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CORPORATE FINANCIAL MANAGEMENT

The Impact of Digital Transformation on A Company's Financial Performance

Case study: El Wataniya Telecom Algeria (Ooredoo)

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Abstract

This study examines the impact of digital transformation on the financial performance of Ooredoo Algeria by adopting a quantitative methodology based on a questionnaire as the primary data collection tool. A total of 202 responses were collected from employees across various departments of the company and analyzed using IBM SPSS software, enabling precise statistical analyses. Additionally, the DuPont analysis method was employed as an advanced financial tool to analyze Ooredoo Algeria's financial performance in comparison with its competitors in the telecommunications sector. This method allowed for the decomposition of financial performance components and their linkage to the overall context of digital transformation within the company.

The results revealed a significant and positive impact of the dimensions of digital transformation on financial performance. The adoption of digital tools, training in digital innovation, and digital customer experience contributed to enhancing profitability, growth, and cost management efficiency. The study emphasizes the necessity of adopting effective strategies in training in digital innovation to enhance employee skills and improve the company's financial performance.

Keywords : Digital transformation, financial performance, digital tools, digital training, digital innovation, employee skills.

Résumé

Cette étude examine l'impact de la transformation digitale sur la performance financière d'Ooredoo Algérie en adoptant une méthodologie quantitative basée sur un questionnaire comme principal outil de collecte de données. Un total de 202 réponses ont été recueillies auprès des employés de différents départements de l'entreprise, puis analysées à l'aide du logiciel IBM SPSS, permettant des analyses statistiques précises. Par ailleurs, la méthode d'analyse DuPont a été utilisée comme un outil financier avancé pour analyser la performance financière d'Ooredoo Algérie en comparaison avec ses concurrents dans le secteur des télécommunications. Cette méthode a permis de décomposer les composantes de la performance financière et de les relier au contexte global de la transformation digitale au sein de l'entreprise.

Les résultats ont révélé un impact significatif et positif des dimensions de la transformation numérique sur la performance financière. L'adoption des outils numériques, la formation à l'innovation digitale et l'expérience client digitale ont contribué à améliorer la rentabilité, la croissance et l'efficacité de la gestion des coûts. L'étude souligne la nécessité d'adopter des stratégies efficaces en matière de formation à l'innovation digitale afin de renforcer les compétences des employés et d'améliorer la performance financière de l'entreprise.

Mots clés : Transformation digitale, Performance financière, Outils digitaux, Formation et innovation digitale, Expérience client digitale, Compétences des employés.

ملخص

تتناول هذه الدراسة تأثير التحول الرقمي على الأداء المالي في شركة أوريدو الجزائر، من خلال اعتماد منهجية كمية قائمة على الإستبيان كأداة رئيسية لجمع البيانات. وقد تم جمع 202 إجابة من موظفي الشركة في مختلف الأقسام، وتم تحليلها باستخدام برنامج IBM SPSS ، مما أتاح إجراء تحليلات إحصائية دقيقة. كما استُخدمت طريقة تحليل دوبونت DUPONT كأداة مالية متقدمة لتحليل الأداء المالي لشركة أوريدو الجزائر مقارنة بمنافسيها في قطاع الاتصالات، حيث مكّنت هذه الطريقة من تفكيك مكونات الأداء المالي وربطها بالسياق العام للتحول الرقمي داخل الشركة. أظهرت النتائج وجود تأثير إيجابي وملحوس لأبعاد التحول الرقمي على الأداء المالي، إذ ساهم اعتماد الأدوات الرقمية، والتدريب والابتكار الرقمي، وتجربة العميل الرقمية، في تعزيز الربحية والنمو وكفاءة إدارة التكاليف. وتؤكد الدراسة ضرورة تبني استراتيجيات فعّالة في التدريب والابتكار الرقمي بهدف تعزيز مهارات الموظفين وتحسين الأداء المالي للمؤسسة.

الكلمات المفتاحية: تحول رقمي، أداء مالي، اعتماد الأدوات الرقمية، تدريب وابتكار رقمي، تجربة العميل الرقمية، مهارات الموظفين.

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LIST OF ABBREVIATIONS

3G: 3rd Generation Mobile Telecommunications

4G: 4th Generation Mobile Telecommunications

AI: Artificial Intelligence

ARPCE: Authority of Regulation of Post and Electronic Communications

ATM: Algérie Télécom Mobilis

CAPM: capital asset pricing model

CM: Crédit moyen

CRM: Customer Relationship Management

DG: General Direction

DRC: Democratic Republic of the Congo

DT: Digital Transformation

ERP: Enterprise Resource Planning

EVA: Economic Value Added

F&PA: Financial and Performance Analysis

Finca: Foundation for International Community Assistance

FSS: Financial Self-sufficiency

GDP: Gross Domestic Product

GSM: Global System for Mobile Communications

ICT: Information and Communication Technologies

IoT: Internet of Things

KIPCO: Kuwait Projects Company

KPI: Key Performance Indicator

MENA: Middle East and North Africa

MFIs : Microfinance institutions

MIX : Microfinance Information Exchange

NP : Nombre des Prêts

OTA : Djezzy

PF: Financial Performance

PGR: Profit Growth Rate

PM: Profit Margin

Qtel: Qatar Telecom

RNOA: Return on Net Operating Assets

ROA: Return on assets

ROE: Return on equity

SEM-PLS: Structural Equation Modelling with Partial Least Squares

SMEs: Small and medium enterprises

SP: Social Performance

SPA: Société par actions

SPSS: Statistical Package for the social sciences

SWOT: Strengths, Weaknesses, Opportunities, and Threats

USD: United States Dollar

WTA: El Wataniya Telecom Algeria

Introduction

Background and importance of the research

In the current context of a rapidly evolving digital economy intertwined with the dynamics of modern business environments, digital transformation has emerged as a pivotal factor reshaping work processes and directly impacting the financial performance of organizations (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013); (kane et al, 2015); (Vial, 2019). Over the past two decades, studies demonstrated that the adoption of digital technologies, the development of employees' digital capabilities, and the enhancement of the digital customer experience constitute key dimensions of successful digital transformation (Fitzgerald et al, 2014); (Hess et al, 2016); (Sebastian et al, 2017). However, many organizations face significant challenges in implementing these transformations, such as weak digital strategies, resistance to change, and a shortage of digital skills, which hinder the realization of the anticipated financial benefits. (Matt, Hess, & Benlian, 2015)

At the same time, growing research suggests that the absence of a comprehensive and in-depth understanding of the impact of digital transformation on financial performance remains a major barrier to enhancing digital management practices, particularly in emerging markets undergoing rapid technological shifts (Li et al, 2020) (Susanti et al, 2021) Evaluating financial performance in this context requires a holistic approach that accounts for the indicators of profitability, growth, and cost management, factors that reflect the effectiveness of digital transformation in enhancing organizational value (Chen et al, 2020) (Kaplan & Norton, 1996)

Despite the increasing attention given to digital transformation in the private sector, many organizations still suffer from a lack of precise data and analysis clarifying the relationship between the dimensions of digital transformation and financial performance, which limits their ability to make informed strategic decisions (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013). Therefore, this study aims to address this knowledge gap by analyzing the impact of the dimensions of digital transformation, namely the adoption of digital tools, training in digital innovation, and the digital customer experience on financial performance, with a focus on providing actionable insights applicable to the evolving business landscape.

Objectives of the study

Our study aims to:

- Measure and evaluate the impact of digital transformation dimensions (adoption of digital tools, training in digital innovation, digital customer experience) on the financial performance of Ooredoo Algeria;
- Develop reliable metrics to measure the level of digital transformation adoption and its impact on financial performance within the company;
- Analyze the company's financial performance using the DuPont analysis methodology to understand the components of financial performance and the impact of digital transformation on them;
- Evaluate the relationship between digital transformation and financial outcomes to determine how digital transformation can enhance profitability, growth, and cost management efficiency;
- Examine different perceptions and levels of satisfaction across company departments regarding the effectiveness of financial performance Compare Ooredoo's performance with its competitors in the telecommunications sector to understand the company's market position;
- Assess the digital readiness and capabilities of employees and their role in enhancing the results of digital transformation;
- This study aims to conduct a SWOT analysis of Ooredoo company to identify its strengths, weaknesses, opportunities, and threats, in order to provide a strategic foundation that helps enhance its competitive ability, support the success of digital transformation, and achieve sustainable financial performance.

Problem statement and research questions

In this context, and from the perspective of studying digital transformation as a lever to improve financial performance, this study, in line with previous research (Alrawashedh & Shubita, 2024); (Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023); (Seda, 2024); (Bocean & Vărzaru, 2023); (ED-DOUIB Amina & FAHMI Youssef, 2025); (Loso Judijanto et al, 2024); (Hattab Samia & El Achari Sanaa, 2023) , aims to answer the main research question:

To what extent does digital transformation affect financial performance?

Given the complexity of the topic, the problem statement has been divided into a set of sub-questions that address specific aspects of the relationship between digital transformation and financial performance, which are:

Q1: To what extent does the adoption of digital tools contribute to improving profitability, achieving growth, and managing costs within the organization?

The adoption of digital tools refers to the integration of advanced technologies into daily organizational processes, which enhances operational efficiency, reduces waste, and thus positively impacts profitability, growth, and cost management.

Q2: How does the digital customer experience affect the organization's financial performance indicators?

The digital customer experience reflects the quality of digital interactions between the organization and its customers; improving it increases customer satisfaction and loyalty, which supports revenue growth and better financial results.

Q3: What are the different dimensions of digital transformation?

The dimensions of digital transformation include digital tool adoption, digital skills development for employees, enhancement of the digital customer experience, and the promotion of innovation within the organization.

Q4: How is the financial performance of organizations evaluated?

Financial performance is evaluated based on a set of indicators such as profitability, growth, cost management, in addition to sector-specific metrics like average revenue per user in the telecommunications sector.

Research hypotheses

We propose the following hypotheses to address our research question, informed by the authors' work (Alrawashedh & Shubita, 2024); (Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023); (Seda, 2024); (Bocean & Vărzaru, 2023); (ED-DOUIB Amina & FAHMI Youssef, 2025); (Loso Judijanto et al, 2024)

H1: Digital transformation has a significant impact on financial performance

H0: Digital transformation has no significant impact on financial performance

H1a: Adoption of digital tools has a significant impact on financial performance

H1b: Training in digital innovation has a significant impact on financial performance

H1c: Digital customer experience has a significant impact on financial performance

Methodology and data

Our research process, grounded in positivist epistemology and employing a deductive logic, adopts a structured quantitative approach to investigate the impact of digital transformation on financial performance. Primary data were collected through a structured questionnaire administered to a sample of 202 employees strategically selected across various departments within Ooredoo. Utilizing rigorous statistical methods, including regression modeling and hypothesis testing, the study aims to analyze the causal relationships between the dimensions of digital transformation encompassing digital tool adoption, training in digital innovation, and digital customer experience and key financial performance indicators, thereby testing the formulated hypotheses.

Company choice

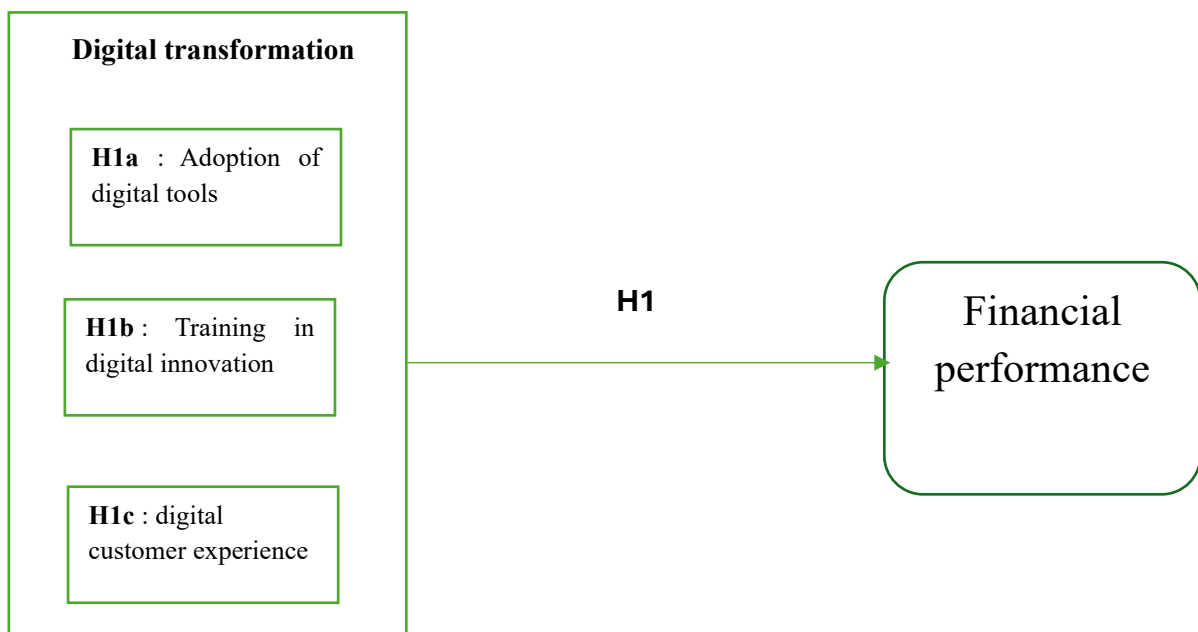
Ooredoo was selected as the central focus of our study due to its status as a private and independent company, unlike other mobile operators in Algeria that are predominantly state-controlled. This characteristic grants Ooredoo greater flexibility in making strategic decisions and adopting digital innovations, making it a suitable environment for clearly and objectively studying the impact of digital transformation on financial performance. Additionally, its private nature reflects different challenges and opportunities compared to those faced by state-owned enterprises, allowing for a deeper understanding of the mechanisms driving successful digital transformation in the private sector within the Algerian context. Therefore, Ooredoo represents an ideal model for examining the relationship between digitalization and financial outcomes in a truly competitive environment.

Research plan

The research will follow a linear structure comprising the following phases:

1. **Literature Review:** Critical analysis of existing studies on digital transformation and financial performance, with a focus on the telecommunications sector and emerging markets;
2. **Methodology:** Detailed description of the research design, data collection instruments, sampling strategy, and analytical methods;
3. **Empirical Study:** Data collection through the questionnaire, followed by statistical analysis and interpretation of results;
4. **Discussion:** Examination of findings in relation to the literature, identification of practical implications, and recommendations for Ooredoo.

Figure 1: Research model



Source: Developed by authors, based on previous studies

Chapter 01: Literature Review and Conceptual Framework

In this chapter, we will present literature related to our topic. We will also explain key concepts that help us to understand the relationship between digital transformation and the financial performance, and how digital transformation affects financial performance.

Section 01: Literature Review

To ensure clarity and consistency, the literature review is structured around the two main variables of the study. This thematic organization follows existing research approaches and serves only as a pedagogical method; it does not alter the focus of the research. The main objective of this section is to present a comprehensive review of existing studies on our topic. It will first present an overview of the key themes addressed within the literature. Then give an overview of what searchers have found regarding the digital transformation's impact on firms' financial performance. Furthermore, it will contrast available research findings, highlight weaknesses and loopholes in existing knowledge, and demonstrate additional value that this analysis produces.

1.1 Digital Transformation

(E.J.Omol, 2024) used in his article a scope review methodology based on existing literature, case studies, and relevant references. The author reviewed the most important developments of digital transformation that lie in digitization and digitalization and then digital transformation. The difference between digitization, digitalization, and digital transformation is that digitization is more or less the process of turning analog information into digital formats. This has made it possible to transfer offline processes to the digital domain, like converting paper documents into electronic files. Concerning digitalization, it refers to a broader transformation of business activities into fully digitized formats. In this period, companies relied on digital technology in many areas, such as planning, production, distribution of products and services, and the emergence of e-commerce.

As for digital transformation, the adoption of new digital technology by itself is no longer enough, so this transformation represents a redefining of business models and processes, including customer interactions, and a focus on new technologies like cloud computing, artificial intelligence, big data analytics, and the Internet of Things in a bid to drive competitiveness among businesses and organizational operations and innovation, as well as improving operations.

In the article by [\(Fadhurrahman, 2024\)](#), the author adopted an inductive approach to research study using grounded theory methodology. This methodology included a review of the literature to identify and analyze the critical components of a digital transformation and collecting and categorizing definitions of digital transformation, using VOSViewer to analyze the co-occurrence of all the terms. The researchers processed the data using thematic analysis, coding the themes and categorizing them according to their relationships. The data were analyzed qualitatively using grounded theory to develop a theory based on empirical data. The researcher believes that there is an issue in defining digital transformation, as there are conflicting definitions and overuse of terms in the academic and professional literature. The research reveals that digital transformation restructures organizational architecture by modernizing processes and enhancing productivity, responsiveness, and innovation. This technological evolution exerts significant influence across multiple organizational dimensions, reconfiguring business models, revolutionizing customer experience frameworks, and optimizing operational procedures.

In another article, [\(Revak, I. O., & Gren, R, 2022\)](#) used the analytical theoretical approach in their study, where they relied on analysis, synthesis, deduction, and observation tools in order to explain the concept of digital transformation and also identify its effects, and statistical methods such as monitoring, aggregation, and graphical presentation were used to analyze digital indicators such as the e-government index and e-participation index. This study aims to clarify digital transformation, highlighting its advantages, disadvantages, challenges, and opportunities in Ukraine. Among the findings of the researchers is that digital transformation has become a global necessity that affects both the state, organizations, and individuals. Although Ukraine has achieved remarkable progress in some digital indicators, the country still faces real challenges such as poor infrastructure, an inadequate legislative framework, a lack of financial resources, and high dependence on foreign technologies.

[\(Kim, Kim, & Kyung, 2022\)](#) examined digital transformation and the distinctions between digitization, digitalization and digital transformation. The researchers used an interpretive case study approach, which included a literature review on digital transformation and the financial sector and an analysis of the real-life cases from financial companies in Korea and overseas, where various technologies were used, such as artificial intelligence, big data, cloud computing, and blockchain. They also qualitatively analyzed the examples to derive

practical lessons and strategies. The study does acknowledge the lack of a quantitative audit to adequately validate the progress and impact of digital transformation. Among the most important findings are that in order to achieve a successful digital transformation, it is necessary to maximize the active and systematic use of advanced digital technologies that form the basis of the business and to create an organizational culture and an open communication system to share and distribute advanced technologies and competencies throughout the organization.

([ABED & HELMI, 2024](#)) used a bibliometric review to analyze Web of Science and Scopus literature on the impact of digital transformation on organizational change. The study found that digital transformation alters the shape, culture, and processes of organizations and impacts financial performance, leading institutions to evolve at a fast rate. The study contributes to the understanding of the elaborate connection between organizational transformation and digital innovation; however, it is limited to specific databases and does not contain the Moroccan setting, one of its limitations.

In his study, ([Assaj et al, 2023](#)) used the descriptive method by reviewing previous literature to explain the concept of information technology, its importance and objectives, while explaining its advantages and disadvantages. The study aimed to enrich the theoretical and applied knowledge about the impact of IT on digital transformation, e-auditing, and financial performance, and to encourage economic institutions to benefit from it. The research findings identified that IT helps in improving information management, productivity and efficiency, communication, process improvement and innovation, and security of information, hence improving sustainable development and e-learning. Literature review was used as the key source of data in the study, without making any apparent limitations.

1.2 Financial performance

Numerous studies have strived to address the topic of financial performance, exploring various aspects and measures to evaluate a company's financial standing effectively:

In his conceptual and theoretical paper, ([C.Jensen, 1967](#)) introduced a risk-adjusted performance measure, now known as Jensen's Alpha, to evaluate whether mutual fund managers could generate returns above what would be expected given the risk of their portfolios. Using the capital asset pricing model (CAPM) as a framework, he analyzed the

returns of 115 mutual funds from 1945 to 1964 to assess the managers' forecasting ability. He found that, on average, these mutual funds did not outperform a simple buy-and-hold market strategy after adjusting for risk, and there was very little evidence that any individual manager consistently beat the market beyond what could be attributed to random chance.

(R. S.Kaplan & D. P.Norton, 1992) emphasized the weakness of relying on traditional financial measures for managing and reporting performance in the organization. In an economy dominated by intangible assets, it is even more critical to understand that financial outcomes may be based on vastly different drivers. Their research focused on the importance of overall industry recession, and perseverance through uncertainty. Creating a framework for predictable evaluation and potential value creation through incorporating both financial and non-financial (unless business-as-usual) measures of success are important in managing organizational performance for the future. They also discussed the value of predictors in both operational and contextual environments. They were emphasizing to practitioners that the value creation process should be measured and evaluated as a holistic activity of measuring what impacts measurement and ultimately financial outcomes, not just measured debates.

In another study, these are the main Indicators of Financial Performance in any company.

- **Activity ratios:** measure how efficiently a company performs day-to-day tasks such as the collection of receivables and management of inventory;
- **Liquidity ratios:** measure the company's ability to meet its short-term obligations;
- **Solvency ratios:** measure a company's ability to meet long-term obligations. Subsets of these ratios are also known as leverage and long-term debt ratios;
- **Profitability ratios:** measure the company's ability to generate profitable sales from its resources (assets);
- **Valuation ratios:** measure the quantity of an asset or flow (e.g., earnings) associated with ownership of a specified claim (e.g., a share or ownership of the enterprise).

However, these indicators are not mutually exclusive; some ratios are useful in measuring multiple aspects of the business. (Thomas R. Robinson, Hennie van Greuning, Elaine Henry, Michael A. Broihahn, 2009)

(Berguiga, Philippe Adair & Imène, 2010) used an instantaneous factorial analysis of a sample of 51 MFIs in 9 MENA countries to examine the relationship between financial and

social performances. The objective of these MFIs is to achieve the best possible performance, which can be achieved when they manage to reconcile two requirements: social performance (SP) by reducing poverty and financial performance (PF) by ensuring sustainable profitability. They chose Return on Assets (ROA) as an indicator of financial performance, which is a comprehensive measure of profitability that encompasses both profit margin and institutional efficiency. Its use in financial decision-making is limited; however, because managers are less concerned with making sure their institutions have sufficient financial resources to sustain client services. ROA fails to capture subsidies but does not even correct for costs of resources. Additionally, they chose a financial management indicator called the Financial Self-sufficiency Ratio (FSS). This ratio, along with the ROA, allows monitoring and evaluation of the institution's situation and progress towards viability and profitability. It is a better indicator of the MFI's ability to grow without subsidies. However, it requires a highly detailed and harmonised accounting for all institutions. Their final indicator is the productivity of an institution's staff.

Table 1: Indicators of financial and social performances

Indicators	Definition of the indicator
Return on Assets (ROA)	After-tax net operating income / average total assets
Financial self-sufficiency ratio (FSS)	Adjusted financial income/ (financial expenses + net provisions for bad loans + operating expenses) Adjusted
Staff Productivity	Number of active borrowers / number of employees

Source : (Berguiga, Philippe Adair & Imène, 2010)

(Amokrane.A & Bekour.F, 2014) examine performance measuring indicators as a way to evaluate the competitiveness of the Algerian SMEs. They introduce the importance of SMEs in economic development and indicate Algeria's effort in promoting them. The objectives are to review the literature to present performance measuring indicators and to present a balanced scorecard for Algerian SMEs. They also present the actions of the Algerian government to help SMEs through financial and technical assistance programs aimed at improving their performance and competitiveness as SMEs under the existing realities of a globalizing economy.

Table 2 : Principal indicators of measuring performance

Analysis level	Indicator	Measured Performances
Financial	Working capital = $\frac{\text{Permanent Capital}}{\text{Fixed Assets}}$	Financial security and ability of the company to continue its activity
	Debt capacity = $\frac{\text{Own funds}}{\text{long and medium – term}}$	Ability of the company to benefit from bank loans: (financial credibility)
	$\frac{\text{Current assets}}{\text{Short – term liabilities}}$	Ability of the company to meet its short-term commitments.
Customer relationship	Customer satisfaction rate by calculating (return rate of products, number of complaints)	Ability of the company to retain customers.
	Sales to existing customers	Ability of the company to build customer loyalty.
	Rate of sales of new customers	Ability of the company to attract new customers.
Internal production and sales processes	Scrap rate; Defective product rate	Quality performance
	Level of missing production Number of equipment failures Rate of change or evolution in production	The performance given Production
	Rate of change in sales Rate of stored production in total production Rate of after-sales service in total turnover	Commercial Performance
Organizational Learning	Absenteeism rate, number of departures, number of work stoppages (strikes), number of people trained	Ability of the company to satisfy its staff and to implement participatory management

Source: (Amokrane.A & Bekour.F, 2014)

(Mihaela Brindusa Tudose, Valentina Diana Rusu, Silvia Avasilcai, 2022) employed panel data analysis for 9 years to evaluate determinants affecting five financial performance indicators (PM, PGR, ROA, ROE, EVA) in automotive firms. Through two sequential models, they established that current ratio positively influences ROE, EVA, and ROA; gearing negatively affects PM and ROA while enhancing EVA; sales growth benefits PM but diminishes ROA and EVA; and company size positively impacts PM, ROA, and EVA. The second model confirmed these relationships while revealing EVA's negative correlation with PGR and ROA. This methodologically rigorous analysis, though limited to pre-2020 automotive industry data, provides significant insights into sector-specific financial performance dynamics.

1.3 The impact of digital transformation on financial performance

There are many studies that have examined the impact of digital transformation on the financial performance of institutions in various sectors. We will present below these studies that are directly related to the subject of our study.

In their article, (ED-DOUIB Amina & FAHMI Youssef, 2025) used a regression analysis on a sample of 108 Moroccan SMEs adopting digital transformations finding that digital transformation improves not only the financial performance in terms of profitability, business and cost savings but also competitiveness, measured by innovation, customer satisfaction, and share of market. Despite its benefits, there are some obstacles that may affect the progress of this huge technological investment, such as lack of digital skills, high costs, insufficient infrastructure technologies, and inadequate infrastructure. However, their work could use a qualitative approach to further identify the key factors. Moreover, conducting similar research in other developed countries would provide additional validation of the results which helps generalizing the findings.

The article by (Alrawashedh & Shubita, 2024), discusses the effects of digital transformation on the financial performance of Jordanian commercial banks. Using a quantitative and descriptive methodology, the authors collected data from 282 employees and used regression analysis to evaluate the impacts. The study demonstrates that digital transformation has a

significant positive effect on customer experience, IT innovation, and the financial performance of banks. However, the authors emphasize that the results are specific to the Jordanian context, which limits their generalization, and that measuring the effects of digital transformation can be complex in a rapidly evolving environment

On the other hand, in the microfinance institutions, (di MBUMBA, 2024) has established on the article, using an analytic method to analyse the socio-economic and financial advantages and disadvantages of digitalization, specifically digital credits. Statistic method to study the relationship between digital credits, social performance, and financial performance. And finally, comparative method to compare the performance of the institution before and after the implementation of digital credits. The results obtained in this research framework have shown that the use of digital products by Finca influences financial performance because an increase of one percent in digital products influences the ROE and ROA of 0.069% and 0.504%, respectively. Similarly, the use of digital products by FINCA influence its social performance, because an increase in the percentage of digital products influences respectively CM and NP of 0.636% and 0.003%.

This research examines the effect of digitalization on profitability for telecommunication companies in Indonesia. For this study, a quantitative research approach is used to conduct a customer survey employing a structured questionnaire to the selected respondents amongst key important persons at telecommunication companies in Indonesia. The collected data is analyzed using Structural Equation Modelling with Partial Least Squares (SEM-PLS) to assess the dependent and independent relationships between digitalization components-network infrastructure, digital services, customer experience and operational efficiency-and profitability indicators. The results show significant positive relationships in support of digitalization initiatives that are strategically important to enhance profitability for telecommunication companies in Indonesia. (Loso Judijanto et al, 2024)

Through their article, (Touil, A., & Saidani, M., 2024) investigated digitization's influence on accounting practices in Algeria using quantitative methodology. Through SPSS analysis of survey data from 39 national respondents, they determined that accounting information systems positively impact accounting efficiency, while investments in software or technology adoption alone showed no significant effect. Their findings emphasize that technological implementation requires comprehensive organization and management within a robust accounting information system to produce high-quality financial information. This

research highlights the complementary relationship between digitization and structured information systems in generating reliable accounting outputs, though generalizability is constrained by the limited sample size.

This study examined how digital transformation affects banking institutions' financial outcomes. Employing comprehensive analysis methods, researchers determined that digitization significantly enhances financial performance through three primary mechanisms: operational improvements, cost reductions, and profitability enhancement. Results demonstrate digitization's positive impact on customer experience via streamlined digital services, transformation toward integrated financial service models, decreased operational costs through reduced physical infrastructure requirements, and accelerated growth through expanded customer acquisition channels. Despite identified challenges (cybersecurity vulnerabilities, data protection concerns, and FinTech competition), findings confirm digital transformation's critical role in optimizing banking profitability, cost efficiency, and operational effectiveness, while highlighting the necessity for robust data protection strategies. (Hattab Samia & El Achari Sanaa, 2023)

In order to understand and describe the phenomenon of digitalization and its role in achieving the financial performance of agencies of MFIs (NGONGANG et al, 2022) established their research adopting the exploratory type qualitative approach on the basis of a reasoned choice sampling, they conducted interviews with five heads of second-category MFI agencies in the cities of Yaoundé and Ngaoundéré, and the Sphinx IQ software was used for Data processing. The findings from the study indicate that the digitalization of MFIs is a rather less partnership-oriented approach, wherein the agreements are vital for the MFIs to achieve their mission. These partnerships are set to boost financial inclusion, improve customer satisfaction and, hence, improve the financial performance.

The article by (Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023) analyzes the impact of financial digital transformation on the performance of 2,566 Chinese listed companies. From a quantitative analysis with panel data regression and text mining, the authors show that digital transformation positively affects the financial performance of companies, especially by improving information symmetry and reducing operating costs. Yet they note that the results are China-specific and that it remains challenging to quantify digital transformation, which limits the generalization of their conclusions

The research by (Seda, 2024) analyzes the impact of digital transformation on the financial performance of banks in Turkey, based on a mixed methodology and content analysis of banks' non-financial reports between the years 2005 and 2023. Based on the study, digital transformation negatively influences the financial performance of public and development banks but positively affects private banks. The scope of the findings, however, is limited by the method and the specific situation of the banks under examination.

The article by (Bocean & Vărzaru, 2023) analyzes the impact of digital transformation on the economic performance and sustainability of European Union countries. The study uses advanced quantitative methods, such as artificial neural network analysis, structural equation modelling, and cluster analysis, to examine the links between the use of digital technologies (computers, Internet, e-commerce, cloud, Big Data, IoT), GDP per capita, and sustainability scores (SDGs). The results show that digital transformation has a significant positive effect on economic growth and sustainability, especially in advanced European countries. However, the study identifies limitations, including differences in access to and adoption of technologies between countries, the difficulty in precisely measuring the impact of each technology, and the risk of increasing economic and social inequalities.

1.4 Limitations of previous studies

This table summarizes key methodological approaches used in digital transformation and financial performance research, presenting various quantitative and qualitative methods alongside their specific limitations as identified in recent literature. From regression analysis to case studies, each approach reveals distinct challenges in capturing the complexities of digital transformation across different sectors.

Table 3: Limitations of previous studies

Method	Studies that used the method	Method Limitations
Regression Analysis (Quantitative)	(ED-DOUIB Amina & FAHMI Youssef, 2025)	Their research could use a qualitative approach that would allow them to deeply explore and identify the key elements that influence their topic. Moreover, replicating similar research in other developed economies will present opportunities to validate and contrast findings within other contexts and cultures.
Scope review (Literature)	(E.J.Omol, 2024)	The limitations of this research had implications for its generalizability. This research focused on the theoretical and strategic aspects of digital transformations and did not provide precise ways of implementing or measuring ways to implement a transformation. The lack of defined criteria when selecting real-life case studies also limited the representation of industries or organization sizes. Therefore, these limitations ultimately reduce the study's ability to provide comprehensive practical recommendations that can be adopted in implementing digital transformation within diverse organizations.
Bibliometric review	(ABED & HELMI, 2024)	<ul style="list-style-type: none"> - Limited to specific databases. - Moroccan context not included. - Results do not cover all environments.
Survey	(Touil, A., & Saidani, M., 2024)	Limited sample size (only 39 respondents), which could affect the generalizability of the results.
Descriptive Literature Review	(Assaj et al, 2023)	The study is theoretical and not based on empirical investigation or quantitative data.

Mixed Methods	(Seda, 2024)	<ul style="list-style-type: none"> - Findings are limited to Turkish context and specific banks. - Content analysis alone is insufficient to capture all influencing factors.
Advanced quantitative Methods	(Bocean & Vărzaru, 2023)	<ul style="list-style-type: none"> - Difficult to isolate the impact of each digital technology. - Significant disparities in digital infrastructure among European countries. - Risk of widening the digital divide.
Survey and SEM-PLS analysis	(Loso Judijanto et al, 2024)	Reliance on customer surveys may introduce bias. Furthermore, the results are context-specific to Indonesian telecom companies.
Descriptive Analysis	(Hattab Samia & El Achari Sanaa, 2023)	Sample size and data collection methods were not detailed. Moreover, challenges like cybersecurity and data protection were not deeply explored.
Panel Data (Quantitative)	(Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023)	The results obtained in this study are specific to the context of China. Furthermore, accurately measuring the multifaceted nature of digital transformation presents a significant challenge. Consequently, generalizing these findings to other countries may be difficult due to varying economic, technological, and social landscapes.
Panel Data (Quantitative)	(Mihaela Brindusa Tudose, Valentina Diana Rusu, Silvia Avasilcai, 2022)	The findings of this study are specific to the automotive sector, which limits their applicability to other industries. Furthermore, the analysis is based on data spanning from 2010 to 2019, and therefore may not reflect the most recent trends or the impact of recent global economic shifts. Consequently, the generalizability of these results is limited.
Interviews	(NGONGANG et al, 2022)	Five enterprises are a very limited representation of the total population of MFIs in Cameroon, and is only a small sample of the total population. Increasing the sample size and thinking more about the location of branches could help in the generalizability and reliability of both study designs. Additionally, the branch limitation placed on the study limits how far and deep the data collected could take us in analyzing the study.

Theoretical / Statistical Analysis	(Revak, I. O., & Gren, R, 2022)	The research has many limitations that reflect the reality of the systemic challenges to the process of digital transformation in Ukraine. The authors remarked that Ukrainian institutions lack the technological and financial capacity to develop and implement localized digital technologies. the vast majority of digital technologies are imported, highlighting clear digital dependency and weak technological sovereignty. The use of imported technologies poses a range of risks for the Ukrainian economy, including reliance on the policies of large tech companies and the threat of industrial espionage, cybercrime, and digital fraud.
Literature Review (Theoretical)	(Amokrane.A & Bekour.F, 2014)	The theoretical results presented are not supported by field data. Consequently, they may not accurately reflect practical reality.
HistoricalData Analysis	(C.Jensen, 1967)	The results of this analysis pertain to a specific historical time period, spanning from 1945 to 1964. Consequently, these findings may not be directly applicable to modern market dynamics or to other economic sectors beyond the scope of the original study. Furthermore, the analysis is purely theoretical in nature.
Theoretical Framework	(R. S.Kaplan & D. P.Norton, 1992)	The proposed framework may not be universally applicable to all types of organizations due to their diverse structures and operational contexts. Furthermore, the specific indicators within the framework might require adaptation to effectively reflect the unique characteristics and priorities of local contexts. Finally, the framework lacks direct field testing to validate its practical utility and effectiveness in real-world organizational settings.
Factorial Analysis	(Berguiga, Philippe Adair & Imène, 2010)	The application of this approach necessitates highly detailed and harmonized accounting data across all institutions, which can be challenging to obtain consistently. Furthermore, the differing institutional contexts and specificities make it difficult to generalize the findings across diverse settings.

Literature Review	(Fadhurrahman, 2024)	A significant challenge in the field is the difficulty in reaching a consensus on a unified definition of digital transformation, leading to varied interpretations. Furthermore, the theoretical results presented are not supported by quantitative data, which limits their empirical validation.
Qualitative Case Study	(Kim, Kim, & Kyung, 2022)	The study acknowledges a lack of quantitative analysis to adequately validate the progress and impact of digital transformation. Additionally, the results are specific to the selected cases of financial companies in Korea and abroad, which may limit their broader applicability.
Literature Review & Financial Analysis	(Thomas R. Robinson, Hennie van Greuning, Elaine Henry, Michael A. Broihahn, 2009)	Significant differences exist in how financial indicators are applied across various sectors, making direct comparisons challenging. Furthermore, variations in the calculation methods of these indicators between companies can further complicate the process of meaningful financial performance analysis.

Source: Developed by authors, based on previous studies

1.5 Critical synthesis of previous studies

Most previous studies have focused on sectors apart from telecommunications, such as banking (Alrawashedh & Shubita, 2024); (Hattab Samia & El Achari Sanaa, 2023); (Seda, 2024), microfinance (di MBUMBA, 2024); (NGONGANG et al, 2022), and small and medium-sized enterprises (SMEs) (ED-DOUIB Amina & FAHMI Youssef, 2025)

These studies were often conducted in different economic and regulatory environments (Jordan, Morocco, Turkey, Cameroon, China, and Indonesia), which limits the generalizability of their results to the telecommunications sector in Algeria. (Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023)

Most studies relied solely on small questionnaires or secondary data, without integrating data sources or using in-depth financial analysis. (Loso Judijanto et al, 2024)

Most studies did not address comparative analysis between companies in the same sector or financial analysis covering a long-term period.

Studies in Algeria and elsewhere have focused on the organizational or technical dimensions of digital transformation or the impact of digitization on accounting and administrative practices, without a precise link to financial performance or without specifically studying the telecommunications sector. (Touil, A., & Saidani, M., 2024)

Also, some studies sufficed with evaluating the impact of digital transformation on customer satisfaction or operational efficiency without actual financial analysis. (NGONGANG et al, 2022); (Alrawashedh & Shubita, 2024)

The study by (Loso Judijanto et al, 2024) focused on the telecommunications sector in Indonesia, but it was limited to a customer survey and an analysis of the relationship between digital transformation components and profitability, without a detailed financial analysis or a comparison between multiple companies.

The study by (Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023) concentrated on Chinese companies but did not provide an in-depth financial analysis or a comparison between companies.

- **Identifying Research Gaps:** The existing body of research presents several notable gaps. Firstly, there's a geographical sector gap, characterized by a lack of comprehensive studies specifically investigating the impact of digital transformation on the financial performance within Algeria's crucial telecommunications sector. Secondly, a methodological gap exists, as most studies tend to utilize either primary or secondary data in isolation, rarely integrating both. Furthermore, there's a scarcity of research offering comparative financial analyses among companies within the same national sector over extended timeframes. Thirdly, a financial analysis gap is evident, with prior studies often overlooking precise financial indicators like EBITDA, profit margins, and investments, and failing to establish a connection between these metrics and an organization's capacity to embrace digital transformation. Finally, a significant local context gap persists, with most previous research neglecting the unique regulatory, economic, and technological characteristics of the Algerian market.

1.6 The added value of our study

Our study contributes to filling a significant gap in the existing literature by focusing on the impact of digital transformation on the financial performance of a specific Algerian telecommunications company, Ooredoo Algeria, within the emerging telecommunications market in Algeria a context that has received limited attention in prior research. While current studies often concentrate on broad industry samples or large firms, our research offers an in-depth analysis of multiple dimensions of digital transformation, including the adoption of digital tools, training in digital innovation, and the digital customer experience, linked to employees' internal perceptions. Furthermore, our study incorporates a detailed financial performance analysis of Ooredoo and its competitors over the period 2015 to 2022, enhancing understanding of how digital transformation contributes to profitability, growth, and cost management, thereby strengthening the company's competitive position. We also pay particular attention to organizational and contextual constraints, such as time and resource limitations, which affect the implementation and measurement of digital transformation initiatives. By integrating financial data, employee perspectives, and organizational context, our comprehensive approach offers a unique contribution that enriches knowledge about the critical factors influencing the success of digital transformation in Algeria's telecommunications sector. It provides both scholars and practitioners with practical insights to design more tailored and effective digital strategies in similar environments.

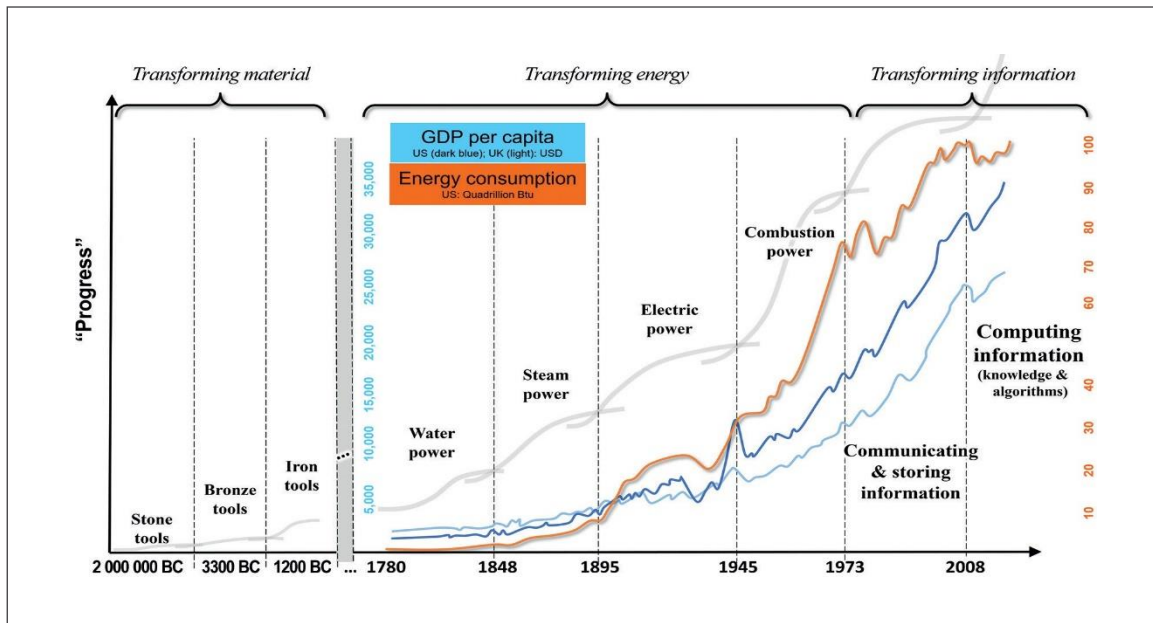
Section 2: Conceptual Framework

This section reviews the conceptual foundation of digital transformation, beginning by tracing its origins and historical development, then providing a comprehensive definition of the concept of digital transformation, and clarifying the differences in definitions between digitization, digitalization, and digital transformation. Then we're going to explore the main drivers behind the adoption of digital transformation and its particular importance for telecommunications companies. It also addresses the various dimensions of digital transformation and concludes by identifying the key elements for the success and failure of this process.

2.1. The origins and historical development of digital transformation

Digital transformation is considered part of a long series of technological revolutions that have shaped the course of human civilization. Its origin traces back to the major technological revolutions that humanity has witnessed throughout the ages, with the first revolutions occurring in the Stone, Bronze, and Iron Ages, when the important variable was the transformation of materials. This then transitioned to the second wave of societal modernization, which was represented by the industrial revolutions and the significant focus on energy transformation (i.e., water, steam, electric, and combustion). In terms of digital transformation, this third and latest wave focused on the transformation of information (the author pins the earliest stages as those that focused on communication and data storage and then eventually transitioned to the age of algorithms and artificial intelligence) and represented a transition from the transformation of information to the automated transformation of information into actionable knowledge. ([Hilbert, 2020](#))

Figure 2: Schematic presentation of Schumpeterian long waves. GDP, gross domestic product



Source: (Hilbert, 2020)

The following figure divides history into three main phases, which the author describes as meta-models, each characterized by the dominant type of technological transformation: transformation of materials, transformation of energy, and transformation of information.

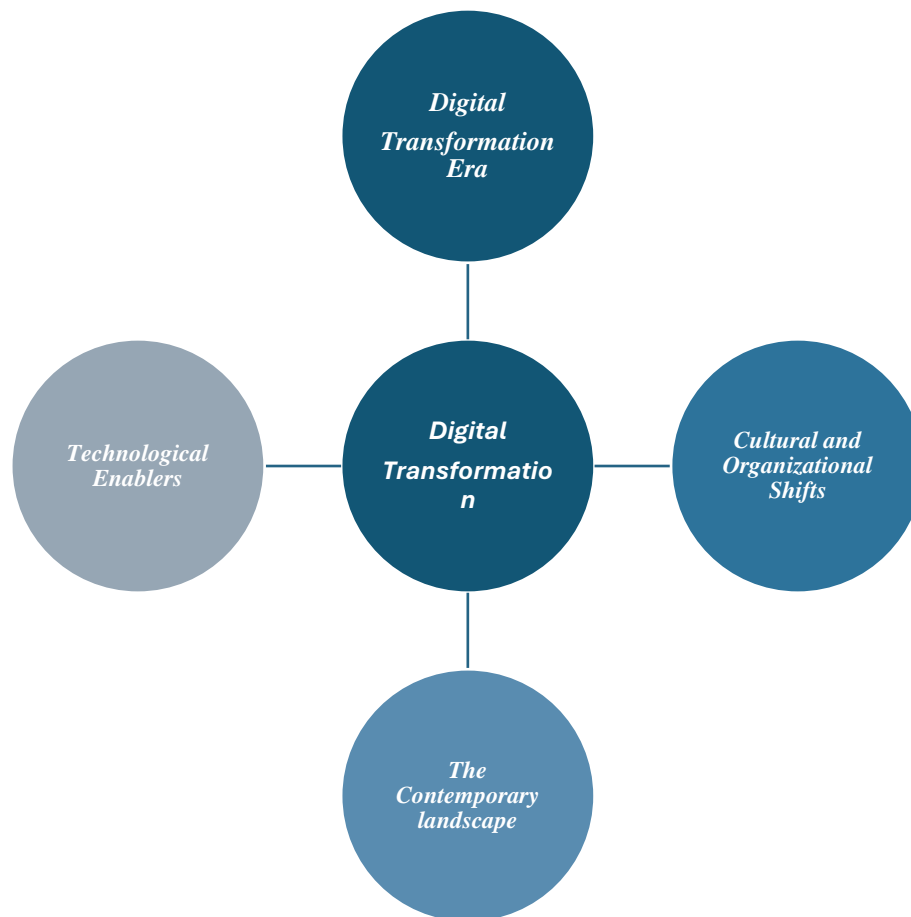
The idea of digital transformation emerged as a distinct area of academic study in 2013, as its discovery became an important part of the study of the digital economy. The term digital economy has been widely used since 1994; its origins are traced as far back as the 1960s. The term went through several important stages, starting with digitization in 1960, then digitalization in 1990, and ultimately to full digital transformation in the early 2000s. (E.J.Omol, 2024)

The first stage is digitization, which is the conversion of analog data into digital values, and this transformation made it possible to transfer offline processes to the digital domain, such as converting paper documents into electronic files. (E.J.Omol, 2024)

As for the second stage of development, Digitalization refers to a broader transformation of business activities into fully digitized formats. During this period, companies relied on digital technology in many areas, such as planning, production, distribution of products and services, and the emergence of e-commerce. (E.J.Omol, 2024)

The third stage was digital transformation, this transformation represents reimagining business models and processes, including customer interactions, and also focusing on more advanced technologies such as cloud computing, artificial intelligence, big data analysis, and the Internet of Things in order to enhance competitiveness among companies and how organizations operate and innovate, as well as improve operational efficiency. In order to shape the future horizons of digital transformation, it is necessary to focus on ethical considerations and the evolution of laws and regulations related to digital transformation, and navigating the areas of digital transformation requires understanding four contemporary senses that the research visualized in the following figure:

Figure 3: Contemporary sensations in organization digital transformation



Source: (E.J.Omol, 2024)

2.2 Definition of Digital Transformation

Multiple authors have proposed definitions of digital transformation, which we will pre

« Digital transformation is the use of technology to radically improve the performance or reach of enterprises » (Westerman, 2011)

(Siebel, 2019) established that digital transformation is the coming together of four disruptive technologies: cloud computing, big data, artificial intelligence. Internet of Things. These technologies do not operate independently but work together as a force to redefine all industries on the planet. And that digital transformation is not just the use of technology but is much deeper than that. And the best way to understand it is through real-life examples, because it is still unfolding and evolving, so even the full impact of its applications is not completely understood.

At its core, digital transformation is an iterative organizational process reflecting both evolutionary and disruptive changes that are driven by digital technology. An important component is the ability to adapt the business model, whether by integrating or leveraging new technology within the socio-technical space, leading to significant impacts on internal operations and the external customer experience. (Siebel, 2019)

Digital transformation is the use of modern digital technologies, represented by (social media, mobile phones, analytics, and embedded devices), in order to bring about substantial improvements in business, whether that be through the innovation of new business models, or by enhancing customer experience, or streamlining operational processes. (Fitzgerald, 2014), (Liere-Netheler, 2018), (Horlacher, 2016), (Singh, 2020)

« We believe that digital transformation is a business model innovation, aiming to develop new ways of creating and capturing value in the market » (Dong, 2024)

(Fadhlurrahman, 2024) defined digital transformation (DT) as a profound change process driven by digital technologies. This process aims to generate value for stakeholders through the strategic deployment of key resources and competencies. The core objective of DT is to fundamentally innovate and enhance an entity, whether it be a company, industry, organization, or society. His research indicates that the fundamental entity being transformed is linked to a specific industry, business network, organization, or society, making the

concept applicable across various contexts such as organizational, industrial, and societal levels.

According to (E.J.Omol, 2024), the adoption of new digital technology by itself is no longer enough, so this transformation represents a reimagining of business models and processes, including customer interactions, and a focus on new technologies like cloud computing, artificial intelligence, big data analytics, and the Internet of Things in a bid to drive competitiveness among businesses and organizational operations and innovation, as well as improving operations.

We can conclude from all the previous definitions that digital transformation is much more than just adopting technology and modern digital techniques. Rather, it represents a comprehensive reimagining of various business models and internal and external processes of organizations, with the aim of enhancing customer experience and achieving advancements and improvements in performance. Digital transformation also relies on the effective integration of a set of interconnected technologies such as social media and also revolutionary technologies like cloud computing and artificial intelligence, etc.

2.3 The difference between digitization, digitalization, and digital transformation

Table 4: The difference between Digitization, digitalization, and digital transformation

	Concepts	Examples
Digitization	Digitization is the process of converting analogue data to digital data (E.J.Omol, 2024), (Kim, Kim, & Kyung, 2022).	e.g. converting paper documents to electronic files
Digitalization	Digitalization is the full application of information and communication technologies to institutional processes (E.J.Omol, 2024), (Kim, Kim, & Kyung, 2022).	e.g. management, production and services.

Digital transformation	Digital Transformation is a full, radical change process involving systems, methods and culture through advanced digital technology (E.J.Omol, 2024), (Kim, Kim, & Kyung, 2022).	e.g. Adopting smart sensors to reduce operating costs and improve performance.
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Source: Developed by authors, based on previous studies

2.4 Drivers of digital transformation

Organizations are embracing digital transformation due to a wide range of interrelated factors. On the customer front, changing customer (Haffke, 2017), (Schmidt, 2017), attitudes and expectations are a prime driver, as the digital era of today requires organizations to respond to customers' requirements quickly and effectively. In addition, organizations need to keep up with the fast pace of digital changes in industries in order to remain competitive.

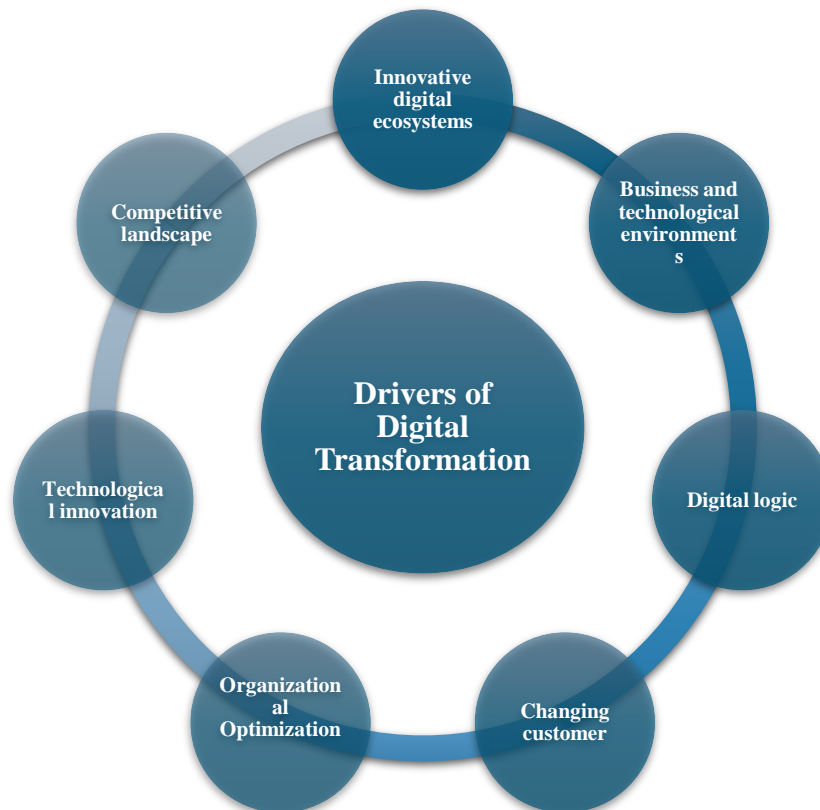
The emergence of a new competitive landscape (Berghaus, 2017) and new digital business models requires a greater degree of transformation across organizations. Relying on technological innovation (E.J.Omol, 2024) (Leite, Figueiredo, Lopes, & Passos, 2024) such as the use of artificial intelligence and big data analysis provides huge opportunities for organizations to improve operations and decision-making, and the use of the Internet of Things (IoT) and blockchain contributes to enhancing business efficiency and providing new ways to deliver services, and digital transformation also contributes to reducing operational costs through automation and data analysis. They are motivated by rapidly changing business and technological environments (Haffke, 2017), to which organizations must demonstrate continuous flexibility and adaptation to the new digital environment as well. Integrated and innovative digital ecosystems (Haffke, 2017) are also adding to the creation of new value.

Finally, organizations must also embrace a digital logic (Leite, Figueiredo, Lopes, & Passos, 2024) that focuses on the optimization of the use of data and analytics to improve organizational performance and efficiency. Overall, changing the organization to improve

performance and increase performance and efficiency (Berghaus, 2017) is the overarching driving force that combines all of these factors.

Based on the above, the key drivers of digital transformation can be concisely represented in the following figure:

Figure 4: Drivers of digital transformation



Source: Author, based on previous studies

2.5 The importance of digital transformation for telecommunications companies

According to (Caylar, 2016) and (Manda, 2020), the importance of digital transformation in the telecom sector is as follows:

- **Reinventing the Core Business:** This includes new omnichannel sales, expanding e-care, digitally transforming, and using advanced analytics to improve business. If done well, investing in digital sales can enhance revenue and reduce costs;

- **Pursuit of Adjacencies:** Digital transformation promotes exploration in adjacent sectors, such as financial services, IT services, media, and utilities that give telecoms the opportunity to diversify revenue sources dependent on telecommunications and related capabilities;
- **To Digitize Business:** Digital transformation enables organizations to streamline their internal operations and improve operational effectiveness;
- **Building Digital Capabilities:** Digital Transformation will include building people's capabilities in their areas of responsibility related to areas of analytics, artificial intelligence, and cybersecurity to truly leverage the benefits of digital infrastructure and technologies;
- **Implementing Digital transformation at Scale:** Digital transformation must occur in all parts of an organization for it to be successful;
- **Improving Efficiency and Flexibility:** Digital technologies contribute to improve efficiency and increase the firm's flexibility and speed of operations, which allows for quick response to market activities;
- **Improving Customer Experience:** Digital tools extend telecoms ability to provide more personalized customer experiences quicker and consistently, which increases satisfaction and loyalty;
- **Innovative Development:** Digital transformation presents new opportunities to develop services, and products, such as applications on 5G and IoT service platforms;
- **Update Infrastructure:** Digital transformation promotes or demands much of the old infrastructure must also be modernized to introduce digital alternatives.

2.6 Dimensions of digital transformation

Digital transformation is a complex phenomenon that has been developing rapidly across various sectors around the world. It is the use of digital technologies to better change working processes, business models, and relationships with customers. Digital transformation consists of three main dimensions, which are technological, organizational, and social dimensions. However, we see an emerging emphasis on sustainability and smart cities as dimensions to consider. Therefore, these dimensions allow organizations to shift from more

traditional working practices to a more digital way of working to stay relevant and analyzed in a digital age.

(Reis & ao, 2023) identified six dimensions and seventeen enabling categories of digital transformation based on a descriptive literature review. They considered organizational, technological, and social dimensions as the core dimensions of digital transformation, and identified sustainability and smart cities as new dimensions.

1. **Business Models:** concerning business process innovation and business strategy;
2. **Digital business:** concerning digital culture, literacy, skills, digital economy, and innovation, social and technical shared values;
3. **Technology:** Covers technology and innovation management, artificial intelligence, big data, Internet of Things, and Industry 4.0;
4. **Sustainability:** Includes sustainable business, sustainable competitive advantage, sustainable development, and sustainable innovation;
5. **Human Resources:** Prioritizing employee experience and job dynamics;
6. **Smart Cities:** Incorporating sustainable smart manufacturing and digital manufacturing. The authors thought that organizational, technological, and social factors are important for digital transformation. They also found sustainability and smart cities to be additional factors.

(Udovita, 2020) claims that there are numerous frameworks and theories on digital transformation, but most consider only aspects of the functioning business. The author argues that digital transformation should be understood as a holistic term to apply to all aspects of a business. Thus, the four dimensions identified that require consideration during the digital transformation process are:

1. **Go-to-market:** What the organization is offering to the customer and how it is marketed and distributed in the marketplace:
 - **Offering:** The change from physical offerings to digital offerings, as digital offerings can be disrupted digitally;
 - **Channel:** How the offerings are sold and reach the customer recognizes that customers utilize the market's digital channels.
2. **Engagement:** Digitalizing opportunities for engaging with key stakeholders:

- **Customers:** Digitalizing services in the customer environment to improve the customer experience.;
- **Partners:** Digitalizing engagement with suppliers, professional service firms, digital agencies;
- **Workforce:** Transformation of staff, including mobility and access to information, through cloud-based technologies, as employee's transition to a digitalized working culture.

3. **Operations:** Changing the company's operations to fit in with the digital business model:

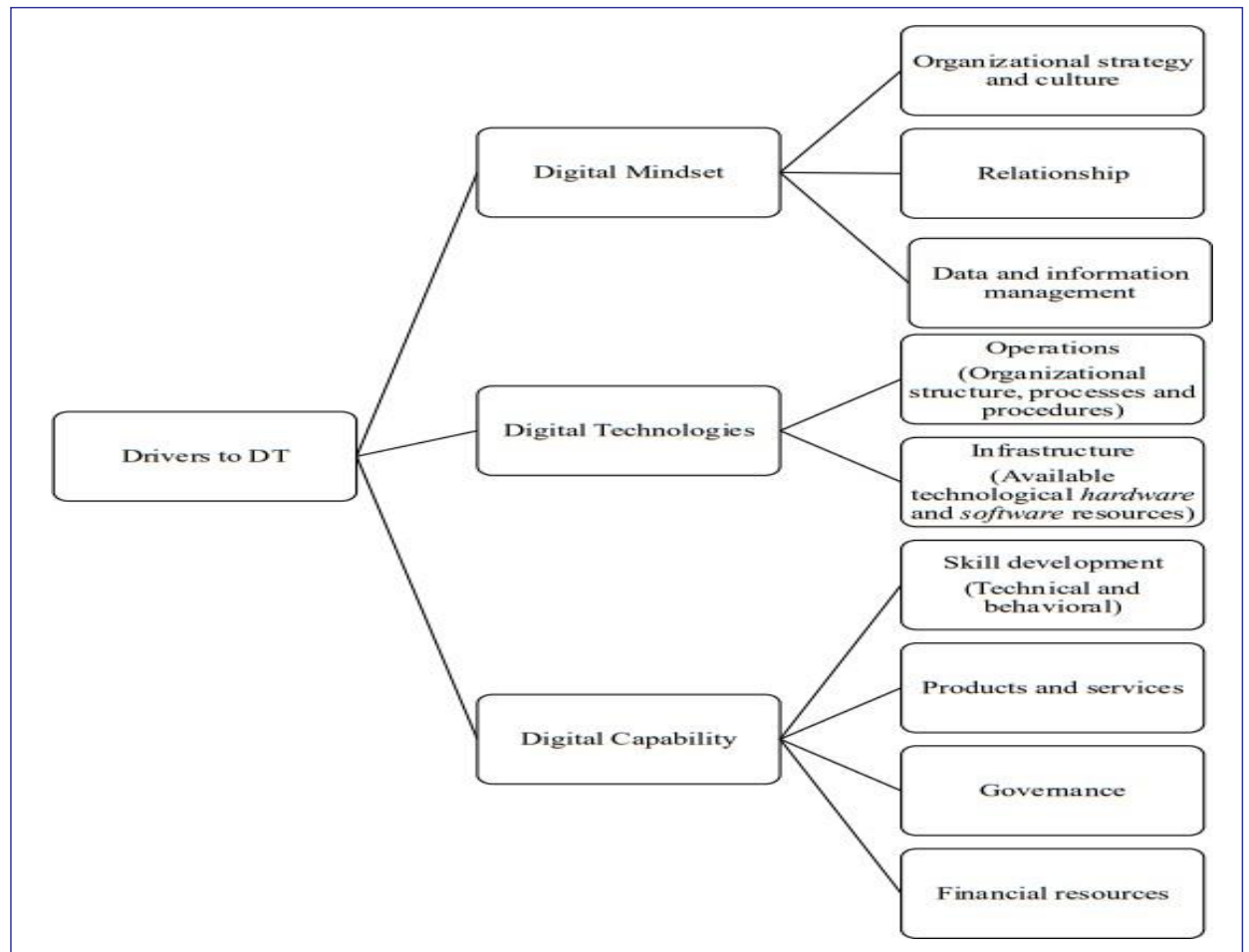
- **Business processes:** Understanding how the firm's core processes will need to change;
- **Performance management:** Aligning KPIs, incentives and reporting to reflect digital transformation.

4. **Organization:** How the organization will be structured to deliver on the transformation:

- **People:** Ensuring the right people are in the right roles and that they have the digital skills needed;
- **Structure:** Assessing the organizational structure to meet digital transformation needs, enabling collaboration and breaking down silos;
- **Culture:** Building a culture ready to pursue the development of a digital transformation by promoting innovation, agility, and a customer-focused mindset.

(Leite, Figueiredo, Lopes, & Passos, 2024) identified three drivers on which the dimensions of digital transformation in an organization are based, namely 9 dimensions; these nine dimensions are divided by the three drivers as follows:

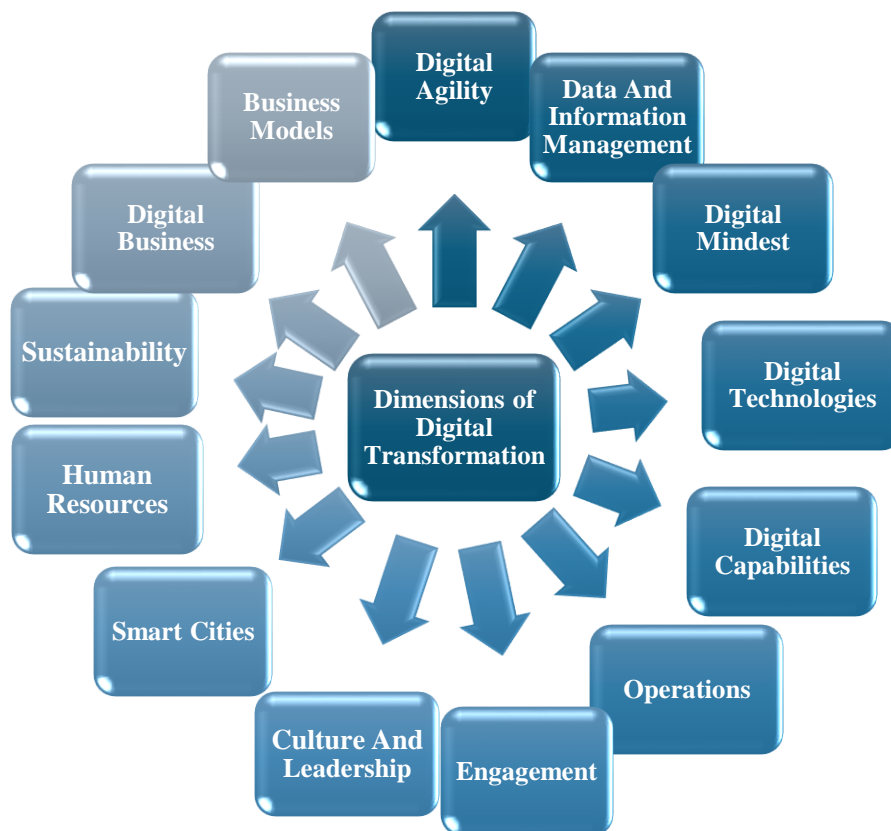
Figure 5: Basic dimensions for digital transformation



Source: (Leite, Figueiredo, Lopes, & Passos, 2024)

According to (Leite, Figueiredo, Lopes, & Passos, 2024), (Udovita, 2020), (Reis & ao, 2023), we can summarize the dimensions of digital transformation in the following figure:

Figure 6: Dimensions of Digital Transformation



Source: Author, inspired by (Leite, Figueiredo, Lopes, & Passos, 2024), (Udovita, 2020), (Reis & ao, 2023).

In conclusion, the dimensions of digital transformation can be categorized into 5 main dimensions: technological dimensions, organizational dimensions, social dimensions, sustainability dimensions, and smart city dimensions.

2.7 The keys to digital transformation

Digital forces are impacting and transforming five major domains of business strategy, i.e., how companies interact with customers, compete with challengers, use data, power innovation, and construct value (Rogers, 2016)

These five areas are the main focus of digital transformation and provide a handy model for understanding the changes that occur in business due to digital change (Fadhurrahman, 2024)

Figure 7: Digital Transformation elements



Source : (Rogers, 2016)

The 5 digital transformation keys are described below:

According to (Rogers, 2016), the first key is the customer. In the past, the common practice was to market goods and services to as many customers as one could in the same manner. With the advent of the digital era, customers are considered to be unique individuals with different tastes. This opens up new methods of engaging with customers, finding out what they prefer, and offering them a more personal experience. The phenomenon of digital transformation has revolutionized the paradigm that governs company-customer interaction. With the advent of the digital age, the customer has shifted from being a passive receiver to an active participant in a dynamic network that influences markets and organizations alike while enabling two-way exchange at the same time.

The second key is competition. It focuses on how a company competes and cooperates with other companies. Traditionally, competition and cooperation are seen as opposing forces: competing with companies of the same business type and category and cooperating with supplier partners who provide the company's products and raw materials for production (Fadhlurrahman, 2024).

The third key is based at Data. How businesses create, manage and use data that is processed into information. Generally, information is collected through a range of pre-planned measurement technique (from customer surveys to inventory recording) that involve a number of components in the business such as manufacturing, operations, sales and

marketing. This information once data is collected is used to evaluate and make a decision (Fadhlurrahman, 2024)

The fourth element is innovation. Innovation is how a company creates new ideas, tests them and brings them, to a market. Traditionally, innovation meant developing end products. Since it was difficult and expensive to market test at that time, most decisions about innovation were made based on managerial assessment and instinct. Since the cost of failure to the company was great then, failure avoidance was paramount. Today's innovation can be low cost and can be accomplished easily (Fadhlurrahman, 2024).

The fifth key, according to (Fadhlurrahman, 2024), is value. The value proposition of a company has, in the traditional sense, been regarded as fairly constant. You might update your product, update your marketing, or improve your operations, but the value a business offers customers is considered constant and defined by the industry it is in (automotive companies, for instance, offer varying degrees of transportation, safety, comfort, and status). A successful business will understand its value proposition well enough to find a point of difference in the market (price or brand, etc.). In a digital age, the value proposition has not changed; it has simply shifted focus to challenges and disruptions created by competitors of the business. The value proportion of a product that can offer added value to customers is determined by customers' own desires.

With all five keys above, with all forms of digital technology available, a company must reorder the fundamental ideas of business strategy and change business rules to fit the environment for business. A company that existed before the existence of the Internet needs to admit that the fundamental organization of the business must be improved.

2.8 Success and failure factors of digital transformation in businesses

Today, digital transformation is an essential component of the growth and expansion strategies used by organizations across industries. As the pace of digital adoption increases exponentially, a key question arises as to what determinants are driving the success or failure of this complex transformation. Knowing these determinants—from effective leadership and a clear vision to a culture of change and risk-managing management—is a key first step to realizing sustainable value from digitalization investments without falling into the traps that can derail the transformation process.

2.8.1 Success factors for digital business transformation

In order to adapt and grow in the digital age, a set of crucial factors reveals itself as determining for the success of digital transformation initiatives, according to (Almunawar, 2022), are:

- **Organizational culture:** Organizational culture is a critical element in supporting the digital transformation journey. A culture that values innovation, embraces change, and encourages calculated risk-taking, alongside a customer focus, is considered a fundamental pillar of success. Studies emphasize that a company's adoption of a culture that embraces a digital orientation and fosters collaboration, flexibility, and adaptability is indispensable for achieving positive outcomes from this transformation;
- **Effective managed transformation activities:** Effective managerial competencies highlight a vital role in leading and supporting the digital transformation journey. Effective management works to direct resources, set priorities, provide a clear vision, and maintain continuous communication with all stakeholders. It also emphasizes the importance of management's ability to embrace change, motivate employees, and develop their digital capabilities;
- **Leveraged knowledge:** Leveraging external influence is of paramount importance in the digital transformation journey. Collaboration with external partners, suppliers, and consultants, in addition to mergers and acquisitions, can provide access to new technologies, specialized knowledge, and the necessary resources to accelerate the pace of this transformation and achieve better results;
- **Engagement of employees and managers:** To ensure organizations fully embrace digital transformation and engage in adopting new technologies, it is crucial to foster collaboration, consultation, information sharing, and the involvement of internal stakeholders. Furthermore, employee participation in change processes helps minimize their resistance and progressively improves the organization's goal attainment and organizational commitment. Additionally, research highlights the significance of attracting, employing, and retaining workers who possess new talent and the capability to integrate business expertise with digital technological know-how;

- **Development of (IS) capabilities:** IS capabilities facilitate digital transformation, such as an organization's ability to standardize, deploy, and integrate IS assets with other assets. The article describes that organizations with improved IS capabilities have a greater chance of achieving digital transformation by re-engineering and redesigning existing business processes and transforming traditional products into digital products;
- **Development of dynamic capabilities:** The unpredictable shift in innovations and technologies has led to disruptions not only in organizations but also in industries at large. The article argues that dynamic capabilities help companies recognize and capitalize on opportunities by transforming the company, reshaping its resources, developing and building digital platform capabilities;
- **Formulation of digital business strategy that incorporates an alignment of business and information systems:** It is important to align the changes with the organization's strategies in order to achieve digital transformation. This alignment between business and information systems strategy is known as digital strategy. Ultimately, the article states how vital management is in the leading and supporting of digital transformation by noting management engages in effective management by directing personnel and resources, setting priorities and ensuring a vision that is communicated consistently with all stakeholders and also notes the importance of management in being willing to embrace change, inspire employees, and develop their digital competencies.

2.8.2 Failure factors of digital transformation in business

According to (Mielli, 2019), there are several reasons why digital transformation fails in organizations:

- **Missing a Holistic Vision and Clearly Defining Corporate Digital Strategy:** The lack of a clear definition of business strategy across the organization and misalignment in the digital strategy are significant barriers. Digital transformation projects that are not linked to the company's overall business strategy and projects that don't have clear priorities and funding as defined in the financial plan often don't receive the right level of priority and funding to execute;
- **Thinking of Technology as the Silver Bullet:** Thinking of technology in isolation as a quick fix or not defining what digital transformation means across the organization can set an organization up for failure;

- **Technology-Thinking vs. Problem-Thinking:** Boiling these new technologies down before getting clear on what the business problem is that you are trying to solve is common;
- **No Good Business Case/No Return on Investment:** If you don't define your project initiatives, their value and risks, and build a full business case for the project, you are only setting up the project to fail;
- **Wrong Suppliers and Partnerships:** Vendors that focus entirely on selling their solutions rather than aligning with the business's needs, while lacking digital transformation knowledge and implementation skills, will generally not be a valuable partner for any transformation project;
- **Wrong/No Skills:** If organizations are unable to find digitally skilled workers with soft skills, like collaboration, curiosity, and critical thinking, the implementation and use of digital solutions is less likely to be successful;
- **Custom and In-House Applications:** Another cause of failure is often reliance on custom software solutions that cannot be maintained, expanded, altered, or secured easily;
- **No Scalability Plan:** There are organizations that will not have a plan or strategy to scale their digital transformation efforts out across the organization, which can impact their ability to help their isolated initiatives matter;
- **Challenges in Integrating Legacy infrastructure:** Difficulty in implementing new hardware or software and ensuring connections with all pre-existing infrastructure, especially if there is an existing legacy ERP in place, slows down digital transformation.

Section 03: Financial performance

This section examines the concept of performance in its broader context and its various typologies, before delving specifically into financial performance. We will analyze key financial indicators and ratios, as well as their strategic importance within organizations, with particular attention to the telecommunications sector. This methodical exploration establishes the conceptual framework necessary for the analysis of empirical results presented later in this study.

3.1 Performance

Overall performance is complex and multifaceted, leading numerous researchers to explore it without achieving a universally accepted definition.

In academic literature, performance generally refers to attaining a level of excellence relative to a specific goal within a particular domain or organization. Despite the lack of a clear Unanimity, the notion of performance remains a central theme in various fields, reflecting the pursuit of achieving objectives effectively.

In the fifteenth century, the verb to perform was defined as a numerical result associated with a certain objective. (Hattab Samia & El Achari Sanaa, 2023)

3.2 Typologies of company performance

Nowadays, performance is considered as a multidimensional concept that draws on several perspectives, such as strategic performance, social and human performance, economic and financial performance, commercial performance and societal performance. (Mbarek Aoufir & Eragraoui Safaa, 2023)

- **Strategic performance:** Strategic performance, also known as long-term performance, refers to a company's ability to distance itself from the competition, as well as to the processes it adopts to achieve its objectives and the way in which it intends to achieve them; (Issor, 2017)
- **Human and social performance:** the concept represents social or human relations within the company. It combines human capabilities with social interactions in order to achieve individual and collective. It focuses on the role of relationship and trust and the human's knowledge skills in developing; (Wild,M.G.,Cutler,R.A., & Bachorowski,J.A, 2023)
- **Commercial performance:** Academically, (Yuan-chieh Changa et al, 2009) defined commercial performance as the ability to turn research results into products or services that can be sold, often connected to an organization's capacity to balance exploration and exploitation;
(Plauchu, V., & Taïrou, A. A, 2008) define commercial performance and its determinants as “the art of being present with the right contact at the right time, with a relevant offer that will help establish long-lasting, profitable business relationships for the company, in a context of constant striving for excellence in service”;

Commercial performance always puts the customer first, while striving to meet their needs and satisfy them; (Issor, 2017)

- **Global performance:** Global performance is a combination of economic, social and environmental performance. It covers the company, society, employees and citizens, and can be measured by ratings, certifications or codes of conduct; (Raquin, M., Teneau, G., Bringer, J., & Meert, D, 2011)
- **Financial performance:** For a long time, financial performance has been the main foundation for assessing a company's performance. However, it remains insufficient to reflect a complete and true picture of the company's situation. Financial performance is explained by increased and satisfactory profitability, considerable growth and the creation of shareholder value. (Guérard, 2006)

3.3 Financial Performance

Financial performance is an essential measure of a company's overall health, as it reflects the organization's ability to generate profits, meet its debt obligations, and create value for its shareholders.

3.3.1 Definition

Financial performance is a complex concept that covers many aspects, including profitability, liquidity, financial structure, and shareholder value creation. It is typically measured using key financial indicators such as net income, return on equity, cash flow, and economic value added. (Brealey, Myers, & Allen, 2020)

Financial performance reflects a company's ability to effectively manage and control its resources. Key financial statements-such as cash flow, balance sheet, profit and loss, and changes in capital-provide essential information for corporate managers to make informed decisions. Understanding both fundamental and technical analysis is crucial, and acquiring knowledge in finance, economics, financial management, and accounting is necessary to fully grasp a company's financial behaviour.

(Didin Fatihudin, Jungsi, Mochamed Mochklas, 2018)

3.3.2 Financial performance indicators and ratios

These ratios are primarily tools for turning the data contained in financial statements into information used by managers and executives to better understand what is happening in a company. They can be used for things other than their original design, such as evaluating an acquisition, creating pro-forma statements related to potential courses of action, or figuring out which stock to buy.

The main indicator types for grouping financial ratios are as follows: (Michael Rist & Albert J. Pizzica, 2015)

- Liquidity ratios
- Performance ratios
- Profitability ratios
- Debt ratios

✓ **Liquidity ratios**

Liquidity ratios measure the company's ability to pay off short-term debt obligations. Evidently, they can be used to see if a company is in trouble and evaluate their ability to make loan payments or pay suppliers. Moreover, they can be used to judge a company's ability to take on more debt, or spend more cash, to explore new means for growth through innovation or acquisition.

$$\text{Acid test (the quick ratio)} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$$

Description

The acid test ratio shows whether a company has enough short-term assets to cover its immediate liabilities without selling inventory. The higher the ratio, the safer a position the company is in.

Cash conversion cycle (CCC)

$$\text{Cash conversion cycle (CCC)} = \text{Days in inventory} + \text{Days sales outstanding} - \text{Days payable outstanding}$$

Description

The cash conversion cycle represents the number of days a company's cash remains invested in its production and sales activities. A shorter cycle signifies greater liquidity in the company's working capital.

$$\text{Current ratio} = \text{Current assets} / \text{Current liabilities}$$

Description

The current ratio indicates the extent to which current liabilities can be covered by current assets. Current liabilities include accounts payable, short-term notes, current portion of long-term debt, and accrued expenses.

✓ **Debt ratios**

Debt ratios measure the company's overall debt load and the mix of equity and debt. They give us a look at the company's leverage situation. Debt ratios can be good, bad, or indifferent, depending on a several factors depending on who's asking. For example, a high total debt ratio may be good for stockholders not wanting to dilute their shares but bad for the creditors of the company.

$$\text{Debt ratio} = \text{Total liabilities} / \text{Total assets}$$

Description

Also known as debt to asset ratio or debt to capital ratio. It shows the proportion of a company's total debt relative to its assets. Thus, giving an idea as to the leverage of the company along with the potential risks the company faces in terms of its debt-load.

$$\text{Debt to equity} = \text{Total liabilities} / \text{Total equity}$$

Description

The debt-to-equity measures how much of the company is financed by its debt holders compared with its owners. A high debt to equity ratio means that the company has a big amount of debt. Companies with lower debt to equity ratios are generally less risky than those with higher debt to equity ratios.

$$\text{Cash flow to debt ratio} = \text{Operating cash flow} / \text{Total debt}$$

Description

This ratio indicates the company's ability to cover total debt with its annual cash flow operations. A high cash flow to debt ratio puts the company in a strong position to cover its total debt.

✓ Profitability ratios

Profitability ratios can be thought of as the combination of many of the other more specific ratios to show a more complete picture of a company's ability to generate profits.

$$\text{Return on assets} = \text{Net income} / \text{Total assets}$$

Description

The return on assets illustrates how profitable a company's assets are in generating revenue. For instance, a ratio of 25% means that for every \$100 of investment in assets, net income of \$25 is generated.

$$\text{Return on equity} = \text{Net income} / \text{Shareholder's equity}$$

Description

The return on equity is the amount of net income generated as a percentage of shareholders equity. ROE measures the company's profitability by how much profit is generated with the money shareholders have invested.

$$\text{ROE} = \text{Profit margin} \times \text{Total asset turnover} \times \text{Equity multiplier}$$

$$\text{ROE} = \text{Net income} / \text{Sales} \times \text{Sales} / \text{Total assets} \times \text{Total assets} / \text{Equity}$$

Description

The DuPont ratio is an expression that breaks return on equity (ROE) into its three components to give a total picture of how the company is performing. ROE is defined as profit margin multiplied by total asset turnover and the equity multiplier. What is important are the components, not necessarily the final number. Two companies might have the exact same ROE, but their components could be very different, showing different business strategies.

$$\text{ROI} = \text{Gain from investment} - \text{Cost of investment} / \text{Cost of investment}$$

Description

The return on investment measures the efficiency of an investment, it can also be used to compare a number of past or prospective investments. However, in this case, we're not taking into account the time value of money.

✓ Performance ratios

Performance ratios (also known as activity ratios) measure a company's ability to generate sales and derive profit from its resources. They are used to measure the relative efficiency of a company based on the use of its assets. Leverage, or other such balance sheet items.

Companies must often strike a balance between the inefficiencies of having too few or too many assets. For example, in the case of too little inventory, you may risk disruption to production and loss of sales. However, sitting on inventory that does not move is a very inefficient use of cash.

$$\text{Total assets turnover} = \text{Sales} / \text{Total assets}$$

Description

This ratio measures the sales generated per dollar of assets, and indicates how efficient the company is using their assets to generate sales. Asset-intensive companies such as mining, manufacturing, and so on will generally have lower asset turnover ratios compared to companies that have fewer assets such as consulting and service companies.

Working capital ratio=Current assets/Current liabilities

Description

The working capital is the capital that a company has for day-to-day operations. It indicates whether the company has enough short-term assets (current assets) to cover its short-term liabilities (current liabilities). A ratio below 1 is an indication of negative working capital, meaning that the company will most likely not be able to cover its current short-term obligations.

Accounts receivable turnover=Sales/Receivables

Description

The receivable turnover shows how many times receivables are collected and converted into cash in a specific time period. This is different from the average collection period, which shows the number of days it takes to collect the receivables. Ideally, credit sales should be used in the numerator and average receivables in the denominator. However, these are most often not easily available in the financial statements.

3.3.3 Importance of financial performance

Understanding a company's financial performance is critical for knowing how healthy and successful a company is. Financial performance shows how well a company is making finances, managing its resources, and achieving its objectives. Through analyzing financial data and measures, companies can identify strengths, recognize weaknesses, and make better decisions to build growth and create value for their shareholders. (Alexander, 2018)

Strategic decision-making: The analysis of financial performance, ultimately through FP&A, is the basis for making informed decisions concerning how to allocate resources, investments, and operational decisions;

Performance Measurement and Accountability: Financial metrics are necessary for measuring, tracking, and being accountable for teams' achieving goals on both strategic and operational fronts through the development of KPI metrics;

Value Creation: An important goal of FP&A is to identify and support activities that increase the shareholders' value with specific attention on measures of long-term profits and return;

Risk Management: Financial performance provides insights as an indicator of risks (such as liquidity, solvency, and operational efficiency) that are helpful to support strategies for risk amelioration;

Effective Communication: FP&A provides or causes a financial basis, structuring of information to support reporting and effective communication of financial information to stakeholders clearly and quickly;

Continuous Improvement: Financial planning and analysis allow continuous measurement and feedback of financial performance that can allow you to pivot effectively to changing market conditions;

Competitive Advantage: Organizations or firms desire to gain competitive advantage through the analysis of financial performance in relation to other similar firms in their industry;

Resource allocation: The appropriate analysis of financial performance allows firms are to make informed and timely decisions about capital investments, marketing campaigns, and other initiatives.

3.3.4 Financial performance in the telecommunications sector

The financial performance of the telecommunications sector is distinguished by a set of specific indicators that reflect the industry's capital intensity, operational complexity, and market dynamics. This table summarizes the most important one.

Table 5: The main indicators in the telecommunication sector

Indicator	Definition	Importance for the sector
Operating profit margin (OPM)	Percentage of revenue left after deducting operational costs.	Reflecting the company's ability to manage costs and pricing.
EBITDA (Earnings Before Interest, taxes, depreciation, and amortization)	Assessing operational profitability.	A key for comparing profitability industry-wide.
ARPU (Average Revenue Per User)	Revenue generated by customer or subscriber.	Assessing the ability to generate revenue from the customer base

Revenue Growth Rate	Percentage increase in revenue over time.	Indicates market expansion and demand
Churn Rate	The percentage of customers discontinuing service during a period.	Directly impacts recurring revenue
Subscriber Growth	Increase in total number of subscribers	Drives revenue and market share

Source: Author, inspired by (White, s.d.)

3.3.5 Key Dimensions of financial performance

(Penman & H.Stephen, 2013) outlines five key areas for understanding a company's financial performance:

Profitability: It measures the company's ability to generate steady profits from its main activity, disregarding loans and debts. Its key indicators include Return on Equity (ROE) and Return on Net Operating Assets (RNOA);

Growth: Evaluates growth that adds value (through increased revenue, earnings, or equity) by generating returns higher than the company's investment costs. Its key indicators are Revenue Growth Rate and Earnings Persistence;

Risk: This dimension evaluates the financial stability through leverage and earnings volatility. Its main indicators are debt to equity ratio and interest coverage ratio;

Cash Flow: It validates earning quality by comparing accrual-based profits to actual cash generation. Its main indicators are Free Cash Flow (FCF) and Operating Cash Flow (OCF);

Earnings quality: It measures how trustworthy a company's reported earnings are by identifying irregularities in its accounting practices. Its main indicators are accruals ratios, that calculates the difference between net income and operating cash flow and discretionary vs non-discretionary accruals, that identifies earnings management.

3.3.6 Evaluating financial performance

Evaluating financial performance is a critical aspect of understanding an organization's overall health and sustainability. Instead of relying on a single metric, a comprehensive assessment requires the use of many financial indicators that together capture various dimensions of performance. In which they include measures of liquidity, solvency, profitability, financial efficiency, and repayment capacity. (Bir, C., Jones, R., & Ladd, B., 2022)

- Liquidity measures the company's ability to meet short-term debts;
- Solvency, that assesses the ability to meet long-term debts, usually measured by ratios such as equity-to-asset, debt-to-asset, and debt-to-equity;
- Profitability assesses the degree to which a business/activity earns income relative to the resources used;
- Financial efficiency looks at how effectively resources are used to produce the outputs;
- Repayment capacity reflects the ability to repay debts from income sources.

Overall, the financial performance evaluation mainly depends on financial statements and their analysis to identify strengths, weaknesses, and potential risks.

Conclusion

In summary, this chapter provided a comprehensive review of the key concepts and literature relevant to our study. It clarified the distinctions between digitization, digitalization, and digital transformation, and explored how these processes are reshaping organizational models and strategies. Importantly, the chapter examined the various ways in which digital transformation can influence financial performance, drawing on both theoretical perspectives and empirical findings from previous research. By highlighting existing gaps and limitations in the literature, this chapter established a strong foundation for analyzing the impact of digital transformation on financial performance in the context of our study, and set the stage for the empirical investigation in the following chapters.

Chapter 02: Methodological Framework and Evidence-Based Data

Introduction:

This chapter outlines the methodology used to study the relationship between financial performance and employee perceptions at WTA Ooredoo. The research utilizes a quantitative, cross-sectional approach to gather information about topics relevant to the researcher's purpose. In this chapter, we will describe the particular instruments and process used to gather the data and describe how we measured financial performance and employee perceptions, and we will also be describing the analytic techniques employed in the study to underpin the relationship between the two.

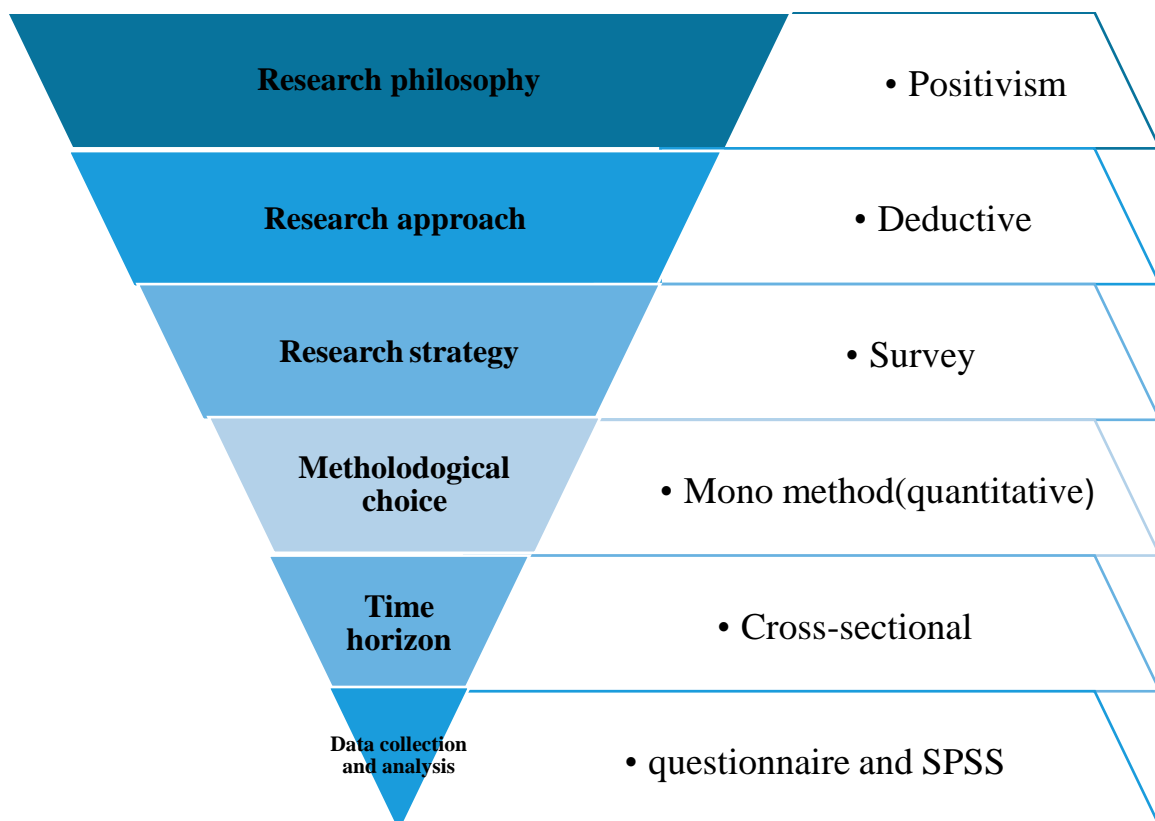
Section 01: Methodological Framework and supporting evidence

This section will describe the methodological approach to this thesis in relation to the choice of research design, data collection methods and data analysis processes to address the relationship between financial performance and employee perceptions at WTA Ooredoo. A quantitative approach through a cross-sectional survey of employees has been selected as the best means of relevant data collection. Accordingly, this section will give a detailed account of the measurement of the key variables included in the questionnaire, sampling strategy and statistical methods selected.

Research process

Research is a multi-stage process that allows systematic investigation of a topic. The usual steps of research include defining and refining the research question, reviewing literature, planning the research design, collecting data, analyzing the findings, and reporting the findings. This process is iterative, meaning that some stages may overlap, requiring ongoing adjustments and reflection.

Figure 8: The research process used



Source: Author, inspired by (Saunders, Mark ; Lewis , Philip ; Thornhill, Adrian Thornhill;, 2009)

1.1 Research philosophy (theoretical perspective)

In this study, the theoretical perspective clarifies how assumptions about knowledge and reality shape the research questions, design, and interpretation of findings. (Crotty, 1998)

1.1.1 Epistemology

Epistemology is a branch of philosophy concerned with the nature, scope, and limits of human knowledge. It handles fundamental questions such as: what does it mean to know something? How are beliefs justified or supported by evidence? What distinguishes true knowledge from mere opinion or belief? Epistemology investigates the criteria and methods through which knowledge claims can be evaluated, aiming to understand how we acquire reliable information about the world. (Audi, 2011)

1.1.2 Positivism

Positivism is a type of epistemological position, that has the belief, like that of natural science, that reality can be observed and measured with objectivity. Knowledge is valid only if it is empirical (based on real-world observations), and the observational data is logically analyzed, usually in a structured way through quantitative methods. Positivist researchers seek to find patterns, regularities, and cause and effect relationships that can be generalized to form universal laws. In this regard, strict adherence to objectivity and replicability, with limited or eliminated researcher bias is vital; positivism emphasizes science because it uses rigor (in the way the science is conducted and in the sense of proper investigation), and seeks knowledge that is applicable in different situations or across contexts. (Raymond-Alain ThietartET AL, 2025)

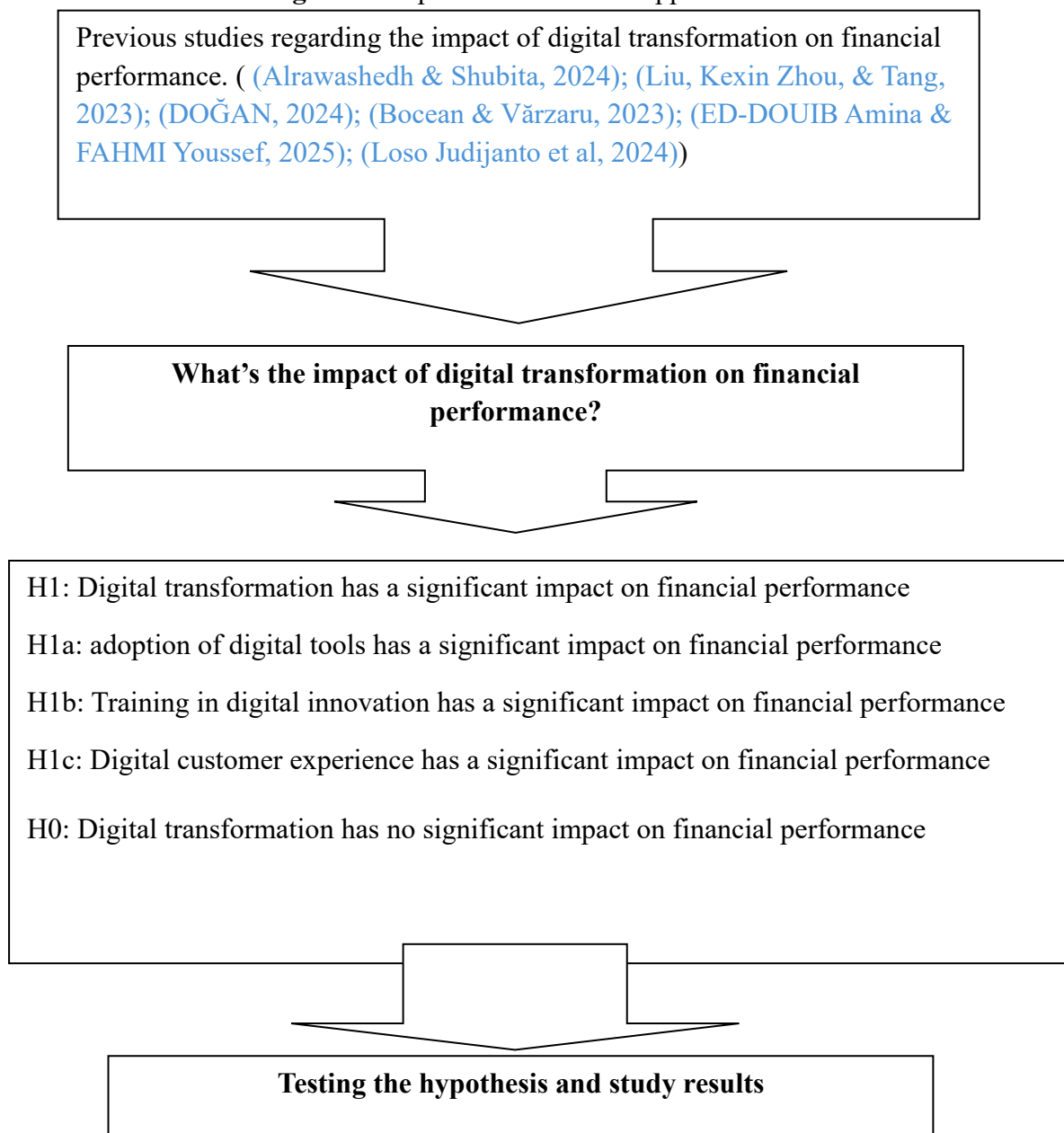
For our study, we followed the positivism paradigm because it suits our study's objectives.

1.2 Research approach

According to (Saunders, Mark ; Lewis , Philip ; Thornhill, Adrian Thornhill;, 2009), there are two main research approaches: the deductive and inductive approaches. The deductive approach is based on the researcher finding existing theories or concepts and then experimenting with those theories through empirical observation, while the inductive researcher starts with observations and develops new theories based on the patterns they see

in the data. In our case, we specifically chose the deductive approach to conduct our inquiry because we are starting with theories related to organizational outcomes (financial performance) and then we're using new data from Ooredoo WTA employees to determine whether what we know theoretically will hold true in its context by testing the former hypotheses.

Figure 9: steps of the deductive approach



Source: Author, inspired by (Saunders, Mark ; Lewis , Philip ; Thornhill, Adrian Thornhill;, 2009)

1.3 Research strategy

The survey strategy is typically linked to the deductive research approach and is widely used in business and management studies. It is especially effective for addressing questions such as who, what, where, how much, and how many, making it well-suited for exploratory and descriptive research. Surveys are favoured because they enable researchers to gather large volumes of data from a substantial population efficiently and cost-effectively. (Saunders, Mark ; Lewis , Philip ; Thornhill, Adrian Thornhill;, 2009)

An online questionnaire was distributed to managers in the various departments, enabling rapid and structured data collection.

1.4 Methodological choice

Quantitative research's main focus is on measuring and analyzing numerical data to understand how much of something exists. How long has it been happening, and why it occurs. Quantitative research plays a vital role in producing reliable knowledge and explaining patterns that can guide decisions, improvements, and even predict future findings. It often aims to explain patterns. It uses structured methods like surveys and experiments to collect data that can be tested and generalized. (Williams Malcolm ,Wiggins, Richard D, Vogt, W.P., 2022). Quantitative techniques are effective at analyzing large populations and enabling researchers to generalize findings from the studied sample to larger groups beyond it. (Holton, E. F., & Burnett, M. F, 2005)

Therefore, our study belongs to the quantitative method based on measuring and analyzing numerical data to understand the existence of something, and our study combines a questionnaire with financial analysis.

1.5 Time horizon

Aligned with the time- sensitive aspect of academic research, our work is designed as a cross-sectional study. In consideration of the timeline limitation of the project, the data collection and analysis will attempt to capture only a snapshot of the relationships between the financial performance of WTA Ooredoo and the employee perspectives. (Saunders, Mark ; Lewis , Philip ; Thornhill, Adrian Thornhill;, 2009)

Hence, the questionnaire will be administrative a limited period of 2 months to capture a snapshot of perceptions.

1.6 Data collection and analysis

In this thesis, data were collected using a structured questionnaire to collect relevant information from the respondents. The collected data were then analyzed using SPSS software to run statistical tests and generate useful results.

The choice of using primary or secondary data is ultimately based on these main aspects: the nature of the data itself, its potential impact on the research's accuracy, its accessibility, and its adaptability. (Raymond-Alain ThietartET AL, 2025)

We collected primary data using a survey provided to employees directly, ensures that the collected information directly addresses many of our research objectives, represents the current employees' perspectives, and matches the specific characteristics of the organization. While this approach is more time and resource intensive, it helps to enhance the accuracy, relevance, and control over the data we collected, which ultimately enhances the validity and reliability of our findings in this study's specific context.

1.6.1 Questionnaire structure

To examine the impact of digital transformation on the financial performance of the organization, a questionnaire was distributed to employees across various departments using Google Forms. The questionnaire utilized a 5-point Likert scale and consisted of eight sections, each designed to measure specific indicators related to the study variables. The independent variables included key dimensions of digital transformation: adoption of digital tools, training in digital innovation, and digital customer experience. The dependent variable focused on financial performance indicators, namely profitability, growth, and cost management.

- **Adoption of digital tools**

Evaluate the level of integration and use of digital tools within the company. [Q1-Q2]

- **Training and skills**

This section aims to measure the enhancement of employee skills development on the organization's ability to optimize processes, therefore increasing efficiency and ultimately boosting profits and financial performance. [Q3-Q4]

- **Digital innovation**

Supporting innovation, organizations can create new income streams and achieve a larger share of the market, maximizing their financial performance. [Q5-Q6]

- **Digital customer experience**

By supporting a greater digital experience for customers, organizations can improve customer loyalty, which has a value proposition to support increased revenue and reduced service costs, which will increase financial performance. [Q7-Q8]

- **Profitability**

Digital transformation will improve profit as it will streamline operations and maximize efficient use of resources. These efforts impact the organization's bottom line directly. [Q9-Q10]

- **Growth**

By creating innovation, digital transformation also creates opportunities for business expansion and growth. [Q11-Q12]

- **Cost management**

The adoption of a digital technology will allow organizations to maximize processes and reduce operational costs, which will improve their overall cost management. [Q13-Q14]

- **Description sheet**

This section is mainly to identify the characteristics and to capture the key background information. Additionally, helping to determine whether respondents have experienced the digital transformation process and can accurately assess its impact on Ooredoo's financial performance for more reliable results. [Q15-Q17]

We can summarize the study variables in the following table:

Table 6: Variables of the study

Variables	Dimensions	Measured variable	Affirmation example (Likert 1-5)	Link with financial performance	
Independent variables	Adoption of digital tools	Use of digital tools	Digital tools (CRM, ERP...etc) have improved work efficiency.	→ Reduction of operational costs / Increased productivity	
		Support for the use of digital tools	Management actively encourages the use of new tools.	→ Better resources allocation	
	Training and skills	Access to training	I receive training adapted to mastering digital tools.	→ Process optimisation → profitability	
		User proficiency level	I feel capable of using digital technologies in my work.	→ Innovation → growth	
	Digital innovation	Investment in innovation	Ooredoo Algeria invests in innovative projects (AI, IoT...etc).	→ New revenues → market share	
		Innovation culture	Employee's ideas for digital solutions are often valued.	→ Competitive differentiation	
	Digital customer experience	Customer satisfaction	Digital solutions (apps, chatbots) have improved customer satisfaction.	→ Customer loyalty → revenue	
		Request processing speed	Digital tools have reduced response times to customers.	→ Reduction of service costs	
	Dependent variable	Financial performance	Profitability	Digital investments have a visible return on investment (ROI)	
			Growth	Digital transformation has helped expand the customer base (e.g., online services).	

		Cost management	Digital transformation has reduced unnecessary expenses (e.g., dematerialization).
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Source: Author

1.6.2 Questionnaire administration

The questionnaire was first developed based on an extensive review of previous studies. The initial version was then further refined to the aims of our research, the context, and needs of the employees with the recommendations of three experts. The final version of the questionnaire was then administered online using Google Forms, sent to employees of Ooredoo Algeria over two weeks in march 2025. The employees were informed of the purpose of the study and assured of their anonymity. A total of 202 responses were collected and through quality checks, all were valid responses to be used in a subsequent analysis. The administration process was smooth and the level of response satisfactory.

1.6.3 Choice of measurement scale

In this study, a Likert scale was used to measure the variables in the questionnaire assessing the impact of digital transformation on financial performance. The Likert scale was chosen because it allows respondents to express varying degrees of agreement or disagreement, providing more reliable insights than simple questions. Moreover, this scale is known for its simplicity, flexibility, and ability to convert subjective opinions into quantitative data, which facilitates efficient statistical analysis.

Table 7: Likert scale response options (1 to 5)

Scale point	Description	Label
1	Extreme disagreement	Totally disagree
2	Disagreement	Disagree
3	Neutral	Neither agree nor disagree
4	Agreement	Agree
5	Extreme agreement	Totally agree

Source: author, based on research results

1.6.4 Data analysis

IBM SPSS software is used in this study for data analysis due to its reliability and extensive application in business research. SPSS offers strength in handling and analyzing big data, it enabled the summarized questionnaire answers, checked measurement reliability and assessed the relationship between digital transformation and financial performance with the relevant statistical tests such as reliability tests, correlations, and regressions. The wide variety of output and visualisation options made the results easier to be clarified and precise. Overall, SPSS was important to discover and conduct a thorough and systematic analysis objective to the study.

1.7 Evidence-based data

The evidence data collected is the basis for analyzing the research questions and hypotheses. The data provides empirical evidence that permits an in-depth review of the objects of study and helps reach valid conclusions.

1.7.1 Study population

The study population consists of a few selected departments within the company, encompassing a total of about 600 employees whose perspectives on digital transformation and its impact on financial performance were examined. Due to limitations in time and resources, a survey questionnaire was distributed to a representative sample of only 202 employees. Despite this sampling approach, the primary objective of the research is to generate findings and conclusions that accurately reflect the experiences and viewpoints of the entire employee population.

1.7.2 Sample size

We followed the works of (Thompson, 2012) to calculate minimal sample size for a finite population of our study with a total of about 600 employees. Therefore, we used this equation:

$$n = \frac{N \times P \times q}{\left[(N - 1) \left(\frac{d^2}{z^2} \right) \right] + p(1 - P)}$$

where:

- n = required sample size
- N =population size (finite)
- $z=1.96$ (for a 95% confidence level)
- $p=0.5$ (the most conservative value if the proportion is unknown)
- $q=1-p=0.5$
- $d=0.05$ (margin of error of 5%)

For a finite population of about 600 employees, with a 95% confidence level and a 5% margin of error, the recommended sample size is of 235 employees. Due to employees' busy schedules and the limited time available for the study, we were unable to reach the minimum sample size of 235 recommended, but successfully collected responses from 202 participants. We can guarantee that the data still provide useful insights for this study.

1.7.3 Sampling method

In this study, a random sampling method was used to distribute the questionnaire to the maximum number of respondents possible. This method was chosen to allow each member of the population to have an equal chance of selection, which helps reduce selection bias and enhances the generalizability of research findings. (Raymond-Alain Thietart ET AL, 2025)

Section 2: Company presentation

In this section, we will present the company and explore the organizational context of EL Wataniya Telecom Algeria Ooredoo by presenting the organizational structure of the organization, relying on information extracted from various documents and collected through direct interaction with the company. We will also talk about the company's digital transformation stages and present its SWOT analysis.

2.1 Ooredoo group

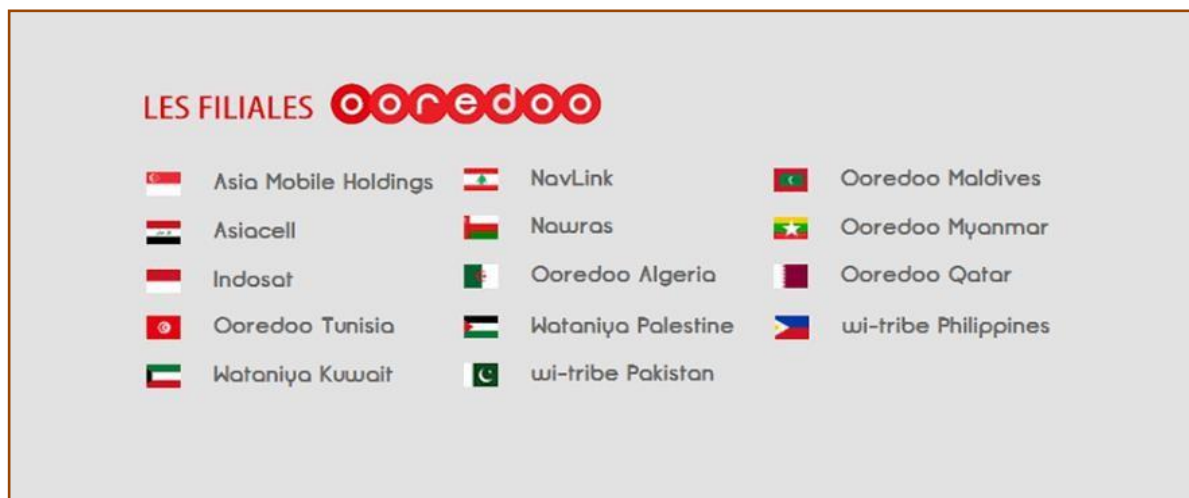
Wataniya Telecom (Ooredoo) is an international telecommunications company, providing mobile telephony and broadband Internet services tailored to the needs of individuals and businesses throughout the Middle East, North Africa and Southeast Asia.

Ooredoo, the benchmark Ooredoo operator, was founded in 1999 in Kuwait. It is part of the Kuwait Projects Company (KIPCO), the largest private company in Kuwait boasts assets exceeding 10 billion USD. Ooredoo has enjoyed rapid growth in the world of wireless telecommunications in the Middle East and North Africa.

In March 2007, Qatar Telecom (Qtel) became the majority shareholder (51%) of Wataniya Telecom Kuwait and consequently owns 80% of Ooredoo. The Qatari operator Qatar Telecom (Qtel) has bought out Kpico's majority share in the capital of the Kuwaiti operator Wataniya. The value of the transaction could be in the region of 3.7 billion dollars. Qtel has thus acquired the Algerian market.

2.1.1 Ooredoo group's subsidiaries

Ooredoo is a leading international communications company, with operations spanning North Africa, the Middle East and Southeast Asia. The company is present in:

Figure 10: Ooredoo subsidiaries

Source: Internal company document

2.1.2 History of Ooredoo Algeria

Ooredoo offers Algerian users a new world of mobile telecommunications. Ooredoo provides Algerian customers not only with innovative products and services but also high transmission quality thanks to equipment based on the latest technologies, customer service based on the highest standards, and a highly competitive pricing policy.

Ooredoo is the leading multimedia operator in Algeria. On December 02, 2003, it was awarded a license to provide nationwide cell phone services. On August 25, 2004, WTA launched its NEDJMA brand.

NEDJMA immediately adopted a policy of accelerated network deployment, covering the whole of Algeria by the end of 2005.

In March 2007, the KPICO Group concluded a transaction with the Qatar Telecom Group (Qtel), which became the majority shareholder in Wataniya Telecom. On February 25, 2013, Qtel Group changed its color and identity to Ooredoo Group.

This change will gradually be applied to all the group's operations, so on November 21, 2013, NEDJMA in turn became Ooredoo.

Table 8: Profile of Ooredoo

Creation	25 August 2005
Key date	December 15, 2013: change of name (from NEDJAMA to Ooredoo).
Legal form	Joint-stock company (S.P.A.)
The slogan	Ooredoo, Dima Maakoum Ooredoo, Ich internet
Head office	Ouled Fayet, Algiers, Algeria.
Direction	Hendrikkasteel (Managing Director) and Waleed Mohamed Al-Sayed (vice president).
Activity	Telecommunicationsoperator
Products	SIM card, STORME, split phone, TPE recharge card
Website	WWW.OOREDOO.DZ

Source: Internal company document

2.1.3 Its values

As part of the continuity/change, Ooredoo's new brand identity was launched on November 21, 2013 to herald a new era whilst respecting the accomplishments and values of Nedjma and this will be maintained and enriched within Ooredoo through:

- **Caring:** for the consideration and trust, respect for others and responsibility that Ooredoo demonstrates;
- **Connecting:** for the way that Ooredoo is dedicated to acting together and creating a spirit of seamless integration of the Algerian community.
- **Challenging:** for the advancement that Ooredoo desires and the commitment to always searching for the next level of improvement and difference.

2.1.4 Its talents

Ooredoo in Algeria's Top Employers of the Year 2022 stands out among the biggest firms by being ranked among Algeria's Best Employers of the Year 2022 as part of the best places to work program, initiated by the Best Companies USA Institute.

2.1.5 Its business lines

Ooredoo offers a wide range of professions, from sales and technical to diverse support roles. Whether you're passionate about sales, telecommunications or administrative functions, we have the right opportunity for you. Join us to develop your skills in a dynamic and stimulating environment:

Sales: Contribute to our growth by helping our customers discover our innovative offers and services.

Technical: Enhance and deploy our telecom infrastructures to guarantee quality connectivity.

Support: Support our human resources, finance and communications teams to ensure our continued success.

2.1.6 Missions and objectives of company

Missions: The missions of the company Ooredoo are presented as follows:

- To provide telecommunication services enabling the transport and exchange of voice, written messages, digital data, and audiovisual information.
- To provide a unique customer experience by offering on highly skilled employees and building the strongest, most innovative brand in Algeria.
- To install, develop, operate, and manage mobile telephony networks.
- To maintain and assemble mobile telephony equipment.
- To ensure the permanent availability of its products for all customers throughout the territory.
- To conduct its activities in compliance with competition regulations.
- To offer its mobile products and services originating from and destined for foreign countries in compliance with the rules defined by international regulations in the field of activity.

Objectives: The objectives of the company Ooredoo are presented as follows

- Ensure a unique and quality customer experience.
- Make services available to the entire population and businesses in Algeria.
- Acquire the maximum number of subscribers.
- Attract and develop the best talent.
- Achieve excellence in all actions.
- Maintain and develop leadership.
- Acquire new market shares.
- Become the leading multimedia operator.
- Implement customer loyalty initiatives.
- Introduce new technology and become a market leader.
- Employ an innovative marketing approach and an effective communication policy.

2.2 Logos

The following figure illustrates the evolution of the company's logo.

Table 9: The evolution of the Ooredoo logo

	2004-2009.
	2010-2013.
	<i>From 2014.</i>
	Logos from 2017.

Source: Internal company document

2.3 Ooredoo organization chart

Ooredoo has made a number of changes in its organizational structure, which are justified by a realignment of its goals and missions in order to achieve the targets set by the top management. (see appendix B)

The departments below are the most significant directions in WTA Ooredoo, and their decisions are relevant and have implications for the digital transformation and financial performance aspects. These directions are important in decision making and ultimately provide understandings of the strategic, operational and financial dimensions of the organization.

- **Chief Financial Officer (CFO):** It has the responsibility for all financial activities and operations including planning, reporting, risk management and budgeting. WTA Ooredoo's own CFO department's stated mission is: enables financial sustainability and financial transparency, supports decision making at the strategic level and optimises resource allocation to support growth and operational excellence. It includes the treasury department, the business planning, and reporting department, and the finance department;
- **Strategy Department:** This direction is concerned with establishing and refining the organisation's vision, objectives, and long-term outlook. When establishing the strategic plan, this direction leads the exploration of where digital transformation fits into the business strategy to enable competitive positioning and sustainable development, since environments are always changing;
- **Technology Department:** This department has two important roles: it is the driver of innovation with respect to the development and implementation of both digital solutions and organizational IT infrastructure. An important function is determining and delivering the technological means for seamless digital transformation that enhances operational efficiency and increases opportunity for new business models;
- **Marketing Department:** The direction of marketing is to effectively establish and promote the company brand, products and services using both digital means and data analytics to provide valuable insights into understanding the customer needs and market attitude to supplement revenues and structure for customer engagement;
- **Customer Service Department:** This department aims to provide customers with the best experience possible, by managing all customer interaction in a multichannel

service system. Their objective is to drive customer satisfaction and loyalty, and to achieve this, they implemented choices for customers to interact in the most meaningful way for them. This means utilizing digital platforms designed to support seamless and efficient service and responsiveness;

- **Juridique (Legal) Department:** To ensure compliance of laws and regulations, this field is responsible for managing regulatory compliance and mitigating legal risk. Moreover, it is responsible for supporting all corporate governance with regard to contracts, policies and the digital transformation programs of the organization to ensure corporate integrity;
- **Human Resource Department:** Responsible for talent management and organizational development, it drives initiatives to build a skilled workforce aligned with digital transformation goals. It focuses on employee engagement, training, and change management to foster a culture of innovation and adaptability;
- **IT Department:** It must manage all IT environments with a focus on safety and stability while merging and aligning them into transformative digital solutions. This department must complete projects, manage risk, and maintain sound facilities in place surrounding technology in support of business innovation and growth.

2.4 Digitalization in the company

Ooredoo Algeria is a leading company in digital transformation, employing a comprehensive strategy aimed at developing its technological infrastructure and enhancing customer experience through the adoption of the latest digital solutions and advanced software. Digitization plays a central role in improving operational efficiency, supporting decision-making, and providing innovative services that meet the expectations of users in the Algerian market.

The company relies on a sophisticated set of core systems and software in its daily operations, including an Enterprise Resource Planning (ERP) system that contributes to highly efficient resource and process management, and the SPSS statistical analysis system used for data analysis and strategic decision support. The company also utilizes Oracle databases for secure and organized information storage, and the JIRA platform, which facilitates project management and enhances coordination among work teams, thereby accelerating task completion and ensuring performance quality.

Regarding customer experience, Ooredoo offers advanced digital applications such as My Ooredoo and Yooz that offer the subscribers complete control over their accounts, the ability to choose their numbers, and easily manage their balance via smartphones. These applications reflect the company's commitment to providing innovative and seamless digital services that enhance customer satisfaction and increase their loyalty.

Ooredoo strengthens its digital transformation through strategic partnerships with global companies like Google Cloud and Tech Mahindra, which support the modernization of IT operations across advanced digital platforms, significantly improving performance and customer experience. The company also invests heavily in digital infrastructure, such as modern, world-standard data centers in Constantine, which ensure high reliability and service continuity.

Artificial intelligence technologies play an increasingly important role in Ooredoo's strategy, where they are used to enhance cybersecurity, automate network operations, personalize offers based on user behaviour analysis, and provide advanced automated technical support. Furthermore, the company is investing in the launch of the fifth-generation network (5G), which represents a qualitative leap in the development of multiple sectors such as smart agriculture, smart cities, Industry 4.0, health, and education, thereby reinforcing its role as a key driver of digital transformation in Algeria.

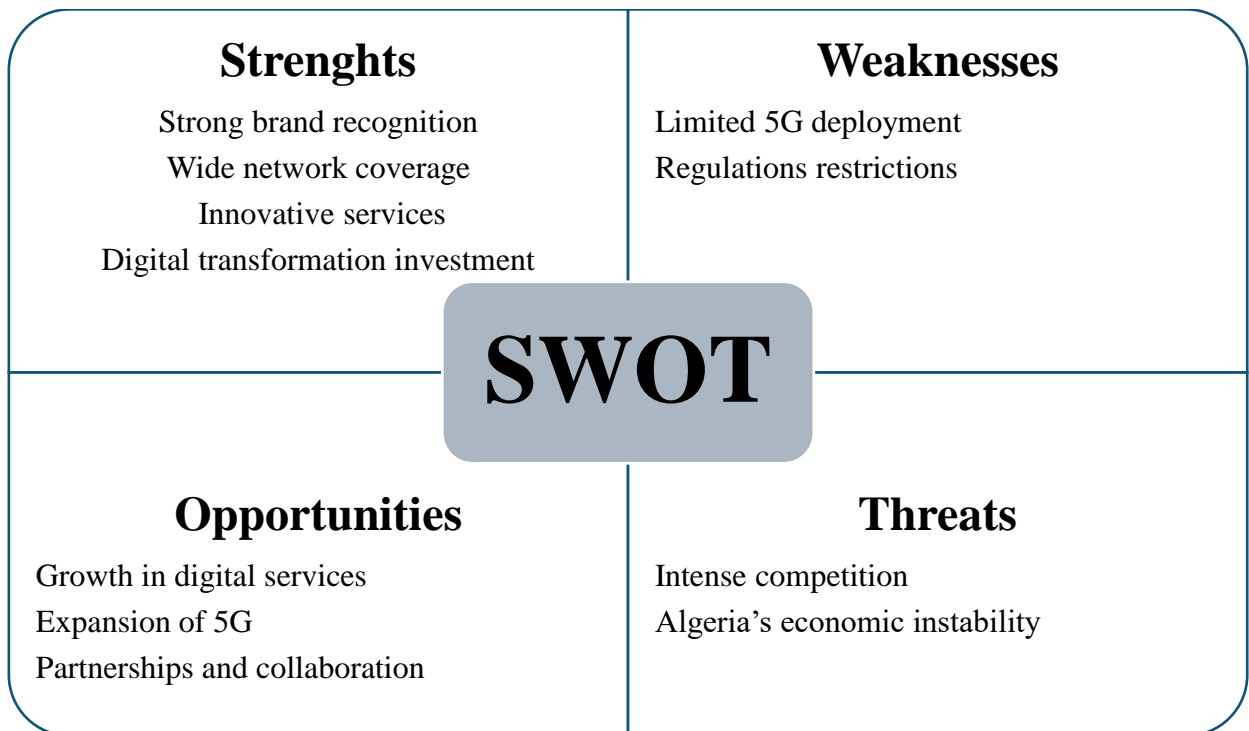
Ooredoo has also launched innovative initiatives like the Smart Store, which provides an advanced digital experience for customers and embodies the company's commitment to promoting digital transformation at the level of direct sales points. Ooredoo actively participates in international and regional events such as the Africa IT & Telecom Summit, where it showcases its latest digital solutions and affirms its leadership in innovation and technology.

Consequently, digital transformation in Ooredoo Algeria represents a fundamental strategic pillar that integrates modern technology, data analysis, artificial intelligence, and digital customer experience, supporting the company's financial growth and enhancing its competitive position in the Algerian and African markets. This makes the subject of your study of great importance for understanding the dynamics of the organization's success and its future directions.

2.5 SWOT ANALYSIS

A SWOT analysis is essential to fully understand the company's strategic positioning and future potential. This analytical framework will illuminate the organization's core strengths and identify key areas requiring enhancement, while simultaneously revealing promising opportunities and potential challenges that warrant strategic consideration.

Figure 11: SWOT analysis of the company WTA Ooredoo



Source: Author

Strengths:

- **Strong brand recognition:** Ooredoo is one of the top telecom operators in Algeria and a well-established international brand;
- **Wide network coverage:** Ooredoo offers wide 4G network coverage throughout Algeria, reaching both urban and rural areas;
- **Innovative services:** the company offers a range of unique and special services, such as the mobile application my Ooredoo that provides all the information the customer needs;
- **Digital transformation investment:** Ooredoo is always investing in digital services, such as mobile banking, self-service applications, social media platforms.

Weaknesses:

- **Limited 5G deployment:** despite Ooredoo being a leader in 4G, the rollout of 5G services in Algeria is still in progress;
- **Regulations restrictions:** the telecommunication sector in Algeria is highly regulated, which may slow down the company's development.

Opportunities:

- **Growth in digital services:** the demand for digital financial services and e-learning is quite strong;
- **Expansion of 5G:** Ooredoo has the chance to be among the first to introduce 5G and Internet of Things (IoT) services for both individual and business customers;
- **Partnerships and collaboration:** collaborating with startups and global tech companies can help the company introduce new digital products and services, leading to better revenues.

Threats:

- **Intense competition:** Ooredoo faces strong competition from the other operators like Djazzy and Mobilis in Algeria;
- **Algeria's economic instability:** changes in the economy may affect the consumer's choices.

Section 3: Financial analysis of mobile operators in Algeria

The Algerian mobile phone market is experiencing significant growth and development, making it a focal point for investors and economic players. This analysis aims to conduct a comprehensive financial study of this strategic market, with a particular emphasis on evaluating the financial health of Ooredoo and comparing its performance to that of its main competitors, Mobilis and Djezzy, during the period from 2015 to 2022. The DuPont method will be employed as a primary analytical tool to examine key financial performance indicators such as return on equity and profitability, and to identify the factors influencing them. Through this approach, we seek a deeper understanding of the financial dynamics driving this market and aim to provide valuable insights and recommendations for stakeholders, while aiming for highlighting Ooredoo's relative financial position within the competitive landscape.

3.1.1 Mobile operators in Algeria

The mobile sector in Algeria is a fast-moving sector led by three main operators, and with high adoption of mobile technologies and penetration, regulated by ARPCE which publishes observatories with the evolution of subscribers, market shares, as well as terms of subscriptions and technologies. According to ARPCE, the mobile market in Algeria includes all mobile telephony services (GSM, 3G, 4G) offered to users/clients on national territory, both prepaid and postpaid subscriptions. The market was active for a total of around 51.5 million active subscribers at the end of 2023, meaning a penetration of 116.5%, showing the number of subscriptions exceeds the population which shows high usage of mobile services.

Algeria's mobile operators are licensed to provide mobile telecommunications services to users. There are three major mobile operators:

- **Mobilis** (subsidiary of Algérie Télécom, the incumbent public operator).
- **Djezzy** (private operator majority-owned by the National Investment Fund).
- **Ooredoo Algérie** (private mobile operator majority owned by the Qatari operator Ooredoo) between the three of them, they capture most of the market, providing GSM, 3G and 4G mobile telecommunications services.

3.1.2 Analyzing the activity of mobile operators in Algeria

The ARPCE has presented an overview of mobile operator activity in Algeria, which provides some interesting information about the development of the telecoms sector in Algeria. ARPCE measures subscription levels, market shares of the various operators, and usage of mobile technologies, including GSM, 3G, and 4G. ARPCE furthermore guarantees fair competition among the players, quality of services provided, and regulation of frequencies and infrastructures. This data analysis helps ARPCE monitor developments in the sector and assist the public authorities in their regulation of telecommunications in Algeria.

3.2 Evolution of subscribers by customer

The change in the number of subscribers per customer in Algiers demonstrates the increasing mobility of the mobile telephony market. According to ARPCE, the growth is correlated to the slight growth of the market and the demographic growth. The penetration rate of mobile networks continues to evolve and showcases the growing problem of the use of modern telecommunications services by customers. Hence, as a customer, you either have prepaid offers or a preference for 3G/4G technologies.

Table 10: Evolution of subscribers by customer from 2015 to 2023 (in millions).

Year	Mobilis (ATM)	Djezzy (OTA)	Ooredoo (WTA)	Grand total
2015	13.4%	16.1%	12.3%	41.8%
2016	14.0%	16.6%	13.1%	43.7%
2017	14.9%	16.8%	14.1%	45.8%
2018	15.7%	15.8%	14.5%	46.0%
2019	16.2%	15.2%	14.1%	45.5%
2020	17.2%	15.6%	14.5%	47.3%
2021	18.6%	15.6%	14.7%	48.9%
2022	21.1%	15.2%	12.7%	49.0%
2023	22.5%	15.9%	13.1%	51.5%

Source: Developed by the author on the basis of data published in ARPCE reports

The activity of mobile operators in Algeria from 2015 to 2023 shows a market in full expansion and technological transformation. The total number of subscribers has increased from about 35 million at the end of 2015 to over 51 million in 2023, with a penetration rate of 116.5% at the end 2023, clearly illustrating the phenomenon of frequent multi-subscription among users. There is also an important technological shift toward 3G and 4G technologies, which now represent more than 94% of active subscriptions, while the GSM is gradually phased out. On the competitive landscape, Mobilis is still maintaining its leadership position with 43.6% market share and about 22.5 million subscribers, followed by Djezzy (30.9%) and Ooredoo (25.4%). Those active subscriptions are also mainly pre-paid (over 95%) demonstrating high flexibility in terms of consumption. Voice and SMS traffic is also very much on the rise, confirming the relevant share of mobile services in the daily lives of its users in Algeria. This transition reflects a matured industry, with a healthy level of digital services adoption and active and regulated oversight of the ARPCE, which monitors and supports the expansion of electricity while defending the quality and competitiveness of the market.

3.2.1 Market share evolution of the three operators

ARPCE indicates that the trajectory of market shares of mobile operators in Algeria is stable with small fluctuations among the main players. Mobilis remains the largest share, followed by Djezzy and Ooredoo that both continue to have a significant portion of the market. The results show balanced competition in an environment of moderate growth in the total number of subscribers and continued growth of new technologies, specifically mobile technologies including 3G and 4G.

Table 11: Market share evolution of the three operators (2015-2023)

Year	Mobilis (ATM)	Djezzy (OTA)	Ooredoo (WTA)
2015	32.1%	38.4%	28.4%
2017	32.5%	36.7%	30.8%
2019	35.6%	33.4%	31.0%
2021	38.0%	31.9%	30.1%
2023	43.7%	30.9%	25.4%

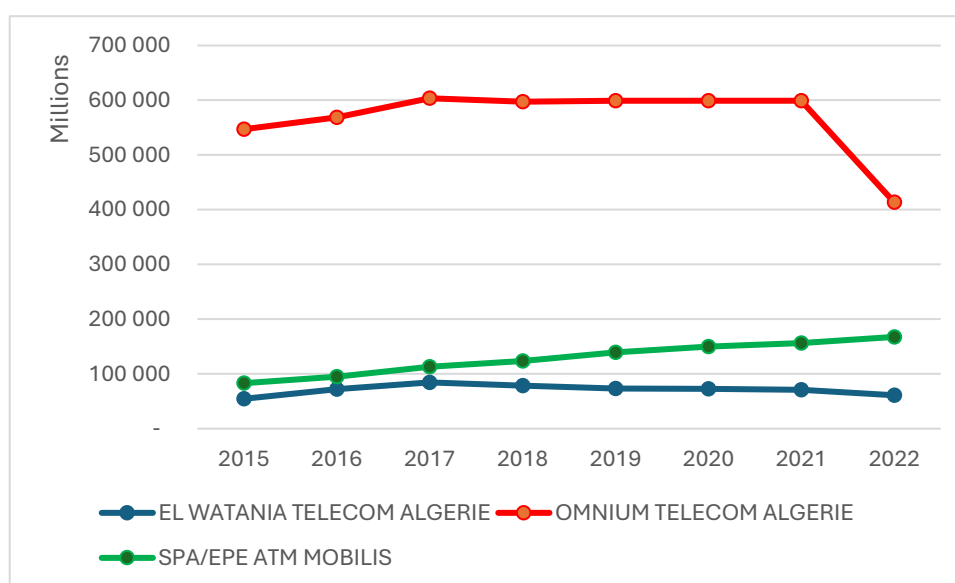
Source: Developed by the author on the basis of data published in ARPCE reports

The mobile phone market in Algeria has experienced steady growth in subscribers between 2015 and 2023, increasing from 41.8 million subscribers in 2015 to 51.5 million subscribers by 2023, with a penetration rate rising to over 116% as well. Mobilis experienced a strong growth rate to be the clear leader with a market share of 43.7% in 2023, followed by Djezzy (30.9%) and Ooredoo (25.4%). Factors in this growth included a growing footprint of network coverage and a growing penetration of 3G and 4G usage, with the prepaid system continuing to dominate the mobile telephone market with around 95% of total subscribers.

3.2.2 Evolution of shareholders' equity

The equity of mobile operators in Algeria between 2015 and 2022 has evolved differently as a result of strategies to adapt to economic shifts and increased competition in the market, as well as the impact of renewed sectoral regulation. While the overall trend shows significant growth for some operators, the specific performance of each operator remains dependent on local conditions and their respective investment policies.

Figure 12: Evolution of mobile operators' equity during the period (2015-2022)



Source: Developed from the annual reports of mobile operators (2015-2022)

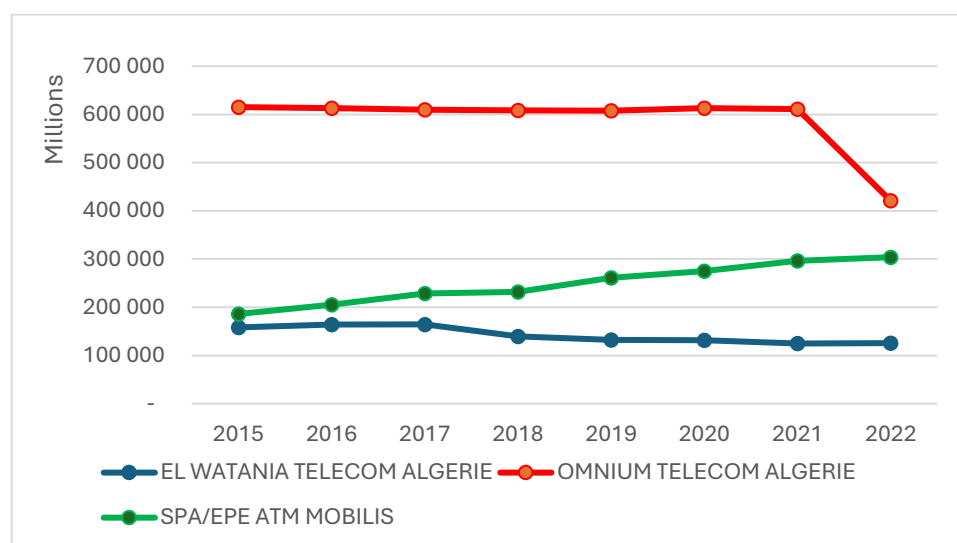
The strong rises recorded especially by OMNIUM TELECOM ALGERIE (Djezzy) in 2016-2017 were followed by sharp declines after 2018, while Mobilis (SPA/EPE ATM MOBILIS) showed a gradual and more stable growth, while Ooredoo (EL WATANIA TELECOM ALGERIE) suffered a marked decline after 2017. The main and compelling reason for these

shifts, as confirmed by the ARPCE's annual reports, is the intensity of competition in the market, which has pushed operators to increase investments in network development and improve the quality of services to keep up with the growing demand for high-flow internet. This significant investment, although it has contributed to improving revenues in the short term, has led to eroding profit margins and rising costs, which is directly reflected in private funds, especially as net profits have declined in some years. Intense competition and continued infrastructure investment are the main factors behind these fluctuations, as clearly stated in the annual ARPCE reports.

3.2.3 Evolution of total assets

The following figure illustrates the evolution of total assets for mobile phone operators in Algeria, namely: Ooredoo (EL WATANIA TELECOM ALGERIE), Djezzy (OMNIUM TELECOM ALGERIE), and Mobilis (SPA/EPE ATM MOBILIS) during the period 2015-2022:

Figure 13: Evolution of the total assets of mobile operators during the period (2015-2022)



Source: Developed from the annual reports of mobile operators (2015-2022)

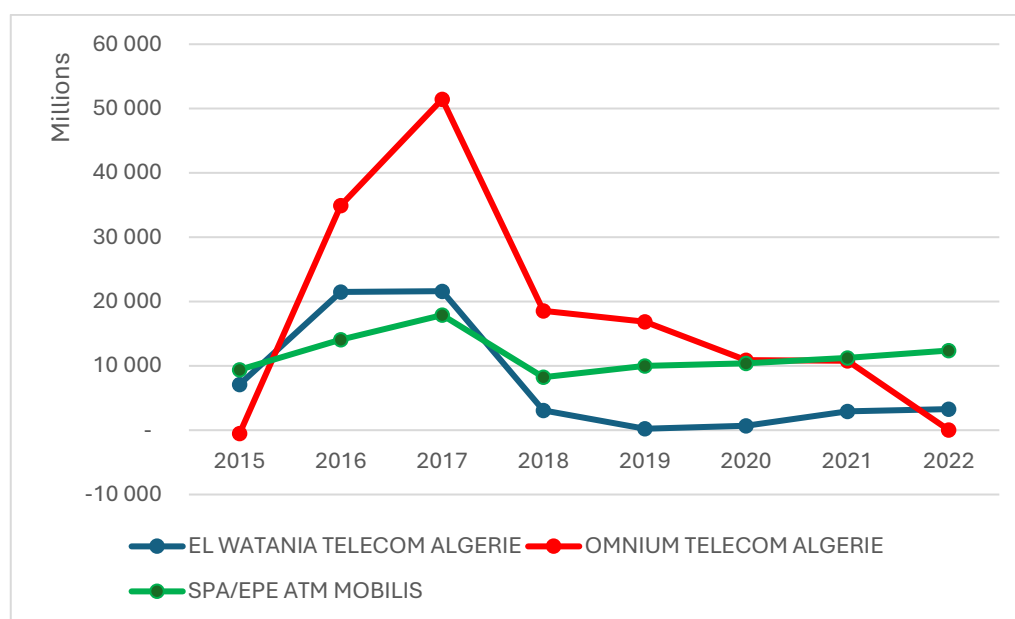
OMNIUM TELECOM ALGERIE (Djezzy) had been leading in terms of asset size in spite of taking a huge fall in 2022 following years of relative stability, revealing the impact of strategic change and competition in the sector. Meanwhile, SPA/EPE ATM MOBILIS continued to record steady growth in its assets due to well-established investment and expansion plans for the development of its network and service enhancement, thereby consolidating its position in the industry. For EL WATANIA TELECOM ALGERIE

(Ooredoo), its assets had a certain level of stability with a slight decrease, which may indicate either limited growth in investments or the impact of intense competition on its business efficiency. All these together reveal the paramount role of mobile service operators in the Algerian digital economy, in which investments in technological infrastructure are crucial for enhancing their market share and ensuring sustainable asset growth, as supported by the annual reports issued by ARPCE.

3.2.4 Evolution of net income

The table shows the evolution of the net income for mobile phone operators in Algeria (Ooredoo, Djezzy, and Mobilis) during the period 2015-2022, revealing a clear disparity in financial performance among the three companies due to market factors, competition, and investment.

Figure 14: Evolution of the net results generated by mobile operators during the period (2015-2022)



Source: Developed from the annual reports of mobile operators (2015-2022)

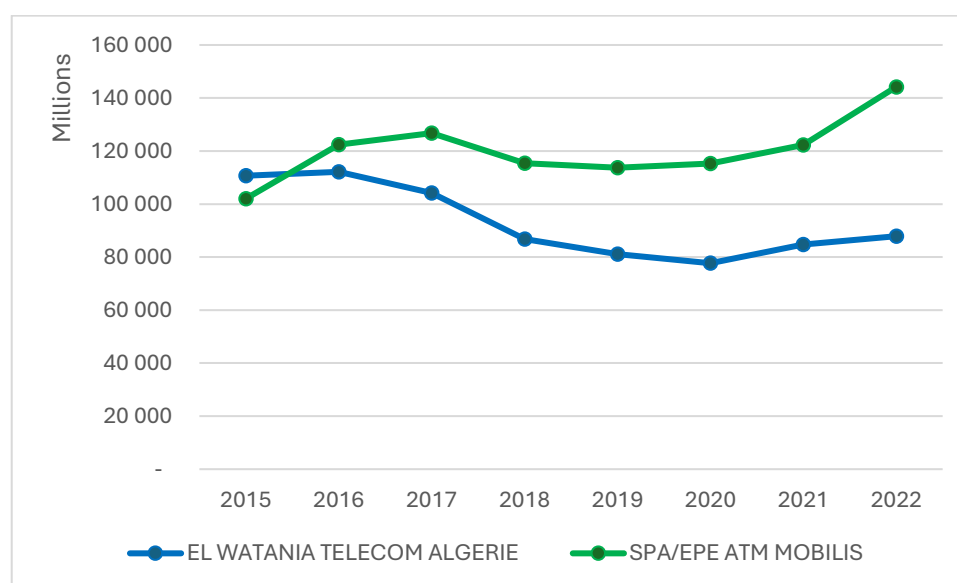
From 2015 to 2022, Ooredoo results showed some fluctuations but began a recovery to reach 3.3 billion dinars in 2022. Mobilis had consistently achieved better results reaching 12.4 billion dinars in 2022; as it had made advancements in service and infrastructure development. Furthermore, the profits in the above -mentioned firms contributed to each having a better, positive Return on Equity metric. Djezzy did not make net profits for the full

period in our observation. In general, the Algerian telecommunications sector had a positive improvement in profit, notably for Ooredoo and Mobilis.

3.2.5 The evolution of revenue

According to the annual reports of the National Authority for Post and Electronic Communication (ARPCE), the turnover is established by taking the total of all the revenues secured from primary and secondary services provided to customers (individuals, business, administrations) excluding value-added taxes. In the sector of telecommunications, turnover is the main indicator for measuring the volume of commercial activities of the company, as well as overall success in the market. Turnover represents the company's ability to acquire subscribers through service development.

Figure 15: Evolution of revenue generated by the mobile operators Mobilis and Ooredoo during the period 2015-2022



Source: Developed from the annual reports of mobile operators (2015-2022)

From 2015 to 2022, Wataniya's turnover varied from 110.7 billion DZD (2015) to 77.7 billion DZD (2020) and then rose again to 87.9 billion DZD (2022) due to competition and shifting consumption. Meanwhile, Mobilis recorded steady growth from 102 billion DZD to 144.1 billion DZD thanks to investment in infrastructure and digital services with state backing. This shift was driven by subscriber expansion, investment in digital infrastructure, competition and tariffs, and the COVID-19 pandemic, which affected traditional services and boosted internet demand.

3.3 Analysis of the key financial performance ratios of mobile operators in Algeria

In this part, we will examine the financial performance of mobile operators in Algeria. With a focus on financial performance indicators using the DuPont method as a financial analysis tool to calculate and analyze these indicators.

3.3.1 DuPont analysis

For any enterprise in the private sector, there are various models to represent how the business is performing. Among them, there is DuPont model. DuPont de Nemours Company developed in the 1960s a system that is based on ratio analysis for it to rapidly determine if a company was making the best use of all means available to achieve its financial goal. As stated, the financial goal of any company should be, of course, to maximize the shareholder's wealth. Hence, it can be safely said that a company is financially healthy if the wealth of shareholders grows according to the risk they take. And as for the means they use to achieve this objective. (SAIDI & BENMOUFFEKI, 2021)

According to (Almazari, 2012), Dupont analysis is a financial analysis system used to evaluate a company's financial performance, identify the drivers of its financial success, and plan its future performance. Dupont analysis is based on the Return on Equity (ROE) model, which in turn analyzes financial performance into three components: Net Profit Margin (NPM), Total Assets Turnover (TAT), and Equity Multiplier (EM). Net Profit Margin (NPM) indicates a company's efficiency in controlling its costs and converting its revenues into real profits, as well as better cost management. Total asset turnover (UA) refers to an assessment of a company's efficiency in using its assets to generate revenue. The Equity Multiplier (EM) is used to calculate a company's leverage, meaning the use of debt to finance its assets. Return on Equity (ROE) is first analyzed into Return on Assets (ROA) and Equity Multiplier (EM). ROA is analyzed into net profit margin (NPM) and total asset turnover (TAT).

We can summarize the indicators of this method in the table below:

Table 12: Indicators of Dupont Analysis

Indicator	Definition	Mathematical formula
Profit Margin (PM)	The net profit margin measures the percentage of sales that remains as net profit after deduction of all expenses, including operating costs, interest and taxes.	Net Income/Revenue
Assets Turnover (UA)	Asset turnover indicates how much sales are generated for each monetary unit of assets. It measures the efficiency with which the company uses its assets to generate sales.	Revenue/Total Assets
Equity Multiplier (EM)	Financial leverage measures the extent to which a company uses debt to finance its assets. The higher the ratio, the more the company uses debt to finance its operations.	Total Assets/Equity
Return on Equity (ROE)	ROE indicates the return generated on each monetary unit invested by shareholders. A high ROE indicates a good use of shareholders' equity to generate profits.	Net Income/Equity
Return on Assets (ROA)	Return on assets measures a company's ability to generate profits from its total assets. In other words, it indicates how efficiently the company uses its resources (assets) to generate profits.	Net Income/Total Assets

Source: Prepared by the student on the basis of data from (SAIDI & BENMOUFFEKI, 2021)

3.3.2 The Importance of the DuPont Method in Analyzing the Efficiency of Mobile Operators

The DuPont method is very important in analyzing the mobile market, as it provides an accurate and complete understanding of a company's operating performance by breaking down the return on equity into its components of profitability, asset efficiency, and leverage. In comparing the major mobile operators in Algeria (Mobilis, Djezzy, and Ooredoo), the DuPont method allows one to know the different strengths and weaknesses of the companies. A decision maker or analyst can now determine how operationally effective each operator is in terms of profitability, resource utilization, and cost financing. As such, DuPont's analysis adds an integrated framework for making decisions on investments and strategic alternatives based on solid financial figures and helps improve performance and competitiveness in the Algerian telecommunications market.

The following table summarizes the evolution of DuPont analysis ratios over an 8-year period, from 2015 to 2022, for mobile operators in Algeria:

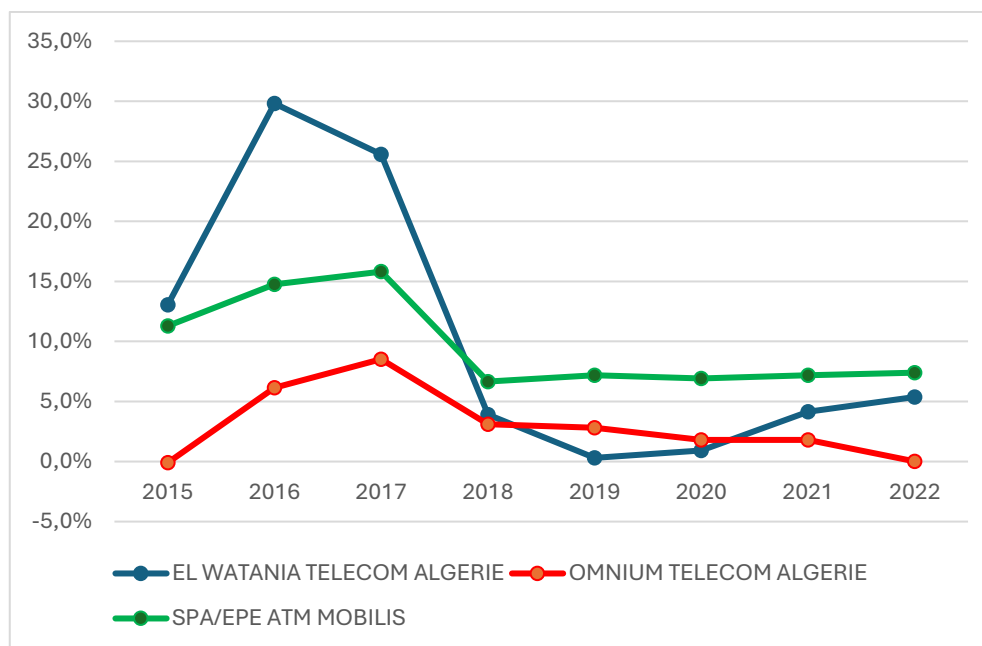
Table 13: The evolution of DuPont analysis indicators for mobile operators in Algeria during the period 2015-2022.

Year	ATM MOBILIS					OMNIUM TELECOM ALGERIA					EL WATANIA TELECOM ALGERIA				
	ROE %	ROA %	EM %	PM %	UA %	ROE %	ROA %	EM %	PM %	UA %	ROE %	ROA %	EM %	PM %	UA %
2015	11.3	5.04	2.24	9.2	54.8	(0.1)	(0.08)	1.12	(5.8)	1.5	13.0	4.50	2.90	6.4	70.0
2016	14.8	6.84	2.16	11.5	59.5	6.1	5.70	1.08	-	-	29.8	13.09	2.28	19.1	68.4
2017	15.8	7.84	2.02	14.1	55.5	8.5	8.44	1.01	-	-	25.6	13.14	1.95	20.7	63.3
2018	6.7	3.56	1.87	7.1	49.8	3.1	3.05	1.02	-	-	3.9	2.21	1.78	3.5	62.1
2019	7.2	3.83	1.87	8.8	43.6	2.8	2.77	1.01	-	-	0.3	0.17	1.80	0.3	61.4
2020	6.9	3.77	1.84	9.0	41.9	1.8	1.77	1.02	-	-	0.9	0.51	1.81	0.9	59.1
2021	7.2	3.79	1.90	9.2	41.3	1.8	1.77	1.02	-	-	4.1	2.36	1.76	3.5	67.9
2022	7.4	4.08	1.81	8.6	47.5	0.01	0.02	1.02	-	-	5.4	2.61	2.06	3.7	70.2

Source: Based on the operators' annual reports.

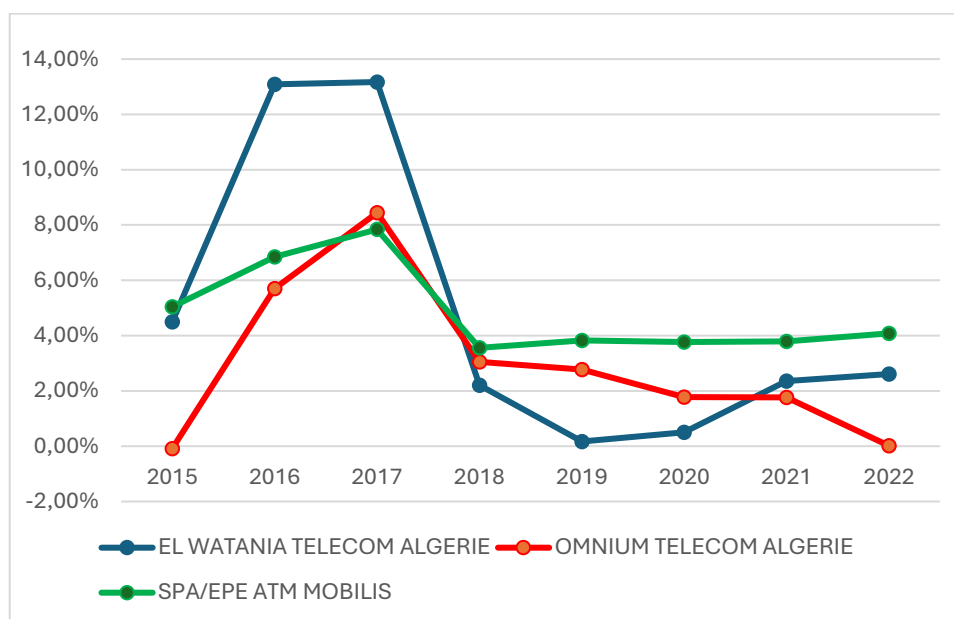
Based on the presented table, a continuous fluctuation in the Return on Equity (ROE) margins of Algerian mobile phone operators during the study period (2015-2022). Such variation of ROE shows the extent to which the ability of such companies to ensure sustainable profits and make effective investment decisions is affected in a changing competitive environment.

Figure 16: Evolution of ROE for mobile operators from 2015 to 2022



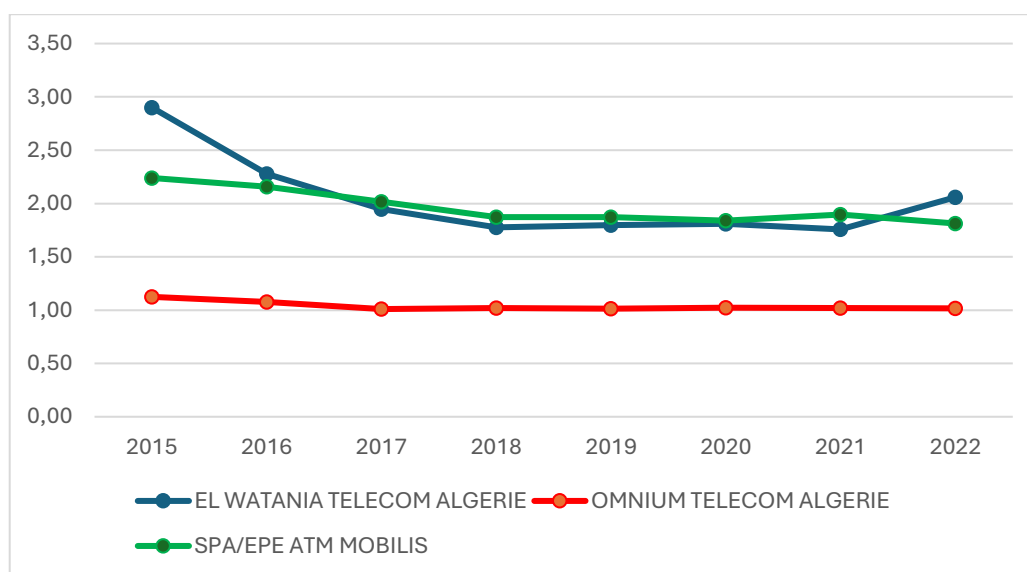
Source: Generated from the data in table 13

Between 2015 and 2022, the return on equity (ROE) of the three Algerian telecommunications companies showed a notable disparity. Wataniya recorded a high ROE initially (29.9% in 2016) before sharply declining due to competition and market fluctuations, eventually settling at 5.4% in 2022. Mobilis showed more stable ROE with an upward trend, which, after declining temporarily due to the impacts of COVID-19 and economic conditions, recovered to 7.4% in 2022, thanks to strategic investment efforts and fiscal incentives. Omnim, in contrast, showed weak or negative ROE for most of the period under study, reflecting persistent issues in terms of profitability. Overall, ROE in the sector seemed to react sensitively to fluctuations in profits, investment, and supportive policies, with more vibrant firms yielding better performance while traditional businesses struggled.

Figure 17: Evolution of ROA for mobile operators from 2015 to 2022

Source: Generated from the data in table 13

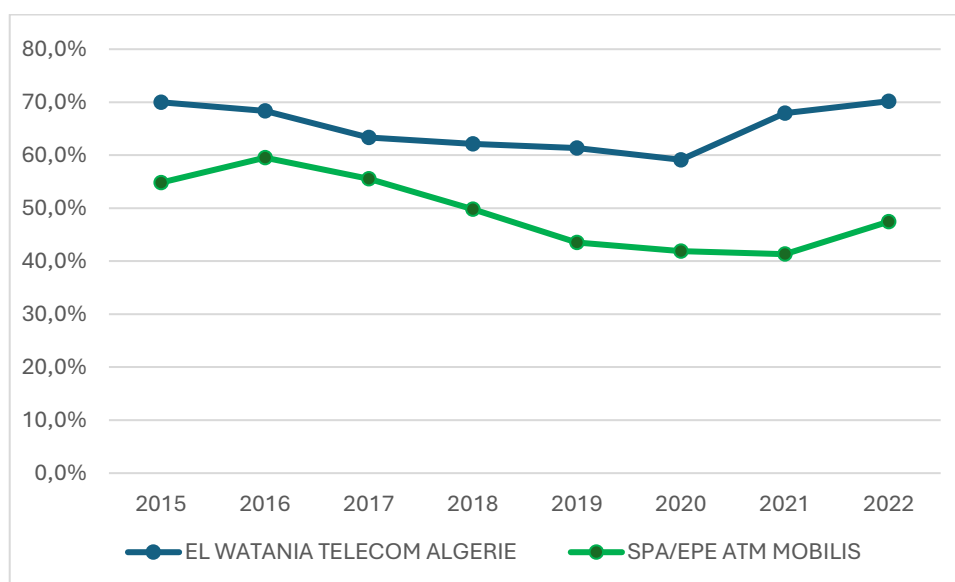
In 2015-2022, Return on Assets (ROA) of the three Algerian telcos showed variation. Wataniya recorded a spike in ROA during 2016-2017 but later diluted to stay at low levels (2.6% in 2022) due to competition and profit decline. Mobilis recorded quite a stable ROA (4-8%) prior to decreasing slightly to 4.08% in 2022, showing stable asset utilization. Omnim had very low ROA (<2%) due to low profitability and weak asset utilization. On average, companies that managed to transform and expand their digital products had higher ROA.

Figure 18: Evolution of EM for mobile operators from 2015 to 2022

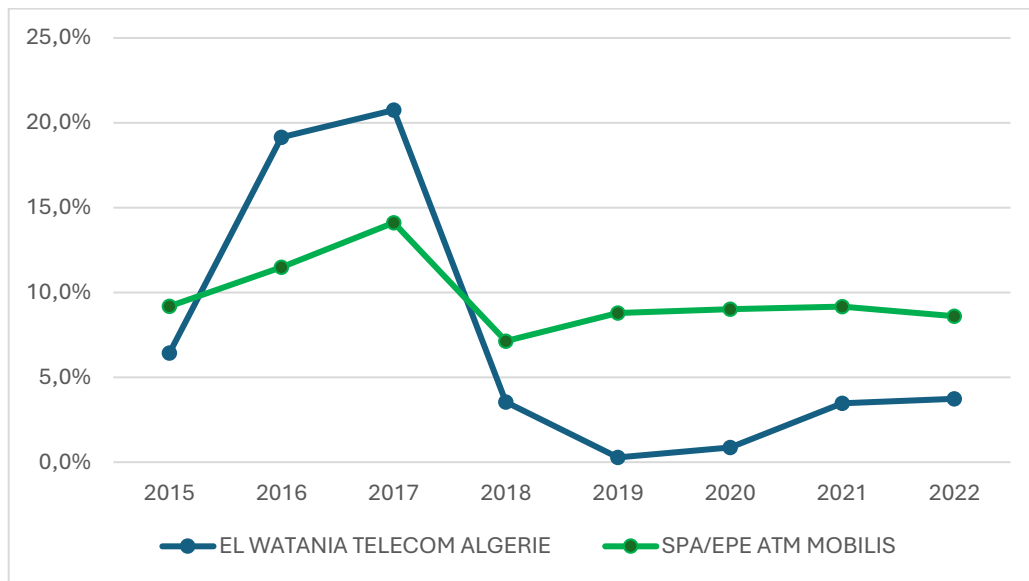
Source: Generated from the data in table 13

Between 2015 and 2022, the Equity Multiplier (EM) of the three Algerian telecommunications companies showed differences in their financing strategies. Wataniya started with a high EM (2.90 in 2015), indicating a greater reliance on debt, which gradually decreased to 1.62 in 2022, suggesting a strengthening of its financial structure. Mobilis had a relatively stable EM (1.81 to 1.02) through self-financing and state assistance. Omnum had a low and relatively stable EM (around 1.40), as expected from its almost complete reliance on self-financing and zero ability to mobilize external funds, as in its weak financial performance. ARPCE reports link these trends to each firm's financial policy, such that debt reduction enhances the ability to deal with market challenges. Generally speaking, EM's development represents an industry-wide trend towards increased financial sustainability and decreased risks when it comes to outside funding.

Figure 19: Evolution of UA for mobile operators (Ooredoo, Mobilis) 2015-2022



Source: Generated from the data in table 13

Figure 20: Evolution of PM for mobile operators Ooredoo and Mobilis from 2015 to 2022

Source: Generated from the data in table 13

The data shows that Ooredoo's profit margin (EL WATANIA TELECOM ALGERIE) experienced a strong rise between 2016 and 2017 (reaching 20.7%) and then declined sharply to stabilize at weak levels (around 3-4% between 2019 and 2022), reflecting the impact of intense competition and market changes. Mobilis (SPA/EPE ATM MOBILIS) has maintained a relatively stable profit margin between 7% and 14%, indicating a better ability to control costs and adapt to market conditions. These trends reflect initial turnover growth followed by a slowdown caused by market saturation, rising investments, and evolving consumer demand for data services.

Conclusion

In this chapter, we reviewed the comprehensive research process undertaken to achieve the study objectives. We collected reliable, evidence-based data through a carefully designed questionnaire, which enabled us to obtain precise and relevant information from the participants. A systematic data analysis was conducted using SPSS software, allowing for accurate statistical analyses and validation of the study findings. Additionally, a simplified financial analysis of Ooredoo Algeria was performed using the DuPont model, an advanced financial tool for assessing financial performance. This model enabled us to decompose the components of financial performance and link them to the broader context of the company's digital transformation, while also comparing the results with key financial indicators of its competitors in the Algerian telecommunications sector. Collectively, these methodological

steps enhance the rigor and credibility of the research and provide a solid foundation for its conclusions. The SWOT analysis of Ooredoo offered comprehensive insights into its strengths, weaknesses, opportunities, and threats, forming a foundation for strategic formulation that enhance its competitiveness, support the success of digital transformation and achieve sustainable financial performance, thus contributing significant value to the company's adaptability in a dynamic environment.

Chapter 03: Results and Discussion

Section 1: Presentation, Analysis, and Interpretation of Results

After explaining the methodology and processes in the study, we can start to analyze the results with SPSS Software version 27. The data collected through the online survey are variables relevant to digital transformation. In this chapter we will interpret the results as a means to test the hypotheses of the study: whether digital transformation and its component have a significant and positive effect on financial performance.

1.1 Data screening and preprocessing or preliminary data analysis

This process involves detecting and correcting errors, handling missing or inconsistent values, removing irrelevant or noisy data, and transforming the data into a clean, organized format suitable for statistical analysis or machine learning. The goal is to improve data quality and ensure that subsequent analyses are accurate and reliable.

1.1.1 Missing values analysis

Before conducting any statistical analysis, it is essential to identify and handle missing values to ensure the reliability of the results. In this study, the questionnaire was administered using Google Forms with the mandatory response option enabled. As a result, no missing data were recorded, ensuring that all responses in the sample ($n = 202$) were complete and valid. (see appendix C)

1.1.2 Reliability Test (Cronbach's Alpha)

Cronbach's Alpha is an essential statistical indicator of reliability for a questionnaire, given as an indicator of internal consistency of items, or how closely the different items in a dimension measure the same concept. A large coefficient (close to 1) means the items were highly correlated with each other, thus supporting the validity of the tool. In this research, Cronbach's Alpha is calculated to assess the internal consistency and reliability of the questionnaire items. (Mallery, P., & George, D, 2005) offer a set of frequently referenced guidelines for interpreting Cronbach's alpha as a measure of the internal consistency reliability for research instruments. Their rough guidelines for alpha scores are:

Table 14: Alpha scores and their interpretation

Cronbach's Alpha (α)	Interpretation
≥ 0.90	Excellent
≥ 0.80	Good
≥ 0.70	Acceptable
≥ 0.60	Questionable
≥ 0.50	Poor
< 0.50	Unacceptable

Source: Author, inspired by (Mallery, P., & George, D, 2005)

Table 15: Reliability Statistics – Cronbach's Alpha of all the variables

Cronbach's Alpha	Number of Items
0,929	14

Source: Generated by the authors using SPSS software (V.27)

The Cronbach's Alpha coefficient obtained is 0.929 for a total of 14 items, indicating strong internal consistency of the scale used in our questionnaire.

A value above 0.9 reflects excellent reliability, meaning that the items consistently measure the same dimensions. This result validates the reliability of our questionnaire and supports its use for data analysis.

Table 16: Reliability Statistics Cronbach's Alpha of digital transformation

Cronbach's Alpha	Number of Items
0,881	8

Source: Generated by the authors using SPSS software (V.27)

The Cronbach's Alpha value of 0.881 indicates a high level of internal consistency among the items, meaning they reliably measure the same underlying construct. The items are well-correlated and the measurement is consistent.

Table 17: Reliability Statistics Cronbach's Alpha of adoption of digital tools

Cronbach's Alpha	Number of Items
0,780	2

Source: Generated by the authors using SPSS software (V.27)

The Cronbach's Alpha value of 0.780 indicates a high level of internal consistency among the items, meaning they reliably measure the same underlying construct. The items are well-correlated and the measurement is consistent.

Table 18: Reliability Statistics Cronbach's Alpha of training in digital innovation

Cronbach's Alpha	Number of Items
0,786	4

Source: Generated by the authors using SPSS software (V.27)

The Cronbach's Alpha value of 0.786 indicates a high level of internal consistency among the items, meaning they reliably measure the same underlying construct. The items are well-correlated and the measurement is consistent.

Table 19: Reliability Statistics Cronbach's Alpha of digital customer experience

Cronbach's Alpha	Number of Items
0,766	2

Source: Generated by the authors using SPSS software (V.27)

The Cronbach's Alpha value of 0.766 indicates a high level of internal consistency among the items, meaning they reliably measure the same underlying construct. The items are well-correlated and the measurement is consistent.

The reliability assessment of the digital transformation variable indicates a good degree of internal consistency for each of its dimensions. Thus, the scale designed to measure digital transformation is reliable, and all of its dimensions have acceptable levels of internal consistency and thus, can be used for further statistical analysis.

Table 20: Reliability Statistics Cronbach's Alpha of financial performance

Cronbach's Alpha	Number of Items
0,884	6

Source: Generated by the authors using SPSS software (V.27)

For the financial performance dimension, the reliability test confirmed a Cronbach's Alpha of 0.884 across six items, indicating high internal consistency, indicating the items were correlated and measured the same thing.

1.1.3 Normality test

The Kolmogorov-Smirnov test is particularly suitable for larger sample sizes, such as ours ($n = 202$), and provides a straightforward way to compare the sample distribution with a

theoretical normal distribution. Its ability to handle larger datasets makes it a practical choice for our analysis, ensuring that our conclusions about the data's distribution are robust and reliable. We're going to test the distribution of both the independent variable and the dependent, including the 3 dimensions of the independent variable. The hypotheses for this test are:

- Null Hypothesis (H_0): The data is normally distributed.
- Alternative Hypothesis (H_1): The data is not normally distributed.

Table 21: Results of normality test of adoption of digital tools

		Kolmogorov-Smirnov ^a		
		Statistics	Ddl	Sig
Adoption	of	0.05	202	0.200
digital tools				
Training	in	0.052	202	0.200
digital innovation				
Digital customer		0.042	202	0.200
experience				
Digital		0.056	202	0.200
transformation				
Financial		0.031	202	0.200
performance				

Source: Generated by the authors using SPSS software (V.27)

To complement this verification process, an alternative method was used, which involved generating derived variables that conform to a normal distribution, derived from the initial variables. This approach allows for the transformation of potentially non-normally distributed data into normalized variables, thereby enhancing the validity of statistical analyses that assume normality.

The K-S test ($p = 0.200$) indicates no significant deviation from normality for all variables, confirming the assumption of normal distribution. As a result, we can proceed with the regression test to explore the impact of digital transformation on financial performance.

1.2 Description of the study sample

This part provides some key demographic and pertinent characteristics of the participants, including the characteristics related to participant variables. The statistical summaries provide a clear overview of the sample composition, offering context for the findings and indicating the representativeness of the sample for the target population.

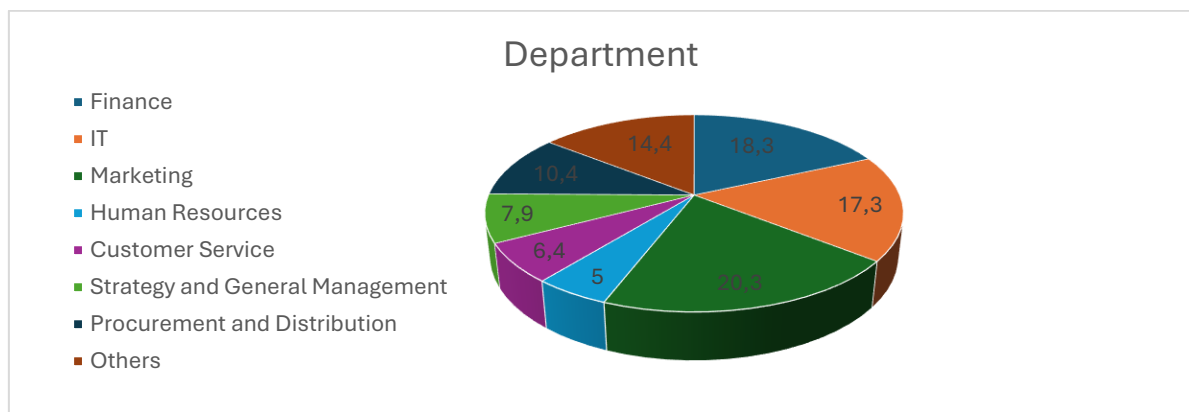
1.2.1 Sample Distribution by Department

Table 22: Distribution of the Study Sample by Department

		Frequency	Percentage	Valid Percentage	Cumulative Percentage (%)
Valid	Finance	37	18,3	18,3	18,3
	IT	35	17,3	17,3	35,6
	Marketing	41	20,3	20,3	55,9
	Human Resources	10	5,0	5,0	60,9
	Customer Service	13	6,4	6,4	67,3
	Strategy and General Management	16	7,9	7,9	75,2
	Procurement and Distribution	21	10,4	10,4	85,6
	Others	29	14,4	14,4	100,0
	Total	202	100,0	100,0	

Source: Generated by the authors using SPSS software (V.27)

Figure 21: Distribution of the study sample by department



Source: Generated by the authors using SPSS software (V.27)

The study sample shows an approximate distribution across departments. The Marketing department had the most respondents (20.3%), followed by Finance (18.3%) and IT (17.3%). These three departments accounted for over half (55.9%) of the total study population distribution demonstrating a high level of participation by strategic and technical functions. The remaining category Others (14.4%) refers to a variety of smaller units represent relevant specializations including Technology, CSDO, Procurement,

Authorizations, Revenue Assurances, Corporate Affairs, to name but a few. The diversity demonstrates digital transformation issues are common concerns across the multiple different specializations beyond the main functional departments. This distribution represents a wide degree of organizational involvement and which results in a comprehensive viewpoint in the analysis.

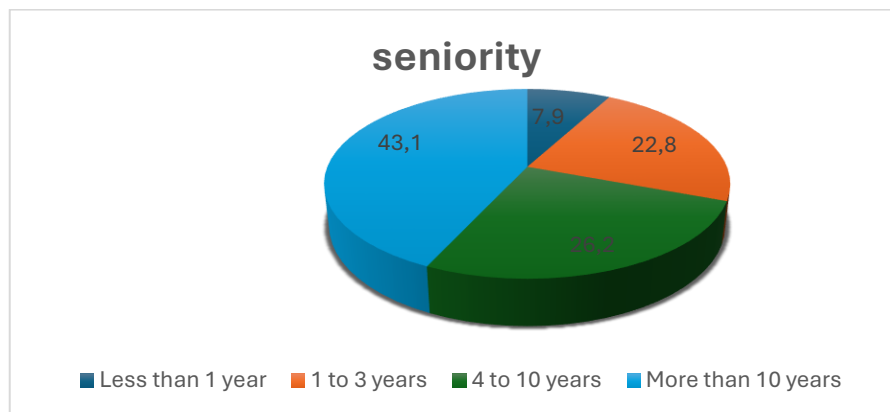
1.2.2 Sample distribution by seniority

Table 23: Distribution of the Study Sample by seniority

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Less than 1 year	16	7,9	7,9	7,9
	1 to 3 years	46	22,8	22,8	30,7
	4 to 10 years	53	26,2	26,2	56,9
	More than 10 years	87	43,1	43,1	100,0
	Total	202	100,0	100,0	

Source: Generated by the authors using SPSS software (V.27)

Figure 22: Distribution of the study sample by seniority



Source: by us based on data from SPSS software (V.27).

When considering the distribution of respondents by seniority, it can be noted that the majority of participants seem to have a considerable amount of experience within Ooredoo Algeria. The largest group of respondents (43.1%) are individuals who have more than 10 years of experience. The remaining respondents come from those with 4 to 10 years (26.2%) and 1 to 3 years (22.8%). Only 7.9% of respondents indicated that they have worked at the organization for less than one year, which suggests that newly hired employees may be somewhat limited in representation. This distribution does suggest that the perspectives collected through the questionnaire are informed by a sample of mostly experienced

professionals, who are likely to have had extensive exposure to organizational systems and processes, which also include the systems/processes used for digital transformation and performance evaluation.

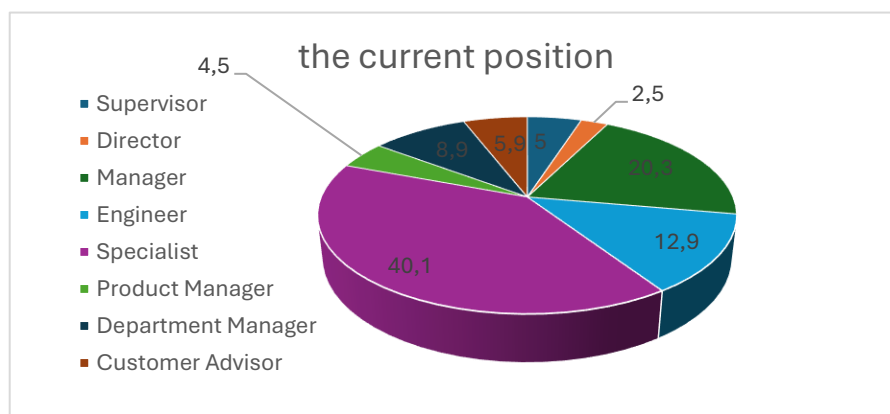
1.2.3 Sample Distribution by the current position

Table 24: Distribution of the Study Sample by the current position

		Frequency	Percentage (%)	Valid Percentage	Cumulative Percentage
Valid	Supervisor	10	5,0	5,0	5,0
	Director	5	2,5	2,5	7,4
	Manager	41	20,3	20,3	27,7
	Engineer	26	12,9	12,9	40,6
	Specialist	81	40,1	40,1	80,7
	Product Manager	9	4,5	4,5	85,1
	Department Manager	18	8,9	8,9	94,1
	Customer Advisor	12	5,9	5,9	100,0
	Total	202	100,0	100,0	

Source: Generated by the authors using SPSS software (V.27)

Figure 23: Distribution of the study sample by the current position



Source: by us based on data from SPSS software (V.27).

The distribution of respondents by current position indicates the preponderance of specialists who comprise **40.1%** of the respondents. The subsequent largest group are managers (**20.3%**), which suggest the proportion of the sample in middle management with responsibility for both action and coordination is significant. The presence of engineers (**12.9%**) and department managers (**8.9%**) is also indicative of technical and strategic

profiles among the sample. Directors (2.5%) and product managers (4.5%) are in low proportions which indicates lesser representation of upper management and product-related roles. Overall, the distribution of current positions gives a good snapshot of the workforce at varying levels, which is helpful in evaluating perceptions and implications of digital transformation at different levels of hierarchy.

1.3 Statistical analysis of the questionnaire results (study results)

The following table indicates the minimum and maximum averages of the intervals and their corresponding relative weights:

Table 25: The range of minimum and maximum averages

The interval	[1-1.8[[1.8-2.6[[2.6-3.4[[3.4-4.2[[4.2-5]
Relative weight	Totally disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

Source: Established by us based on the Likert scale used.

the results generated by calculating the means and standard deviations of the various questionnaire items illustrate a diversity of opinions among respondents regarding the dimensions of digital transformation. The following tables summarize these results, indicating for each item the mean, standard deviation, and reported level of agreement (response trend).

1.3.1 Analysis of the Results for digital transformation

Table 26: The averages and standard deviations of digital transformation

N°	Question Title	Mean	Standard Deviation	Response Trend
1	Digital tools have improved the efficiency of my work.	4,54	0,760	Strongly agree
2	Management actively encourages the use of new digital tools.	4,43	0,845	Strongly agree
Adoption of Digital Tools		4,48	0,727	Strongly agree

3	I regularly receive training to master digital tools.	3,42	1,178	Agree
4	I consider myself competent enough to utilize digital technologies in my job.	4,28	0,888	Strongly agree
5	Ooredoo Algeria is investing in innovative projects (Artificial Intelligence, Big Data, etc.).	4,23	0,925	Strongly agree
6	Digital improvement ideas from employees are commonly considered.	3,97	0,883	Agree
Training in digital innovation		3,97	0,761	Agree
7	Digital solutions (mobile application, chatbot) have improved customer satisfaction.	4,04	0,874	Agree
8	Customer feedback is processed faster thanks to digital tools.	4,25	0,870	Strongly agree
Digital customer experience		4,14	0,785	Agree
Digital transformation		4,20	0,663	Strongly agree

Source: Generated by the authors using SPSS software (V.27)

The data in Table 26 showed an overall positive impression from respondents, with an overall average of 4.20 and a standard deviation of 0.663, indicating a robust tendency towards agreement and relatively consistent responses from the sample. The best-reviewed items were those associated with perceived improvement of workplace efficiency through digital tools (mean = 4.54), management encouraging employees to use digital tools (mean = 4.43), and the perceived competence of employees using digital technologies/tools (mean = 4.28). These data show a very positive view of the use and support of digital tools by, and in, their workplace. The sub-dimensions also demonstrated strong results: adoption of digital tools (mean = 4.48), Digital Customer Experience (mean = 4.14), and training in digital innovation (mean = 3.97). This is strong evidence that the organization reflects its mission, vision, and values in its digital transformation. Some items received lower scores such as frequency of training on digital tools (mean = 3.42) and consideration of employee's improvement ideas (mean = 3.97), which may suggest some potential opportunities for improvement concerning systemic continuous learning and participatory processes of innovation. Overall, the data suggest a good impression of digital transformation at Ooredoo Algeria, particularly in regard to adoption of digital tools and improvements to customer

experience while identifying the need to develop training programs and prospects to provide feedback on innovations to employees.

1.3.2 Analysis of the Results for the Dimension: financial performance

Table 27: The averages and standard deviations of financial performance

N°	Question Title	Mean	Standard Deviation	Response Trend
1	Digital transformation has contributed to the increase in company revenue (e.g., online sales).	4,04	0,822	Agree
2	Digital investments have a visible return on investment (ROI).	3,88	0,850	Agree
3	Digital transformation has made it possible to attract new customers (e.g.: digital partnerships).	4,06	0,844	Agree
4	Digital services have opened new markets for Ooredoo.	4,24	0,826	Strongly agree
5	Digital transformation has reduced operational costs (e.g., process automation).	3,91	0,859	Agree
6	Digital tools optimize the use of resources (time, budget).	4,07	0,810	Agree
Financial performance		4,03	0,664	Agree

Source: Generated by the authors using SPSS software (V.27)

The results found in Table indicate a generally favourable perception of the effect of digital transformation on financial performance with an overall mean score of 4.03 and a standard deviation of 0.664. A general tendency toward agreement and moderate homogeneity of responses. The highest rated item relates to the perceived role of digital services in opening new markets (mean = 4.24), followed by optimizing resources through digital resources (mean = 4.07) and attracting new customers through digital means (mean = 4.06). From these results, we see respondents demonstrate that they valued tangible financial and strategic benefit associated with digital transformation.

The somewhat lower scores (but still positive) pertain to visibility of ROI of digital investments (mean = 3.88) and operational cost reductions (mean = 3.91). This could indicate that participants anticipated more nuanced contextual outcomes in these areas.

To summarize, the results suggest that their employees see digital transformation being a positive contributor to financial performance at Ooredoo, particularly in their ability to expand markets, attract new customers, and improve efficiencies. However, some areas, such as measuring their ROI or reductions in costs, could be more effective if there was clearer messaging or stronger communication to elicit perceived value.

1.4 Hypothesis Test

The objective of this analysis is to examine the impact of the different dimensions of digital transformation (adoption of digital tools, training in digital innovation, and digital customer experience) on financial performance. We're going to start analysing the main hypothesis that contains the independent variable (digital transformation) and then every single other secondary hypothesis that contains the dimensions of this independent variable, using the linear regression test.

Table 28 : Multiple Linear Regression Model Statistics (Financial Performance)

Dimension	Dependent variable	R	R ²	T	Sig	B	Constant	Beta
				3.188	0.002			
Adoption of digital tools	Financial performance	0.391	0.153	1.552	0.122	0.118	1.427	0.107
Training in digital innovation				3.640	0.00	0.267		0.247
Digital customer experience				2.852	0.005	0.221		0.195

Source: Generated by the authors using SPSS software (V.27)

1.4.1 Digital transformation

The main hypothesis states that digital transformation has a significant impact on financial performance. To test this, a multiple linear regression analysis was conducted.

H0: There is no relationship between digital transformation and financial performance

H1: Digital transformation has a significant impact on financial performance

The table that examines the relationship between the independent variable and the dependent variable (financial performance) shows the correlation coefficient $R=0.391$ that indicates a moderate positive linear relationship between the variables. The coefficient of determination

$R^2=0.153$ meaning that approximately **15.3%** of the variance in the dependent variable is explained by digital transformation, but still leaves room for other influencing variables. The $T\text{-value}=3.188$ and $p=0.002<0.05$ confirms that the effect of digital transformation on financial performance is statistically significant in this model. The hypothesis H1 is then accepted. This relationship can be represented by this equation:

Financial performance= **1.427**+ **0.267** (training in digital innovation) + **0.221** (digital customer experience)

As for Standardized Beta, a one standard deviation increase in digital innovation training is associated with a 24.7% standard deviation increase in financial performance, assuming other variables remain constant and a one standard deviation increase in improving digital customer experience leads to a 19.5% standard deviation increase in financial performance. As a result, the combined impact of these two dimensions on financial performance in this model is 44.2%, indicating a moderate effect.

1.4.2 Adoption of digital tools

Table 29: Simple Linear Regression Model Statistics (financial performance)

Dimension	R	R ²	F	T	Sig	B	Constant
Adoption of digital tools	0.210	0.044	9.182	1.552	0.122	0.232	2.865

Source: Generated by the authors using SPSS software (V.27)

The secondary hypothesis states that adoption of digital tools has a significant impact on financial performance.

H0: There is no relationship between adoption of digital tools and financial performance

H1a: Adoption of digital tools has a significant impact on financial performance

The table shows the correlation coefficient $R=0.210$ that indicates a weak positive linear relationship between the variables. The coefficient of determination $R^2=0.044$ showing that approximately **4.4%** of the variance in the dependent variable is explained by the adoption of digital tools, but still leaves room for other influencing variables. The F-statistic value of **9.182** suggests the overall regression model is statistically significant, meaning the model explains a significant portion of the variance beyond what would be expected by chance. $T=1.552$ indicating stronger evidence that the predictor variable has a significant effect on

the dependent variable. However, $\text{sig}=0.122>0.05$, indicating that the effect of adoption of digital tools on the dependent variable is not statistically significant in this model. The hypothesis H1a is then rejected and we accept H0.

1.4.3 Training in digital innovation

Table 30: Simple Linear Regression Model Statistics (Financial Performance)

Dimension	R	R ²	F	T	Sig	B	Constant
Training in digital innovation	0.311	0,097	21,419	3.640	0.00	0.335	2.597

Source: Generated by the authors using SPSS software (V.27)

The secondary hypothesis states that training in digital innovation has a significant impact on financial performance.

H0: There is no relationship between training in digital innovation and financial performance

H1b: Training in digital innovation has a significant impact on financial performance

The table shows the correlation coefficient $R=0.311$ that indicates a weak to moderate positive linear relationship between the variables. The coefficient of determination $R^2=0.097$ explaining that approximately **9.7%** of the variance in the dependent variable is explained by training in digital innovation, but still leaves room for other influencing variables. The F-statistic value of **21.419** suggests the overall regression model is statistically significant, meaning the model explains a significant portion of the variance beyond what would be expected by chance. $T=3.640$ indicating stronger evidence that the predictor variable has a significant effect on the dependent variable. $\text{Sig}=0.00<0.05$, indicating that the effect of training in digital innovation on the dependent variable is statistically significant in this model. The hypothesis H1b is then accepted. This relationship can be translated into the following equation: $y= 2.597+ 0.335x$

1.4.4 Digital customer experience

Table 31: Simple Linear Regression Model Statistics (Financial Performance)

Dimension	R	R ²	F	T	Sig	B	Constant
Digital customer experience	0.274	0,075	16,182	2.852	0.005	0.232	2.865

Source: Generated by the authors using SPSS software (V.27)

The secondary hypothesis states that digital customer experience has a significant impact on financial performance.

H0: There is no relationship between digital customer experience and financial performance

H1c: Digital customer experience has a significant impact on financial performance

The table illustrates the correlation coefficient $R=0.274$ that indicates a weak positive linear relationship between the variables. The coefficient of determination $R^2=0.075$ meaning that approximately 7.5% of the variance in the dependent variable is explained by digital customer experience, but still leaves room for other influencing variables. The F-statistic value of 16.182 suggests the overall regression model is statistically significant, meaning the model explains a significant portion of the variance beyond what would be expected by chance. $T=2.852$ indicating stronger evidence that the predictor variable has a significant effect on the dependent variable. $Sig=0.005 < 0.05$, indicating that the effect of digital customer experience on the dependent variable is statistically significant in this model. The hypothesis H1c is then accepted. This relationship can be translated into the following equation: $y= 2.865+ 0.232x$

In conclusion, the results strongly support H1, as digital transformation demonstrates a significant positive impact on financial performance ($p < 0.05$), rejecting the null hypothesis (H0). Similarly, H1b (training in digital innovation, $p < 0.05$) and H1c (digital customer experience, $p = 0.005 < 0.05$) are also supported, confirming that structured training and customer-centric digital strategies enhance financial outcomes. However, H1a (adoption of digital tools, $p = 0.122 > 0.05$) is not statistically significant, suggesting that merely adopting digital tools without complementary training, customer engagement, or broader

transformation does not significantly improve financial performance. These findings highlight that while digital transformation as a whole drives financial success, its effectiveness depends on specific strategic factors such as employee training and customer experience optimization.

Table 32: Summary of the decision regarding the hypotheses of the study

Study hypotheses			Decision
H1	Digital transformation has a significant impact on financial performance		Accepted
	H1a	adoption of digital tools has a significant impact on financial performance	Rejected
	H1b	Training in digital innovation has a significant impact on financial performance	Accepted
	H1c	Digital customer experience has a significant impact on financial performance	Accepted
H0	Digital transformation has no significant impact on financial performance		Rejected

Source: author

Section 02: Discussion

Given the increasing interest in the scientific literature regarding the impact of digital transformation on the financial performance of organizations, particularly in dynamic and competitive sectors such as banking and telecommunications. However, a clear gap remains in applied studies that deeply explore the relationship between the dimensions of digital transformation and financial performance outcomes within the Algerian context, especially from the perspective of employees themselves.

This study aims to investigate the impact of digital transformation in its three dimensions (adoption of digital tools, training in digital innovation, and digital customer experience) on the financial performance of Ooredoo Algeria. The study relied on developing a precise scale for these dimensions, focusing on evaluating the level of digital transformation from the viewpoint of employees across various departments and analyzing the extent to which this is reflected in financial performance indicators, while considering the structural distribution of the sample in terms of department, seniority, and current position, in addition to an in-depth statistical analysis of the survey results and hypothesis testing using advanced statistical models.

2.1 Sample Description

The sample included employees from various departments and job levels, with a strong representation of experienced individuals (more than 43% having over 10 years of experience), which reflects in-depth and informed perspectives on digital transformation within the company.

2.2 Digital transformation as a whole and financial performance

Our study's results showed a statistically significant, moderate positive relationship between digital transformation and financial performance ($R^2 = 0.091$, Sig. = $0.002 < 0.05$). This indicates that digital transformation explains a considerable portion of the variance in financial performance, even if the effect is moderate. This result aligns with findings from studies such as the one by [\(Loso Judijanto et al, 2024\)](#) in the Indonesian telecommunications sector, which showed that digital transformation with its components (digital infrastructure, digital services, customer experience, operational efficiency) enhances profitability and operational efficiency.

Furthermore, our results showed that digital transformation at Ooredoo is perceived as an ongoing process that requires continuous investments in technology and human resources, and not as a momentary or short-term transformation. This is consistent with what (ABED & HELMI, 2024) pointed out about digital transformation gradually changing the form, culture, and processes of organizations, which is reflected in financial performance cumulatively rather than immediately.

The results of this study are consistent with recent literature that emphasizes that digital transformation does not automatically translate into positive financial results unless it is coupled with a real investment in human capital, an organizational culture that supports innovation, and a focus on the digital customer experience. Furthermore, the financial impact is more evident in growth and market expansion, while measuring cost reduction and achieving return on digital investment requires accurate indicators and continuous monitoring mechanisms. (Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023); (Alrawashedh & Shubita, 2024), on the contrary the study by (NGONGANG et al, 2022) did not find a direct and strong relationship between overall digital transformation and financial indicators. Instead, it focused on organizational impact and customer satisfaction without conducting an in-depth financial analysis. In that study, the financial relationship was not quantitatively tested; rather, the emphasis was placed on changes in administrative processes and improvements in operational efficiency.

2.3 Analysis of digital transformation dimensions

The results showed a generally positive perception of digital transformation at Ooredoo, with an overall average of 4.20 out of 5. The adoption of digital tools dimension stood out with the highest average (4.48), followed by digital customer experience (4.14), and then Training in digital innovation (3.97). The highest-rated items were related to improving efficiency through digital tools and management support for digital transformation.

2.3.1 Adoption of digital tools

Among the notable findings in our study is that the adoption of digital tools despite receiving a high rating from employees (average of 4.48) did not have a strong direct financial impact ($p=0.122>0.05$ (H1a)) compared to other dimensions. This partially contradicts some studies that have linked investment in digital tools with rapid improvements in financial performance (Kim, Kim, & Kyung, 2022) This dimension received the highest average (4.48 out of 5), indicating the widespread adoption and effective use of digital tools within the company. This aligns with literature such as (Bocean & Vărzaru, 2023) and (Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023), which emphasize that digital tools enhance productivity and operational efficiency.

2.3.2 Training in digital innovation

Despite the average score for the Training in Digital Innovation dimension being **3.97**, which still indicates a positive level, it is considered the lowest compared to the other analyzed dimensions. Participants highlighted promising opportunities to enhance the effectiveness of continuous training in broaden employee involvement in suggesting innovative ideas. Prior studies (ED-DOUIB Amina & FAHMI Youssef, 2025) emphasize the pivotal role that both training and innovation play as essential elements in translating digital investment into tangible financial gains, cautioning that any deficiency in attention to these aspects may diminish the expected positive return from digital transformation initiatives. It is worth noting that this dimension has a significant impact on financial performance (H1b), which particularly underscores the importance of strategic investment in developing human capital and fostering a culture of digital innovation within organizations.

The study by (Hattab Samia & El Achari Sanaa, 2023) focused on the effect of training on enhancing innovation or employee satisfaction without directly linking it to financial performance. Their results indicated that digital training contributes to raising the level of organizational innovation and improving the work environment, but its direct impact on financial performance indicators such as profitability or return on investment was neither proven nor tested. This differs from my study's findings, which quantitatively and directly linked digital training to financial performance.

2.3.3 Digital customer experience

The average score for the Digital Customer Experience dimension, at 4.14, reflects a significant focus by the company on enhancing customer experience across various digital channels. Items related to digital responsiveness speed and customer satisfaction with digital services received the highest ratings within this dimension. These findings align with the conclusions of studies by (Seda, 2024) ; (Loso Judijanto et al, 2024), which affirm that the digital customer experience has become a key driver of financial growth in modern companies. The considerable impact of this dimension on financial performance (H1c), underscores that the continuous improvement of the digital customer experience translates positively into better financial outcomes.

The study by (Alrawashedh & Shubita, 2024) focused solely on measuring the impact of digital customer experience on customer satisfaction, without directly addressing financial performance indicators. Their findings showed that digital transformation enhanced customer satisfaction and loyalty; however, no explicit link was made between this experience and financial outcomes. This highlights a difference in the analytical approach compared to our study, which concentrated on the direct financial relationship.

2.4 Financial performance analysis

The average financial performance score (4.03) reflects a positive perception of the impact of digital transformation on profitability, growth, and new customer acquisition indicators. The highest-rated items were new market expansion, resource optimization, and new customer acquisition, while the least clear items were return on investment and operating cost reduction, which may indicate challenges in measuring the direct financial impact or weak internal communication about the results of digital transformation. The literature (Alrawashedh & Shubita, 2024) confirms that the financial impact of digital transformation often appears in growth and market expansion before it appears in cost reduction.

2.5 Hypotheses testing and analysis of causal relationships

The regression analysis showed a statistically significant positive relationship between digital transformation and financial performance ($R^2 = 0.091$, Sig. < 0.05), confirming that digital transformation explains a considerable portion of the variation in financial performance. The sub-dimensions also showed that training in digital innovation, and digital

customer experience have the greatest impact compared to the adoption of digital tools alone, which supports the findings in the literature about the importance of human empowerment and customer experience in maximizing the financial impact of digital transformation.

The results of this study are consistent with recent literature that emphasizes that digital transformation does not automatically translate into positive financial results unless it is coupled with a real investment in human capital, an organizational culture that supports innovation, and a focus on the digital customer experience. Furthermore, the financial impact is more evident in growth and market expansion, while measuring cost reduction and achieving return on digital investment requires accurate indicators and continuous monitoring mechanisms. (Liu, Jiajia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023); (Alrawashedh & Shubita, 2024)

2.6 Distribution by seniority

The study results showed clear differences in the perception of the impact of digital transformation based on employees' years of experience. It was found that employees with longer experience (more than 10 years) have a greater awareness of the importance of digital transformation, especially in the dimensions of digital tool adoption and digital customer experience. This is attributed to their extensive interaction with the company's operations and their direct exposure to the stages of technological development that the organization has undergone, making them more capable of evaluating the improvements achieved in operational efficiency and the quality of services provided to customers.

On the other hand, employees with less experience (less than 5 years) showed greater enthusiasm for digital innovation, but their perception of the impact of digital transformation on financial performance was less clear, perhaps due to their limited knowledge of financial indicators or their limited participation in strategic decision-making. This result is consistent with the literature that suggests that the accumulation of professional experience enhances an employee's understanding of organizational variables and their financial impact. (ED-DOUIB Amina & FAHMI Youssef, 2025)

2.7 Distribution by departments

When analyzing the differences between the various departments, it was observed that employees in the Finance and Marketing departments showed a higher level of awareness of the importance of digital transformation in improving financial performance. These employees indicated that digital transformation contributed to improving financial planning processes, speeding up procedures, and providing more accurate and transparent reports, and it also positively impacted attracting new customers and expanding market share.

However, employees in the technical departments (Information Technology, Networks) focused more on the operational aspects of digital transformation, such as updating the digital infrastructure and adopting process automation solutions, with less attention to the direct financial aspects. In contrast, employees in the administrative and human resources departments showed a moderate evaluation of digital transformation, with their focus on its impact on improving internal communication and facilitating administrative procedures.

These results are consistent with what is mentioned in the literature ([Liu, Jijia; Kexin Zhou, Ye Zhang; Tang, Fangcheng, 2023](#)), which confirms that the perception of the impact of digital transformation varies depending on the job specialization, where it is more evident in departments that deal directly with financial operations or customers. The study by ([NGONGANG et al, 2022](#)) focused on specific departments without a similar level of comprehensiveness, which may affect the overall inclusiveness of the results and fail to represent all organizational perspectives.

2.8 Distribution by job level

The study results illustrated that job level plays a fundamental role in determining how the impact of digital transformation is perceived. Managers and supervisory staff demonstrated a deeper understanding of the relationship between digital transformation and financial performance, indicating that digital transformation has become a strategic necessity for enhancing competitiveness and achieving sustainable growth.

In contrast, employees at the executive levels (field workers and technicians) showed greater interest in the practical aspects of digital transformation, such as the ease of use of digital systems and the improvement of working conditions, without focusing significantly on financial results. As for employees at the middle levels (team leaders, supervisors), they

acted as a link between the strategic vision and practical application, demonstrating a balanced awareness of the importance of digital transformation at both the operational and financial levels.

These differences are consistent with the literature (Bocean & Vărzaru, 2023) which suggests that the strategic perception of the impact of digital transformation is more evident among senior management, while the practical perception is concentrated among executive levels. The study by (Hattab Samia & El Achari Sanaa, 2023) focused solely on top management, which may limit the comprehensiveness of the results and make them less representative of various organizational levels.

Conclusion

- **Research overview and objectives**

The study aimed to quantitatively assess the impact of digital transformation on the financial performance of Ooredoo, one of Algeria's leading telecommunications companies. Employing a quantitative research design, primary data were collected through a structured questionnaire distributed to employees across multiple departments within Ooredoo, ensuring a representative sample of the organizational population involved in digital initiatives.

The results strongly support the main hypothesis (H1), demonstrating that digital transformation has a significant and positive effect on financial performance ($p < 0.05$), thereby rejecting the null hypothesis (H0). More specifically, the findings reveal that training in digital innovation (H1b) and digital customer experience (H1c) substantially enhance financial outcomes. These results suggest the important role of employee capacity building and customer-centric digital strategies as potential drivers of financial success. Conversely, the adoption of digital tools alone (H1a) was not statistically significant ($p > 0.05$), suggesting that technology implementation may not sufficiently improve financial performance without complementary training and customer engagement. These findings contribute to the academic discourse by clarifying that digital transformation's effectiveness depends not merely on technology adoption but on a strategic integration of human resource development and enhanced customer experience. For practitioners, the study highlights the importance of investing in structured training programs and customer-focused digital initiatives to maximize financial returns from digital transformation efforts.

- **Research Limitations**

Despite the valuable insights provided, this study has several limitations, including:

- The cross-sectional design of this study captures data at a single point in time, limiting the ability to establish causal relationships between digital transformation and financial performance;
- Sample limitation: The study was limited to employees of Ooredoo only, which restricts the generalizability of the results to the entire telecommunications sector in Algeria.
- Lack of financial data: There was missing financial information for some companies in the telecommunications sector (mobile operators), which prevented comprehensive comparative analyses across all companies.

- The survey focused on specific dimensions of digital transformation, which may have led to the exclusion of other important factors. Additionally, since these dimensions are not universally applicable, the findings might not capture the full complexity of digital transformation across different contexts;
- Potential response bias may have influenced the survey results, as participants might have provided socially desirable answers, misunderstood questions, or responded inconsistently;
- The sample size of 202, although substantial, falls short of the recommended minimum of 235, which may reduce the statistical power of the study.

- **Suggestions**

- **Enhance Professional Training and Development Programs:** Investing in employee training on digital innovation should be a priority to ensure the sustainability of digital transformation and translate it into tangible financial results;
- **Activate a Culture of Participatory Innovation:** Encouraging employees to propose new digital solutions and adopting their ideas will enhance the financial impact of digital transformation;
- **Improve Mechanisms for Measuring Digital Financial Performance:** Developing precise indicators to measure the return on digital investment and reduce operating costs;
- **Focus on the Digital Customer Experience:** Continue developing digital service channels and improving the speed of response and quality of interaction with customers;
- **Enhance Internal Communication:** Share the results of digital transformation with employees to increase awareness and collective commitment.

- **Future research directions**

Building on these limitations, future research should consider the following directions:

- longitudinal studies to track the evolution of digital transformation's impact on financial performance over time, providing deeper insights into causal relationships and sustainability of benefits;
- Expanding the scope to include multiple organizations and industries would enhance the external validity of the findings;

- Incorporating qualitative methods such as interviews or case studies could enrich understanding of organizational and cultural factors that facilitate or hinder successful digital transformation;
- Further investigation into the role of complementary factors-such as leadership, organizational culture, and technology infrastructure-would also be valuable to develop a more holistic model of digital transformation's financial impact.

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APPENDICES

APPENDIX A-QUESTIONNAIRE

This study is part of a Master's thesis at the National Graduate School of Management (ENSM), in partnership with El Wataniya Telecom Algeria (Ooredoo DZ). It aims to measure the influence of digital technologies on profitability, growth, and cost management, while identifying levers for improvement to optimize digital investments. Your responses, anonymous and strictly confidential, will help us analyze the impact of digital technologies on financial performance. Estimated time: 5 minutes.

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Part 1: The variables of the study

Section 1 : Digital transformation

1- Adoption of Digital Tools

/	1	2	3	4	5
Digital tools have improved the efficiency of my work.					
Management actively encourages the use of new digital tools.					

2- Digital Training and Skills

/	1	2	3	4	5
I regularly receive training to master digital tools.					
I consider myself competent enough to utilize digital technologies in my job.					

3- Digital innovation

/	1	2	3	4	5
Ooredoo Algeria is investing in innovative					

projects (Artificial Intelligence, Big Data, etc.).					
Digital improvement ideas from employees are commonly considered.					

4- Digital Customer Experience

/	1	2	3	4	5
Digital solutions (mobile application, chatbot) have improved customer satisfaction.					
Customer feedback is processed faster thanks to digital tools.					

Section 2: Financial performance

/	1	2	3	4	5
Digital transformation has contributed to the increase in company revenue (e.g., online sales).					
Digital investments have a visible return on investment (ROI).					
Digital transformation has made it possible to attract new customers (e.g.: digital partnerships).					
Digital services have opened new markets for Ooredoo.					
Digital transformation has reduced operational costs					

(e.g., process automation).					
Digital tools optimize the use of resources (time, budget).					

Part 2: Description sheet**1- Department**

/	Finance	IT	Human resources	Customer service	Strategy	Other
Which department do you belong to?						

2-Experience

/	Less than a year	1 to 3 years	4 to 10 years	More than 10 years
How long have you been working at Ooredoo DZ?				

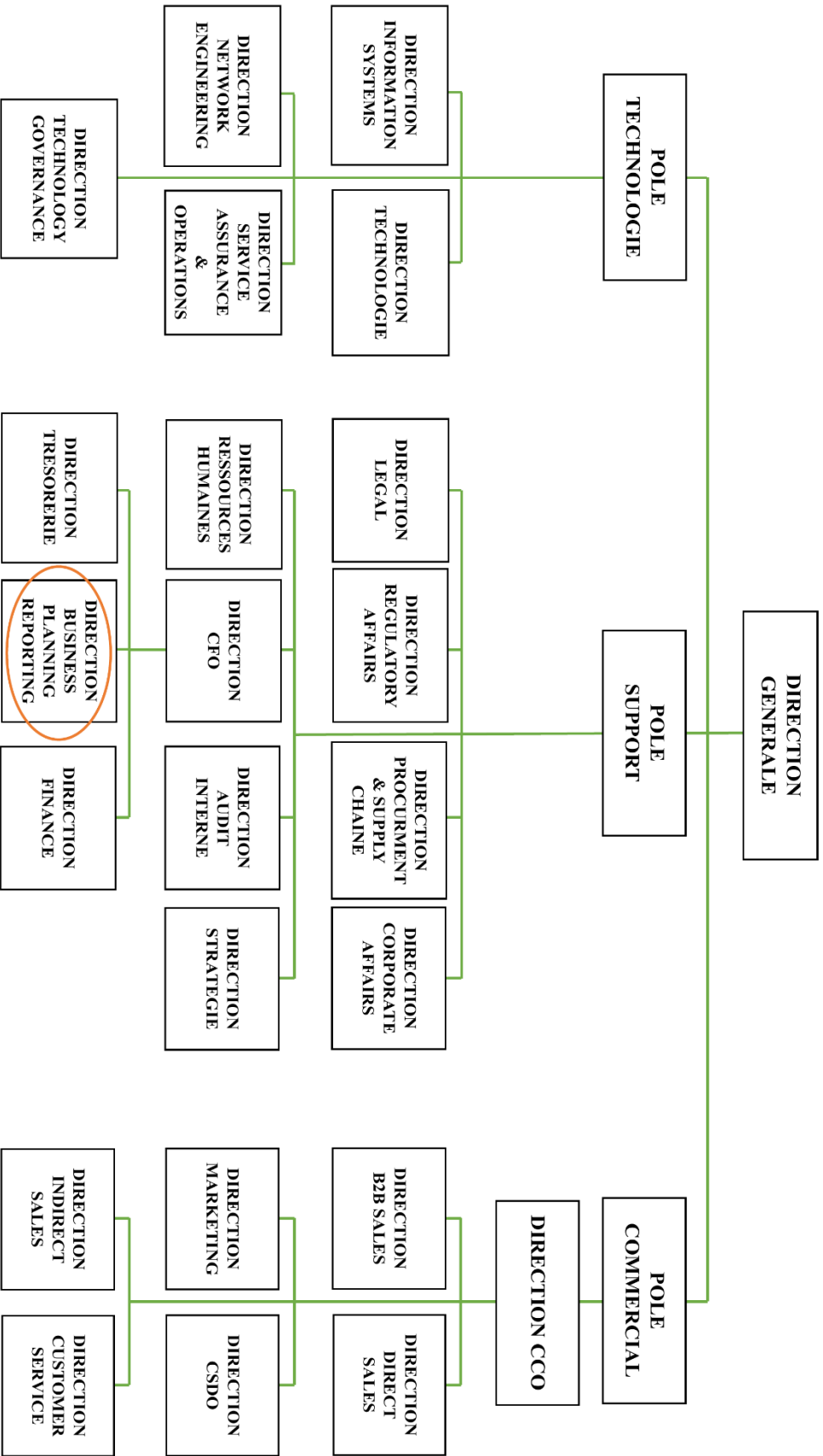
3-Post

/	Supervisor	Director	Manager	Engineer	Specialist	Product Manager	Service Manager	Customer Advisor
What is your current position?								

Part 3: Acknowledgements

Thank you for taking the time to answer this questionnaire. Your responses will help us better understand the impact of digitalization on the financial performance of El Wataniya Telecom Algeria.

**APPENDIX B- OOREDOO
ORGANIZATION CHART**



APPENDIX C- MISSING VALUES TEST

Récapitulatif général des valeurs manquantes

