

Business intelligence and its impact on organizational decision-making: a systematic review

Cesar Patricio-Peralta¹, Hernan Peña Carnero¹, Jesús Zamora Mondragon¹,
Adan Eugenio Contreras Angeles¹, Marina Vargas Vega², Walter Patricio Peralta³,
Marco Mayor Ravines⁴, Juan Mayor Gamero⁴, Cesar Paccha Rufasto⁵

¹Faculty of Engineering, Universidad Tecnológica del Perú, Lima, Perú

²Faculty of Engineering, Universidad Nacional Federico Villarreal, Lima, Perú

³Faculty of Psychology, Universidad Científica del Sur, Lima, Perú

⁴Faculty of Administrative Sciences, Universidad Nacional Mayor de San Marcos, Lima, Perú

⁵Faculty of Architecture, Universidad Nacional de Ingeniería, Lima, Perú

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ABSTRACT

This research examines in detail how business intelligence (BI) supports and guides organizations in decision-making for their plans. The paper warns that the BI tool must be adapted to users' real needs. It's super crucial to keep all the important info in one spot. This optimizes resources and boosts the system's capabilities. The study used a set approach to tackle its main question. This included much searching through big science lists. Scopus and Web of Science were on the list. The search term was a particular word used to pinpoint documents. The review looked at studies from 2019 to 2025. Initially, we found 77 papers. Rules were then applied to include or exclude papers. These descartes criteria take into account the kind of paper, the language used, and how relevant it is to the subject. In the end, 24 papers went through the peer review process. These were reviewed following the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines. The findings indicate that the application of BI considerably improves the group's ability to attain superior goals. Some research showed a 93% boost in productivity. Profits went up by 65%, too. These results come only from articles written in English, Spanish, and Portuguese. They mainly focus on explaining the functioning in wealthier nations. The results really show off the main perks of BI. It facilitates informed decision-making more easily for all organisations

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Corresponding Author:

Cesar Patricio-Peralta
Faculty of Engineering, Universidad Tecnológica del Perú
Lima, Perú
Email: cesar.patricio@outlook.es

1. INTRODUCTION

In business now, using data smartly is a must for good decision-making and staying ahead [1], [2]. Business intelligence (BI) used to be just for big companies, but now it's needed for small and medium-sized businesses (SMEs), which often have trouble managing data and don't have a lot of resources [3], [4]. If SMEs aren't ready, they can't respond fast or compete well when problems come up [5].

BI systems allow businesses to collect, organize, and study data from different places to come up with useful ideas [6], [7]. Things like getting data ready, building data warehouses, and using dashboards are important for using data to reach goals and make quick decisions based on facts [8], [9]. But many companies still struggle because they don't know how to set up BI or what they want to achieve, which makes it less

useful, especially when things get tough [10], [11]. So, using BI well is key for companies to work better, use resources wisely, and make decisions based on data [1], [2], [12].

A lot has been written about using BI and its good points, but there aren't many studies that really look at how BI helps with making decisions in different areas. The studies out there tend to be narrow, focusing on certain industries or tech parts of BI, and they don't compare how BI systems perform in different companies [5], [13], [14]. Plus, updates in BI applications since 2019 haven't been put together and studied, so we need a good look at where things are now, what the problems are, and how to do well.

Past studies, like those by Ain *et al.* (2019) and Lateef & Keikhosrokiani (2022), have given good ideas about using BI and what makes it work, but they focus more on setting up the tech than on how BI helps businesses decide. This study is about how BI systems help with planning and decision-making in different areas. By putting together data from 2019–2025, this look offers a view that shows how tech and managing are mixed in BI. So, this article aims to collect current info on how BI helps businesses make better choices and get better results, and to find problems and keys to success when using it in different organizations. This review aims to explain how BI helps businesses plan and assist in guiding future studies and the best ways.

2. METHOD

Our study used a systematic literature review (SLR) approach. We started with a research question based on the population, intervention, comparison, outcome (PICO) model, detailed in Table 1 [15]. This helped us set a clear scope and search parameters to find and check relevant studies about BI as a decision-support tool in Business.

We searched Scopus and Web of Science using keywords related to our research goals [16], [17]. We looked at papers from 2019 to 2025 and initially found 77 documents [18]. After removing duplicates and non-article types, we moved on to the next step.

We filtered the studies, focusing on peer-reviewed scientific articles, which left us with 39 studies [19]. We included papers in English, Spanish, and Portuguese, which narrowed it down to 38 [20]. Then, we checked the remaining papers for relevance, quality, and how well they fit our topic. In the end, we had 24 studies that directly addressed our main focus [21], [22].

Table 2 [23] shows how we chose search terms and keywords based on the PICO model. We used specific inclusion and exclusion rules Table 3 [24] to keep things consistent. We also followed the preferred reporting items for systematic reviews and meta-analyses (PRISMA) protocol to keep track of our search, screening, and selection stages, making the process clear and easy to reproduce. This method gives us a solid base for reviewing how BI helps with Business decision-making. By using structured rules, different databases, and PRISMA reporting, we made sure the selected studies properly answered our research questions [25].

As part of this systematic review, a standardized literature review process was implemented to identify and select the most relevant sources and articles for the study [5], [6]. This process followed the PRISMA methodology, which provides a structured and transparent approach for the inclusion of scientific literature, as illustrated in Figure 1 [7]. After applying the predefined inclusion and exclusion criteria, a total of 24 articles were selected for final analysis, ensuring that the chosen documents were directly aligned with the research objectives [8], [9].

Table 1. Pico elements

PICO	Keywords
Problem	Decision making
Intervention	BI system
Comparison	Manual analysis intelligence system
Results	The efficiency of using the BI system
Context	The planning area of companies

Table 2. Sources and search equations

Source	Search equations
Scopus	("business intelligence system") AND TITLE-ABS-KEY ("decision making") AND TITLE-ABS-KEY ("business") AND NOT TITLE-ABS-KEY ("machine learning") AND NOT TITLE-ABS-KEY ("artificial intelligence") AND NOT TITLE-ABS-KEY (health)) AND PUBYEAR > 2019 AND PUBYEAR < 2025 AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English") OR LIMIT-TO (LANGUAGE, "Spanish") OR LIMIT-TO (LANGUAGE, "Portuguese"))

Table 3. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
CI1: Approaching decision-making studies using the BI system	CE1: Type of publication does NOT correspond to the original article
CI2: Results should include statistical graphs showing improvement in decision-making	CE2: exclusion of documents before 2019 (date corresponding to a previous systematic review)
CI3: Application of the BI system for decision making in the area of business planning	CE3: Publications that are not in Spanish, Portuguese or English will not be considered
CI4: Methodologies applied to companies using BI systems	CE4: Studies that do not develop the main research topic

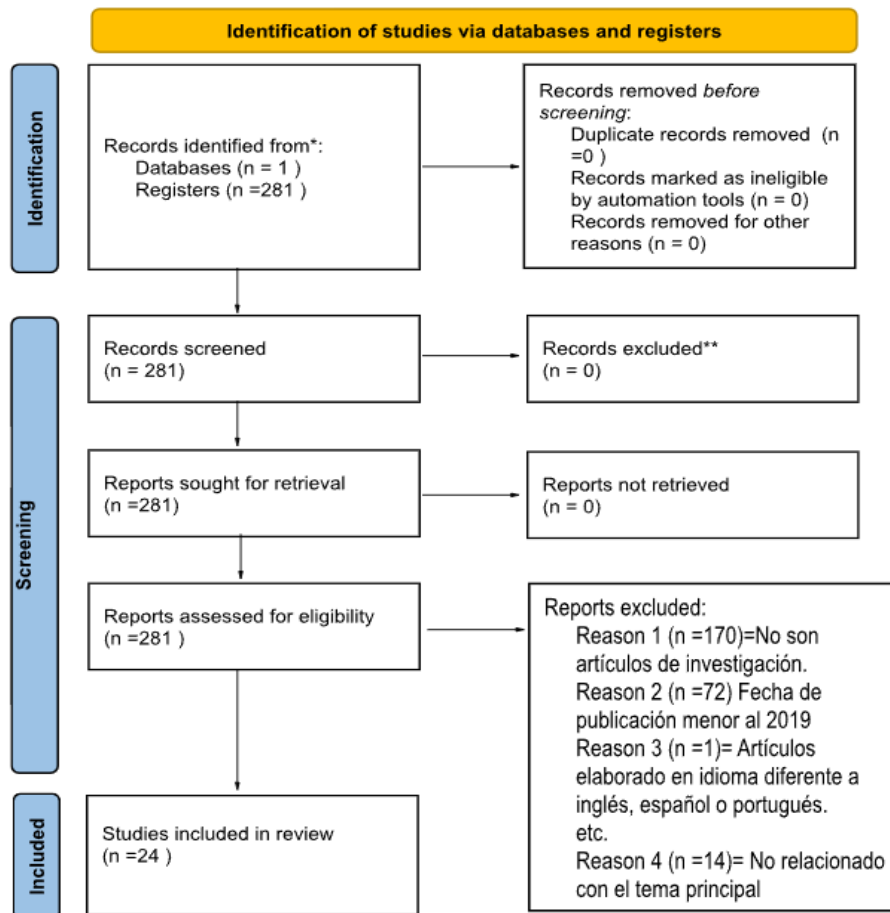


Figure 1. Flowchart of inclusion and exclusion of articles

3. RESULTS AND DISCUSSION

After reviewing 24 articles, we looked at how BI systems help with corporate planning decisions. The research shows that BI systems are key in turning basic data into useful advice for both strategy and operations. Companies that use BI tools see their productivity, efficiency, and profits go up because they can get to and see data better [26]-[28]. When BI systems fit what people need, this really helps centralize data, make decisions faster, and use resources better in all kinds of industries and companies [29]-[32].

Numerous studies report measurable benefits from BI adoption. For instance, some organizations experienced productivity increases of up to 93% and profitability improvements of up to 65% [33], [34]. These results underscore the strategic value of BI systems-not merely as data processing tools, but as critical assets for navigating uncertainty and enhancing long-term business planning [35], [36]. This review answers the research questions using the PICO model. The analysis shows that BI systems do help improve decision-making by turning complex data into useful knowledge. When organizations back BI with things like knowledge management, market awareness, and tech readiness, data use works even better [37]-[39]. The tables and figures below sum up these points, showing how BI helps with better business planning and supports decisions based on data.

3.1. RQ how does the BI system help improve decision-making in the planning area of companies?

To answer this question, it is necessary to understand what decision-making was like in the past and what it is like now, what changes enabled a BI system to positively impact decision-making, and why its use is necessary. Using a BI system allows companies to achieve growth in productivity, profitability, and efficiency, the first two being the most important. Companies that have implemented a BI system have increased their productivity by up to 93% and their profitability by up to 65%, demonstrating that a BI system has a positive impact on the company's decision-making process [40], [41].

In conclusion, this system benefits companies by speeding up and improving the accuracy of decisions, which positively affects corporate planning [42]. Also, integrating these systems improves an organization's ability to track and analyze key performance indicators instantly, which makes resource allocation more efficient. As a result, companies that use BI tools usually have better strategic alignment and perform better overall than those that depend on old-fashioned decision-making methods [43].

3.2. RQ1 what is a BI system?

A BI system is an intelligent data management tool that enables organizations to collect, process, and transform raw data into actionable information. This information becomes a strategic asset, playing a critical role in supporting effective decision-making processes. BI systems are designed to consolidate data from multiple sources and present it in a way that facilitates timely and informed decisions across all levels of the organization.

A standard BI system is composed of five key components:

- Data sources: These include internal and external sources, as well as operational databases, from which raw data is extracted to feed the BI environment [44].
- Extraction, transformation, and loading (ETL): This process involves extracting data from various sources, transforming it into a consistent format, and loading it into a central repository for further analysis [45].
- Data storage: The processed data is stored using technologies such as data warehouses, data marts, and data lakes, providing a structured environment for querying and analysis [46].
- Data aggregation: Data is integrated and organized through multidimensional models, such as online analytical processing (OLAP) cubes, using facts and dimensions to enable complex analytical queries [47].
- Data visualization: In the final stage, data is transformed into meaningful visual outputs such as dashboards, reports, and performance indicators providing decision-makers with clear, real-time insights [48].

Figure 2 shows how BI systems are set up to help with planning, efficiency, and adapting to changes. With this system, businesses can keep tabs on their performance, guess what might be coming, and make informed calls based on data, even when things get difficult. Plus, because everything works smoothly together—from data sources to analysis and presentation—companies can stay flexible and constantly look for ways to improve.

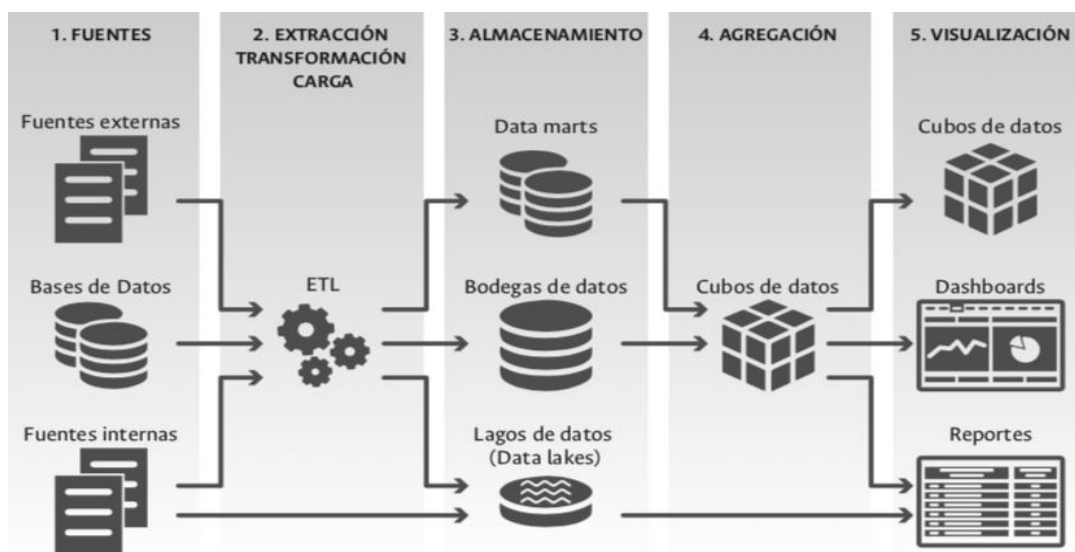


Figure 2. Stages for implementing BI in an organization

3.3. RQ2 what is the importance of BI systems for decision-making?

BI systems are key to better decision-making in organizations. They let you systematically look at data from different parts of the business. Because they fit with data strategy and can turn data into useful insights, they're helpful in many fields, like education and marketing [46]. As a result, BI systems are now basic to how data drives business today, helping with both everyday tasks and long-range planning.

But for BI to work well, it's not just about putting the tech in place. You also need a smart plan and skilled people to handle and understand the data. This means organizations need to keep training their staff and set up good rules to make sure data is used correctly. So, how well BI helps in decision-making depends on having clear rules and a company that's ready to use it.

For instance, one study looked at a college and found that using a BI system helped the school's data strategy and made information flow and data handling better [47]. This shows how BI can make things clearer, help measure how well things are going, and align actions with goals in schools. Because of this, universities that use BI systems can handle resources better, keep an eye on key numbers, and change as education changes.

In marketing, which is important to most businesses, BI systems build live, data-based dashboards for getting and keeping customers. These dashboards help companies get a better handle on the market and make quick, smart choices to be more competitive [48]. Also, being able to see and guess what customers will do lets marketing teams create better campaigns and spend money more wisely. Generally, studies show that using BI tools smartly helps in making decisions based on facts, makes organizations quicker to react, and strengthens how well they manage performance in different areas. When set up right, BI systems help move businesses into the digital age, encouraging flexibility, new ideas, and steady growth in all sorts of industries.

3.4. RQ3 what are the applications of BI in improving manual data analysis for decision-making?

The research shows a move away from old-fashioned manual data analysis to using automated, data-driven tech that makes decisions more accurate and faster. Things like ETL processes, BIS, and interactive data visualization tools help companies automate how they gather and analyze data as shown in Figure 3. This cuts down on mistakes and makes the information better. As you can see in Figure 4, these BI apps make data work easier, improve accuracy, and keep an eye on how well things are going. This helps companies make quick, smart choices when dealing with lots of data.

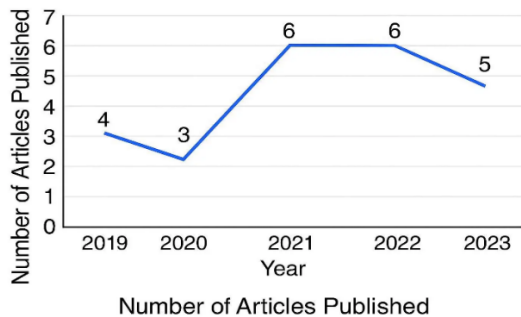


Figure 3. Number of articles published per year



Figure 4. Applications for decision-making analysis

4. CONCLUSION

This research looks at how BI systems help make better decisions for planning in organizations. We checked out articles from 2019 to 2025 in the Scopus database to see how BI is used, what words people use when talking about it, and how it changes things in companies. The studies we looked at said that BI could improve productivity by up to 93%, efficiency by 65%, and sales by 65%. Also, 83% of the studies showed positive changes after adding BI, with moderate confidence. This shows that BI systems help manage data and make smart, fast business choices in different sections like education, marketing, company operations, and buying other companies. But there were not so many studies to look at, and some might have been biased. So, when looking at these results, keep that in mind. Future studies should include more studies from different places and industries. They should also use stories or a mix of ways to learn more about how BI helps with solid business planning and staying ahead of the competition.

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AUTHOR CONTRIBUTIONS STATEMENT

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Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Cesar Patricio-Peralta	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓
Hernan Peña Carnero	✓										✓			
Jesús Zamora Mondragón						✓	✓	✓	✓	✓	✓	✓		
Adan Eugenio Contreras Angeles					✓		✓			✓	✓	✓		✓
Marina Vargas Vega	✓		✓	✓			✓			✓	✓		✓	✓
Walter Patricio Peralta		✓			✓		✓				✓	✓		
Marco Mayor Ravines	✓			✓			✓				✓	✓		
Juan Mayor Gamero		✓			✓		✓				✓	✓		
Cesar Paccha Rufasto					✓		✓				✓	✓		

C : **C**onceptualization

M : **M**ethodology

So : **S**oftware

Va : **V**alidation

Fo : **F**ormal analysis

I : **I**nvestigation

R : **R**esources

D : **D**ata Curation

O : **O**riting - **O**riginal Draft

E : **E**riting - **R**eview & **E**ditng

Vi : **V**isualization

Su : **S**upervision

P : **P**roject administration

Fu : **F**unding acquisition

CONFLICT OF INTEREST STATEMENT

The authors state no conflict of interest.

INFORMED CONSENT

This study did not involve human participants, and informed consent was therefore not required.

ETHICAL APPROVAL

This research did not involve human or animal subjects and did not require ethical approval.

DATA AVAILABILITY

The data supporting the findings of this study were collected through research and are available in the SCOPUS database and from the corresponding author.

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BIOGRAPHIES OF AUTHORS






Cesar Patricio-Peralta    Systems and Computer Engineer, Doctor in Systems Engineering from the Universidad Nacional Federico Villarreal (UNFV), and Master in Systems Engineering with a mention in Information Technologies and Telematics. He has over 13 years of professional experience in the private sector, focusing on systems engineering, Technological Infrastructure, Science, Technology, and Electronic Government. He currently works as a Professor at the Professional School of Systems Engineering and Informatics at the Universidad Continental in Perú. He is also a Professor of Software Engineering at the Universidad Tecnológica del Perú. He can be contacted at email: cesar.patricio@outlook.es.






Hernan Peña Carnero    Systems Engineer, Master's in Systems Engineering, with over 10 years of professional experience in the public and private sectors, including experience in Academic Management. I also have 10 years of experience as a professor and thesis advisor in Systems and Software Engineering at the university level. You can contact me at email: c22434@utp.edu.pe.







Jesús Zamora Mondragon    Systems and Computer Engineer, Doctor in Administration, highly qualified professional in ICT, Management and Administration; accustomed to working as a team with leadership and institutional commitment and faculty advisor at the Universidad César Vallejo. He can be contacted at email: jezm78@gmail.com.







Adan Eugenio Contreras Angeles    A Systems engineer from the Universidad Alas Peruanas, with a Master's degree in Public Management and Government Control from the Universidad Alas Peruanas. Professor at the Peruvian National Police Officers' School from 2016 to the present. Professor at the Universidad Tecnológica del Perú to the present. He can be contacted at email: adan_21_8@hotmail.com.







Marina Vargas Vega     Systems and Computer Engineer, Ph.D. candidate in Systems Engineering, Master's in Systems Engineering with a mention in Information Technology, highly qualified professional in Technological Innovation R&D+i, system development, government management in a Naval Institution; accustomed to working in a team with leadership and institutional commitment, invited postgraduate lecturer at the National University of Federico Villarreal. She can be contacted at email: Marina.esperanza.vargas.vega@gmail.com and dirtel.planesyprocesos@marina.pe.







Walter Patricio Peralta     Master in Psychology, Bachelor in Psychology, and graduate of the Doctorate in Psychology. University Professor with 21 years of experience in universities such as Universidad de San Martín de Porres, Universidad Peruana Los Andes, Universidad Cesar Vallejo, Universidad Nacional Federico Villarreal, Universidad Continental, etc., Gestalt Psychotherapist, Cognitive Behavioral, and International Master in Neurolinguistic Programming by the Neurolinguistic Programming Society of the USA. Diploma in Talent Management and University Teaching. He can be contacted at email: whpatricio@yahoo.com.







Marco Mayor Ravines     Full Professor - School of International Business Administration and Master's Program (UNMSM), Associate Professor (ESAN) RENACYT Researcher. He holds three master's degrees related to business management and development. He is a full-time professor at the Universidad Nacional Mayor de San Marcos, where he teaches undergraduate and graduate courses. He also teaches at the ESAN Graduate School. His work focuses on the digital transformation of organizations, with a special interest in artificial intelligence, e-commerce, and digital strategy, articulating academic knowledge with its practical application in the business environment. He can be contacted at email: mmayorr@unmsm.edu.pe.



Juan Mayor Gamero     Ph.D. in Accounting, with more than 25 years of experience at the Ministry of Economy and Finance as an official of the General Directorate of Public Accounting (1999–2020). He is an appointed professor at the Universidad Nacional Mayor de San Marcos (UNMSM), with over 20 years of academic experience at both the undergraduate and graduate levels. A specialist in government accounting, public management, IPSAS, and IFRS, he has led reforms such as the implementation of the Government Cost System and the updating of the PCGE (General Accounting System) by international standards. He has published books and technical articles in journals such as Caballero Bustamante, Thomson Reuters, and the Official Gazette El Peruano. He can be contacted at email: juan.mayor@unmsm.edu.pe.



Cesar Paccha Rufasto     Professor at the Faculty of Architecture, Urban Planning and Arts of the National University of Engineering (UNI), where he actively contributes to the training of future professionals in areas related to sustainable urban development and environmental design. He holds a Master of Science degree with a specialization in Environmental Management from the same institution, which allows him to integrate technical and strategic approaches in teaching and projects related to environmental management, urban planning, and sustainability. His academic and professional experience focuses on the research and application of interdisciplinary solutions that articulate urban development with the preservation of the natural environment, promoting responsible practices in the fields of architecture and urban planning. He can be contacted at email: cpacchar@gmail.com.