

Measuring the Contribution of Digital Transformation (Through the Application of Digital Management, Digital Strategy and Digital Culture) to Enhancing Performance of Algerian Economic Enterprises

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Abstract: Purpose: The background of the research paper was to address Digital Transformation topic, and to know the extent of its possible contribution to enhancing the performance of economic enterprises in Algeria, the study aims to clarify the application of the main dimensions of digital transformation, which are Digital Management, Digital Strategy, and Digital culture, which would work to enhance the quality of work. **Methodology:** we relied on the descriptive approach to accurately describe the studied phenomenon, the case study approach and the statistical method: The sample included 03 economic enterprises located in the city of Annaba, -Algeria, 100 questionnaires were collected that can be measured statistically, all of the individuals interviewed were mostly specialists and experienced professionals and cadres. **Findings:** The study reached a variety of results, the most important of which are: Digital transformation works to increase the degree of creativity and innovation within the organization, Digital management contributes to reducing costs and improving Quality of organizations' performance, In addition, following a digital strategy will allow the preparation of ideal development plans, and making the best strategic decisions, employees within enterprises enjoyment of a digital culture creates ideal work behaviour, and facilitates dealing with digital technologies and solutions, which reflects positively on strengthening functional ties. **Conclusions:** for Algeria, although the economic enterprises under study, and through the answers of the sample members and the results obtained, it was proven that these organisations depend in their activities on the elements of digital transformation, and that it actually contributes to enhancing their performance, But it cannot be said with certainty that Algerian enterprises suffer from weakness of the digital infrastructure, and the fragility of the legal and regulatory frameworks. **Recommendations:** The study concludes by presenting suggestions, the most prominent of which are the necessity of allocating training and coaching courses to hone human resources skills in the field of digitization, adapting the legal and regulatory aspects in Algeria, and increasing awareness of the importance of the opportunities achieved by digital transformation in the world of finance and business.

Keywords: Digital transformation; Enhancing Performance; Economic Enterprises; Algeria.

قياس مساهمة التحول الرقمي (من خلال تطبيق الإدارة الرقمية، الإستراتيجية الرقمية، والثقافة الرقمية) في تعزيز أداء المؤسسات الاقتصادية الجزائرية

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الملخص: الهدف: تمثلت خلفية الورقة البحثية في التطرق لموضوع التحول الرقمي ومعرفة مدى إمكانية مساهمته في تعزيز أداء المؤسسات الاقتصادية في الجزائر، والهدف من الدراسة هو توضيح تطبيق الأبعاد الرئيسية للتحول الرقمي وهي الإدارة الرقمية، الإستراتيجية الرقمية، والثقافة الرقمية، التي من شأنها العمل على تعزيز جودة العمل. **المنهجية:** تم الاعتماد على المنهج الوصفي لوصف الظاهرة المدروسة وصفا دقيقا، ومنهج دراسة حالة والأسلوب الإحصائي، حيث ضمت العينة 03 مؤسسات اقتصادية متواجدة بمدينة عنابة بالجزائر، تم جمع 100 استمارة قابلة للقياس الإحصائي، جميع الأفراد المستجوبين أغلبهم من ذوي الاختصاص والخبرة، إطارات وكوادر. **النتائج:** توصلت الدراسة لمجموعة متنوعة من النتائج من أهمها: يعمل التحول الرقمي على الرفع من درجة الإبداع والابتكار داخل المؤسسة، تسهم الإدارة الرقمية في التقليل من التكاليف وتحسين جودة أداء المنظمات، إضافة أن اتباع إستراتيجية رقمية سيسمح بإعداد الخطط التنموية المثالية واتخاذ أفضل القرارات الإستراتيجية، كما أن تمتع الموظفين داخل المؤسسات بثقافة رقمية يخلق سلوك عمل مثالي، ويسهل من التعامل مع التقنيات والحلول الرقمية، مما ينعكس إيجابا على تقوية الروابط الوظيفية. **الاستنتاجات:** بالنسبة للجزائر رغم أن المؤسسات الاقتصادية محل الدراسة، ومن خلال إجابات أفراد العينة والنتائج المتحصل عليها، التي أثبتت أن هذه المؤسسات تعتمد في أنشطتها على مقومات التحول الرقمي، وأنه بالفعل يسهم في تعزيز أدائها، لكن لا يمكن الجزم أن المؤسسات الجزائرية تعاني من ضعف البنية التحتية الرقمية، وهشاشة الأطر القانونية والتنظيمية. **التوصيات:** تختتم الدراسة بتقديم مقترحات من أبرزها ضرورة تخصيص دورات تدريبية وتكوينية لصفقات الموارد البشرية في مجال الرقمنة، تكييف الجانب القانوني والتنظيمي في الجزائر، وزيادة الوعي بأهمية الفرص التي يحققها التحول الرقمي في دنيا المال والأعمال. **الكلمات المفتاحية:** تحول رقمي، تعزيز أداء، مؤسسات اقتصادية، جزائر.

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Introduction

After the Fourth Industrial Revolution, and its most important outcomes of Financial Technology, modern technological techniques and Artificial Intelligence innovations, as well as the Covid-19 virus that stimulated E-commerce and Digital Marketing, the need to adopt Digital Transformation has become more necessary than ever before (Rodríguez et al., 2023), especially since digital technology has caused a new wave of industrial and economic turmoil (Ruiz et al., 2024). In the same context, countries with a global orientation are investing significant financial resources in digital transformation. According to estimates, major budgets are allocated to keep pace with digital transformation developments around the world (Malewska et al., 2024). Many enterprises and organizations seek to benefit from technological innovation services, in order to improve their services and their relationship with customers and stakeholders (Wang, Mansor, & Leong, 2024). Digital transformation is a complete comprehensive program that affects the enterprise, and affects the way and method of its work internally, and does not only mean applying technology within it. With this, there will be a huge amount of data and information, which will help decision-makers in these enterprises monitor performance, in addition to the analysis process that will facilitate decision-making and setting goals and strategies (Alkhaldi, 2024).

In fact, the economic superiority of business enterprises comes only through innovation and creativity, through their financial, human and technological resources; this would achieve a competitive advantage for them through good and distinguished performance, thus preserving their survival and continuity in the global market (Kwabla Pomegbe et al., 2020) (Alnasr, Kharoub, & Yahya, 2025). Economic enterprises have become Digital Management methods, mainly represented by the Internet,

advanced and renewable means and technologies, in order to conduct their tasks and activities (Fischer-Preßler, Bonaretti, & Bunker, 2024). Also, enterprises must follow Digital Strategy, their approach when using digital technologies such as computers, mobile devices and Internet services, in order to increase the efficiency of operations and develop their business (Niankara, 2024). On the other hand, another stream of studies and research focused on building a digital culture has emerged as a pillar towards organizational change within enterprises (Deep, 2023).

Our contribution to this research paper will be through exposure to the reality of digital transformation in Algeria, by *measuring the tendencies of the enterprises under study, to rely on it to improve their performance*. From another angle, *do these enterprises have the necessary capabilities and means to implement Digital Management, and program Digital plans and Strategies?* and *If its employees have a Digital Culture and awareness of the importance of technological innovation?*

The study lies in exposing the issue of digital transformation in Algerian economic enterprises, and attempting to measure its dimensions, also familiarity with the theoretical aspects, and presenting some data and statistics about digital transformation.

The study aims to achieve the following corrections:

1. Introducing Digital Transformation and its importance in improving the performance of economic enterprises.
2. Identifying the problems that economic enterprises suffer from in adopting Digital Transformation technologies and tools.
3. Introducing the concept of Digital management, Digital strategy, and Digital culture.

4. Estimating the impact of Digital Transformation and its dimensions on improving the Performance of selected enterprises in Algeria.

Background Literature

The Concept of Digital Transformation

Many literatures and references have addressed the concepts of *Digitization*, *Digitilization*, and *Digital Transformation*, also many writers have reported that there is an overlap, and shared meaning between them, The word digital transformation refers to the process, through which various modern digital means and innovations are used, such as cloud computing, artificial intelligence tools, and information and communication technologies, the purpose of which is for enterprises to keep pace with change, in order to improve their business (Mikalef & Parmiggiani, 2022), It is the necessary digital stage that organizations must take to enhance their strengths, It is the mirror that reflects the level of change in the enterprise, leading to the creation of advanced business models, One of the common definitions is that it is a new concept of business, based on achieving added value and economic gains (Verhoef, et al., 2022), Many studies believe that digital transformation is a deep, and accelerated transformation of processes and competencies within an organization, When talking about the functions in which digital transformation can be included, we can say that it is very reasonable to digitize distribution channels, service and product offerings, and communication networks within the organization, to provide more creative and innovative ways, to attract more customers. Managers can integrate technology into business transactions and change traditional strategies to digital plans, especially in light of the reliance on data and technological business models (Vial, 2019), It can be concluded that economic enterprises concerned with digital

transformation are moving from the simple model, towards more digital institutions, and adopting new tools such as Big Data, Internet of Things...etc, This will affect the change in work patterns, leadership centers, and even organizational culture (Thanh DAN & CHUONG, 2021).

Definition of D-Management, D-Strategy, and D-Culture

Digital Management: In the organization, *DM* it means the tight and effective planification of digital resources, and the technological supervision to control plans and strategies using digital systems, In another definition, it is managing organizational change, refining human talents and competencies, organizing the provision of digitization, to run the enterprise and creating a basic digital infrastructure, which drives the wheel of technological innovation (Bygstad & Iden, 2024), Digital management is the most important part of digital transformation, and enterprises use it to express the relationship between management and digital benefits, Through it, the institution can find more opportunities in its external environment and with its customers, and be more ambitious in exploiting information technologies in its daily activities (Terlizzi, Albertin, & de Oliveira Cesar de Moraes, 2017).

Digital Strategy: The need for economic enterprises to adopt a *Digital Strategy* has emerged, with the aim of keeping up with the technological development taking place, This concept means using complete and different policies, embodying the most prominent technological tools that lead workers towards the path of digitization, generate decisions based on digital data, and reduce administrative charges, which will positively reflect on the returns of stakeholders (Ruiz et al., 2024), Studies and research indicate that economic enterprises, in the wake of the Covid-19 crisis,

focused on recovery by exploiting digital transformation, by digital strategies to adapt and be flexible to the new situation, which contributed to supporting growth and stability, and facing the unknown future (Niankara, 2024).

Digital Culture: Regarding *Digital Culture*, it is very natural for enterprises to transform their culture, it is foolish to continue to adopt manual and classic techniques and equipment, and accordingly, a digital culture can be developed with great precision and care, in order to successfully implement business, and support the digital strategy. Despite the importance of having a culture that supports digital transformation, the guidelines and approaches that help encourage economic enterprises to build a digital culture, as a basic station, are still very limited (Butt et al., 2024). Emerging technology is creating a cultural transformation within organizations, as it is not possible to develop new business models, and change the current operating model, unless there are digital mindsets present in the organization, Digital organizational culture forces the mindset of managers and employees to change, in order to accept new solutions driven by emerging technologies, The topic of digital culture is widely resonant with studies and research, For example, a study of *Tabrizi* in 2019 proved that the proper and successful implementation of digital transformation initiatives grows primarily, from the desire-ability of managers and leaders to change the mentality of the institution's employees, and push them towards digitization, which in the future facilitates the process of instilling cultures in organizing and operating transactions (Ghosh et al., 2022). The most important thing that can be reached, is that the

digital transformation process requires successful digital management, an optimally explained digital strategy, and a diverse digital culture, All of these dimensions can be invested in, by providing the necessary capabilities and resources, and unlimited depth in identifying the tools and innovations that are to be used (Rodríguez et al., 2023).

Benefits of digital transformation for economic enterprises

Digital transformation derives its power from the various technological innovations left behind by the Fourth Industrial Revolution, The goal is to try to connect the physical and virtual worlds together, while economic enterprises use it for the purpose of change and reaching a high degree of intelligence, Also the openness of companies to globalization and digitization has allowed them to develop and grow continuously, and when talking about the most difficult and complex digital technologies, It focuses significantly on knowledge, the use of wireless networks and technological communication, to become more integrated into the organization's operations, and allow it to make strategic decisions (Cater et al., 2021), Digital transformation innovations and technologies, which can be used in economic enterprises, have been divided into two groups, the first one is front-end technologies (smart manufacturing, smart products, smart supply chain, and smart work), which deal with operational and market needs, The second group includes basic technologies (cloud computing, big data, artificial intelligence, business and communication technologies, ...), Its main role is to provide accurate and proper communication for the enterprises transactions (Ghobakhloo & Ching, 2019).

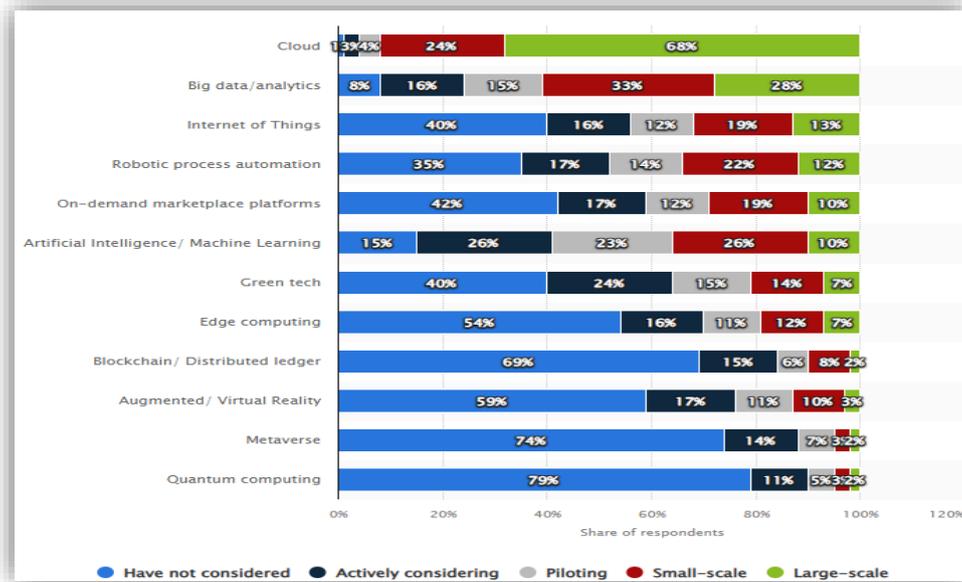


Figure (1): Digital Transformation Technologies used in Economic Enterprises 2023.

Source: (Taylor, 2024).

Many researchers emphasize the great importance of digital transformation, especially in supporting organizational change in the enterprise, and working to enhance its value and prove its economic identity, It also redesigns the process of creating value and exploiting digital resources, more efficiently than its classical counterpart, and attempts to effectively coordinate digital initiatives within organizations (Fischer-Preßler, Bonaretti, & Bunker, 2024), This phenomenon has the potential to prepare companies to confront, and respond to their changing environments, reshaping their capabilities and developing their resources, The impact of digital transformation on employees is demonstrated by directing them to technology, enhancing innovation and cooperation to access information, which improves productivity in the workplace (Wang, Mansor, & Leong, 2024). On the other hand, enterprises focus on ensuring increased trust with their customers, There is a new term that has been circulating recently, named digital trust, which means achieving security and reliability with a low risk ratio, as for digital leadership, it means using the capabilities and competencies of

employees, and managing them in the market and the institution's strategy in a digital way (Mo et al., 2023), Projects can achieve more profits and increase their market shares through modern digital services, benefit from production gains and lower costs, reduce effort and time, as for marketing, digital transformation technologies improve customer interactions, as well as placing orders, with the possibility of launching creative, and innovative products and services (Rego, Rodrigues, & Ruivo, 2024), The most important point that can be corrected is that digital transformation plays a major role in improving the environmental, social, and government performance indicators (ESG), by enhancing pollution control, energy conservation, and achieving resource efficiency, It also ensures information asymmetry and effective performance monitoring, as a key part of strategic decision-making, and increases high-quality development for both management and stakeholders, without forgetting its impact on financial performance and resistance to failure and bankruptcy (Sang, Loganathan, & Lin, 2024).

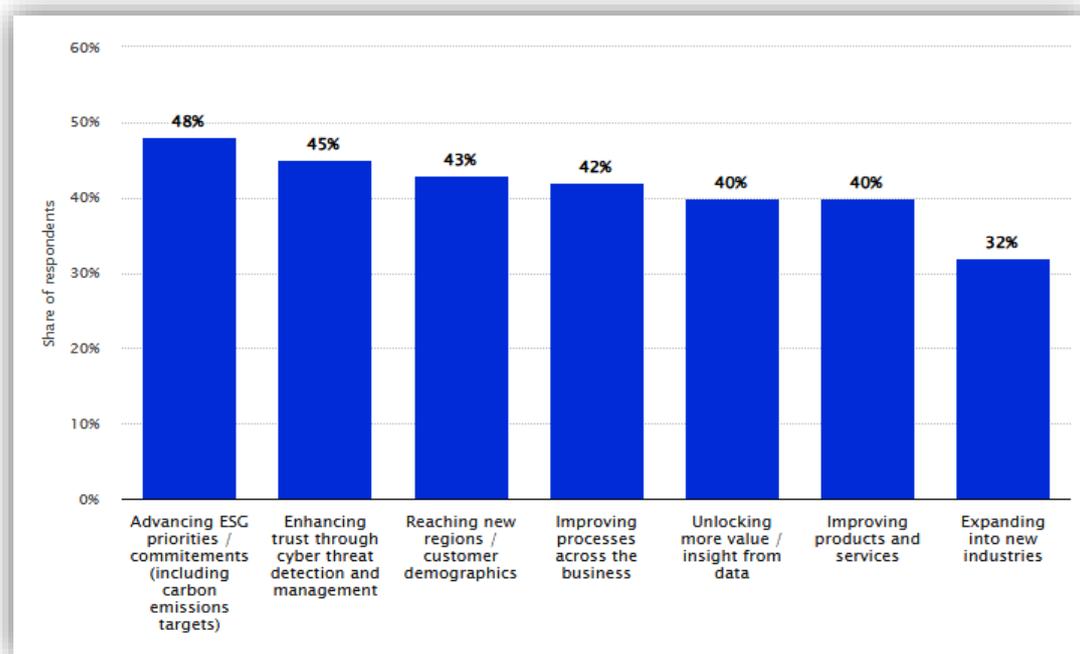


Figure (2): Achieving the goals of enterprises through digital transformation 2024/2025.

Source: (Taylor, 2024).

Although most economic enterprises follow digital transformation in order to reach their various goals, many studies have shown that accepting digitization, and technology will not be an easy matter, due to a set of problems, which could create a lack of compatibility between digital investments and the general strategies of enterprises, The first challenge lies in the lack of initiatives towards digital transformation, caused by the intense fear of shareholders and the Board of Directors of losing data, and thus losing control over the organization, Employees also feel fear as a result of the challenges imposed on them, by digital transformation, even if they have a passion for the culture of change. Also lack of strategy, inadequate and skewed corporate structures (Mahboub & Sadok, 2024), Without the human factor, the economic benefits of digital transformation cannot be applied The latter requires the presence of employees with digital skills and knowledge of digital

solutions, The major challenge facing most organizations today is the digital organizational culture, which will be difficult to adopt, because any attempt to change the organization's culture leads to anxiety and resistance to change (Kohnke, 2017),enterprises and customers reject some of the aspects of digital transformation, due to a lack of trust in the technology, which makes the transformation weak, the lack of financial resources necessary to cover the costs of technological tools and techniques, Digitization is also linked to the need to provide the necessary infrastructure to embrace technology, which is difficult due to high costs, so costs be seen as the most prominent challenges of digital transformation. We also cannot forget that **D-Transformation** will indirectly pose a risk of systems, and data being hacked, which requires the need to provide special protection (Diener & Špacek, 2021).

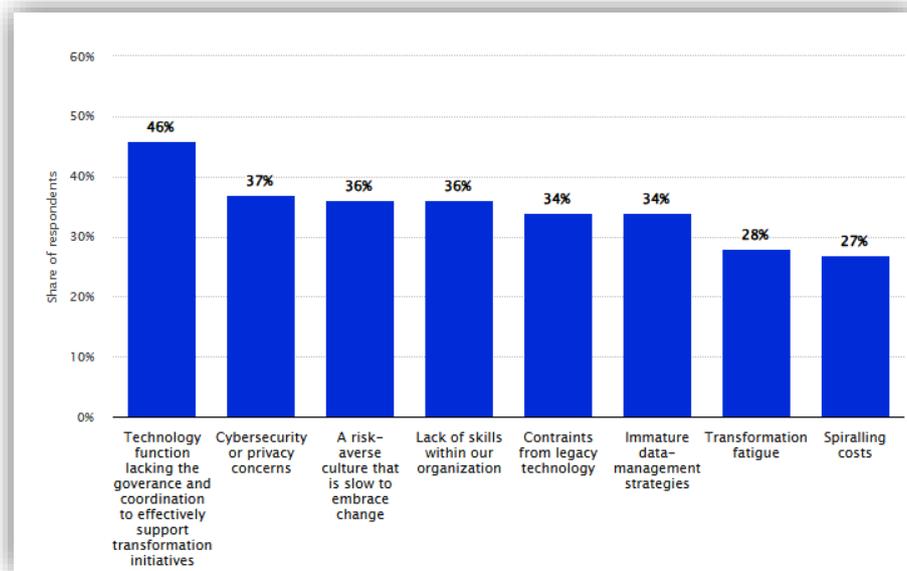


Figure (3): Digital transformation challenges facing enterprises.

Source: (Taylor, 2024).

Research Methodology

The descriptive approach and the statistical method were relied upon in the theoretical aspect, in order to study the literature related to digital transformation and its dimensions, and to know its impact on the effectiveness of performance. In the field aspect, a case study approach was used, by projecting the theoretical part onto the application, and trying to find out the relationship between the two variables using three economic enterprises (*Biocar Company, Evolab Company, Hipone Packaging*) located in the city of Annaba in Algeria.

These enterprises were chosen firstly because they are considered among the most used in their various activities on digitization and modern technologies, also the rest of the economic enterprises in the region categorically refuse to provide us with information about the digital transformation, as well as the geographical distance of many of them, which makes it difficult to travel to them. Therefore, we had to rely on these three to represent a clear and accurate representation of the phenomenon studied.

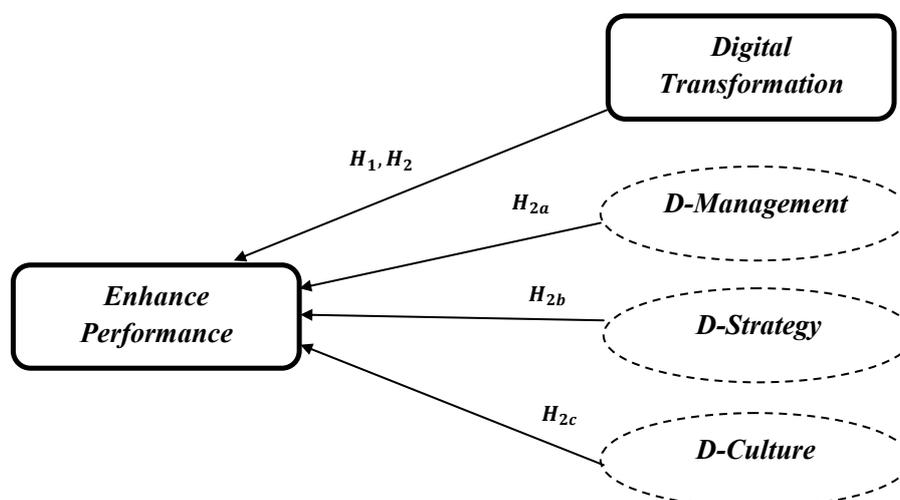


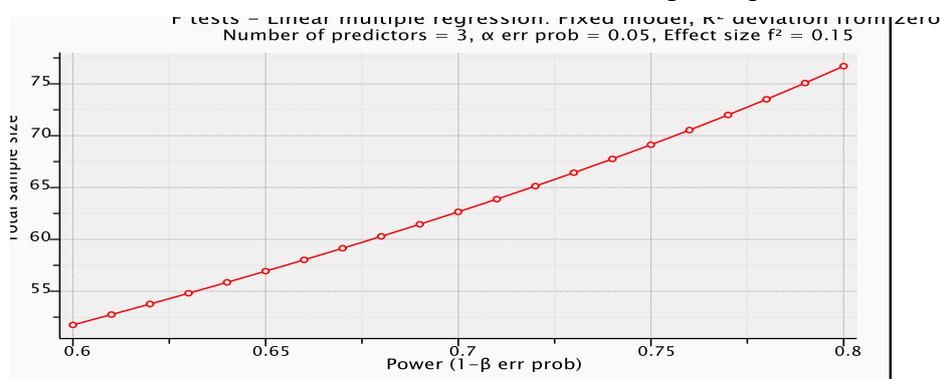
Figure (4): Research Model.

Sampling and data collection

The first step we take is to introduce the population and sample of the study, as we relied on the answers of employees of 03 Economic Enterprises in the state of Annaba-Algeria, 200 questionnaires were distributed, of which only 100 were suitable for analysis according to statistical custom, the necessary statistical treatments to obtain accurate results will also be discussed.

The sample size used in this study consists of 100 individuals, which is considered medium to small, In order to verify the

adequacy of the sample size, we conducted a preliminary study using the **Gpower 3.1** tool, as shown in the image, The number of dimensions of the independent variable was estimated at 03, a significance level of **5%(α)** was relied upon for statistical power, Regarding statistical power, as recommended by the most important reference (Cohen, 1988), A value of **0.80 ($1-\beta$)**, and an effect size of **0.15**, It was reached through the program outputs that the minimum sample size required is 77, noting that the sample number for the current study reached 100. This indicates on fulfilling the study sample requirement.



F tests – Linear multiple regression: Fixed model, R² deviation from zero
Analysis: A priori: Compute required sample size

Input:	Effect size f ²	= 0.15
	α err prob	= 0.05
	Power (1-β err prob)	= 0.80
	Number of predictors	= 3
Output:	Noncentrality parameter λ	= 11.5500000
	Critical F	= 2.7300187
	Numerator df	= 3
	Denominator df	= 73
	Total sample size	= 77
	Actual power	= 0.8017655

Figure (5): Sampling Test.

Source: G-Power Program.

Reliability and validity analysis

In this study, The Spss **IBM Program Version 26** was used, also the questionnaire was designed based on a **five-point Likert scale**, and in order to measure the degree of reliability and validity in the study tool, the **Cronbach's alpha** coefficient was calculated for the dimensions and variables of the study, The results in the table above showed that the

Cronbach's alpha coefficients for the independent variable (**digital transformation**), dependent variable (**Enhance performance**) are greater than the comparative value of 0.70, The same applies to the study tool as a whole, which indicates the stability of the research questionnaire, The Reliability coefficients also recorded high values, which means the validity of the tool for analysis and hypothesis testing.

Table (1): Convergent validity of the constructs.

Variables	Number of Elements	Cronbach's α	Reliability coefficient
Digital Transformation	15	0.820	0.905
1. Digital Management	05	0.609	0.780
2. Digital Strategy	05	0.685	0.827
3. Digital Culture	05	0.630	0.793
Enhance Performance	10	0.852	0.923
Tool	25	0.901	0.949

Note(s): significant at the 0.01 level.

Source: Author calculation.

Measure consistency

In table 2, Statistical analysis was continued using Pearson's correlation coefficient test relationships between variables and study dimensions, The independent variable digital transformation and its dimensions (digital

management, digital strategy, and digital culture) recorded high values of 0.825, 0.817, and 0.853, respectively, while the relationship between the main variables was an average value of 0.730.

Table (2): Correlation Matrix of variables of the study.

Variables	Digital Transformation	Digital Management	Digital Strategy	Digital Culture	Enhance Performance
Digital Transformation	1.000				
1. Digital Management	0.825**	1.000			
2. Digital Strategy	0.817**	0.488**	1.000		
3. Digital Culture	0.853**	0.577**	0.546**	1.000	
Enhance Performance	0.730**	0.574**	0.572**	0.674**	1.000

Note(s): Correlation is significant at the 0.01 level.

Source: Author calculation.

Demographic and Descriptive analysis

The sample included individuals of different nationalities, ages, job position, educational levels, and work experience, Males constituted 68% of the survey participants, while females constituted 32%. Of those who responded, 44% were between 30 and 40 years old, and the

lowest 2% of respondents were less than or equal to 50 years old, about 74% of the survey participants had university degrees, most of the participants had 1-10 years of job experience, 37% of the eligible respondents had a position as assigned assistant, and 11% of them were administrative assistant.

Table (3): Respondent's demographic profile.

Demographic (Total=100)	Categories	Frequency	Percent (%)
Gender	Female	32	32.0
	Male	68	68.0
Age	less than 30	39	39.0
	[30 – 40[44	44.0
	[40 – 50[15	15.0
	≥ 50	02	02.0
Job position	General Manager, Deputy Director	06	06.0
	Head of department	26	26.0
	Cadre	20	20.0
	Assigned assistant	37	37.0
	Administrative assistant	11	11.0
Experience	less than 05	39	39.0
	[05 – 10[39	39.0
	[10 – 15[22	22.0
Level of Education	Secondary Education	07	07.0
	Vocational Education	19	19.0
	University Education	74	74.0

Source: Author calculation.

Table 4 presents descriptive statistics for the manifest variables analyzed in the model. It includes the mean, median, standard deviation,

minimum and maximum values, as well as kurtosis coefficient, The results were moderate to good as follows:

Table (4): Descriptive Statistics.

Variables	Mean	Median	Min	Max	Std.Deviation	Kurtosis	
	statistic	statistic	statistic	statistic	statistic	statistic	Std.Error
Digital Transformation	3.907	3.933	3.00	4.80	0.433	-.0808	0.478
Digital Management	3.980	4.00	3.00	5.00	0.514	-0.580	0.478
Digital Strategy	3.912	4.00	2.60	5.00	0.525	-0.028	0.478
Digital Culture	3.830	4.00	2.80	5.00	0.527	-0.297	0.478
Enhance Performance	3.972	4.00	2.70	5.00	0.629	-1.045	0.478

Source: Author calculation.

Hypothesis testing results

Before starting to test the study hypotheses, we checked the quality of the model using the following analyses:

- Calculate both the *Variance Inflation Factor (VIF)* and *Tolerance coefficient* to achieve the assumption that there is no multicollinearity problem between the independent variables;
- Assume the absence of autocorrelation for random errors by calculating the *Durbin-Watson coefficient*, whose value should be limited to d2 and 4-d2;
- Testing for normal distribution by relying on the *Kolmogorov-Smirnov/Shapiro-Wik coefficients*, whose value should be equal to or more than 5%.

From the results shown in the next table, it is clear that all VIF for the dimensions of the independent variable (digital transformation) are less than the comparative value of 10, and the Tolerance coefficients also exceed the comparative percentage, which is 5 percent, On the other hand, the Durbin-Watson coefficient recorded a value of 1.695, which falls in the range of 1.613 and 2.387 according Durbin-Watson Significance Tables, Finally, the model follows a normal distribution using the Kolmogorov-Smirnov scale. the value of the coefficient was obtained as 0.071, in addition to the level of significance estimated at 0.200, which is more than 0.05, The same applies to the Shapiro-Wik that was used to verify the results of the first scale.

Table (5): Standardized test study model.

Dimensions	Tolerance		VIF	
Digital Management	0.624		1.602	
Digital Strategy	0.658		1.521	
Digital Culture	0.575		1.738	
Durbin-Watson= 1.695				
Digital Transformation	Kolmogorov-Smirnov		Shapiro-Wik	
	Statistic	Sig	Statistic	Sig
	0.071	0.200	0.980	0.126

Source: Author calculation.

Multiple regression analysis was also used to study the effects of all independent variables on the dependent variable at one time, this is the first main hypothesis, which states as follows:

H₁: *There is no statistically significant effect of digital transformation in enhancing the performance of economic enterprises.*

Since the null hypothesis is rejected if the significance level is less than or equal to 5%, the results of the multiple regression analysis can be expressed in the following table:

Table (6): Multiple regression analysis for determinants of Digital Transformation.

Variables	Unstandardized coefficients		Standardized coefficients	t-value	Sig
	B	Standard Error	Bêta		
Digital Management	0.265	0.107	0.217	2.482	0.015
Digital Strategy	0.284	0.102	0.238	2.792	0.006
Digital Culture	0.500	0.109	0.419	4.603	0.000
R	R^2	$R^2_{adjusted}$	Estimation Error	F-Value	Sig.F
0.737	0.543	0.528	0.431	37.969	0.000

Source: Author calculation.

We note that all levels of significance for t are less than the comparative value of 0.05 (specially dimensions of the independent variable), which can be interpreted as the presence of a significant effect of the digital strategy, digital administration, and digital culture in enhancing the performance of the economic enterprises under study. It is also clear from the table above that the relationship between all dimensions of the independent variable and the dependent variable is estimated at 73.70%, which indicates the strong direct relationship between them. Also, the coefficient of determination reached 0.543, which means that 54% of the changes occurring in the performance of economic enterprises are caused by digital transformation. The remaining percentage is due to reasons outside the field of study, 52.8% representing the studied phenomenon, also the significance level of F is less than 5%.

The second hypothesis was related to testing the existence of the independent variable Digital Transformation with its three dimensions: Management, Strategy, and Culture, where the main hypothesis was with sub-hypotheses as follows:

H₂ : *The enterprises under study do not have a digital transformation from the point of view of the selected sample at a significant level $\alpha \leq 5\%$.*

H_{2a} : *Absence of the digital management dimension in the institutions under study.*

H_{2b} : *Absence of the digital strategy dimension in the institutions under study.*

H_{2c} : *Absence of the digital culture dimension in the institutions under study.*

Test was relied upon for one sample t-test, and the null hypothesis is accepted if the significance level is greater than 0.05, The results are shown in the following table:

Table (7): Outputs of the independent variable test and its dimensions.

Single sample testing						
	Test value = 3					
	t	ddl	Sig. (bilateral)	Average difference	Mean	Standard Deviation
Digital Management	19,079	99	0,000	0,980	3.980	0.513
Digital Strategy	17,365	99	0,000	0,912	3.912	0.525
Digital Culture	15,757	99	0,000	0,830	3.830	0.526
Digital Transformation	20,911	99	0,000	0,907	3.907	0.433

Source: Author calculation.

It is clear from the data in the table above that the mean value of the digital transformation variable and its dimensions is greater than the comparative value 3, As (t) is greater than the tabulated value, the level of significance is less than 5 percent. Therefore, we reject the null hypothesis and confirm the

availability of digital transformation and its dimensions in the enterprises under study.

Conclusion, Results and Suggestions

Discussion of Results

The global economy has undergone multiple stages of development over the past three

decades, with the most significant changes being the level of technology and knowledge possessed by the economy and their impact on its growth. Researchers have found that intellectual capital and knowledge have become essential elements for any organization's success in light of the digital transformation (Khreisat, Saqfalhait, A. Spetan, & Al-tal, 2024). The accelerated pace of digitization and digital transformation prompted enterprises to restructure their plans and strategies, and the first desire was to improve the performance of their work, and increase technological efficiency, which enhances survival in competition and achieving sustainability in its various dimensions, Digital tools and technologies have emerged, such as the *World Wide Web, Digital Collaboration Tools (chat platforms and video conferences), Automation of Manual Processes, Digital Boards* and other technological solutions, that help increase employee engagement and improve their productive efficiency.

Digital transformation within enterprise is considered the only criterion for its success and continuity, it is the essential secret through which it can achieve its small and large goals, and obtain accurate and effective internal management. Also, enterprises can link all their departments and branches, which enhance official communication between employees and the Board of Directors. This technological phenomenon also contributes to raising the degree of creativity and innovation in the organization, and drives it to create and produce unique services and products, or find new marketing methods, harnessing innovative means of organizing the workplace and new external relations.

The classic model of the enterprise, in which the use of complex organizational structures is relied upon, differs from the digital form, which

requires a small workforce, without commitment to specific geographical locations, works to reduce costs, improve the management, and increase the quality of performance, as well as relying on electronic data storage systems. It will achieve security and transparency, and facilitate the allocation and division of work, without forgetting to increase the degree of absorption of the largest possible amount of administrative and management procedures.

The digital transformation Strategy plays an effective role in modernizing many processes and activities, creating a radical change in the organizational structure of institutions, also preparing ideal plans for growth, making decisions in the medium and long term, engaging employees and enhancing job affiliation.

Enterprises having a Digital Culture means having better employee behaviour, their ability to be open and changeable to everything digital, ease of dealing with modern devices and technologies, refining and improving their skills, which always motivates enterprises to train and qualify their employees.

In Algeria, although the economic enterprises that we relied on in our study have achieved acceptable results, in terms of their embrace of digital transformation and their application of its three dimensions: digital management, digital strategy, and digital culture (one-sample test hypothesis), we also noticed that there is an impact of digital transformation in enhancing Performance of economic enterprises (multiple regression hypothesis), but it is not possible to generalize to all Algerian economic enterprises, In view of the problems and challenges they face, as many experts consider that Algerian enterprises are severely underutilized in the use of technological information systems, digital

technologies, hosting of Internet service providers and electronic transaction execution services, The weak legal and regulatory structure of information technology and digital solutions is one of the most significant challenges to digital transformation, and the application of its forms within Algerian organisations, We also point out that the delay in legislative laws and regulations (for example cloud computing) has contributed to the digital deficit that Algeria suffers from, also the fragile digital infrastructure and the failure to exploit the valuable opportunities contained in the knowledge economy, in light of the lack of political will to adopt digital transformation. Last but not least, the lack of digital culture and awareness of the importance of digital solutions, to facilitate daily and professional life, are among the most prominent features of technological weakness in Algerian society.

Proposals and Recommendations

- Digital transformation in economic enterprises requires the availability of a set of financial, human, and technological components, that stimulate it and encourage employees, administrators, owners, and managers to turn to technological innovation and take a distinctive approach, to continuous transformation with the aim of leadership in the sector of activity.
- Creating an effective strategic organization, that supports digital transformation, the most important components of which are the size of the enterprise, the organizational culture of employees, the level of skills and capabilities, creativity and innovation, and enjoyment of authority and independence.
- Forming mini-teams to select innovative and technological ideas within enterprises, and searching for topics that enhance digital innovation, with the need to harness multimedia, digital data, computer graphics and videos, the goal is to enhance digital communication and meeting without wasting time.
- Developing the embodiment of the culture of digital management in enterprises is a basic necessity in order to maximize the value, and its positive impact on employees and partners.
- Identify current and future needs for qualified and trained individuals in information systems, Internet software, electronic marketing, etc., also find flexible methods and relationships to share digital experiences and knowledge together.
- Intensifying research and scientific forums in universities, with the presence of Algerian economic enterprises, and introducing the importance of digital transformation and the advantages that emerge from it.
- Amending the laws and regulations of the Algerian legislator, and activating the application of both digital solutions and technologies, so that enterprises can benefit from them in their activities.

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The author personally reviewed the published manuscript.

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