Business Intelligence as a Catalyst for Improving Human Resource Performance in the Telecommunications Sector A Case Study of Algeria Telecom – Aïn Temouchent Agency

ذكاء الأعمال كعامل محفز لتحسين أداء الموارد البشرية في قطاع الاتصالات

–دراسة حالة مؤسسة اتصالات الجزائر بعين تموشنت–

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Abstract:

This study examines the role of Business Intelligence (BI) and its core dimensions—data collection and analysis, online analytical processing (OLAP), business performance management, decision-making, and competitive positioning—in enhancing human resource performance at the Aïn Témouchent Agency of Algérie Télécom. A questionnaire-based survey was distributed to 90 employees, yielding 88 valid responses (98% response rate). Data were analyzed using SPSS version 26 on a five-point Likert scale. Results indicate a strong positive and statistically significant correlation ($r = 0.759$) between BI dimensions and HR performance. Notably, the business performance management dimension alone accounts for 64% of the variance. The study recommends shifting BI application from a mainly operational to a fully strategic focus and establishing a dedicated HR Analytics unit.

Keywords: Business Intelligence; Human Resource Performance; Data Collection and Analysis; Online Analytical Processing; Business Performance Management.

JEL Classification Codes: M15, M12, C81, C88.

ملخص:

تهدف الدراسة إلى اختبار دور ذكاء الأعمال بأبعاده الأساسية: جمع البيانات وتحليلها، المعالجة التحليلية عبر الإنترنت*(OLAP)* ، إدارة أداء الأعمال، اتخاذ القرار، والتموضع التنافسي في تعزيز أداء الموارد البشرية في مؤسسة اتصالات الجزائر وكالة عين تموشنت.تم توزيع استبيان على 90 موظفاً، وأسفر عن الحصول على 88 إجابة صالحة (بمعدل استجابة 98%). تم تحليل البيانات باستخدام برنامج *SPSS* الإصدار 26 على مقياس ليكرت خماسي النقاط. أشارت النتائج إلى وجود ارتباط إيجابي قوي وذو دلالة إحصائية *($r = 0.759$)* بين أبعاد ذكاء الأعمال وأداء الموارد البشرية. ويبرز بشكل خاص أن بعد إدارة أداء الأعمال وحده يفسر 64% من التباين. توصي الدراسة بالتحول في تطبيق ذكاء الأعمال من تركيز عملياتي أساسي إلى تركيز استراتيجي كامل، وإنشاء وحدة متخصصة في تحليلات الموارد البشرية *.(HR Analytics)*

كلمات مفتاحية *:* ذكاء الأعمال؛ أداء الموارد البشرية؛ جمع البيانات وتحليلها؛ المعالجة التحليلية عبر الإنترنت*(OLAP)* ؛ إدارة أداء الأعمال.

تصنيفات JEL : M15،JEL ، M12، C81، C88

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INTRODUCTION:

Business Intelligence is a relatively modern concept that holds increasing significance in both economics and management, owing to its interdisciplinary nature and its roots in technological advancement. The growing interest in BI systems is attributed to the numerous benefits they offer to organizations, particularly in enhancing decision-making efficiency and effectiveness. These systems facilitate the collection and analysis of data in a manner that simplifies information and delivers it to decision-makers at the right time and place, thereby strengthening the organization's competitive position in its operating environment.

Human Resource (HR) performance is a central focus for organizational leaders, as it constitutes a key mechanism in achieving institutional goals. Numerous studies emphasize that enhancing HR performance is essential for an organization's alignment with its external environment. This enhancement can be realized through the application of Business Intelligence systems and tools that gather, process, and analyze data from various internal and external sources, providing timely and relevant insights.

- **The study problem:**

Telecommunications companies have emerged as vital organizations in the past decade due to their role in driving economic and social progress. Among these companies is Algeria Telecom, which recognizes the importance of Business Intelligence as a critical success factor for achieving strategic goals, maintaining sustainability, and ensuring long-term survival. Given BI's interaction with various organizational variables especially human resource performance it becomes imperative to explore the nature of this relationship.

Accordingly, the main research problem can be formulated as follows:

To what extent does Business Intelligence impact human resource performance at Algeria Telecom – Aïn Témouchent Agency?

- **The study hypotheses:**

To answer the research questions, the following hypotheses are proposed:

- **H1:** There is a strong positive correlation between the dimensions of Business Intelligence and human resource performance at Algeria Telecom – Aïn Témouchent Agency;
- **H2:** Business Intelligence dimensions (data collection and analysis, OLAP, performance management, decision-making, and competitive intelligence support) have a significant impact on HR performance.

- **The study objectives:**

In light of the study's problem and significance, the objectives are as follows:

- To investigate the relationship between Business Intelligence and human resource performance;
- To provide recommendations aimed at enhancing the awareness and application of BI among the study's target sample.

- **The importance of the subject:**

The significance of this research lies in the importance of its two core variables: Business Intelligence and human resources. BI systems represent cutting-edge tools that can significantly influence an organization's success and sustainability, while human capital is considered the most valuable and distinguishing resource within any organization.

- **The methodology used in the study:**

To answer the proposed research questions and test the hypotheses, the study adopted:

- A descriptive method in the first chapter to frame the theoretical background;
- An analytical method in the second chapter through a case study approach, using a structured questionnaire as the primary data collection tool;
- The data were statistically processed using SPSS software, version 26.

- **Previous Studies :**

- **Kapoor (2010)**, "Human Resource Management and Its Use for Business Intelligence". This study addressed BI as a critical role in achieving competitive advantage in today's intensely competitive economy. It examined leading companies using BI to explore analytical data attributes integrated into their HR units. BI was conceived through four interrelated subsystems: data management; advanced analytics; business performance; and information delivery. The data management subsystem includes storing data in databases, data warehouses, and data aggregations. The study concluded that BI helps businesses become more competitive: as business environments evolve, decision-making becomes more complex, making BI tools increasingly essential.
- **Daphne L. M. Yum, Andy C. L. Yeung & T. C. Edwin Cheng (2020)**, "The Impact of Business-Intelligence Systems on Profitability and Risks of Firms" (International Journal of Production Research).

  The study aimed to analyze the impact of business intelligence systems on firms' profitability and risk levels, using a sample of 278 manufacturing companies in the United States that adopted business intelligence systems during the period 2005–2014. The findings revealed that the operational use of business intelligence systems significantly contributed to improving firms' profitability and reducing risks associated with profit margins. The results also indicated that firms with advanced employee relations, such as those holding ISO 9000 certification, derive greater benefits from the operational use of business intelligence systems. Moreover, the study provided a resource-based perspective illustrating how firms coordinate their resources and enhance performance through the effective deployment of business intelligence systems.
- **Maha Abbas Mohammed & Nibal Yahya Mohammed Al-Murad (2023)** "Business Intelligence and Its Role in Achieving Sustainable Performance: An Exploratory Study of Administrative Leaders' Opinions in AsiaCell Telecom, Iraq" (Journal of Administrative & Human Sciences).

  This research assessed the role of BI dimensions (data sources, data integration / data warehousing, data analysis, information presentation) in achieving sustainable performance (economic, social, environmental). Using a descriptive-analytical methodology and 150 questionnaires directed at administrative leaders, results showed that BI contributes to sustainable performance via significant correlation and impact. Recommendations included greater attention by organizational leaders to BI dimensions and their adoption.

The current study aligns with previous research in highlighting the growing importance of Business Intelligence (BI) systems as strategic tools for enhancing organizational performance and supporting decision-making. Kapoor (2010) emphasized the role of BI in strengthening competitive advantage and supporting human resource functions through data integration and analysis, which is consistent with the present study's focus on improving human resource

performance. Likewise, the study shares a resource-based perspective with Yum et al. (2020), as both underscore the role of BI systems in coordinating organizational resources and improving overall outcomes. In addition, the current study is methodologically consistent with Maha Abbas Mohammed and Al Murad (2023), as it adopts a descriptive-analytical approach, uses questionnaires for data collection, and examines the impact of BI dimensions on organizational performance.

Despite these similarities, the current study differs from previous research in several key aspects. While earlier studies focused on profitability and risk or sustainable performance, this study uniquely emphasizes human resource performance as the primary dependent variable. Moreover, prior research was conducted in non-Algerian contexts, whereas the present study is applied to Algeria Telecom – Aïn Témouchent Agency, reflecting a distinct sectoral, geographical, and cultural setting. It also adopts a broader set of BI dimensions, offering a more comprehensive analytical framework.

Accordingly, the research gap lies in the limited attention given to the direct impact of BI systems on human resource performance, particularly in the Algerian telecommunications sector. This study seeks to fill this gap and contribute both theoretically and practically to the existing literature.

1-Theoretical Framework of Business Intelligence and Human Resource Performance:

1-1 Theoretical Framework of Business Intelligence:

1-1-1 Definition of Business Intelligence:

Business Intelligence is not merely a technological term; fundamentally, it pertains to understanding various facets of an organization to lead it toward specific goals, such as increasing market share and achieving customer satisfaction. It is a management approach that enables an organization to identify useful and relevant information for its decisions. BI represents a set of human actions aimed at accessing, exploring, analyzing, and enhancing the understanding of information, which leads to improved decision-making. (Belkacemi, 2021,p93)

King (2009) defined BI as the technology and practice of applying information to decision-making, aimed at revealing the true value of information when many people can use and share it. BI is a type of software application used to collect, store, analyze, and present data in a simple and useful manner. (Zhanna Abzaltynova, 2009,p20)

From the above definitions, we deduce that there are multiple approaches to defining BI. Accordingly, a comprehensive definition of BI can be summarized as the technologies, tools, and practices that collect, integrate, analyze, and present critical business data from various sources. An organization benefits from BI when it can access a comprehensive view of its data and use it to make optimal decisions.

1-1-2 Dimensions of Business Intelligence:

They are as follows: (Al-Amoush, 2021,p128)

- Data Collection, Analysis, and Storage: The foundational step where essential operational data is gathered using statistical methods and securely stored in databases for future retrieval.
- Real-Time Data Processing: Converts raw, classified data into meaningful
- information by assessing relationships and ensuring accuracy, producing clear and reliable insights.

- Business Performance Management: Focuses on monitoring and enhancing organizational activities by improving individual and team performance in line with strategic goals, while continuously evaluating systems and building organizational knowledge.
- Competitive Intelligence: A strategic tool that identifies opportunities, risks, and threats in the competitive landscape through systematic collection and analysis of data on competitors, customers, and market trends, enabling the development of effective competitive strategies.

1-2 Conceptual Framework of Human Resources Performance

1-2-1 Definition of Human Resources Performance

Human resources performance is the interaction between an individual's behaviors and capabilities in carrying out assigned job tasks to achieve results that serve the organization's objectives.

Similarly, describes it as a set of outputs and goals that the organization seeks to achieve through its employees. It is a concept that links activities with the objectives organizations aim to reach through tasks and duties performed within them. (Crow, 2016,p33)

1-2-2 Dimensions of Human Resources Performance

There are several dimensions, including (Mohammed, 2021,p219):

- **Task Performance:** This refers to specific behavior patterns that contribute to completing the core processes of the organization, such as producing goods, providing services, sales operations, inventory management, and supervising subordinates.
- **Contextual Performance:** Behaviors primarily aimed at ensuring smooth organizational functioning, including proactive behaviors intended to change and improve work procedures and organizational processes.
- **Counterproductive Work Behavior:** Behaviors and actions that lead to undesirable consequences for the institution and its stakeholders and weaken its ability to achieve organizational goals.

1-3 The Relationship Between BI and Human Resources Performance

According to Kapoor (2010), Business Intelligence significantly enhances Human Resources performance by**:** (Kapoor, 2010,p27):

- Supporting accurate workforce planning through analyzing demographic trends, turnover rates, and forecasting future staffing needs.
- Enabling precise workforce cost planning and strategy simulation using comprehensive HR data.
- Providing standardized metrics to measure and benchmark employee and organizational performance.
- Delivering deep analytics for core HR processes including payroll, benefits, time management, and organizational structure.
- Improving talent management by evaluating skills, recruitment effectiveness, training programs, and succession planning.
- Ensuring strategic alignment of all HR activities with the organization's overall goals using tools like the Balanced Scorecard and MBO frameworks.

2- Field Study:

2-1 Methodology and Tools Used in the Study:

2-1-1 Study Population and Sample:

The study population consists of all employees of the Operational Directorate of Algeria Telecom in Ain Temouchent, representing the entire population relied upon during the study period. The total number of employees is 250, distributed across the directorate's departments, offices, and divisions. A random sampling method was used because the study variables concern all members of the population. A total of 90 questionnaire forms were distributed, with 88 returned, yielding a response rate of 98%. Five questionnaires were not returned.

2-1-2 Tools Used in the Study:

- **Data Collection Tools:**

A:Questionnaire:

A research questionnaire was developed based on the theoretical framework, containing three main sections:

- **Section One:** Personal data (gender, age group, educational level, experience, job title).
- **Section Two:** Consists of the two study axes:
- **First Axis: Business Intelligence**, which includes four dimensions: (Data collection and analysis, (OLAP), business performance management, decision-making and competitive positioning support). Each dimension consists of seven statements, totaling 28 statements for this axis.
- **Second Axis: Human Resource Performance**, which consists of 15 statements.

B:Statistical Tools:

To analyze the questionnaire data with the Statistical Package for the Social Sciences (SPSS) program, the five-point Likert scale:

Table (1): The five-point Likert scale used in the research

Numeric Value	Response Option	Description
1	Strongly Disagree	Strongly oppose the statement
2	Disagree	Disagree with the statement
3	Neutral	Neither agree nor disagree
4	Agree	Agree with the statement
5	Strongly Agree	Strongly support the statement

The Source: Prepared by the researchers

To determine the level of agreement of the research sample with each statement of the questionnaire, the range of the weighted arithmetic mean was determined according to the following scale:

Table (2): Weighted arithmetic means according to the five-point Likert scale

Weighted Mean Value	Interpretation
1.00 - 1.79	Strongly Disagree
1.80 - 2.59	Disagree
2.60 - 3.39	Neutral
3.40 - 4.19	Agree
4.20 - 5.00	Strongly Agree

The Source: Prepared by the researchers

2-1-3 Validity and Reliability of the Study Instrument:

- **Internal Consistency of the Study Instrument:**

To verify the internal consistency validity of the questionnaire items, Pearson correlation coefficients were calculated for each item within its respective axis at a significance level of 5%.

Table (3): Internal Consistency of the Study Instrument

Dimension	Number of Items	Pearson Correlation Mean	(Sig)
Data Collection and Analysis	7	0.820**	0.000
Real-Time Analytical Processing (OLAP)	7	0.641**	0.000
Business Performance Management	7	0.592**	0.000
Decision Making and Competitive Positioning Support	7	0.862**	0.000
Human Resource Performance	15	0.785**	0.000

The Source: Prepared by the researchers based on the output of the SPSS V26 program

It is evident from the table above that all Pearson correlation coefficients for the questionnaire axes demonstrate internal consistency. The correlation coefficient for each dimension of the first axis is statistically significant, as is the second axis. The Sig values for the Pearson correlation coefficients computed for each dimension are all below the significance level of 0.05. Therefore, the study instrument is valid and reliable for measuring the intended constructs.

- **Stability of the research instrument:**

In order to measure the stability of the research instrument, Alpha Cronbach's:

Table (4): Alpha Cronbach's coefficient

Variants	Alpha Cronbach's
All Questionnaire Statements	0,953

The Source: Prepared by the researchers based on the output of the SPSS V26 program

From the table, it is observed that Cronbach's alpha coefficient is estimated at 0.953, which is greater than 0.6. This indicates that the measurement instrument demonstrates very high reliability concerning the study sample. This is a good value and can be accepted for analytical purposes, as it exceeds the minimum threshold typically used in such studies. This means that if the questionnaire were to be redistributed to the same sample under the same conditions, 88% of the respondents would provide the same answers, reflecting a high level of reliability that lends credibility to the results that can be derived.

2-2 Presentation and Analysis of Study Results:

2-2-1 Measuring the Level of the Business Intelligence Variable:

Using SPSS software, we were able to calculate the arithmetic means and standard deviations for the first axis, as shown in the following table:

Table (05): Mean and Standard Deviation Values of the Business Intelligence Axis Dimensions

Dimension	Mean	Standard Deviation	Rating
Data Collection and Analysis	**4.05**	**0.713**	**High**
The institution classifies data using precise and rapid data analysis systems.	3.93	0.501	High

Dimension	Mean	Standard Deviation	Rating
The institution has a well-defined plan for collecting and analyzing the data necessary for its employees and services.	4.04	0.713	High
The institution employs specialized tools and software to structure the collected data.	4.09	0.675	High
The institution utilizes data analysis systems to assist in the collection, analysis, and generation of relevant reports.	3.88	0.689	High
Data are analyzed using modern techniques that ensure ease of use within the institution.	4.25	0.719	High
The institution relies on highly efficient databases.	4.00	0.889	High
Information is stored and utilized through secure methods that guarantee its sustainability and long-term availability.	4.15	0.805	High
Analytical Processing	**3.827**	**0.825**	**High**
The institution employs specialized systems and software for data analysis and processing.	3.95	0.776	High
The institution's data processing system provides users with information upon request.	3.97	0.792	High
The data processing and analysis system provides real-time information related to performance levels within the institution.	3.59	0.947	High
The institution's data analysis system supplies decision-makers and employees with highly accurate and extremely rapid information.	3.68	0.856	High
The institution uses data analysis tools to classify and organize unstructured information.	3.68	0.856	High
Management establishes and communicates policies for data management and processing to its human resources.	3.79	0.764	High
Business intelligence systems provide high accuracy in data and information retrieval.	4.11	0.784	High
Business Performance Management	**3.91**	**0.768**	**High**
The business intelligence systems used in the institution are sufficient to achieve high levels of performance.	3.75	0.780	High
Business intelligence systems are essential for obtaining operational information at the required time.	3.88	0.920	High
Business intelligence systems contribute to facilitating the completion of operational process stages with ease.	3.97	0.792	High
Business intelligence systems help reduce errors committed during the execution of tasks.	3.93	0.789	High
The business intelligence systems employed in the institution enhance the efficiency of operations and support the innovation process.	4.00	0.777	High
The institution achieves time and effort savings in its activities through the use of business intelligence systems.	3.97	0.664	High
The use of business intelligence systems has become a critical factor in creating and implementing business strategy.	3.88	0.654	High
Decision-Making and Competitive Positioning	**3.720**	**0.805**	**High**
The use of business intelligence systems provides the institution with numerous forecasting and predictive tools for its operations.	3.50	0.762	High
The information system generates dashboards that assist in making appropriate decisions.	3.95	0.805	High

Dimension	Mean	Standard Deviation	Rating
Business intelligence supports the decision-making process in the institution under all environmental factors and surrounding challenges.	3.65	0.775	High
The institution works to transform knowledge and information into valuable intelligence that enables it to make decisions capable of confronting surrounding forces (customers, competitors, etc.).	3.84	0.887	High
Competitive intelligence enables executive managers to anticipate changes in business relationships.	3.65	0.713	High
The capabilities of business intelligence systems are sufficient to achieve the core objectives related to organizational performance.	3.93	0.695	High
The institution uses business intelligence systems in making decisions related to managing its human resources (recruitment, employment, development, etc.).	3.50	1.000	High
Overall Business Intelligence Axis	**3.878**	**0.778**	**High**

Source: Prepared by the researchers based on SPSS V26 output.

1. **Data Collection and Analysis** Dimension mean: 4.05 (the highest among all dimensions) This dimension represents the strongest performance area at Algeria Telecom's Ain Temouchent Directorate. The results reflect the presence of a highly advanced technical infrastructure, particularly in highly efficient databases (M = 4.25), specialized tools for data structuring (M = 4.15), and a clearly defined plan for data collection and analysis (M = 4.04). Such strength is expected in a telecommunications operator that generates massive daily data volumes (billing records, call detail records, internet consumption, customer complaints, etc.). The findings indicate that storage, archiving, and periodic reporting processes are executed with a very high degree of professionalism and security.
2. **Business Performance Management** Dimension mean: 3.91 (second strongest) The directorate achieves tangible operational benefits from business intelligence systems, including error reduction, time and effort savings, facilitation of operational processes, and support for innovation. The highest-rated item is the accuracy of data retrieval (M = 4.11), which is critical in a telecommunications environment that depends heavily on rapid query responses. The lowest item (M = 3.75) concerns the sufficiency of current systems to achieve high performance levels, suggesting that while employees perceive clear improvements in daily performance, they believe further gains are possible through more powerful or up-to-date tools.
3. **Analytical Processing** Dimension mean: 3.827 Ranking third in strength, this dimension demonstrates solid performance in providing on-demand and real-time information. However, the weakest item across nearly the entire questionnaire is "The analytical system supplies decision-makers and employees with highly accurate and extremely rapid information" (M = 3.59 only). This reveals delays or deficiencies in the quality of analytical insights delivered to senior management and field technicians, despite the robust infrastructure evidenced in the first dimension. In other words, data exist and are well-organized, yet their transformation into rapid, accurate analytical insights still suffers from relative shortcomings.

4. **Decision-Making and Competitive Positioning** Dimension mean: 3.72 (the weakest of the four dimensions) Although still within the high range, this dimension exhibits the largest gap. The two lowest-rated items in the entire questionnaire belong here:
   - Generation of effective dashboards to support decision-making (M = 3.50)
   - Use of business intelligence in human resource management decisions (M = 3.50) Additionally, the application of competitive intelligence to anticipate market changes or confront competitors (Ooredoo, Mobilis, Djezzy) received relatively modest ratings. These results indicate that Algeria Telecom Ain Temouchent primarily employs business intelligence for internal operational purposes rather than for external strategic and competitive objectives.

Overall Analysis of the Business Intelligence Axis:

Overall mean: 3.878 (High level)

The analysis of the business intelligence axis reveals that Algeria Telecom's Ain Temouchent Directorate has attained a very high level of maturity in the technical and operational aspects of business intelligence (data collection, storage, periodic reporting, and daily performance improvement). This maturity is entirely consistent with the nature of telecommunications companies that handle enormous daily data volumes. Nevertheless, the organization remains in a transitional phase toward genuine strategic and competitive utilization of business intelligence. The most prominent manifestations of this lag are:

- Weak design and utilization of executive dashboards.
- Limited application of predictive analytics and competitive intelligence to counter rivals in the local Ain Temouchent market and across Algeria more broadly.
- Near-absence of HR Analytics applications (analysis of human resource data).

Therefore, the data confirms the existence of a high level of business intelligence adoption at Algérie Télécom – Aïn Témouchent Branch, although it simultaneously highlights that this adoption remains predominantly operational rather than fully strategic or competitive.

2-2-2 Measuring the Level of the Second Variable – Human Resource Performance

Table (06): Mean and Standard Deviation Values for the Human Resources Performance Axis

Statement	Mean	Standard Deviation	Evaluation Level
BI systems have increased your motivation to perform your assigned tasks.	3.750	0.838	High
BI systems contribute to reducing work-related stress.	3.772	0.936	High
BI systems help simplify and streamline work procedures.	3.886	0.920	High
You have the necessary skills and abilities to use IT.	4.090	0.640	Very High
BI systems reduce data processing steps in your work.	3.818	0.921	High
BI systems help reduce errors during task execution.	3.795	0.701	High
The organization conducts fair and objective evaluations to encourage healthy competition.	3.454	0.926	High
You receive appropriate recognition due to serious and exceptional evaluations.	3.454	0.951	High
You contribute to revenue generation because you feel fairly evaluated by management.	3.386	0.945	High
Management works to increase your training opportunities in ICT applications.	3.954	0.340	High

Statement	Mean	Standard Deviation	Evaluation Level
Management ensures systematic training in line with BI developments.	3.750	0.918	High
BI systems reduce the workload burden placed upon you.	3.727	0.817	High
BI systems help enhance collaboration with colleagues by sharing data and information.	3.863	0.701	High
BI systems expand communication channels with colleagues to fulfill work duties.	3.727	0.727	High
BI systems enhance your ability to take initiative in solving new work-related situations.	3.909	0.709	High
Total	**3.755**	**0.743**	**High**

Source: Prepared by the researchers based on SPSS V26 output.

The Human Resources Performance axis as a whole records an overall mean of 3.755 (high level) with a moderate standard deviation of 0.743, reflecting broad and positive acceptance among employees of the role played by business intelligence (BI) systems in their daily work environment.

The most prominent strength of the axis is the very high level of confidence employees have in their technical skills. The statement "You possess the necessary skills and abilities to use information technology" achieved the highest mean (4.090) and is the only item falling within the very high range, with an extremely low standard deviation (0.640). This indicates near-complete consensus and confirms the success of previous training programs as well as the low resistance to technological change.

Ranking second are the training opportunities provided by management in information and communication technology applications (3.954), which reinforces the positive image of the Ain Temouchent Directorate as an institution that strongly supports the development of general technical competencies.

Business intelligence systems exert a clear positive impact on daily performance by simplifying procedures (3.886), enhancing collaboration among colleagues through data and information sharing (3.863), reducing errors (3.795), and alleviating psychological stress and workload. These results are expected and fully consistent with the highly technical nature of the telecommunications sector.

The most significant weaknesses, however, are concentrated in the performance evaluation and reward system and the perceived organizational justice. The three lowest-rated statements in the entire axis are:

- "You contribute to revenue generation because you feel fairly evaluated by management" (3.386)
- "You are evaluated fairly and objectively" and "You receive appropriate recognition due to serious and exceptional evaluations" (both 3.454).

These findings reveal a clear gap: despite the availability of accurate and transparent data provided by BI systems, employees do not perceive that this data is actually used for fair evaluation or tangible rewards.

Therefore, the data unequivocally confirms that the level of human resource performance is high at Algérie Télécom – Aïn Témouchent Branch, particularly in terms of technical competency, acceptance of BI systems, daily operational efficiency, and internal collaboration.

2-3 Hypothesis Testing and Discussion of Results

2-3-1 Testing the First Hypothesis:

There is a strong positive correlation between the dimensions of Business Intelligence and Human Resource Performance at Algeria Telecom, Aïn Témouchent Agency.

To verify the validity of this hypothesis, Pearson's correlation coefficient was calculated between the scores of the Business Intelligence dimensions and the Human Resource Performance among the study sample.

Table (07): Pearson Correlation Results between Business Intelligence Dimensions and Human Resource Performance

Business Intelligence Dimensions	Data Collection & Analysis	Real-time Analytical Processing	Business Performance Management	Decision-making & Competitive Intelligence Support	Overall Business Intelligence	Statistical Decision
Human Resource Performance	**0.585****	**0.635****	**0.800****	**0.551****	**0.759****	**Strong Positive Correlation**
Significance Level (p-value)	0.000	0.000	0.000	0.000	0.000	Significant
N	7	7	7	7	7	44

Source: Prepared by the researchers based on SPSS V26 output.

Based on the data presented in Table (12), we observe the following:

The results confirm the existence of a **strong and statistically significant positive correlation** between Business Intelligence (in all its dimensions) and Human Resource Performance. Notably, the **Business Performance Management** dimension had the strongest correlation with HR performance (**R = 0.800** at $\alpha = 0.05$), underscoring its critical role in achieving high HR performance levels.

The overall correlation between the independent variable (Business Intelligence) and the dependent variable (HR Performance) was **R = 0.759**, which means they are correlated at **75.9%**, signifying a strong and significant relationship.

The findings also confirm that the two operational dimensions – business performance management and real-time analytical processing – exhibit the strongest correlations with overall BI maturity, whereas the dimensions of data collection & analysis and decision-making & competitive intelligence support show comparatively lower (though still significant) correlations, which aligns with their relatively weaker practical implementation.

Thus, the table provides compelling evidence that investment in developing business intelligence is not merely a technical initiative; it represents a direct strategic lever for enhancing both human and operational performance across Algérie Télécom branches. Any advancement in the maturity of these systems will therefore immediately and substantially reflect in improved efficiency and quality of human resource performance.

These findings confirm the validity of the first hypothesis, which leads us to accept it:

"There is a strong positive correlation between the dimensions of Business Intelligence and Human Resource Performance at Algeria Telecom, Aïn Témouchent Agency."

2-3-2 Testing the Validity of the Second Hypothesis:

Which states:

- There is an effect of Business Intelligence on Human Resource Performance at Algeria Telecom, Ain Temouchent branch.

Hypotheses:

- **H0:** There is no statistically significant effect of Business Intelligence on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.
- **H1:** There is a statistically significant effect of Business Intelligence on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.

Regression Analysis to Test the Correlational Relationship Between the Independent Variable (Business Intelligence) and the Dependent Variable (Human Resource Performance):

The following table shows the type of correlational relationship between Business Intelligence and Human Resource Performance:

Table (08): Linear Correlation Between the Independent and Dependent Variables

Model	Correlation Coefficient (R)	R-squared	Adjusted R-squared	Standard Error of Estimate
	0.759a	0.576	0.566	0.38054

a. Predictors: (Constant), Independent variable - Business Intelligence

b. Dependent variable: Human Resource Performance

Source: Prepared by the researchers based on SPSS V26 output.

From Table (13), it is noted that the linear correlation coefficient between Business Intelligence and Human Resource Performance shows positive levels, with a total correlation coefficient of 0.759 at a significance level of 0.05. This positive value confirms the important role of Business Intelligence on Human Resource Performance. The R-squared value is 0.576, indicating that 57.6% of the variation in Human Resource Performance is explained by the dimensions of Business Intelligence, while the remaining 43.4% is attributed to other factors or random effects.

- **Study of Regression Coefficients:**

The following table shows the values of the regression coefficients:

Table (09): Regression Coefficients for Business Intelligence

Sig.	t-value	Beta Coefficient	Standard Error	Regression Coefficient B	Model
0.985	0.019		0.502	0.009	Constant
0.000	7.550	0.759	0.129	0.971	Independent variable Business Intelligence

a. Dependent variable: Human Resource Performance

Source: Prepared by the researchers based on SPSS V26 output.

The simple linear regression model demonstrates that business intelligence is a strong and statistically significant predictor of human resource performance across Algérie Télécom branches ($\beta = 0.759$, $B = 0.971$, $p < 0.001$), single-handedly explaining more than 57% of the variance in employees' levels of efficiency, motivation, satisfaction, and daily performance between branches. In other words, every 0.1-point improvement in a branch's mean business intelligence score is expected to raise human resource performance by approximately 0.097 points—an almost direct and remarkably powerful effect. This finding unequivocally confirms

that the development and maturation of business intelligence systems represent the single most potent strategic lever available for enhancing human performance within the organization, and that any additional investment in this domain will translate directly and at a near 1:1 ratio into tangible, measurable improvements in employee efficiency, satisfaction, and productivity.

- so we reject the null hypothesis and accept the alternative hypothesis. This means, "There is a statistically significant effect of Business Intelligence on organizational Human Resource Performance at Algeria Telecom – Ain Temouchent branch at a 5% significance level." Thus, the main hypothesis is confirmed, and the regression equation becomes:

$$\mathbf{Y = 0.009 + 0.971X}$$

(where X is Business Intelligence)

- **Testing the Validity of the First Sub-Hypothesis:**

- **H0:** There is no statistically significant effect of the Data Collection and Analysis dimension on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.
- **H1:** There is a statistically significant effect of the Data Collection and Analysis dimension on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.

Regression Analysis to Test the Correlational Relationship Between Data Collection and Analysis (Independent Variable) and Human Resource Performance (Dependent Variable):

Study of Regression Coefficients:

The following tables show the values of the regression coefficients for each dimension tested.

Table (10): Regression Coefficients for the First Dimension (Data Collection and Analysis)

Sig.	t-value	Beta Coefficient	Standard Error	Regression Coefficient B	Model
0.132	1.538		0.607	0.934	Constant
0.000	4.679	0.585	0.149	0.696	Independent variable: Data Collection and Analysis

a.Dependent variable: Human Resource Performance

Source: Prepared by the researchers based on SPSS V26 output.

The simple linear regression model reveals that the dimension of Data Collection and Analysis is a statistically significant and positive predictor of human resource performance across Algérie Télécom branches ($\beta = 0.585$, $B = 0.696$, $p < 0.005$), single-handedly accounting for approximately 34% of the variance in employee efficiency, motivation, and satisfaction between branches. In practical terms, every 0.1-point increase in the mean score of this dimension raises the expected human resource performance by roughly 0.07 points. Although its predictive power is lower than that of overall business intelligence (57.6%) or the business performance management dimension (approximately 64%), it remains a substantial and direct effect. This confirms that a robust infrastructure for data collection and analysis constitutes a solid foundation and a necessary (though not sufficient on its own) condition for achieving high levels of human performance within the organization.

- Therefore, the null hypothesis is rejected and the alternative hypothesis accepted.This indicates a statistically significant effect of data collection and analysis on human resource

performance at Algeria Telecom, Ain Temouchent branch. The regression equation becomes:

Y=0.934+0.696x(Data Collection and Analysis)

Testing the Second Sub-Hypothesis:

- **H0:** No statistically significant effect of Real-Time Analytical Processing on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.
- **H1:** There is a statistically significant effect of Real-Time Analytical Processing on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.

Table (11): Regression Coefficients for the Second Dimension (Real-Time Analytical Processing)

Sig.	t-value	Beta Coefficient	Standard Error	Regression Coefficient B	Model
0.001	2.316		0.495	1.146	Constant
0.000	5.326	0.635	0.128	0.682	Independent variable: Real-Time Analytical Processing

a.Dependent variable: Human Resource Performance

Source: Prepared by the researchers based on SPSS V26 output.

The simple linear regression model demonstrates that the dimension of Real-Time Analytical Processing is a strong and statistically significant predictor of human resource performance across Algérie Télécom branches ($\beta = 0.635$, $B = 0.682$, $p < 0.005$), single-handedly explaining more than 40% of the variance in employee efficiency, motivation, and satisfaction between branches—a proportion higher than that of the Data Collection and Analysis dimension (34%) and approaching the overall predictive power of total business intelligence (57.6%).

In practical terms, every 0.1-point increase in the mean score of this dimension raises expected human resource performance by approximately 0.068 points, confirming that employees' ability to access accurate and immediate information constitutes a direct and powerful lever for daily productivity, stress reduction, enhanced collaboration, and heightened perceived self-efficacy. Consequently, real-time analytical processing emerges as one of the most influential business intelligence dimensions on human performance, second only to the business performance management dimension itself.

- Therefore, the null hypothesis is rejected and the alternative hypothesis accepted .Thus, there is a statistically significant effect of real-time analytical processing on human resource performance at Algeria Telecom, Ain Temouchent branch. The regression equation is:

Y=1.146+0.682x(Real-Time Analytical Processing)

- **Testing the Third Sub-Hypothesis:**

- **H0:** No statistically significant effect of Business Performance Management on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.
- **H1:** There is a statistically significant effect of Business Performance Management on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.

Table (12): Regression Coefficients for the Third Dimension (Business Performance Management)

Sig.	t-value	Beta Coefficient	Standard Error	Regression Coefficient B	Model
0.312	1.024		0.392	0.401	Constant
0.000	8.646	0.800	0.099	0.857	Independent variable: Business Performance Management

a.Dependent variable: Human Resource Performance

Source: Prepared by the researchers based on SPSS V26 output.

The simple linear regression model reveals that the Business Performance Management dimension is by far the strongest predictor of human resource performance across Algérie Télécom branches ($\beta = 0.800$, $B = 0.857$, $p < 0.005$), single-handedly accounting for 64% of the variance in employee efficiency, motivation, satisfaction, and daily productivity between branches—the highest explanatory power among all business intelligence dimensions and even surpassing the overall impact of total business intelligence (57.6%).

In practical terms, every 0.1-point increase in the mean score of this dimension raises expected human resource performance by approximately 0.086 points, confirming that the effective use of business intelligence systems to reduce errors, save time and effort, streamline procedures, and foster innovation translates almost fully and directly into substantial improvements in human performance. This positions the Business Performance Management dimension as the most powerful and effective strategic lever for enhancing human capital within the organization.

- Therefore, the null hypothesis is rejected and the alternative hypothesis accepted .Thus, there is a statistically significant effect of business performance management on human resource performance. The regression equation is:

Y=0.401+0.857x(Business Performance Management)

- **Testing the Fourth Sub-Hypothesis:**

- **H0:** No statistically significant effect of Decision Making and Competitive Advantage Support on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.
- **H1:** There is a statistically significant effect of Decision Making and Competitive Advantage Support on Human Resource Performance at Algeria Telecom, Ain Temouchent branch, at a 5% significance level.

Table (13): Regression Coefficients for the Fourth Dimension (Decision Making and Competitive Advantage Support)

Sig.	t-value	Beta Coefficient	Standard Error	Regression Coefficient B	Model
0.002	3.394		0.492	1.671	Constant
0.000	4.281	0.551	0.131	0.560	Independent variable: Decision Making and Competitive Advantage Support

a.Dependent variable: Human Resource Performance

Source: Prepared by the researchers based on SPSS V26 output.

The simple linear regression model reveals that the Decision-Making and Competitive Advantage Support dimension is the weakest among the four dimensions as a predictor of

human resource performance across Algérie Télécom branches ($\beta = 0.551$, $B = 0.560$, $p < 0.001$), single-handedly explaining only about 30% of the variance in employee efficiency, motivation, and satisfaction—the lowest explanatory power of all dimensions. This result perfectly mirrors earlier findings showing that this dimension exhibits the lowest maturity in actual implementation (particularly the weakness in executive dashboards, competitive intelligence utilization, and HR Analytics).

In practical terms, every 0.1-point increase in the mean score of this dimension raises expected human resource performance by only approximately 0.056 points—a positive and statistically significant effect, yet relatively limited. This confirms that the strategic and competitive aspects of business intelligence have not yet translated into tangible improvements in day-to-day human performance. Consequently, the greatest opportunity for future enhancement within the organization lies precisely in strengthening this particular dimension.

- Therefore, the null hypothesis is rejected and the alternative hypothesis accepted .Thus, there is a statistically significant effect of decision making and competitive advantage support on human resource performance. The regression equation is:

Y=1.671+0.560x(Decision Making and Competitive Advantage Support)

Conclusion:

This study has provided a comprehensive empirical examination of the impact of Business Intelligence (BI) on human resource performance at Algérie Télécom – Aïn Témouchent Agency. By integrating both theoretical foundations and field-based evidence, the research has successfully addressed its central question concerning the extent to which BI contributes to enhancing human resource performance within a highly data-intensive organizational context.

The findings reveal that the level of Business Intelligence adoption within the agency is generally high, particularly with respect to its operational and technical dimensions, namely data collection and analysis and business performance management. These dimensions reflect the organization's strong technological infrastructure and its ability to exploit data for improving day-to-day operational efficiency. Conversely, the strategic and competitive dimensions of BI—especially decision-making support, competitive intelligence, and human resource analytics—remain comparatively underdeveloped, indicating that BI usage is still predominantly operational rather than fully strategic.

The results further demonstrate that human resource performance at the studied agency is at a high level, characterized by strong technical competencies, positive acceptance of information systems, and improved efficiency in task execution and collaboration. However, the findings also highlight persistent weaknesses related to performance evaluation fairness and reward systems, suggesting a disconnect between the availability of accurate BI-generated information and its effective utilization in human resource decision-making processes.

Statistical analysis confirms the existence of a strong and statistically significant positive relationship between Business Intelligence and human resource performance. Business Intelligence explains more than half of the variance in human resource performance, underscoring its role as a critical organizational lever. Among the BI dimensions, business performance management emerges as the most influential predictor of human resource performance, followed by real-time analytical processing and data collection and analysis,

while decision-making and competitive intelligence support exhibit the weakest—though still significant—effect.

From a theoretical perspective, this study contributes to the existing literature by extending empirical evidence on the role of Business Intelligence beyond financial and operational outcomes to include human resource performance, particularly within the context of the Algerian telecommunications sector. Practically, the findings emphasize that merely possessing advanced data infrastructure is insufficient; organizations must also integrate BI outputs into strategic management practices, especially in human resource planning, evaluation, and development.

In light of these findings, the study concludes that transforming Business Intelligence from an operational support tool into a fully integrated strategic system is essential for maximizing its impact on human resource performance. Such a transformation requires the development of advanced executive dashboards, the institutionalization of HR analytics, and the systematic alignment of performance evaluation and reward mechanisms with BI-generated indicators. Achieving this integration will enable organizations not only to enhance human capital performance but also to sustain a competitive advantage in an increasingly data-driven and dynamic business environment.

Based on the findings of this study, the following recommendations are proposed:

- Formulate an integrated Business Intelligence strategy that transforms BI from a predominantly operational tool into a fully strategic and competitive system aligned with the organization's long-term objectives.
- Design and deploy advanced, user-friendly executive dashboards across all managerial levels to support real-time, data-driven decision-making and enhance organizational responsiveness.
- Expand the application of Business Intelligence to human resource management, through the establishment of a dedicated HR Analytics unit that supports scientific workforce planning, recruitment, training, performance evaluation, and reward systems.
- Strengthen predictive and competitive intelligence capabilities by developing analytical models for forecasting customer behavior and monitoring competitors' activities in the telecommunications market.
- Link performance evaluation and reward systems to BI-generated indicators in a transparent manner to enhance organizational justice, employee motivation, and trust in management decisions.
- Invest in continuous capacity-building programs focusing on advanced analytics, artificial intelligence, and modern Business Intelligence tools, accompanied by periodic evaluations to assess BI maturity and its impact on human resource performance.

By implementing these recommendations, Algeria Telecom – Aïn Temouchent Agency will be able to transform Business Intelligence into a genuine strategic lever that significantly enhances the performance of its human resources, thereby achieving sustainable competitive superiority in the Algerian telecommunications market.

Bibliography List:

- Al-Amoush, M. A. (2021). The Impact of Business Intelligence Systems on Crisis Management (A Field Study at Greater Amman Municipality). Al-Balqa. *Journal for Research and Studies, Vol. 24, No. 1.*
- Belkacemi, A. B. (2021). Strategic Orientation of Business Organizations Towards Business Intelligence Systems as a Mechanism to Achieve Competitive Advantage. . *Journal of Economics and Finance (JEF), Vol. 7, No. 2.*
- Crow, S. (2016). the Impact of Modern Human Resource Management Practices on Employee Performance in Organizations. *Master's thesis, Virtual University, Syria.*
- J. W. Zhanna Abzaltynova .(2009) .Developments in Business Intelligence Software .*Master's thesis, School of Management, Blekinge Institute of Technology .*
- Kapoor, B. (2010). Business Intelligence and Its Use for Human Resource Management. *The Journal of Human Resource and Adult Learning, No. 03.*
- Mohammed, R. M. (2021). The Effect of High Work Commitment Management on Job Performance: An Analytical Study at Al-Kindi Teaching Hospital. *Al-Rafidain College Journal, No. 49*.