that are closely aligned with broader economic and social development agendas. These roadmaps must define priority sectors, investment needs, capacity-building initiatives, and measurable indicators of success. National strategies should also outline timelines for digital transformation, inter-agency coordination frameworks, and policies for responsible AI use. By embedding BI within economic planning, nations can enhance fiscal resilience, reduce poverty, and promote inclusive growth (Haldar et al., 2025).

5.2. Open-Source MIS Platforms to Reduce Vendor Lock-in

Adopting open-source Management Information Systems (MIS) can minimize reliance on proprietary software vendors, enhance transparency, and foster innovation. Open-source platforms are adaptable to local needs, offer greater interoperability, and often benefit from global developer communities. Barikdar et al. (2025) suggest that funding and developing modular MIS architectures can empower local governments to scale digital services cost-effectively, especially in resource-constrained settings.

5.3. Build Cross-Sectoral Task Forces to Oversee Integration

Effective deployment of BI technologies requires multi-stakeholder collaboration. Governments should establish task forces that include representatives from finance, technology, academia, and civil society. These bodies would oversee strategic alignment, monitor progress, and ensure ethical compliance. Mahmud et al. (2025) emphasizes that cross-sectoral task forces play a critical role in breaking down bureaucratic silos, promoting transparency, and building public trust in digital governance systems.

5.4. Promote International Cooperation for Data Governance

As data flows increasingly transcend national borders, international collaboration is essential to develop coherent governance mechanisms. Participating in global dialogues on data protection, algorithmic accountability, and AI ethics allows countries to harmonize regulations and adopt best practices. Countries should engage with regional organizations, such as the OECD and World Bank, to co-develop data-sharing standards, digital trade frameworks, and transnational AI research initiatives (Goffer et al., 2025). Building a digitally competent workforce is critical to sustaining BI innovation. Governments must invest in technical education, vocational training, and professional certification programs in AI, data science, and MIS. In addition, public awareness campaigns should promote digital literacy and data rights among citizens to foster responsible technology adoption and civic engagement (Hossain et al., 2025).

6. Conclusion

Business Intelligence (BI), powered by the integration of Management Information Systems (MIS), Artificial Intelligence (AI), and Predictive Analytics, marks a fundamental transformation in the way governments approach economic decision-making. As digital transformation becomes a cornerstone of public policy, BI enables nations to transition from reactive governance toward a model of proactive, anticipatory policymaking. Through this paradigm, governments can

better forecast economic outcomes, optimize policy implementation, and respond swiftly to emerging challenges. The deployment of MIS ensures the collection, organization, and accessibility of economic data across departments, creating a cohesive infrastructure for real-time decision-making. AI introduces adaptive intelligence capable of uncovering patterns, generating forecasts, and recommending evidence-based strategies, while predictive analytics adds a layer of foresight critical for long-term economic planning. When combined, these technologies empower public administrators with a holistic and data-enriched view of the national economy. However, the integration of these technologies is not without barriers. As outlined in this paper, governments must confront technical challenges such as data silos and skills shortages, ethical concerns surrounding AI bias and surveillance, and institutional resistance to change. Addressing these barriers requires comprehensive policy reforms, cross-sector collaboration, and investments in digital infrastructure and human capital. Strategically implemented, BI becomes more than a tool—it evolves into a governance philosophy rooted in transparency, inclusivity, and accountability. Nations that prioritize ethical design, interoperability, and continuous learning in their BI frameworks will be better positioned to achieve equitable economic growth, resilient institutions, and informed civic engagement. Looking ahead, the future of economic growth lies not merely in access to data, but in the intelligent, ethical, and strategic use of that data to guide development. Business Intelligence thus serves as both a technological framework and a moral imperative for shaping the next generation of digital governance and economic resilience.

Compliance with ethical standards

Acknowledgments

We would like to express our gratitude to all the co-authors for their contribution and critical reviews from the anonymous reviewers.

Disclosure of conflict of interest

No potential conflict of interest relevant to this article was reported

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