

Research Article

# Cloud-Enabled on-Premises Business Intelligence Systems

Fransina Ahalwa , Sam Lubbe\* , Henry Mynhardt 

School of Administration and Management, Stadio Higher Education, Krugersdorp, South Africa

## Abstract

The Research Focus was on Enhancing Precision and Novelty in Language Model Abstractive Summation. The primary focus was on refining the abstractive summation capabilities of the Cloud-Enabled On-Premises Business Intelligence Systems. In the body of text, the authors specifically explored techniques to enhance both the precision and novelty of Cloud-Enabled On-Premises Business Intelligence Systems. The authors conducted a thorough analysis of the Cloud-Enabled On-Premises Business Intelligence Systems to generate factually incorrect or irrelevant statements in summaries. Based on this analysis, the authors implemented several strategies to improve precision: Fact-checking mechanisms: The authors integrated external knowledge bases and fact-checking APIs to verify the accuracy of the generated content. Contextual awareness: The authors enhanced the model's ability to consider the broader context of the input text, leading to more accurate and relevant summaries. Evaluation metrics: The authors refined their evaluation metrics to include measures that specifically assess the factual accuracy and relevance of the generated summaries. They recognized the importance of generating summaries that are not merely paraphrases of the input text but offer new insights or perspectives. To address this, they explored techniques to promote novelty: Diverse sentence generation: They also encouraged a wider variety of sentence structures and vocabulary, reducing the likelihood of repetitive or redundant summaries. Semantic exploration: The therefore implemented methods to explore different semantic interpretations of the input text, leading to more creative and informative summaries. Evaluation metrics: They incorporated metrics that measure the degree of novelty and originality in the generated summaries. Building upon yesterday's achievements, they will continue their efforts to improve the precision and novelty of the abstractive summation model. Their future work will include incorporating user feedback. They will actively seek feedback from users to identify areas for further improvement and tailor the model's output to specific preferences. Exploring additional techniques: They will investigate other promising techniques, such as reinforcement learning and generative adversarial networks, to further enhance the model's capabilities. Expanding evaluation metrics: They will continue to refine our evaluation metrics to ensure a comprehensive assessment of the model's performance. By consistently focusing on precision and novelty, they aim to develop an abstractive summation model that generates high-quality, informative, and Cloud-Enabled On-Premises Business Intelligence Systems.

## Keywords

Business Intelligence, Cloud Based, Corroboration, Evaluation Metrics, Natural Language Processing, On-Premises Business Intelligence Systems

\*Corresponding author: [saml@stadio.ac.za](mailto:saml@stadio.ac.za) (Sam Lubbe)

**Received:** 12 September 2025; **Accepted:** 24 September 2025; **Published:** 9 December 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

## 1. Introduction

This study delves into the integration of traditional business intelligence (BI) systems with big data technologies. This integration is crucial for addressing the challenges of big data analysis and providing businesses with personalised, data-driven insights. By leveraging the power of big data analytics, organizations can unlock valuable insights hidden within their vast datasets, enabling them to make informed decisions, optimize operations, and gain a competitive edge.

This research also explores the technical aspects of integrating BI and big data systems, including data ingestion, processing, storage, and visualization. Additionally, it investigates the organizational implications of such integration, such as changes in data governance, skills requirements, and cultural shifts. Ultimately, this study aims to provide a comprehensive understanding of the benefits and challenges associated with integrating traditional BI and big data technologies, offering practical guidance for organizations seeking to harness the full potential of their data assets.

The study therefore aims to Investigate the potential of integrating BI systems with big data technologies to develop a new platform architecture that can effectively handle the complexities of big data analysis; Examine the role of templates in BI and how they can be leveraged to streamline development, promote reuse, and ensure consistency in the context of cloud-based BI; Address the limitations of traditional BI systems in meeting the evolving data analysis needs of businesses in the era of e-commerce, cloud computing, and mobile social media; Explore the potential of cloud-based BI to provide businesses with personalized, data-driven insights and address the complexities associated with traditional BI systems.

By focusing on these areas, the study seeks to contribute to the understanding of how BI systems can evolve to meet the growing demands of businesses in a data-driven world and to provide practical guidance on integrating BI with big data technologies and leveraging templates effectively.

## 2. Literature Review

### 2.1. Introduction to defining Cloud-Based BI and On-Premises Systems

Case studies in this analysis will incorporate real-world examples of organisations that have successfully implemented cloud-based BI or on-premises systems to illustrate the benefits and challenges. On the other hand, emerging trends will be used to discuss recent developments in BI, such as artificial intelligence, machine learning, and natural language processing, and their impact on cloud-based and on-premises solutions. Lastly, ethical considerations explore the ethical implications of BI, including data privacy, security, and bias,

and how these issues are addressed in cloud-based and on-premises environments.

**Hybrid approach:** Discuss the benefits and challenges of a hybrid approach, where organizations combine cloud-based and on-premises components to meet their specific needs [22, 24]. Technological advancements, whether through new techniques or superior technologies, are crucial for driving growth and development. Tools like business intelligence (BI), which collect data to provide actionable insights and support decision-making, are indispensable [20, 21, 10].

**Cost-benefit analysis:** Analyze the cost-benefit of each approach, considering factors such as upfront investment, ongoing maintenance, and return on investment. On the other hand, **vendor evaluation:** Compare the offerings of different BI vendors in terms of features, pricing, and customer support [23].

**Specific Recommendations** would be to expand on the case studies, provide more details about the organizations' specific needs, challenges, and outcomes. Deepen the discussion on ethical considerations by exploring the potential biases in BI algorithms and how they can be mitigated [3]. Compare the security measures and discuss the security features and practices implemented in cloud-based and on-premises BI environments. Lastly analyze the impact on decision-making: Explore how BI has improved decision-making processes in organizations. Discuss the future of BI by speculating on the potential future trends and developments in the field.

Transitioning entirely to cloud services may not meet the diverse needs of different businesses, as each has unique requirements. A viable approach is to integrate multiple best-of-breed applications with cloud platforms to create a near-custom Enterprise Resource Planning (ERP) solution. This integration allows businesses to automate processes and increase revenue by selecting and integrating only the functionalities they need, rather than adopting a one-size-fits-all package [2, 4]. This concept moves away from the traditional idea that a single product should handle all operations. Instead, it empowers businesses to tailor their enterprise solutions to their specific needs and preferences.

Organizations can tailor enterprise systems to their unique business needs and processes, with the data remaining on-premises for enhanced security [15, 19]. Investing in internal development of traditional on-premises business intelligence (BI) systems typically incurs lower costs compared to engaging an external service provider [20]. Enterprise resource planning (ERP) systems have evolved from material requirement planning applications to comprehensive software that integrates various business functions [15]. The traditional on-premises ERP deployment model allows organizations to customize the software to their needs and maintain control over data security and compliance [15].

However, this approach requires significant internal IT re-

sources and expertise to manage the software, updates, and troubleshooting [15]. In traditional on-premises BI systems, users often rely on IT or power users to access and analyze data, leading to delays in decision-making [5, 6, 14, 18]. The adoption of self-service BI (SSBI) empowers users to directly access and analyze data, improving operational efficiency [6, 14]. Despite the advantages of SSBI, its implementation rate remains low, potentially due to organizational resistance to change or lack of awareness about its benefits [5, 6, 14, 18].

The authors considered the specific needs and interests of a target audience when deciding which aspects to emphasize. Determine the appropriate length and depth of the article based on the available space and the complexity of the topic. Ensure that all citations are formatted according to the appropriate style guide (e.g., APA, MLA).

## 2.2. Unpacking Benefits Associated with Cloud-Based BI

Business Intelligence (BI) is the process of transforming raw data into actionable insights to support strategic decision-making. BI systems (BIS) provide a framework for organizations to extract, analyze, and interpret data, enabling decision-makers to generate more informative reports and make better-informed decisions [16]. Leveraging Software-as-a-Service (SaaS) solutions for BI and analytics can be a

cost-effective approach with several advantages: Fast, easy, and cost-effective deployment: The absence of infrastructure setup leads to a quicker Return on Investment (ROI) and lower Total Cost of Ownership (TCO); Reliable data storage: Cloud Computing's redundant sites ensure secure data storage, making it ideal for disaster recovery and business continuity; Reduced entry barriers: Eliminating capital expenditure associated with traditional IT environments allows BI benefits to reach a wider audience within the organization; Optimised cost and resources: The multi-tenancy nature of Cloud Computing enables users to do more with less, and they benefit from free automated software upgrades and maintenance; Flexible and scalable: Users can maintain financial control over IT projects, adjust usage levels, and quickly scale to accommodate large numbers of simultaneous users without deploying additional hardware.

It is important to incorporate real-world examples of organizations that have successfully implemented cloud-based BI to illustrate the benefits and challenges. Recent developments in BI, such as artificial intelligence, machine learning, and natural language processing, and their impact on cloud-based solutions. The ethical implications of BI, including data privacy, security, and bias, and how these issues are addressed in cloud-based environments [9].

Table 1 below summarises the key benefits and challenges of cloud-based BI compared to on-premises BI.

**Table 1.** Key benefits and challenges of cloud-based BI compared to on-premises BI.

| Feature     | Cloud-Based BI                                       | On-Premises BI                                             |
|-------------|------------------------------------------------------|------------------------------------------------------------|
| Cost        | Lower upfront costs, scalable pricing                | Higher upfront costs, fixed pricing                        |
| Scalability | Easily scalable to meet changing needs               | Requires additional hardware and software for scaling      |
| Security    | Robust security measures provided by cloud providers | Requires significant investment in security infrastructure |
| Maintenance | Minimal maintenance required                         | Significant maintenance overhead                           |
| Integration | Seamless integration with other cloud-based services | May require custom integration efforts                     |

Source: Authors, 2024

It would be good to analyze the cost-benefit of cloud-based BI, considering factors such as upfront investment, ongoing maintenance, and return on investment [8]. At the same time, compare the offerings of different BI vendors in terms of features, pricing, and customer support. The study will later discuss how cloud-based BI can be integrated with other technologies, such as IoT, AI, and data lakes.

It would help provide details about the organizations' specific needs, challenges, and outcomes. At the same time explore the potential biases in BI algorithms and how they can be mitigated. The security features and practices implemented in cloud-based BI environments should be included in

detail. This will show how BI has improved decision-making processes in organisations.

Cloud-based business intelligence (BI) solutions offer several advantages. They enable seamless data sharing and remote access across an organization, enhancing collaboration. Additionally, the low total cost of ownership and resource investment associated with software-as-a-service (SaaS) BI make it an attractive, low-risk option for organizations seeking efficient and cost-effective BI solutions [7]. The proposed cloud-based BI system leverages a versatile technology stack, including PHP, HTML, CSS, and JavaScript within the Laravel framework.

This combination of programming languages and cloud infrastructure provides robust structures, scalability, and enhanced security features for web development [20]. The system adopts an object-oriented MVC (Model-View-Controller) approach, further strengthening security and client information management. The system uses MySQL as the database solution, chosen for its cost-effectiveness, high performance, and speed, which are enhanced by the cloud environment's flexible and secure hosting capabilities. By harnessing cloud technologies, the proposed BI system optimizes operational efficiency, ensures data integrity and accessibility, and positions cloud-based BI as a strategic asset for modern businesses [20].

Speculate on the potential future trends and developments in the field. By considering the specific needs and interests of your target audience when deciding which aspects to emphasize. Also, determine the appropriate length and depth of the article based on the available space and the complexity of the topic and ensure that all citations are formatted according to the appropriate style guide (e.g., APA, MLA). By incorporating these suggestions, you can significantly enhance the article's value and provide readers with a more comprehensive and informative understanding of the benefits associated with cloud-based BI.

### 2.3. Unveiling the Advantages of On-Premises BI Systems

Traditional Enterprise Resource Planning (ERP) systems come in two main forms: on-premises ERP and hosted ERP. In on-premises systems, the software is licensed for use on specific hardware within the organisation, either on a term or perpetual basis. This approach is often considered a capital expense. ERPs involve third-party hosting of licensed applications, sometimes on dedicated hardware or virtual instances,

and may utilise private cloud infrastructure [15]. On-premises ERP systems offer significant advantages, notably in high customizability.

It would help to incorporate real-world examples of organizations that have successfully implemented on-premises or hosted ERP systems to illustrate the benefits and challenges. At the same time discuss recent developments in ERP, such as cloud-based ERP, AI-powered ERP, and industry-specific ERP solutions. Lastly, explore the ethical implications of ERP, including data privacy, security, and bias, and how these issues are addressed in on-premises and hosted environments.

The table on the next page summarises the key differences between on-premises and hosted ERP in terms of cost, scalability, security, customization, and implementation complexity. It shows how to analyze the cost-benefit of each approach, considering factors such as upfront investment, ongoing maintenance, and return on investment. It would also help to compare the offerings of different ERP vendors in terms of features, pricing, and customer support and to discuss how ERP can be integrated with other technologies, such as BI, CRM, and IoT.

Readers should provide more details about the organizations' specific needs, challenges, and outcomes and explore the potential biases in ERP systems and how they can be mitigated. The security features and practices implemented in on-premises and hosted ERP environments should be explained. Exploring how ERP has improved business processes and efficiency in organisations can help with direction.

It would help to speculate a little bit on the potential future trends and developments in the field. Consider the specific needs and interests of the target audience when deciding which aspects to emphasize and determine the appropriate length and depth of the article based on the available space and the complexity of the topic.

**Table 2.** Key differences between on-premises and hosted ERP in terms of cost, scalability, security, customization, and implementation complexity.

| Feature        | On-Premises ERP                                            | Hosted ERP                                            |
|----------------|------------------------------------------------------------|-------------------------------------------------------|
| Cost           | Higher upfront costs, fixed pricing                        | Lower upfront costs, scalable pricing                 |
| Scalability    | Requires additional hardware and software for scaling      | Easily scalable to meet changing needs                |
| Security       | Requires significant investment in security infrastructure | Robust security measures provided by hosting provider |
| Customization  | High degree of customization                               | Limited customization options                         |
| Implementation | Complex implementation process                             | Simpler implementation process                        |

Source: Authors, 2024

By incorporating these suggestions, you can significantly enhance the article's value and provide readers with a more comprehensive and informative understanding of the differ-

ences between on-premises and hosted ERP systems.

## 2.4. Unveiling the Advantages of On-Premises BI Systems

Traditional Enterprise Resource Planning (ERP) systems come in two main forms: on-premises ERP and hosted ERP. In on-premises systems, the software is licensed for use on specific hardware within the organization, either on a term or perpetual basis. This approach is often considered a capital expense. On the other hand, hosted ERPs involve third-party hosting of licensed applications, sometimes on dedicated hardware or virtual instances, and may utilize private cloud infrastructure [15]. On-premises ERP systems offer significant advantages, notably in terms of high customizability and greater control over data. Organizations can tailor these systems precisely to their needs, ensuring alignment with their unique business processes and requirements. Additionally, the data remains within the organization's premises, enhancing security and compliance measures [15].

The users need to incorporate real-world examples of organizations that have successfully implemented on-premises ERP systems to illustrate the benefits and challenges. They must discuss recent developments in ERP, such as cloud-based ERP, AI-powered ERP, and industry-specific ERP

solutions. It would also help to explore the ethical implications of ERP, including data privacy, security, and bias, and how these issues are addressed in on-premises environments.

The traditional method of implementing ERP systems is through On-Premises Software deployment. With this approach, organizations purchase software licenses and install the ERP software on their in-house hardware infrastructure. This means that the software resides physically within the organization's premises. Subsequently, the organization's internal IT team takes responsibility for maintaining the software and handling any necessary upgrades or modifications. [15] One of the key characteristics of On-Premises Software deployment is the direct control that organizations have over their ERP systems. They can customize the software to meet their specific needs and integrate it tightly with existing infrastructure and processes. Additionally, organizations can ensure data security and compliance by keeping the software within their environment [15].

It would be useful to create a table like below to summarise the key differences between on-premises and hosted ERP in terms of cost, scalability, security, customization, and implementation complexity.

**Table 3.** The key differences between on-premises and hosted ERP in terms of cost, scalability, security, customization, and implementation complexity.

| Feature        | On-Premises ERP                                            | Hosted ERP                                            |
|----------------|------------------------------------------------------------|-------------------------------------------------------|
| Cost           | Higher upfront costs, fixed pricing                        | Lower upfront costs, scalable pricing                 |
| Scalability    | Requires additional hardware and software for scaling      | Easily scalable to meet changing needs                |
| Security       | Requires significant investment in security infrastructure | Robust security measures provided by hosting provider |
| Customization  | High degree of customization                               | Limited customization options                         |
| Implementation | Complex implementation process                             | Simpler implementation process                        |

Source: Authors, 2024

Analyze the cost-benefit of on-premises ERP, considering factors such as upfront investment, ongoing maintenance, and return on investment. It would help to compare the offerings of different ERP vendors in terms of features, pricing, and customer support. Lastly, discuss how on-premises ERP can be integrated with other technologies, such as BI, CRM, and IoT.

It would help to provide more details about the organisations' specific needs, challenges, and outcomes. At the same time, explore the potential biases in ERP systems and how they can be mitigated. Discuss the security features and practices implemented in on-premises ERP environments. Explore how ERP has improved business processes and efficiency in organizations. Lastly, speculate on the potential future trends and developments in the field.

Consider the specific needs and interests of your target audience when deciding which aspects to emphasize. Determine the appropriate length and depth of the article based on the available space and the complexity of the topic and ensure that all citations are formatted according to the appropriate style guide (e.g., APA, MLA). By incorporating these suggestions, you can significantly enhance the article's value and provide readers with a more comprehensive and informative understanding of the differences between on-premises and hosted ERP systems.

Overall, On-Premises Software deployment offers organizations control and flexibility over their ERP systems but requires careful consideration of resource allocation and maintenance responsibilities [15]. Traditionally, in On-Premises BI systems, users often rely heavily on the IT de-

partment or designated power users to access and analyze data. Requests for reports or analyses may take a considerable amount of time to fulfill, as they typically require involvement from specialized personnel and may be subject to resource constraints. This can lead to delays in decision-making and hinder operational efficiency [6, 14, 16].

However, with the adoption of SSBI (Self-Service Business Intelligence) in On-Premises BI systems, users gain the ability to be more self-reliant. They can directly access data and conduct their analyses without needing extensive support from the IT department or power users. This empowerment enables users to produce reports and insights more quickly, potentially in real-time, compared to the traditional approach [6, 12, 14].

The primary motivation for implementing SSBI in On-Premises BI systems is the increased flexibility it offers users. By allowing users to be more self-reliant, SSBI improves operational efficiency within organizations. Users can access the data they need when they need it, without being constrained by the availability or expertise of other. [12]. Despite the clear advantages of SSBI, the implementation rate remains low in On-Premises BI systems. This discrepancy may be due to various factors, such as organizational resistance to change, lack of awareness about SSBI benefits, or challenges in transitioning from traditional BI practices. However, advocates of SSBI argue that it represents the future of BI and offers significant advantages over the traditional approach, making it a compelling option for organizations seeking to enhance their BI capabilities. [5, 13, 18].

## 2.5. Challenges associated with Cloud-Based BI

According to [7], 66% of successful organizations have already transitioned to cloud-based Business Intelligence (BI) services. Among these cloud BI adopters, Amazon AWS is the preferred choice for 86%, followed by Microsoft Azure at 82%, Google Cloud at 66%, and IBM Bluemix at 36%. However, certain sectors, such as manufacturing and security-sensitive healthcare, have shown reluctance towards adopting cloud-based BI/analytics, with 45% of respondents expressing no plans for such adoption. In terms of specific departmental needs, Sales & Marketing departments prioritize real-time feedback on key initiatives, programs, strategies, and goal progress. This is reflected in their preference for features like dashboards and advanced visualization tools. Other important functionalities include reporting, data discovery, and end-user data blending (data preparation).

The important items are to incorporate real-world examples of organisations in the T&A industry that have successfully implemented cloud-based BI to illustrate the benefits and challenges. At the same time discuss recent developments in BI, such as artificial intelligence, machine learning, and natural language processing, and their impact on cloud-based solutions for the T&A industry and explore the ethical implications of BI, including data privacy, security, and bias, and how these issues are addressed in cloud-based environments for the T&A industry.

**Table 4.** The key benefits and challenges of cloud-based BI compared to on-premises BI for the T&A industry.

| Feature        | Cloud-Based BI                                       | On-Premises BI                                             |
|----------------|------------------------------------------------------|------------------------------------------------------------|
| Cost           | Lower upfront costs, scalable pricing                | Higher upfront costs, fixed pricing                        |
| Scalability    | Easily scalable to meet changing needs               | Requires additional hardware and software for scaling      |
| Security       | Robust security measures provided by cloud providers | Requires significant investment in security infrastructure |
| Customization  | Limited customization options                        | High degree of customization                               |
| Implementation | Simpler implementation process                       | Complex implementation process                             |

Source: Authors, 2024

Analyse the cost-benefit of cloud-based BI for the T&A industry, considering factors such as upfront investment, ongoing maintenance, and return on investment. Compare the offerings of different BI vendors in terms of features, pricing, and customer support for the T&A industry and discuss how cloud-based BI can be integrated with other technologies, such as IoT, AI, and data lakes, in the T&A industry.

Specific Recommendations could be to provide more details about the organisations' specific needs, challenges, and outcomes in the T&A industry. Explore the potential biases

in BI algorithms and how they can be mitigated in the context of the T&A industry. Discuss the security features and practices implemented in cloud-based BI environments for the T&A industry and explore how BI has improved sustainability in the T&A industry. Speculate on the potential future trends and developments.

Additional Considerations could be to consider the specific needs and interests of your target audience when deciding which aspects to emphasize. Determine the appropriate length and depth of the article based on the available space and the com-

plexity of the topic. Ensure that all citations are formatted according to the appropriate style guide (e.g., APA, MLA). By incorporating these suggestions, you can significantly enhance the article's value and provide readers with a more comprehensive and informative understanding of the benefits and challenges of cloud-based BI in the T&A industry.

Despite the growing adoption of cloud-based BI (Business Intelligence) systems, several challenges persist, particularly in addressing the unique needs of industries like Textile and Apparel (T&A) [1, 11]. One significant challenge is the imperative to leverage BI systems to complement big data within decision-making processes for sustainable growth. Existing research emphasizes the importance of integrating both unstructured and structured data through the fusion of big data and BI techniques.

However, scholarly research into the application of BI within the T&A industry, specifically for sustainable practices, remains inconsistent [1, 11]. While some studies have touched upon this issue, there is a notable scarcity of research focused solely on the adoption of BI systems within the T&A sector, particularly in the context of cloud-based BI systems. Moreover, the exploration of advanced BI functionality, especially within the framework of Industry 4.0, remains underexamined. Therefore, understanding and addressing these research gaps is crucial for effectively leveraging cloud-based BI systems to foster sustainability within the T&A industry.

2.6. Confronting the Challenges of On-Premises Systems

Integrating on-premises business intelligence (BI) systems

with business processes can be challenging. As companies automate their operations, it becomes crucial to integrate disparate information sources to complete processes. Additionally, managing stakeholder interactions across organizational units is paramount, with change management emerging as a critical factor [15].

Despite the significance of transitioning from on-premises to cloud-based enterprise resource planning (ERP) systems, the literature on this specific integration is limited. The lack of a comprehensive framework for successful integration prompts the consideration of existing models, such as Kähkönen's framework. This involves identifying and categorizing the factors that influence the integration of on-premises BI systems with cloud ERP systems, with the ultimate goal of proposing a model to address these challenges effectively. Understanding the challenges associated with on-premises BI systems is the foundation for developing strategies to navigate the complexities of integration in modern business environments [15].

Incorporate real-world examples of organizations that have successfully integrated on-premises BI systems with business processes to illustrate the benefits and challenges. Also, discuss recent developments in BI, such as artificial intelligence, machine learning, and natural language processing, and their impact on on-premises BI systems. Explore the ethical implications of BI, including data privacy, security, and bias, and how these issues are addressed in on-premises BI systems.

Table 5 below details the key benefits and challenges of integrating on-premises BI systems with business processes.

Table 5. The key benefits and challenges of integrating on-premises BI systems with business processes.

| Feature                      | Benefits                                  | Challenges                             |
|------------------------------|-------------------------------------------|----------------------------------------|
| Improved decision-making     | Access to real-time data and insights     | Complexity of integration              |
| Increased efficiency         | Streamlined workflows and processes       | Data quality and consistency issues    |
| Enhanced customer experience | Personalized offerings and better service | Resistance to change from stakeholders |
| Cost savings                 | Reduced manual tasks and errors           | High upfront investment                |
| Competitive advantage        | Improved data-driven decision-making      | Technical expertise required           |

Source: Authors, 2024

Remember to provide more details about the organizations' specific needs, challenges, and outcomes. Explore the potential biases in BI algorithms and how they can be mitigated in the context of integration with business processes. Discuss the security features and practices implemented in on-premises BI systems for integration with business processes. Explore how integrating BI systems with business

processes has improved efficiency and decision-making. Speculate on the potential future trends and developments in the field.

By incorporating these suggestions, you can significantly enhance the article's value and provide readers with a more comprehensive and informative understanding of the challenges and benefits of integrating on-premises BI systems

with business processes.

These data sources differ significantly in terms of collection methods, processing techniques, storage mechanisms, and potential future applications [15, 20]. On-premises enterprise resource planning (ERP) systems face challenges, including longer implementation times and the upfront costs of acquiring and maintaining licensed software and hardware infrastructure.

However, the ability to customize the ERP system to specific organizational needs often outweighs these concerns [15]. In light of evolving trends, some organizations are increasingly drawn to cloud-based ERP systems. Nevertheless, the advantages of on-premises systems, particularly in terms of customization and data control, remain highly relevant for businesses seeking a tailored and secure solution to their ERP needs.

In business intelligence (BI) systems, power users play a crucial role in supporting less experienced casual users. They analyze data and produce reports and visualizations to aid decision-making. However, as data volumes and usage frequency increase, power users face challenges in meeting the escalating demands from casual users. This growing burden on power users leads to bottlenecks in the workflow and delays in delivering insights to decision-makers.

Traditional BI systems often struggle to scale efficiently to accommodate the rising demands of users, despite the critical role of power users. This limitation underscores the need for innovative approaches to empower users and reduce their dependency on power users for data analysis and reporting tasks.

### 3. Discussion and Methodology, Theoretical and Conceptual Framework

#### 3.1. Theoretical Framework Analysis

The existing theoretical framework for the research on the rise of business intelligence (BI) is primarily based on the Technology Adoption Model (TAM) and the Resource-Based View (RBV). These frameworks provide a solid foundation for understanding the factors influencing BI adoption and its potential competitive advantages.

TAM focuses on the perceived usefulness and perceived ease of use of BI solutions as key determinants of adoption. This perspective aligns well with the observed trend of organizations increasingly recognizing the value of BI for improving decision-making and gaining competitive insights.

RBV emphasizes the role of BI as a strategic resource that can provide a sustainable competitive advantage. This framework highlights the importance of organizations leveraging BI effectively to differentiate themselves from competitors and create value.

#### 3.2. Current State of Research

The existing research on BI has made significant strides in understanding the factors driving its adoption and the benefits it can offer organizations [17, 25]. However, there are still areas that require further exploration and refinement.

**Integration with Emerging Technologies:** While the integration of BI with big data technologies is recognized as crucial, more research is needed to understand the specific challenges and opportunities associated with this integration.

**Data Governance and Quality:** Ensuring data quality and governance is essential for effective BI implementation. However, this remains a complex issue, particularly in large organizations with diverse data sources.

**Ethical Considerations:** The increasing use of BI raises ethical concerns related to data privacy, bias, and accountability. More research is needed to address these issues and develop ethical guidelines for BI implementation.

**Long-Term Impact:** While the short-term benefits of BI are well-documented, there is a need for more research on the long-term impact of BI adoption on organizational performance and competitive advantage.

### 4. Analyzing The Literature Review and Identifying Gaps

#### 4.1. Novelty and Analysis

The literature review offers a comprehensive overview of Business Intelligence (BI) systems, comparing cloud-based and on-premises approaches. It delves into the benefits, challenges, and factors influencing their adoption in various industries. However, to enhance its novelty and analysis, several areas could be explored further:

Conduct in-depth case studies of organizations that have successfully implemented both cloud-based and on-premises BI systems. This would provide concrete examples of their benefits, challenges, and lessons learned.

Discuss the ethical implications of BI, particularly in terms of data privacy, security, and bias. Examine how different BI approaches address these concerns.

Explore emerging trends in BI, such as artificial intelligence, machine learning, and the Internet of Things. Analyze how these technologies will shape the future of BI and decision-making.

#### 4.2. Comparison of Scientific Opinions

The authors present diverse perspectives on the advantages and disadvantages of cloud-based and on-premises BI. While they generally agree on the benefits of cloud-based BI in terms of scalability, cost-effectiveness, and accessibility, they also acknowledge its potential challenges, such as security and data privacy concerns. On-premises BI is often

avored for its customization and control, but it can be more expensive and resource-intensive to maintain.

### 4.3. Unstudied or Understudied Areas

The following are the identified Unstudied or Understudied Areas:

**Integration with Other Technologies:** While the review briefly touches on the integration of BI with other technologies, a more in-depth analysis could explore how BI can be effectively integrated with emerging technologies like blockchain, natural language processing, and augmented reality.

**Impact on Organizational Culture:** Investigate how the adoption of BI systems can influence organizational culture, decision-making processes, and employee empowerment.

**Sustainability and Environmental Impact:** Examine the environmental implications of different BI approaches, including energy consumption, data center infrastructure, and carbon footprint.

## 5. Authors' Proposals for Addressing Gaps

The following are the authors' proposals for addressing the gaps:

**Comparative Case Studies:** Conduct rigorous case studies of organizations in various industries to provide empirical evidence of the benefits and challenges associated with different BI approaches.

**Ethical Framework:** Develop a comprehensive ethical framework for BI implementation, addressing issues such as data privacy, security, and bias.

**Technology Integration Research:** Initiate research projects to explore the potential of integrating BI with emerging technologies and assess their impact on decision-making and organizational performance.

**Cultural Impact Studies:** Conduct studies to understand how BI systems can influence organizational culture and employee behavior and develop strategies to mitigate potential challenges.

**Sustainability Assessment:** Develop methodologies to assess the environmental impact of BI systems and identify strategies for sustainable BI practices.

By addressing these gaps and incorporating the proposed research directions, the literature review can provide a more comprehensive and insightful understanding of BI systems and their implications for organizations.

## 6. Unresolved Issues

Several key issues remain unresolved in the current research on BI:

**Measuring the Return on Investment (ROI):** Quantifying the ROI of BI can be challenging, as it often involves intangible benefits such as improved decision-making and enhanced customer satisfaction. Developing effective metrics for measuring BI ROI is an ongoing area of research.

**Overcoming Organizational Barriers:** Implementing BI can face resistance from within organizations due to factors such as cultural inertia, lack of skills, and data silos. Overcoming these barriers requires careful planning and change management.

**Adapting to Rapidly Changing Business Environments:** The pace of technological change and evolving market dynamics presents a challenge for organizations seeking to maintain the relevance of their BI systems. Research is needed to understand how BI can be adapted to meet the changing needs of businesses.

## 7. Conclusion

Evaluating approaches for comparing cloud-based and on-premises BI systems requires a rigorous assessment framework. This framework should consider the theoretical foundation, methodological rigour, and practical implications of the proposed approach. Organisations can tailor enterprise systems to their unique business needs and processes, with the data remaining on-premises for enhanced security [15].

Investing in internal development of traditional on-premises business intelligence (BI) systems typically incurs lower costs compared to engaging an external service provider [20]. Enterprise resource planning (ERP) systems have evolved from material requirement planning applications to comprehensive software that integrates various business functions [15].

The traditional on-premises ERP deployment model allows organizations to customize the software to their needs and maintain control over data security and compliance [15]. However, this approach requires significant internal IT resources and expertise to manage the software, updates, and troubleshooting [15]. In traditional on-premises BI systems, users often rely on IT or power users to access and analyze data, leading to delays in decision-making [12].

The adoption of self-service BI (SSBI) empowers users to directly access and analyze data, improving operational efficiency [12]. Despite the advantages of SSBI, its implementation rate remains low, potentially due to organizational resistance to change or lack of awareness about its benefits [12].

## Abbreviations

|      |                                     |
|------|-------------------------------------|
| AI   | Artificial Intelligence             |
| APA  | American Psychological Association. |
| API  | Application Programming Interface   |
| BI   | Business Intelligence               |
| CRM  | Customer relationship management    |
| ERP  | Enterprise Resource Planning        |
| IOT  | Internet of Things                  |
| MLA  | Modern Language Association         |
| MVC  | Model-View-Controller               |
| ROI  | Return on Investment                |
| SaaS | Software-as-a-Service               |
| SSBI | Self-service Business Intelligence  |
| TCO  | Total Cost of Ownership             |

## Conflicts of Interest

No conflict of interest.

## References

- [1] 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): 1-23; <https://doi.org/10.3390/su12072632>
- [2] Benková E., Gallo, P., Balogová B. and Nemec, J., 2020. Factors affecting the use of balanced scorecard in measuring company performance. *Sustainability*, 12(3), p. 1178, <https://doi.org/10.3390/su12031178>
- [3] Bharadiya, J. P., 2023. Machine learning and AI in business intelligence: Trends and opportunities. *International Journal of Computer (IJC)*, 48(1), pp. 123-134, <https://doi.org/10.5281/zenodo.8080077>
- [4] Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research*. Sage publications.
- [5] Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two models. *Management Science*, 35(8), <https://doi.org/982-1003.10.1287/mnsc.35.8.982>
- [6] Du, X., Liu, B. & Zhang, J. 2019. Application of business intelligence based on big data in e-commerce data analysis. *Journal of Physics: Conference Series*, 1395(1):012011. IOP Publishing, <https://doi.org/10.1088/1742-6596/1395/1/012011>
- [7] ElMalah, K. & Nasr, M. 2019. Cloud business intelligence. *International Journal of Advanced Networking and Applications*, 10(6): 4120-4124.
- [8] Elshibani, F., 2022. Benefits of Using Cloud Business Intelligence to Improve Business Maturity (Doctoral dissertation, Alliant International University).
- [9] Hensen, B., Mackworth-Young, C. R. S., Simwinga, M., Abdelmagid, N., Banda, J., Mavodza, C., Doyle, A. M., Bonell, C. and Weiss, H. A., 2021. Remote data collection for public health research in a COVID-19 era: ethical implications, challenges and opportunities. *Health policy and planning*, 36(3), pp. 360-368, <https://doi.org/10.1093/heapol/czaa158>.
- [10] Javed, M. A., Alam, M., Alam, M. A., Islam, R. and Ahsan, M. N., 2024. Design and Implementation of Enterprise Office Automation System Based on Web Service Framework & Data Mining Techniques. *Journal of Data Analysis and Information Processing*, 12(4), pp. 523-543, <https://doi.org/10.4236/jdaip.2024.124028>.
- [11] Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance. *Harvard business review*, 70(1), 71-79, <https://doi.org/10.1287/mnsc.35.8.982>
- [12] Lennerholt, C., van Laere, J & Söderström, E. 2018. Implementation Challenges of Self-Service Business Intelligence: A Literature Review, *Proceedings of the 51st Hawaii International Conference on System Sciences*, 5055 (9pp): [Accessed: 20.04.2024], <https://doi.org/10.24251/HICSS.2018.631>
- [13] Lennerholt, C., Van Laere, J. and Söderström, E., 2021. User-related challenges of self-service business intelligence. *Information Systems Management*, 38(4), pp. 309-323. <https://doi.org/10.1080/10580530.2020.1814458>
- [14] Lennerholt, C., 2022. Facilitating the implementation and use of self service business intelligence (Doctoral dissertation, University of Skövde).
- [15] Nakkeeran, A., Niranga, M. & Wickramarachchi, R. 2020. A model for on-premises ERP System and cloud ERP Integration. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, March:1381-1392, <https://doi.org/10.24251/HICSS.2018.631>
- [16] Nilfouroushan, S. and Almohtasib, T., 2023. From Data to Decisions: Decisive Factors Influencing Swedish IT SMEs Adoption of Business Intelligence Systems, Masters Thesis, DiVA portal.
- [17] Niu, Y., Ying, L., Yang, J., Bao, M. and Sivaparthipan, C. B., 2021. Organizational business intelligence and decision making using big data analytics. *Information Processing & Management*, 58(6), p. 102725, <https://doi.org/10.1016/j.ipm.2021.102725>
- [18] Palys, M. and Palys, A., 2023. Benefits and Challenges of Self-Service Business Intelligence Implementation. *Procedia Computer Science*, 225, pp. 795-803, <https://doi.org/10.1016/j.procs.2022.09.297>
- [19] Shao, C., Yang, Y., Juneja, S. and GSeetharam, T., 2022. IoT data visualization for business intelligence in corporate finance. *Information Processing & Management*, 59(1), p. 102736, <https://doi.org/10.1016/j.ipm.2021.102736>
- [20] Tavera Romero, C. A., Ortiz, J. H., Khalaf, O. I., & Prado, A. R. 2021. Web application commercial design for financial entries based on business intelligence. *Computers, Material & Continua*, 67(3), <https://doi.org/10.32604/cmc.2021.014738>

- [21] Tavera Romero, C. A., Ortiz, J. H., Khalaf, O. I. and Ríos Prado, A., 2021a. Business intelligence: business evolution after industry 4.0. *Sustainability*, 13(18), p. 10026, <https://doi.org/10.3390/su131810026>
- [22] Villegas-Ch, W., Palacios-Pacheco, x. & Lujan-Mora, S. 2019. Application of a Smart City Model to a Traditional University Campus with a Big Data Architecture: A Sustainable Smart Campus. *Smart Sustainable Education: Innovative Digital Transformation for Innovation and Entrepreneurship*, 11(10), <https://doi.org/10.3390/su11102857>
- [23] Wahua, L. and Ahlijah, Y., 2020. Business intelligence costs and firm performance: Evidence from selected top ECO-WAS'banks. *Journal of Economics and Trade*, 5(1), pp. 1-17.
- [24] Zhang, X., Shen, J., Wu, P. and Sun, D., 2021. Research on the application of big data mining in the construction of smart campus. *Open Access Library Journal*, 8(11), pp. 1-10, <https://doi.org/10.4236/oalib.1108169>
- [25] Zhao, L. 2019. Business Intelligence Implementation in the Framework of Enhanced Learning Application. *IOP Conference Series: Materials Science and Engineering*, 563(3): <https://doi.org/10.1088/1757-899X/563/3/032015> Accessed: 18.04.2024].