الجمهورية الجزائرية الديمقراطية الشعبية
République Algérienne Démocratique et Populaire

Ministère de l'Enseignement Supérieur
et de la Recherche Scientifique

Ecole Nationale Supérieure de Management
Koléa

وزارة التعليم العالي و البحث العلمي

المدرسة الوطنية العليا للمناجمنت
القليعة

**GRADUATE DISSERTATION**

Presentation with a view to obtaining an academic master's degree in the specialty

**Strategic management and information system**

# The role of SAP ERP in the improvement of Strategic Financial Management: case study ENAFOR

Elaborated by:

**Habta Islem Moncef Abdelhamid**

Supervised by:

**Pr. Mohammed Himrane**

Academic year:

**2024-2025**

## ABSTRACT:

This research examines the role of SAP ERP integration on strategic financial management at ENAFOR, Algeria's leading oil and gas company. In an increasingly complex economic environment, financial process optimization has become crucial for maintaining long-term sustainability and competitiveness, particularly in capital intensive sectors. The study investigates how SAP ERP implementation affects ENAFOR's budgeting accuracy, financial transparency, and strategic decision-making capabilities. Through a qualitative methodology incorporating semi-structured interviews, field observations, and document analysis, this research provides a comprehensive assessment of SAP ERP's role in transforming financial operations. The theoretical framework traces the evolution of ERP systems from basic inventory management tools of the 1960s to today's intelligent, cloud-based platforms, with particular focus on SAP FICO architecture and its integration with core business functions. The findings reveal that SAP ERP implementation at ENAFOR has significantly enhanced budget planning precision, strengthened financial transparency, and enriched analytical capabilities for strategic decision-making. The centralization of financial data and real-time synchronization across departments have eliminated information silos that previously hindered operational efficiency. However, the digital transformation journey faced several challenges, including technical and infrastructural considerations, organizational change management, and human capital development. This study contributes to the understanding of complex interactions between information systems, financial management, and corporate strategy. It offers valuable insights for other organizations, particularly in the public sector, considering similar digital transformations. The lessons learned from ENAFOR's experience can serve as a guide to maximize benefits and minimize risks associated with ERP implementation in comparable organizational contexts.

Additionally, measurable improvements were observed in key financial processes such as billing, payroll execution, and cost monitoring cycles. These improvements reflect the growing automation and integration achieved through SAP ERP, which helped reduce delays, increase accuracy, and free up human resources for higher-value tasks. The introduction of real-time dashboards, predictive analytics, and cross-functional reporting tools provided decision-makers with immediate access to critical financial insights. This allowed for more agile, proactive, and data-driven decision-making aligned with ENAFOR’s strategic goals.

However, the research also highlighted some limitations. The rotational work schedule at ENAFOR (four weeks on, four weeks off) restricted access to certain user groups during the fieldwork period, potentially limiting the diversity of perspectives. Despite this, the inclusion of core functional users helped ensure that key processes and impacts were accurately captured. This study thus offers not only a valuable case for understanding ERP driven financial transformation but also underscores the importance of change management, continuous training, and stakeholder involvement in large scale digital initiatives.

**Keywords:** SAP ERP, Strategic Financial Management, FICO, Oil and Gas Industry, Digital Transformation, State Owned Enterprise

## RÉSUMÉ :

Cette recherche examine le rôle de l'intégration de SAP ERP sur la gestion financière stratégique d'ENAFOR, première entreprise pétrolière et gazière d'Algérie. Dans un environnement économique de plus en plus complexe, l'optimisation des processus financiers est devenue cruciale pour maintenir la durabilité et la compétitivité à long terme, particulièrement dans les secteurs à forte intensité capitalistique. L'étude se concentre sur le rôle d'implémentation de SAP ERP sur la précision budgétaire, la transparence financière et les capacités de prise de décision stratégique d'ENAFOR. À travers une méthodologie qualitative incorporant des entretiens semi-structurés, des observations de terrain et l'analyse documentaire, cette recherche fournit une évaluation complète du rôle de SAP ERP dans la transformation des opérations financières. Le cadre théorique retrace l'évolution des systèmes ERP, depuis les outils basiques de gestion d'inventaire des années 1960 jusqu'aux plateformes intelligentes basées sur le cloud d'aujourd'hui, avec un accent particulier sur l'architecture SAP FICO et son intégration avec les fonctions essentielles de l'entreprise. Les résultats révèlent que l'implémentation de SAP ERP chez ENAFOR a considérablement amélioré la précision de la planification budgétaire, renforcé la transparence financière et enrichi les capacités analytiques pour la prise de décision stratégique. La centralisation des données financières et leur synchronisation en temps réel avec les autres départements ont permis d'éliminer les silos informationnels qui entravaient auparavant l'efficacité opérationnelle. Cependant, ce parcours de transformation numérique a fait face à plusieurs défis, notamment des considérations techniques et infrastructurelles, la gestion du changement organisationnel et le développement du capital humain. Cette étude contribue à la compréhension des interactions complexes entre les systèmes d'information, la gestion financière et la stratégie d'entreprise. Elle offre des enseignements précieux pour d'autres organisations, notamment dans le secteur public, qui envisagent des transformations numériques similaires. Les leçons tirées de l'expérience d'ENAFOR peuvent servir de guide pour maximiser les bénéfices et minimiser les risques associés à l'implémentation d'ERP dans des contextes organisationnels comparables.

De plus, des améliorations mesurables ont été observées dans des processus financiers clés tels que la facturation, l'exécution de la paie et les cycles de suivi des coûts. Ces progrès reflètent l'automatisation et l'intégration croissantes permises par SAP ERP, qui ont contribué à réduire les délais, à accroître la précision et à libérer des ressources humaines pour des tâches à plus

forte valeur ajoutée. L'introduction de tableaux de bord en temps réel, d'outils d'analytique prédictive et de rapports transversaux a offert aux décideurs un accès immédiat à des informations financières essentielles. Cela a permis une prise de décision plus agile, proactive et fondée sur les données, en phase avec les objectifs stratégiques d'ENAFOR.

Cependant, la recherche a également mis en évidence certaines limites. Le régime de travail alterné d'ENAFOR (quatre semaines en poste, quatre semaines de congé) a restreint l'accès à certains groupes d'utilisateurs durant la période de collecte de données, limitant potentiellement la diversité des points de vue. Malgré cela, l'inclusion des utilisateurs fonctionnels clés a permis de s'assurer que les processus et impacts majeurs ont été correctement documentés. Cette étude offre ainsi non seulement un cas précieux pour comprendre la transformation financière pilotée par ERP, mais souligne également l'importance de la gestion du changement, de la formation continue et de l'implication des parties prenantes dans les initiatives numériques de grande ampleur.

**Mots-clés :** SAP ERP, Gestion Financière Stratégique, FICO, Industrie Pétrolière et Gazière, Transformation Numérique, Entreprise Publique

**الملخص**

هذا البحث يفحص دور تكامل نظام SAP ERP في الإدارة المالية الاستراتيجية بشركةENAFOR ، الشركة الجزائرية الرائدة في قطاع النفط والغاز. في ظل بيئة اقتصادية متعقدة بشكل متزايد، أصبحت عملية تحسين الإجراءات المالية أمرًا حاسمًا للحفاظ على الاستدامة والتنافسية الطويلة الأمد، لا سيما في القطاعات كثيفة رأس المال. تهدف الدراسة إلى استكشاف تنفيذ SAP ERP على دقة الميزانية وشفافية المعلومات المالية وقدرات اتخاذ القرار الاستراتيجي في ENAFOR. من خلال منهجية نوعية تتضمن مقابلات شبه منظمة وملاحظات ميدانية وتحليل الوثائق، تقدم هذه الدراسة تقييمًا شاملًا لدور SAP ERP في تحويل العمليات المالية.

يتتبع الإطار النظري تطور أنظمة ERP منذ أدوات إدارة المخزون الأساسية في ستينيات القرن العشرين وحتى المنصات الذكية القائمة على السحابة اليوم، مع تركيز خاص على بنية SAP FICO وتكاملها مع الوظائف الأساسية للأعمال. تكشف النتائج أن تنفيذ SAP ERP في ENAFOR حسن بشكل كبير دقة التخطيط الميزاني وتعمّق شفافية البيانات المالية وعزز القدرات التحليلية لصانعي القرار الاستراتيجي. لقد ألغت مركزة البيانات المالية ومزامنتها في الوقت الحقيقي عبر الأقسام الصوامع المعلوماتية التي كانت تعيق الكفاءة التشغيلية سابقًا. ومع ذلك، واجهت رحلة التحول الرقمي عدة تحديات، منها الاعتبارات التقنية والبنية التحتية، وإدارة التغيير التنظيمي، وتطوير رأس المال البشري.

تُسهِم هذه الدراسة في فهم التفاعلات المعقدة بين نظم المعلومات والإدارة المالية والاستراتيجية المؤسسية، وتقدم رؤى قيِّمة للمنظمات الأخرى، خاصة في القطاع العام، التي تفكر في تنفيذ تحولات رقمية مماثلة. ويمكن أن تعمل الدروس المستفادة من تجربة ENAFOR كدليل لتعظيم الفوائد وتقليل المخاطر المرتبطة بتنفيذ أنظمة ERP في سياقات تنظيمية مماثلة.

بالإضافة إلى ذلك، لوحظت تحسينات ملموسة في العمليات المالية الرئيسية مثل الفوترة، وتنفيذ كشوف الرواتب، ودورات مراقبة التكاليف. وتعكس هذه التحسينات الأتمتة والتكامل المتناميين اللذين أتاحهماSAP ERP ، مما ساعد في تقليل التأخيرات، وزيادة الدقة، وتحرير الموارد البشرية للقيام بمهام أكثر قيمة. كما وفرت لوحات المعلومات في الوقت الحقيقي والتحليلات التنبؤية وأدوات التقارير متعددة الوظائف إمكانية وصول فوري إلى رؤى مالية حاسمة لصانعي القرار، مما أتاح لهم اتخاذ قرارات أكثر رشاقة واستباقية ومرتكزة على البيانات بما يتوافق مع الأهداف الاستراتيجية لـ.ENAFOR

مع ذلك، يسلط البحث أيضًا الضوء على بعض القيود. فقد حدّت جداول العمل الدورية في ENAFOR (أربعة أسابيع عمل متتابعة تليها أربعة أسابيع راحة) من إمكانية الوصول إلى بعض مجموعات المستخدمين خلال فترة العمل الميداني، مما قد يحد من تنوع وجهات النظر. ورغم ذلك، فقد ساهمت شمولية اختيار المستخدمين الرئيسيين في ضمان التقاط العمليات والتأثيرات الرئيسية بدقة. وهكذا، تقدم هذه الدراسة ليس فقط حالة قيمة لفهم التحول المالي المدفوع بنظامERP ، بل تؤكد أيضًا أهمية إدارة التغيير والتدريب المستمر ومشاركة أصحاب المصلحة في مبادرات رقمية واسعة النطاق.

**الكلمات المفتاحية**SAP ERP **:**، الإدارة المالية الاستراتيجية، FICO، صناعة النفط والغاز، التحول الرقمي، مؤسسة مملوكة للدولة.

## Acknowledgment

First and foremost, I would like to express my sincere gratitude to my supervisor, Professor Himrane Mohammed, at the École Nationale Supérieure de Management (ENSM), for his continuous support, patience, and invaluable guidance throughout the course of this dissertation. His insightful feedback, academic expertise, and commitment to excellence have been crucial to the development and completion of this research. I am truly fortunate to have had the opportunity to work under his supervision.

I would also like to extend my heartfelt appreciation to the faculty and staff of ENSM for providing a stimulating academic environment and for equipping me with the knowledge and tools necessary to complete this work. My time at this institution has been both enriching and transformative.

On a more personal note, I am deeply grateful to my mother, Djalila, and my father, Saleh, for their unconditional love, sacrifices, and unwavering belief in my potential. Their moral and emotional support has been the cornerstone of my academic journey. Without their encouragement and constant presence in my life, this achievement would not have been possible.

I would also like to thank my beloved sister, Amani, for her continuous encouragement, patience, and for always being there to lift my spirits during moments of doubt.

To all those who have contributed to this journey, directly or indirectly, whether through intellectual exchange, emotional support, or kind words of motivation I extend my sincere thanks. This dissertation is as much a reflection of your support as it is of my own efforts.

# Table of Contents:

## List of Figures:

# List of Tables:

## List of Abbreviations:

### General Abbreviations

- **EAI**: Enterprise Application Integration
- **ERP**: Enterprise Resource Planning
- **IS**: Information System
- **IT**: Information Technology
- **SOE**: State-Owned Enterprise

### Financial & Accounting Abbreviations

- **AP**: Accounts Payable
- **AR**: Accounts Receivable
- **CO**: Controlling (SAP Module)
- **FI**: Financial Accounting (SAP Module)
- **GAAP**: Generally Accepted Accounting Principles
- **GL**: General Ledger
- **IFRS**: International Financial Reporting Standards
- **KPI**: Key Performance Indicator
- **P&L**: Profit and Loss Statement
- **ROI**: Return on Investment
- **SFM**: Strategic Financial Management
- **TRM**: Treasury and Risk Management (SAP Module)

### SAP ERP-Specific Abbreviations

- **BI**: Business Intelligence
- **BW**: Business Warehouse
- **ECC**: ERP Central Component (Older version of SAP ERP)
- **FICO**: Financial Accounting & Controlling (Combined FI & CO modules)
- **HR**: Human Resources (SAP Module)
- **MM**: Materials Management (SAP Module)
- **PP**: Production Planning (SAP Module)
- **SAP**: Systems, Applications, and Products in Data Processing
- **SAP S/4HANA**: SAP Business Suite 4 High-Performance Analytic Appliance
- **SD**: Sales and Distribution (SAP Module)

# GENERAL INTRODUCTION

## THEORETICAL FRAMEWORK

Strategic financial management is becoming more and more difficult for businesses in a continuously changing economic climate. In order to maintain long-term sustainability and competitiveness, financial process optimization has become crucial, especially in capital-intensive sectors like oil and gas. Information systems are essential to this change because they facilitate improved decision-making, more transparent financial processes, and more effective resource management. Nonetheless, the spread of disjointed databases and tools may result in inconsistent and ineffective financial data processing. Many businesses have implemented Enterprise Resource Planning (ERP) systems to deal with these issues, and SAP ERP has emerged as one of the top options. SAP ERP is renowned for its capacity to organize and standardize financial procedures, guaranteeing smooth integration between different business operations. The top oil and gas business in Algeria, ENAFOR, has strengthened coordination across its strategic departments, improved forecasting accuracy, and improved financial management through the implementation of SAP ERP. In light of this, our study is to investigate how SAP ERP affects ENAFOR's strategic financial management, particularly assessing its function in Improving budgeting and financial forecasting, Improving accountability and transparency in finance. Using advanced analytics to assist in making strategic decisions.

The purpose of this study is to ascertain how ENAFOR's financial efficiency and governance are enhanced by the implementation of SAP ERP.

### Research Problematic:

SAP ERP and other integrated information systems are critical to the digital transformation of large industrial organizations. Advanced automation, better financial process management, and greater strategic decision-making are all promised by these technologies. Regarding their actual effect on financial performance and adaptation to a state-owned organization (SOE) like ENAFOR, its implementation, however, presents a number of important challenges.

As a result, we pose the following primary research query:

What is the role of SAP ERP integration on strategic financial management at ENAFOR?

We investigate the following sub-questions in order to respond to this:

How has SAP ERP affected the accuracy of budget planning at ENAFOR?

What specific SAP ERP features contribute to financial transparency?

How do ENAFOR's financial managers use SAP ERP's analytics for strategic decision-making?

We begin with an introduction outlining the relevance of the topic, the research problem statement, objectives, and the methodology used.

**Research approach:**

The main body consists of three chapters:

This study is structured into three main chapters. Chapter 1 outlines the theoretical framework by defining key concepts such as ERP, Strategic Financial Management (SFM), and SAP FICO modules, while also examining the evolution and strategic role of ERP systems. Chapter 2 details the methodological approach, which is qualitative in nature, relying on semi-structured interviews, field observations, and document analysis to investigate the impact of SAP ERP on strategic financial management at ENAFOR, with thematic analysis applied to extract meaningful insights. Ethical considerations, including confidentiality and informed consent, were upheld throughout the research process. Chapter 3 presents a case study of ENAFOR, focusing on how the integration of SAP ERP has affected the company's budgeting, forecasting, cost control, and strategic decision-making processes.

# CHAPTER I: Literature Review and Conceptual Framework

## section 1: Literature Review

This section presents a comprehensive review of the literature on Enterprise Resource Planning (ERP) systems. We begin with the historical development of ERP, tracing its roots from early material and distribution planning tools to the fully integrated suites of the 1990s and beyond. Next, we examine how ERP architectures have evolved in successive phases expanding functionality, embracing real-time analytics, and migrating to the cloud. Building on this foundation, the review then turns to the specific role of SAP ERP in financial management, including its core FICO modules and cross-functional integrations. Finally, we discuss contemporary implementation challenges, critical success factors, and emerging trends that are reshaping ERP's strategic impact in complex organizations.

### 1 History and Evolution of ERP Systems:

The history and evolution of ERP systems trace a transformative journey from basic inventory management tools of the 1960s to today's intelligent, cloud-based platforms that integrate and optimize enterprise-wide operations.

#### 1.1 Historical Development of ERP (1960s–Present)

The roots of what would become ERP trace back to the **1960s**, when Material Requirements Planning (MRP) systems first automated the explosion of bill-of-materials data and production scheduling, dramatically reducing manual inventory control and lead times (F. Robert Jacobs a, 2006). During the 1970s, Distribution Requirements Planning (DRP) extended MRP logic beyond the factory floor into multi-site networks, time-phasing inventory replenishment to ensure "just-in-time" delivery across warehouses (F. Robert Jacobs, 2006) . By the early 1980s, Manufacturing Resource Planning (MRP II) introduced closed-loop feedback, integrating capacity planning, shop-floor control, order processing and basic financial modules into a single system (Elragal, 2012).As these suites began to encompass HR, accounting and distribution, practitioners coined the term Enterprise Resource Planning (ERP) to reflect their enterprise-wide scope (F. Robert Jacobs, 2006). During the 1990s, the convergence of globalization pressures, regulatory changes and Y2K compliance drove hundreds of organizations to replace siloed legacy systems with fully integrated ERP packages from SAP, PeopleSoft and others (Rahman M. A., 2023) Finally, in the early 2000s, ERP evolved into Extended Resource

Planning (XRP or ERP II) overlaying the ERP backbone onto supplier and customer networks to synchronize planning across the entire value chain (Klaus & Al-Amin et al., 2023)

## 1.2 From MRP to Modern ERP Architecture:

According to (Md. Al-Amin, 2023), the transition from Materials Requirements Planning (MRP) to modern ERP systems marked a significant shift in how organizations manage their resources and processes. While MRP systems were initially focused on production scheduling and inventory management, modern ERP systems integrate various functions across an organization, such as finance, human resources, and supply chain management. This integration enables seamless information flow, ensuring that all departments operate on the same data set, enhancing decision-making and efficiency. Goldston (Goldston, 2020) emphasizes that the development of ERP systems is built on the foundation of MRP and its successors, such as Manufacturing Resource Planning (MRPII). These early systems laid the groundwork for ERP's evolution by focusing on the manufacturing sector. However, modern ERP systems have expanded to encompass all business functions, becoming more versatile and adaptive to the needs of different industries.

## 1.3 Four Phases of ERP Evolution:

(Jacobs, 2008) define the four phases of ERP evolution as a series of stages where ERP systems gradually transformed from simple software used for inventory and order management to highly sophisticated platforms that integrate various functions across an organization. The first phase was the basic MRP, followed by MRPII, which focused on expanding production planning to other aspects like capacity and workforce management. The third phase saw the rise of ERP systems, which began to include financial, human resources, and supply chain modules. Finally, the fourth phase, which is still evolving, includes modern ERP systems that are highly flexible, cloud-based, and integrate advanced technologies such as artificial intelligence and machine learning. (Rahman, 2023) explain that as organizations transitioned through these phases, ERP systems have continually adapted to business needs and technological advancements. This evolution reflects the growing complexity of global businesses and the need for systems that can handle vast amounts of data and offer real-time insights for decision-making.

### 1.4 Contemporary ERP Trends

(Haddara, 2020) highlights the current trends in ERP systems, which include the shift towards cloud-based solutions, the integration of advanced analytics and AI, and the rise of industry-specific ERPs. Modern organizations are increasingly adopting cloud ERP due to its cost-effectiveness, scalability, and accessibility, allowing businesses to operate across multiple locations without the need for extensive on-premise infrastructure. Additionally, the integration of artificial intelligence and machine learning into ERP systems enhances their capabilities for predictive analytics, automation, and decision support.(Rahman, 2023) further emphasize that businesses are increasingly looking for ERP systems that not only automate business processes but also provide real-time data and analytics that help in strategic decision-making. These contemporary ERP trends reflect the growing demand for ERP systems to become more flexible, adaptable, and intelligent, thereby enabling organizations to stay competitive in the rapidly changing business environment.

## 2 SAP ERP in Financial Management

SAP ERP in financial management, particularly through its FICO module, provides an integrated and automated framework for managing both external reporting and internal financial control, ensuring accuracy, transparency, and efficiency across enterprise operations.

### 2.1 SAP FICO Architecture

According to (Syed, 2014), SAP FICO (Financial Accounting and Controlling) represents the core financial module within SAP ERP systems, designed to support both external and internal financial processes. The architecture is composed of two main components: Financial Accounting (FI), which deals with external reporting requirements such as balance sheets and profit & loss statements, and Controlling (CO), which focuses on internal cost monitoring, budgeting, and decision making. The FI module integrates seamlessly with other SAP modules like Materials Management (MM) and Sales and Distribution (SD), ensuring that financial transactions are accurately captured across business operations. The CO module, meanwhile, provides tools for cost center accounting, internal orders, and profitability analysis, allowing organizations like ENAFOR to track and optimize internal financial performance. This dual-

structured architecture supports the overall transparency, accuracy, and efficiency of financial processes.

## 2.2 Integration with Business Functions

According to (Al-Matari Y. A.-S., 2023), SAP ERP achieves seamless integration by connecting financial modules with core business functions such as procurement, sales, inventory management, and human resources. This integration is enabled through a centralized database architecture that ensures real-time data synchronization across departments. For instance, when a purchase order is created in the Materials Management module, it automatically reflects in the Financial Accounting and Controlling modules without manual intervention. This tight integration enhances operational visibility and allows for automated workflows, reducing data redundancy and improving decision-making. In the context of large and complex organizations like ENAFOR, such interconnectivity ensures that strategic, financial, and operational data are always aligned leading to improved resource allocation and compliance with internal controls.

## 2.3 SAP Financial Modules Applications

(Al-Matari Y. A.-S., 2023) emphasize that SAP ERP's financial modules , particularly Financial Accounting (FI) and Controlling (CO)play a pivotal role in managing an organization's financial operations efficiently. The FI module ensures compliance with external reporting standards, automating functions such as general ledger accounting, accounts payable/receivable, and asset accounting. Meanwhile, the CO module supports internal decision-making by tracking costs, managing internal orders, and evaluating profitability In the oil and gas industry, these modules enable enterprises like ENAFOR to process large volumes of financial transactions, monitor project budgets, and generate timely financial statements. The automation and standardization offered by these applications reduce human error, increase transparency, and support financial planning with real-time analytics.

## 3 Implementation Challenges and Critical Success Factors

ERP implementation involves several challenges that must be addressed to ensure success. This section outlines the key technical, organizational, and financial factors that influence the effective adoption and long-term impact of ERP systems.

### 3.1 Technical and Infrastructural Considerations:

According to (Al-Matari Y. A.-S., 2023), technical and infrastructural considerations are essential when implementing ERP systems in any organization. The authors highlight that robust technological infrastructure, including hardware, software, and network capabilities, forms the backbone of ERP functionality. (Rahman M. A., 2023) emphasize that the choice of ERP software must align with an organization's current and future technological needs, and the system should be scalable to accommodate future growth. The integration of ERP with existing IT systems can pose challenges related to system compatibility and data migration, which require careful planning and execution. These technical challenges often impact the speed and effectiveness of ERP adoption.

(Rahman M. A., 2023) stress that organizations must also ensure their technical team is adequately prepared to handle the complexities of ERP system integration. This requires up to date knowledge of ERP tools. as well as a clear understanding of the business processes being integrated, A failure to consider these technical aspects can lead to system downtimes, data loss, or inefficiencies that undermine the value of the ERP implementation.

### 3.2 Organizational Change Management

According to (Ibrahim, 2022), organizational change management is a critical aspect of successful ERP implementation. The authors argue that for an ERP system to be fully integrated into an organization, there must be a shift in both organizational culture and structure. (Ibrahim, 2022) emphasizes that managing change effectively involves clear communication, leadership, and employee involvement throughout the transition. Without proper management of these changes, resistance to the new system can arise, leading to delays and even failure of the ERP implementation.

(Ibrahim, 2022)further highlight that organizational change management strategies should be designed to align with the overall business objectives of the organization. A structured approach

to change management, including stakeholder engagement, training, and continuous feedback, can help mitigate potential disruptions and enhance the adoption process. In addition, (Rahman M. A., 2023)suggest that involving employees early in the decision-making process and providing ongoing support can foster a smoother transition and improve system adoption rates.

### 3.3 Human Capital Development and Training

According to (Olonade, 2020), human capital development and training are crucial to ensuring the successful implementation of ERP systems. They argue that training employees on the new system helps them understand how to use ERP software effectively, which increases productivity and reduces resistance to change. (Al-Tit, 2022) further emphasize that the success of an ERP system heavily depends on the skills and knowledge of the staff involved. Organizations must invest in training programs that are tailored to the needs of different employee roles to ensure the system's adoption is seamless.

(Vandika, 2024) stress the importance of ongoing training after the initial implementation phase. Since ERP systems are constantly evolving, employees must be regularly updated with new features and improvements. This continuous learning process ensures that the organization can fully capitalize on the system's capabilities and prevent skills degradation over time. Furthermore, (Vandika, 2024) highlights that having a well-trained workforce fosters a more positive environment for ERP system integration, as employees feel more confident in their ability to use the system effectively.

### 3.4 Cost-Benefit Analysis and ROI Assessment

According to (Chris, 2024), a cost-benefit analysis (CBA) is crucial for evaluating the financial feasibility of ERP systems. This analysis helps organizations determine whether the long-term benefits of ERP implementation outweigh the initial investment and ongoing operational costs. (Radhakrishnan, 2025) emphasizes that businesses should assess both tangible and intangible benefits, such as increased operational efficiency, improved decision-making, and enhanced customer satisfaction. However, the ROI (Return on Investment) can sometimes be difficult to quantify due to the complex nature of ERP systems and their indirect effects on various business functions.

(Cordes, 2017) add that measuring ROI involves calculating the savings generated from the automation of business processes and comparing them with the costs involved in system implementation and maintenance. A strong ROI assessment can provide senior management with the necessary insights to justify the ERP investment and ensure the system aligns with the company's strategic goals.

However, according to Rahman (2024), organizations must also be mindful of the potential challenges in conducting a comprehensive cost-benefit analysis. These challenges may include difficulties in measuring intangible benefits and predicting the long-term impacts of the ERP system. Therefore, it is essential to establish clear metrics for evaluating performance and ensure that the ERP system's benefits are fully realized over time.

## 4 Strategic Financial Management: Theoretical Foundations

This section explores the key concepts of Strategic Financial Management, focusing on core principles, budgeting, forecasting, financial control, and their application in complex organizations. These elements provide the foundation for aligning financial practices with long-term strategic goals.

### 4.1 Core Principles of Strategic Financial Management (SFM)

According to (Chemakh, 2023), Strategic Financial Management (SFM) is a set of financial practices and processes aimed at aligning financial planning with long-term organizational goals. The core principles of SFM include value maximization, financial planning, investment decision-making, risk management, and performance evaluation. These principles ensure that financial resources are effectively allocated to support sustainable growth and competitive advantage.

The authors emphasize that SFM is not limited to routine financial operations but involves strategic thinking where financial managers play a pivotal role in shaping the overall direction of the enterprise. This approach is especially crucial in large and dynamic organizations like ENAFOR, where financial decisions must account for both internal efficiency and external market volatility.

### 4.2 Budgeting, Forecasting, and Financial Control

According to (Al-Matari, 2024), budgeting, forecasting, and financial control are essential components of Strategic Financial Management that contribute to effective resource allocation and long-term stability. Budgeting enables organizations to plan expenditures in alignment with strategic priorities, while forecasting anticipates future financial trends based on internal and external variables. Together, these processes ensure financial discipline, mitigate risks, and support informed decision making. In the case of Enafor , (Al-Matari, 2024) underlines that the integration of advanced ERP tools has enhanced the accuracy and transparency of budgeting and forecasting. This allows financial managers to simulate multiple scenarios, adapt to volatile market conditions, and maintain robust control mechanisms across departments. These tools also support continuous monitoring, ensuring that any deviation from planned financial objectives can be corrected promptly.

### 4.3 Financial Management in Complex Organizations

According to (Chemakh, 2023), financial management within large and complex organizations such as ENAFOR requires robust systems capable of handling vast amounts of financial data across multiple subsidiaries and departments. These organizations often face challenges related to decentralization, operational scale, and regulatory compliance, which necessitate structured and integrated financial strategies.

The authors emphasize that effective financial management in such contexts depends on reliable information systems that provide real-time data, streamline financial operations, and enhance transparency. For instance, by leveraging ERP systems, ENAFOR is able to centralize financial data, standardize reporting practices, and implement internal controls across its diverse business units. This centralization strengthens auditability and supports strategic financial decisions at both operational and executive levels.

### 4.4 Role of Forecasting in Strategic Financial Management:

According to (R Barrett, 2006) Forecasting has multiple roles including the adaptation to environmental changes so Organizations can stay on track by using forecasting to predict future performance and modify strategies appropriately. It is important in a business environment that is changing quickly, as static annual budgets may become outdated. Rolling predictions and regular updates (such as monthly or quarterly) offer better insights into market developments., which enhance responsiveness and facilitate strategic modifications. Another essential role is

enhancing Decision making by improving the accuracy and quality of financial plans, as a consequence there will be more reliable strategic decisions. ((PricewaterhouseCoopers, 2011). Last role is Strategic Flexibility Forecasting, especially through driver-based planning and scenario analysis, allows organizations to evaluate multiple strategic options and prepare for uncertainties, enhancing competitiveness in dynamic markets

### 4.5 Role of Financial Control in Strategic Financial Management:

According to (Hope, 2003) Financial control aligns strategy with performance by enabling both accountability and growth. One key aspect is performance measurement, where tools like variance analysis (provide critical insights into potential risks and opportunities. In fact, research in the Eastern Cape's manufacturing sector revealed that all surveyed companies use variance analysis to strengthen the credibility and usefulness of their financial plans.

This practice helps organizations detect when strategies go off track and take timely corrective action. Beyond just identifying gaps, financial control also fosters learning and improvement. Rather than assigning blame, it allows teams to reflect on past inaccuracies and refine their approach moving forward. Through tools like KPIs and scenario analysis, companies can monitor strategic plans in real-time and adjust as needed.

Ultimately, (Hope, 2003) also stated that financial control integrates seamlessly with strategy by creating a feedback loop where decisions are grounded in data and continuously informed by performance outcomes. This not only sharpens planning but also empowers organizations to stay agile and competitive in a changing environment.

## 5 Intersection of SAP ERP and SFM:

This section bridges SAP ERP and SFM, showing how ERP enhances financial reporting, performance optimization, and strategic decision-making.

### 5.1 ERP Systems as a Solution to Financial Reporting Challenges:

According to (Z Zhang, 2019) Enterprise Resource Planning (ERP) systems have become integral to addressing the multifaceted challenges of financial reporting in large-scale energy operations. (Odunayo Abosede Oluokun, 2024) emphasize that by consolidating disparate financial datasets into a unified platform, ERP systems enhance data accuracy and consistency, substantially reducing the need for manual reconciliations and the potential for human error.

Automation of core financial processes such as period-end closing, intercompany eliminations, and budget consolidation has led major energy firms to report up to a 15 % reduction in close cycle times, while integrated parallel-ledger functionality ensures simultaneous compliance with IFRS and US GAAP (Z Zhang, 2019). The central data architecture also fosters robust audit trails and continuous monitoring, lowering the risk of non-compliance and enabling the rapid generation of regulatory disclosures.

(Menon, 2019) Furthermore, argue that beyond transactional improvements, ERP systems deliver advanced analytics and forecasting tools that transform static historical figures into predictive insights. Finance teams gain real-time visibility into key performance indicators such as cash-flow projections, cost variances, and working capital metrics empowering them to anticipate market fluctuations (e.g., commodity price swings) and adjust strategies proactively. For instance, through scenario-based simulations, companies can model the financial impact of a sudden drop in oil prices or the ramp-up of renewable investments, enabling earlier mitigation measures or capital reallocation.

(Z Zhang, 2019) claimed that effective ERP deployment also hinges on strong data governance and user adoption strategies.

Establishing clear master data management policies ensures that finance, procurement, and asset teams work from the same "single source of truth," preventing downstream reporting inconsistencies. Moreover, comprehensive training programs and stakeholder engagement are critical. (Menon, 2019)reports that organizations investing in continuous, role-based training achieve up to 30 % higher user satisfaction and faster realization of ERP benefits. Such initiatives help overcome resistance to new workflows and cement the system's role as a strategic decision-support tool.

(Menon, 2019)& (Somto Emmanuel Ewim, 2024) said also that despite substantial upfront investments spanning software licensing, infrastructure, and change energy management multinationals routinely achieve positive return on investment within two to three years. Cost savings emerge from shortened close cycles, reduced audit fees, and fewer restatements, while the strategic value is seen in improved forecasting accuracy and enhanced regulatory agility.

As energy markets continue to evolve, ERP systems will remain pivotal in transforming raw financial data into actionable intelligence, thereby strengthening organizational resilience and governance (Somto Emmanuel Ewim, 2024).

### 5.2 Challenges and Considerations in ERP Implementation:

According to (Saxena, 2016) Implementing an ERP system is a major organizational undertaking that aims to integrate diverse departments finance, procurement, HR, and production into one cohesive digital platform. This transformation offers the potential for increased transparency, improved reporting, and more effective decision-making. However, the process is complex and filled with risks. High upfront costs for software, infrastructure, and expert consultation often strain organizations operating under tight budgets.

(Faisal Mahmood, 2020) said that Legacy systems frequently pose integration issues, making it difficult to synchronize outdated platforms with modern ERP solutions. Customization further complicates matters, requiring significant adjustments to tailor ERP software to an organization's unique needs, which can extend timelines and inflate budgets.

(Vayyavur, 2015) stated that Employee resistance is another major barrier. Staff members often cling to familiar processes and may be reluctant to adapt to new systems, reducing user adoption and overall system effectiveness. Without adequate training and change management, even technically sound implementations can falter.

(Kara, 2022)argued that in complex industries such as oil and gas, aviation, or pharmaceuticals, regulatory compliance and industry-specific functionality further increase implementation complexity. A poorly planned rollout risks business disruptions, data inconsistencies, and cost overruns turning the ERP dream into a costly misstep. Despite these obstacles, successful ERP adoption remains achievable. With strategic planning, thorough training, and executive commitment, organizations can overcome these challenges, ultimately enhancing operational efficiency and gaining competitive advantages in a data-driven market.

## 6 Core Mechanisms for Financial Performance Optimization

This section examines how SAP ERP enhances financial performance through core mechanisms such as data integrity, real-time intelligence, process automation, strategic decision support, and

cost control. These tools help organizations improve accuracy, speed, and strategic alignment in financial operations—especially vital in complex sectors like oil and gas.

### 6.1 Data Integrity and Real-Time Intelligence

According to (Rahman, 2023), data integrity and real-time intelligence are foundational advantages offered by SAP ERP in financial management. SAP's integrated database and centralized data architecture eliminate duplication and ensure that all departments work with consistent, validated information. This improves data accuracy, traceability, and reliability across the organization.

In a high-stakes environment like the oil and gas sector, these capabilities are crucial. With access to real-time data, financial managers can monitor key performance indicators (KPIs), detect anomalies instantly, and respond proactively to financial risks. Rahman emphasizes that real-time dashboards and automated alerts not only enhance transparency but also accelerate the speed of financial decision-making, thereby supporting strategic agility in volatile markets.

### 6.2 Process Automation

According (Al-Matari Y. A.-S., 2023), process automation is a central feature of SAP ERP systems that significantly enhances financial management efficiency. The authors explain that SAP automates routine financial tasks such as journal entries, invoice processing, and reconciliation, which reduces human error and frees up valuable time for strategic analysis.

In sectors like oil and gas, where transaction volumes are high and compliance requirements are strict, automation minimizes operational bottlenecks and ensures timely reporting.

(Al-Matari Y. A.-S., 2023)et al. highlight that automation not only boosts accuracy and speed but also enforces consistency in applying financial rules and procedures across departments. This fosters a standardized and streamlined financial workflow that aligns with corporate governance standards.

### 6.3 Strategic Decision Support

Strategic decision-making in financial management has evolved significantly with the integration of ERP systems.

According to (Rahman M. , 2024), SAP ERP provides real-time financial insights and scenario analysis capabilities that enhance strategic planning. These systems allow financial managers to assess the financial impact of various operational decisions before they are implemented, which reduces risks and improves long-term financial performance.

(Al-Matari Y. A.-S., 2023) emphasize that SAP ERP enables predictive analytics and financial simulations by integrating internal and external data sources. This capability helps companies in dynamic sectors like oil and gas anticipate market changes and adjust financial strategies proactively. Both studies agree that ERP systems have shifted finance departments from being transactional units to strategic partners in organizational growth.

### 6.4 Cost Control and Optimization

According to (Rahman M. , 2024), one of the key advantages of ERP systems, particularly SAP, is their ability to optimize cost management across an organization. The implementation of ERP systems provides real-time data that supports cost transparency, which is critical for identifying inefficiencies and taking corrective actions. The integration of various departments through ERP allows for better tracking of cost data, from production to administration, ultimately reducing waste and improving resource utilization.

Additionally, (Rahman M. , 2024) explains that cost control through ERP is facilitated by features like automated reporting and alerts, which notify managers of discrepancies between planned and actual costs. This proactive approach helps to avoid cost overruns and ensures that resources are allocated efficiently, fostering continuous financial optimization.

### 6.5 Challenges in Traditional Financial Reporting

According to (Bouarar, 2017) Algeria's historic reliance on the National Chart of created a financial reporting framework primarily tailored to the needs of tax authorities and government regulators, leaving investors and other stakeholders underserved.

(Bouarar, 2017) also stated that When the Financial Accounting System was introduced in 2010 to align more closely with IAS/IFRS principles, its design remained constrained by the PCN's rigid structure, resulting in standardized financial statements that lacked the flexibility and

comparability demanded by global capital markets (. Income statements continued to exhibit "extraordinary results" categories that diverged from IFRS classification rules, while many enterprises hampered by years of underfunded accounting departments resisted the unfamiliar reporting framework, hampering effective adoption.

Beyond corporate reluctance, Algeria's broader financial ecosystem struggled to support transparent reporting: an underdeveloped capital market diminished demand for high quality disclosures, and the absence of a centralized economic information system undermined data reliability . Accounting education evolved slowly, leaving professionals ill-prepared for complex fair-value measurements in sectors such as real estate, where monopolistic markets further obscured reliable valuation inputs (Bouarar, 2017). Culturally, accounting remained viewed chiefly as a tax instrument, and the prevailing legal and economic environment clashed with the Anglo-centric ethos of IFRS, deepening the divide between traditional practice and international best practices (Bouarar, 2017).

To conclude, this literature review has explored the multifaceted evolution and impact of Enterprise Resource Planning (ERP) systems, with a particular emphasis on SAP ERP's role in financial management. From their origins as rudimentary inventory management tools in the 1960s, ERP systems have transformed into sophisticated, cloud-based platforms that integrate enterprise-wide operations, as evidenced by the historical progression from MRP to modern ERP architectures. SAP ERP, through its FICO modules, stands out as a cornerstone for financial management, offering robust architecture and seamless integration with business functions such as procurement, sales, and human resources. This integration enhances data accuracy, transparency, and operational efficiency, making it a vital tool for complex organizations like those in the oil and gas sector.

Despite its transformative potential, ERP implementation presents significant challenges, including technical complexities, organizational resistance, and substantial costs. However, these hurdles can be mitigated through strategic planning, comprehensive training, and executive commitment, unlocking benefits such as real-time financial intelligence, process automation, and strategic decision support. SAP ERP further optimizes financial performance by ensuring data integrity, streamlining workflows, and enabling cost control, aligning financial operations with long-term strategic goals. Looking ahead, emerging trends like cloud

computing, AI integration, and industry-specific solutions signal a future where ERP systems will continue to evolve, offering increasingly advanced tools to navigate the dynamic landscape of financial management. Ultimately, SAP ERP emerges not just as an operational system but as a strategic asset, driving financial excellence and organizational resilience in an ever-changing global environment.

## Section 02: conceptual framework

This conceptual framework provides the theoretical foundation for examining how SAP ERP influences strategic financial management (SFM) at ENAFOR, Algeria's leading oil and gas company. It defines key concepts SAP ERP, strategic financial management, and their interrelationships and outlines the research methodology used to explore their impact. The framework aims to clarify how ERP systems enhance financial operations, transparency, and decision-making,

### 1 Enterprise Resource Planning (ERP) & Related Terms

This section introduces Enterprise Resource Planning (ERP) systems, focusing on SAP ERP, its architecture, and related concepts such as digital transformation, automation, and business process integration.

### 1.1 SAP ERP

SAP ERP (Systems, Applications, and Products in Data Processing) is a comprehensive, modular software suite originally developed by SAP AG in 1972 that integrates all core business processes such as finance and accounting, human resources, logistics, procurement, manufacturing, and distribution on a single database, enabling real-time `planning, management, control, and analysis of enterprise operations to streamline workflows, improve data accuracy, reduce costs, and enhance organizational productivity (Małgorzata, 2023).

According to (Fleisch, 2004), an ERP system is an integrated software package that centrally manages *all* core business processes, administering every aspect of the enterprise through a unified database. (Dao, 2019) stated that an ERP is a commercial software system that integrates

all information flows across functions (finance, HR, supply, customer management, etc.), enabling unified data processing and reporting. (Gartner, 2023)also defined ERP as an integrated suite of business applications sharing a common process and data model, automating end to end operational processes across the enterprise in real time.

### 1.2 SAP ERP (and S/4HANA) Architecture:

According to (Wang, 2022), SAP S/4HANA is a comprehensive ERP suite that fully integrates all information flows within a business on a single platform, allowing both transactional processing and real-time analytics on live data.

### 1.3 Digital Transformation:

Digital transformation refers to the comprehensive integration of digital technologies into all areas of an organization, fundamentally changing how the organization operates and delivers value to customers. It involves a cultural, structural, and operational shift that affects processes, business models, and customer engagement (Westerman, 2014).

### 1.4 Automation:

Automation is the use of technology to perform tasks without direct human intervention, thereby reducing manual effort and increasing efficiency, accuracy, and speed. In a business context, automation can encompass everything from routine administrative processes to complex industrial operations (Davenport, 2018).

### 1.5 Business Process Integration

Business Process Integration involves aligning and linking together various organizational processes often through the use of an ERP system so that data flows seamlessly across departments. This integration helps in eliminating data silos, promoting consistency, improving efficiency, and supporting informed decision-making throughout the organization.

## 2 Strategic Financial Management & Organizational Performance

This section explores strategic financial management and its influence on organizational performance, covering key topics like budgeting, forecasting, and Return on Investment (ROI).

### 2.1 Definition of Strategic Financial Management:

(Kenton, 2024) defined Strategic financial management is about creating profit for the business and ensuring an acceptable return on investment (ROI). Financial management is accomplished through business financial plans, setting up financial controls, and financial decision-making.

Before a company can manage itself strategically, it first needs to define its objectives precisely, identify and quantify its available and potential resources, and devise a specific plan to use its

finances and other capital resources_toward achieving its goals. Strategic management also involves understanding and properly controlling, allocating, and obtaining a company's assets and liabilities, including monitoring operational financing items like expenditures, revenues, accounts receivable and payable, cash flow, and profitability.

Strategic financial management encompasses furthermore involves continuous evaluating, planning, and adjusting to keep the company focused and on track toward long-term goals. When a company is managing strategically, it deals with short-term issues on an ad hoc basis in ways that do not derail its long-term vision (Kenton, 2024).

## 2.2 Organizational Performance

Organizational performance refers to how well an organization meets the needs of its stakeholders and ensures its own survival, balancing financial success with non-financial aspects like sustainability and social responsibility (Gutterman, 2023).

## 2.3 Budgeting

According to Abrahams's review of the literature, budgeting is "planning distributed to individual areas of responsibility in a business," engaging more people at a detailed level. Budgets act as control mechanisms through both feed-forward loops (to ensure plans align with organizational goals) and feedback loops (to investigate variances between budgeted and actual performance and take corrective action) (Abrahams, 2012).

## 2.4 Forecasting :

Abrahams describes forecasting as "a re-casting of the budget, in summarized form, to reflect changing market conditions, strategic plan alterations, error corrections and revised assumptions in the original approved budget." Organizations typically re-forecast monthly or on an ad-hoc basis to help managers stay on track, with forecasts serving as forward-looking revisions that better link budgeting to strategic planning (Abrahams, 2012).

## 2.5 Return on Investment (ROI)

In the context of evaluating Information Systems, such as ERP implementations, ROI serves as a critical measure to determine whether the benefits derived from the system justify the costs incurred. This includes not only direct financial gains but also improvements in efficiency, decision-making, and strategic alignment. Accurate ROI analysis in this domain requires a

thorough understanding of both tangible and intangible benefits, as well as a careful assessment of all associated costs (Botchkarev, 2011).

## 3 Data Management and Reporting

This section examines data management and reporting, including financial reporting, data integration, and the role of Key Performance Indicators (KPIs) in assessing performance.

### 3.1 Financial Reporting:

Financial reporting is the structured process of preparing and presenting financial statements such as the balance sheet, income statement, and cash flow statement to communicate an organization's financial performance and position to stakeholders, regulators, and decision-makers (Weygandt, 2020).

### 3.2 Data Integration:

Data integration is the process of combining information from different sources to provide users with a unified and consistent view, typically via a global schema that resolves semantic and structural differences between data sources (Lenzerini, 2002).

### 3.3 Key Performance Indicators (KPIs):

Key Performance Indicators (KPIs) are quantifiable metrics used to assess an organization's performance in achieving its strategic and operational goals, helping guide decision-making and performance improvement efforts (Parmenter, 2015).

## 4 Qualitative & Change Enablers

This section discusses qualitative factors and change enablers, such as field observation, change management, and internal controls, that support organizational transformation.

### 4.1 Field Observation:

field observation is a qualitative data collection technique where researchers observe behaviors, processes, and interactions in their natural settings.

(Flick, 2009) explains that observing in the field provides insight into how activities naturally unfold, capturing aspects of context and behavior that might be missed by other methods.

### 4.2 Change Management:

Change management is the systematic approach to transitioning individuals, teams, and organizations from a current state to a desired future state. (Kotter, 1996) provides a widely recognized framework that outlines the steps required to implement effective change, emphasizing the importance of leadership, clear communication, and stakeholder engagement in achieving successful outcomes.

### 4.3 Internal Controls:

Internal controls are the policies, procedures, and measures implemented within an organization to safeguard assets, ensure the accuracy and reliability of financial and operational information, and promote compliance with laws and regulations. These controls are designed to prevent and detect errors and fraud (Moeller, 2006).

## 5 Strategic Financial Management (SFM)

According to (Mutambara, 2025) strategic financial management is the practice of managing a company's finances to achieve set long-term goals, involving creation of a strategic financial plan that ensures the chosen strategy is implemented as intended and is sustainable over time. (Kenton, 2024) defined strategic financial management means not only managing a company's finances, but doing so intentionally to attain its long-term goals and maximize shareholder value essentially aligning all financial resources with the firm's strategic objectives.

(Mercieca, 2024) (Wang X. C., 2025) also defined strategic financial management is a long term approach that uses financial planning, budgeting, forecasting, and control to utilize a company's financial resources to meet its objectives; it integrates these activities in support of the overall strategy to maximize firm value.

### 5.1 Budgeting and Forecasting Accuracy:

Budgeting and forecasting accuracy refers to how closely budgeted and forecasted financial figures match actual outcomes; for example, the authors report that AI driven budgeting tools have reduced forecast errors by about 25–40%, thereby increasing accuracy (Wang X. C., 2025)

.

### 5.2 Financial Transparency and Accountability

Accountability means accepting responsibility for one's financial actions; in practice, this requires organizations and their leaders to answer for financial outcomes and maintain open records, ensuring decisions can be audited by stakeholders (Kenton, 2024).

### 5.3 Compliance and Internal Controls

According to (Bowman, 2023), Sarbanes Oxley (SOX) compliance requires public companies to implement internal controls for accurate financial reporting; internal controls are the procedures and rules used to prevent or detect errors in processes, ensuring the organization meets its objectives. (Kenton, 2024) said that compliance refers to an internal framework of policies and procedures designed to ensure the company adheres to laws, regulations, and ethical standards in its financial operations.

### 5.4 Module Integration & Interoperability:

well implemented ERP creates cross module integration and data standardization across the enterprise. By integrating sales, procurement, accounting and other processes into one cash to cash cycle, the ERP embeds industry best practices and connects multiple functions end to end (Dunaway, 2008).

### 5.5 Organizational Culture & Readiness

Organizational culture types significantly impact readiness for change. An organization's readiness is its collective preparedness to adopt new systems – including existing skills, change acceptance, and infrastructure – and is often assessed before implementation (Stahl, 2023).

### 5.6 Stakeholder Engagement & Communication

According to (PMI, 2022), effective communication is critical for ERP success: it involves structured channels (meetings, newsletters, dashboards) to regularly update stakeholders on objectives, timelines, and impacts. Engaged stakeholders who receive consistent, tailored communication are more likely to champion the ERP initiative and align their work with its success.

(Havi, 2021) stated that stakeholder engagement in ERP implementations is "an organized strategy" that includes clear communication plans. By consulting users and executives early and explaining how the ERP will solve problems, the project team ensures that stakeholder concerns are addressed and expectations managed, thereby improving implementation outcomes.

To conclude, in an era marked by rapid economic shifts and increasing complexity, strategic financial management has emerged as a cornerstone for organizations striving for sustainability and competitive advantage, particularly in capital intensive industries like oil and gas.

This study has investigated the transformative role of SAP ERP in enhancing strategic financial management at ENAFOR, Algeria's leading oil and gas company. By addressing the challenges posed by fragmented databases and inefficient financial processes, SAP ERP has proven instrumental in optimizing financial operations, fostering transparency, and enabling data driven decision making. The research centered on the primary question: "What is the impact of SAP ERP integration on strategic financial management at ENAFOR?" To answer this, the study explored key sub questions related to budgeting accuracy, financial transparency, and the use of advanced analytics for strategic decisions. The findings reveal that SAP ERP significantly improves budgeting and forecasting precision by automating data collection and providing real time insights, allowing ENAFOR to adapt swiftly to market volatility. Features such as automated reporting and audit trails enhance financial accountability, addressing the limitations of traditional reporting systems rooted in Algeria's historical accounting practices.

Furthermore, the system's advanced analytics empower financial managers to shift from transactional roles to strategic partners, leveraging predictive tools to navigate the dynamic energy sector.

Theoretically, this study traced the evolution of ERP systems from their origins in Material Requirements Planning (MRP) to modern, cloud-based solutions integrating AI and underscored their alignment with the principles of strategic financial management, including value maximization, risk management, and resource allocation. SAP ERP's Financial Accounting and Controlling (FICO) architecture integrates seamlessly with ENAFOR's broader business functions, ensuring data integrity and process efficiency. However, successful implementation required overcoming technical hurdles, managing organizational change, and investing in human capital development challenges that, when addressed, unlocked substantial benefits.

This research contributes to a deeper understanding of how SAP ERP enhances financial efficiency and governance in state owned enterprises like ENAFOR. The implications extend beyond ENAFOR, offering insights for similar organizations in the oil and gas sector seeking to modernize financial processes. Looking ahead, future studies could explore the long term effects of ERP adoption or investigate industry specific customizations to further optimize performance.

Ultimately, this study affirms SAP ERP's role as a catalyst for financial resilience and strategic agility, equipping ENAFOR to thrive in an increasingly complex global landscape.

# CHAPTER 2: METHODOLOGICAL AND ORGANIZATIONAL FRAMEWORK

## Section 1: Methodological Framework

After establishing the theoretical foundations of our research, we now turn to the methodology that structures our thinking and guides our work. This chapter is dedicated to presenting the methodological framework of our study on the impact of SAP ERP implementation on strategic financial management at ENAFOR. Here, we describe the organizational context of ENAFOR, the methods, tools, and techniques used for collecting relevant data to address the research problem. Furthermore, we detail the organization's structure its organizational chart and the missions of the management department where our internship was carried out thus paving the way to achieve the study's objectives.

### 1 Epistemological Approach:

In the field of Information Systems (IS) and financial management, the researcher's theoretical perspective known as the epistemological approach is fundamental in shaping the research process and guiding the interpretation of results. This approach revolves around the core question of how we come to know what we know and what constitutes valid knowledge in a particular domain. In our study, the epistemological inquiry not only clarifies the underlying assumptions regarding the nature of knowledge but also influences our choice of research methods and data analysis techniques.

Two predominant epistemological positions are typically discussed in academic literature: **positivism** and **constructivism**. Positivism is rooted in the belief that knowledge is objective and measurable, derived from empirical observations and can be validated through statistical analysis. Researchers adopting a positivist approach tend to favor structured methodologies where hypotheses are rigorously tested using quantitative data. In contrast, constructivism posits that knowledge is not simply discovered but rather constructed through social interactions and personal experiences (Hokroh, 2022).

Within a constructivist framework, the focus is on understanding the subjective meanings that individuals attach to phenomena, recognizing that multiple interpretations can exist based on one's context, culture, and interactions.

Our study aligns with a constructivist stance, acknowledging that in the realm of IS and financial management, what is known about the impact of SAP ERP is cocreated by the experiences,

perceptions, and interactions of the organization's members. This perspective allows us to delve into the rich, qualitative data gathered through interviews, observations, and document analysis. It encourages us to explore how different stakeholders interpret the role of SAP ERP in shaping strategic financial management practices at ENAFOR. By explicitly stating our epistemological position, we provide transparency regarding our research design and justify our qualitative methods, emphasizing that our findings emerge from a collaborative process of meaning making rather than solely from objective measurements (Minovski Z. M., 2020).

## 2 The Constructivist Paradigm:

Our study adopts a constructivist approach, which holds that knowledge is not an objective fact waiting to be discovered, but rather a product of social interactions and shared experiences (Hokroh, 2022).

In this paradigm, both the researcher and the participants contribute to the construction of meaning, which is shaped by their cultural and social contexts. This collaborative process means that the data collected are not merely "facts" in a traditional sense, but interpretations and understandings that emerge through dialogue and reflection.

(Elbardan, 2024). Within our research context, which focuses on measuring the contribution of SAP ERP to strategic financial management at ENAFOR, a constructivist stance is particularly pertinent. By engaging directly with various stakeholders such as top management, the project team, and system users we aim to capture a multifaceted perspective on how SAP ERP affects financial practices (Minovski Z. M., 2020).

These interactions help us to understand the nuances of organizational change, the challenges experienced by individuals during the transition, and the ways in which the ERP system reshapes financial decision making (Bala, 2016).

Adopting this idiographic approach, we do not seek to develop broad, generalized laws applicable to every organization. Instead, we focus on a deep, context specific analysis of ENAFOR's experience. This means every interview, observation, and document contributes to a unique narrative that provides rich insights into the complex interplay between technology and finance. The interpretative nature of our study allows for multiple viewpoints to coexist, ultimately painting a comprehensive picture of the ERP's impact. This methodology reinforces

the idea that our findings are co constructed through the active participation of all stakeholders, and that they reflect the dynamic reality of organizational life rather than a fixed, universal truth (Nour, 2023).

## 3 Research Approach

Scientific research generally proceeds according to two complementary logics: the inductive logic for exploration and the deductive logic for testing. Inductive reasoning moves from specific observations to formulating universal statements or general theories, while deductive reasoning starts with an established general theory and uses it to explain or predict specific cases. In our research, we follow an inductive approach. This decision is driven by the need to explore an area where existing knowledge is fragmented or insufficient to explain complex phenomena in our case, the nuanced impact of SAP ERP implementation on strategic financial management at ENAFOR (Minovski Z. , 2020).

By adopting an inductive approach, our objective is to collect detailed, context specific observations from the field gathering qualitative data through interviews, observations, and document analysis and then synthesize these individual insights to develop a cohesive framework or conceptual model. This process allows us to capture the complexity and diversity of experiences across different groups within the organization, such as top management, the project team, and end users. we start with these rich data sources and look for emerging patterns and relationships that can inform a broader understanding of ERP's contribution to organizational performance (Gärtner, 2016).

This approach is particularly suited for our study because it provides the flexibility needed to explore the human and contextual dimensions of ERP implementation dimensions that are often overlooked in purely quantitative or deductive studies. It enables us to build an evidence based understanding from the ground up, ensuring that our final model or theory closely reflects the realities observed within ENAFOR. Moreover, this inductive logic complements the constructivist paradigm underpinning our study, as it emphasizes the co creation of knowledge through the interaction between researcher and participants (Dovetail, 2023).

In essence, our research approach allows us to derive meaningful generalizations and measurement practices from concrete, real world experiences, forming a robust foundation for future research and practical applications in the realm of strategic financial management.

## 4 Methodological Approach

In light of our research objective to evaluate the contribution of SAP ERP to enhancing strategic financial management at ENAFOR we opted for a qualitative descriptive method. This method involves a comprehensive collection of rich, in depth data through interviews, field observations, and the collection and analysis of documents. Specifically , the descriptive method enables us to delve deeply into the experiences and perceptions of various stakeholders involved in the ERP implementation, including top management, the dedicated project team, and the end users of SAP ERP. Semi structured interviews are central to this approach, as they provide the flexibility to explore emerging themes while ensuring that specific topics related to financial management and system performance are thoroughly addressed. These interviews are designed to capture not only the observable effects of the system but also the personal insights and interpretations of those directly interacting with the technology. Field observations complement these interviews by allowing us to witness the day today operations where SAP ERP is employed. Observing actual practices on site at ENAFOR gives us contextual insights into how the system integrates with existing processes, the challenges faced during implementation, and the resultant transformations in financial reporting and decision making. This real time evidence is invaluable for understanding the dynamic interplay between technology and organizational practice. In addition to interviews and observations, we gather a wide range of documents, including internal reports, organizational charts, implementation guidelines, and performance dashboards. Document analysis helps validate and enrich the qualitative data collected through personal interactions, ensuring that our study is grounded in the practical realities of ENAFOR. By triangulating these different data sources, our methodological approach provides a holistic view of SAP ERP's impact, capturing both the tangible and intangible effects on strategic financial management. Overall, this qualitative descriptive approach is particularly suited to our study because it embraces the complexity and nuance inherent in large scale ERP implementations. It allows us to construct a detailed, context specific understanding of how SAP ERP contributes to organizational performance, laying a solid foundation for the subsequent analysis and discussion in our thesis (Gärtner, 2016).

## 5 Methods and Data Collection Tools:

this section outlines the research design, detailing the specific qualitative and quantitative methods and instruments employed to collect and analyze the study's data.

### 5.1 Documentary Research:

The initial phase of the study involved extensive documentary research to gather relevant background information and empirical evidence on ERP systems and performance models in Information Systems. This process entailed a thorough examination of a wide range of documents and online publications, including academic books, peer reviewed journal articles, and grey literature available through Google Scholar, ASJP, and ResearchGate. Books and articles obtained from these reputable sources provided foundational knowledge on the evaluation of ERP systems and offered various performance models. Additionally, the study drew on numerous documents available from the ENSM library, which included theoretical treatises and methodological guides that enriched the theoretical framework. Internal data from the IT Department, public websites, as well as internal documents such as organizational charts and company presentations accessed during the internship, further supplemented this research. This documentary exploration not only deepened the understanding of the research topic but also contributed significantly to the development of the theoretical framework for the thesis, ensuring a robust contextual background for the empirical investigation.

### 5.2 Field Observation:

Field observation is a critical component of the data collection process, especially in qualitative research that aims to understand complex organizational phenomena such as the implementation of ERP systems. This approach will require careful and continuous attention during scheduled visits to the internship site at ENAFOR. Through direct observation of daily activities and interactions related to SAP ERP, it will be possible to gather contextual data that may not be fully captured through interviews or documentation alone. Observation will help in identifying how the ERP system is integrated into various financial management processes, how employees interact with the system, and what challenges or efficiencies emerge in real time. It will also provide insights into organizational behavior, communication flows, and potential gaps between formal procedures and actual practices. Documenting these observations will contribute to

building a clearer understanding of the organization's perspective on SAP ERP and its impact on financial operations. This real world, experiential evidence will play a key role in the evaluation phase of the study, allowing for the validation of data collected through other methods and offering a more complete picture of the system's contribution to strategic financial management.

### 5.3 Semi Structured Interviews:

We used a semi structured interview guide drawn from our literature review and adapted to ENAFOR's context to collect rich, qualitative data on SAP ERP's influence on strategic financial management.

### 5.4 Interview Period and Setting:

Final interviews were conducted in person at ENAFOR from April 17 to April 26, 2025. Each session lasted 30–50 minutes. In accordance with ENAFOR's confidentiality policy, no recordings were made, detailed handwritten notes capturing both verbal responses and nonverbal cues were taken during and immediately after each interview.

**Participants:**

Using **purposive sampling**, we interviewed:

DSI (IT Department**)** staff responsible for SAP ERP administration

Key module users covering:

FI (Financial Accounting)

CO (Controlling)

RH (Human Resources)

MM (Materials Management)

These profiles ensured we gathered both technical and managerial perspectives on SAP ERP's strategic role.

### 5.5 Semi Structured Interview Guide:

**V Objective:** Explore how SAP ERP aligns with and supports ENAFOR's strategic financial objectives, and identify both benefits and challenges.

This section has delineated the methodological framework guiding our investigation into the impact of SAP ERP implementation on strategic financial management at ENAFOR, laying a robust foundation for the research process. Grounded in a constructivist epistemological stance, our study recognizes that knowledge about SAP ERP's influence is not a static, objective truth but a dynamic construct, co-created through the experiences, perceptions, and interactions of ENAFOR's stakeholders. This perspective has shaped our choice of an inductive research approach and a qualitative descriptive methodology, enabling us to explore the nuanced, context-specific effects of the ERP system within the organization.

The adoption of a constructivist paradigm underscores our commitment to capturing the subjective meanings that participants ranging from top management to end users attribute to SAP ERP's role in financial management. By prioritizing qualitative data collection methods such as semi-structured interviews, field observations, and document analysis, we have sought to construct a rich, multifaceted narrative of the system's impact. This idiographic focus ensures that our findings reflect the unique organizational context of ENAFOR, rather than aiming for broad, universal generalizations. The inductive approach further complements this framework, allowing us to build an evidence-based understanding from the ground up, synthesizing detailed observations into a cohesive conceptual model that illuminates how SAP ERP reshapes financial practices.

Our methodological toolkit—comprising documentary research, real-time field observations, and targeted interviews with key stakeholders such as IT staff and Finance Division module users—provides a holistic lens through which to evaluate SAP ERP's contribution. Triangulation of these data sources enhances the credibility and depth of our analysis, capturing both tangible outcomes (e.g., improved data accuracy and process efficiency) and intangible dynamics (e.g., organizational resistance and stakeholder perceptions). The qualitative descriptive method, with its emphasis on in-depth exploration, proves particularly apt for unraveling the complexities of ERP implementation, offering insights into how the system aligns

with ENAFOR's strategic financial objectives amidst technical, cultural, and operational challenges.

In essence, this methodological framework establishes a transparent and systematic approach to studying SAP ERP's integration into ENAFOR's financial management landscape. It positions our research to not only document the system's operational effects but also to interpret its strategic significance, as co-constructed by those who interact with it daily. By rooting our inquiry in the lived realities of the organization, this section paves the way for a comprehensive analysis of SAP ERP's transformative potential, setting the stage for subsequent findings that bridge technology, finance, and organizational performance in a meaningful and contextually grounded manner.

### 5.6 Use of NVivo for Qualitative Data Analysis:

To deepen the rigor and transparency of my thematic analysis, I employed NVivo software (version 12) to manage and code all qualitative data collected through semi-structured interviews and field observations. By importing transcripts and observational notes directly into NVivo, I was able to systematically apply inductive coding, refine emerging themes via hierarchical node structures, and visualize relationships among concepts through word-frequency queries and cluster analysis. This approach not only streamlined the organization of over 50 interview excerpts but also enhanced the trustworthiness of my findings by allowing me to track coding decisions, generate audit trails, and iteratively compare data segments across different stakeholder groups. Through NVivo's query tools, I identified recurring patterns in participants' perceptions of SAP ERP's impact on budgeting accuracy, transparency, and decision-making thereby ensuring that my interpretations were firmly grounded in the raw data.

## Section 2: organizational framework

The National Drilling Company (ENAFOR) has a rich history that began in 1966 with the creation of the joint venture ALFOR between SONATRACH (51%) and SEDCO (49%). Following SONATRACH's restructuring, ENAFOR was officially established under Decree No. 81.170 on August 1, 1981, and became operational on January 1, 1982, inheriting all assets and personnel from ALFOR. The company gained independence in 1989 with a capital of 20 million Algerian dinars and transitioned into a joint stock company in 1995, increasing its capital to 4 billion dinars and capturing 40% of the national drilling market. On March 3, 1998, SONATRACH became the majority shareholder with 51%, while the remaining 49% was held by RGT, later replaced by RMC Holding in 2000. ENAFOR obtained ISO 9001:2000 Quality certification on January 13, 2004, followed by ISO 14001:2004 Environmental certification on December 6, 2005. In December 2007, pursuant to Executive Decree No. 210/07, its capital was increased to 14.8 billion dinars. On June 6, 2008, ENAFOR renewed both ISO 9001:2000 and ISO 14001:2004 certifications and also earned OHSAS 18001:1999 certification for health and safety management. Today, ENAFOR employs approximately 7,000 people across 318 structural units (services, departments, sections). The company manages 29,500 fixed assets, including computers, vehicles, cabinets, and drilling site equipment such as masts and catwalks. It operates 63 warehouses with over 84,000 stocked items and handles around 200,000 stock movements annually. Its financial operations include processing 180,000 accounting documents, 8,000 purchase orders, and 10,000 invoices per year, mainly through the DOKA system. Previously, most applications were installed on PCs using WinDev, except for payroll, which ran on a large IBM mainframe using a DB2 database and a programming language known as GAP.

### 1 Missions and Objectives:

The ENAFOR company is responsible for managing drilling operations for the exploration and exploitation of oil and gas fields and water bodies on behalf of local and foreign companies. It also handles maintenance operations for existing oil and gas wells (Work Over).The National Drilling Company is also open to forming joint ventures with international partners in its various areas of activity, including complementary services, mainly within the country, but also abroad.

## 2 Detailed Presentation of the Company's Organizational Structure:

We will present the organizational structure of the company in greater detail, in order to better understand the various departments that make up the company and which fall under the directorates shown in the figure.

### 2.1 Human Resources Directorate (DRHU):

The Human Resources Department at ENAFOR is responsible for developing and implementing the company's overall HR policy in alignment with the directives of the General Directorate and in compliance with applicable regulations. It assesses and supports the human resource needs of various departments, executing the annual recruitment plan accordingly. The department also evaluates training needs across the company, ensures the implementation and follow up of training and internship programs as outlined in the annual training plan, and manages employee administration in accordance with legal requirements. A key responsibility is developing and implementing a succession plan, particularly adapted to ENAFOR's rotation based work schedule of four weeks on site followed by two weeks off. Additionally, the department oversees the development and optimization of human capital, applies job and competency management in line with the company's strategic development plan, ensures social monitoring to prevent workplace conflicts, and tracks performance deviations to ensure that operational objectives are met effectively.

### 2.2 Planning and Management Control Directorate (DPCG):

The Strategy and Organizational Development Department at ENAFOR plays a crucial role in supporting the company's overall performance and strategic alignment. Its primary responsibilities include developing short and medium term operational plans for various departments, evaluating departmental performance, identifying issues and gaps, analyzing root causes, and proposing appropriate corrective actions. The department prepares comprehensive management reports and ensures their dissemination to the appropriate stakeholders. It also works on activating and improving operational dashboards to enhance performance tracking across departments. Additionally, it conducts strategic monitoring, prepares in depth strategic analysis reports, and develops the company's strategic dashboard to support informed decision making. The department also facilitates the regular updating of the organizational structure and ensures the implementation of organizational decisions in line with corporate goals quality.

### 2.3 Health, Safety, and Environment Directorate (DQSE):

The Quality, Health, Safety, and Environment (QHSE) Department at ENAFOR is responsible for establishing and implementing the company's QHSE policy in alignment with the directives of the General Directorate and in compliance with applicable regulations. It mobilizes the necessary human and material resources to ensure the health and safety of employees while enforcing systems dedicated to environmental protection. The department is also tasked with implementing emergency response plans in case of internal incidents and actively participates in organizing mutual aid and disaster response initiatives. It ensures the availability, functionality, and renewal of intervention, monitoring, and safety equipment across the company. Furthermore, the QHSE Department manages the company's QHSE system, ensuring its effective operation and maintenance, particularly during certification audits or renewal procedures.

### 2.4 General Administration Directorate (DAGE):

it is responsible for ensuring continuous regulatory and legislative vigilance. It provides legal assistance by drafting model contracts, agreements (related to purchasing, recruitment, training, etc.), and technical specifications. The department ensures that all necessary measures and procedures are implemented to protect the company's rights and interests in relation to third parties. It is also in charge of disseminating and interpreting laws and regulations while evaluating their proper application within the company's various structures. Additionally, the department develops and executes internal and external communication plans aligned with ENAFOR's communication policy. It also manages the implementation of social function activities designed for the benefit of company employees.

### 2.5 Internal Audit (AUD):

The Internal Audit Department (AUD) at ENAFOR is responsible for preparing the draft annual audit plan and implementing it once approved, ensuring alignment with the company's overall strategy. It also conducts internal audit operations as assigned by the General Directorate, aiming to evaluate and improve the effectiveness of internal controls, risk management, and governance processes across the organization.

### 2.6 Internal Security (ON):

The Internal Security Department (ON) at ENAFOR assists the General Director in developing and implementing the company's internal security policies. It is also responsible for managing surveillance operations across the company's sites and operational bases, ensuring the protection of personnel, assets, and facilities.

### 2.7 Assistants and Advisors:

The team of Assistants and Advisors at ENAFOR plays a vital role in supporting the General Director by contributing to decision making processes and addressing specific strategic or operational issues. They are also tasked with facilitating and conducting discussions on critical matters, offering informed recommendations to guide the company's leadership.

### 2.8 Operations Division:

Ensure the completion of drilling and well maintenance by the company's clients under optimal conditions in terms of cost, safety, schedule, and environmental protection.

### 2.9 Drilling Directorate (DFOR):

The Drilling Directorate (DFOR) is responsible for achieving the annual production plan in alignment with the operational goals assigned to it. It leads and develops exploration activities aimed at enhancing and improving production methods. Additionally, the DFOR coordinates the execution of approved drilling programs in accordance with production targets and client requirements.

### 2.10 Work Over Directorate (DWOK):

The Work Over Directorate (DWOK) is responsible for achieving the annual production plan based on the operational goals assigned to it. It leads and develops exploration activities related to Work Over operations to enhance and improve production methods. The directorate also coordinates the execution of Work Over programs in alignment with both production objectives and client requirements.

### 2.11 Transport Directorate (RSD):

The Transport Directorate (RSD) is responsible for coordinating and executing site transfer and relocation programs (DTM) in accordance with production goals and client requirements. It efficiently manages and operates the transportation and unloading equipment assigned to it,

ensuring their proper maintenance and optimal availability. Additionally, the directorate conducts technical and commercial studies related to the management, operation, and maintenance of the company's transportation means.

### 2.12 Supply Division:

Ensure meeting the needs arising from the company's activities under optimal conditions in terms of cost, safety, deadlines, and environmental protection.

### 2.13 Petroleum Equipment Maintenance Directorate (DMEP):

The Petroleum Equipment Maintenance Directorate (DMEP) is responsible for establishing and reviewing maintenance plans for company affiliated equipment, drilling tools, and facilities, using a Computerized Maintenance Management System (GMAO). It ensures the execution of related technical and commercial studies and prepares technical files for tenders concerning drilling rigs and well maintenance equipment. Additionally, the directorate is tasked with establishing and executing programs to renew and restore certifications of production structures, as well as defining and regularly updating maintenance plans. Directorate of Hospitality and Infrastructure

### 2.14 Maintenance (DHEI):

The Maintenance Directorate (DHEI) is responsible for meeting all company requirements related to housing and food, ensuring they meet the required standards. It ensures the availability of food products, maintenance, sleeping arrangements, and cooking equipment. The directorate also oversees all maintenance and repair work for bases, living camps, technical and administrative work sites, and company housing. Additionally, it manages spaces and resources related to the environment, including potable water treatment plants, water wells, gardens, lighting, transformers, and other related infrastructure.

### 2.15 Directorate of Supply and Stock Management (DAGS)

The Directorate of Supply and Stock Management (DAGS) is responsible for planning procurement operations in the short and medium term, based on the needs of the company's various structures. It ensures the fulfillment of purchase requests in line with authorized powers and established procurement procedures. DAGS updates and executes the company's supply

plans and oversees the organization and management of drilling and transportation stock. It also manages equipment and tools sent for repair, ensuring their proper disposal or destruction in accordance with procedures, and conducts inventory operations in line with company policies.

### 2.16 Development Branch :

The Development Branch (4th Branch) plays a key role in supporting the company's transformation processes, particularly in transitioning its status toward integrated interests. It is also responsible for implementing the company's development and expansion strategy, as well as leading and coordinating all international activities to support growth and competitiveness on a global scale.

### 2.17 Directorate of Drilling Engineering (DEDF)

The Directorate of Drilling Engineering (DEDF) is responsible for the supervision and integrated management of well drilling and maintenance projects. It promotes the creation and development of new drilling techniques and activities, prepares technical bids in collaboration with DBDV for tenders and consultations in which the company participates, and ensures technological monitoring. Additionally, it provides technical support to drilling departments by offering solutions to operational challenges, identifies and updates supply plans for spare parts and consumables used in exploration, and establishes protocols for trials and tests while ensuring their proper supervision.

## 3 The New Dimension in ENAFOR: Overview of Information Technology in ENAFOR

No organization operates without an information system to manage its various activities. However, the difference lies in the level of advancement of these systems, which may be manual or computerized. The latter varies depending on the technological level each system incorporates. ENAFOR, the organization under study, has undergone several developments in its use of information systems throughout its operations. In this presentation, we focus on the most significant developments. The use of computers at ENAFOR dates back to 1975, starting with punched cards. These applications covered payroll calculations, accounting processes, and inventory management. A decade later, additional applications were introduced for archive tracking and invoice generation. Over time, hardware was replaced multiple times to ensure continued operation. However, the applications, except for the tedious and ongoing processes of adapting to new equipment, did not benefit from any innovation. This indicates that computers or information technology were limited to meeting the basic needs of administrative structures and supporting them. Until the year 2000, the company's structures relied on an outdated information system operating in "batch" mode, as opposed to an interactive mode. The

batch mode restricted computer use and operation exclusively to the IT department. Employees in this department were, in most cases, confined to preparing input commands, then monitoring and reviewing output states generated through delayed processing. In 2000, ENAFOR, like many organizations worldwide, became aware of the obsolescence of its computer system and launched an ambitious modernization program. To this end, it established a Directorate for Organization, Planning, and, which later, in 2003, became the Directorate of Information Technologies. The targeted system needed to provide large quantities of high quality information for direct use, allowing for more analysis and precise decision making to enable the organization to create a stimulating work environment, address an increasingly complex competitive environment and generate value by improving productivity and operational efficiency.

### 3.1 Implementation:

The implementation of the program followed a gradual and structured approach. It began with the phasing out of batch operated minicomputers, replacing them with a network of servers and an interactive mainframe system. To support this transition, DOPI took several key steps: acquiring the necessary hardware, installing local networks, developing relevant applications, and assembling a young, skilled IT team who also provided internal user training. Simultaneously, DOPI worked with the company's departments to establish formal organizational tools, including organizational charts, job descriptions, procedures, charters, and delegation frameworks. Today, all departments are equipped with the hardware and software required for their tasks personal computers, printers, and power units are interconnected through local networks and linked to centralized servers housed in data processing centers. These centers are operated by specialists who manage the equipment, maintain software, and ensure secure data storage. On the software side, in addition to standard office applications, each department uses specialized management tools tailored to their operations. These include Win Stock for inventory management, Win Compta for accounting and invoicing, and G.M.A.O for maintenance management.

### 3.2 Reasons for Changing the Old Information System

The decision to overhaul ENAFOR's old information system was driven by growing concerns across its various departments regarding the system's overall efficiency and effectiveness. Key

issues included a lack of software integration, which caused data duplication and inconsistencies, and the absence of interconnectivity between site networks, making data sharing difficult. Additionally, the company faced coordination challenges, delays in operations that affected timely decision making, and the lack of a unified database, which hindered information exchange and reduced collaboration between departments.

Although recent improvements had brought some benefits such as better responsiveness, increased awareness of the need for change, and growing employee engagement there was a shared understanding across all departments that a more comprehensive system was essential. This shift came as the company entered an era focused on value creation, requiring a robust, integrated information system capable of supporting strategic goals.

The modernization of the information system became part of a larger initiative to enhance overall management, guided by strategic priorities such as adopting an integrated management approach, embracing open and adaptable technologies, and leveraging external expertise to facilitate skill transfer and best practice adoption. At the heart of this transformation was the idea of equipping employees with effective tools in an environment that promotes engagement, skill development, and performance improvement. This alignment between information systems and business needs is now recognized as crucial to generating value for stakeholders. With 4,000 employees across 35 sites, ENAFOR sees information and communication technology as a vital part of its management process one that must encompass all areas of operation to truly support business growth and effectiveness. Implementing an integrated and decentralized management system with reliable and efficient communication lines will undoubtedly achieve overarching goals. It fosters synergy between functions, drives continuous improvement, and allows the organization to seize market opportunities while meeting customer needs, thereby achieving customer satisfaction. At the operational level, the project aims to develop the information system by transitioning from a patchwork of applications shared between computers to a unified tool that integrates all functions into a single information system. ENAFOR's management could no longer accept or tolerate disparate, often contradictory information, whether written on paper or generated by non integrated applications. Consequently, ENAFOR required a truly integrated system that enables full interaction between management, finance, and operational levels to facilitate planning, monitoring, and decision making across all sectors of activity. To

better address the shortcomings of the existing information system, ENAFOR decided to implement a fully integrated Enterprise Resource Planning (ERP) system.

### 3.3 Project Name and Location

The committee appointed by senior management adopted the slogan depicted in the figure, a product of the creativity and talent of the head of the systems department and the secretary of the studies and engineering department.

**Figure 1 Project Slogan**


**Source:** Internal company documents 2015

This slogan symbolizes the determination, will, and strength of the National Exploration Company (ENAFOR) in facing market openness and international competition, aiming to give ENAFOR greater international prominence and significance.

### 3.4 Project Objectives

The project was launched with a clear set of objectives aimed at transforming and modernizing the company's information system. At its core, the initiative seeks to implement a fully integrated and adaptable solution capable of supporting current and future business needs. A key goal is to introduce advanced management and monitoring practices that align with industry standards while replacing outdated information systems that no longer meet operational demands. The project also aims to empower users by providing them with powerful tools and functionalities that enhance their productivity and enable them to remain competitive in a global market. Expanding the scope of information coverage and ensuring real time data availability are critical components, as they allow for more informed, timely, and objective decision making. Moreover, the project targets the elimination of inefficiencies, such as redundant data entry across multiple systems, by streamlining processes and integrating platforms. It also seeks

to standardize the company's technological framework, ensuring consistency and compatibility across all departments. Finally, it includes mechanisms for analyzing performance across different workshops, enabling better oversight and continuous improvement throughout the organization.

### 3.5 Project Scope:

To successfully meet its objectives, the project required a clearly defined scope, reflected in its guiding slogan and structured approach. Establishing a precise starting point was essential to ensure alignment and direction throughout the implementation process. The scope of the project was outlined along two primary dimensions, with a strong focus on functional coverage. From a functional perspective, the ERP/SAP system was deployed across several critical business areas to streamline operations and enhance efficiency. These areas included general and analytical accounting (CO/FI), which supported financial reporting and control; procurement and inventory management (MM), to optimize supply chain operations; and maintenance management (PM), aimed at ensuring the reliability and availability of assets. Additionally, the system covered project and workshop management (PS), human resources management (HR) to handle employee related processes, and billing management (SD) to support sales and invoicing operations. This comprehensive functional integration was essential to ensure the system addressed the full range of the company's operational needs.


**Figure 2 SAP MODULES**

**Source:** Internal company documents 2017

### 3.6 Geographical and Organizational Perspective:

From a geographical and organizational standpoint, the project's scope extends across multiple directorates such as the Human Resources Directorate as well as various operational sites, including the company's headquarters and field workshops. These entities are all directly affected by the implementation of the new ERP system, making it vital to consider their unique needs and integration requirements. Clearly defining this scope is crucial, as experience shows that many ERP project failures stem from scope creep the gradual expansion of project boundaries without proper control. To mitigate this risk, the project requires ongoing scope monitoring to ensure alignment with its original objectives and to prevent any unplanned deviations that could impact timelines, resources, or outcomes.

To conclude, this chapter has outlined the methodological framework guiding our study on the impact of SAP ERP implementation on strategic financial management at ENAFOR. By adopting a constructivist epistemological stance, we recognize that knowledge about ERP's influence is co-created through the experiences and interactions of organizational stakeholders. This perspective justifies our qualitative, inductive approach, which prioritizes rich, context specific insights over broad generalizations. The qualitative descriptive method, supported by semi structured interviews, field observations, and document analysis, enables a comprehensive exploration of stakeholder perspectives, capturing both tangible and intangible effects of SAP ERP on financial practices. The methodological choices align with the study's objective to evaluate SAP ERP's contribution within ENAFOR's unique organizational context. By triangulating data from diverse sources interviews with key users and management, real time observations of system integration, and analysis of internal documents we ensure a robust and nuanced understanding of the ERP's role. The detailed presentation of ENAFOR's organizational structure and the missions of its management departments further grounds our research, providing a clear backdrop for analyzing how SAP ERP reshapes financial decision making and operational processes. This framework lays a solid foundation for the subsequent empirical analysis, enabling us to construct a context specific narrative that reflects the dynamic interplay between technology and strategic financial management at ENAFOR. The insights derived from this approach will not only address the research problem but also contribute to broader discussions on ERP implementation in complex organizational settings.

# CHAPTER III: ANALYSIS AND DISCUSSION

# Section 1: Analysis

## 1 Introduction to the Study

This study explores the implementation and impact of the SAP ERP system within the ENAFOR organization, aiming to understand its role in key areas such as strategy, financial management, and operational efficiency. The analysis is based on qualitative data, specifically interview transcripts with various stakeholders, thus providing perspectives on how SAP ERP shapes departmental workflows, decision making, and long term planning.

The study is divided into several parts to ensure clarity and depth of analysis. It begins with an introduction and global overview of the data, followed by detailed analyses of specific themes (strategy, financial management, SAP ERP system), and concludes with a synthesis of interdepartmental perspectives and conclusions. The main tools used for this analysis include word clouds that visualize the most frequent and significant terms, as well as a condensed matrix that captures departmental perspectives.

### 1.1 Study Objectives

The objectives of this study are to identify key themes and concerns related to SAP ERP across the organization, to analyze how these vary according to areas of interest, and to provide practical recommendations based on stakeholder feedback.

## 2 Global Lexical Analysis An Overview of the Data

The global lexical analysis, conducted from all interview transcripts, reveals the most prominent terms and provides an initial perspective on the organization's priorities and perceptions.

**Figure 3 presents the global word cloud from this analysis.**

**Figure 3 global word cloud**

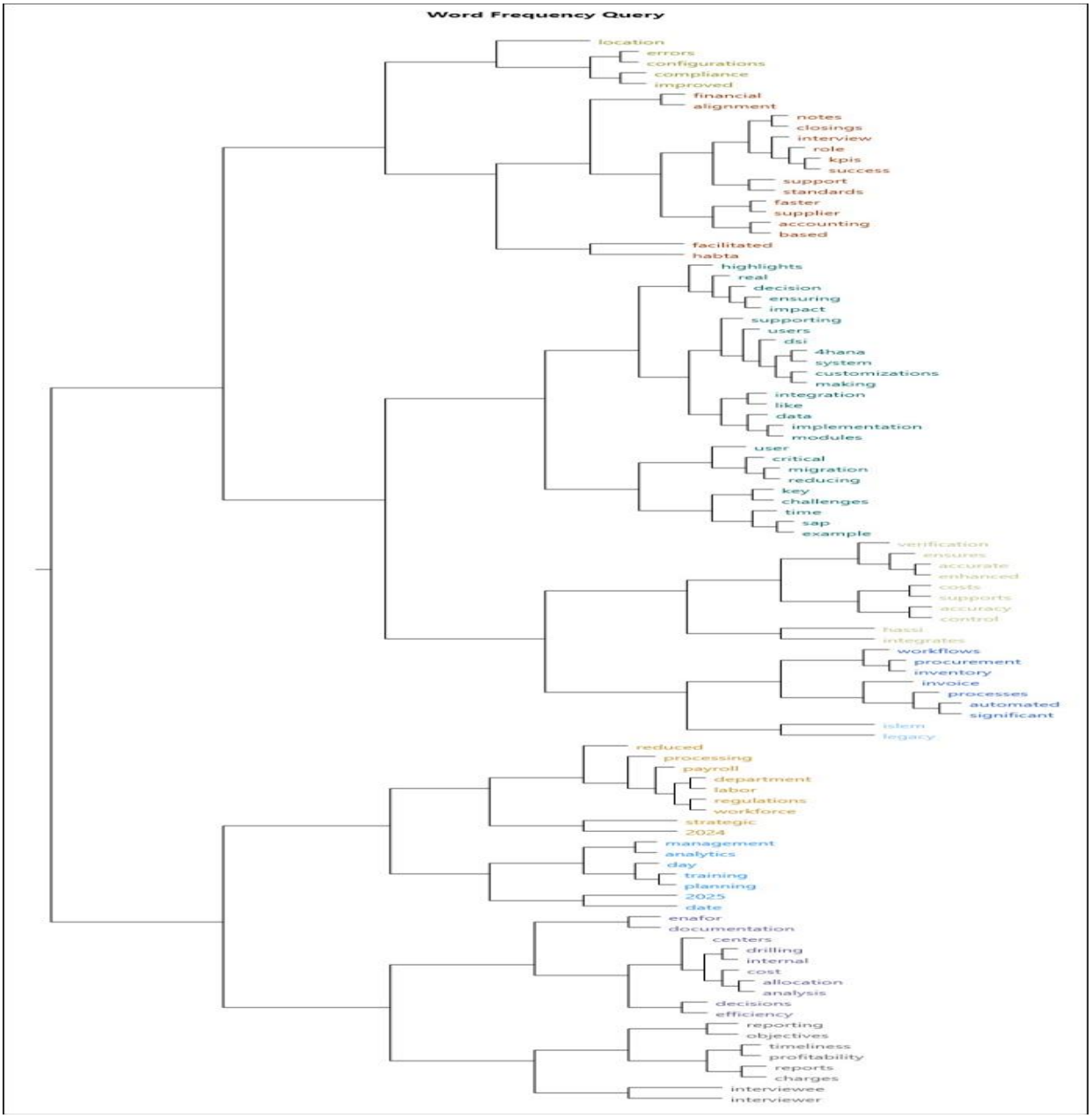

**elaborated by nvivo**

Examination of this global word cloud highlights several dominant terms that reflect the organization's central concerns. The terms "financial," "cost," "data," "management," "training," and "4hana" appear particularly salient, indicating the importance given to financial aspects, cost management, data quality, and migration to S/4HANA. This visualization offers an initial conceptual mapping of the issues related to the use of SAP ERP at ENAFOR.

The detailed analysis of lexical frequencies, extracted from the "Word Frequency Query.xlsx" file (is too long file cannot be added but it is just a table that classes the use of all the words by percentage ), reveals that terms related to workforce ("workforce," "workflows") appear with significant frequency (0.31% each), highlighting the importance of human resources in the context of SAP implementation. Similarly, terms related to verification ("verification") and variance ("variance") show notable occurrences (0.31% and 0.20% respectively), suggesting a concern for accuracy and control in financial processes.

The tree structure of terms, visible in Figure 1.2, allows for a deeper analysis by showing the hierarchical relationships between key concepts.

**Figure 4 Hierarchical Structure of Frequent Terms**




**elaborated by nvivo**

This hierarchical representation reveals significant conceptual groupings. Notably, clusters are observed around "location" (including "errors," "configurations," "compliance," "improved"), the "financial" aspect (with "alignment," "notes," "closings," "interview," "role," "kpis," "success"), and processes ("facilitated," "habta," "highlights," "real," "decision," "ensuring," "impact"). This conceptual organization suggests that the implementation of SAP ERP has had multidimensional impacts, affecting the technical, financial, and decision-making aspects of the organization.

The dominant presence of "SAP" and "ERP" underscores the central role of the system in organizational discourse, both as a tool and as a challenge. Financial terms suggest that cost management and reporting accuracy are critical discussion points, possibly related to the implementation or ongoing use of SAP ERP. Operational terms like "data" and "processes" imply efforts to optimize workflows and leverage data, a characteristic of ERP systems. Strategic terms suggest that SAP ERP is more than a tactical tool it is part of the organization's broader vision.

This global analysis provides a foundation for further exploration. Recurring themes strategy, finance, and operations will be developed in the following sections, with particular emphasis on how they manifest in different contexts and departments.

## 3 Financial Management Analysis

### 3.1 Overview of Financial Management Improvements

The implementation of SAP ERP at ENAFOR has significantly transformed its financial management processes. By integrating modules such as Management Control (CO), Financial Accounting (FI), Human Resources (HR), Materials Management (MM), and the Information Systems Department (DSI), SAP ERP has resolved long standing inefficiencies, such as manual data entry, reporting delays, and compliance gaps. This section analyzes how the system has improved accuracy, speed, compliance, and efficiency of processes in these key areas.

The thematic analysis of interviews, presented in the thematic analysis matrix (Table 1), reveals the main improvements brought by SAP ERP in each department.

**Table 1 Thematic Analysis Matrix**

| | A : Financial Management | B : SAP ERP | C : strategic |
|---|---|---|---|
| 1 : co | CO has streamlined cost allocation and variance analysis by automating the assignment of costs to cost centers and internal orders<br><br>By integrating with FI and other modules, CO ensures cost data accuracy through real time updates<br><br>CO tracks success via KPIs like cost variance, budget adherence, and report timeliness.<br><br>CO ensures compliance with internal policies and Sonatrach's standards through auditable cost allocations and transparent reporting | CO collaborates with FI, MM (Materials Management), and HR (Human Resources) for a holistic cost overview<br><br>The 2005 SAP implementation posed challenges for CO, including mapping legacy cost structures to SAP's framework<br><br>CO tailored cost centers and internal orders to ENAFOR's structure, ensuring precise cost tracking | The SAP CO module aligns with ENAFOR's goals of cost optimization and profitability by enabling detailed cost tracking and analysis<br><br>CO aids strategic decisions with detailed cost and profitability reports<br><br>delivering granular, real time cost and profitability insights, optimizing resource use and reducing expenses |

| | | | |
|---|---|---|---|
| | payroll processing time was reduced by 8 days, now occurring in real time without prior month debts<br><br>Annual financial closings, previously completed in late March, now occur before February 28, reducing workload and enabling faster reporting.<br><br>eliminating manual entries and reducing errors through centralized data management<br><br>financial reports are always current<br><br>ensuring timely access to accurate financial data.<br><br>10 day gain in facturation and 8 day payroll reduction are key metrics. | SAP ERP aligns with ENAFOR's financial objectives<br><br>integration of FI, CO, MM, and HR modules ensures accurate financial insights,<br><br>DSI ensures seamless integration of SAP modules<br><br>procurement data from MM flows into FI for payment processing,<br><br>migrating data from legacy systems (e.g., WinDev, IBM DB2)<br><br>phased implementation<br><br>helpdesk support, and intranet based documentation ensure effective use of SAP for financial tasks<br><br>configuring chart of accounts, fiscal year | unified platform for real time data access across 52 sites<br><br>real time analytics enable proactive financial decisions.<br><br>predictive tools in S/4HANA forecast cash flow<br><br>2024 S/4HANA migration, completed in 8 months using a Brownfield approach and SAP Activate methodology<br><br>in memory computing, speeding up financial processes<br><br>transformation from siloed, inefficient systems to an integrated, real time platform<br><br>data driven financial strategies |
| 2 : DSI | | | |

| | | | |
|---|---|---|---|
| | using automated checks and audit trails<br><br>ensuring only authorized users access financial data | variants, and reporting structures.<br><br>These customizations ensure alignment with local and international financial standards | positioned ENAFOR as a technologically advanced enterprise |

| | | | |
|---|---|---|---|
| | FI processes like invoice processing (MIRO) and supplier payments (F110/F111) are streamlined<br><br>10 day gain in facturation, improving cash flow<br><br>Real time transaction recording ensures accurate financial statements.<br><br>days to close books (reduced to before February 28), report accuracy, and audit compliance | FI processes like invoice processing (MIRO) and supplier payments (F110/F111) are streamlined, reducing errors<br><br>FI integrates with CO for cost allocation, MM for invoice verification, and SD for sales<br><br>Mapping legacy accounting processes to SAP and training users were significant hurdles<br><br>FI organizes periodic training and daily supervisor support<br><br>FI customized supplier codes (e.g., extending from 1 200 to 1 300) and tax configurations, | SAP FI supports ENAFOR's objectives by providing precise financial data for budgeting, forecasting, and cost control<br><br>faster financial closings (before February 28) and streamlined facturation,<br><br>profitability and financial transparency.<br><br>10 day gain in facturation, improving cash flow<br><br>Real time transaction recording ensures accurate financial statements.<br><br>days to close books (reduced to before February 28), report accuracy, and audit compliance<br><br>FI ensures compliance with Algerian |
| 3 : FI | | | |

| | | | |
|---|---|---|---|
| | | | accounting standards through automated tax calculations and regulatory reports |

| | | | |
|---|---|---|---|
| | Automated payroll and time management have reduced processing times, with payroll now completed in real time, cutting 8 days from the process<br><br>Real time payroll data ensures accurate and timely financial reporting, with seamless integration into FI for payroll accounting.<br><br>KPIs for Success<br>Metrics include payroll accuracy, processing time, and workforce productivity. The 8 day reduction in payroll processing reflects significant efficiency gains.<br><br>HR ensures compliance with labor laws and payroll tax regulations through automated calculations and | HR integrates with FI for payroll postings and with CO for labor cost allocation to cost centers<br><br>Mapping legacy HR processes to SAP and training users on new payroll workflows were key challenges<br><br>HR conducts regular training and provides documentation on payroll and time management, ensuring user proficiency and reducing errors.<br><br>HR customized payroll rules, tax calculations, and employee self service features to align with Algerian labor laws and ENAFOR's policies.<br><br>The 2024 S/4HANA migration improved payroll processing speed and introduced | SAP HR supports ENAFOR's financial goals by ensuring efficient payroll processing and workforce management,<br><br>aligning with objectives like labor cost optimization and productivity improvement.<br><br>to align with Algerian labor laws and ENAFOR's policies.<br><br>Workforce analytics support strategic staffing decisions, such as identifying training needs or optimizing shift schedules<br><br>enhancing strategic HR decisions.<br><br>Reduced payroll processing time and improved labor cost management have |
| 4 : hr | reporting | | |

| | | | |
|---|---|---|---|
| | | advanced analytics for workforce planning | significantly contributed to ENAFOR's financial efficiency and strategic workforce planning. |

| | | | |
|---|---|---|---|
| | streamlined procurement processes, including purchase requisitions, order processing, and goods receipt<br><br>Automated workflows have reduced procurement cycle times<br><br>invoice verification (MIRO) ensures accurate payment processing<br><br>Real time inventory tracking and automated data entry reduce errors<br><br>ensuring accurate stock levels across 63 stores with 84,000 articles<br><br>supports timely financial reporting and inventory valuation<br><br>Key metrics include inventory turnover, procurement cycle time, | MM integrates with FI for invoice verification and payment processing, and with CO for cost allocation to cost centers.<br><br>ensures procurement costs are accurately reflected in financial statements and internal reports<br><br>Data migration from legacy systems and configuring procurement workflows for 63 stores were significant challenges<br><br>User training was also critical, addressed through workshops and key user involvement.<br><br>MM provides ongoing training and supervisor support, with documentation on procurement processes available on the intranet | optimizing procurement costs and inventory levels<br><br>reducing carrying costs<br><br>ensuring timely availability of materials for drilling operations<br><br>aligns with the strategic objective of cost control across 318 structural units<br><br>Optimized inventory levels and reduced procurement costs have significantly improved financial efficiency<br><br>supporting ENAFOR's strategic cost management |
| 5 : mm | | | |

| | | | |
|---|---|---|---|
| | and stock accuracy<br><br>compliance with procurement policies and inventory valuation standards through automated checks and audit trails<br><br>supporting financial transparency. | MM tailored procurement workflows, vendor evaluations, and inventory structures to ENAFOR's needs, ensuring efficient management of 84,000 stock items | |

**elaborated by nvivo**

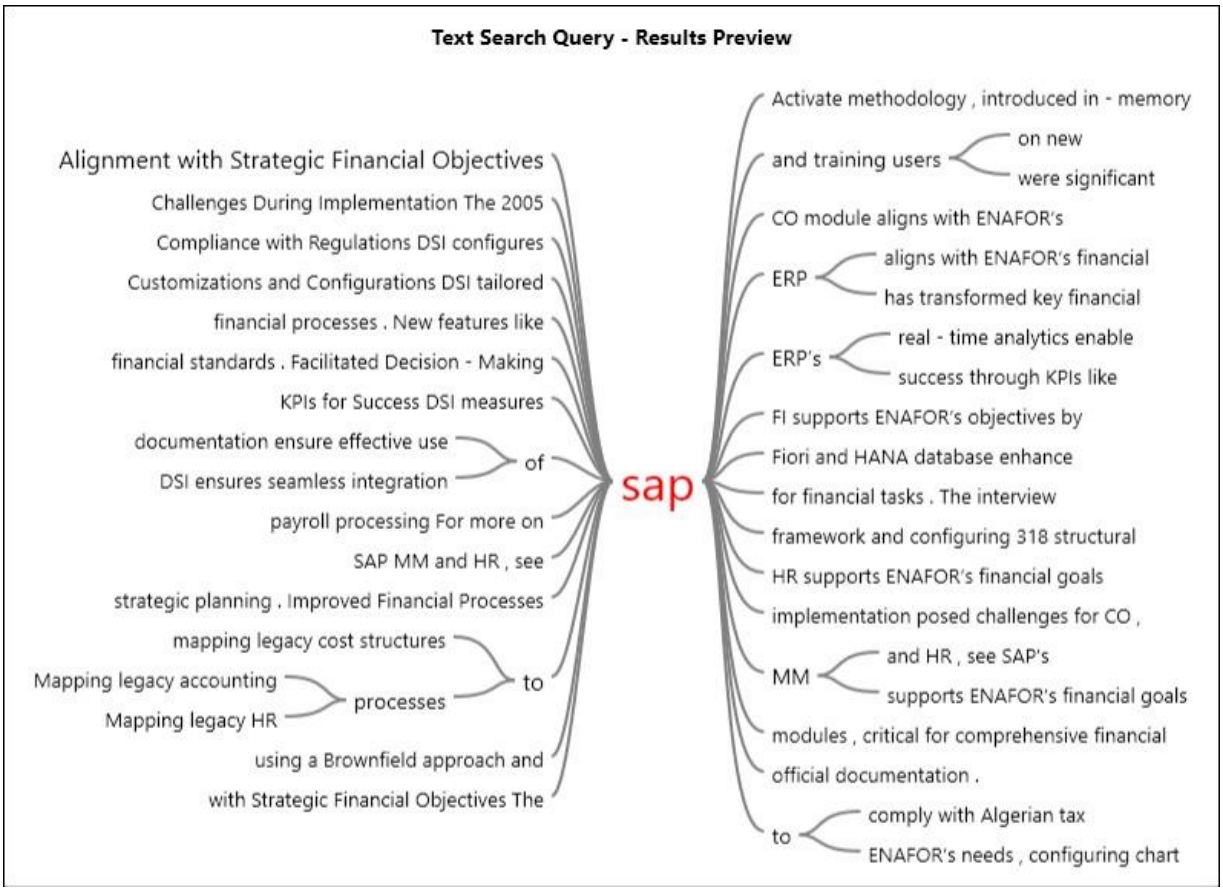
Examination of this thematic matrix shows that each SAP module has contributed specifically to improving financial management. The CO module has enabled detailed cost tracking across 318 structural units, while the FI module has facilitated faster financial closings (before February 28) and streamlined billing. The HR module has automated payroll and time management, reducing processing times by 8 days, and the MM module has optimized procurement processes and inventory management for 84,000 items across 63 warehouses.

### 3.2 Accuracy and Speed

SAP ERP has introduced real time data processing and centralized management, thus eliminating many inaccuracies and delays inherent in ENAFOR's legacy systems.

The Management Control (CO) module ensures real time updates that align financial accounting and management accounting, thus reducing discrepancies. CO also validates FI charges, ensuring that no costs are overlooked, which improves the reliability of internal reports used for strategic planning. This integration is illustrated in Figure 5, which shows the interconnections between different financial aspects.

**Figure 5 Analysis of Financial Interconnections elaborated by nvivo**




**elaborated by nvivo**

The Information Systems Department (DSI) has implemented centralized data management that eliminates manual entries, thus reducing errors. Financial reports are constantly up to date, providing quick access to accurate data. This centralization is crucial for maintaining the integrity of financial data across the organization.

Financial Accounting (FI) ensures real time transaction recording, guaranteeing that financial statements reflect current data. Charges are entered within the allotted timeframes, with manual Excel imports used only for late submissions, thus maintaining accuracy even under pressure. This improvement in accuracy and speed is particularly important for ENAFOR as a public company subject to strict reporting requirements.

Human Resources (HR) integrates real time payroll data with FI, ensuring accurate and rapid financial reporting. This integration eliminates delays and errors that were common in the previous system, where payroll data had to be manually transferred to the financial system.

Materials Management (MM) maintains real time inventory tracking and automated data entry, ensuring accurate stock levels across 63 warehouses and 84,000 items. This supports rapid financial reporting and accurate inventory valuation, essential elements for effective financial management.

### 3.3 Compliance and Controls

SAP ERP has strengthened ENAFOR's adherence to regulatory and internal standards through automation and robust access controls. The strategic analysis of interview data, presented in Figure 6, highlights the importance of compliance in the financial context.

**Figure 6 Strategic Analysis of Financial Aspects elaborated by nvivo**

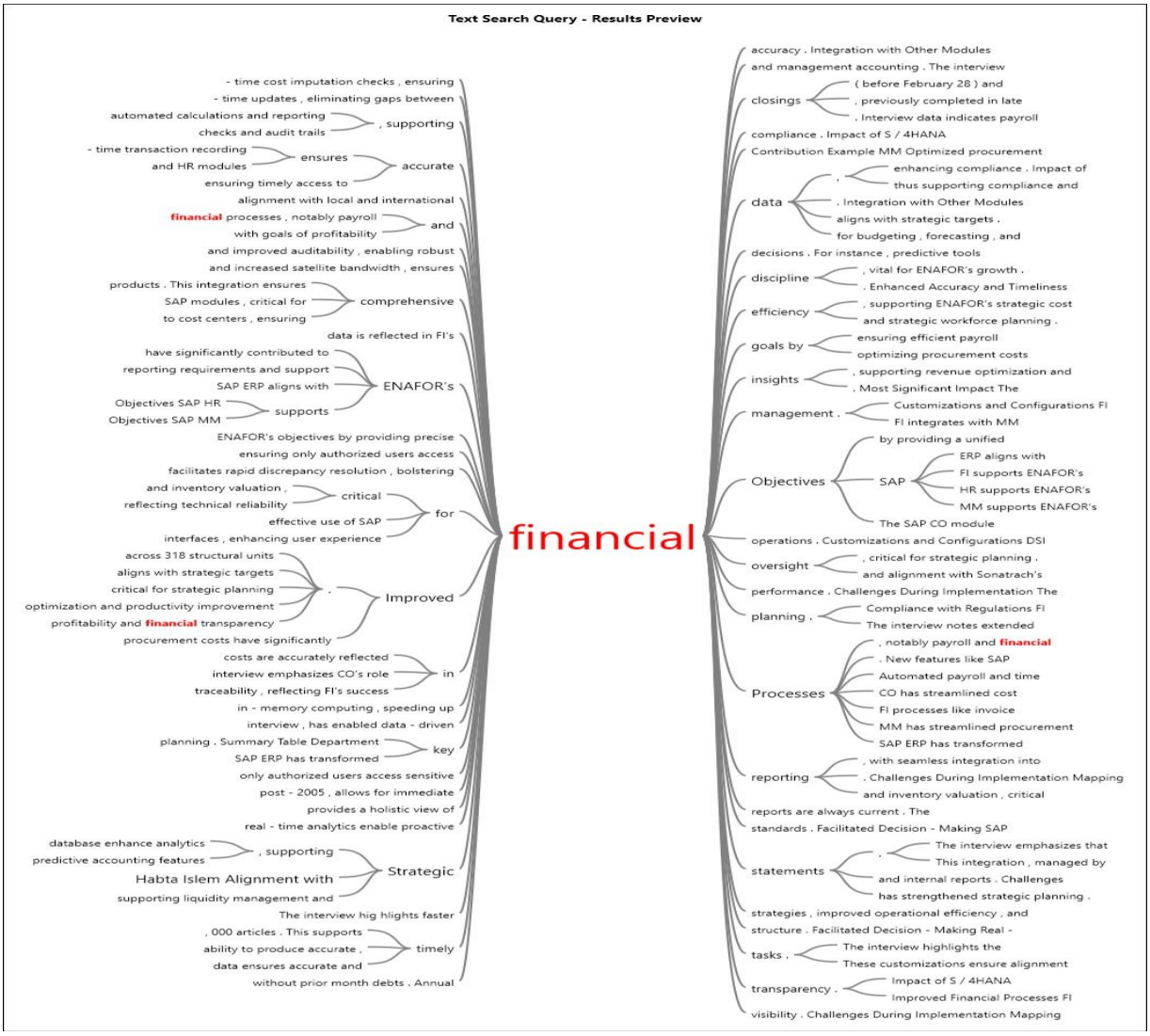



**Figure 7Strategic Analysis of Financial Aspects elaborated by nvivo**

The Management Control (CO) module ensures auditable cost allocations and transparent reporting, ensuring compliance with internal policies and Sonatrach standards. CO verification of FI charges ensures justifiable and compliant cost data. This double verification is an important control mechanism that strengthens financial governance.

The Information Systems Department (DSI) has implemented automated checks and audit trails that enhance compliance. Role based authorizations restrict access to financial data to authorized users, thus supporting transparency. These access controls are essential for maintaining the integrity of financial data and preventing unauthorized access.

Financial Accounting (FI) ensures automated tax calculations and regulatory reports aligned with Algerian accounting standards. Role based authorizations prevent unauthorized modifications, strengthening data integrity. This compliance with local standards is particularly important for ENAFOR as a public company.

Human Resources (HR) ensures compliance with labor laws and tax regulations through automated payroll calculations and reports, thus strengthening financial compliance. This

automation reduces the risk of human error in calculating salaries and taxes, areas often subject to errors in manual systems.

Materials Management (MM) maintains compliance with procurement policies and inventory valuation standards through automated checks and audit trails, ensuring financial transparency. This compliance is essential to ensure that procurement processes comply with internal and external regulations.

### 3.4 Key Performance Indicators (KPIs) and Performance

SAP ERP has introduced measurable improvements in financial performance, tracked through specific KPIs. The analysis of SAP ERP data, presented in Figure 2.4, reveals the system's impact on different aspects of performance.

![Figure 2.4: SAP ERP Analysis](/home/ubuntu/upload/Sap Erp analysis.xlsx)

| | A : Customizations & Configurations | B : Implementation Challenges | C : Module Integration | D : Training & Change Management |
|---|---|---|---|---|
| 1 : co | CO tailored cost centers and internal orders to ENAFOR's structure, ensuring precise cost tracking<br><br>Activity based costing was implemented for accurate overhead allocation in drilling operations<br><br>Coordination with FI on supplier code extensions, as noted in the interview, supports CO's cost accuracy | mapping legacy cost structures to SAP's framework and configuring 318 structural units.<br><br>were overcome with workshops and key user involvement, who subsequently trained end users. | CO collaborates with FI, MM (Materials Management), and HR (Human Resources) for a holistic cost overview<br><br>Procurement costs from MM and payroll data from HR are seamlessly allocated to CO's cost centers | CO maintains user proficiency with regular training and supervisor support.<br><br>periodic sessions and daily guidance, alongside intranet documentation |

| | | | | |
|---|---|---|---|---|
| 2 : DSI | configuring chart of accounts, fiscal year variants, and reporting structures<br><br>The S/4HANA migration introduced Fiori interfaces, enhancing user experience for financial tasks<br><br>These customizations ensure alignment with local and international financial standards | challenges like migrating data from legacy systems (e.g., WinDev, IBM DB2)<br><br>difficulties in harmonizing data from disparate systems, addressed through meticulous planning and phased implementation | The system's integration of FI, CO, MM, and HR modules ensures accurate financial insights<br><br>FI integrates with MM for invoice verification, CO for cost allocation, and HR for payroll accounting<br><br>procurement data from MM flows into FI for payment processing | helpdesk support, and intranet based documentation ensure effective use of SAP for financial tasks<br><br>formation of a dedicated change management team to promote the system and provide training, ensuring user proficiency. |
| 3 : FI | FI customized supplier codes (e.g., extending from 1 200 to 1 300) and tax configurations, coordinated with DSI for traceability<br><br>compliance with local reporting requirements and support ENAFOR's | Mapping legacy accounting processes to SAP and training users were significant hurdles<br><br>entries, resolved through training and supervisor support. Data migration required careful validation to | | FI organizes periodic training and daily supervisor support<br><br>Procedures are documented on the intranet, with step by step guides ensuring user proficiency<br><br>Training addresses common errors |

| | | | | |
|---|---|---|---|---|
| | financial structure. | ensure accuracy. | | like incorrect variant entries. |
| 4 : hr | HR customized payroll rules, tax calculations, and employee self service features | Mapping legacy HR processes to SAP and training users on new payroll workflows were key challenges<br><br>addressed through detailed process mapping | HR integrates with FI for payroll postings and with CO for labor cost allocation to cost centers<br><br>ensuring comprehensive financial visibility | HR conducts regular training and provides documentation on payroll and time management<br><br>ensuring user proficiency and reducing errors |

| | | | | |
|---|---|---|---|---|
| 5 : mm | MM tailored procurement workflows, vendor evaluations, and inventory structures to ENAFOR's needs<br><br>ensuring efficient management of 84,000 stock items. | Data migration from legacy systems and configuring procurement workflows for 63 stores were significant challenges<br><br>User training was also critical, addressed through workshops and key user involvement | MM integrates with FI for invoice verification and payment processing<br><br>and with CO for cost allocation to cost centers<br><br>ensures procurement costs are accurately reflected in financial statements and internal reports | MM provides ongoing training and supervisor support<br><br>documentation on procurement processes available on the intranet<br><br>ensures users effectively manage procurement and inventory tasks |

**Table 3 3.4 Key Performance Indicators (KPIs) and Performance by nvivo**

The Management Control (CO) module uses KPIs including cost variance, budget adherence, and reporting speed. Rapid cost reviews after FI closings and reduced allocation discrepancies reflect improved efficiency and control. These KPIs allow management to track financial efficiency and quickly identify areas requiring attention.

The Information Systems Department (DSI) has achieved a 10day gain in billing and an 8 day reduction in payroll processing, remarkable metrics. More than 500 users are supported without system slowdown, indicating technical reliability. These performance improvements have a direct impact on the organization's operational and financial efficiency.

Financial Accounting (FI) uses KPIs including book closing time (reduced to before February 28), reporting accuracy, and audit compliance. The decrease in audit findings due to improved data traceability underscores FI's success. This improved traceability strengthens confidence in financial data and facilitates audit processes.

Human Resources (HR) measures payroll accuracy and processing time, with an 8day reduction demonstrating efficiency gains. This reduction in processing time allows HR staff to focus on higher value tasks rather than routine administrative processes.

Materials Management (MM) uses key metrics including inventory turnover, procurement cycle time, and inventory accuracy. Improved inventory turnover reflects better inventory management, reducing holding costs. These KPIs help optimize inventory management and reduce costs associated with excess inventory.

### 3.5 Process Improvements

SAP ERP's automation and integration capabilities have streamlined financial processes, reducing inefficiencies and improving operational discipline. The analysis of interconnections between SAP and financial processes, illustrated in Figure, shows how the system has transformed financial operations.

The Management Control (CO) module has automated cost allocations, thus streamlining cost allocation and variance analysis. CO verification of FI allocations accelerates monthly cost reviews and facilitates rapid resolution of discrepancies. This automation reduces the time needed to identify and correct errors, thus improving overall efficiency.

The Information Systems Department (DSI) has reduced payroll processing time by 8 days, which is now done in real time without debts from the previous month. Annual financial closings have moved from the end of March to before February 28, reducing workload and accelerating reporting. These process improvements have a significant impact on the speed and efficiency of financial operations.

Financial Accounting (FI) has streamlined processes such as invoice processing (MIRO) and supplier payments (F110/F111), reducing errors. A 10day gain in billing improves cash flow, while automated workflows accelerate monthly closings. These process improvements have a direct impact on the organization's financial health.

Human Resources (HR) has automated payroll and time management, reducing processing times by 8 days and enabling real time execution. This automation frees up human resources for more strategic tasks and improves employee satisfaction through faster and more accurate payroll processing.

Materials Management (MM) has streamlined procurement processes (purchase requisitions, order processing, goods receipt), reducing cycle times. Invoice verification (MIRO) ensures accurate payment processing, improving cash flow management. These process improvements contribute to more efficient management of material and financial resources.

### 3.6 Summary of Financial Impact

The SAP ERP system has revolutionized ENAFOR's financial management by bringing significant improvements in several key areas. Accuracy has been considerably improved through real time data and automated checks that minimize errors. The speed of financial operations has increased with faster closings and real time reporting that improve decision making. Compliance with regulatory and internal standards is ensured by automated controls and audit trails. Finally, overall efficiency has been strengthened by streamlined processes that reduce workloads and improve cash flows.

These improvements provide a solid foundation for the next section, which will explore the technical configurations of the SAP ERP system, the challenges encountered, and integration efforts.

## 4 SAP ERP System Analysis

### 4.1 Overview of SAP ERP Customizations and Configurations

The SAP ERP system has been extensively customized and configured to align with ENAFOR's unique operational and financial requirements. The key modules Management Control (CO), Financial Accounting (FI), Human Resources (HR), Materials Management (MM), and the Information Systems Department (DSI) have been adapted to handle processes ranging from cost tracking in drilling operations to compliance with Algerian financial standards.

The analysis of SAP ERP customizations, extracted from the "Sap Erp analysis.xlsx" file, reveals the extent of adaptations made to meet ENAFOR's specific needs. The CO module has been configured to reflect ENAFOR's organizational structure, allowing precise cost tracking

across 318 structural units. Activity based accounting has been implemented to accurately allocate overhead in drilling operations based on resource usage. Vendor code extensions have been coordinated with FI to improve cost traceability.

DSI has configured the chart of accounts and fiscal year variants to comply with local and international financial standards, ensuring consistent reporting. Fiori interfaces were introduced during the migration to S/4HANA to improve the user experience for financial tasks, enhancing accessibility.

The FI module has customized vendor codes and adjusted tax settings to meet local reporting requirements. Traceability enhancements have been implemented in collaboration with DSI to ensure complete traceability of financial transactions, supporting audit and compliance needs.

The HR module has customized payroll rules and tax calculations to comply with Algerian labor laws and ENAFOR policies. Employee self-service functionalities have been adapted to provide easy access to payroll and HR data, improving transparency and reducing administrative workload.

The MM module has configured procurement workflows and supplier evaluations to efficiently manage 84,000 stock items across 63 warehouses. Inventory structures have been adapted to ENAFOR's specific needs, optimizing inventory management and reducing holding costs.

## 4.2 Implementation Challenges

The implementation of SAP ERP faced several challenges related to data migration, process mapping, and user adoption, which were addressed through careful planning and training.

The CO module encountered difficulties integrating ENAFOR's existing cost structures into SAP, requiring extensive workshops and key user involvement. User training was organized so that key users were trained to use the system and then trained end users, ensuring a smooth transition.

DSI had to address the challenge of migrating data from legacy systems like WinDev and IBM DB2, complicated by format inconsistencies. A phased approach was used to harmonize data sources, minimizing disruptions.

The FI module had to align legacy accounting processes with SAP's structure, requiring detailed planning and validation. Initial user errors, such as incorrect variant entries, were mitigated through targeted training and supervisor support.

The HR module had to integrate existing HR workflows with the SAP payroll system, a complex process but managed with detailed documentation. Comprehensive training enabled users to efficiently navigate the new payroll workflows.

The MM module had to migrate data for 84,000 items across 63 warehouses, requiring careful validation. Procurement workflow configuration was accomplished through workshops and key user collaboration.

### 4.3 Module Integration

The seamless integration of SAP ERP modules ensures data consistency and comprehensive financial oversight by enabling real time data flow between departments.

The CO module integrates with FI, MM, and HR, drawing data from FI (financial transactions), MM (procurement costs), and HR (labor expenses) for a holistic view of costs. Procurement and payroll data are automatically allocated to cost centers, ensuring accurate internal reporting.

DSI ensures integration between the FI, CO, MM, and HR modules for real time data sharing. Procurement data flows to FI for invoice verification and payment, streamlining the procure to pay cycle.

The FI module integrates with CO for cost allocation and with MM for invoice verification, reflecting operational activities in financial data. Integration with the Sales and Distribution (SD) module supports accurate revenue recognition and customer billing.

The HR module integrates with FI to directly post payroll expenses to the general ledger. Labor costs are allocated to CO cost centers for detailed cost analysis.

The MM module integrates with FI for invoice verification and payment processing. Procurement costs are allocated to CO cost centers for accurate tracking.

### 4.4 Training and Change Management

Training and change management were essential to ensure user adoption and minimize disruptions during the deployment of SAP ERP.

The CO module organizes regular training sessions and daily supervisor support to maintain user competence. Step by step guides on the intranet provide ongoing support to users.

DSI has set up a dedicated helpdesk to assist with financial tasks. A specialized change management team promotes the system, provides training, and ensures competence.

The FI module organizes periodic training and supervisor support to address user challenges. Detailed procedures on the intranet help prevent errors such as incorrect variant entries.

The HR module provides regular training on payroll and time management, with documentation, reducing errors.

The MM module ensures ongoing training and supervisor support for efficient procurement and inventory management. Intranet resources documenting procurement processes support user autonomy.

### 4.5 Summary of SAP ERP System Impact

The SAP ERP system at ENAFOR has been adapted to meet specific organizational needs through targeted customizations and configurations aligned with local standards. Implementation challenges were addressed through strategic planning, phased deployment, and targeted training. The integration of various modules has enabled real time data flow and improved financial oversight. Additionally, effective training and change management efforts have ensured smooth user adoption and minimized operational disruptions.

## 5 Impact of SAP ERP on Strategic Decision Making at ENAFOR

SAP ERP has transformed ENAFOR's strategic decision making by integrating real time data, advanced analytics, and predictive tools into its fundamental processes. This has allowed the company to move from reactive to proactive decision making, aligning its operations with its long-term objectives. Below, we explore the system's impact in key areas: budgeting and forecasting, decision support and analytics, and the strategic roadmap through migration to S/4HANA.

### 5.1 Budgeting and Forecasting

The strategic analysis, extracted from the "strategic analysis.xlsx" file, reveals how SAP ERP has transformed budgeting and forecasting processes at ENAFOR. The CO module enables

detailed cost tracking and analysis, ensuring that operational expenses across 318 structural units are monitored against budgets. CO integrates with FI for real time cost posting checks, ensuring that financial data aligns with strategic objectives.

DSI has implemented a unified platform for real time data access across 52 sites, facilitating a global view of financial performance. This data centralization enables more accurate budget planning and rapid adjustments based on changing conditions.

The MM module optimizes procurement costs and inventory levels, reducing holding costs and ensuring timely availability of materials for drilling operations. This aligns with the strategic objective of cost control across 318 structural units, contributing to more effective budget management.

These improvements in budgeting and forecasting have allowed ENAFOR to develop more accurate and responsive financial plans, supporting better resource allocation and strategic financial management.

### 5.2 Decision Support and Analytics

SAP ERP has significantly improved ENAFOR's analytical and decision support capabilities, enabling more informed and proactive decision making. The CO module provides detailed reports on costs and profitability, assesses the viability of drilling projects, and conducts variance analyses that guide resource allocation decisions.

DSI facilitates real time analysis that enables proactive financial decisions. Predictive tools in S/4HANA forecast cash flows, while DSI's role in maintaining data integrity ensures reliable inputs for decision making.

The HR module uses workforce analytics to support strategic personnel decisions, such as identifying training needs or optimizing schedules, helping to manage labor costs.

The MM module uses real time procurement and inventory data to inform strategic purchasing decisions, such as bulk purchases or supplier negotiations, helping with budgeting and cost control.

These enhanced analytical capabilities have transformed how ENAFOR makes strategic decisions, moving from a reactive approach based on historical data to a proactive approach informed by real time analyses and forecasts.

### 5.3 Migration to S/4HANA and Strategic Roadmap

ENAFOR's migration to S/4HANA in 2024 represents a significant step in its strategic roadmap, bringing substantial improvements in terms of performance and analytical capabilities. This migration, completed in 8 months using a Brownfield approach and the SAP Activate methodology, introduced in memory computing, accelerating financial processes.

The CO module benefits from real time analytics and faster data processing via in memory computing, with extended support until 2027. This performance improvement enables more complex analyses and faster insights.

The migration to S/4HANA has improved the processing speed of the HR module's payroll and introduced advanced analytics for workforce planning, supporting more strategic human resource management.

The MM module has been enhanced with faster processing and advanced analytics, improving inventory forecasting and procurement planning. These improvements support more efficient supply chain management and better resource planning.

The migration to S/4HANA positions ENAFOR for future growth and increased agility, with enhanced analytical capabilities that support more strategic and proactive decision making.

**Table 4 Pearson Correlation Coefficients Between Internal Sources**

| Source A | Source B | Correlation Coefficient |
|---|---|---|
| FI | DSI | 0.614 |
| HR | DSI | 0.490 |
| MM | HR | 0.382 |
| FI | CO | 0.379 |

| Source A | Source B | Correlation Coefficient |
|---|---|---|
| MM | DSI | 0.363 |
| HR | FI | 0.349 |
| MM | FI | 0.334 |
| MM | CO | 0.312 |
| DSI | CO | 0.304 |
| HR | CO | 0.303 |

Legend: This table presents Pearson correlation coefficients between SAP ERP modules/departments based on NVivo analysis of interview data. Positive correlations reflect the degree of perceived integration and interaction, supporting qualitative findings on the impact of SAP ERP.

The strong correlation between FI and DSI (0.614) underscores the central role of the IT department in enabling financial transparency through real time data access and automated controls, as discussed in Section 3.2.2. Similarly, the moderate correlations between FI and CO (0.379), MM and FI (0.334), and MM and CO (0.312) align with the improvement in budget planning accuracy highlighted in Section 3.2.1, reflecting the collaborative role of these modules in cost tracking and forecasting. This quantitative evidence reinforces the qualitative observation that the integrated nature of SAP ERP drives its transformative impact on ENAFOR's strategic financial management.

Thus, the overall impact of SAP ERP integration is manifested through financial management that is simultaneously more rigorous, more integrated, and more strategy oriented. Although the initial phases of implementation were marked by significant challenges particularly in terms of data migration, user training, and process adaptation the gains in operational efficiency (reduced closing times, automation of repetitive tasks, streamlining of billing and payroll cycles) and strategic steering capability (planning, anticipation, optimization) position SAP ERP as a key lever for performance and modernization for ENAFOR.

## Section 2: Discussion

### 1 Alignment Between Theory and Practice

The discussion highlights a strong alignment between theory and practice. The SAP ERP functionalities implemented at ENAFOR automated reporting, robust audit trails, role based access, and centralized data directly contribute to increased financial transparency, as predicted by theory.

For ENAFOR, this transparency is particularly crucial to ensure compliance with Algerian accounting standards and SONATRACH requirements. The system's ability to provide auditable data constitutes a key advantage. The mention of "financial transparency" as an improvement related to SAP in the Text Search Query (Improvement of profitability and financial transparency) reinforces this conclusion.

Nevertheless, a point of caution concerns initial user errors in the FI module (e.g., incorrect variant entries), suggesting that effective use of features contributing to transparency also depends on training and user competence.

### 2 Use of SAP ERP Analytics for Strategic Decision Making by ENAFOR Financial Managers

Enterprise Resource Planning (ERP) systems particularly those with advanced analytical capabilities like those offered by S/4HANA are theoretically expected to support strategic decision making. They do so by providing timely, accurate, and complete data; enabling sophisticated analyses (simulations, forecasts); offering insights into performance, risks, and opportunities; and facilitating databased decision making rather than intuition.

At ENAFOR, the use of SAP ERP's analytical capabilities for strategic decision making is clearly evident. The CO (Management Control) module plays a central role by providing detailed reports on costs and profitability, enabling the evaluation of drilling project viability (such as calculating the cost of goods sold), and conducting variance analyses that inform resource allocation decisions. Real time analyses, particularly since the migration to S/4HANA, are considered essential for financial oversight and agility.

The Information Systems Department (DSI) actively supports this initiative by enabling real time analysis that facilitates proactive financial decisions. Predictive tools in S/4HANA are used for cash flow forecasting, while DSI ensures data integrity, strengthening the reliability of analyses performed.

The HR module leverages workforce analytics to support strategic personnel decisions, such as identifying training needs or optimizing schedules contributing to more efficient labor cost management. The migration to S/4HANA has introduced advanced analytics for workforce planning. Meanwhile, the MM (Materials Management) module uses real time procurement and inventory data to inform strategic purchasing decisions (bulk purchases, supplier negotiations), which helps with budgeting and cost control. S/4HANA has enhanced the MM module with predictive analytics for inventory forecasting and procurement planning.

Although the FI (Financial Accounting) module provides fundamental financial data, strategic analysis seems to be more actively conducted through the CO, DSI, HR, and MM modules, which rely on this data for more actionable insights. Nevertheless, timely financial closings and the accuracy of financial statements generated by FI are indispensable prerequisites for effective strategic analysis. Overall, SAP ERP seems to have facilitated more informed and proactive decision making, as highlighted in Question 9 of the semi structured interview guide. The migration to S/4HANA is consistently cited as a key enabler of enhanced analytical capabilities. The Text Search Query highlights keywords such as "strategic" in relation to "financial objectives," "planning," "decision making CO helps," "improved financial efficiency," and "analytics for workforce planning," further confirming the strategic use of data generated by SAP.

The alignment between theory and practice is therefore substantial. SAP ERP and particularly its S/4HANA version equips ENAFOR's financial managers with powerful analytical tools that transform operational data into strategic intelligence. This enables more proactive and informed management. However, it is important to recognize that fully leveraging these tools requires a data driven organizational culture and strong analytical skills within financial teams. The initial challenges related to data migration and user training serve as a reminder that technology alone is insufficient; human and organizational factors are critical for translating analytical capabilities into effective strategic decisions.

## 3 Overall Impact of SAP ERP Integration on Strategic Financial Management at ENAFOR

The integration of the SAP ERP system has profoundly transformed ENAFOR's strategic financial management. In response to the central problem "What is the impact of SAP ERP integration on strategic financial management at ENAFOR?" the analysis of sub questions highlights a clear convergence around three major contributions: improved budget accuracy, enhanced financial transparency, and development of analysis based decision making capabilities.

First, SAP ERP enables more accurate budget planning through access to centralized, reliable, and real time data. This precision facilitates strict monitoring of budget execution, allowing the company to quickly adjust its allocations based on observed variances. This agile management is all the more strategic for a public company operating in a capital-intensive sector, where resource rationalization is imperative. The CO (Management Control) and MM (Materials Management) modules contribute to this dynamic by ensuring cost traceability, while the FI (Financial Accounting) module guarantees the consistency and accuracy of basic data.

Second, the integration of SAP ERP promotes increased financial transparency, supported by robust mechanisms for internal control, traceability, and process standardization. For a public company like ENAFOR, this transparency is crucial to meet accountability obligations, particularly towards SONATRACH and regulatory bodies. SAP ERP not only enables compliance with Algerian accounting standards but also significantly reduces the risks of errors, manipulation, or fraud, thus strengthening the organization's financial governance.

Third, the adoption of SAP S/4HANA marks an evolution towards proactive and strategic financial management. Advanced analytical functionalities (predictive analyses, scenario modeling, interactive dashboards) transform ENAFOR's financial managers into strategic actors, capable not only of understanding past performances but also of anticipating future developments. The integration of financial data with data from other modules (HR, logistics) offers an essential cross functional vision for effectively steering the company's overall strategy.

Additional evidence of the integration achieved through SAP ERP is provided by a correlation analysis of interview data conducted in NVivo. Pearson correlation coefficients, presented in Table 3.1, reveal positive associations between various modules or departments, reflecting the strength of their perceived interdependence as discussed by stakeholders. The strongest correlation is between FI (Financial Accounting) and DSI (IT Department) at 0.614, followed by HR (Human Resources) and DSI at 0.490, and MM (Materials Management) and HR at 0.382. These values suggest that interviewees frequently mentioned these modules together, indicating their operational interconnection.

In conclusion, the discussion of this study's results confirms the positive and significant impact of SAP ERP integration on strategic financial management within ENAFOR. Practical observations largely align with the theoretical benefits expected from ERP systems, particularly regarding improved budget planning accuracy, increased financial transparency, and enhanced analytical capabilities for strategic decision making. The study highlights how specific SAP modules (CO, FI, MM, HR), in interaction and supported by the IT department (DSI), contribute to these improvements.

The challenges related to implementation and user adoption remind us that technology, although powerful, must be accompanied by appropriate change management and continuous skills development to maximize its results. The recent migration to S/4HANA seems to have further amplified the benefits, particularly at the analytical level, paving the way for even more proactive and predictive financial management.

For ENAFOR, as a public company operating in a demanding sector, the integration of SAP ERP represents a strategic investment that strengthens its governance, optimizes its operations, and supports its decision making. The results of this study provide valuable insights into how such technologies can be leveraged to address the challenges of modern financial management in large and complex organizations. The next steps in research could explore in more detail the quantitative measurement of these impacts or examine the evolution of the strategic use of SAP ERP over the long term within ENAFOR.

# GENERAL CONCLUSION

## GENERAL CONCLUSION

The integration of information systems into strategic financial management today represents a major challenge for companies operating in capital intensive sectors such as oil and gas. This study, focused on the impact of SAP ERP on the strategic financial management of ENAFOR, Algeria's leading oil and gas company, has allowed us to explore the multiple dimensions of this digital transformation and its concrete implications. At the end of this research, it appears clearly that the implementation of SAP ERP constitutes much more than a simple technological modernization. It represents a profound overhaul of financial processes and a significant evolution in the way financial information is processed, analyzed, and used for strategic decision making. The historical evolution of ERP systems, from the first MRP tools of the 1960s to today's intelligent cloud platforms, testifies to their growing ability to integrate and optimize operations at the enterprise level. In this context, SAP ERP, with its FICO (Financial Accounting and Controlling) modules, has established itself as a reference solution for integrated financial management. The analysis of the ENAFOR case reveals that the integration of SAP ERP has significantly improved the accuracy of budget planning, strengthened financial transparency, and enriched analytical capabilities for strategic decision making. The centralization of financial data and their real time synchronization with other business functions have eliminated the information silos that previously hindered operational efficiency. This integration has also facilitated the standardization of financial processes, ensuring better compliance with accounting standards and a significant reduction in human errors. However, this digital transformation has not been without challenges. Technical and infrastructural considerations, organizational change management, and human capital development have proven to be critical success factors. Resistance to change, difficulties in adapting to new processes, and data migration issues have required a methodical approach and a rigorous implementation strategy. These challenges underscore the importance of adequate preparation and ongoing support when adopting such systems. The results of this study also highlight the added value of SAP ERP in the specific context of a public enterprise like ENAFOR. Improved financial governance, cost rationalization, and resource optimization are tangible benefits that contribute directly to the company's overall performance. The system's ability to provide predictive analytics and real time dashboards has transformed the way financial managers approach strategic planning and decision making. Beyond the immediate benefits, this study opens interesting perspectives on

the future evolution of ERP systems and their role in the digital transformation of enterprises. The increasing integration of artificial intelligence, machine learning, and advanced data analytics promises to further enhance the capabilities of these systems. For ENAFOR and other similar companies, these technological advancements represent an opportunity to strengthen their competitive advantage and further optimize their strategic financial management. Ultimately, this research confirms that the impact of SAP ERP on ENAFOR's strategic financial management is profound and multidimensional. It demonstrates that, despite the challenges inherent in its implementation, a well-integrated ERP system can fundamentally transform the way a company manages its financial resources and makes strategic decisions. In a constantly evolving economic environment, this capacity for adaptation and optimization constitutes a valuable asset for ensuring long term sustainability and competitiveness. This study thus contributes to enriching the understanding of the complex interactions between information systems, financial management, and corporate strategy. It also offers valuable lessons for other organizations, particularly in the public sector, that are considering undertaking a similar digital transformation. The lessons learned from ENAFOR's experience can serve as a guide to maximize benefits and minimize risks associated with implementing ERP systems in comparable organizational contexts.

# BIBLIOGRAPHY

## Bibliography


- (PricewaterhouseCoopers. (2011).
- Abrahams, S. (2012). Budgeting, forecasting and financial planning as a strategic tool in the Eastern Cape's manufacturing industry (Master's thesis).
- Al Matari, E. M. (2024). The Role of ERP in Enhancing Budgeting and Financial Planning Efficiency: Evidence from the Algerian Energy Sector. *International Journal of Accounting and Financial Reporting, 14(1), 33–49.*
- Al Matari, Y. A. S. (2023). The Role of ERP Systems in Enhancing Financial Performance: Evidence from the Oil and Gas Sector.
- Al Tit, A. A. (2022). The Impact of Employee Development Practices on Human Capital and Social Capital: The Mediating Contribution of Knowledge Management.
- Bala, H. &. (2016). Adaptation to Information Technology: A Holistic Nomological Network from Implementation to Job Outcomes.
- Botchkarev, A. &. (2011). A return on investment as a metric for evaluating information systems: Taxonomy and application.
- Bouarar. (2017). Challenges Of Adopting International Accounting Standards And International Financial Reporting Standard.
- Bowman, R. (2023). SOX compliance and internal controls.
- Chemakh, N. &. (2023). Les pratiques de gestion financière stratégique dans les entreprises publiques algériennes : Cas de Sonatrach. Revue Algérienne d'Économie et de Management, 14(2), 45 62.
- Chris, E. (2024). Cost Benefit Analysis of Technology Implementation.
- Cordes, J. J. (2017). Using cost benefit analysis and social return on investment to evaluate the impact of social enterprise: Promises, implementation, and limitation.
- Dao, B. S. (2019). Literature review and framework.

- Davenport, T. H. (2018). The AI Advantage: How to Put the Artificial Intelligence Revolution to Work.
- Dovetail. (2023). Constructivist grounded theory: Defined, explained, and illustrated. *https://dovetail.com/research/constructivist theory*.
- Dunaway, M. M. (2008). Cross module integration in ERP systems. Journal of Enterprise Systems.
- Elbardan, H. (2024). Enterprise Resource Planning, Corporate Governance and Internal Auditing.
- Elragal, A. (2012). The Future of ERP Systems: Look Backward Before Moving Forward. Procedia Technol. 5, 21 30.
- F. Robert Jacobs a, F. '. (2006). Enterprise resource planning (ERP) A brief history. Retrieved from https://dacemirror.sci hub.red/journal article/acf60e9f6439e74440edd126661e7365/robertjacobs2007.pdf
- F. Robert Jacobs, F. '. (2006). Enterprise resource planning (ERP) A brief history.
- Faisal Mahmood, A. Z. (2020). ERP issues and challenges: a research synthesis.
- Fleisch, E. O. (2004). The ERP landscape. Information Systems Journal, 14(4), 257–275.
- Flick, U. (2009). An Introduction to Qualitative Research (4th ed.).
- Gartner. (2023). Magic Quadrant for ERP.
- Gärtner, B. (2016). Implementation process of ERP systems – Qualitative empirical findings from large Austrian enterprises of the industry sector.
- Goldston, J. (2020). The Evolution of ERP Systems: A Literature Review.
- Gutterman, A. S. (2023). Organizational Performance and Effectiveness.
- Haddara, M. (2020). Cloud based ERP: Trends and Opportunities in Enterprise Resource Planning.

- Havi, L. (2021). Stakeholder strategies in ERP implementations.
- Hokroh, M. (2022). Research Paradigms in Management Information Systems (MIS) Studies. .
- Hope, J. &. (2003). Beyond budgeting: How managers can break free from the annual performance trap.
- Ibrahim, A. K. (2022). Organizational change management of digital administration.
- Jacobs, F. R. (2008). Enterprise Resource Planning (ERP) Systems: A Conceptual Framework for Implementation. .
- Kara, H. (2022). Failure Case Studies and Challenges in ERP Integration.
- Kenton, W. (2024). Strategic financial management explained.
- Klaus, R. &., & Al Amin et al., 2. (2023).
- Kotter, J. P. (1996). Leading Change.
- Lenzerini, M. (2002). A theoretical perspective.
- Małgorzata, O. (2023). SAP ERP software as a tool for managing the logistics subsystems of an enterprise.
- Md. Al Amin, M. T. (2023). History, Features, Challenges, and Critical Success Factors of Enterprise Resource Planning (ERP) in The Era of Industry 4.0.
- Menon, S. (2019). Benefits and Process Improvements for ERP Implementation: Results from an Exploratory Case Study. Retrieved from https://www.ccsenet.org/journal/index.php/ibr/article/view/0/40230
- Mercieca, P. (2024). Strategic financial management: A systems approach.
- Minovski, Z. (2020). NEW PARADIGM IN ACCOUNTING INFORMATION SYSTEMS – THE ROLE OF THE LATEST INFORMATION TECHNOLOGY TRENDS.

- Minovski, Z. M. (2020). New Paradigm in Accounting Information Systems – The Role of the Latest Information Technology Trends. Economic and Business Trends Shaping the Future.
- Moeller, R. R. (2006). Executive's Guide to COSO Internal Controls: Understanding and Implementing the New COSO Framework (2nd ed.).
- Mutambara, E. &. (2025). Sustainable strategic financial planning.
- Nour, M. A. (2023). The Impact of ERP Systems on Organizational Performance: The Role of Antecedents and Moderators.
- Odunayo Abosede Oluokun, O. A. (2024). STRATEGIC POLICY IMPLEMENTATION FOR ENHANCED ENERGY.
- Olonade, Z. (2020). Human Capital Development and Employee Training as Correlates to Employee Job Performance in Redeemer University Ede, Osun State.
- Parmenter, D. (2015). Key Performance Indicators: Developing, Implementing, and Using Winning KPIs (3rd ed.).
- PMI. (2022). The Standard for Program Management.
- R Barrett, J. H. (2006). Measuring business excellence.
- Radhakrishnan, V. (2025). Integrating environmental impacts into Cost Benefit Analysis using emergy.
- Rahman, M. (2024). Digital Transformation of Financial Strategy through ERP Systems.
- Rahman, M. A. (2023). ERP Systems and Their Impact on Business Process Integration and Decision Making.
- Saxena. (2016). ERP Implementation in Industries and Its Challenges. Retrieved from https://www.ijert.org/erp implementation in industries and its challenges
- Somto Emmanuel Ewim, T. O. (2024). Enhancing financial reporting and management efficiency through enterprise resource planning (ERP) systems: A theoretical review for large scale energy operations.

- Stahl, G. V. (2023). Organizational culture and readiness for change.
- Syed, R. G. (2014). Adoption of ERP System: An Empirical Study of Factors Influencing the Usage of SAP in the United Arab Emirates.
- Vandika, A. Y. (2024). The Effect of Enterprise Resource Planning (ERP) System Implementation, User Training, and Management Support on User Satisfaction in Manufacturing Companies.
- Vayyavur, R. (2015). ERP Implementation Challenges & Critical Organizational Success Factors.
- Wang, L. (2022). SAP S/4HANA platform overview.
- Wang, X. C. (2025). AI driven budgeting tools and forecast accuracy.
- Wang, X. C. (2025). AI driven budgeting tools and forecast accuracy.
- Westerman, G. B. (2014). Leading Digital: Turning Technology into Business Transformation. .
- Weygandt, J. J. (2020). Financial Accounting (11th ed.). Wiley.
- Z Zhang, C. H. (2019). Guidelines for the diagnosis and treatment of osteoarthritis in China.

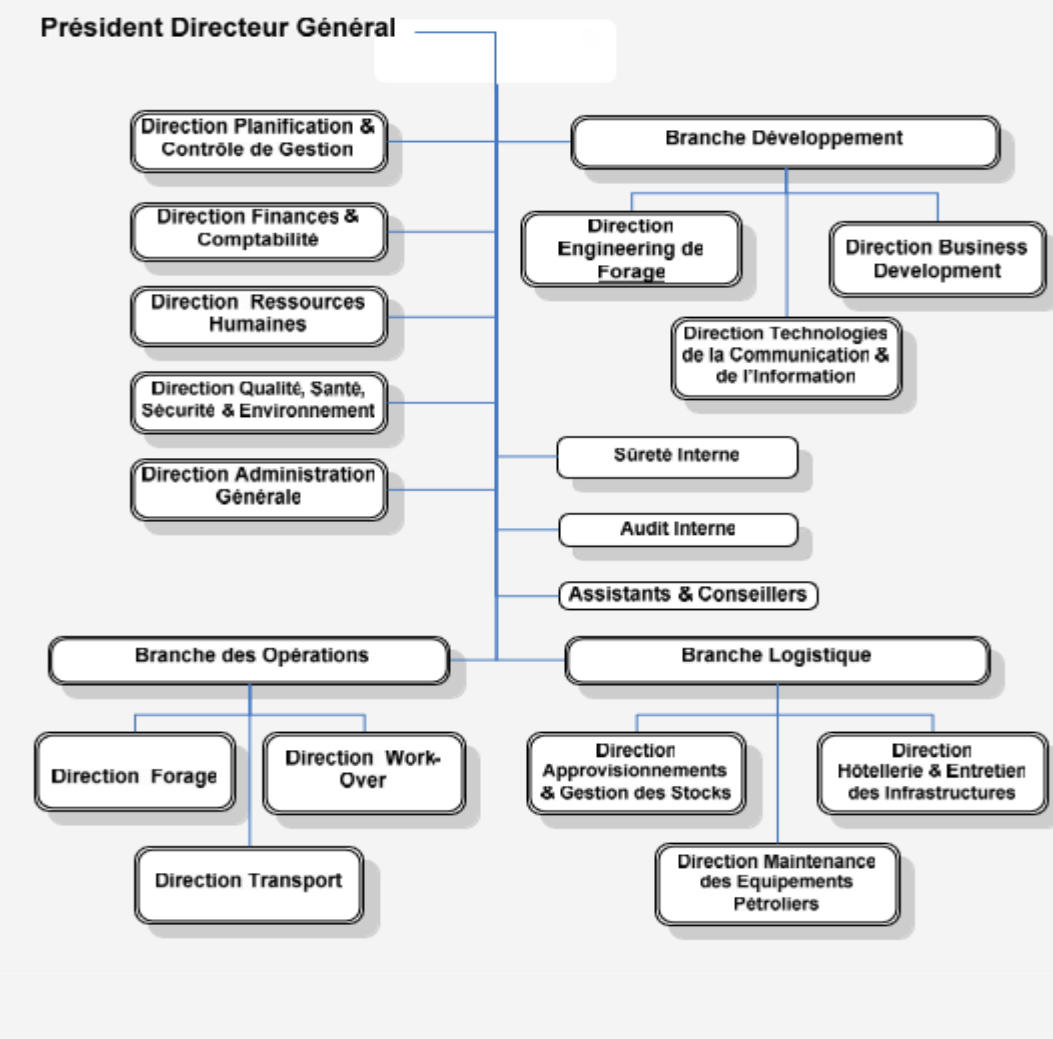
# APPENDIX

# APPENDIX 1 : Semi-structured interview

| Theme | Interview Question | Notes / Response Summary |
|---|---|---|
| Strategic Alignment | From your department's perspective, how has SAP ERP aligned with and supported ENAFOR's strategic financial objectives? | |
| Process Improvement | What specific financial processes in your department have been improved or transformed by SAP ERP? Please provide examples. | |
| Data Accuracy & Timeliness | How has SAP ERP enhanced the accuracy and timeliness of financial data and reporting within your department? | |
| Module Integration | Can you explain how your department's SAP module integrates with other modules to support comprehensive financial management? | |
| Implementation Challenges | What were the major challenges your department faced during the implementation of SAP ERP, and how were they addressed? | |
| Training & Support | How does your department ensure that users are adequately trained and supported to use SAP ERP effectively for financial tasks? | |
| Performance Metrics | What key performance indicators (KPIs) or metrics does your department use to measure the success of SAP ERP in managing finances? | |
| Customizations & Configurations | Can you discuss any customizations or configurations made in your department's SAP module to meet ENAFOR's specific financial management needs? | |
| Decision Making | How has SAP ERP facilitated better decision making in financial matters within your department? Please provide examples. | |
| Regulatory Compliance | What role does your department's SAP module play in ensuring compliance with financial regulations and standards? | |

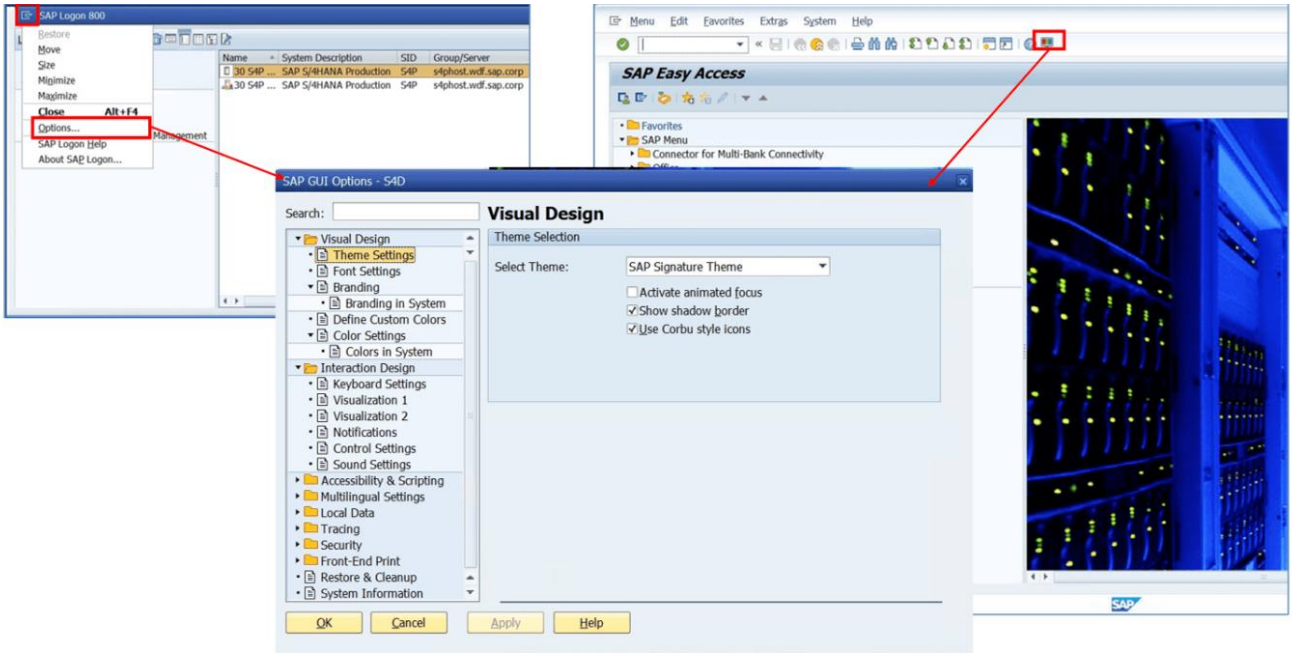
| Theme | Interview Question | Notes / Response Summary |
|---|---|---|
| Future Enhancements | Looking ahead, what recent updates or future enhancements in SAP ERP (e.g., migration to S/4HANA) are impacting or will impact your department's support for strategic financial management? | |
| Overall Impact | From your department's perspective, what has been the most significant impact of SAP ERP on ENAFOR's financial management strategy? | |

## APPENDIX 2 : Internal diagram document




**Internal ressources 2020 .**

# APPENDIX 3 :Sap Dashboard

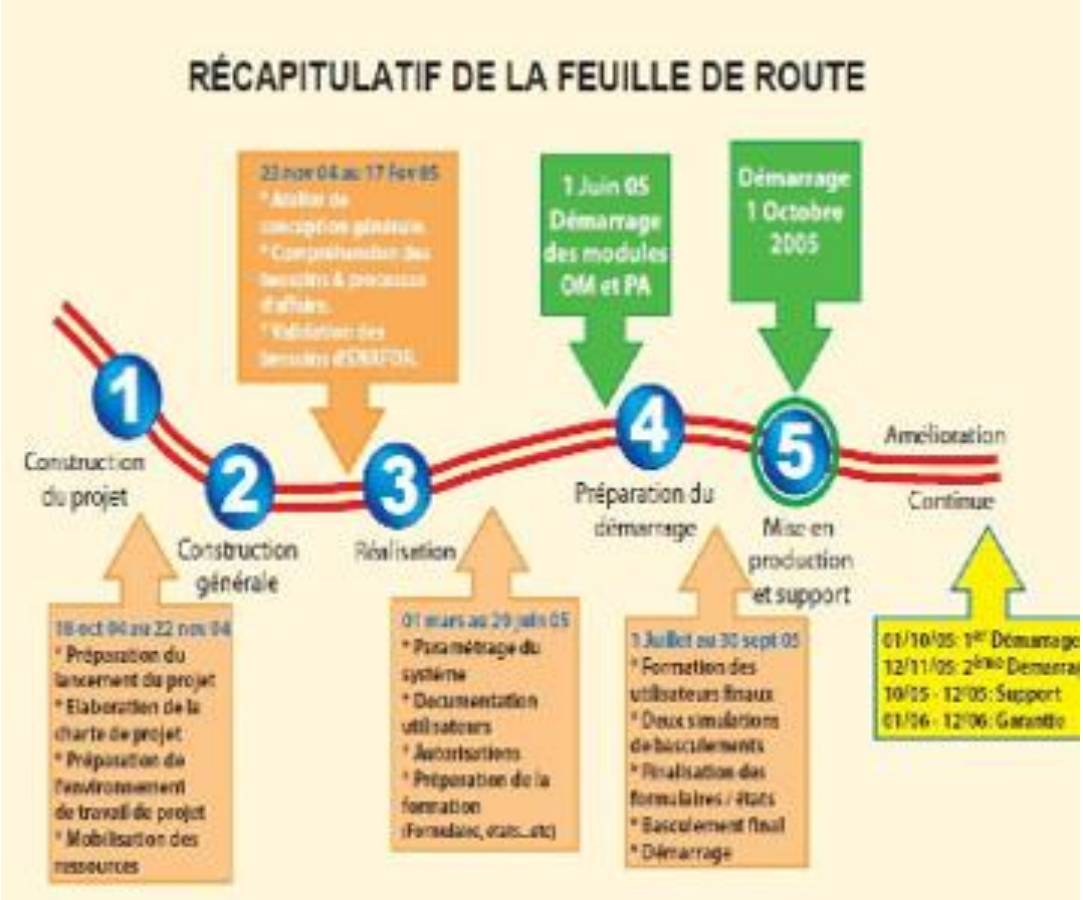



**Internal ressources 2021.**

## APPENDIX 4 :Project steps

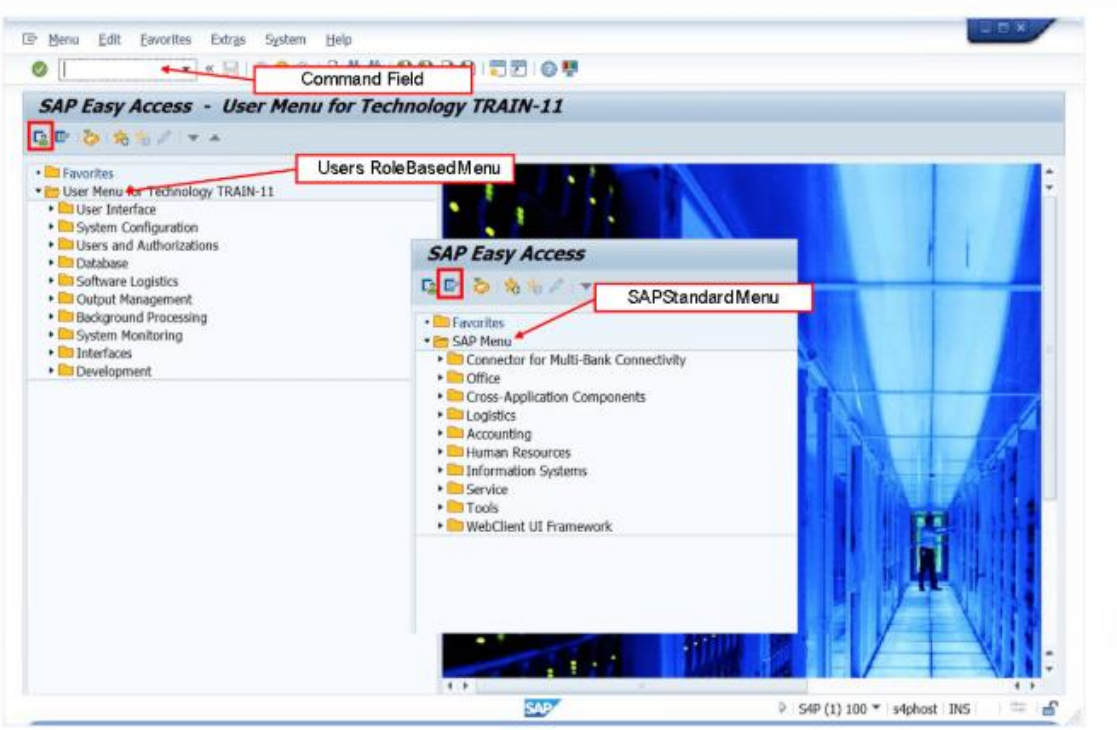

**Internal ressources 2017.**

# APPENDIX 5:Project plan




**Internal ressources 2016.**

# APPENDIX 5: Hana4 Dashboard




**Internal ressources 2025.**