People's Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

Belhadj Bouchaib University Ain Temouchent

Faculty of Economics, Commercial and Management Sciences

Department: Management Sciences

Major: Human Resources Management

Title of the Thesis:

Human performance in the context of adopting digital transformation
A case study of Sonelgaz Ain Temouchant

A thesis submitted as part of the requirements for obtaining
The Master's degree

Submitted by :

Khadraoui Fatima

Supervised by :

Dr.Nait Ibrahim Boussad

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Academic Year
2023/2024

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Thanks

Dedication

I express my sincere gratitude to Allah Almighty for His guidance and assistance in completing this research. I dedicate this work to my beloved father, who has always been my inspiration and motivator, and to my loving mother, who has selflessly supported me throughout my life. I am also grateful to my grandmother who was like a second mother to me, my dear aunt who has always been a source of encouragement, and my siblings who have shared my life's journey. Additionally, I would like to express my sincere appreciation to all my esteemed teachers who have contributed to my academic growth and to everyone who has supported me in completing this work

Khadraoui Fatima

Abstract:

This study aims to identify the digital transformation and human performance, as well as to determine the extent to which digital transformation affects human performance in its dimensions (training, discipline, and creativity) at Sonelgaz company in Ain Temouchent. To answer the research problem and sub-questions, the descriptive and analytical approach was adopted using a questionnaire distributed to a sample of 60 employees of the company. The data was analyzed using SPSS version 21. The results showed that there is a positive significant effect of digital transformation on enhancing human performance in its dimensions (training, discipline, and creativity).

Keywords: Digital Transformation, Human Performance, Training, Sonelgaz company.

Résumé :

Cette étude vise à identifier la transformation numérique et la performance humaine, ainsi qu'à déterminer dans quelle mesure la transformation numérique affecte la performance humaine dans ses dimensions (formation, discipline et créativité) au sein de l'entreprise Sonelgaz à Ain Temouchent. Pour répondre à la problématique et aux sous-questions de la recherche, l'approche descriptive et analytique a été adoptée à l'aide d'un questionnaire distribué à un échantillon de 60 employés de l'entreprise. Les données ont été analysées à l'aide de SPSS version 21. Les résultats ont montré qu'il y a un effet positif significatif de la transformation numérique sur l'amélioration de la performance humaine dans ses dimensions (formation, discipline et créativité).

Mots-clés : Transformation numérique, performance humaine, formation, entreprise Sonelgaz.

الملخص

هدفت هذه الدراسة إلى التعرف على مفهومي التحول الرقمي وأداء العنصر البشري ، وكذا تحديد مدى تأثير التحول الرقمي على أداء العنصر البشري بمختلف أبعاده (التدريب، الانضباط، والإبداع) في شركة سونلغاز بعين تموشنت.

للإجابة عن مشكلة البحث وأسئلته الفرعية، تم اعتماد المنهج الوصفي والتحليلي باستخدام استبيان تم توزيعه على عينة مكونة من 60 موظفًا من موظفي الشركة. وتم تحليل البيانات باستخدام الإصدار 21 من برنامج الحزمة الاحصائية للعلوم الاجتماعي spss أظهرت النتائج أن هناك تأثيراً إيجابياً ذو دلالة احصائية للتحول الرقمي في تعزيز أداء العنصر البشري بمختلف أبعاده (التدريب، والانضباط، والإبداع) في شركة سونلغاز بعين تموشنت.

الكلمات المفتاحية: التحوّل الرقمي، أداء العنصر البشري، التدريب، شركة سونلغاز.

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Introduction

General Introduction:

In an era of accelerating digitisation, digital transformation has become a driving force that profoundly affects the performance of human resources within organisations. It goes beyond simply introducing technology or modernising systems to reshape how people work and interact with their environments. The impact of digital transformation extends to all aspects of work, boosting efficiency, fuelling creativity and instilling discipline.

When organisations adopt advanced digital strategies, they open up new avenues for their employees to learn and grow. Continuous training becomes an integral part of the organisational culture, allowing workers to acquire the necessary skills to keep up with rapid changes. This training not only enhances their competence but also stimulates innovation, as employees are better able to offer new ideas and innovative solutions in line with changing market needs.

Moreover, digital transformation fosters discipline within the work environment. Adhering to new standards and adapting to digital tools requires a high level of professionalism and self-discipline. This transformation creates a more organised and efficient work environment, where every employee becomes part of an integrated system aimed at achieving strategic goals. From the above, the issue of the study is highlighted:

Problem of the study:

Main Problem: What is the impact of adopting digital transformation on human performance in Sonelgaz company?

To clarify this question, we ask the following sub-questions:

- Is there a statistically significant effect of digital transformation on enhancing training in sonelgaz company?
- Is there a statistically significant effect of digital transformation on enhancing discipline in sonelgaz company ?
- Is there a statistically significant effect of digital transformation in enhancing creativity in sonelgaz company ?

Hypotheses of the study :

Main hypothesis: There is a positive and statistically significant impact of digital transformation in enhancing human performance

Sub-hypotheses:

- There is a positive and statistically significant effect of digital transformation in enhancing training in sonelgaz company.
- There is a positive and statistically significant effect of digitalization in enhancing discipline in sonelgaz company.
- There is a statistically significant positive effect of digitalization in enhancing creativity in sonelgaz company.

Reasons for choosing the study topic:

- Self-desire to study the digital transformation and its impact on the human performance;
- The topic and variables of the study are related to the specialization studied, as digital transformation and human performance are topics related to the field of human resource management;
- The great importance of the concept of digital transformation as it is considered one of the modern concepts ;
- Trying to familiarize with all aspects of digital transformation and highlight its impact on the performance of the human element.

The importance of the study:

The importance of the study lies in the fact that it will address good aspects of improving human performance, especially after adopting the principles of digital transformation, namely:

- Rooting the basic concepts of digital transformation, and raising awareness of the importance of adopting it due to its contribution to the overall performance of the organisation in general and human performance in particular.
- Continuous attention to improving human performance.
- Mainstreaming the adoption of digital transformation in small and medium-sized organisations.

Objectives of the study:

In conducting this study, we seek to achieve a number of objectives, including the following:

- Validate the hypotheses and highlight the extent of the impact of digital transformation on human performance.
- Define the terms digital transformation and human performance and explain their importance.

‒ Highlighting the reality of digital transformation in Sonelgaz Ain Tamouchant.
‒ Recognise the techniques of digital transformation.

Approach to the study:

In order to address and answer the study question, the descriptive method was adopted, which relies on the study of the phenomenon quantitatively and qualitatively by relying on books, memoirs, journals, etc. ...., the analytical approach: in the applied aspect to identify the impact of digital transformation in enhancing human performance through the field study at the level of Sonelgaz Ain Tamouchant by using the questionnaire to collect information and to analyse that information, the Statistical Package for Social Sciences (SPSS) version 21 and Microsoft Excel were used.

The study sample:

A paper-based questionnaire consisting of two main axes was applied

‒ The first axis: Digital Transformation, consisting of 3 dimensions with a total of 12 questions
‒ The second axis: Human performance, consisting of 3 dimensions with a total of 12 questions

The questionnaire was addressed to a sample of 60 workers from different professional categories at Sonelgaz Ain Tamouchant.

The limits of the study:

‒ Spatial boundaries: Sonelgaz Ain Tamouchant
‒ Temporal Limits: The study took place from 27 February to 07 March.
‒ Objective limits: The study focused on digital transformation as an independent variable with its dimensions (technology, data, digital strategy) and its impact on human performance as a dependent variable with its dimensions (training, creativity, discipline)
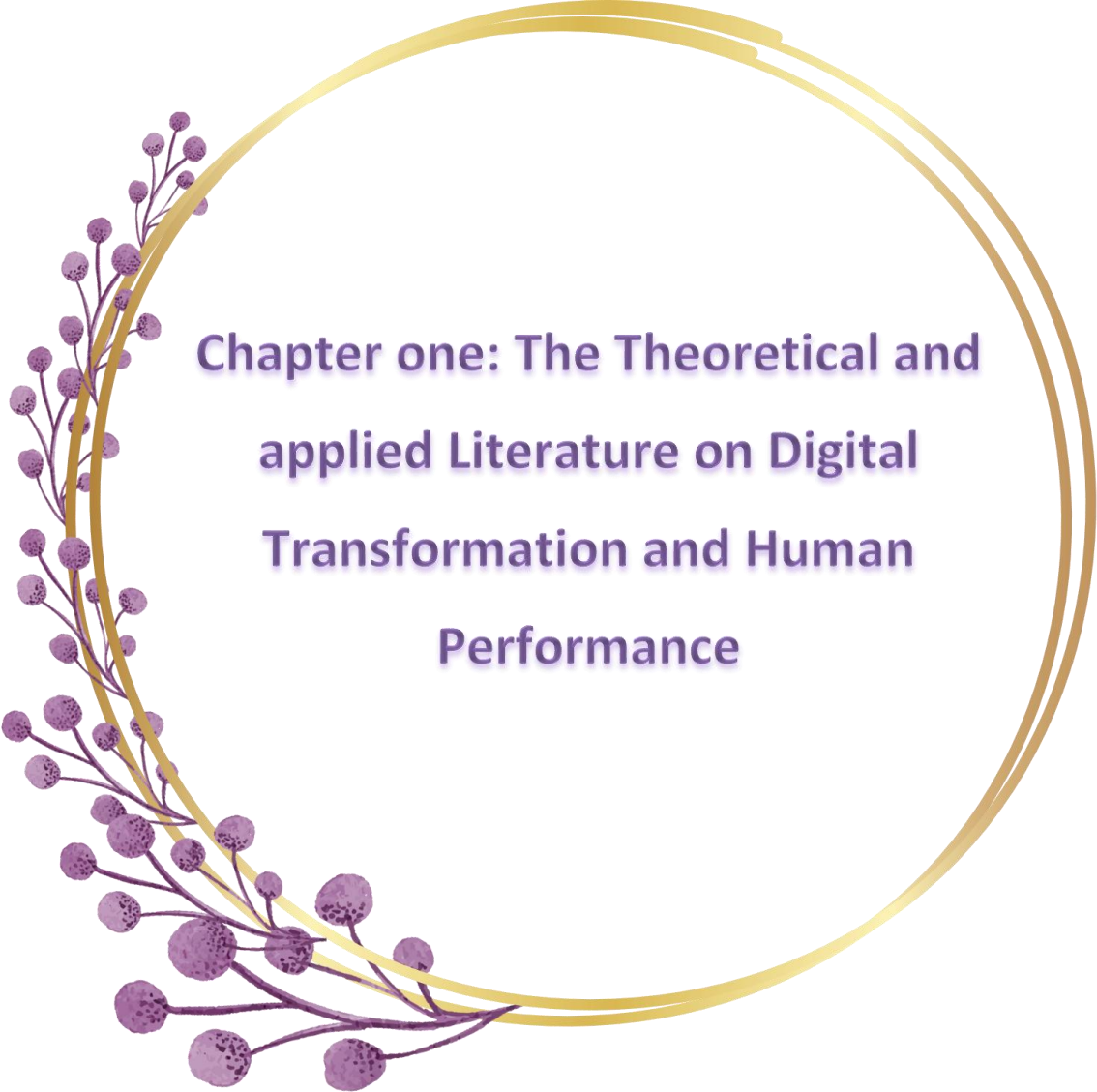
The model of the study:

In order to answer the question, we believe that the best way to answer the question is to divide the study into two chapters, one theoretical and one applied:

‒ Chapter one: The Theoretical and applied Literature on Digital Transformation and Human Performance.
‒ Chapter Two: Applied Studies of Digital Transformation and Human Performance in Sonelgaz company, Ain Temouchent.

Figure 1-1: The model of the study
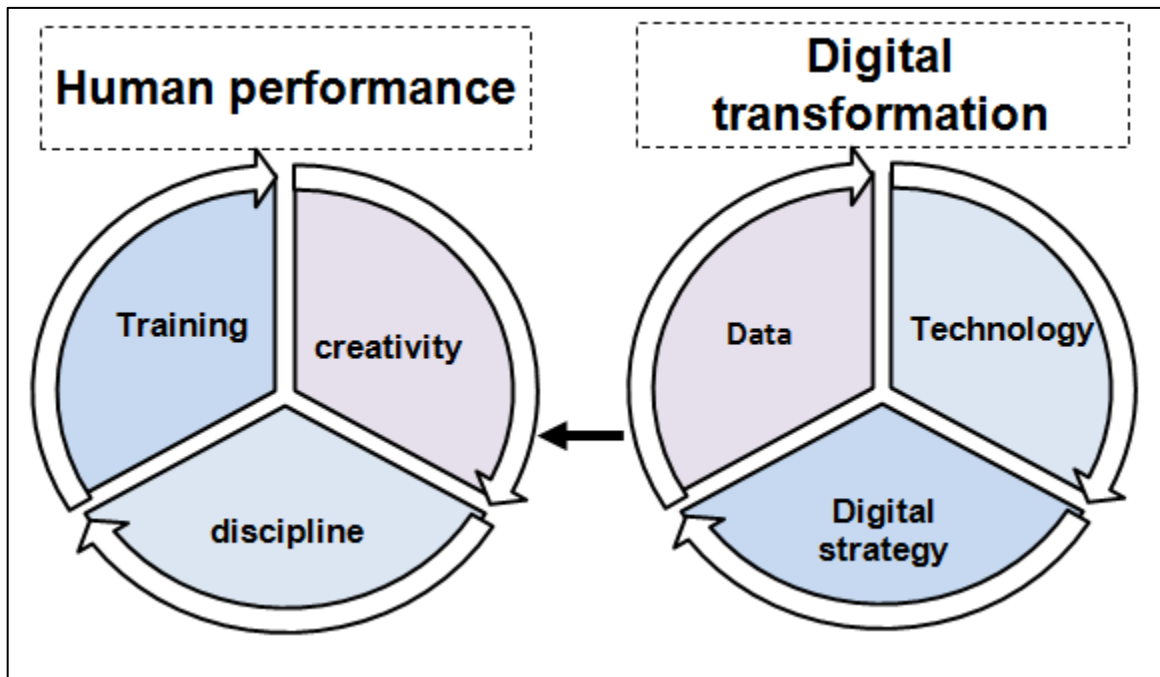
Chapter one: The Theoretical and applied Literature on Digital Transformation and Human Performance

Chapter Introduction:

The world today is witnessing rapid developments in technology and this has led to the emergence of the so-called digital transformation, which represents a qualitative shift in many aspects, including organizations. Digital transformation has become an urgent necessity for the survival and competition of organizations, as they strive to adopt its principles in order to improve their operations and increase their efficiency. Perhaps the most prominent area that has been affected by this transformation is the field of human resources, as the use of digital technologies such as artificial intelligence and big data analytics increases, the human resource needs to keep up with these developments. Therefore, we divided this chapter into two requirements:

Section one: The Theoretical Framework of Digital Transformation and Human Performance

Section Two: Applied Literature on Digital Transformation and Human Performance

Section one: The Theoretical Framework of Digital Transformation and Human Performance

In this Section we will delve into the fundamental aspects of digital transformation and human performance. The chapter is divided into two main topics.

A. The concept of digital transformation :
1. Definition of digital transformation :

- ❖ The concept of digital transformation has been interpreted in multiple ways, reflecting the diver's perspectives of those who have explored this topic. For instance, some scholars view digital transformation as a collection of modern methods and technologies used to simplify a specific activity and improve its performance. It encompasses a range of devices that process and circulate information, such as computers, software, storage and retrieval equipment, and wired and wireless electronic transmission via all forms and types of communication, whether written, audio, or visual. Its primary goal is to facilitate both bilateral and group communication through closed and open networks.

- ❖ Digital transformation is the combined effects of several digital innovations bringing about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace, or complement existing riles of the game within organizations, ecosystems, industries, or fields (HININGS, GEGENHUBER, & GREENWOOD, 2018).

- ❖ Vial claims that digital transformation entails integrating digital technology into every aspect of a company, leading to significant adjustments in how the firm functions and provides value to its clients. Changes to organizational structures, procedures, and business models may be part of this. On the other hand, digitalization utilizes digital technology to automate current business operations and increase efficiency without materially altering how the organization functions. Digitalization is a crucial initial stage in the digital transformation process. (Zolinski, 2023),It was also known as: "Benefiting from the information and communication revolution, to provide services and products in an innovative way, which generates a distinctive experience at all levels, which is the change associated with the application of information technology in all aspects (education, health, commerce...), it targets any institution, and all activities. (Nadjia, 2023, p. 201)

- ❖ Digital transformation is the use of new digital technologies, such as mobile, artificial intelligence, cloud, blockchain, and the Internet of things technologies, to enable major business improvements to augment customer experience, streamline operations, or create new business models. (Andreasson, 2023)

2. Digital transformation technologies:

❖ **Cloud computing**: is a kind of computing technique where IT services are provided by massive low-cost computing units connected by IP networks. Cloud computing is rooted in search engine platform design. There are 5 major technical characteristics of cloud computing:

 − large scale computing resources
 − high scale-ability & elastic
 − shared resource pool (virtualized and physical resource)
 − dynamic resource scheduling
 − general purpose (Qian, Luo, Du, & Guo, 2009, p. 627).

❖ **Artificial Intelligence**: is the mechanical simulation system of collecting knowledge and information and processing intelligence of universe: (collating and interpreting) and disseminating it to the eligible in the form of actionable intelligence (Grewal, 2014, p. 13). AI refers to a machine's ability to simulate the human mind by interpreting data it receives from its environment, learning from them and using that learning to successfully complete tasks, even in the most unexpected and novel scenarios. (Nikitas, Michalakopoulou, Njoya, & Karampatzakis, 2020, p. 13)

❖ **Internet of things**: refers to the networked interconnection of everyday objects, which are often equipped with ubiquitous intelligence. IoT integrating every object for interaction via embedded systems, which leads to a highly distributed network of devices communicating with human beings as well as other devices (Xia, Yang, Wang, & Vinel, 2012).Also its viewed as a gigantic network consisting of subnetworks of devices and computers connected through a series of intermediate technologies where numerous technologies such as RFID, barcodes, and wired and wireless connections may act as enablers of this connectivity. Under the International Telecommunications Union (ITU), the perception of the IoT was structured as 4 dimensions of things (Tagging Things, Feeling Things, Shrinking Things, and Thinking Things). (Vongsingthong & Smanchat, 2014)

Figure 1-2: Four dimensions for the IoT
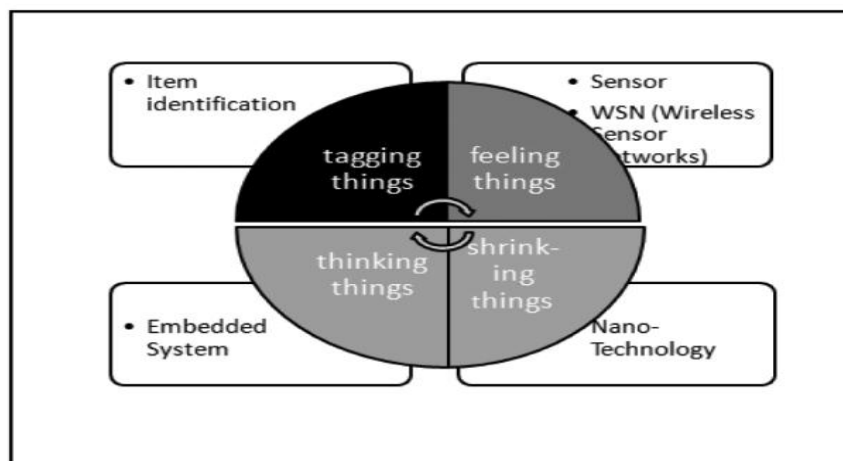
❖ **Blockchain:** is a digital transformation technology that allows the storage of data and information used to record transactions in a secure, transparent and decentralized manner. However, from a broader perspective, a block chain can be considered a distributed system that in general includes:
A Peer-to-Peer (P2P) network made of all those nodes that either read or cooperatively write transactions in the blockchain, and a consensus protocol, namely, a set of policies agreed upon and implemented by all nodes, which are the rules that regulate which and how new transactions can be added to the blockchain. (Ghiro, et al., 2021)

<u>**Figure 1-3**</u>**: Processing of a transaction before storage in the blockchain.**
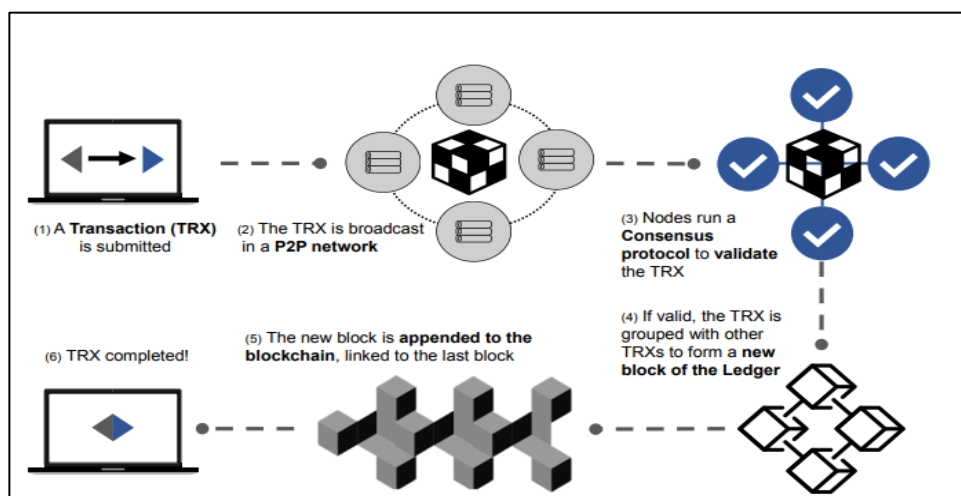
<u>**Source:**</u> (Ghiro, et al., 2021)

❖ **Big Data** is a data analysis methodology enabled by recent advances in technologies that support high-velocity data capture, storage and analysis. Data sources extend beyond the traditional corporate database to include emails, mobile device outputs, and sensor-generated data where data is no longer restricted to structured database records but rather unstructured data having no standard formatting . (Zakir, Seymour, & Berg, 2015)

❖ **Virtual reality**(VR) immerses users in a fully artificial digital environment.

❖ **Augmented reality**(AR) overlays virtual objects on the real-world environment.

❖ **Mixed reality** (MR) not just overlays but anchors virtual objects to the real world. (Milman, 2018, p. 55)

❖ **Robotics:** is a branch of engineering and computer science that involves the conception, design, manufacture and operation of robots. The objective of the robotics field is to create intelligent machines that can assist humans in a variety of ways. (Yasar, 2024)

❖ **Cybersecurity:** is the organization and collection of resources, processes, and structures used to protect cyberspace and cyberspace-enabled systems from

occurrences that misalign de jure from de facto property rights. (Craigen, Diakun-Thibault, & Purse, 2014, p. 13)

Figure 1-4:Digital transformation technologies
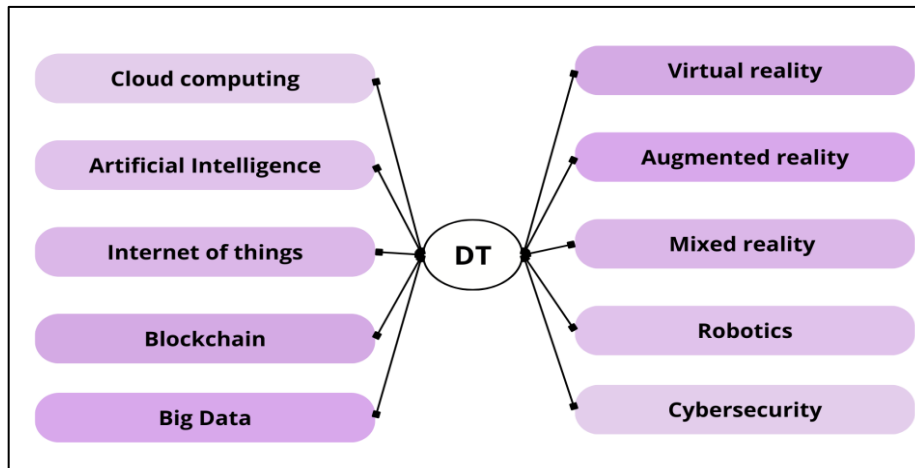
Source: prepared by the student

3. **DIGITAL TRANSFORMATION DIMENSIONS:** (Zaoui, Assoul, & Souissi, 2019, p. 9963)

   ❖ **Structural Dimension :** Involves changing the organizational structure, processes and skills needed to exploit new technologies **.**

   ❖ **Informational Dimension :** Involves data/information management**.**

   ❖ **Environmental Dimension :** Includes macro-environmental factors influencing ICT integration (Regulatory Framework, Resources)

   ❖ **Security Dimension:** Includes; IT security (hardware, application and network), data and human security and environmental security **.**

   ❖ **Quality Dimension:** Consists of the quality of the product and service resulting from Digital Transformation **.**

   ❖ **Financial dimension :** Consists of investment / return on investment**.**

   ❖ **Cultural Dimension:** Consists of all the values and behaviors shared by a community / ICT Culture**.**

   ❖ **Innovation Dimension**: Includes innovation in technology design, technology processes and ICT Management.

   ❖ **Participative Dimension**: Consists of the collaboration / interaction of any stakeholder, including the user**.**

   ❖ **Organizational Dimension:** Consists of ICT adoption, ICT deployment, Dissemination, Implementation, Infusion, Integration.

   ❖ **Operational Dimension:** Definition of all actions / activities after digital transformation.

   ❖ **Managerial Dimension:** Consists of SI Management / IS Governance.

   ❖ **Data Management**: Data management process, Collection, Sorting, Analysis.

   ❖ **Information Management**: Process for managing information resulting from data processing Resources Integrates all technical, technological and human resources.

- ❖ **Regulatory Dimension:** Consists of the legal and political framework .
- ❖ **SI Security**: Hardware, application and network security device.
- ❖ **Data security**: Tools and means of data security.
- ❖ **Service / Product** : Prestation offerte/consommée par canal digital.
- ❖ **Financial Investment:** Funds injected into Digital transformation.
- ❖ **Return on investment:** The financial gains generated by Digital transformation**.**
- ❖ **ICT adoption**: ICT use in people's daily lives .
- ❖ **Technological design**: Technological creations .
- ❖ **Technological process:** Steps of design, production and technological commissioning phases.
- ❖ **ICT Management:** Organization techniques and technology management.
- ❖ **Interaction:** Interactive use of digital products / services.
- ❖ **Collaboration:** The user is a key stakeholder in the digital processes. Digital offer oriented user**.**
- ❖ **ICT integration process:** Includes steps in ICT integration, actors, responsibilities and interactions.
- ❖ **Work Organization and Design:** Reorganization of trades and responsibilities, Creation of new professions
- ❖ **Responsibility for Digital Transformation strategy**: Centralized, decentralized.
- ❖ **Operational changes:** All changes impacting post-digitization actions/activities
- ❖ **Skills building:** Training on new jobs created by digitalization
- ❖ **Leadership, Governance, Strategy**: Components of a business plan of a company in Governance the context of digital transformation.
- ❖ **Technical Dimension**: Includes technical infrastructure, development and technical implementation .
- ❖ **Technological Dimension**: Includes Hardware, Software and Network Components.
- ❖ **Human Dimension:** The social aspect: knowledge of information technologies and user skills.
- ❖ **Legal dimension:** Rules governing the digital question (data protection, transaction regulation) .
- ❖ **Political dimension:** General framework governing a population integrating the digital movement.

B. The concept of Human performance:

1. Definition of Human performance:

- ❖ Human performance defines as the level of ability to accomplish a specific task within the context of their knowledge, expertise and job needs. (Otoo, 2024, p. 111)
- ❖ According to Batal, Christian. (2000), Human Performance is the result of the interaction of three primary elements: skills, motivation, the level of work organization, and the available resources. (Batal, 2000, p. 95)
- ❖ According to Sonnentag et al. (2008), Human performance is the total expected value for an organization about the discrete behavioral episodes that the concerned individual engages in throughout a typical time period. (Almaaitah, Al-Rwaidan, Al-Adamat, & Enaizan, 2024)
- ❖ Kushendar et al. (2020) define performance as the means by which workers assess the extent to which they add value to the organization through services rendered and output outcomes. (Suprayitno, 2024, p. 88)

Through the definitions we have reviewed and the definitions mentioned above, we can define human performance: It is one of the basic elements of the productive process as it expresses the ability of the human resource in terms of skills, knowledge and expertise to accomplish the tasks assigned to it efficiently and effectively in order to achieve the desired goals that the organization seeks to achieve.

2. Factors affecting Human performance:

A number of factors that vary in different jobs affect workers. It is also difficult to identify all these factors, as there is almost no phenomenon in economic life, social life or life in general, that does not affect performance. It can be pointed out to two main factors that affect the performance of individuals, and these factors are:

- ✓ **Internal factors**: They are all that the institution contains of multiple functions and different means, and they consist of several factors:
  - • The human element: It constitutes the most important resource in the organization, because of its effectiveness and dynamism affecting all production processes, and in terms of its role in making decisions and quick solutions to various situations. The human element is the basis for determining the quality, quantity and cost of production.
  - • Management: The administration has major responsibilities of great importance in the effective use of all the resources. That are under the control of the institution. and it is said, that more than 75% of the increase in performance rates depends on the management methods represented in planning, organizing, coordination, leadership and control, as its methods affect the All activities, so no weakness. Alternatively, the failure

of any administrative pillar will cause a deficit in the efficiency and effectiveness of the administration as a whole.

- Organizing: It includes the distribution and identification of tasks and responsibilities and the division of work. According to the disciplines, control and coordination, the degree of budgeting in the organization and the creation of the necessary changes in accordance with the new developments in the systems and methods of work, employment, the incentive system, development and training would greatly affect the performance and the achievement of goals efficiently and at higher levels.

- Work environment: There are many elements surrounding the worker during his performance of his duties and what is known as the components of the internal environment of horizontal and vertical organizational social relations. Incentive system, communication... or the so-called organizing factors, have a very important impact on the performance behavior of the human element. Irregularity in work, withdrawal, absences, accidents, and employee turnover often lead to a negative work environment.

- Nature of work: It indicates the extent of the importance of the job that the worker performs, the amount of growth and promotion opportunities available to the incumbent, and the level of saturation resulting from the job, as the greater the degree of compatibility between the worker and the work he performs, the greater his motivation and loyalty to the institution and, accordingly, productivity.

- Technical factors: Machines and equipment have a central role in influencing performance, maintenance, operating conditions of machines and equipment, availability of spare parts and performance knowledge, all of which are specific to the size and level of production capacity used.

✓ **External factors**: The external factors affecting the performance include a list of factors, including:

- Social and cultural environment: inherited customs and traditions, individual tendencies in society, illiteracy rate, and types of vocational and technical education programs.

- The political and legal environment: in terms of the nature of the political system, political stability, flexibility of regulations and legislation, and foreign policy.

- Economic environment: in terms of the general economic framework of the state (free or directed economy). (Khadija, 2022, pp. 366-367)

Figure 1-5: Factors affecting Human performance
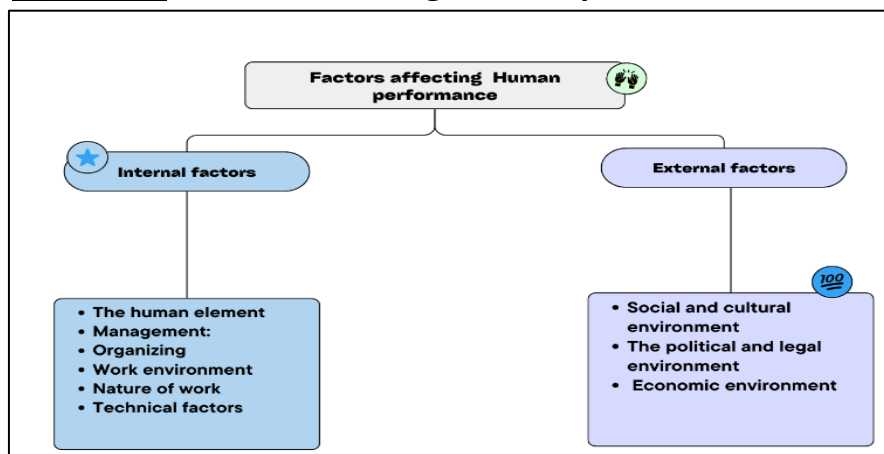
Source: prepared by the student

3. **Methods of evaluating human resource performance**: The methods of evaluating the performance of the human resource can be classified into two groups: the traditional methods and the modern methods. Before we get acquainted with them briefly, we discuss the concept of evaluating the HR performance.

   ❖ **The concept of human performance evaluation**: evaluating the performance of workers is to measure their competence, analyse and evaluate patterns and levels of their performance and determine their current and expected degree of competence as a basis for evaluation, Given the importance of human performance evaluation, it has been described as a mediator between HR management practices and the performance of the organization

   ❖ **The methods used to evaluate the human performance:** Through table (1-1), it is clear the multiplicity of methods and ways used in assessing the performance of the HR in institutions. This is due to the increasing interest in it, and the variation of methods according to the nature and activity of the institution. There are traditional methods that were applied in institutions and are still in small and medium enterprises. As for modern methods, they can be applied to any institution, no matter how large, with varying costs, and it is possible to pair between more than one method and style in one institution. (DOKKAR & BENSANIA, 2020, p. 347)

Table 1-1: Methods and styles used to evaluate the human performance (traditional, modern)

Modern methods	Traditional methods
Critical events method	Graphic gradient method
Evaluation based on results	Arrangement method
Style of management of goals	The marital comparison between two factors or the gradient method
Gradient behaviour scale	Compulsory distribution method ABC
Performance evaluation by 360º method	Lists method
	Expression of evaluation freely method

Source: (DOKKAR & BENSANIA, 2020)

Section two: practical literature on digital transformation and human performance

A. previous studies:

1. Studies on Digital Transformation:

- **Khosa Mustapha (2022) entitled**: Digital transformation and the issue of developing human resources management practices in Algeria - a field study of a group of institutions active in Algeria؛ the study aimed to identify the obstacles that prevent the digitization and development of human resources management practices and thus draw the appropriate strategy to overcome these obstacles.

  A heuristic approach was used to test organizational and individual capabilities, and a case study approach was used to study the digital maturity of Ooredoo, where a sample of 19 organizations active in Algeria in various industries was studied.

  The study found that the lack of digital competencies and the lack of leadership interest in digitizing HRM practices are among the most important barriers that prevent the development of HRM practices, in addition to the lack of digital mindsets of the leadership, and the results showed that the business environment in Algeria supports digital transformation. (Mustapha, 2022)

- **Bashir Abdel Hamid's study (2023) entitled** : The impact of digital transformation on human resources management practices in business organizations - a case study of Algerian Telecom. This study aimed to measure the extent to which digital transformation in its various dimensions (operational digital management, relational digital management, transformational digital management) contributes to improving human resources management practices at Algerian Telecom.

  The quantitative and qualitative methods were combined using a questionnaire distributed to a simple random sample of 219 individuals working at the organization, and the data were analyzed using spss v26. The study found that there is an impact of digital transformation in its various dimensions on the human resource management practices at Algerian Telecom. (Hamid, 2023)

- **The study of Denis Zolinski (2023) entitled** : Digital transformation and business model innovation: A multiple case study of retail chains in Germany
  This thesis examines how the digital revolution has affected German grocery stores in particular and the country's retail sector as a whole. This study illuminates the connection between digital transformation and business model innovation in the retail industry using various qualitative research techniques, including expert interviews with Company A and Company B and a thorough

literature analysis. The findings draw attention to the enabling elements, which include strong leadership commitment, successful change management, engagement with external partners, availability of resources and competencies, and a customer centric emphasis. Legacy systems, talent shortages, poor IT infrastructure, and cultural barriers are a few of the reported difficulties. By evaluating these elements, the study offers valuable perceptions and suggestions for retail businesses seeking to negotiate the challenges and take advantage of the advantages of digital transformation and business model innovation. The study adds to the body of knowledge by providing actual data and case studies that deepen the comprehension of how business model innovation in the retail sector interacts with digital transformation. This thesis offers concrete solutions to improve operations and preserve competitiveness in the constantly changing consumer products industry. It is an invaluable resource for retail organizations looking to stimulate business model innovation and drive digital transformation. (Zolinski, 2023)

- **The study of Rleid Abdelkrim and Mustapha Othmani(2023) entitled**: An analytical study of the requirements of digital transformation in the Algerian university after the COVID19 pandemic in light of the dimensions of digital transformation.

This study aimed to know the reality of digital transformation in one of the most sensitive sectors in Algeria, the higher education sector, in light of the "COVID-19" crisis, by providing a theoretical presentation to understand the variables of the study, through which the basic requirements for analyzing the reality of digital transformation in Algerian universities were identified, and aimed to provide a vision of the process of transformation in Algerian universities, the following results were reached: Digital transformation is an inevitable necessity in Algerian universities, with an emphasis on the importance of providing the necessary financial support to prepare human cadres and technical aspects, and providing an appropriate organizational environment. (Abdelkrim & Mustapha, 2023)

- **Al-Balushiya et al (2020) study entitled**: The reality of digital transformation in Omani organizations

This study aimed to shed light on the reality of digital transformation in the Sultanate of Oman, by identifying the roles played by different institutions in the Sultanate in the field of digital transformation and e-government, and assessing their levels of transformation, in addition to identifying the most prominent projects implemented in this aspect, in line with global trends in the field.
The study adopted a qualitative descriptive approach, using the semi-structured interview as the main data collection tool, and supported the results of the interview by analyzing the content of relevant documents from the sample institutions, where the study was applied to four governmental institutions, namely: Ministry of Technology and Communications, Ministry of Education,

Ministry of Health, Royal Oman Police, and one private sector organization, Bank Muscat. The following results were found:

The organization has made clear efforts to digitally transform

The organizations in the study sample varied in their level of transformation, but all of them contributed to Oman's progress in the level of digital transformation, according to the latest UN report for 2018.

The most prominent transformation projects in the Sultanate are infrastructure projects such as the e-certification system, the Government Integration Platform project, and other projects such as the National Cyber Safety Centre and the various SAS centers at the Ministry of Technology and Communications.

The study recommended the need to introduce and promote e-services as well as exploit the technologies of the Fourth Industrial Revolution. (AlBalushi, AlHarrasi, & Al-Aufi, 2020)

- **Mary and Oldřich (2022) study entitled** :The Digital Transformation and its major impacts on British economy

  This research examines how the digitalization of business and education in the UK is impacting economic growth. In order to conduct this study, qualitative research has been chosen. An electronic literature review was conducted with keywords for search as "digital businesses", "business operations", "virtual workplaces" "economy of UK" and "economy driven factors of UK" were considered.

  Literature reveals the UK as an early adopter of digital technologies, contributing 2.5% to the GDP through enhanced business performance. Virtual organizations expand the labor market by utilizing the online platforms and the remote workers. Since 2015, the increased workplace automation has reduced the basic roles but also expanded specialized positions, boosting the employment. However, smaller firms sometimes lack the expertise and resources to digitize, causing the shutdowns and unemployment. Studies show the small-medium enterprises (SMEs) benefiting from timely digital transitions through marketing, profitability, and also purchasing power improvements. Recommendations include governmental encouragement of the digital transitions and quantitative research comparing the traditional and digital organizations. In conclusion, significant relationships exist between the digitalizing business operations/workplaces and the Britain's economic prosperity. Timely virtualisation allows the organizations to improve the competitiveness. (Paseková & Hájek, 2022)

- **Sanaa and Halima (2023)study entitled:** The Impact of Digital Transformation on the Job Performance of Workers in Algerian Commercial Banks: A Case Study of the Commercial Bank of the State of El Tarf

  The study aims to highlight the impact of digital transformation in its three dimensions (the use of digital technologies, the digitization of bank employees,

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and the digitization of customers and their relationships) on the job performance of workers in Algerian commercial banks, and the questionnaire represented the main tool to reach the results. The study found a set of results, the most important of which are: Digital transformation affects the job performance of employees, as there is no impact of the use of digital technologies on the job performance of employees, while there is a positive impact of digitizing customers and digitizing workers on the job performance of workers at a level of morale of 5%. (sana.raheb & halima.chabbi, 2023)

- **Shinta et al (2020) study , entitled :** Impact of Digital Transformation on Employee Engagement Influenced by Work Stress on Indonesian Private Banking Sector.
  This research paper aimed to increase the awareness of banking sector companies of the risks that may arise from radical changes that occur during the transformation process. This research was conducted in a private bank in Indonesia on 448 respondents in Jakarta, which has conducted technology-based radical changes for a period of one year. This research utilises a quantitative approach using the SEM PLS method, with 25 indicators from various international journals. The results showed that the 25 indicators used in this study were able to develop each of the latent variables, showed that work pressure has a negative impact on employee engagement, and as an implied effect, it was suggested that more research be conducted on the issues discussed. (Winasis, Wildan, & Sutawidjaya, 2020)

- **Josè Manuel et al (2023) study , entitled :** The impact of digital transformation on talent management.
  This study analyses the influence of digital transformation on talent management processes. In an effort to determine whether companies make different investments in each, we analyse talent management by separating the variables that attract and retain talent. The sample under study is made up of 314 Spanish companies who are currently undergoing the process of digital transformation. Company data were obtained through a questionnaire answered by managers of these organizations. The statistical technique used to test the model assumptions was a structural equation model. The results obtained lead us to accept the model hypotheses. The organizational changes brought about by digital transformation are thus seen to influence talent management and to attract and retain talent.

- **Rawan Masoud and Sarah Basahel(2023) study, entitled:** The Effects of Digital Transformation on Firm Performance: The Role of Customer Experience and IT Innovation.
  This study empirically investigated the effect of digital transformation on firm performance by classifying the capabilities required to realize digital transformation, customer experience, and IT innovation. A structured

questionnaire was used to collect data from 164 representatives of service sector firms in Saudi Arabia, namely chief information officers, chief transformation officers, and IT managers. Based on the findings of this study, it is evident that digital transformation, customer experience, and IT innovation positively impact a firm's performance, with customer experience exhibiting the strongest effect. (Rawan & Basahel, 2023)

2. Studies on human performance:

- **Belkaid Mohammed Jawad (2019) study , entitled :** The role of social responsibility and business ethics in increasing the performance of human resources - an applied study of a sample of organisations in Western Algeria**.** This study aims to identify the impact of social responsibility and work ethics on the performance of the human element in Algerian economic institutions by distributing a questionnaire to a segment of workers in a sample of institutions and the results were analysed by structural equations using PLS SMART software. The results of the study were that the dimensions of social responsibility positively affect the performance of human resources and work ethics increase the performance of human resources**.** (Jawad, 2019)

- **Suharno et al (2017) study, entitled:** Factors affecting employee performance of PT.Kiyokuni Indonesia.
  This study aims to examine, analyze and explain the influence of leadership style, motivation and discipline to employee performance simultaneously and partially at PT. Kiyokuni Indonesia.
  The primary data used in this study come from questionnaire on respondents' motivation, discipline, leadership style and employee performance. From 451 people as the population, 82 respondents who met the criteria as a sample were chosen by using the Slovin formula. The analytical method used is multiple linear regression analysis using SPSS Version 22.
   The results of this study indicate that there is a positive and significant influence simultaneously between leadership style, employee motivation and discipline on employee performance. The results also show that there is a positive and significant influence partially between leadership style, employee motivation and discipline on employee performance. Discipline is the variable of the most powerful influence on employee performance, so it needs special attention. (Suharno, Sarjana, & Muchtar, 2017)

- **Nasser et al (2016) study, entitled**: The Impact of Human Resources Management on Employee Performance: Organizational Commitment Mediator Variable.
  This study aims to examine the impact of the human resource management (HRM) policies on the organizational commitment and the performance of the employees at Jumhoruia bank in Libya. The study encompasses the policies factor as an independent variable and the factor of employee performance as a dependent variable. This study also intends to investigate the role of

"organizational commitment" as a mediator variable between the polices of (HRM) and the performance of the employee, and to achieve these aims, the researchers have used the descriptive analytical method (quantitative) which represented using (CFA) in order to verify the structural truth of the study factors reaching to use (SEM-AMOS). The study is targeting all employees working in Jumhoruia bank, the headquarters and the branches in the capital city of Libya, Tripoli The study has concluded with many results, and one of the most important results is that, there is a positive relationship between the (HRM) and the employees' performance. The study also found that there is an indirect positive effect to the (HRM) through the organizational commitment with a percentage higher than the direct impact. the researchers recommends that all policy makers of (HRM) should pay more concern on policies and practices related to the employees which results into developing the employees' performance, also policy makers inside the bank should concentrate on emotional aspects of the employees which in turn result into a higher positive influence on their performance compared with the direct impact on their performances. (Tabouli1, Habtoor, & S., 2016)

- **Frakis Al Habib (2018) study, entitled** : This study aims to highlight the reality of human resources management and its role in improving the performance of workers in public institutions and administrations, where the researcher focused on the municipality as a model for the study. The descriptive and analytical method was used with the use of 3 different methods represented by the questionnaire, interview and observation as tools for the study in the applied aspect. This study found that the training programmes responsible for the municipal administration are very low in addition to not embodying the organisational structure and weak motivation, which according to the respondents is of great importance in raising their performance. (habib, 2018)

- **Yandra et al (2023) study, entitled:** Employee Performance: Education, Training, Experience and Work Discipline.
  This study was conducted on the basis of the purpose of determining the extent to which education, training, experience, and job discipline affect the performance of employees in the company. There is a total of 87 employees PT. Infineon Technologies Batam in this study on the number of samples more than the population and the method of sampling is census. In the research using multiple regression, the theory is tested with SPSS mathematical tools, and this study takes 6 months. Positively influenced by employee education, training, experience, and work discipline. The scope of this study is a pandemic that hinders research and there are not many variables to be evaluated. This research contributes to the analysis of management literature and provides powerful results that are available to most people. (Yandra & Nabella, 2023)

- **Dunia dif (2022) study, entitled** :
  This study aims to determine the contribution of the application of employees' empowerment strategy in improving human performance in the telecommunications sector through a case study of operators of mobile phone (Mobilis, Ooredoo, Djezzy). To achieve this purpose, the study relies on the descriptive and analytical approach, In addition to the use of the quantitative approach in the practical part, using the statistical analysis program SPSS.V26. This allowed reaching several results that revolve mainly around the existence of a relative application of the strategy of empowering workers through its psychological and structural aspects. The study also allowed ascertaining the existence of a positive impact of both psychological empowerment and structural empowerment on the dimensions of human performance (task performance, contextual performance, adaptive performance). While emphasizing that this effect is not due to demographic and functional factors. Based on the results of the study, these institutions must expand the use and direct the strategy of empowering employees according to what serves their human performance goals. (Dif, 2022)

- **Ben mery mustafa(2021) study, entitled** :
  The study aimed to identify the reality of strategic management of human resources and its role in improving the performance of employees. By addressing each strategy of human resources management and identifying its role in improving employee performance at branche antibiotique de la institution SAIDAL à Médéa, In that, a descriptive and analytical approach was followed, as it is the most appropriate approach to study the subject. The case of workers of the Medea Antibiotic Branch Saidal Corporation was studied. The results showed acceptance of all the hypotheses of the study, as it was found that the strategic management of human resources has a clear role in improving the performance of the employees of the Saidal Corporation, Antibiotic Branch in the Medea, This is evidenced by the contribution of each strategy of strategic management of human resources in improving and developing the performance of employees. (mustafa, 2021)

- **Rony et al(2024) study, entitled:** Analyzing the Impact of Human Resources Competence and Work Motivation on Employee Performance: A Statistical Perspective.
  This study aims to analyze the impact of human resources competence and work motivation on employee performance. A quantitative research methodology was employed, and multiple regression analysis was used to analyze the data. The results indicated that changes in human resources competence have a significant positive impact on employee performance, and work motivation is also significantly positively correlated with employee performance. (Rony, et al., 2024)

- **Tamirat Tafese Keltu(2024) study, entitled :** The effect of human resource development practice on employee performance with the mediating role of job satisfaction among Mizan Tepi University's academic staff in Southwestern Ethiopia.

  This study examined the effect of human resource development practices on employee performance, with job satisfaction as a mediating variable among academic staff at Mizan Tepi University. A standardized Likert-scale questionnaire was administered to academic staff members selected through stratified random sampling from eight colleges at Mizan Tepi University. Descriptive and inferential statistics, including a structural equation model and t-tests, were used for data analysis. The study found a significant positive correlation between human resource development practices and employee performance. Job satisfaction was identified as a mediator between HRM practices and employee performance. Specific dimensions of human resource development practices, such as training and development, academic career development, teamwork spirit, and counseling, had significant effects on employee performance, with both positive and negative impacts observed. Additionally, academic career development, succession planning, and counseling were found to have a statistically significant positive effect on the academic staff at Mizan Tepi University. (Keltu, 2024)

- **Yenny Rachmawati and Raden Rijanto (2024) study, entitled:** Employee performance: a predictor of job placement in large companie.

  The purpose of this study is to examine the influence of job placement on employee performance , the predictive power of job placement in exploration. The research design uses a quantitative approach, a type of survey. Primary data as the main data of the study was obtained from the respondents' answers to the instruments distributed to 50 employees, the total sample technique was selected, and a Likert scale of 1-5 was applied. The data analysis method was carried out by instrument test. For the influence test, a correlation test, calculation and analysis of the determination coefficient, and regression analysis were carried out. The findings of the study, Employee job placement has a correlation with employee performance, with the level of closeness being in a strong category, the relationship between the two is confirmed to be positive. Employee job placement has a positive correlation with employee performance, so contributing can affect employee performance . JP has a strong predictive ability towards EP. A high level of suitability of employee qualifications will be able to answer the demands of the specifications of a position or a job, then good work results can be achieved and overall employee performance is possible to meet the expectations of the company's management. (Yenny & Rijanto, 2024)

B. The position of the current study in relation to previous studies:

Commentary on previous studies: By reviewing the previous studies, we find that they varied according to their objectives, the nature of the variables they addressed, the environments in which they were conducted, and the methods used to analyze the case study data, and through the studies that have been addressed, it is clear to us the following:

All the previous studies are considered reference studies, as they all came within the subject of our study, where we find one study that analyzed the relationship between digital transformation and human performance, which is Sanaa's study, and the other nine studies studied the variable of digital transformation with other variables, and the dimensions that were adopted varied between these studies, such as Mary and Oldřich's study and Al-Balushiya et al.

As for the human performance variable, there were 10 studies, all of which agreed with my study in terms of considering human performance as a dependent variable, such as the study of Tamirat Tafese Keltu, Belkaid Mohammed Jawad, and Ben Mery Mustafa. ....

The time period of the studies varies as the time gap between the previous studies reached 9 years, the oldest of which is Nasser et al (2016) and the most recent study of Yenny Rachmawati and Raden Rijanto, Tamirat Tafese Keltu, and Rony et al (2024).

The samples used in the previous studies are workers from different companies compatible with my study, which studied the workers of Sonelgaz Ain Tamouchent.

Most of the previous studies focused on studying the relationship, role or impact between variables using a descriptive-analytical approach, relying on it with the questionnaire tool as the main tool for collecting information, in some studies a hierarchical approach and a case study such as the study of Khosa Mustapha and in another study a qualitative approach with multiple research techniques such as Denis Zolinski's study and others a quantitative approach and statistical analysis such as Yenny Rachmawati and Raden Rijanto's study.

The research gap:

After identifying and analyzing previous studies, the research gap between our study and previous studies was reached as the digital transformation variable was studied from a comprehensive perspective in some studies and in other studies it was linked with variables such as human resource management and organizational performance, but in our study we studied the impact of digital transformation on human performance and its dimensions of training, creativity and discipline.

Benefit from previous studies:

We benefited from previous studies in the theoretical framework of the research and forming a comprehensive idea about the subject of the study, as well as in preparing the questionnaire and identifying different environments and different sectors that dealt with the topic of digital transformation and human performance.

Chapter Conclusion:

Through this chapter, we have introduced the concept of the independent variable of digital transformation, highlighting its technologies and its most important dimensions, as well as introducing the concept of the dependent variable of human performance, its influencing factors (internal and external), and the method of evaluation. In addition, we presented a set of previous studies that are relevant to the topic of our study, commented on them, and identified the research gap.

Chapter Two: Applied Studies of Digital Transformation and Human Performance in Sonelgaz Institution, Ain Temouchent

Chapter Introduction:

Having concluded the first chapter, which provided a theoretical framework for digital transformation and human performance, as well as a review of previous study, this chapter aims to apply these concepts to a real-world context. By conducting a case study of sonelgaz in Ain temouchent, we seek to empirically examine the impact of digital transformation on human performance. The chapter is divided into :

Section One: Methodology and Tools Used in the Field Study

Section Two: Presentation and Discussion of Study Results

Section One: Methodology and Tools Used in the Field Study

This section contains two parts: the first is the method adopted in the study and the second is the tools and methods of the study.

A. The method adopted in the study
I. Introduction of the Case study Organization :
1. Presentation to the Directorate of Electricity and Gas Distribution Ain Temouchent:

Established in 2001, the Ain Temouchant Distribution Directorate is one of the West Directorates (sdo), as the latter is a company with shares, the Ain Temouchent Distribution Directorate is located on the road of the municipality of Chaabet El Ham (46000), and oversees the technical and commercial management of the electricity and gas distribution networks across all municipalities of the state, and has a network of 8 agencies and employs 450 employees of all professional categories.

Tasks of the Gas and Electricity Distribution Organisation of Ain Temouchent:

- ❖ Distribution of electricity and gas works
- ❖ Maintenance and development of the electricity and gas distribution network
- ❖ Ensuring safety and quality prevention, repair and maintenance of generators
- ❖ Keeping up with new technologies
- ❖ Secure the necessary funding to deliver projects
- ❖ Define the standards that apply to equipment and materials
- ❖ Contribute to the realization of the energy policy in the field of rural lighting
- ❖ Undertake investment programs to increase their capacities and enhance productivity, especially in electricity, and intensify their electricity and gas transmission networks.

Organization Objectives:

- ❖ Optimize the use of resources and technologies to continuously improve and adapt to global trends to meet national needs.
- ❖ Achieve national integration by strengthening support for the industrial base and diversifying its products.
- ❖ Participate in industrial and commercial projects abroad to be closer to the end consumer.
- ❖ Market and introduce new products to gain a larger share of the global market.
- ❖ Produce, transmit, distribute, and market electricity both domestically and internationally.

2. *Organizational Structure :*

Figure 2-1: Depicts the Organizational Structure

```
                        ┌──────────────────────┐
                        │ Distribution Manager │
                        └──────────┬───────────┘
                                   │
┌──────────────────────┐          │
│   Legal Supplement    ├──────────┤
└──────────────────────┘          │
                                   │
┌──────────────────────┐          │          ┌──────────────────────┐
│ Communication officer ├──────────┼──────────┤  General Secretariat  │
└──────────────────────┘          │          └──────────────────────┘
                                   │
┌──────────────────────┐          │
│   Security Engineer   ├──────────┤
└──────────────────────┘          │
                                   │
┌──────────────────────┐          │
│  Security Assistant   ├──────────┤
└──────────────────────┘          │
```

Commercial Relations Department	Human Resources Department	Accounting and Finance Department	Studies and Works Department
Gas Technician Department	Electrical Technician Department	Public Works Department	Deal Management Department
	Research and Development	Information Systems Management	

Source: Prepared by the student based on documents provided by the organization

We note that the organizational structure of the organization consists of:

- **Distribution Manager**: is responsible for the entire organization both internally and externally.
- **General Secretariat**: The Secretariat is responsible for transferring and receiving calls and correspondence to and from the Director, as well as preparing the installation minutes for all employees of the organization.
- **Legal Supplement**: Responsible for all legal matters pertaining to the organization.
- **Communication officer**: Responsibilities include sensitizing and educating customers, advertising, sales activation, etc.
- **Security Engineer:** is responsible for conducting comprehensive studies to determine the appropriate locations for electrical connections, ensuring compliance with safety regulations, and following up on occupational accidents.
- **Security Assistant:** is responsible for ensuring the safety and security of the organization and coordinating appropriate decisions and actions for internal security.
- **Commercial Relations Department:** is in charge of customer service and operations, including electricity and gas supply. It oversees a network of six agencies: Hammam Bouhadjar, Beni Saf, El Amria, Ain El Kihal, North Ain Temouchent, and South Ain Temouchent.
- **Human Resources Department:** plays a pivotal role in meeting the organization's needs through its people. It is responsible for managing employees, administering payroll, and developing and enhancing the skills and careers of the workforce, while ensuring compliance with organizational policies.
- **Accounting and Finance Department**: This department is considered one of the most critical departments within the directorate. It houses multiple divisions and is responsible for managing the company's finances, ensuring timely debt payments, and maximizing profits. In addition, the department oversees monthly bank and postal receipts, conducts quarterly and annual inventory audits, prepares the annual budget in June, monitors and analyzes the petty cash fund, manages employee payroll, and oversees all transactions recorded in the general journal and balance sheet.
- **The Studies and Works Department**: is responsible for receiving study requests accompanied by files from the Commercial Relations Department. The department then conducts site surveys and studies, including the preparation of necessary estimates for the project.
- **The Gas Distribution Department**: is dedicated to undertaking all works and investments related solely to gas. Its responsibilities include maintaining gas valves and measuring the stresses of steel pipelines.

- **The Electricity Distribution Department:** is responsible for the distribution of electricity, the expansion of the electrical network, and its extension to the farthest reaches.
- **Deal Management Department**: This department is responsible for awarding the company's contracts. It actively participates in financial matters and oversight activities. This department is also responsible for selecting and classifying contracting entities, as well as granting them accreditation in accordance with the applicable laws and regulations regarding public tenders and bids.
- **Information Systems Management:** This department is responsible for generating and issuing customer invoices. Its duties include processing and managing data received through automated systems, transferring information between department divisions, and implementing upgrades to the IT network and information systems. The department also maintains computer hardware, oversees all IT resources, and manages data storage on servers. Additionally, it is responsible for managing the internal communication network, ensuring continuous connectivity of all IT devices within the directorate.

II. Study sample:

The study population was selected from among the workers of Sonelgaz Company in Ain Tamouchent. For the purposes of the research, a random sample of workers was selected and 60 paper questionnaires were distributed. All questionnaires were 100% retrieved, ensuring data quality and the ability to be analyzed statistically.

III. Sources of data collection and study methodology:

1. Sources of data collection:

To fulfil the requirements of the current study, primary data collected directly from the research field was relied upon. Questionnaires were designed and distributed to a sample of the organization's employees, in addition to conducting field observations. In parallel, secondary sources such as previous studies, scientific articles, books, and reports were utilized to provide a strong theoretical framework for the study and deepen the understanding of the phenomenon studied.

2. Study methodology:

In our study, we adopted the descriptive method, which aims to study the phenomenon as it is without change in order to control the concepts related to digital transformation and human performance, based on the various available information and references. We also used the analytical method to analyze the results of the applied study using the questionnaire and then analyze and interpret the results of the questionnaire.

B. *The study tools and methods*:

I. *The study tools:*

The tools of our study were observation, which enabled us to identify some of the behaviors of the organization as well as to learn more about the nature and conditions

of work, and the questionnaire was used to collect primary information through a number of questions that are intended to provide a set of answers that obtain the statistical data we are about to collect.

Objective of the questionnaire list: The main objective is to answer the main question

Questionnaire data: We collected data through the field study by designing a paper-based questionnaire addressed to a sample of 60 individuals from Sonelgaz for different categories, consisting of two parts ;

The first part is for personal information (gender, age, educational level, job rank, seniority).

The second part related to the questions related to the study, which in turn consists of two axes :

  – The first axis is about digital transformation with a total of 12 questions;

  – The second axis is about the performance of the human element with a total of 12 questions. showing the dimensions of the questionnaire

Table 2-1: Showing the dimensions of the questionnaire

Axes	Dimensions
DIGITAL TRANSFORMATION	**Technology**
	Data
	Digital strategy
HUMAN PERFORMANCE	**Training**
	Discipline
	Creativity

Source: prepared by the student

A 5-point Likert scale was used to answer the survey questions due to its widespread use in measuring opinions, ease of understanding, and balanced scoring. This scale provides respondents with five options for each question: "Strongly Agree," "Agree," "Neutral," "Disagree," and "Strongly Disagree." Respondents were asked to mark an 'X' next to their chosen response. The scoring system assigned the following values: "Strongly Disagree" = 2 points, "Disagree" = 1 point, "Neutral" = 1 point, "Agree" = 0 points, and "Strongly Agree" = 5 points.

Table2- 2: Five-point Likert scale

Scale	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Score	1	2	3	4	5

Table2- 3: Significance level and responsiveness of mean values

Weighted average	1 to 1.80	1.81 to 2.60	2.61 to 3.40	3.41 to 4.20	4.21 to 5
Level	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Degree of response	Very low	Low	Medium	High	Very high

II. Statically methods:

To achieve the study objectives, the data collected from the questionnaire were analyzed using the statically software package SPSS. The following statically methods were applied:

− Cronbach's alpha test to measure the reliability of questionnaire items;
− Pearson correlation coefficient to measure the construct validity of the study instrument;
− The mean: Measures the central tendency of the data, indicating the average value or most common response among the study sample.
− The standard deviation: Measures the dispersion or spread of the data, showing how much the data values deviate from the mean.
− The Range: Used to measure the dispersion or spread of data, specifically the variability in responses to survey items. It is calculated as the difference between the highest and lowest values on the measurement scale. In this case, we've used a 5-point Likert scale ranging from 1 to 5. The range would be (5-1=4). This range is then divided by the number of scale points (4/5 = 0.8), and this value is added to each scale point. The resulting intervals are used to categorize responses as follows:
  ✓ [1 – 1.80[Very low
  ✓ [1.81 – 2.60[Low
  ✓ [2.61 – 3.40[Medium
  ✓ [3.41 – 4.20[High
  ✓ [4.21 – 5[Very high
− Frequencies and percentages: used to visualize the distribution of responses among the study sample.
− Analysis of variance (ANOVA)
− Simple linear regression: used to model the relationship between two variables.

3. **Reliability of the Research Instrument:** To measure the reliability of the research instrument (questionnaire), we used Cronbach's alpha coefficient. Cronbach's alpha is a measure of internal consistency, indicating the extent to which items within a test or scale are measuring the same construct. The value of Cronbach's alpha ranges from 0 to 1. A value of 0 indicates no reliability, while a value of 1 indicates perfect reliability. The following table shows:

Table 2-4: Cronbach's alpha coefficient

Axes	Dimensions	Number of Sentences	Reliability Coefficient
Digital transformation	Technology	4	0.83
	Data	3	0.71
	Digital strategy	4	0.87
Digital transformation reliability		**11**	**0.89**
Human performance	Training	3	0.66
	Discipline	4	0.86
	Creativity	4	0.70
Humane performance reliability		**11**	**0.84**
Global reliability		**22**	**0.91**

Source: **prepared by the student based on spss 21 output**

The table above shows that the reliability coefficient for the digital transformation dimension is 0.89, and for the human performance dimension is 0.84.The overall Cronbach's alpha was 0.91,(91%) indicating a high level of internal consistency for the study instrument.

Note: Item 1 was removed from both the data and training sections in order to enhance the internal consistency of the research instrument.

4. **Validity of the research instrument:**
1. **Face Validity:** To establish the face validity of the research instrument and ensure its alignment with the study objectives, it was presented to the supervisor and a panel of experts from the faculty of Economics, Management, and Business Sciences at University of Ain-temouchent. These experts were tasked with evaluating the instrument in terms of the relevance of items to the research topic, the clarity and appropriateness of the content, the linguistic clarity and presentation, the suitability of response options, the sufficiency and order of items, and any other relevant comments regarding modifications or deletions. The experts feedback was carefully considered, and the necessary adjustments were made, thus ensuring the face validity of the research instrument and confirming its suitability for measuring the intended construct.

2. **Construct Validity:** The validity of internal consistency was confirmed by studying the correlation for each of the questionnaire axes using the Pearson correlation coefficient.

❖ **Studying the sincerity of consistency for the dimensions of digital transformation:**

Table 2-5: Demonstrates the sincerity of the internal consistency of the technology dimension

N°	Sentence	Pearson correlation coefficient.	SIG
1	The organization exploits the use of modern technology that it owns to improve operations and services	0.753	0.000
2	The organization provides the appropriate electronic devices and technological tools to accomplish tasks efficiently	0.876	0.000
3	The organization develops the skills of employees in the use of modern technology	0.833	0.000
4	The organization has a digital infrastructure that supports digital transformation	0.780	0.000

Source: prepared by the student based on spss 21 output

Table 2-6: Demonstrates the sincerity of the internal consistency of the data dimension

N°	Sentence	Pearson correlation coefficient.	SIG
1	The organization has a database to collect and store data	0.582	0.000
2	The organization works on analyzing big data and advanced algorithms	0.909	0.000
3	The organization trains employees to search and retrieve data in caseof loss	0.866	0.000

Source: prepared by the student based on spss 21 output

Table 2-7: **Demonstrates the sincerity of the internal consistency of the digital strategy dimension**

N°	Sentence	Pearson correlation coefficient.	SIG
1	The organization supports the development of a clear digital strategy	0.799	0.000
2	The organization seeks to implement the digital strategy in all its business unites	0.923	0.000
3	The organization integrates the digital transformation strategy into the corporate strategy	0.909	0.000
4	The organization's senior management is committed to monitoring the progress of the digital strategy to ensure its success	0.770	0.000

Source: prepared by the student based on spss 21 output

The tables above show that all correlation coefficients for the items of the first factor, "digital transformation", are statistically significant at the 0.01 level. This indicates a high degree of internal consistency reliability for most items in the first factor, digital transformation, reflecting the validity of the construct.

❖ **Studying the sincerity of consistency for the dimensions of human performance:**

Table 2-8: **Demonstrates the sincerity of the internal consistency of the Training dimension**

N°	Sentence	Pearson correlation coefficient.	SIG
1	The training process affects all employees in the organization	0.741	0.000
2	The organization encourages employees to participate in training programs related to the digital transformation process	0.817	0.000
3	The content of the training courses corresponds to the requirements of a good job	0.756	0.000

Source: prepared by the student based on spss 21 output

Table2-9: Demonstrates the sincerity of the internal consistency of the Discipline dimension

N°	Sentence	Pearson correlation coefficient.	SIG
1	Going digital in the organization makes me more disciplined in my work than before	0.798	0.000
2	Digital technology enhances knowledge of business requirements	0.879	0.000
3	The use of digital technology has increased the speed of getting things done	0.872	0.000
4	Digital technology helps in doing work efficiently	0.841	0.000

Source: prepared by the student based on spss 21 output

Table 2-10: Demonstrates the sincerity of the internal consistency of the Creativity dimension

N°	Sentence	Pearson correlation coefficient.	SIG
1	The organization's workers have the skills to accomplish the tasks assigned to them efficiently	0.738	0.000
2	Your organization's workers have the ability to keep up with technological developments in the workplace	0.774	0.000
3	Your organization's workers have the desire to develop and innovate	0.732	0.000
4	Technology encourages me to be creative and innovative	0.648	0.000

Source: prepared by the student based on spss 21 output

The tables above show that all correlation coefficients for the items of the second factor, "Human Performance", are statistically significant at the 0.01 level, indicating a high degree of internal consistency among the items of this factor and supporting the construct validity of the measure.

Section two: Presentation and Discussion of Study Results

A. Presentation of Study Results:

In this section, we will present the most significant findings of the empirical study that were derived from the data collection, analysis, and discussion.

I. Study sample description: we will describe the characteristics of study participants based on demographic and employment variables, including gender, age, educational level, job rank, and seniority.

1. Distribution of study participants by Gender:

Table 2-11: Demonstrates the Gender distribution of the sample

Gender	Frequency	percentage
Male	45	75%
Female	15	25%
Total	60	100%

Source: prepared by the student based on spss 21 output

Figure 2-02: Demonstrates the Gender distribution of the sample
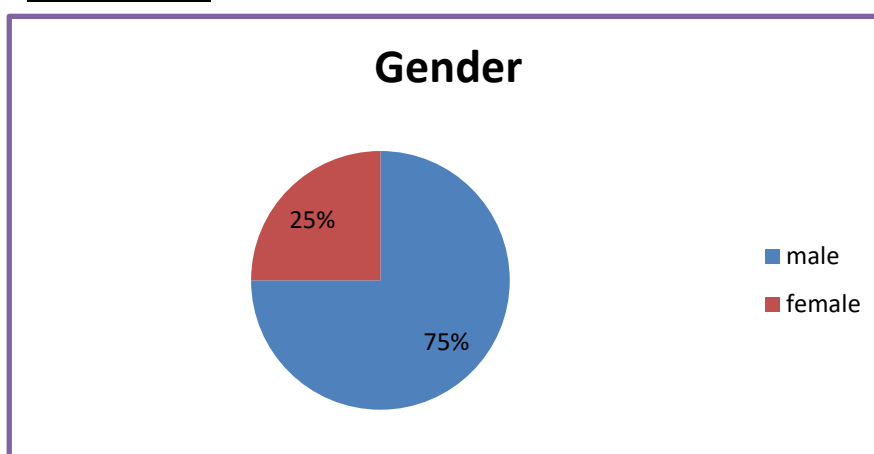
Source: prepared by the student based on spss 21 and excel output

 were male (n=45), while 25% were female (n=15). This indicates that the majority of the study sample consisted of males.

2. **Distribution of study participants by Age:**

Table 2-12: **Demonstrates the Age distribution of the sample**

Age	Frequency	percentage
20-30 yo	3	5%
31-40 yo	17	28.3%
41-50 yo	29	48.3%
50+	11	18.3%
Total	60	100%

Source: prepared by the student based on spss 21 output

Figure 2-03: Demonstrates the Age distribution of the sample
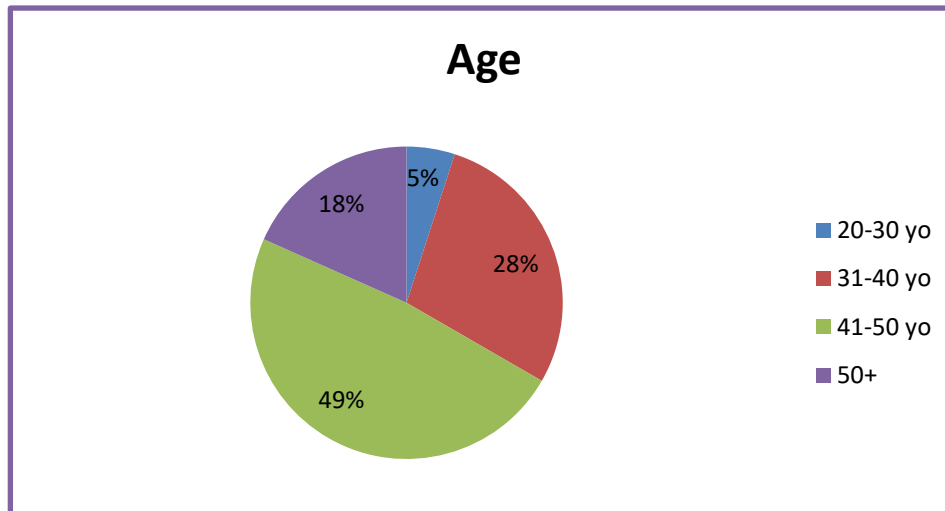
Source: prepared by the student based on spss 21 and excel output

As evident from the table and figure above, the percentage of workers aged between 20-30 years was 5% (n=3), while those aged between 31-40 years constituted 28% (n=17). The 41-50 age group represented the largest proportion at 49% (n=29), followed by the 31-40 age group. Workers aged 50 years and above accounted for 18% (n=11) of the sample. This analysis reveals that the dominant age group is 41-50 years, followed by the 31-40 years age group.

3. **Distribution of study participants by Educational level:**

Table 2-13: Demonstrates the Educationel level distribution of the sample

Educational level	Frequency	percentage
Primary	0	0%
Secondary	17	28.3%
Undergraduate	32	53.3%
Graduate	11	18.3%
Total	60	100%

Source: prepared by the student based on spss 21 output

Figure2- 04: Demonstrates the Educationel level distribution of the sample
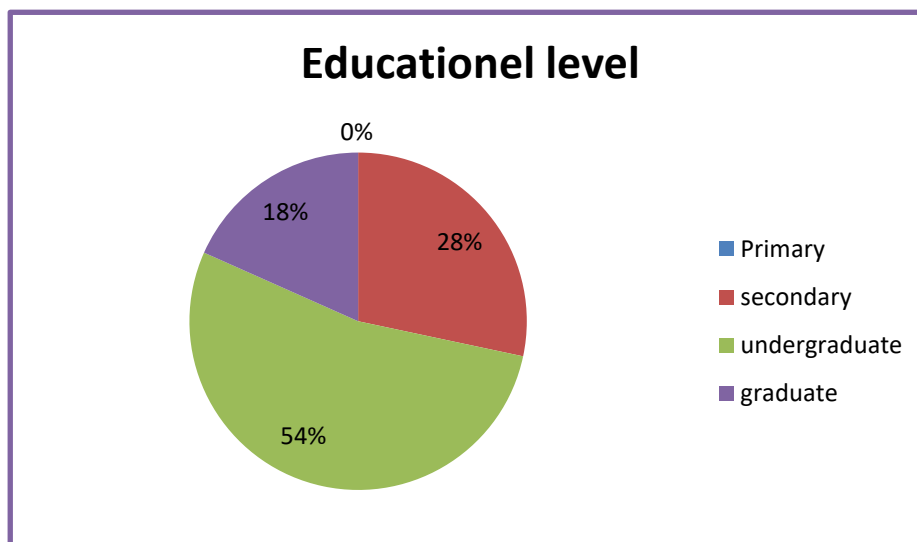
Source: prepared by the student based on spss 21 and excel output

As evident from the table and figure above, 28.3% of the workers, amounting to 17 individuals, hold a secondary school education. Meanwhile, 53.3% of the workforce, comprising 32 individuals, possesses an Undergraduate. Furthermore, 18.3% of the workers, equivalent to 11 individuals, have a Graduate. Consequently, it is clear that the majority of workers in this sample hold a Undergraduate.

4. **Distribution of study participants by Job rank:**

Table 2-14: Demonstrates the Job rank distribution of the sample

Job rank	Frequency	percentage
Implementation Assistant	7	11.7%
Skills Facilitator	21	35%
Framework	26	43.3%
High-Level Framework	6	10%
Total	60	100%

Source: prepared by the student based on spss 21 output

Figure 2-05: Demonstrates the Job rank distribution of the sample
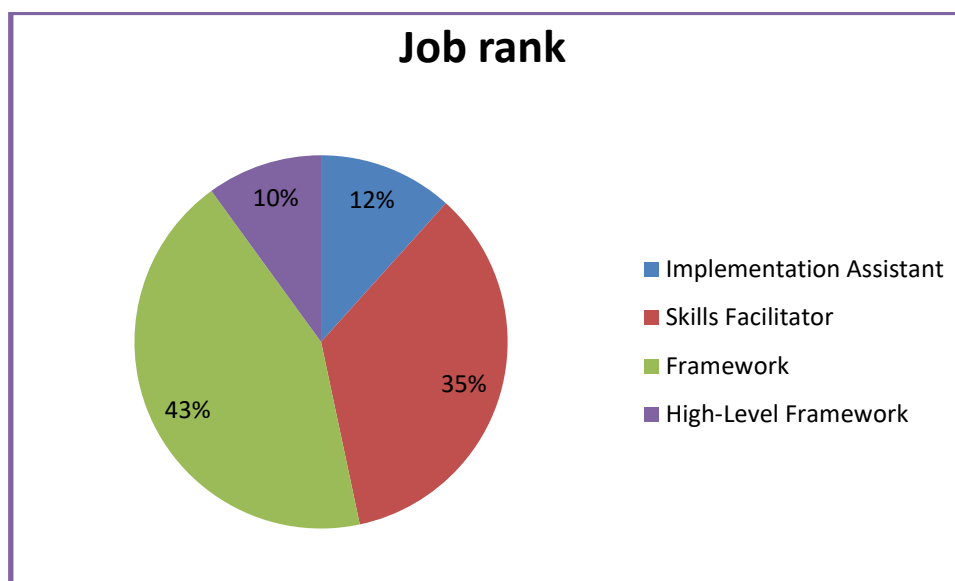
Source: prepared by the student based on spss 21 and excel output

As seen in the table and figure above, the percentage of workers with the rank of 'Implementation Assistant' was 11.7% (7 individuals), while the percentage of workers with the rank of 'Skills Facilitator' was 35% (21 individuals). Moreover, the percentage of workers with the rank of 'Framworkr' was 43.3% (26 individuals), and those with the rank of High-Level Framwork' was 10% (6 individuals). Hence, it can be observed that the majority of workers hold the rank of 'Framwork'.

5. Distribution of study participants by Seniority:

Table2-15: Demonstrates the Seniority distribution of the sample

Seniority	Frequency	percentage
Under 5 years	2	3.3%
05_14 yo	33	55%
05_14 yo	15	25%
21+	10	16.7%
Total	60	100%

Source: prepared by the student based on spss 21 output

Figure 2-06: Demonstrates the Seniority distribution of the sample
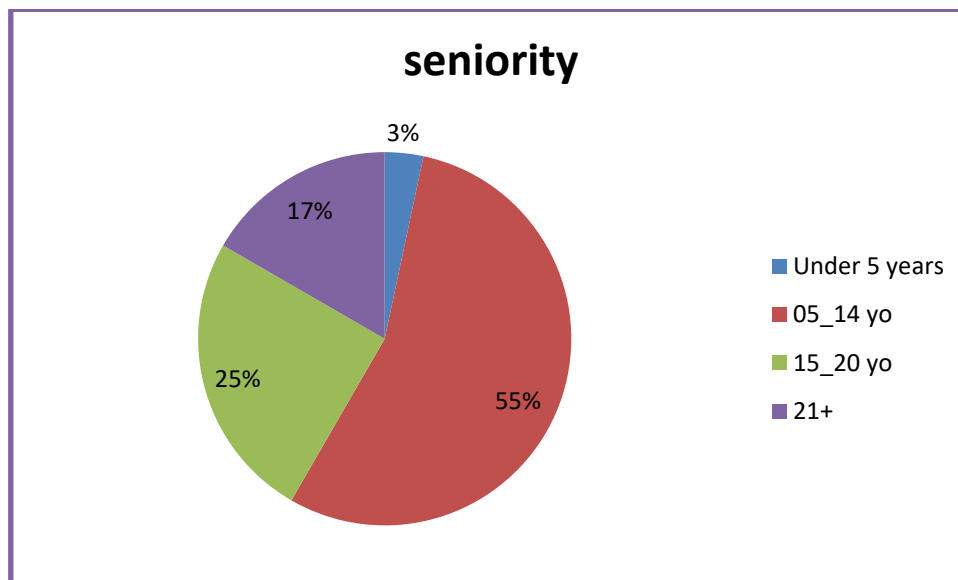
Source: prepared by the student based on spss 21 and excel output

As evident from the table and figure above, the number of employees with less than 5 years of Seniority was 2, representing 3.3% of the total. Those with 5 to 14 years of Seniority accounted for 33 employees, or 55% of the total. Employees with 15 to 20 years of Seniority numbered 15 (25%), while those with 21 or more years of Seniority totaled 10 (16.7%). Consequently, the largest group of employees falls within the 5 to 14 years of Seniority category.

II. **Statistical Data Analysis**: In this context, we will delve into the analysis of the study's axes, which are represented by digital transformation with its three dimensions (technology, data, digital strategy) and human performance with its three dimensions (training, discipline, creativity).

1. **The first axis: Digital transformation**

Table 2-16: shows the responses of the study sample members to the technology dimension

N°	Sentences	Frequencies and percentage	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Arithmetic mean	Standard deviation	Adoption rate	Ranking
technological dimension											
1	The organization exploits the use of modern technology that it owns to improve operations and services	F	2	1	2	41	14	4.07	0.800	High	1
		%	3.3	1.7	3.3	68.3	23.3				
2	The organization provides the appropriate electronic devices and technological tools to accomplish tasks efficiently	F	2	3	8	37	10	3.83	0.886	High	3
		%	3.3	5.0	13.3	61.7	16.7				
3	The organization develops the skills of employees in the use of modern technology	F	1	3.	11	36	9	3.82	0.813	High	4
		%	1.7	5.0	18.3	60.0	15.0				
4	The organization has a digital infrastructure that supports digital transformation	F	1	3	6	43	7	3.87	0.747	High	2
		%	1.7	5.0	10.0	71.7	11.7				
Weighted average								3,898	0.660	High	

<u>Source:</u> **prepared by the student based on spss 21 output**

The above table shows the ranking of the sentences of the technology dimension according to the importance of each sentence through the opinions of the study sample, where the sentence "The organization exploits the use of modern technology that it owns to improve operations and services" ranked first with a mean of 4.07and a standard deviation of 0.800, followed by the sentence "The organization has a digital infrastructure that supports digital

transformation" with a mean of 3.87and a standard deviation of 0.747, then the sentence "The organization provides the appropriate electronic devices and technological tools to accomplish tasks efficiently" with a mean of 3.83and a standard deviation of 0.886, while the sentence "The organization develops the skills of employees in the use of modern technology" ranked last with a mean of 3.82 and a standard deviation of 0.813.

We also note that the overall mean was 3,898, with a deviation of 0.660 which indicates a high level, meaning that the organization is using the necessary technology for digital transformation according to the opinions of the study sample.

Table 2-17: shows the responses of the study sample members to the Data dimension

N°	Sentences	Frequencies and percentage	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Arithmetic mean	Standard deviation	Adoption rate	Ranking
		Data dimension									
1	The organization has a database to collect and store data	F	0	2	4	41	13	4.08	0.645	High	1
		%	0.0	3.3	6.7	68.3	21.7				
2	The organization works on analyzing big data and advanced algorithms	F	1	6	17	30	6	3.57	0.871	High	2
		%	1.7	10.0	28.3	50.0	10.0				
3	The organization trains employees to search and retrieve data in case of loss	F	1	8	17	26	8	3.53	0.974	High	3
		%	1.7	13.3	28.3	43.3	13.3				
Weighted average								3.728	0.662	High	

Source: prepared by the student based on spss 21 output

The above table shows the ranking of the sentences of the Data dimension according to the importance of each sentence through the opinions of the study sample, where the sentence "The organization has a database to collect and store data" ranked first with a mean of 4.08 and a standard deviation of 0.645, followed by the sentence "The organization works on analyzing big data and advanced algorithms" with a mean of 3.57and a standard deviation of 0.871, while the sentence "The organization trains employees to search and retrieve data in case of loss" ranked last with a mean of 3.53and a standard deviation of 0.974.

We also note that the overall mean was 3.728, with a deviation of 0.662 which indicates a high level, which means that the organization cares about the data dimension according to the opinions of the study sample.

Table 2-18: shows the responses of the study sample members to the Digital strategy dimension

N°	Sentences	Frequencies and percentage	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Arithmetic mean	Standard deviation	Adoption rate	Ranking
Digital strategy dimension											
1	The organization supports the development of a clear digital strategy	F	3	4	10	36	7	3.67	0.951	High	3
		%	5.0	6.7	16.7	60.0	11.7				
2	The organization seeks to implement the digital strategy in all its business unites	F	1	6	9	38	6	3.70	0.850	High	2
		%	1.7	10.0	15.0	63.3	10.0				
3	The organization integrates the digital transformation strategy into the corporate strategy	F	1	6	9	38	6	3.70	0.850	High	2
		%	1.7	10.0	15.0	63.3	10.0				
4	The organization's senior management is committed to monitoring the progress of the digital strategy to ensure its success	F	1	5	8	38	8	3.78	0.846	High	1
		%	1.7	8.3	13.3	63.3	13.3				
Weighted average								3,713	0.742	High	

Source: prepared by the student based on spss 21 output

The above table shows the ranking of the sentences of the Digital strategy dimension according to the importance of each sentence through the opinions of the study sample, where the sentence "The organization's senior management is committed to monitoring the progress of the digital strategy to ensure its success" ranked first with a mean of 3.78and a standard deviation of 0.846 while the sentence "The organization supports the development of a clear digital strategy" ranked last with a mean of 3.67 and a standard deviation of 0.951.

We also note that the overall mean was 3.713, with a deviation of 0.742 which indicates a high level, which means that the organization cares about the digital strategy dimension according to the opinions of the study sample.

2. The second axis: Human performance

Table 2-19: shows the responses of the study sample members to the Training dimension

Training dimension											
N°	Sentences	Frequencies and percentage	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Arithmetic mean	Standard deviation	Adoption rate	Ranking
1	The training process affects all employees in the organization	F	0	10	9	32	9	3.67	0.933	High	2
		%	0.0	16.7	15.0	53.3	150				
2	The organization encourages employees to participate in training programs related to the digital transformation process	F	2	6	19	25	8	3.52	0.965	High	3
		%	3.3	10.0	31.7	41.7	13.3				
3	The content of the training courses corresponds to the requirements of a good job	F	1	6	10	32	11	3.77	0.927	High	1
		%	1.7	10.0	16.7	53.3	18.3				
Weighted average								3.653	0.727	High	

Source: prepared by the student based on spss 21 output

The table shows the ranking of the sentences of the Training dimension according to the importance of each sentence through the opinions of the study sample, where the sentence "The content of the training courses corresponds to the requirements of a good job" ranked first with a mean of 3.77 and a standard deviation of 0.927, followed by the sentence "The training process affects all employees in the organization" with a mean of 3.67and a standard deviation of 0.933, while the sentence "The organization encourages employees to participate in training programs related to the digital transformation process" ranked last with a mean of 3.52and a standard deviation of 0.965.

We also note that the overall mean was 3.653, with a deviation of 0.727 which indicates a high level, which means that the organization cares about the Training dimension according to the opinions of the study sample.

Table 2-20: shows the responses of the study sample members to the Discipline dimension

N°	Sentences	Frequencies and percentage	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Arithmetic mean	Standard deviation	Adoption rate	Ranking
	Discipline dimension										
1	**Going digital in the organization makes me more disciplined in my work than before**	F	2	5	11	35	7	3.67	0.914	High	4
		%	3.3	8.3	18.3	58.3	11.7				
2	**Digital technology enhances knowledge of business requirements**	F	1	3	7	40	9	3.88	0.783	High	3
		%	1.7	5.0	11.7	66.7	15.0				
3	**The use of digital technology has increased the speed of getting things done**	F	1	1	7	37	14	4.03	0.758	High	1
		%	1.7	1.7	11.7	61.7	23.3				
4	**Digital technology helps in doing work efficiently**	F	1	3	4	38	14	4.02	0.813	High	2
		%	1.7	5.0	6.7	63.3	23.3				
	Weighted average							3.900	0.691	High	

Source: **prepared by the student based on spss 21 output**

The above table shows the ranking of the sentences of the Discipline dimension according to the importance of each sentence through the opinions of the study sample, where the sentence "The use of digital technology has increased the speed of getting things done" ranked first with a mean of 4.03and a standard deviation of 0.758, followed by the sentence "Digital technology helps in doing work efficiently" with a mean of 4.02 and a standard deviation of 0.813, then the sentence " Digital technology enhances knowledge of business requirements" with a mean of 3.88and a standard deviation of 0.783, while the sentence " Going digital in the organization makes me more disciplined in my work than before" ranked last with a mean of 3.67 and a standard deviation of 0.914.

We also note that the overall mean was 3,900, with a deviation of 0.691 which indicates a high level, meaning that the organization cares about training, especially related to digital transformation.

Table 2-21: shows the responses of the study sample members to the Creativity dimension

Creativity dimension											
N°	Sentences	Frequencies and percentage	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Arithmetic mean	Standard deviation	Adoption rate	Ranking
1	The organization's workers have the skills to accomplish the tasks assigned to them efficiently	F	2	2	12	38	6	3.73	0.821	High	3
		%	3.3	3.3	20.0	63.3	10.0				
2	Your organization's workers have the ability to keep up with technological developments in the workplace	F	0	6	9	38	7	3.77	0.789	High	2
		%	0.0	10.0	15.0	63.3	11.7				
3	Your organization's workers have the desire to develop and innovate	F	2	3	16	30	9	3.68	0.911	High	4
		%	3.3	5.0	26.7	50.0	15.0				
4	Technology encourages me to be creative and innovative	F	0	3	8	35	14	4.00	0.759	High	1
		%	0.0	5.0	13.3	58.3	23.3				
Weighted average								3,795	0.594	High	

Source: prepared by the student based on spss 21 output

The above table shows the ranking of the sentences of the Creativity dimension according to the importance of each sentence through the opinions of the study sample, where the sentence "Technology encourages me to be creative and innovative" ranked first with a mean of 4.00and a standard deviation of 0.759, followed by the sentence "Your organization's workers have the ability to keep up with technological developments in the workplace" with a mean of 3.77 and a standard deviation of 0.789, then the sentence The organization's workers have the skills to accomplish the tasks assigned to them efficiently" with a mean of 3.73and a standard deviation of 0.821, while the sentence " Your

organization's workers have the desire to develop and innovate" ranked last with a mean of 3.68 and a standard deviation of 0.911.

We also note that the overall mean was 3,795, with a deviation of 0.594 which indicates a high level, meaning that the organization cares about the element of creativity among employees according to the opinions of the study sample.

B. Hypothesis testing:

In this context, the hypotheses of the study will be tested and discussed as required by the topic of the study:

- − **The main hypothesis**: There is a positive and statistically significant effect of digital transformation in enhancing human performance.
- − **Sub-hypotheses**:
- • There is a positive and statistically significant effect of digital transformation in enhancing training.
- • There is a positive and statistically significant effect of digitalization in enhancing discipline.
- • There is a statistically significant positive effect of digitalization in enhancing creativity.

I. Testing the main hypothesis:

H0: There is no positive and statistically significant positive effect of digital transformation in enhancing human performance.

H1: There is a positive and statistically significant effect of digital transformation in enhancing human performance.

To test these hypotheses, a simple linear regression analysis was used. The aim was to determine whether there is a statistically significant relationship te reject or accept the null hypothesis.

- • Accept the null hypothesis if the significance level value is greater than 0.05
- • Accept the alternative hypothesis if the significance level value is less than 0.05.

The mathematical model for the main effect hypothesis is as follows:

(Digital Transformation)×α+β = (Human Performance)

- • **α** : Regression coefficient of the independent variable
- • **β** :The constant represents the value of the dependent variable when the independent variables are equal to 0.

Table 2-22: Shows the results of the correlation coefficient and analysis of variance for the main hypothesis

Correlation coefficient	Coefficient of determination R²	Adjusted R²	Source of variation	Sum of squares	Mean square	Degrees of freedom	F-value	Sig
0.665	0.442	0.432	Regression	7.518	7.518	1	45.864	0.000
			Residual	9.508	0.164	58		
			Total	17.026		59		

Source: **prepared by the student based on spss 21 output**

The table above shows that the value of the correlation coefficient R = 0.665 and the value of the coefficient of determination R² = 0.442 that the independent variable (digital transformation) explains 44.2% of the dependent variable (human performance), and the table also shows that the value of F = 45.864 which explains the quality of the linear model at a significance level of 0.000 < 0.05, which indicates the presence of significant significance of the model.

Table 2-23: Results of a simple linear regression analysis of the main hypothesis

Model	Unstandardized coefficients		Standardized coefficients	t-statistic	Sig
	Regression coefficients	Standard error	Beta		
Constant	1.423	0.352		4.040	0.000
Digital Transformation	0.624	0.092	0.665	6.772	0.000

Source: **prepared by the student based on spss 21 output**

We can see from the table that the value of T=6.772 is statistically significant at a significance level of 0.000 less than 0.05

The results of the table also show that the regression coefficient for digital transformation is 0.624, which explains that the change in the value of the independent variable (digital transformation) is matched by a change of 0.624 of the dependent variable (human performance). This means that there is a positive effect of digital transformation on the human performance, thus rejecting the null hypothesis and accepting the alternative hypothesis" There is a positive and statistically significant effect of digital transformation in enhancing human performance".

Therefore, the equation can be written as follows:

(Digital Transformation)×0.624+1.423 = (Human Performance)

Figure 2-07: illustrates the standardized regression of digital transformation on human performance.
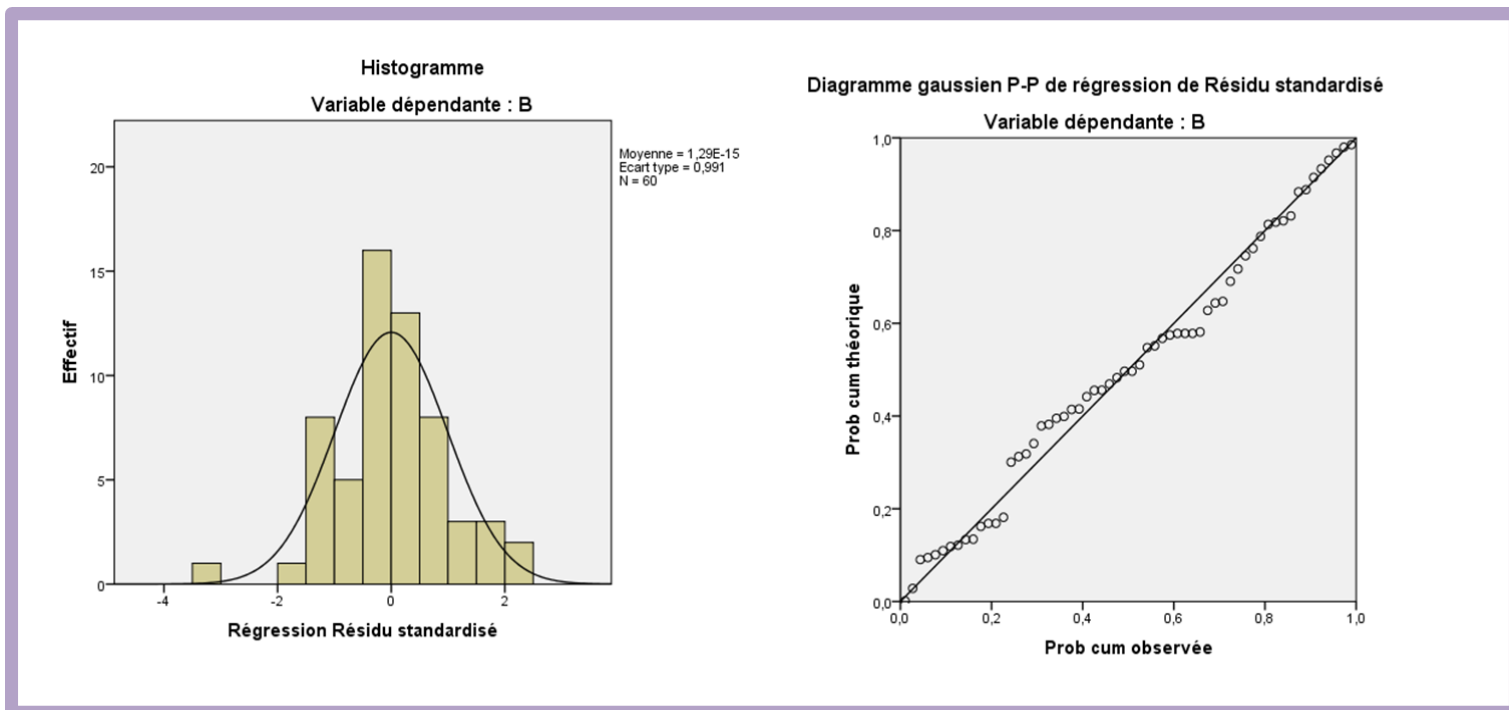
Source: prepared by the student based on spss 21 output

II. Testing Sub-hypotheses:

1. **Hypothesis 01: There is a positive and statistically significant effect of digital transformation in enhancing training.**

Table 2-24: Shows the results of the correlation coefficient and analysis of variance for the sub_hypothesis01

Correlation coefficient	Coefficient of determination R^2	Adjusted R^2	Source of variation	Sum of squares	Mean square	Degrees of freedom	F-value	Sig
0.523	0.274	0.261	Regression	8.550	8.550	1	21.889	0.000
			Residual	22.656	0.391	58		
			Total	31.206		59		

Source: prepared by the student based on spss 21 output

The table above shows that the value of the correlation coefficient R = 0.523 and the value of the coefficient of determination R^2 = 0.274 that the independent variable (digital transformation) explains 27.4% of the dependent variable (training), and the table also shows that the value of F = 21.889 which explains the quality of the linear model at a significance level of 0.000 < 0.05, which indicates the presence of significant significance of the model.

Table 2-25: Results of a simple linear regression analysis of the sub_hypothesis01

Model	Unstandardized coefficients		Standardized coefficients	t-statistic	Sig
	Regression coefficients	Standard error	Beta		
Constant	1.135	0.544		2.087	0.041
Digital Transformation	0.666	0.142	0.523	4.679	0.000

Source: prepared by the student based on spss 21 output

We can see from the table that the value of T=4.679 is statistically significant at a significance level of 0.000 less than 0.05

The results of the table also show that the regression coefficient for digital transformation is 0.666, which explains that the change in the value of the independent variable (digital transformation) is matched by a change of 0.666 of the dependent variable (Training). This means that there is a positive effect of digital transformation on Training, thus rejecting the null hypothesis and accepting the alternative hypothesis"

There is a positive and statistically significant effect of digital transformation in enhancing training".

2. **Hypothesis 02: There is a positive and statistically significant effect of digitalization in enhancing discipline**

Table 2-26: Shows the results of the correlation coefficient and analysis of variance for the sub_hypothesis02

Correlation coefficient	Coefficient of determination R²	Adjusted R²	Source of variation	Sum of squares	Mean square	Degrees of freedom	F-value	Sig
0.636	0.404	0.394	Regression	11.381	11.381	1	39.364	0.000
			Residual	16.769	0.289	58		

Source: prepared by the student based on spss 21 output

The table above shows that the value of the correlation coefficient R = 0.636 and the value of the coefficient of determination R² = 0.404 that the independent variable (digital transformation) explains 40.4% of the dependent variable (discipline), and the table also shows that the value of F = 39.364 which explains the quality of the linear model at a significance level of 0.000 < 0.05, which indicates the presence of significant significance of the model.

Table 2-27: Results of a simple linear regression analysis of the sub_hypothesis02

Model	Unstandardized coefficients		Standardized coefficients	t-statistic	Sig
	Regression coefficients	Standard error	Beta		
Constant	0.998	0.468		2.133	0.037
Digital Transformation	0.768	0.122	0.636	6.274	0.000

Source: prepared by the student based on spss 21 output

We can see from the table that the value of T=6.274 is statistically significant at a significance level of 0.000 less than 0.05

The results of the table also show that the regression coefficient for digital transformation is 0.768 , which explains that the change in the value of the independent variable (Digital transformation) is matched by a change of 0.768 of the dependent variable (Discipline). This means that there is a positive effect of digital transformation on the Discipline, thus rejecting the null hypothesis and accepting the alternative hypothesis" There is a positive and statistically significant effect of digitalization in enhancing discipline".

3. **Hypothesis 03: There is a statistically significant positive effect of digitalization in enhancing creativity**

Table 2-28: Shows the results of the correlation coefficient and analysis of variance for the sub_hypothesis03

Correlation coefficient	Coefficient of determination R^2	Adjusted R^2	Source of variation	Sum of squares	Mean square	Degrees of freedom	F-value	Sig
0.423	0.179	0.164	Regression	3.718	3.718	1	12.616	0.001
			Residual	17.093	0.295	58		
			Total	20.811		59		

Source: prepared by the student based on spss 21 output

The table above shows that the value of the correlation coefficient R = 0.423 and the value of the coefficient of determination R^2 = 0.179 that the independent variable (digital transformation) explains 17.9% of the dependent variable (Creativity), and the table also shows that the value of F = 12.616 which explains the quality of the linear model at a significance level of 0.001 < 0.05, which indicates the presence of significant significance of the model.

Table 2-29: Results of a simple linear regression analysis of the sub_hypothesis03

Model	Unstandardized coefficients		Standardized coefficients	t-statistic	Sig
	Regression coefficients	**Standard error**	**Beta**		
Constant	2.137	0.472		4.525	0.000
Digital Transformation	0.439	0.124	0.423	3.552	0.001

Source: prepared by the student based on spss 21 output

We can see from the table that the value of T=3.552 is statistically significant at a significance level of 0.001 less than 0.05

The results of the table also show that the regression coefficient for digital transformation is 0.439 , which explains that the change in the value of the independent variable (Digital transformation) is matched by a change of 0.439 of the dependent variable (Creativity). This means that there is a positive effect of digital transformation on the Creativity, thus rejecting the null hypothesis and accepting the alternative hypothesis" There is a statistically significant positive effect of digitalization in enhancing creativity".

Chapter Conclusion:

This chapter explores the impact of digital transformation on various aspects of human performance, including training, discipline, an creativity, within the sonelgaz company in Ain temouchent. The empirical study focused on employees from diverse professional backgrounds within the company.The chapter commences with a brief introduction to the company. Data was collected primarily through a questionnaire, supplemented by observation and different documents obtained from the company. Ater the reliability and validity of the study instrument, the collected data was analyzed using appropriate statistical methods via SPSS21.

General Conclusion

General Conclusion:

Through the study and analysis of this topic, we concluded that digital transformation is one of the main issues that affect the performance of humans and organizations, and its importance lies in the fact that it has become one of the most important requirements for the progress and development of today's organizations.

For today's organizations, it is no longer seen as a means used by some organizations according to certain circumstances, which once it passes, all efforts return to a state of stagnation and stability. Digital transformation is defined as a process of radical change through the adoption of a set of modern digital technologies that aim to improve efficiency and effectiveness. Through this applied aspect, we tried to study the impact of digital transformation on human performance and its dimensions (training, discipline, creativity) at Sonelgaz Ain Tamouchant, and to test whether the main hypothesis and sub-hypotheses are true or not by unpacking the data of the questionnaire and processing it by relying on the SPSS program.

After analyzing the responses of the sample members, we reached a set of results, including:

- There is a positive and statistically significant effect of digital transformation in enhancing human performance in Sonelgaz Ain Tamouchent, where the independent variable (digital transformation) was able to explain 0.624 of the changes in the dependent variable (human performance).
- There is a positive and statistically significant effect of digital transformation on enhancing training .
- There is a positive and statistically significant effect of digital transformation on enhancing discipline.
- There is a statistically significant positive effect of digital transformation in enhancing creativity.

Recommendations:

- Provide the necessary technology for digital transformation to improve processes and services and accomplish tasks efficiently.
- Provide a database for data collection and storage
- Moving towards integrating the digital transformation strategy into the organization's strategy
- Provide training programs related to the digital transformation process to raise the performance level of employees.
- View and benefit from the experiences of international organizations on the digital transformation process

- Attracting and attracting specialized human resources in the field of value and technology

Future research:

For future research, we suggest the following areas for future investigation:

- Comparative studies can be conducted to identify the various factors that affect the success of digital transformation in different sectors (public or private).
- Deepen the study of digital strategies
- Study the role of digital transformation in achieving competitive advantage.
- Studying the role of virtual and augmented reality in raising the performance of human resources .
- Studying the impact of the digital divide on employee performance.

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Questionnaire

Ladies and Gentlemen ,

Greeting ,

It is with great pleasure that i present to you this questionnaire which I am using to complete a Master's thesis entitled human performance in the context of adopting Digital transformation A case study of sonalgaz Ain-Temouchent Company, in order to complete this work , i need to collect as much information as possible on this topic . Therefore , i kindly ask for your assistance and cooperation in answering the questions in this questionnaire . I assure you that your informations and perspectives will remain in complete confidentiality and will only be used for the purposes of scientific research.

Submitted by :Khadraoui Fatima   **Supervised by :Dr.Nait Ibrahim**

Please mark (x) next to the answer you consider most

SECTION 1: BIO-DATA

Gender:	☐ Male		☐ Female	

Age :	☐ 20-30 yo	☐ 31-40 yo	☐ 41-50 yo	☐ 50+

Educational level :	☐ Primary	☐ Secondary	☐ Undergraduate	☐ Graduate

Job Rank :	☐ Implementation Assistant	☐ Skills Facilitator	☐ Framework	☐ High-Level Framework

Seniority:	☐ Under 5 years	☐ 05_14 yo	☐ 05_14 yo	☐ 21+

SECTION 2: Digital Transformation

N°	Sentences	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
	Technology	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
01	The organization exploits the use of modern technology that it owns to improve operations and services					
02	The organization provides the appropriate electronic devices and technological tools to accomplish tasks efficiently					
03	The organization develops the skills of employees in the use of modern technology					
04	The organization has a digital infrastructure that supports digital transformation					
	Data	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
05	The organization works to protect and ensure data integrity and privacy					
06	The organization has a database to collect and store data					
07	The organization works on analyzing big data and advanced algorithms					
08	The organization trains employees to search and retrieve data in case of loss					
	Digital strategy	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
09	The organization supports the development of a clear digital strategy					
10	The organization seeks to implement the digital strategy in all its business unites					
11	The organization integrates the digital transformation strategy into the corporate strategy					
12	The organization's senior management is committed to monitoring the progress of the digital strategy to ensure its success					

SECTION 3: Human Perfomance

N°	Sentences					
	Training	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
13	Training programs contribute to raising the performance level of employees					
14	The training process affects all employees in the organization					
15	The organization encourages employees to participate in training programs related to the digital transformation process					
16	The content of the training courses corresponds to the requirements of a good job					
	Discipline	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
17	Going digital in the organization makes me more disciplined in my work than before					
18	Digital technology enhances knowledge of business requirements					
19	The use of digital technology has increased the speed of getting things done					
20	Digital technology helps in doing work efficiently					
	Creativity	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
21	The organization's workers have the skills to accomplish the tasks assigned to them efficiently					
22	Your organization's workers have the ability to keep up with technological developments in the workplace					
23	Your organization's workers have the desire to develop and innovate					
24	Technology encourages me to be creative and innovative					