Dissertation submitted in partial fulfilment of the requirements for a master's degree in the field of

Economic Sciences, Management, and Commercial Sciences

specializing in

E-Business

THEME

Monitoring the implementation and management of the Enterprise Resource Planning SAP S/4HANA within a large company.

CAS: A company client of PricewaterhouseCoopers Algeria

Submitted by
Miss GHEZAL Amina

Supervised by
Mrs MAROUF Djamila

Co-supervised by
Mr. LEMMOUCHI Bilal

Class of

2023-2024

Dissertation submitted in partial fulfilment of the requirements for a master's degree in the field of

Economic Sciences, Management, and Commercial Sciences

specializing in

E-Business

THEME

Monitoring the implementation and management of the Enterprise Resource Planning SAP S/4HANA within a large company.

CAS: A company client of PricewaterhouseCoopers Algeria

Submitted by
Miss GHEZAL Amina

Supervised by
Mrs MAROUF Djamila

Co-supervised by
Mr. LEMMOUCHI Bilal

Class of

2023-2024

بسم الله الرحمن الرحيم

Summary

الحمد لله أولاً حمداً مباركاً لتوفيقي في إنجاز هذا العمل.

أهدي هذا العمل إلى

روح الرجل الراحل الحاضر دائماً في قلبي، إلى من علمني أولى خطواتي، إلى الرجل الصارم الحنون الذي سهر على تربيتي وتعليمي، إلى من أفنى حياته من أجل راحتي وسعادتي، إلى الذي أطعمني من خيرات الدنيا، أطعمه الله من ثمار الجنة. إلى أبي، الذي رحل جسداً وبقيت روحه تملأ حياتي، رحمك الله وأسكنك فسيح جناته.

إلى حبيبتي أمي، غاليتي وقرة عيني، صديقتي الأولى ورفيقة دربي، مشجعتي وسر بلوغي ما بلغت من درجات، إلى مصدر قوتي وإلهامي، إلى من كانت دائماً لي السند والدعم في كل محطات حياتي. شكراً لكِ أمي، لأنكِ كنتِ دائماً هناك لتقدمي لي الحب والتشجيع بلا حدود.

إلى نفسي، على تضحياتي، صبري، تعبي، جهدي واجتهادي، إلى كل اللحظات التي قاومت فيها الصعاب وواصلت الطريق رغم كل شيء.

إلى إخوتي وأخواتي هند، هانية، صراية، لويزة، صباح، نجمة، أيهم، حكيم، موسى بلال، ربيع، وحبيبي آخر العنقود شهاب. إلى عائلتي التي كانت دائماً لي الدعامة والصخرة التي أتكئ عليها، شكراً لكم على كل لحظة دعم ومحبة.

إلى كل أبناء إخوتي وأخواتي وأخص بالذكر التوأم صفاء ومروى، طه باسم، وملاك الرحمن. أنتم المستقبل والأمل، بوجودكم تزداد حياتنا بهجة وسعادة.

إلى أقاربي نادية وبلال حجاج، على دعمهم المستمر وحسن تعاملهم، شكراً لكم لأنكم كنتم دائماً جزءاً من رحلتي. إلى كل رفاق المشوار ليلى، سلسبيل، هديل، إخلاص، شيماء، لمياء، آية، هبة، مريم، أحلام، بدري، عبد المعز، وليد، وعبد الجليل. إلى الأصدقاء الذين كانوا بجانبي في كل خطوة، والذين شاركوني الأفراح والأحزان، شكراً لكم لأنكم كنتم هنا من أجلي.

إلى خالتي عبيدة على دعمها ومساندتها، ولا أنسى بالذكر بناتها. شكراً لكم على دعمكم المستمر.
إلى روح جدتي، عمي محمد وخالتي فاطمة رحمهم الله وأحسن مثواهم.

إلى كل من ساهم في إنجاز هذا العمل من قريب أو بعيد، اشكركم جميعاً على دعمكم.

Acknowledgements

" That man can have nothing but what he strives for, that (the fruit of) his striving will soon be in sight. (Surah An-Najm, 39-40)

List of Figures

List of Tables

List of Graphs

List of abbreviations

ABAP Advanced Business Application Programming

ADKAR Awareness, Desire, Knowledge, Ability, Reinforcement (a change management model)

AMOA Advisory and Monitoring Services

API Application Programming Interface

BBP Business Blueprint

BPM Business Process Management

BPO Business Process Owner

BPR Business Process Reengineering

CRM Customer Relationship Management

CSFs Critical Success Factors

ECC ERP Central Component (previous version of SAP's ERP system)

EHS Environment, Health, and Safety

ERP Enterprise Resource Planning

EWM Extended Warehouse Management

GPAO Computer-Assisted Production Management

GRC Governance, Risk Management, and Compliance

HANA High-Performance Analytic Appliance (SAP HANA database technology)

HCM Human Capital Management

IoT Internet of Things

IT Information Technology

MIT Massachusetts Institute of Technology

MM Materials Management

MRP Material Requirements Planning

MRP II Manufacturing Resource Planning (sometimes considered as MRP II or Material Requirements Planning II)

OCM Organizational Change Management

OLAP Online Analytical Processing

OLTP Online Transaction Processing

PM Plant Maintenance

PMO Project Management Office

PP Production Planning

PwC PricewaterhouseCoopers

QAP Quality Assurance Plan

QMS Quality Management System

RACI Responsible, Accountable, Consulted, Informed (Matrix)

RBV Resource-Based View

S/4HANA SAP S/4HANA (specific version of SAP's ERP system)

SAP Systems, Applications, and Products (in Data Processing)

SD Sales and Distribution

Abstract

This research examines the implementation and management of SAP S/4HANA in Algerian companies in response to the dynamic business environment. The necessity for companies to anticipate future trends and position themselves for emerging opportunities is highlighted.

The research examines the challenges, strategies, and critical success factors of deploying SAP S/4HANA, employing both qualitative and quantitative methodologies. The dissertation offers practical insights and recommendations for successful implementations through case studies and empirical research. The dissertation addresses several key research questions, including the impact of training, change management, and communication on user satisfaction; the role of end-user involvement and stakeholder perceptions; and the influence of these factors on the success of SAP S/4HANA implementations. The study tests hypotheses related to these factors and provided actionable recommendations to enhance SAP S/4HANA implementation success. The findings underscore the significance of efficacious project management, stakeholder engagement, and technology integration for enhancing business operations, customer relations, and sales. The objective of the study is to provide organizations with the knowledge and strategies necessary for successful digital transformation.

Keywords : SAP S/4HANA, ERP implementation, digital transformation, change management, user satisfaction, Algerian companies, project management, critical success factors.

Résumé

Cette recherche a examiné la mise en œuvre et la gestion de SAP S/4HANA dans les entreprises algériennes en réponse à l'environnement commercial dynamique. La nécessité pour les entreprises d'anticiper les tendances futures et de se positionner pour les opportunités émergentes est mise en évidence.

La recherche examine les défis, les stratégies et les facteurs clés de succès du déploiement de SAP S/4HANA, en utilisant des méthodologies qualitatives et quantitatives. La thèse offre des perspectives pratiques et des recommandations pour des implémentations réussies à travers des études de cas et des recherches empiriques. Le mémoire aborde plusieurs questions de recherche clés, notamment l'impact de la formation, de la gestion du changement et de la communication sur la satisfaction des utilisateurs, le rôle de l'implication de l'utilisateur final et les perceptions des parties prenantes, et l'influence de ces facteurs sur le succès des implémentations de SAP S/4HANA. L'étude teste les hypothèses liées à ces facteurs et fournit des recommandations pratiques pour améliorer le succès de la mise en œuvre d'ERP SAP S/4HANA. Les résultats soulignent l'importance d'une gestion de projet efficace, de l'engagement des parties prenantes et de l'intégration de la technologie pour améliorer les opérations commerciales, les relations avec les clients et les ventes. L'objectif de l'étude est de fournir aux organisations les connaissances et les stratégies nécessaires à une transformation numérique réussie.

Mots-clés : SAP S/4HANA, mise en œuvre d'un ERP, transformation numérique, gestion du changement, satisfaction des utilisateurs, entreprises algériennes, gestion de projet, facteurs critiques de succès.

ملخص

قامت هذه الدراسة بفحص تنفيذ وإدارة SAP S/4HANA في الشركات الجزائرية استجابةً للبيئة التجارية الديناميكية. وتم التأكيد على ضرورة أن تتنبأ الشركات بالاتجاهات المستقبلية وأن تتمركز للاستفادة من الفرص الناشئة .

تستعرض الدراسة التحديات والاستراتيجيات والعوامل الحرجة للنجاح في نشر SAP S/4HANA باستخدام منهجيات نوعية وكمية. تقدم الأطروحة رؤى عملية وتوصيات من أجل تنفيذ ناجح من خلال دراسات حالة وبحوث تجريبية. تتناول المذكرة عدة أسئلة بحثية رئيسية، بما في ذلك تأثير التدريب وإدارة التغيير والتواصل على رضا المستخدمين، دور مشاركة المستخدم النهائي، وتأثير هذه العوامل على نجاح تنفيذ SAP S/4HAN تختبر الدراسة الفرضيات المرتبطة بهذه العوامل وتقدم توصيات عملية لتحسين نجاح تنفيذ نظام ERP SAP S/4HANA تؤكد النتائج على أهمية إدارة المشروع الفعّالة، والتزام الأطراف المعنية، ودمج التكنولوجيا لتحسين العمليات التجارية والعلاقات مع العملاء والمبيعات .

هدف الدراسة هو تزويد المؤسسات بالمعرفة والاستراتيجيات اللازمة لتحقيق تحول رقمي ناجح.

الكلمات المفتاحية: SAP S/4HANA، تنفيذ ERP، التحول الرقمي، إدارة التغيير، رضا المستخدمين، الشركات الجزائرية، إدارة المشروع، العوامل الحرجة للنجاح.

General introduction

General introduction

Enterprise Resource Planning (ERP) systems, particularly SAP S/4HANA, are essential for integrating and optimizing business processes in large companies. These systems enhance operational efficiency, real-time decision-making, and overall business performance. However, the implementation and management of SAP S/4HANA ERP systems present significant challenges, including complex project management, high costs, resistance to change, and the need for extensive training and stakeholder engagement. These challenges can delay the successful adoption and utilization of the ERP system.

Despite the critical importance of these systems, there is a lack of comprehensive understanding of the critical success factors (CSFs) that influence their successful implementation and management. Existing literature often provides fragmented insights, lacking a holistic view of the factors that contribute to or impede success. Our research aims to bridge this gap by systematically identifying and analyzing the CSFs for the successful implementation and management of SAP S/4HANA ERP systems in large companies.

« A good hockey player plays where the puck is, a great hockey player plays where the puck is going to be."[1] This insightful quote by the Canadian hockey player Wayne Gretzky resonates deeply in today's business landscape. In a world characterized by instability, frequent change, and rapid technological evolution, companies must navigate a dynamic environment to ensure their long-term survival and growth. Because, processes need to be optimized, communication needs to be streamlined, and it's imperative that circuits be shortened. Besides, in the current business environment, it is no longer sufficient for companies to only react to current trends; they must anticipate future shifts and proactively position themselves to capitalize on emerging opportunities.

Our dissertation explores how SAP S/4HANA is implemented and managed in Algerian companies. The dissertation examines the challenges, strategies, and critical success factors associated with the deployment of SAP S/4HANA, a leading enterprise resource planning (ERP) solution, in the context of today's dynamic business environment. Our dissertation employs an in-depth analysis of ERP fundamentals, SAP S/4HANA architecture, migration strategies, and project management methodologies to provide insights essential for successful implementation projects. Case studies and research approaches are employed to illustrate real-

---

[1] https://www.goodreads.com/quotes/170690-a-good-hockey-player-plays-where-the-puck-is-a , Retrieved 15 February 2024 at 10:04 AM.

world scenarios and identify critical success factors that are crucial for achieving successful SAP S/4HANA deployments. Besides, our dissertation aspires to contribute to the comprehension of SAP S/4HANA implementation, offering valuable recommendations for organizations engaged in their digital transformation journeys.

The choice of our research topic is naturally part of a dual perspective. An academic, and professional perspective. From an academic standpoint, our study in electronic business expands beyond digital marketing to cover various aspects aimed at enhancing business operations, customer relations, and sales through the integration of new information and communication technologies. Because based on the definition of ICD Business School of e-business *"The term e-business refers to the integration within a company of tools based on new information and communication technologies, with the aim of improving business management and customer relations, as well as increasing sales"*[2]. Understanding ERP systems, particularly SAP S/4HANA, is crucial in this academic pursuit, offering insights into the latest advancements in enterprise resource planning.

Practical experience gained during a nine-month internship with SDG Group Algeria, a leading SAP S/4HANA integrator in Algeria, sparked further curiosity about SAP implementations. This experience led to a deeper exploration of the complexities of SAP S/4HANA, both academically and professionally.

Professionally, the focus is on consulting, particularly in new technology consulting, with a specialization in SAP. The aim is to pursue a career in SAP consulting, supported by certification in "SAP Professional Fundamentals ". Globally, the motivation for this research arises from academic curiosity, practical exposure, and professional aspirations, driving an investigation into the complexities of SAP S/4HANA implementation and management.

In the context of our research, comprehending theoretical framework serves as the foundation for a comprehensive understanding of the difficult dynamics surrounding the implementation and management of SAP S4HANA within a prominent steel industry company based in Algeria. This framework integrates contemporary theories pertinent to Enterprise Resource Planning (ERP) systems, change management, technology acceptance, and organizational behavior, enabling a detailed analysis.

---

[2] *https://www.icd-ecoles.com/search?text=e+business, Retrieved 15 February 2024 at 01:37 PM.*

ERP theory serves as a crucial tool for comprehending modern business operations. Esteves and Pastor (2001) as well as Nah et al. (2001) lay the groundwork by highlighting the advantages of ERP systems, such as modularity and scalability. However, they also shed light on the challenges encountered during implementation, particularly in sectors like steel.

Understanding employee perceptions and acceptance of new technologies is essential for successful implementation. The Technology Acceptance Model (TAM) addresses this aspect. Studies by Venkatesh and Bala (2008) underscore factors like perceived usefulness and ease of use, which are instrumental in predicting user adoption. Nonetheless, TAM has its critics, who argue that it may oversimplify the complex interplay of organizational and cultural factors influencing acceptance. Navigating SAP S/4HANA implementation complexities necessitates robust change management strategies. Insights from Hayes (2018) introduce models like Prosci's ADKAR and Lewin's Change Management Model, crucial for addressing resistance and ensuring stakeholder engagement. However, these frameworks may fall short when confronted with unique organizational challenges.

Effective stakeholder management is another critical element. Theories from Freeman et al. (2010) offer guidance on addressing various stakeholders' interests and concerns. However, they often grapple with reconciling conflicting stakeholder interests. Lastly, the socio-technical systems theory, elucidated by Faraj and Azad (2012), emphasizes the interplay between social and technical elements. Understanding how SAP S/4HANA impacts work processes, communication patterns, and employee roles is vital for optimizing system performance and enhancing user satisfaction. Yet, aligning these elements can be particularly challenging in complex organizational settings.

This integrated approach aims to offer a comprehensive understanding of SAP S/4HANA implementation challenges and dynamics. While equipping stakeholders with actionable insights, it's crucial to critically recognize each theoretical framework's limitations to ensure a detailed analysis.

Integrating these contemporary theoretical perspectives not only provides a holistic understanding of the challenges and dynamics surrounding SAP S4HANA implementation but also equips stakeholders with actionable insights for navigating the complexities of ERP adoption and integration in the evolving industrial landscape.

The aim of this research is to explore and analyze the key factors influencing the successful implementation and management of SAP S/4HANA ERP within large companies. By

systematically identifying and examining the challenges experienced by system users and SAP consultants, investigating the factors that contribute to end-user satisfaction, and identifying the critical success factors (CSFs) perceived by stakeholders, this study seeks to bridge existing gaps in the literature. Through empirical research and case studies, the research aims to provide actionable recommendations for organizations embarking on their digital transformation journeys, ultimately enhancing the overall success of SAP S/4HANA implementation.

The main research problem can be summarized as follows:

"What are the critical factors that influence the successful implementation and management of SAP S/4HANA ERP in large companies?"

To address this research problem, the study will focus on the following sub-questions:

1. How do training experiences, change management strategies, and communication influence user satisfaction during SAP S/4HANA implementation and management?

2. How does end-user involvement in decision-making processes contribute to the success of SAP S/4HANA implementation and management?

3. What critical success factors (CSFs) do stakeholders perceive as significantly influencing the success of SAP S/4HANA implementation and management?

By answering these questions, the research aims to provide actionable recommendations for addressing challenges, maximizing benefits, and enhancing the overall success of SAP S/4HANA implementation and management within large companies.

The elements of response to the formulated problem will be provided by verifying the following hypotheses:

Hypothesis 1: Good training experience, effective change management strategies, and clear communication during SAP S/4HANA implementation positively impact the satisfaction levels of system users.

Hypothesis 2: End users involvement in decision making is a critical success factor for the successful implementation of SAP S/4HANA.

Hypothesis 3: SAP S/4HANA implementation stakeholders perceive factors such as project management, Change management programs, and Implementation team composition and skills as critical success factors for SAP S/4HANA implementation.

The research will follow a descriptive and analytical method to investigate the research problem. Both qualitative and quantitative approaches will be utilized to gather relevant data. The methodology involves interviews and questionnaires to collect and analyze data effectively.

In line with this logic, we will address these questions by subdividing our research work into two chapters. The first chapter provides an overview of ERP systems, focusing on SAP's evolution and the introduction of SAP S/4HANA. This chapter begins with an exploration of ERP fundamentals, including their evolution, core characteristics, and functional domains, emphasizing their role in optimizing management processes. It highlights SAP's innovative solutions, particularly SAP S/4HANA, offering a comprehensive introduction to ERP systems and SAP's contributions to digital transformation. Further, the chapter delves into the architecture of SAP S/4HANA, explaining its main components and real-time capabilities. It discusses the business benefits of SAP S/4HANA, such as improved efficiency and decision-making, and examines various migration strategies, including greenfield, Brownfield, and Bluefield approaches. The chapter also identifies key roles involved in SAP S/4HANA implementation, emphasizing the importance of project management methodologies, and exploring the collaboration and coordination required among different roles to ensure a successful implementation. Lastly, it examines the SAP Activate methodology, breaking down each phase of implementation, discussing the challenges of managing SAP S/4HANA projects, and providing best practices and strategies to address these challenges, ensuring effective project execution.

The second chapter presents a case study from the Algerian market, detailing the company profile, project context, and overview of the SAP S/4HANA implementation project. It begins with an introduction to the case study, providing background information on PwC and the client company, outlining the strategic rationale for adopting SAP S/4HANA, and detailing the project's scope, timeline, and constraints. The chapter then identifies and explains critical success factors essential for successful SAP S/4HANA implementation, highlighting factors such as top management support, effective project management, and robust change management programs. The methodological approach of this research is described, employing both qualitative and quantitative methods to examine these critical success factors. This section details the data collection tools and analysis methods used, presenting the findings and insights gained from the research. The conclusion summarizes the purpose and contributions of the research, discussing its limitations and suggesting areas for future research.

Chapter One: Introduction to SAP S/4HANA and factors influencing success

Introduction

In the 21st century business environment, the implementation of enterprise resource planning (ERP) systems represents a crucial aspect of organizational efficiency and agility. At the vanguard of ERP systems is SAP S/4HANA, an advanced system designed to transform business processes in the digital age. This chapter serves as a foundational study of SAP S/4HANA, beginning with an understanding of ERP systems and concluding with an analysis of key issues that impact its effective deployment and management.

The initial step is to elucidate the foundational concept of ERP systems, describing their role in linking diverse business activities and demonstrating their significance in contemporary business processes. By examining the foundational principles of ERP, particularly its capacity to streamline operations and enhance decision-making, readers gain insight into the key ideas that drive the revolutionary capabilities of SAP S/4HANA.

Building on this understanding, we proceed to examine the architecture of SAP S/4HANA, meticulously analyzing its key components and features. From databases and applications to interfaces and memory consumption.

Following this architectural study, we will proceed to a discussion of the actual business benefits that SAP S/4HANA delivers. From enhanced efficiency and real-time reporting to simplified operations and enhanced scalability, SAP S/4HANA is expected to stimulate organizational development and innovation. By means of illustrative examples and case studies, we demonstrate the transformative impact of SAP S/4HANA on organizations across industries, thereby illustrating its role as an engine for digital transformation.

Additionally, we examine the complexities of migration plans and offer insights into the different methods, issues, and concerns associated with moving to SAP S/4HANA. By navigating the various migration methods, including greenfield, brownfield, and hybrid options, organizations can chart a course for the seamless integration of SAP S/4HANA into their existing IT infrastructure.

Central to this implementation process are the key roles and responsibilities required for project success. By identifying and defining the responsibilities of project managers, technical leaders, and functional consultants, we emphasize the need for collaboration, coordination, and good communication to enable the seamless deployment and management of SAP S/4HANA across the enterprise.

Next, we will move from theory to reality by examining the realities of SAP S/4HANA implementation. We will cover methodologies, best practices, and key success criteria for project success. From the initial stages of project planning and scoping to the crucial area of stakeholder engagement and change management, we provide guidance on overcoming the challenges of implementation to optimise the value of SAP S/4HANA.

As we proceed to examine the intricacies of SAP S/4HANA, this chapter serves as a roadmap, guiding us through the complexities of ERP setup and management. By conducting a comprehensive examination of SAP S/4HANA's architectural features, business benefits, migration strategies, implementation methodologies, and key roles, we equip organizations with the knowledge and insights they need to leverage SAP S/4HANA as a strategic enabler for business growth and innovation in the digital age.

Chapter One: Introduction to SAP S/4HANA and factors influencing success.

Section 01: Navigating through ERP fundamentals to understand SAP.

In this introductory section, we delve into the world of Enterprise Resource Planning (ERP) systems, outlining their evolution, defining their core attributes, and exploring their functional domains. We then turn to SAP, a leading player in the ERP space, highlighting its corporate profile and the innovative solutions it offers, including SAP S/4HANA, the latest version of its ERP software. Through this exploration, we aim to lay the groundwork for understanding the role of ERP systems and SAP's contributions to business success and digital transformation.

1.1. ERP System

In this chapter, we will explore the basic concepts of ERP systems, trace their historical development, and examine their key features and functionalities.

1.1.1. Evolution of ERP Systems

In the early stages of their development, in the 1960s and 1970s, ERP systems were mostly used in industry as extensions to Material Requirements Planning (MRP) systems. These early systems focused on managing material resources, inventory control, and production scheduling. They were often separate systems, running on mainframe computers or early minicomputers. While basic compared to modern ERPs, these systems laid the groundwork for the combining of business processes and data management that would become key to ERP functions in later stages of development. In 1960, software applications were created especially to meet the requirements of the production function. [1]

The main goal of the software during this time was to automate the management of the manufacturing unit by establishing the output plan and material needs to supply the production lines with important resources. This technique is known as MRP (Manufacturing Resource Planning) or production resource planning, focusing exclusively on managing a company's operational center.

---

[1] *Sydney Hoffman, The History and Evolution of ERP Systems: The Past and Future,* *https://www.softwareconnect.com/erp/history , Retrieved 29 February 2024 at 02:00 PM.*

In 1980, the MRP II system emerged, which is a software for production management with enhanced functionality and precision, enabling optimal management of the company's materials and resources.[1]

The main limitation of this MRP and MRP2 computer program is that it only operates in the manufacturing unit and not overall, it is restricted to the estimation and automating operational processes through computerized solutions known as GPAO systems (Computer-Assisted Production Management) optimizes production operations by managing the purchase of essential raw materials and maintaining the smooth functioning of the manufacturing process. However, the MRP and MRP2 techniques have been applied in these systems.

During the 1990s, ERP evolved from MRP and MRP2 systems, expanding on previous software programs.[2]

Since the 2000s, the Internet has played a significant role in enhancing the adoption of ERPs in organizations by facilitating communication, and management of supplier/client interactions by integrating external players involved in value creation, such as partners and remote suppliers, without the requirement for physical presence. As shown in Figure 1.1, ERP systems have significantly evolved over the decades, reflecting the advancements in technology and the growing needs of businesses.

Figure 1.1: ERP evolution

Source *Mohammad A. Rashid, Liaquat Hossain, Jon David Patrick (2002), The Evolution of ERP Systems A Historical Perspective, Idea Group Publishing, USA.P5*

---

[1] *VINCENT CRITON, Le MRP et ses évolutions., https://logistique-pour-tous.fr/ le MRP et ses évolutions/, Retrieved 29 February 2024 at 02 :44 PM.*
[2]*Mohammad A. Rashid, Liaquat Hossain, Jon David Patrick (2002), The Evolution of ERP Systems: A Historical Perspective, Idea Group Publishing, USA. P.5*

1.1.2. The definition of an ERPP System

Despite the multiple definitions that can be retrieved from literature, a lot of people still struggle to comprehend what ERP is. ERP may be defined as "*A packed business software system that allows a company to automate and integrate most of its business activities, share common data and processes throughout the company and produce and access information in a real-time environment*". [1]

The ultimate purpose of an ERP system is that information must only be entered once. It is evident from the preceding that an ERP system is more than simply a product or software. [2]

ERP is the technological foundation of electronic business (e-business) in the back office. It was common during the 1990s to find the computing software for the finance department was different from that utilized by the human resources or stores departments. According to Kalakota and Robinson, ERP "Overcomes the integration challenges posed by disconnected, uncoordinated back-office applications that have often outlived their usefulness". [3]

ERP is a computer software which can be considered as a produced item for mapping all processes and data into an integrated package that provides solutions for organizations from a single information and IT structure. [4] This package is often tailored to the specific requirement of the firm. Although many may connect this customisation with negativity, it is only the distinctive design and configuration that ERP acquires which separate this software from other packages in the market. [5] and it is an exceptional tool for reducing inventory cost, improving efficiency, increasing profitability, and most importantly ERP- systems are found to be a key factor for improving customer satisfaction [6].

According to REIX Robert "An information system is an organized set of resources hardware, software, personnel, data, procedures, etc., enabling the acquisition, processing and

---

[1] *Marnewick Carl, Labuschagne Les. (2005). A conceptual model for enterprise resource planning (ERP). Information Management & Computer Security, vol. 13, no.2, P. 145-146. DOI :10.1108/09685220510589325.*
[2] *Ibid*
[3] *Kalakota Ravi, Robinson Marcia, (1999) E-Business: roadmap for success, Addison-Wesley, Reading, Mass. Harlow. P. 167*
[4] *Klaus Helmut, Rosemann Michael, Gable Guy G. (2000). What is ERP? Home Information Systems Frontiers, vol. 2, no. 1, P. 2.*
[5] *Idem, P.3.*
[6] *Muscatello, John R., Small, Mark H., & Chen, I. J. (2003). Implementing enterprise resource planning (ERP) systems in small and midsize manufacturing firms. International Journal of Operations & Production Management, vol. 23, no. 7, P.4.*

storage of information (in the form of data; text, images, sound, etc.), within and between organizations". [1]

1.2. Characteristics of ERP

An ERP, or Enterprise Resource Planning, as mentioned above, according to REIX Robert [2] , is "*a customizable, modular and integrated IT application that aims to federate and optimize a company's management processes by offering a single repository and relying on standard management rules*". ERP systems therefore have the following general characteristics:

1.2.1. Software

An ERP is a software package, in the sense that it is a set of programs designed by a publisher to meet the needs of companies, and marketed with additional options (implementation assistance, maintenance, training, etc.). As a result, it is generic and highly configurable. [3]

1.2.2. Integrated

It's an integrated software package. This means that the various modules of which it is composed communicate with each other,

and are not designed to be independent of each other. They can exchange information according to predefined patterns (standardized interfaces).

As a result, it avoids and manages data and processing redundancy, ensuring internal consistency. It also allows the addition of new functions and provides a degree of complementarity between the different software units. [4]

---

[1] REIX Robert, (2005). Système d'information et management des organisations. Editions Vuibert, 5e edition. Paris: p.3.

[2] REIX Robert. Information systems and organizational management. Op.cit. p.101.

[3] SLIMANI Radia ,(2015). Le pilotage des changements organisationnels et managériaux induits par l'implantation d'un SMQ et d'un ERP : Cas de l'entreprise publique ALCOST Béjaïa. University of Béjaïa. Algeria: 2015. p. 101 to 104.

[4] ABBAOUI Mariem, AGHCHMI Rim, KABLI Wafaa, (2014). Enterprise Resource Planning (ERP). Université Mohammed V - Agdal. Rabat. p. 5, 6.

1.2.3. Customizable

An ERP is a standardized product, originally designed to meet the different needs of different types of company. Different versions are available for different business sectors and languages.[1]

The product adapts to the needs of the company through parameterization, which can be matched, if necessary, to specific complementary programs, articulated with the standard programs, without encroaching on the ERP solution.

1.2.4. Modular

ERP has a modular structure, which means that it consists of a single database to which modules are connected, independent of each other but exchanging information seamlessly.

Each of these modules corresponds to a specific business function, and this breakdown enables the creation of company-specific solutions, as they are assembled to suit the structure and operation of the organization.[2]

1.2.5. Holds a unique repository

ERP is based on a single repository, which means that all data and objects entered or resulting from the software package are defined in the same way and managed by a single type of management system.

Like the data, the commands and data input interfaces are standard and identical whatever the module. This standardization helps to simplify communication and reduce learning difficulties for users.

1.2.6. Aims to optimize management processes

An ERP aims to optimize a company's management processes. To achieve this, when designing the program, editors research and analyze industry "best practices", obtaining a set of management rules that constitute a standard for a given business sector, on which they will base their design. Indeed, publishers often draw on QMS (Quality Management System) practices, the benchmark for best management practices.

---

[1] *HOADJLI Hadia. An approach to integrating agents into ERP. Université Mohamed KHIDER. Biskra: 2010. p. 11.*
[2] *FROUFE Sonia. Contribution of logistics risk management to the evolution of ERP (Enterprise Resource Planning) integrated information systems in the post-implementation phase: longitudinal approach applied to the aeronautical sector. Université du Havre. 2015. p. 35-38.*

1.3. Functionalities of an ERP system

In this section, we explore the various functionalities offered by an ERP system, highlighting its capabilities and benefits.

1.3.1. Functional domains of an ERP system

The interest of the ERP lies in the possibility of offering modular management corresponding to the different functions that cover most of the company's needs. These functions represent the core modules typically found in modern ERP systems, each serving a distinct aspect of organizational operations.

- The finance and accounting function takes care of all financial flows and accounting records.
- Sales management on ERP includes order and sales management and after-sales service.
- Production management integrates planning, quality management and maintenance of industrial sites.
- For its part, human resources management includes pay management, the personnel management, and the follow-up of training.
- Procurement management and logistics covers supply management, inventory management and warehouses.

As shown in Figure 1.2, these functions are interconnected through the ERP system, facilitating streamlined operations and information flow across different departments within an organization.

Figure 1.2: Functions and ERP System
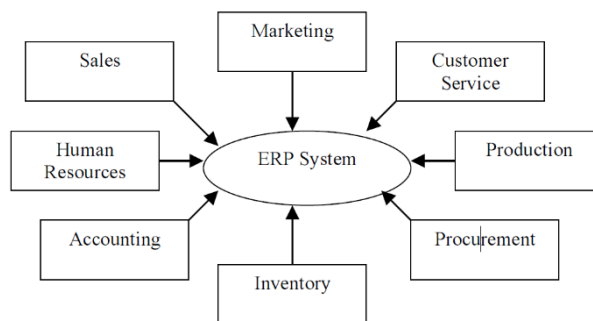
Source *Hedman, J. (2002) IT and business models concepts and theories, Liber Ekonomi Abstrakt Forlag, Malmo; Olso.*

In addition to these functions, the ERP has modular interfaces that enable the automation of the flow of information between actors such as email systems and workflow applications, which significantly promotes group work and user interaction.

1.3.2. Advantages of using an ERP system

Integrated management software enables the company to better control its entire processes and provides better traceability for managers and users. Here are the benefits that can be benefited from the ERP:

- ERP systems facilitate smooth communication between departments, enhancing collaboration and decision-making. Davenport emphasizes that an ERP system restructures a company's data flows, providing management with direct access to a wealth of information.[1] ERP enables efficient internal and external communication, fostering better relationships and faster responses.[2]

- Wallace and Kremzar assert that operating in a rapidly changing and highly competitive environment is the primary motivation behind implementing an ERP system.[3]

- O´Leary suggests that ERP adoption is often driven by competitive pressures, positioning it as a necessity to stay in business.[4]

- Al-Mashari's survey indicates that the most common reason for ERP implementation is the standardization of processes and systems, highlighting the importance of efficiency and consistency across operations.[5]

- **Enhanced traceability and security** ERP offers robust traceability and security features, safeguarding sensitive information and ensuring accountability.[6]

- **Error reduction** ERP minimizes human errors and delays through automation and validation checks, enhancing accuracy and consistency.[7]

---

[1] *Davenport. (1998),'' Putting the enterprise into the enterprise system'', Harvard Business Review, Boston, Vol. 76 No. 4, P.123.*

[2] *Li Fang Sylvia Patrecia, (2005). Critical success factors for ERP implementation and upgrade. Journal of IT and Business Renewal, Jonkoping International Business Scool, P.40.*

[3] *Thomas F. Wallace, Michael H. Kremzar (2001) ERP: making it happen: the implementers' guide to success with enterprise resource planning, Wiley, New York; Chichester.P.12*

[4] *O'Leary, D. E. (2000) Enterprise resource planning systems: systems, life cycle, electronic commerce, and risk, Cambridge University Press, Cambridge.*

[5] *Al-Mashari, M. (2001),'' Process orientation through enterprise resource planning (ERP): a review of critical issues'', Knowledge and Process Management, Vol. 8 No. 3, P.175-185.Quoted in Saad Alwabel, Mohamed Zairi, Angappa Gunasekaran, (2006), The Evolution of ERP and Its Relationship with E-Business, International Journal of Enterprise Information Systems, the Bradford University School of Management.P.11.*

[6] *Idem*

[7] *Idem*

- **Real-time updates** ERP synchronizes processes and provides real-time data updates, enabling faster decision-making and responsiveness.[1]

1.3.3. Disadvantages of implementing ERP systems

Despite the multiple benefits provided by the ERP to the company's operation, it does not prevent having some disadvantages that can be borne by the user:

- **High cost** Implementing an ERP system can impose significant financial and development time expenses on an organization. Even a medium-sized installation can take up tens of millions of dollars and require years of tweaking before the benefits appear. [2]

- **Complexity and lengthy implementation** ERP implementation can be complex, lengthy, and challenging. It requires significant time and resources to customize and integrate with existing systems.[3]

- **Underutilization** ERP systems may be underutilized due to factors such as inadequate training, resistance to change, and organizational constraints. Some features or modules may not be fully implemented or utilized by the organization, leading to missed opportunities for optimization and cost savings.

- **Dependency on vendor** Organizations become dependent on ERP vendors for continuous maintenance, updates, and support. This can lead to potential vendor lock-in and limited flexibility. [4]

- **Staff adaptation time** Employees may require time to adapt to the new ERP system, leading to productivity losses and resistance to change within the organization.[5] It's worth noting that market studies indicate high deployment ERP implementations have failure rates higher than 50% [6] . Therefore, while ERP software offers significant benefits, its

---

[1] *Shari Shang, Peter B. Seddon (2000). Assessing and managing the benefits of enterprise systems: The business manager's perspective. Information Systems Journal, Published online by Cambridge University Press: 05 February 2012.P.272*

[2] *Holland, C. P., Light, B. and Kawale, P. (1999)), Beyond Enterprise Resource Planning Projects: Innovative Strategies for Competitive Advantage, Proceedings of the the 7th European Conference on Information Systems, Copenhagen Business School: Copenhagen, Denmark, pp. 288-301. Quoted in Mohamed Zairi, Angappa Gunasekaran, Op. Cit.P12*

[3] *Idem*

[4] *Ibid*

[5] *Karl M. Kapp, William F. Latham, Henny Ford-Latham, H. (2001) Integrated learning for ERP success: a learning requirement planning approach, St. Lucie Press, Boca Raton, FL. Quoted in Mohamed Zairi, Angappa Gunasekaran, Op. Cit.P12*

[6] *VINCENT CRITON, Le MRP et ses évolutions., https://logistique-pour-tous.fr/ le MRP et ses évolutions/, Retrieved 29 February 2024 at 02 :44 PM*

development and deployment require careful planning, engagement of internal and external stakeholders, and expert supervision.

1.3.4. Types of ERP solutions offered in the market

We find in the ERP market a range of variants of different publishers that offer a variety of software that meet generic and specific needs according to the required measures, in the following we will discuss different forms can have ERP:

1.3.4.1. Standard and Specialized ERP

ERP solutions can broadly be categorized into standard and specialized types, each catering to different business needs and industries.

1.3.4.1.1. Standard ERP Standard ERP refers to a preconfigured business management software provided by software vendors. It covers a wide range of business functions, such as accounting, inventory management, purchasing, sales, production, and human resources.

- Provides standardized solutions applicable to common business processes.
- Built based on best practices and widely used business workflows.
- Offers quick implementation at an affordable cost.

➢ **Advantages**
- Cost-effective due to shared development and maintenance costs.
- Reliable, compliant, and regularly updated by software vendors.

➢ **Disadvantages**
- Limited flexibility for customization to specific company needs.
- May not fully align with unique business processes.

1.3.4.1.2 Specialized ERP known as industry-specific ERP, it is designed to cover specific management requirements of a particular industry or business domain.

- Tailored to address the specific needs of a particular industry or business sector.
- Requires expertise and in-depth knowledge related to that specific industry.
- Provides flexibility to adapt to unique workflows and processes.

a. Proprietary ERP systems is software published and marketed by a company specializing in computer design and programming for commercial reasons that involves the purchase of a license to benefit from the use of software by the purchasing company. Major proprietary ERP

companies include SAP (global leader), Oracle/PeopleSoft, SAGE ADONIX, Microsoft, SSA Global, GEAC, Intentia/Lawson, Infor Global Solutions.

In the following we will look at the two most used integrated management software in the world by:

> **SAP (System Applications Product for Data Processing)**

- A global leader in ERP solutions.
- Offers comprehensive modules for various business functions.
- Widely used in large enterprises across industries. [1]

> **Oracle/PeopleSoft**

- Acquired by Oracle, PeopleSoft provides robust HR and financial management solutions.
- Used by organizations for human capital management and financial operations. [2]

b. Open-Source ERP Open-Source ERP is a flexible and customizable business management software. With its open code, users have the freedom to customize and improve it to suit their individual business requirements.

- Offers a wide range of functionalities like proprietary ERPs.
- Allows customization and integration of additional modules.
- Supports modern trends like cloud-based deployment and vertical specialization.

Among these types of software on the market are Aria, Compiere, ERP5, OFBiz (Open for Business), Tiny ERP, Open Bravo, GI Suite.

Open-source ERPs are widely used by SMEs as they are less expensive and easy to customize and modify to suit the specific needs of the company.

1.3.5. The lifecycle of an ERP system

The ERP life cycle represents the project and the process of implementing an IT solution within a company, this new deployment is passed through a set of phases and stages, the success of this project depends on the continuation and success of the different key phases of the ERP lifecycle. As shown in Figure 1.3, the ERP system lifecycle includes the following stages.

---

[1] *https://www.selecthub.com/erp-software/peoplesoft-vs-sap-erp/ Retrieved 29 February 2024 at 01 :05 PM.*
[2] *https://www.oracle.com/fr/applications/peoplesoft/ Retrieved 29 February 2024 at 03 :55 PM.*

Figure 1.3: ERP System lifecycle
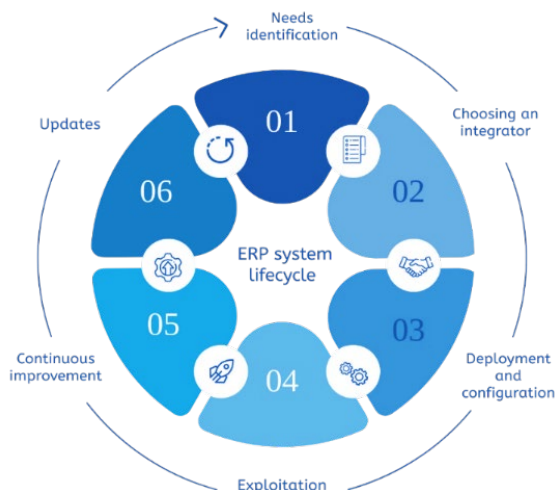
1.4. ERP and E-business

E-business can be defined as a shorthand term that embraces a complex mixture of technologies, infrastructures, processes, and products brings together whole industries and narrow applications, producers, and users, information exchange and economic activity into a global marketplace called "the internet" activity into a global marketplace called "the Internet" [1]

The characteristics of the new economy has increased the level of competition in all the industries and the internet presents an important opportunity for even small firms to launch new products or services because of the speed and low cost of doing business speed and low cost of doing business. [2]

ERP and e-business are not competitive systems. Their greatest benefits can only be achieved when they are used in agreement, completing each other. Thus, without successful ERP system the e-business systems would have only little to present, as in today's new business environment, power has shifted toward consumers who demand intelligent products that deliver new dimensions of value time and content in addition to the current one price and quality [3].

---

[1] *Ahmed, A., Zairi, M. and Alwabel, S. (2003), Global benchmarking for Internet and e-commerce applications, Proceedings of the first International Conference on Performance Measures, Benchmarking and Best Practices in New Economy, Business Excellence 2003. May, University of Minho Guimaraes, Portugal.*
[2] *Alwabel, S. A., Ahmed, A. M., Gouda, S. and Zairi, M. (2004), What, Why and How: Critical review of e-commerce era, Proceedings of the International Conference on Responsive Supply Chain and Organisational Competitiveness (RSC-2004), 5-7 January, Coimbatore, India.*
[3] *Idem.*

ERP and e-business have different functionalities, with ERP handling internal information and e-business serving as a distribution medium. However, ERP is seen as the most important and strategic platform by 66% of IT managers, as it provides a solid foundation and information backbone for e-business. When properly implemented, ERP and e-business can work together to streamline processes and automate data processing throughout the supply chain. [1]

1.5. SAP A Leader in the ERP Domain

In the fields of Enterprise Resource Planning (ERP), SAP stands out as a recognized leader, offering comprehensive solutions indicated to optimize company operations and increase organizational efficiency. This section goes into the essence of SAP as a corporation, its most prominent ERP solutions, and the current edition of its ERP software, SAP S/4HANA.

Figure 1.4 :SAP's company logo

Source www.sap.com

1.5.1. SAP Company

In this part, we will explore SAP's corporate history, its evolution over the years, and the key factors that contribute to its leadership in the ERP market.

1.5.1.1 SAP's evolution and leadership

SAP stands for Systems, Applications, and Products in Data Processing, founded in 1972 by five visionary engineers from IBM, evolved into a global leader in business software solutions. Headquartered in Walldorf, Germany, SAP has established itself as a leader in the digital transformation landscape, serving businesses of every size and sectors all over the globe. From its humble origins as a startup to its status as a worldwide organization, SAP continues to remain committed to its basic principles of innovation, integrity, and client success.

---

[1] *Norris, G., Hurley, J. R., Hartly, K. M., Dunleavy, J. R. and Balls, J. D. (2000) E-Business and ERP: transforming the enterprise, John Wiley, New York; Chichester. Quoted in Mohamed Zairi, Angappa Gunasekaran, Op. Cit.P13*

1.5.1.2 SAP in numbers

Today, SAP offers a comprehensive suite of corporate software solutions, spanning ERP, CRM, supply chain management, human resource management, and more. With a vast customer base of over 440,000 customers in more than 180 countries, and more than 105,000 employees worldwide (as of February 08, 2024). About 80% of its customers are small and midsize companies. Total revenue in 2024 was € 29.52 billion, including €13.66 billion from its cloud business. SAP works with about 25,800. partners and builds software solutions for 25 industries. In 2019, it invested more than €4.3 billion in research and development, including at 20 SAP Labs development centres worldwide SAP's business is helping customers optimize their business processes. SAP's purpose is to help the world run better and improve people's lives. Today, 87% of total global commerce ($46 trillion) of all business transactions worldwide touch an SAP system. For example, SAP's customers produce 78% of the world's food products and 82% of the world's medical devices.[1]

1.5.2 History and evolution of SAP ERP

Figure 1.5 illustrates the evolution of SAP ERP from SAP R/2 in 1972 to the SAP S/4HANA Intelligent Suite in 2020 and beyond.

Figure 1.5: History and evolution of SAP ERP
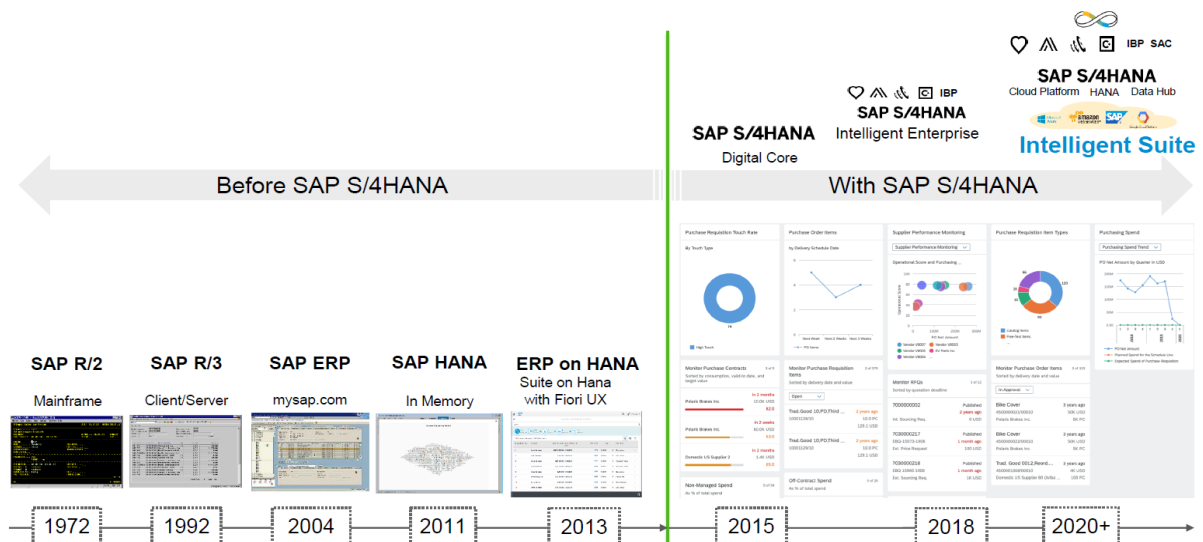
Source www.sap.com 01 March 2024 at 12 45 PM

---

[1] *SAP, https://www.sap.com/africa/about/company.html , Retrieved 29 February 2024 at 08 :09 PM*

- **Before SAP S/HANA**

  SAP S/4HANA is a significant advancement in SAP ERP, building upon decades of innovation.

➢ **SAP R/2 (Mainframe)** was the first ERP system developed by SAP in 1972. It operated on mainframe computers and enabled basic business processes. Despite its simplicity, SAP R/2 set the stage for SAP's future ERP solutions and solidified the company's position as an ERP leader.

➢ **SAP R/3 (Client/Server)** introduced in 1992, was a major advancement in SAP's ERP technology. It shifted from mainframe to client/server architecture, allowing for distributed computing and greater scalability. It also expanded the range of ERP functions, offering modules for finance, sales, and production planning.

➢ **SAP ERP (mySAP)** released in 2004, represents a significant advancement from SAP R/3, is a comprehensive suite of integrated business applications that builds upon the success of SAP R/3. It covers various business processes and offers modular architecture and customization options.

➢ **SAP HANA (In-Memory)** introduced in 2011, revolutionized ERP technology by using in-memory computing. This enabled real-time analytics, faster data processing, and improved performance. SAP HANA empowered businesses to make data-driven decisions and respond quickly to market changes.

➢ **ERP on HANA (Suite with Hana with Fiori UX)** SAP achieved a milestone by combining ERP on HANA with Fiori UX, resulting in a powerful and user-friendly integrated solution. This advancement improved business processes, decision-making, and set new standards for ERP systems, leading to the development of SAP S/4HANA.

  As shown in Figure 06, the history and evolution of SAP ERP illustrates the transformation from basic mainframe systems to sophisticated, intelligent ERP solutions.

- **After SAP S/HANA**

After introducing SAP S/4HANA, SAP kept innovating, introducing new phases to improve ERP systems further:

1. **SAP S/4HANA digital core (2015)** refers to the fundamental structure of SAP's ERP system introduced in 2015. It integrates transactional and analytical processes onto a single, in-memory platform, facilitating real-time data processing and enhancing operational efficiency.

SAP S/4HANA intelligent enterprise (2018) This phase represents the expansion of SAP S/4HANA capabilities focusing on artificial intelligence and machine learning.

2. The concept of the Intelligent Enterprise is grounded in three primary components—The Intelligent Suite, Intelligent Technologies, and the Digital Platform. It's designed to help businesses anticipate and react to customer needs in real-time by leveraging data-driven insights and automated processes.

3. **Intelligent suite solutions (2020)** Looking towards 2020 and beyond, SAP has enhanced its suite with further intelligent solutions, connecting processes within the enterprise as well as between enterprises. These solutions aim to cover all aspects of the business such as the customer experience, network and spend management, people engagement, product lifecycle management, manufacturing, asset management, and more.

- Delivering personalized experiences to customers through SAP C/4HANA suite, which includes marketing, commerce, sales, service, and customer data.

- By integrating applications like SAP Ariba, SAP Fieldglass, and others, organizations can manage procurement processes more effectively and collaborate with suppliers globally. This area covers human experience management solutions (SAP SuccessFactors) to enhance employee engagement, improve performance, and nurture talent.

- With tools such as SAP Integrated Business Planning and SAP Extended Warehouse Management, this phase includes managing end-to-end supply chain processes to increase visibility and agility.

- SAP manages products from design to service, incorporating customer feedback and product revisions. The company aims to meet the evolving demands of modern business by leveraging innovative technologies like AI, Machine Learning, IoT, and advanced analytics to drive process automation and business insight.

1.5.3. SAP ERP solutions

SAP ERP is a software suite that simplifies and connects various organizational operations, helping companies streamline processes and achieve strategic objectives efficiently.

- **Finance**

The finance module in SAP ERP encompasses functionalities for financial accounting, controlling, asset management, and treasury management. It ensures accurate recording and monitoring of financial transactions, as well as strategic financial planning and reporting.

> ➤ In the Finance module of SAP S4HANA, we have business processes such as Plan to Budget, Record to Report, Source to Pay, Lead to Cash. Etc

- **Procurement**

This module includes functionalities for managing procurement processes, vendor management, purchase requisitions, and purchase orders. It aims to optimize procurement spend while ensuring compliance with procurement policies and regulations.

> ➤ In the Procurement module of SAP S4HANA, we have business processes such as Source to Contract, Purchase to Pay. Etc

- **Project**

The project module supports project management processes, including resource allocation, project planning, and tracking project progress. It aims to ensure projects are completed on time, within budget, and according to specifications. In the Project module of SAP S4HANA, we have business processes such as Resource to Project.

- **Production**

This module supports manufacturing processes, including production planning, scheduling, and execution. It aims to ensure efficient production operations and timely delivery of products. In this module of SAP S4HANA Material to Product Involves transforming raw materials or components into finished products through manufacturing processes.

- **Warehousing**

The warehousing module focuses on managing inventory, order fulfilment, and warehouse operations within SAP ERP. It aims to optimize warehouse space utilization and streamline logistics processes. Receive to Leave it's a business process in this module which Encompasses receiving incoming goods, storing them in the warehouse, picking items for orders, and shipping them to customers.

- **Sales and Distribution**

This module facilitates sales order management, pricing, billing, and customer relationship management. It aims to streamline sales processes, improve customer service, and optimize revenue generation.

> ➤ In the Sales and Distribution module of SAP S4HANA, we have business processes such as

- Prospect to Order Involves converting potential leads or prospects into confirmed sales orders.

- Order to Cash Encompasses the entire process from receiving a customer order to receiving payment for goods or services rendered.

- **Maintenance**

Maintenance module focuses on managing equipment maintenance processes, including preventive maintenance, corrective maintenance, and asset management. It aims to minimize downtime, extend asset lifespan, and optimize maintenance costs. It includes business processes such as

- Notify to Maintain Involves detecting equipment failures or issues and initiating maintenance activities to address them promptly.

-Request to Service Encompasses submitting maintenance requests, scheduling maintenance activities, and tracking maintenance work orders to ensure timely resolution of issues.

- **Human Capital Management (HCM)**

HCM modules in SAP ERP focus on managing human resources processes, including payroll, employee benefits, talent acquisition, performance management, and workforce planning. It aims to optimize HR operations and enhance employee engagement. Besides, Hire to Retire is a business process in HCM module which Encompasses all stages of an employee's journey within the organization, from recruitment and onboarding to retirement or separation.

As the figure 1.6 illustrates the interconnected modules within an SAP ERP system, including Finance, Procurement, Warehousing, and Sales. For example, the Finance module tracks financial transactions generated by Procurement and Sales, while Warehousing coordinates with Production to manage inventory and fulfil orders, and Human Resources manages the employee lifecycle impacting all areas.

Figure 1.6 : Functional domains in SAP and business processes

Source *KPMG, should we migrate to SAP S/4HANA, the necessity of a proper SAP strategy and how to draft it.* https//assets.kpmg.com/content/dam/kpmg/ch/pdf/should-we-migrate-to-en.pdf *Retrieved 17 March 2024 at   08 17 AM*

SAP ERP has additional modules to meet specific business needs. SAP is simplifying its applications with SAP S/4HANA to help companies manage complexity and run simple across the digital value chain.

Conclusion

The transition from the introductory exploration of ERP fundamentals to an understanding of SAP S/4HANA establishes a foundational understanding of the evolution and core attributes of ERP systems. This provides the foundation for a more detailed examination of SAP S/4HANA's architecture, business benefits, and migration strategies, which are discussed in the following section. By examining each component of SAP S/4HANA and its real-time functionalities, stakeholders can gain a comprehensive understanding of its role in digital transformation.

Section 2: Understanding SAP S/4HANA architecture, business benefits, and migration strategies.

In this second section, we focus on SAP S/4HANA architecture, highlighting its role as the latest version of SAP ERP solutions. Exploring each of its components, including databases, applications, and interfaces, we emphasize its real-time functionalities and significant characteristics, such as SAP Fiori and the HANA database. Subsequently, we discuss the business benefits of SAP S/4HANA, including improved efficiency and real-time reporting, with examples of its impact on departments like finance, sales, and procurement. Lastly, we discuss the stages and factors of various migration approaches, including hybrid, brownfield, and greenfield techniques.

2.1. Architecture overview

The figure 1.7 below illustrate the architecture overview introduces the structural framework of SAP S/4HANA, highlighting component integration and operational roles to provide a foundational understanding of its functionalities.

Figure 1.7: SAP S/HANA ERP Architecture
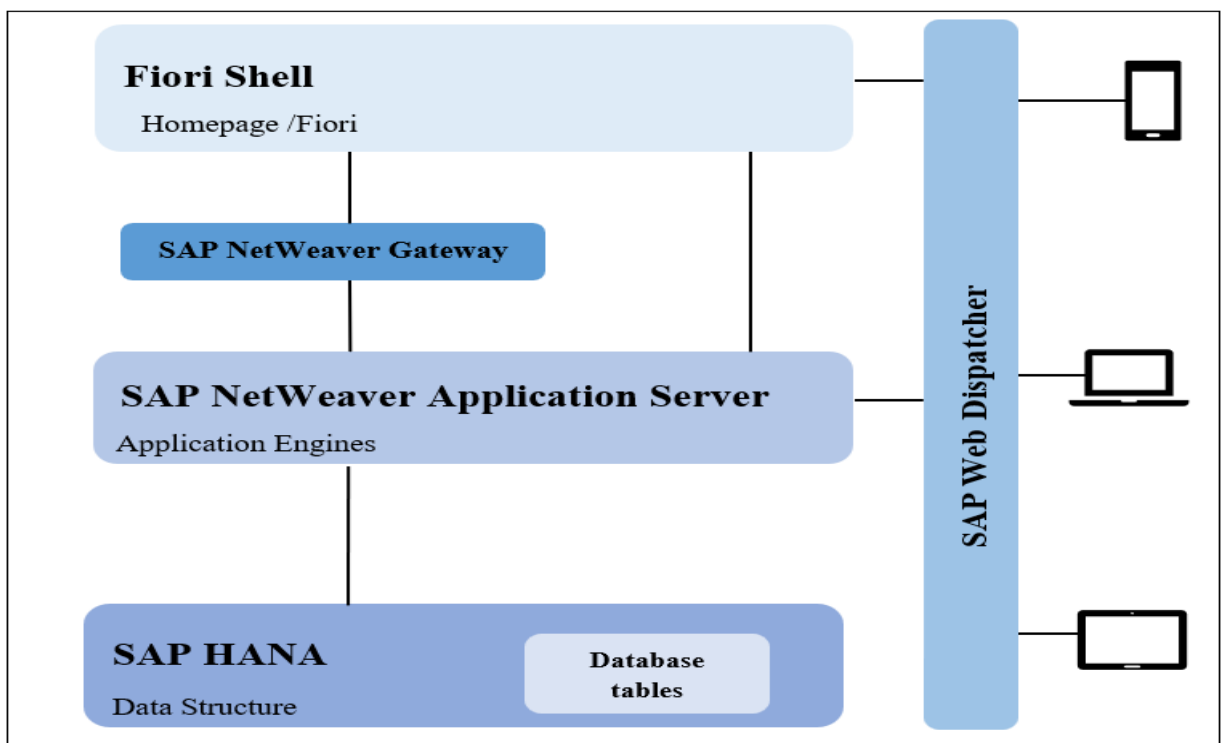
Source Done by us.

➢ **Overview of the main components of SAP S/4HANA**

In this section, we provide an overview of the main components that constitute SAP S/4HANA, highlighting its key functionalities and architecture.

2.1.1. Data Structure

Data, in its raw form, holds immense potential for businesses across all industries. Where, every interaction, transaction, and engagement generate valuable information that, when employed effectively, can unlock essential insights to understanding consumer behaviour, optimizing operations, and predicting market trends. But the vast quantities and complexities of data request powerful managerial tools. In addition to providing an enterprise resource planning solution, SAP S/4HANA is an innovative system that makes use of a specific database called HANA.

- **SAP HANA** SAP HANA is a multimodal database that stores data in memory instead of on disk. Because SAP HANA has an in-memory columnar architecture, it can support both high-speed transactions and advanced analytics within a single system, unlike traditional databases that rely on disk storage.
- ✓ SAP HANA stores data primarily in memory (RAM) rather than on traditional disks. This design enables extremely fast data retrieval, with response times measured in fractions of seconds.[1]
- ✓ Within SAP HANA, data is stored in database tables, each representing a structured collection of related information. These tables serve as the foundational structure for storing and organizing data within the SAP S/4HANA system.
- ✓ The columnar data organization in SAP HANA improves request performance and analytical capabilities. It operates exceptionally effectively for applications that need to analyze data quickly and can manage unexpected increases in volume.[2]
- ✓ SAP HANA combines Online Analytical Processing (OLAP) and Online Transaction Processing (OLTP) in a single system. This means it can handle both complex analytics and real-time transactions efficiently.[3]

---

[1]*SAP, https://www.sap.com/products/technology-platform/hana/what-is-sap-hana.html, Retrieved 11 March 2024 at 09: 00 AM*

[2] *SAP , https://learning.sap.com/learning-journeys/explore-sap-cloud-erp/providing-an-overview-of-sap-s-4hana_fd68c617-605e-4a79-809d-68201d56781c Retrieved 11 March 2024 at 09: 39 AM.*

[3] *Idem*

✓ Beyond being a database, SAP HANA server for developing intelligent applications based on real-time insights, in-memory technology, and machine learning.[1]

✓ SAP HANA's features are available both in the cloud and on-premises. By making all data instantly accessible from a single system.

The figure 1.8 below illustrates the various aspects of database management, application development, data virtualization, and advanced analytics within SAP HANA. It highlights key features such as data modelling, high availability, integration, machine learning, and more, demonstrating the comprehensive capabilities of SAP HANA.

Figure 1.8: What is SAP HANA?
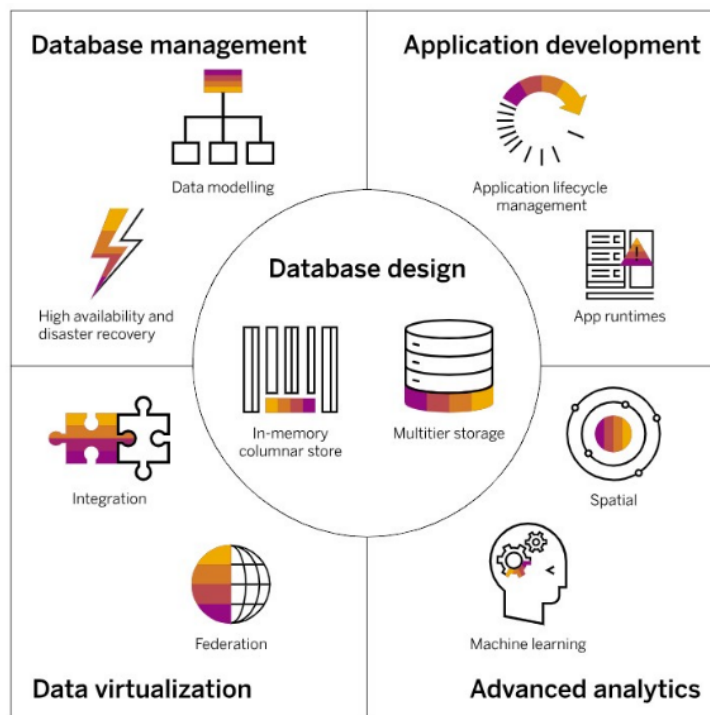
Source Jorge Silva, what is SAP HANA? Understanding the Difference between SAP HANA and SAP S/4HANA? SAP HANA 11 March 2024 at 09 40 AM.

2.1.2. Application Engines

At its core, SAP S/4HANA relies on a set of powerful application engines, each with a particular purpose. Among those engines, the SAP NetWeaver Application Server stands out as a critical component. It is the invisible element that keeps SAP S/4HANA running efficiently

---

[1] *SAP, https://www.sap.com/products/technology-platform/hana/what-is-sap-hana.html Retrieved 11 March 2024 at 10:01 AM*

in the background. Businesses aiming to transform their operations and accomplish strategic goals will find it indispensable because to its dependability, extensibility, and integration possibilities. [1]

1. Execution environment the development environment for different business applications is provided by the SAP NetWeaver Application Server. It includes third-party integrations, standard SAP applications, and programs created specifically for it. This server guarantees efficient execution whether it is handling procurement, coordinating production processes, or managing financial activities. [2]

2. Customization and deployment Organizations can tailor the SAP NetWeaver Application Server to their specific needs. Developers write custom business logic using ABAP (Advanced Business Application Programming), the primary language for SAP applications. This flexibility allows companies to adapt the system to their unique business processes. [3]

3. Integration Hub As part of the SAP NetWeaver framework, this server integrates easily with other components. It organizes data flow, establishes connections with databases, and exchanges information with other systems. The SAP NetWeaver Application Server is essential for extracting data from SAP HANA, communicating with older systems, and working with cloud services. [4]

4. Services and APIs Within the server, a wide range of services and APIs (Application Programming Interfaces) enable communication between different layers. These services provide, authorization, authentication, and more. They make it possible for apps to communicate effectively and securely.

5. Scalability and performance The SAP NetWeaver Application Server is designed for scalability. It can handle many concurrent users, making it suitable for enterprises of all sizes. With its integration into the SAP S/4HANA architecture, it leverages the power of SAP HANA for real-time processing, improving overall performance.

6.Security and compliance Security features, such as user authentication, encryption, and role-based access control, are integral to the server. Organizations can enforce strict security policies, ensuring data confidentiality and compliance with regulations. [5]

---

[1] *SAP, https://www.sap.com/products/technology-platform/netweaver.html Retrieved 12 March 2024 at 11:12 AM*

[2] *SAP, https://www.sap.com/france/products/technology-platform/netweaver.html Retrieved 12 March 2024 at 11:30 AM*

[3] *Idem*

[4] *Idem*

[5] *SAP , https://www.sap.com/france/products/technology-platform/hana/what-is-sap-hana.html Retrieved 12 March 2024 at 12:46 PM*

7. Adaptability Company requirements change, and the SAP NetWeaver Application Server adapts accordingly. This server is adaptable, capable of implementing new features, streamlining current procedures, and taking organizational structure modifications into account[1]

2.1.3. SAP NetWeaver Gateway SAP NetWeaver Gateway serves as the link between the Fiori front-end and the SAP back end, facilitating the exchange of data between the two. Through the Fiori shell, it enables the Fiori apps to take advantage of the SAP NetWeaver Application Server's business logic and data handling capabilities while offering a responsive, user-friendly user interface.[2]

2.1.4. Fiori Shell the Fiori Shell also known as the SAP Fiori Launchpad, is a user interface that serves SAP Fiori apps and provides them with services such as navigation, personalization, embedded support, and application configuration. It acts as the starting point for desktop and mobile SAP Fiori apps. Its key components include:

- ✓ **Launchpad Shell bar** This is the uppermost section of the SAP Fiori Launchpad. It is always visible to give users access to various launchpad functions.
- ✓ **Home page** the heart of the launchpad and the central access point for SAP Fiori apps.
- ✓ **User actions menu** Offers a range of user-specific services. It is accessed by clicking the icon or photo on the right-hand side of the shell bar.
- ✓ **Notifications** Users can access notifications by clicking the Notifications button on the right of the shell bar.

As shown in the figure 1.9 below the home page of SAP S/4HANA, showcasing key metrics and functionalities for sales order management, sales commissions, and incentives.

---

[1] *SAP, https://www.sap.com/products/technology-platform/netweaver.html Retrieved 12 March 2024 at 14:00 PM*
[2] *SAP, https://community.sap.com/t5/technology-blogs-by-members/a-simple-overview-on-sap-netweaver-gateway/ba-p/13232088 Retrieved 12 March 2024 at 15:00 PM*

Figure 1.9: SAP Fiori launchpad - home page
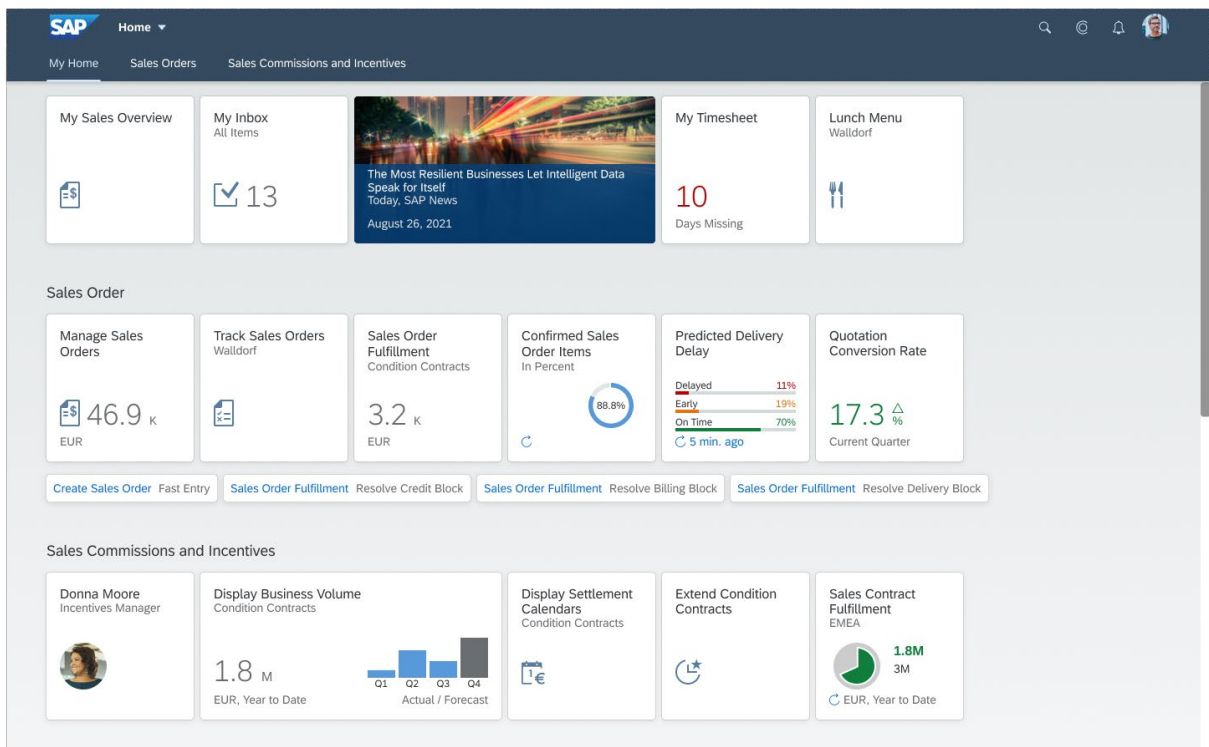
2.1.5. SAP web dispatcher The SAP web dispatcher is a key component of the SAP system architecture. It lies between the Internet and SAP system, serving as the entry point for HTTP(s) requests into the system, which consists of one or more SAP NetWeaver application servers.

The SAP Web Dispatcher is a "software web switch" that could accept or reject connections. When it accepts a connection, it balances the traffic to ensure an even distribution across the servers. This helps SAP system's load balancing and security.[1]

---

[1]*SAP,https://help.sap.com/docs/SAP_NETWEAVER_740/683d6a1797a34730a6e005d1e8de6f22/488fe37933114 e6fe10000000a421937.html Retrieved 12 March 2024 at 17: 49 AM.*

Figure 1.10: SAP S/4HANA as a "Digital core"
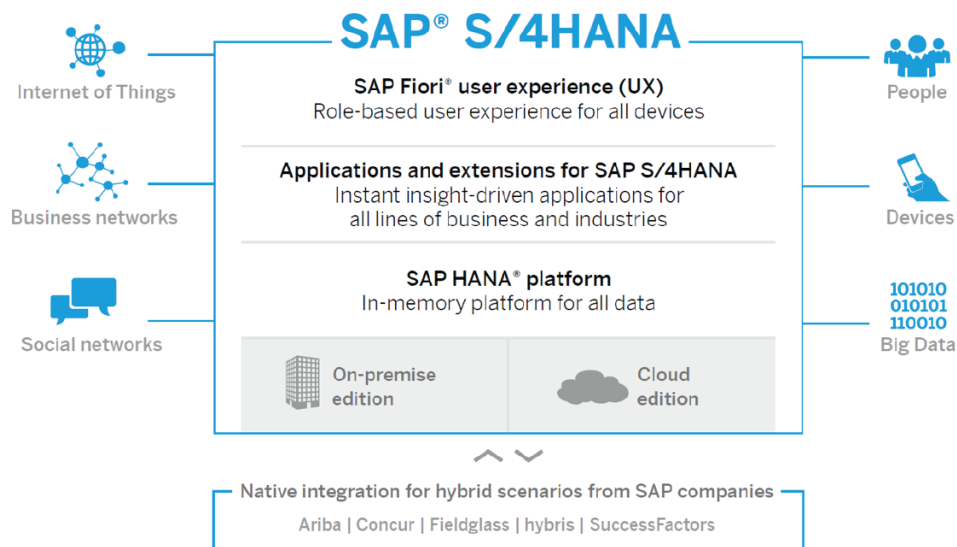
Source KPMG, should we migrate to SAP S/4HANA, the necessity of a proper SAP strategy and how to draft it. https//assets.kpmg.com/content/dam/kpmg/ch/pdf/should-we-migrate-to-en.pdf

SAP S/4HANA serves as a powerful "digital core" for modern enterprises. As shown in Figure 1.10, its architecture leverages the SAP HANA in-memory platform for real-time analytics. The intuitive SAP Fiori user experience and comprehensive applications deliver instant insights and streamlined operations. With seamless integration capabilities and flexible deployment options, SAP S/4HANA connects to IoT, business networks, social networks, and big data, making it a versatile and future-proof ERP solution.

2.2. Real-time capabilities

The real-time capabilities of SAP S/4HANA encompass several key functionalities:

2.2.1. Instant data access

SAP S/4HANA allows users to access data immediately, eliminating the need for lengthy data access processes. By ensuring that users have access to the most recent information, they can make decisions and respond to company demands more quickly.

2.2.2. Real-time analytics

With SAP S/4HANA's in-memory computing technology, organizations can perform complex analytics in real-time. This includes running instant requests, generating reports, and conducting predictive analytics without the delays typically associated with traditional systems.

2.2.3. Faster transactions

SAP S/4HANA accelerates transaction processing, enabling organizations to execute business processes, such as sales orders, procurement, and financial transactions, with significantly reduced processing times. This improves operational efficiency and enhances customer satisfaction by enabling faster order fulfilment and service delivery.

2.2.4. Predictive insights

SAP S/4HANA can produce predictive insights through the analysis of real-time data flows, which enables enterprises to anticipate future trends, risks, and opportunities. This makes strategic planning and proactive decision-making possible, which helps companies stay one step ahead of competitors.

2.2.5. Real-time reporting

SAP S/4HANA provides real-time reporting capabilities, allowing users to generate up-to-date reports and dashboards instantly. This enables stakeholders to monitor key performance indicators, track business metrics, and gain insights into business performance in real-time.

2.3. Business benefits analysis

The adoption of SAP S/4HANA offers organizations significant advantages, including enhanced efficiency, real-time reporting, and improved decision-making.

2.3.1. Improved efficiency

The adoption of SAP S/4HANA yields tangible improvements in operational efficiency and translating directly into enhanced business outcomes. By optimizing processes and providing instant access to critical data, organizations experience streamlined operations, reduced time-to-insight, and increased agility.

In the words of a VP of technology "*SAP S/4HANA is a game changer. It changed my role and contribution as a VP in my company — I'm more involved in solving business problems. It changed the efficiency of our technology team by making us more efficient. It also changed the experience of our end users. They don't know why run times are faster and previous problems*

are gone, but they appreciate how things are working and are accomplishing more in their workday."[1]

2.3.2. Reducing average run times

Increased end user productivity due to reduced run times valued at over $2.1 million. In a survey of 110 SAP S/4HANA customers fifty-three percent of survey respondents indicated that their companies experienced reduced run times, and 35% said the shorter run times increased the productivity of business employees. The average reduced time equated to 100 minutes per week or 4% of an employee's productivity. Forrester assumed that employees recovered 50% of this time in other productive tasks. For a population of 400 employees who were impacted, the savings still accumulated to more than $2.1 million over three years.[2]

A healthcare executive reported "*Our company is a backlog-driven company, meaning that we sell products and then we produce the products to fill that demand. We previously had a process that reconciled our backlog, and it averaged 3.5 hours of run time. We built a prototype and found that processing this same task in an S/4HANA environment took less than 5 minutes to run. I personally tracked every run time improvement, and our most extreme reduction was one process that dropped from 8 hours to 28 seconds.*"[3]

2. 3.3. Impact on finance, sales, and procurement departments

Across finance, sales, and procurement departments, the implementation of SAP S/4HANA delivers substantial benefits that drive measurable results. In finance, real-time access to financial data and advanced analytics capabilities enables faster reporting cycles, more accurate forecasting, and improved compliance, resulting in optimized financial management and heightened transparency. Sales teams benefit from enhanced visibility into customer behaviour, market trends, and sales performance, enabling them to identify opportunities, accelerate sales cycles, and maximize revenue. Similarly, procurement departments leverage SAP S/4HANA to gain real-time insights into supplier performance, inventory levels, and demand patterns, leading to more informed purchasing decisions, cost savings, and enhanced supply chain efficiency. Larger companies indicated that they improved their financial operations, often by

---

[1] *Dean Davison, Richard Cavallaro, Adrienne Capaldo, (2019), A Forrester Total Economic Impact™ Study Commissioned by SAP September the Total Economic Impact™ Of SAP S/4HANA Cost Savings and Business Benefits Enabled by SAP S/4HANA, P.3*
[2] *Idem, P.4*
[3] *Idem, P.8*

combining manufacturing and inventory systems with financial data to optimize inventory and understand the related cost of management decisions.[1]

2.3.4. Enhanced decision making and strategic insights

SAP S/4HANA empowers organizations with the tools and insights needed to drive strategic initiatives. By harnessing real-time data analytics and predictive capabilities, stakeholders gain deeper insights into market dynamics, customer preferences, and operational performance, enabling them to anticipate trends, capitalize on opportunities, and mitigate risks effectively. This proactive approach enables organizations to adapt quickly to changing market conditions, optimize resources, and position themselves for sustained growth and success.

2.4. Migration strategies explanation

As firms continue to evolve and expand, existing software solutions may no longer suit their demands. For those utilizing SAP as their enterprise resource planning (ERP) solution, there are three basic techniques to consider when it comes to migrating to a new system or updating an existing one greenfield, brownfield, and Bluefield migration.

2.4.1. Greenfield approach

Greenfield migration includes setting up a new SAP system from scratch, without depending on any existing configurations or data. This technique is ideal for companies that need to deploy SAP to satisfy business objectives without any limits from current systems.

- Companies must ensure that they have the necessary budget and resources to invest in building a new system from scratch.[2]
- Greenfield migration timelines tend to be longer due to the time and effort required to build a new system from scratch.
- Greenfield migration is suitable for companies with relatively simple system architecture or limited integrations.
- Companies should also consider their future plans, as a new system built from scratch can provide more flexibility for future growth and expansion.[3]

---

[1] *Dean Davison, Richard Cavallaro, Adrienne Capaldo, (2019), Op. Cit, P.10.*
[2] *Accrete Consulting Solutions (2023), The Three Faces of SAP Migration: Greenfield, Brownfield, and Bluefield Explained, USA Corporate Office 7116 252nd Avenue NE Redmond, WA 98053, P.3*
[3] *Idem*

2.4.1.1 Advantages of Greenfield migration

- With no existing system to build upon, companies have the flexibility to design and configure the new SAP system to meet their specific business requirements.

- Greenfield migration allows companies to take advantage of the latest SAP features and functionalities, providing them with the most up-to-date technology.

- A new system allows companies to start fresh and avoid any legacy issues or constraints from existing systems.

2.4.1.2 Disadvantages of Greenfield migration

- Building a new system from scratch requires significant time, resources, and training.
- Companies must also consider the effort and cost of migrating data from the existing system to the new SAP system.
- Customization of the new system can be complex and time-consuming.
- As the system is new, more intensive change management may be required.

2.4.2. Brownfield approach Brownfield migration involves upgrading and updating an existing SAP system while retaining its current configuration and data. This approach is ideal for companies that want to modernize their existing system and take advantage of the latest SAP features without starting from scratch.[1] Upgrading live systems and reusing existing system elements selectively.[2] As shown in the figure 1.11, the process involves transitioning from SAP ECC to SAP S/4HANA through a structured update process.

Figure 1.11: Brownfield approach

Source Accrete Consulting Solutions 2023, Op. Cit, P4

- Brownfield migration is ideal for companies that want to modernize their existing system and take advantage of the latest SAP features while retaining their existing configuration and data.

---

[1] *Accrete Consulting Solutions (2023), Op. Cit, P.4*
[2] *Accenture (2019), Unlocking potential conversion to SAP S4/HANA, P.3*

- Upgrading and updating an existing system is typically less expensive than
- building a new system from scratch, but companies must ensure that they have the necessary budget and resources for the migration process.
- Brownfield migration timelines tend to be shorter than greenfield migration timelines due to the existing system infrastructure and configuration.
- Brownfield migration is suitable for companies with relatively complex system architecture or extensive integrations.
- Companies should also consider their future plans, as upgrading an existing system may limit flexibility for future growth and expansion.

2.4.2.1 Advantages of Brownfield Migration

- Brownfield migration allows companies to leverage their existing SAP system, which can reduce the time and resources needed for training and familiarization.
- Brownfield migration minimizes system downtime and business disruption, as the existing system remains operational during the migration process.
- Upgrading and updating an existing system is typically less expensive than building a new system from scratch.

2.4.2.2 Disadvantages of Brownfield Migration

- Brownfield migration may not provide the flexibility to implement new features and
- functionalities that are not supported by the existing system.
- Upgrading an existing system may result in legacy issues or constraints that can limit system performance and scalability.
- Customization of the upgraded system can be complex and time-consuming.

2.4.3. Bluefield approach

Bluefield migration, also known as a hybrid approach, incorporates the advantages of both greenfield and brownfield migration. This strategy involves building a new SAP system from scratch, but with the potential to use some of the previous system's parameters and data. This strategy provides enterprises with the flexibility to implement new SAP features and functionalities while reducing the risks associated with starting from scratch.[1] As shown in the

---

[1] *Accrete Consulting Solutions (2023), Op. Cit, P.4*

figure 1.12, the process balances the implementation of new systems with the selective reuse of existing data and configurations.

Figure 1.12: Bluefield approach

- Bluefield migration is ideal for companies that need a new SAP system to meet their specific business requirements while minimizing the risks associated with starting from scratch.

- Building a new system from scratch, even with the ability to incorporate some of the existing system's configurations and data, requires a significant investment in time and resources.

- Bluefield migration timelines tend to be longer than brownfield migration timelines due to the complexity of the migration process.

- Bluefield migration is suitable for companies with relatively complex system architecture or extensive integrations.

- Companies should also consider their future plans, as a new system built from scratch can provide more flexibility for future growth and expansion.

2.4.3.1 Advantages of Bluefield Migration

- Bluefield migration allows companies to design and configure a new SAP system to meet their specific business requirements while incorporating some of the existing system's configurations and data.

- Bluefield migration minimizes the risks associated with starting from scratch, as some of the existing system's configurations and data can be leveraged.

- Bluefield migration allows companies to take advantage of the latest SAP features and functionalities, providing them with the most up-to-date technology.

- Bluefield migration minimizes system downtime and business disruption, as the existing system remains operational during the migration process.

2.4.3.2 Disadvantages of Bluefield Migration

- Bluefield migration is more complex than greenfield or brownfield migration and requires significant planning and coordination.

- Building a new system from scratch, even with the ability to incorporate some of the existing system's configurations and data, requires a significant investment in time and resources.

- Companies must also consider the effort and cost of migrating data from the existing system to the new SAP system.

Conclusion

Building upon the preceding discussion of SAP S/4HANA's architecture, business benefits, and migration strategies, the focus shifts to a comprehensive overview of the key roles and project management necessary for its successful implementation. This transition prepares stakeholders for the practical aspects of implementation, thus setting the stage for understanding the collaborative efforts required for a seamless deployment of SAP S/4HANA. The roles and project management dynamics presented next provide valuable insights into orchestrating the implementation journey and guiding stakeholders towards effective SAP S/4HANA deployment.

Section 3 Roles and Project Management in SAP S/4HANA Implementation.

This section of SAP S/4HANA Implementation presents a holistic view of the key roles and project management overview that are critical to the successful implementation of SAP S/4HANA within an organization. It not only identifies key roles such as the project sponsor, project manager, business process owner, technical lead, and end users, but also explores the strategic role of project management methodologies. By clarifying the responsibilities and contributions of each role and exploring the central role of project management in orchestrating the implementation journey, this section provides valuable insights into the collaborative efforts required for an effective SAP S/4HANA deployment. Understanding these roles and project management dynamics enables stakeholders to align resources, manage expectations, and drive successful outcomes in their SAP S/4HANA initiatives.

3.1. Identification of key roles

Before presenting a holistic definition of the main roles in SAP S/4HANA projects we will start by defining the role of consultants, consultants generally work with companies to analyze and solve specific problems. They can operate in a wide variety of fields. They are external service providers who generally work within a firm but can also act as independent officers. Working on behalf of companies, the consultant's aim is to improve their operations in a particular area. They advise senior management on improvements to be made in human resources, general organization, or customer relations. He analyses their problems, prescribes appropriate solutions, and accompanies their implementation.

3.1.1. Operational layer

This layer covering functions such as business and IT user support and back-office auditing. The teams in this layer work on the day-to-day operations of maintenance and delivery of solutions. They participate in project design workshops and provide requirements, manage third parties, provide security requirements and guidelines, implement critical decisions, and provide operational insights; they also lead local communications efforts and manage rollouts. [1]

---

[1] *Sanket Kulkarni (2019), Implementing SAP S/4HANA A Framework for Planning and Executing SAP S/4HANA Projects, Apress Media LLC, Pune, Maharashtra, India, P.174*

- **Technical consultants**

Technical SAP consultants are responsible for the technical aspects of S/4HANA solutions, including system installation, customisation, and integration. They collaborate closely with customers to completely understand their technical expectations and then deliver solutions that satisfy those expectations. [1] Some of the roles that fall under Technical SAP Consultants include:

➢ **SAP Basis Consultant** Responsible for the technical infrastructure of S/4HANA systems, they manage system installations, upgrades, and maintenance.
➢ **SAP ABAP Consultant** Working with S/4HANA's Advanced Business Application Programming (ABAP) language, they develop custom applications and modify existing SAP applications to meet client needs.
➢ **SAP Security Consultant** Responsible for the security of S/4HANA systems, they implement security protocols to protect client data and prevent unauthorized access.
➢ **SAP Integration Consultant** Working with S/4HANA's integration tools, they help clients integrate S/4HANA systems with other applications and technologies.

- **Business process owner**

Is in charge of supervising and controlling a certain business process from end to end. The business process owner takes the responsibility of outlining and recording the process, making sure it is compatible with organizational objectives, keeping updated on and enhancing its performance, handling stakeholders and communication, and promoting innovation and change in the process.

Organizations with established process ownership are more likely to succeed with BPM initiatives in terms of improved efficiency, quality, and agility of business processes than organizations with partial or no established process ownership. [2] Some organizations give

---

[1] *Red,(2023) Functional vs Technical SAP S/4HANA Consultants, https://www.redglobal.com/news-blog/functional-vs-technical-sap-consultants-understanding-the-roles-and-responsibilities-#:~:text=Technical%20SAP%20consultants%20are%20responsible,solutions%20that%20meet%20those%20needs. Retrieved 17 March 2024 at 14: 45 PM.*
[2] *Hernaus, T., Bosilj Vuksic, V, Indihar Stemberger, M. (2016), "How to go from strategy to results? Institutionalising BPM governance within organisations", Business Process Management Journal, Vol. 22 No. 1, P.6.*

process owners a strategic role and extensive authority [1]. In other organizations, process owners have only an operational role or seem to function in name only, with limited authority.[2]

- **End users**

Utilizes the SAP system for daily transactions related to their role. They perform specific tasks such as creating purchase orders or posting invoices, following predefined procedures and guidelines. They have limited transaction authorizations tailored to their job requirements and primarily interact with the system through easy access menus. If they encounter questions, they seek assistance from the implementing company. Their role is essential for the smooth execution of business processes in the SAP system post-implementation.

3.1.2. Tactical layer

The middle layer is the transformation and change management layer. Teams in this layer specialize on operational program management, verifying that detailed release plans and budgets are established, and resources have been acquired to deliver the program's objectives. They take charge for tracking the various initiatives within SAP S/4HANA program to make sure that they are executed on schedule and on budget. [3]

- **Change management lead**

The Change Management Lead ensures successful SAP implementation by guiding the organization through cultural shifts and process adjustments. Develops a change management approach, stakeholder management, change impact assessments, and communications (internal and external) [4]. They focus on increasing employee adoption and minimizing resistance through structured change management plans and effective communication strategies. Working closely with stakeholders, they drive SAP adoption while aligning with organizational objectives and values.

---

[1] *Michael Hammer (2007), "The process audit", Harvard Business Review, Vol. 85 No. 4, P.123.*
[2] *Reijers, H.A. and Peeters, L.J.L. (2010), "Process owners in the wild: findings from a multi-method descriptive study", 1st International Workshop on Empirical Research in Process-Oriented Information Systems (ER-POIS 2010), CEUR Workshop Proceedings, CEUR-WS.org, Hammamet.P.9*
[3] *Sanket Kulkarni (2019), Op. Cit, P.174*
[4] *Idem, P.178*

- **Functional consultants**

Functional consultants are the necessary actor in the ERP implementation project due to the fact that implementing organizations generally lack knowledge about the system and have limited motivation to gain this knowledge internally due to unique character of the project. Here, the consultants' primary responsibilities are to provide the client with the system knowledge they need and perform the tasks required to setup and adapt the system to meet their business goals. However, they may also take on the roles of project manager, mentor, or trainer. The SAP installation project is a continuous partnership between consultants and client's employees which involves knowledge transfers in both directions, among other things.[1]

Functional SAP S/4HANA consultants are responsible for understanding business processes and requirements and translating them into SAP system configurations. They work closely with clients to understand their needs and provide solutions that meet those needs. [2]Some of the roles that fall under Functional SAP Consultants in S/4HANA include:

➢ **SAP Finance Consultant** Working with S/4HANA Finance modules, they help clients configure their financial and accounting systems to align with their business requirements.

➢ **SAP Supply Chain Consultant** Working with S/4HANA Supply Chain modules, they help clients manage their inventory and procurement processes, ensuring that they have the necessary materials and supplies to meet their business needs.

➢ **SAP Sales and Distribution (SD) Consultant** Working with S/4HANA SD module, they help clients manage their sales processes, from order entry to delivery.

➢ **SAP Customer Service Consultant** Working with S/4HANA Customer Service module, they help clients manage customer service processes and enhance the customer experience.

- **Project manager**

An SAP Project Manager is responsible for overseeing SAP projects, providing metrics for reporting, and ensuring successful project delivery. They manage all aspects of the project life cycle, develop detailed project plans, identify, and analyze business systems solutions, and

---

[1] Przemysław Lech, (2013), *Functional consultants' role in enterprise systems implementations, University of Gdansk Poland, P.86*
[2] *Red, (2023), Op.Cit. Retrieved 18 March 2024 at 12: 13 PM.*

reduce project risks. They also motivate team members and ensure alignment with project objectives. This role requires strong knowledge of finance and accounting, expertise in project management methodologies related to SAP like agile project management. An SAP Project Manager plays a critical role in driving SAP projects forward, ensuring they meet internal and external customer requirements while adhering to time, cost, and quality standards.

3.1.3 Strategic layer

The top layer is the system implementation layer. It covers solution design, template governance, and change control management. A collaborative governance structure of key executives and stakeholders is established to confirm that the program is meeting overall business objectives and delivering agreed value. It provides direction, review, and sign-off of key deliverables, engaging stakeholders as needed. This layer is responsible for ensuring that the SAP S/4HANA business case is delivered, business value is realized, and associated costs are minimized during implementation.[1]

- **Technical lead**

Is accountable to the Manager Information Technology and is responsible for providing technical leadership for solution design, development, and delivery for the SAP business system to improve business efficiency and productivity, while ensuring integrity of architecture. The role is responsible for ensuring that contemporary practices are applied to the architecture, design, build and delivery of IT services to support a variety of project, maintenance, operations, and planning processes. The Technical Lead in SAP Solutions works collaboratively with key stakeholders to deliver best for business outcomes with a focus on continuous improvement.

Success in this role is characterized by effective and influential leadership, clear strategic thinking, and the ability to build relationships with a wide range of stakeholders, as well as engineering and design excellence.

- **Project sponsor**

A project sponsor is a senior-level individual within an organization who takes ultimate responsibility for the success of the project. The project sponsor typically provides strategic direction, secures necessary resources, and ensures alignment with the organization's goals and

---

[1] *Sanket Kulkarni (2019), Op. Cit, P.175*

objectives. They act as a champion for the project, advocating for its importance and supporting it throughout its lifecycle. The project sponsor may also liaise with external stakeholders, such as vendors or clients, and make key decisions to overcome obstacles and ensure project success.[1]

Additionally, a project sponsor in SAP projects should be familiar with six key project elements:

1. **Project scope** Understanding the organization and structure of the project's scope, including scope items, work packages, and tasks.
2. **Project phases** Familiarity with the different phases of the project, such as Discover, Prepare, Explore, Realize, Deploy, and Run, and their respective purposes.
3. **Milestones** Recognition of significant milestones within the project timeline and their importance in tracking progress and completion of deliverables.
4. **Quality gates (Stage gates)** Understanding the concept of formal meetings to review completed deliverables and obtain approval to proceed to the next project phase.
5. **Agile release and time windows** Awareness of Agile principles and concepts, including the use of time windows, sprints, waves, and releases for planning and delivering project outcomes.
6. **Business transformation** Acknowledgment of the broader business transformation goals associated with SAP projects, including changes to business processes, policies, and procedures enabled by the new technology solution.

3.2. Collaboration and coordination among roles

Effective collaboration and coordination between different roles are important to the success of SAP implementation projects.

3.2.1. Communication channels between roles

In SAP implementation projects, clear and open communication channels are established between different roles involved in project execution. These channels facilitate effective information exchange, problem-solving, and decision-making among team members.

---

[1] *Bogdan_Gorka,Six things every SAP Project Sponsor must know before starting a project, https://community.sap.com/t5/technology-blogs-by-members/six-things-every-sap-project-sponsor-must-know-before-starting-a-project/ba-p/13580731, Retrieved 19 March at 14:12PM*

Communication methods such as email, instant messaging platforms like Microsoft Teams or Slack, and phone calls are commonly used for day-to-day interactions.

Additionally, collaborative tools like SAP Jam or Microsoft SharePoint provide, SAP Community, centralized repositories for project documentation, task assignments, and discussions, enabling seamless communication and collaboration across distributed teams.

3.2.2. Collaboration platforms and tools

To enhance teamwork and productivity, SAP projects often leverage collaboration platforms and tools. These platforms serve as centralized hubs for project-related activities, allowing team members to collaborate on tasks, share documents, and track progress. For example, SAP Solution Manager provides functionalities for managing project documentation, tracking requirements, and monitoring project progress. Task management tools like Jira or Asana facilitate the assignment and tracking of project tasks, while virtual whiteboards and video conferencing tools like Zoom or Microsoft Teams enable real-time collaboration and brainstorming sessions among team members.

3.2.3. Regular meetings and updates for coordination

Scheduled meetings play a crucial role in coordinating activities and aligning stakeholders' expectations in SAP projects. These meetings provide opportunities for team members to discuss progress, address issues, and make decisions collaboratively. For instance, weekly status meetings are held to review project progress, milestones, and upcoming deadlines.

During these meetings, team members provide updates on their tasks, discuss any challenges or risks, and ensure alignment with project objectives. Steering committee meetings are also conducted periodically to review project status, address strategic issues, and make decisions to keep the project on track.

3.3.Project management

Project management is the discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives. The objective of project management is to secure quality planning and implementing the project successfully.[1]

---

[1] *Ganesh Neupane (2020), A PROJECT PLAN FOR THE IMPLEMENTATION OF S/4HANA Thesis, Industrial Management CENTRIA UNIVERSITY OF APPLIED SCIENCES.P.3*

3.3.1 Definition of the project management

Project management can be stated as the structured application of skills, knowledge, tools, and techniques to organize process, activities and tasks developed to provide about a planned outcome that efficiently meets a project, or a business requires. A project is a temporary effort defined by scope, duration, and cost that creates a unique product, service, or outcome that meets the specified requirements or a customer need.[1] Moreover, a project can be defined as a unique venture with beginning and end, conducted by people to meet established goals within parameters of cost, schedule and quality [2].

3.3.2 Definition of ERP project management

ERP project management involves the planning, organization, and execution of the implementation or upgrade of an ERP system within an organization. It encompasses the management of resources, schedules, budgets, and scope to ensure the successful deployment of an ERP solution that integrates various business processes and functions. A well-managed ERP project follows a structured methodology that includes phases such as project initiation, planning, execution, monitoring and controlling, and closure. Effective ERP project management aims to achieve seamless integration, enhance operational efficiency, and provide real-time data visibility across the organization.[3]

3.3.3 Project life cycle

A project life cycle consists of several stages during which deliverables are created and end with approval of the deliverables. The simplest way to envision this is that a project must somehow start – therefore, there is an initiating stage that starts with the germ of an idea for a project and culminates in a decision to perform the project (or at least a decision to plan it in more detail and then make the decision whether to perform the project. In the vast middle time on most projects there is a combination of planning and executing of project work. The most deliberative approach would have all the planning completed before beginning any project

---

[1] *Quartararo, M. (2016). Project management in electronic discovery. An introduction to core principles of legal project management and leadership in eDiscovery: eDiscoveryPM.com, Quoted in Ganesh Neupane (2020), Op. Cit, P3*
[2] *Jeffrey K, P. (2010). Project management. Achieving competitive management. 2nd edition. Erie: Pren-tice Hall Quoted in Ganesh Neupane (2020), Op. Cit, P3*

[3] *Monk, E. F., & Wagner, B. J. (2012). "Concepts in Enterprise Resource Planning." Boston: Cengage Learning. This book provides a comprehensive overview of ERP systems and the critical aspects of managing ERP projects. Chapter 7, P. 217-219*

execution. The last stage in a project life cycle, closing, begins when the project's customers formally accept the project deliverables and ends when all the books are closed, documentation is complete, resources are reassigned, etc. This basic project life cycle is shown in Figure 1.13.

Figure 1.13 : A project life cycle
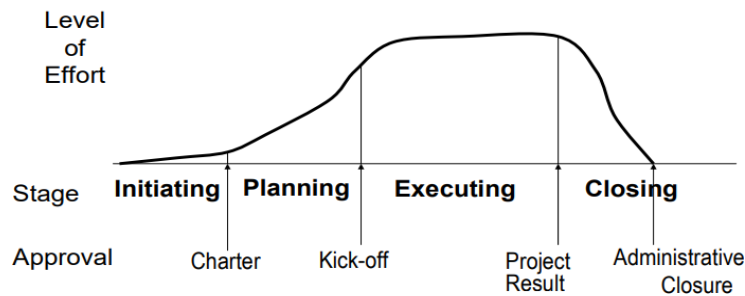
Source Kloppenborg, Timothy J. (2009). Contemporary Project Management, South-western CENGAGE Learning, Mason, OH, P.8

3.3.2.1 Project Initiation

Project initiation is the starting phase of the project which aims at defining the project at a broad level. Whether the project should be taken or not, this is the stage where the feasibility testing is performed. When doing so, the project charter is created that outlines the purpose and requirements of the project. The scope of the work is determined, and the necessary resources is identified followed by the stake-holder's commitment. [1]

Within the initiation phase, the business problem or opportunity is identified, a solution is defined, a project is formed, and a project team is appointed to build and deliver the solution to the customer. [2]

3.3.2.2 Project Planning

Project planning is the second phase where all the detailed information regarding specifications, sched-ules and other plans are developed, and the project enters the planning phase. This involves creating a

• Project plan outlining the activities, tasks, dependencies, and timeframes.

---

[1] *Eby, K. (2018). Demystifying five phases of project management: Smartsheet Inc. https://www.smartsheet.com/blog/demystifying-5-phases-project-management. Retrieved 22 March 2024 at 04 :14 PM.*
[2] *Jason Westland,(2007), The Project Management Life Cycle by Jason Westland (A book review by R. Max Wideman), AEW Services, Vancouver, P.2*

• Resource plan listing the labour, equipment and materials required.

• Financial plan identifying the labour, equipment, and materials costs.

 • Quality plan providing quality targets, assurance, and control measures.

• Risk plan highlighting potential risks and actions to be taken to mitigate those risks.[1]

The most crucial thing to do during the planning phase is to set goals that are C.L.E.A.R. (Collaborative, Limited, Emotional, Appreciable, Refine-able) and S.M.A.R.T. (Specific, Measurable, Achievable, Realistic, Timely). Establishing baselines or performance metrics is another aspect of the project plan that helps in determining the project's direction. The roles and responsibilities are clearly defined so that everyone knows what their role is. Therefore, the planning phase defines the project scope statement, work break-down schedule (WBS), milestones, Gantt Chart, Communication plan and the risk management plan.[2]

3.3.2.3 Project Execution

Project execution is the third phase where deliverables are developed and completed. This phase involves implementing the plans created during the project planning phase. While each plan is being executed, a series of management processes are undertaken to monitor and control the deliverables being output by the project. This includes identifying change, risks, and issues, reviewing deliverable quality, and measuring each deliverable produced against the acceptance criteria. Once all the deliverables have been produced and the customer has accepted the final solution, the project is ready for closure.[3]

3.2.4 Project Closure

Essentially involves winding up the project. This includes:

 • Determining whether all the project completion criteria have been met.

• Identifying any outstanding project activities, risks, or issues.

• Handing over all project deliverables and documentation to the customer.

• Cancelling supplier contracts and releasing project resources to the business.

• Communicating the closure of the project to all stakeholders and interested parties.

---

[1] *Jason Westland, Op. Cit, P3*
[2] *Eby, K. Op. Cit, Retrieved 22 March 2024 at 04 :20PM.*
[3] *Jason Westland, Op. Cit, P.6*

A project closure report is documented and submitted to the customer and/or project sponsor for approval. The project manager is responsible for undertaking each of the activities identified in the project closure report, and the project is closed only when all the activities listed in the project closure report have been completed.[1]

Conclusion

The transition from the comprehensive overview of the key roles and project management necessary for SAP S/4HANA implementation to the practical implementation of SAP S/4HANA is then made. The next section delves into the complicated process of deploying SAP S/4HANA within an organization, highlighting the unique methodology of SAP Activate and the associated considerations and challenges. Those interested in further exploring the implementation process may do so in the section that follows, where we will gain insights into the practical aspects of deploying SAP S/4HANA and navigating its complexities effectively.

---

[1] *Ibid, P.10*

Section 4: The implementation of SAP S/4HANA.

This section examines the complicated process of implementing SAP S/4HANA, an essential phase in updating an organization's systems. SAP S/4HANA implementations are unique from standard ERP implementations because they follow a specific methodology defined in the SAP Activate methodology.

This methodology divides the implementation process into phases, including Discover, Prepare, Explore, Realize, Deploy, and Run. By examining this methodology, we aim to explain the unique approach to implementing SAP S/4HANA and its potential impact on organizations. In addition, we explore the key considerations, best practices, and challenges associated with deploying SAP S/4HANA, providing insights critical to successful project execution.

4.1. Methodology and process of SAP S/4HANA implementation

Implementing S/4HANA involves many process and organizational changes. Depending on organizational needs and available resources, the entire process can take up to several years. Virtually everyone in the organization is involved, whether they are part of the SAP technical support organization or the actual end users of SAP software. Therefore, it is important that the implementation process is planned and executed using a solid methodology to meet the organization's goals in terms of budget, product quality, and time. SAP has provided several implementation methodologies, such as Accelerated SAP (ASAP) for on-premises and SAP Launch for the cloud. However, the latest implementation method offered by SAP is SAP Activate. Before we continue with the SAP Activate methodology, let us briefly review the SAP ASAP methodology and find the differences. However, the latest implementation method provided by SAP is SAP Activate. Before we continue with the SAP Activate methodology, let us quickly review the SAP ASAP methodology and find the differences.[1]

4.1.1. ASAP methodology

ASAP methodology is one of the most important software development life cycles used for SAP implementation projects.

---

[1] *Singh, V. (2017). Implementing SAP S/4HANA. Manage your SAP Projects with SAP Activate. Bir-mingham: Packt publishing ltd. Quoted in Ganesh Neupane (2020), A PROJECT PLAN FOR THE IMPLEMENTATION OF S/4HANA Thesis, Industrial Management CENTRIA UNIVERSITY OF APPLIED SCIENCES.P.14.*

SAP projects are long and intensive, requiring a lot of effort and resources from developers and managers. It can be difficult if SAP projects are not planned properly. The ASAP methodology provides the right roadmap for implementation. The ASAP methodology divides a project into key phases, each of which is considered a milestone. It is a phased, delivery-oriented methodology that minimizes risk and reduces the total cost of implementation. The overall process consists of five steps as shown in Figure 1.14. Each step of the roadmap provides a detailed plan for documenting SAP systems, gathering recommendations, and implementing them. Each step of the process is accompanied by quality controls that help track deliverables and other critical success factors.[1]

Figure 1.14: ASAP methodology.

Source https//www.sastrageek.com/post/asap-methodology. Retrieved 25 March 2024 at 11 50 AM.

4.1.2. The SAP Activate methodology

The SAP Activate methodology is a project implementation methodology for planning and implementing complex SAP solutions. [2]

It is based on the Agile methodology, which uses an iterative approach to continuously improve processes to increase overall project quality and success.[3]

SAP Activate is a complete methodology that is more comprehensive than any system SAP has built before. [4] By building on the foundation of the ASAP methodology, SAP Activate has been able to create a system for upgrading, migrating, or transforming any SAP landscape, enabling companies to modernize their software stack and meet the SAP 2025 deadline.[5]

SAP Activate is more up to date than ASAP in terms of software upgrades and the real-time information it provides. In addition, customers have a much clearer path with an up-to-date

---

[1] *Ibid, P8.*
[2] *SAP Activate Framework , Retrieved 25 March 2024 at 09: 49 AM.*
[3] *Idem.*
[4] *Jamessina Hille,(2019),ASAP Methodology vs. SAP Activate: Understanding the Differences, ASAP Methodology vs. SAP Activate, Retrieved 26 March 2024 at 10:33 AM .*
[5] *Idem.*

selection of resources and tools to guide them through their migration journey. Because SAP Activate supports both waterfall and agile methodologies, customers can choose to work with ASAP's existing waterfall methodologies or create their own sprints. Fit-to-standard analysis is one of the Activate enhancements that helps reduce the need for costly and time-consuming customization by starting with the functionality that SAP already provides. In a fit-to-standard workshop, customers can explore how a standard design and process could fit their business needs. In addition, SAP Activate combines both ASAP and Launch into one methodology, a complete methodology for on-premises and cloud landscapes.[1] As shown in the figure 1.15, SAP Activate combines both ASAP and Launch into one methodology, providing a complete methodology for on-premises and cloud landscapes.

Figure 1.15: SAP Activate methodology phases.

a.Discover

The purpose of the discovery phase is to find the solution's capabilities, to understand, its business value and its benefits for business, and to determine an adoption strategy and roadmap in alignment with the solution's capabilities and product roadmap. During this phase, users often access trial environments to get hands-on experience with the application and aid in the selection process.[2]

Example deliverables in the discovery phase are as follows:

- Strategic planning.
- Application value and scoping.
- Trial system access.
- Discovery assessment.

---

[1] *Ibid.*
[2] *Sven Denecken, Jan Musil, Srivatsan Santhanam, (2022) SAP Activate: Project Management for SAP S/4HANA and SAP S/4HANA Cloud (Second Edition) (SAP PRESS), Rheinwerk Publishing, USA, P58.* .

b.Prepare

The prepare phase kicks off the initial planning and preparation for the project. Currently, the project is started, plans are finalized, project team resources are assigned, and work is underway to start the project. In addition, the initial technical and application environment is provisioned or set up during this stage of the project (this is different from previous methodologies that instructed users to set up the initial environment much later in the project as they didn't use the working system during the solution fit confirmation and requirements definition stage). [1]

Example deliverables in the prepare phase are as follows:

- OCM (Organizational change management) roadmap.
- Project initiation.
- Project governance.
- Plan project, schedule, and budget.
- Project kick-off.
- Project standards and infrastructure.
- Initial environment provisioning/setup and activation of best practices.
- Access to implementation-supporting tools.
- Fit-to-standard preparation, including system preparation (functionality/data/
- authorizations).
- Data migration strategy.
- Testing strategy and approach.
- End-user learning strategy.
- Phase closure and sign-off.

c.Explore

The purpose of the explore phase is to perform a fit-to-standard analysis to confirm that the standard functionality of the solution meets the organization's needs and to determine configuration values, necessary enhancements, and analysis requirements. The Explore phase also includes identifying required integrations, establishing data requirements, and designing identity and access management. Identified delta requirements and configuration values are added to the backlog to be addressed during the Realize phase.

During the Explore phase, the project team also prepares to perform data migration activities, makes plans for testing (including selecting the appropriate testing tools to ensure the

---

[1] *Sven Denecken, Jan Musil, Srivatsan Santhanam, (2022), Op. Cit, P.59.*

quality of the delivered solution), and begins to assemble a Learning team as part of the Adoption workstream to manage OCM and end-user enablement activities. [1]

Example deliverables in this phase are as follows:

- Execution and monitoring of the project.
- Fit-to-standard analysis.
- Company execution of standard processes.
- Solution definition.
- Integration planning and design.
- Extensions planning and design.
- Analytics planning and design.
- Identity and access management planning and design.
- Data load preparation.
- Test planning.
- Mobilization of the learning team.
- Phase closure and sign-off.

d.Realize

During the Realize phase, a series of agile iterations are used to incrementally build, test, and validate an integrated business and systems environment based on the business scenarios and process requirements identified during the Fit to Standard analysis workshops in the Explore phase. This phase includes loading enterprise data, performing adoption activities, and planning operations in the new environment. [2]

Example deliverables in this phase are as follows:

- Execution and monitoring of the project.
- OCM alignment activities.
- Initial access and setup of the development environment (SAP S/4HANA Cloud)
- Initial access and setup of the test environment (SAP S/4HANA Cloud).
- Configuration and solution documentation.
- Setup of integrations.
- Development and setup of solution extensibility.
- Setup of output management and printing.
- Legacy data migration activities.
- Execution of unit and string testing in sprints.

---

[1] *Ibid.*
[2] *Idem, P.60.*

- Solution walkthrough in each sprint.
- Technical operations and handover plan.
- Development of key user enablement materials.
- Development of end user training and documentation.

e.Deploy

The purpose of this phase is to finalize the readiness for S/4HANA and business process for the production go-live. This includes final testing, preparing the cut-over, and finalizing the IT infrastructure and operations.[1]

Example deliverables in this phase are as follows:

- Execution and monitoring of the project.
- Execution of OCM activities.
- End user learning delivery.

f.Run

The run phase is the open-ended phase after go-live. Its purpose is to ensure that the solution runs at peak performance and to take advantage of the regular innovations that SAP releases for the SAP S/4HANA Cloud environment. This phase also focuses on the continuous adoption of the solution by new users according to the needs of the organization.[2]

Example deliverables in this phase are as follows:

- Ongoing system operations.
- Continuous OCM activities.
- Continuous learning.
- Continuous business process and system improvements.
- New scope activation.
- New country/countries activation.
- Setup and onboarding of new users.
- System upgrade.

4.2. Challenges for managing SAP S/4HANA implementation projects

Like most ERP deployments, a successful SAP S/4HANA implementation requires a great deal of discipline. SAP's technological advancements make complete business transformation possible, but not without risk. For better or for worse, SAP has a reputation for troubled implementations. Though many have implemented the product successfully, news of

---

[1] *SAP 2019. Transition to SAP S/4HANA, Volume Q4.*
https://support.sap.com/content/dam/SAAP/SAP_Activate/S4H_155.pdf Retrieved 26 March 2024 at 11:19 AM.
[2] *Sven Denecken, Jan Musil, Srivatsan Santhanam, (2022),Op. Cit, P.63.*

challenged implementations among its Fortune 1,000 customer base tend to overshadow the successes. These distressed deployments are not a result of bad luck or broken software. Instead, they are a result of the failure to leverage SAP implementation best practices.[1] Next are the main challenges fait ace companies during SAP S/4HANA implementation.

4.2.1.IT transformation rather than business transformation

The shift to S/4HANA is more than just an upgrade of IT systems. It's a comprehensive change that impacts the whole organization. This involves not only mastering a new software but also altering our thought processes and methods of operation. The emphasis should be on how S/4HANA can facilitate the business to evolve and meet future demands. Therefore, it's more about transforming the business rather than just the IT aspect.[2]

4.2.2. Value of S/4HANA is not leveraged

One of the biggest challenges organizations often face is articulating and demonstrating the long-term value that S/4HANA can deliver. This is not just about immediate gains, but also about the sustainable benefits that can be realized over time. These can include cost savings from improved efficiency, increased revenue from new digital services, or strategic advantages from data-driven insights. It's a common problem that many companies don't take full advantage of all the capabilities of SAP S/4HANA.[3]

4.2.3.Impact is underrated

The transition to S/4HANA can have profound implications on an organization. It's not merely about achieving the 'go-live' milestone, but about instilling enduring changes and realizing the projected benefits. This involves a comprehensive understanding of the system's capabilities, a strategic approach to its implementation, and a commitment to ongoing optimization post go-live. The impact of this transformation, therefore, extends beyond the technical realm to encompass organizational processes, employee roles and responsibilities, and overall business strategy.[4]

---

[1] *Eric Kimberling, Third Stage Consulting Group LLC. (2018), The Definitive Guide to a Successful SAP S/4HANA Digital Transformation, P.4*

[2] *Oesha Rughubir, (2021), S/4 HANA Migration can be an Opportunity Rather than a Challenge, https://news.sap.com/africa/2021/01/s-4-hana-migration-can-be-an-opportunity-rather-than-a-challenge/ Retrieved 27 March 2024 at 10:30 AM.*

[3] *Deloitte Consulting / CSO Forum CRM Project Survey results and Deloitte (2019), Human Capital Trends (2022) Quoted in "Next Level Human-Centric Change Management: Innovative and digital methods to humanise SAP S/4HANA transformations", P.3.*

[4] *SAP, https://learning.sap.com/learning-journeys/discovering-sap-activate-implementation-tools-and-methodology/describing-challenges-and-opportunities-transforming-to-sap-s-4hana_f7516089-8f4c-437e-a48a-e6303dc6ae0e. Retrieved 27 March 2024 at 10:45 AM.*

4.2.4. Project horizon ends with go live

The success of an S/4HANA transformation is not just about reaching the go-live stage. It's about sustaining the changes and realizing the expected benefits. This means that the project doesn't end when the system goes live. Instead, it's the beginning of a new phase where the focus shifts to leveraging the new system to achieve strategic business goals. [1]

4.2.5. Risk management not enough emphasized

The underemphasis on risk management in SAP S/4HANA implementation projects is common due to several factors. These include project complexity, lack of awareness of potential risks, tight timelines and budgets, and over-reliance on external expertise. To address these issues, organizations must recognize the importance of risk management, allocate sufficient resources to it, and integrate it into the project planning and execution processes to ensure successful outcomes. [2]

4.2.6. Project methodology applied without assessment

Every organization has its own goals, systems, processes, and culture. Because of this, it's important to look at these requirements before choosing a method for managing projects. Organizations might automatically use a standard project methodology without checking to see if it works well with their unique needs. This can cause inefficiencies, problems with organizational goals, and delays or failures in the implementation projects. Instead, project teams should carefully consider what they need, what can't be done, and what stakeholders expect to choose the best method. [3]

4.2.7.Customers struggle with magnitude

Customers struggle with the sheer scale of SAP S/4HANA migration. The transition involves navigating complex SAP landscapes consisting of interconnected systems, modules, and customizations. This extensive scope and complexity present significant challenges for organizations undergoing the transition. Adapting to this complexity requires stakeholders to fundamentally change their mindsets and operational approaches to accommodate changes in

---

[1]*Vivecca Frank (2022), SAP S/4HANA Transformation: Three Steps to Gain Insight into Your Processes, https://www.signavio.com/post/sap-s4hana-transformation/, Retrieved 28 March 2024 at 09:23 AM.*

[2] *SAP, https://learning.sap.com/learning-journeys/discovering-sap-activate-implementation-tools-and-methodology/describing-challenges-and-opportunities-transforming-to-sap-s-4hana_f7516089-8f4c-437e-a48a-e6303dc6ae0e Retrieved 27 March 2024 at 10:45 AM.*

[3] *Vivecca Frank (2022), Op.Cit.*

workflows, processes, and systems. [1] In addition, the transformation process requires significant departmental capacity, diverting resources from other critical tasks and projects. [2]

4.2.8. End to End process is not in focus

Many organizations fail to prioritize end-to-end business process optimization when implementing SAP S/4HANA. While focusing on technical upgrades, they overlook the critical step of modifying core systems to align with S/4HANA capabilities. This oversight prevents them from realizing the full potential of the system and achieving strategic goals. It underscores the need for a holistic approach to implementation that integrates both technical upgrades and process improvements. [3]

4.2. 9. Resource and capacity planning is underestimated

Resource and capacity planning for SAP S/4HANA implementations often receives insufficient attention. This oversight can result in IT departments lacking the necessary resources or expertise to effectively manage the project. Proactive planning is critical to ensuring adequate support, including assessing capabilities, filling skill gaps, and reallocating resources as needed. Failure to do so can result in delays and compromised project outcomes. [4]

4.2.10. Lack of user centricity

A common challenge on S/4HANA transformation is the lack of user centricity in change management efforts. Human-centric change management prioritizes the needs, concerns, and experiences of employees throughout the transformation process. It involves actively listening to the voice of employees, soliciting their feedback, and incorporating their input into decision-making processes. [5]

4.2.11. Missing End to End view from requirements to IT functionality

A major challenge in SAP S/4HANA implementation is the lack of comprehensive planning. Organizations often fail to consider the entire transformation journey, from initial requirements gathering to final [6] deployment of IT functionality. This oversight leads to

---

[1] *Deloitte, Five key things to understand about SAP S/4HANA before implementing it,*
https://www.deloitte.com/uk/en/services/consulting/research/saphana-key-things-to-understand.html, Retrieved 27 March 2024 at 11:39 AM.
[2] *Deloitte, Selective Transformation for moving to SAP S/4HANA® ,*
https://www2.deloitte.com/uk/en/pages/consulting/articles/selective-transformation-for-moving-to-sap.html
Retrieved 27 March 2024 at 11:09 AM.
[3] *Vivecca Frank (2022), Op.Cit.*
[4] *Bill Hale, (2019), How you can intelligently rethink the SAP S/4HANA® transformation,*
https://www.ey.com/en_us/consulting/intelligence-realized-rethinking-the-sap-s-4hana-transformation,
Retrieved 28 March 2024 at 09:37 AM.
[5] *Deloitte, The key to SAP S/4HANA transformation success? , https://www2.deloitte.com/uk/en/pages/digital-transformation/articles/saphana-key-to-transformation-success.html Retrieved 27 March 2024 at 11:21 AM.*
[6] *Deloitte, five key things to understand about SAP S/4HANA before implementing it, Op.Cit.*

potential issues with data migration strategies, system integrations, customization requirements, and business process redesigns. [1] As shown below in figure 1.16, these challenges highlight the key areas organizations need to focus on to prepare for a successful move to SAP S/4HANA.

Figure 1.16: Project risks and challenges in S/4HANA transformations.

Source Torsten Hübsch, (2019)," Prepare for a successful move to SAP S/4HANA, PwC Belgium, P.38

4.3. Best practices and strategies for managing SAP S/4HANA implementation projects

As mentioned earlier, organizations face significant challenges during SAP S/4HANA implementation, and to effectively address these challenges and ensure a successful transition to SAP S/4HANA while maximizing the value of this implementation, organizations set strategies, and these are some of them:

4.3.1. Preparing to leverage the capabilities of SAP S/4HANA

Companies should strategically assess their readiness to embrace the changes required by SAP S/4HANA and align their organizational culture with the platform's transformative, potential. This includes evaluating current processes, structures,

and attitudes to identify areas that may need to be adjusted or enhanced to take full advantage of S/4HANA's capabilities.

4.3.2. Adequately investment in the business process management

Investing in future-state business process mapping early on is critical to a successful SAP S/4HANA implementation. This proactive approach helps identify gaps between business needs and SAP functionality, allowing you to prioritize adjustments such as process optimization or software customization.

4.3.3. Making the business process and organizational changes required of an SAP S/HANA implementation

Successful implementation requires a commitment to effective organizational change management, including communication, training, and cultural shifts. This process goes beyond

---

[1] *Ibid.*

traditional end-user training to include identifying gaps between current and future state processes, initiating cultural adjustments to fully embrace the new software, and other essential organizational change activities.

4.3.4. Implementing a strong third-party quality assurance and risk mitigation framework

To ensure the success of SAP implementations, it is critical to establish a robust quality assurance and risk mitigation framework. This proactive approach helps identify and address potential issues early, preventing project delays and budget overruns. By implementing a comprehensive quality assurance and risk management strategy, organizations can effectively overcome challenges and maintain project momentum toward successful outcomes.

4.3.5.Establishing an internal SAP S/4HANA competency center

To ensure sustainable process and system optimization, prioritize the development of internal competencies aligned with business objectives. This includes retraining and refocusing IT and business support resources to take long-term ownership of the SAP solution. By establishing a dedicated SAP center of excellence, companies can foster continuous process improvement and enhance internal training initiatives. This strategy also enables effective use of new S/4HANA capabilities through upgrades. Ultimately, the focus shifts from software adequacy to organizational readiness for comprehensive digital and business transformation.

Conclusion

The focus of our study shifts from a comprehensive analysis of the SAP S/4HANA implementation project at the client company to a deeper exploration of SAP S/4HANA implementation within the advisory and monitoring services (AMOA) context provided by PwC Algeria. The following chapter will examine the specific methodologies, research approaches, and empirical findings employed to investigate the implementation of SAP S/4HANA in this distinctive operational context. The subsequent sections will synthesize practical experiences and empirical data to provide actionable recommendations and insights for stakeholders involved in ERP projects. This will contribute to a deeper understanding of effective strategies, best practices, and key considerations to optimize the success of SAP S/4HANA implementations.

Chapter Two: Case study and the research approach
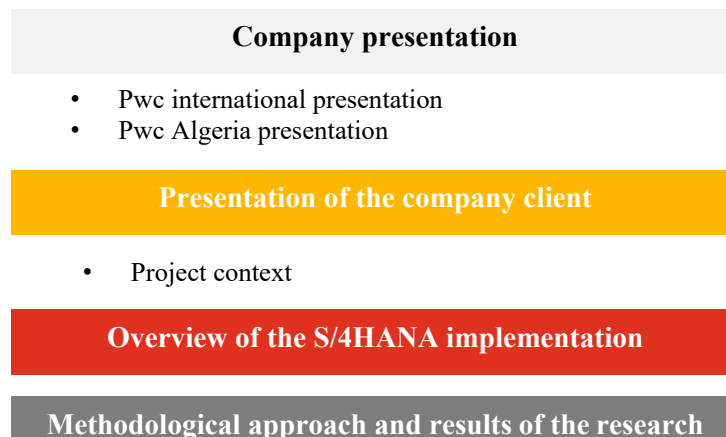
Introduction

In today's dynamic business landscape, the successful implementation of ERP systems such as SAP S/4HANA is essential for organizations seeking to improve operational efficiency and embrace digital transformation. This chapter focuses on a comprehensive analysis of the SAP S/4HANA implementation project at the client company with advisory and monitoring services (AMOA) provided by PwC Algeria.

Our study begins by detailing the methodology and research approach used to examine the implementation of SAP S/4HANA at the client company. The objective is to unravel the complexities of the ERP implementation, specifically in the context of the client company's operational environment, to gain valuable insights that can guide strategic decision-making and project management.

This research involves a quantitative/qualitative analysis of the SAP S/4HANA implementation process at the confidential PwC client, with the aim of identifying the challenges encountered, assessing the strategies implemented and evaluating the project outcomes. By applying a rigorous research approach, we aim to provide actionable recommendations and insights that can inform future SAP S/4HANA implementations and contribute to the collective understanding of ERP systems.

By synthesizing empirical findings and practical experiences, this chapter contributes to a deeper understanding of SAP S/4HANA implementation within the unique context of the client company and PwC Algeria's advisory role. It serves as a roadmap for stakeholders involved in ERP projects, providing guidance on effective strategies, best practices, and key considerations to optimize the success of SAP S/4HANA implementations. Figure 2.1 outlines Chapter 2 starting with PwC's company presentation, followed by the client overview, project context, S/4HANA implementation, and concluding with the research methodology and results.

Figure 2.1: Logical framing of the approach and structure of Chapter 02.

Company presentation

- Pwc international presentation
- Pwc Algeria presentation

Presentation of the company client

- Project context

Overview of the S/4HANA implementation

Methodological approach and results of the research

Chapter Two: Case study and the research approach

Section 1: Company profile, project context, and overview of the S/4HANA implementation project.

To advance our research further, it is essential to enhance it with practical case studies and by providing an example from the Algerian market. In this opening section of the case study chapter, we delve into the company profile, project context, and an provide of the S/4HANA implementation project. We will gain insight into the company's background, the strategic rationale for adopting SAP S/4HANA, and a preliminary outline of the implementation effort. This would help us to figure out how this transformative initiative aligns with the company's vision and strategic goals, setting the stage for a detailed exploration of the project's key aspects and outcomes. Please note that the company name is anonymized due to the confidentiality requirements of PwC's client.

1.1. Company profile

In this part, we introduce the companies involved in the case study, providing details about its background, industry, and market position. Starting with PwC:

1.1.1 Introducing PwC

Here, we introduce PwC, the consulting firm assisting with the S/4HANA implementation.

1.1.1.1. PwC international

PricewaterhouseCoopers (PwC) is one of the Big Four audit and consulting firms in the world, alongside Deloitte, Ernst & Young and KPMG.

PwC is a large-scale British network of companies, specializing in audit, accounting, and consulting assignments, with an emphasis on sector-specific approaches to meet specific business needs.

According to PwC's 2020 internal review, the firm has 328,000 employees in 742 offices in 157 countries worldwide. In fiscal year 2022, PwC firms provided services to 84% of the Fortune 500 companies worldwide. As of June 30, 2022, the firm's revenues totalled $50.3 billion.

- **History of the firm**

PwC puts its expertise at the disposal of today's companies to help them secure their future success. To achieve this, PwC draws on experience accumulated over more than 160 years of the company's existence:

● **1849** Auditor Samuel Lowell Price opened a law firm in London.

● **1854** William Cooper founded his own company in London, which seven years later became Cooper Brothers.

● **1865** Price, Holyland and Waterhouse joined forces.

● **1874** The company changed its name to Price, Waterhouse & Co.

● **1898** Robert H. Montgomery, William M. Lybrand, Adam A. Ross Jr., and his brother T. Edward Ross created Lybrand, Ross Brothers and Montgomery.

● **1957** Cooper Brothers & Co (UK), McDonald, Currie, and Co (Canada) and Lybrand, Ross Bros & Montgomery (USA) merged to form Coopers & Lybrand.

● **1982** Launch of Price Waterhouse World Firm.

● **1990** Coopers & Lybrand merged with Deloitte Haskins & Sells in several countries around the world.

● **1998** Worldwide merger of Price Waterhouse and Coopers & Lybrand to create PricewaterhouseCoopers.

● **2002** PricewaterhouseCoopers concluded the sale of its management consulting division, PwC Consulting, to IBM.

● **2004** PricewaterhouseCoopers implemented the Connected Thinking methodology.

● **2008** Tenth anniversary of the PricewaterhouseCoopers merger.

● **2010** PricewaterhouseCoopers formally shortened its brand name to PwC but legally remains PricewaterhouseCoopers.

● **In April 2014**, PwC merged with international consulting firm Booz & Company.

1.1.1.2. PwC Algeria

In 2008, EURL PwC Algeria was created to develop its presence in the Mediterranean region. PwC Algeria is part of the PwC France et Maghreb network and employs more than 120 people in Algiers office. Thanks to its proximity and in-depth knowledge of the local economic fabric, PwC Algeria can assist its clients with all their business issues.

Drawing on its experience with local companies and subsidiaries of foreign firms operating in Algeria, PwC has developed in-depth knowledge of the Algerian legal, tax, economic and financial environment.

In Algeria, PwC operates through two legal entities:

- PricewaterhouseCoopers Algeria
- PASA Audit Services Algeria.

They work in close collaboration with all the other member entities of the PwC International Ltd network within the PwC France and Maghreb organization. This enables them to allow their customers in Algeria to benefit from the technical and sectoral expertise of the entire network.

PwC is involved in Algeria's development in a wide range of sectors agrifood, manufacturing, pharmaceuticals, financial services, oil & gas, steel, and metallurgy, etc.

- **Value of PwC Algeria**

PwC's strategic ambition illustrates the firm's global raison d'être, "Build trust in society and solve important problems". This ambition aims to help stakeholders navigate the profound transformations in business models and society. PwC's global values as shown below on figure 2.2, which underpin its raison d'être, are a central pillar of the company worldwide. They include integrity, the will to make a difference, empathy, teamwork, and the ability to reinvent the possible. These values guide PwC's actions to help businesses meet today's challenges and prepare for the future.

Figure 2.2 : PwC Algeria values

Act with integrity	Make a difference	Care	Work together	Reimagine the possible
• Speak up for what is right,especially when it feels difficult. • Expect and deliver the highest quality outcomes. • Make decisions and act as if our personal reputations were at stake.	• Stay informed and ask questions about the future of the world we live in • Create impact with our colleagues, our clients and society through our actions • Respond with agility to the ever changing environment in which we operate	• Make the effort to understand every individual and what matters to them. • Recognise the value that each person contributes. • Support others to grow and work in the ways that bring out their best .	Collaborate and share relationships, ideas and knowledge beyond boundaries • Seek and integrate a diverse range of perspectives, people and ideas • Give and ask for feedback to improve ourselves andothers	Dare to challenge the status quo and try newthings. • Innovate, test and learn from failure. • Have an open mind to the possibilities in every idea.

Source PwC Algeria values (Internal documents).

- **Business areas of PwC Algeria**

PwC offers audit and consulting services in strategy, management, transactions, legal and tax to a diverse clientele, ranging from small businesses to large multinationals, in both public and private sectors, in Algeria and abroad. PwC is involved in:

● **Insurance** statutory audit and risk management consulting.

● **Consulting** advice on strategy, management, and operational solutions.

● **Deals** assisting companies with acquisitions, disposals and restructuring projects

● **TLS** A multidisciplinary law firm specializing in tax, business, and labour law, and combining its expertise with other PwC businesses where appropriate.

● **Internal functions** supporting partners and associates in their day-to-day tasks.

● **Structure of PwC Algeria**

PwC's structure is characterized by a degree of autonomy granted to each team, while encouraging strong cooperation and an exchange of expertise on assignments that are generally multidisciplinary. This structure is shown in the figure 2.3 below:

Figure 2.3: PwC Algeria organization chart.
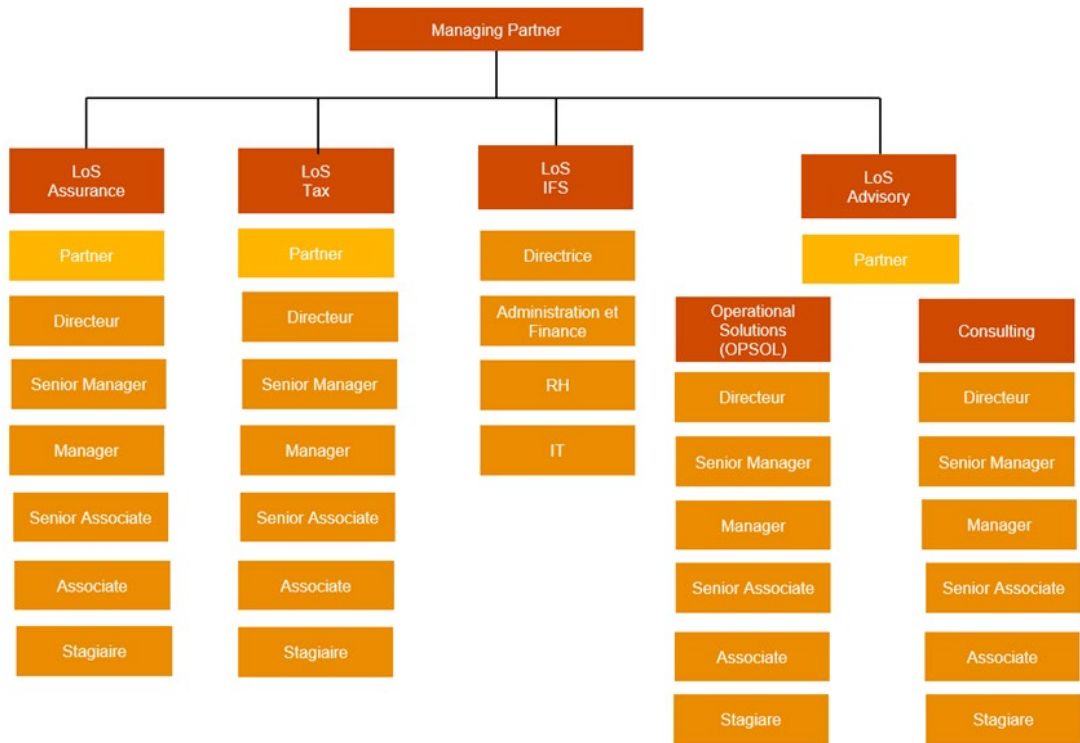
Source PwC Algeria organization chart [Internal documents].

The organization chart shows that PwC Algeria structure is made up of two parts:

1.The operational side brings together the various departments that provide the services we mentioned earlier.

2. The administrative (support) section covers the various support functions required to run the firm (HR, Accounting, IT, etc.).

● **PwC Algeria" Advisory "**

The Advisory department, where we're currently interning as a "Junior Consultant Trainee" for our final year project, carries out management consulting assignments on 6 levels :

• **Technology** advising on emerging applications and technologies, Cloud and

connectivity, providing support to Chief Information Officers (CIOs), managing ERP systems, data, and analytics, as well as cybersecurity and Salesforce.

• **Strategy** provide support to senior management in matters of growth, competitiveness, and innovation.

• **Finance** develops financial strategies, optimize operations, manage cash flow, and improve overall corporate performance.

• **People and organizations** people-based organization, change management, HR performance and transformation, restriction, and social management.

• **Operations** manage purchasing and procurement, optimize the supply chain and promote operational excellence.

• **Financial institutions** offer specific consulting services to financial institutions. PwC's consulting teams use globally shared sector and business knowledge bases, as well as common methodologies and working tools, to offer tailor-made support to client companies.

In close collaboration with the management consulting teams of the PwC network, as well as with other local expertise (audit, tax and legal). PwC consultants provide their expertise to help companies sustainably improve their performance, manage their transformation projects, and strengthen their risk management.

A presentation of the firm, made to situate the field of application at the end of this work, will begin in the following section with a presentation of the client company.

- **PwC and SAP**

PwC and SAP have a strong global alliance. They collaborate to provide transformational solutions for businesses, leveraging their combined expertise in various sectors.[1] Here are some key points about this partnership:

- PwC took the 2019 Pinnacle Awards for S/4 HANA public cloud and SF.
- PwC IP for BXT digital client co-creation events and agile methodology.
- S/4 HANA P3 global industry templates, Leonardo industry solutions, business insights and our analysis tools.
- The expansion of its SAP practice into other business areas such as tax, insurance, financial efficiency, and transactions enables us to deliver world-class projects.[2]

- Recruit smarter, bring in top talent from top universities and expand its team of direct intake partners with highly qualified product and industry experience gained from leading competitors.

- Member of the S / 4HANA Product Advisory Board.

➢ **Recognition from SAP**

- SAP North America Partner Excellence Award 2016 for Partner Growth.

- SAP North America Partner Excellence Award 2015 for Services Innovation.

- Fastest Growing SAP Transformation Practice - Finalists PWC SAP North America Partner.

- Excellence Award 2014 for Innovation.

- 2010 UK Partner of the year-Financial performance and risk management.

➢ **Delivery awards**

- Implementation-PwC India.

- SAP ACE award for best service Providers.

- Gold Star award for best implementation in CIS-PwC Russia.

- SAP Quality Award for large enterprise-PwC, Azerbaijan, and India.

- SAP Quality Award for New Business.

- SAP Award of Excellence Project Award (2010, 2009, 2008, 2002), SAP Award of Excellence Project of the Year (2007), SAP Award of Excellence HCM Award (2006, 2005), SAP Award of Excellence Special Award (2002), SAP Award of Excellence Service Partner Award (2004, 2001)-PwC Japan.

➢ **Expertise awards**

- SAP Special Expertise Partner status for 2014/2013 in Supply Chain and GRC-PwCUS.

- Special Expertise Partner status for Public Sector, Health, and Education (2008-11)-PwC Spain.

- Special Expertise Partner status for Distribution (2008–2011)-PwC Spain.

➢ **Analyst PwC is positioned as Leader in Gartner's FY15 Magic Quadrant for SAP Implementation Service Providers**

- PwC is positioned as Leader in IDC's FY16 MarketScape Worldwide SAP Implementation Services Ecosystem Vendor Assessment.

    Figure 2.4 highlights key statistics PwC has 9200 SAP consultants across 53 countries, with 5000 trained in S/4 HANA. PwC ranks 5 globally and 1 in S/4 HANA partnerships, with over $125M impact from SAP software licenses. They have completed 334 S/4 HANA projects, with 114 live in 42 countries.

Figure 2.4: PwC and SAP in numbers.

Source 2018 calendar year results; based on 17 partners of PwC, S/4 stats as of April 3, 2019.

1.2. Project context

After introducing our firm PwC, this part consists in presenting the client company, one of the Algerian players in the production of iron ore, which is the subject of our project.

1.2.1 Presentation of the client company

After presenting our firm PwC, this part consists in presenting the client company, one of the Algerian players in the production of iron ore, which is the subject of our project.

PwC's client is a joint venture was created in 2013 and it has a social capital of 76,193,000,000 Algerian dinars. The company operates in an industrial zone located 400 km from the capital on a total area of 260 hectares. With its high production volume, operational reliability, and technical advances.

The company primary mission is to increase production and ensure the quality of its steel products at competitive prices, with the goal of customer satisfaction and loyalty. The company is a strong partner, offering an excellent mix of services and high-quality products, responding quickly to customer needs with innovative solutions. X is committed to sustainability, closely aligning customer and environmental objectives.

It aims to expand its product reach throughout the country and modernize its facilities with advanced machinery and techniques to increase production volumes.

PwC's client is a large enterprise undertaking a significant SAP S/4HANA implementation to streamline its operations and enhance its business processes.

- **Business Activities**

PwC's client company contributes to wealth creation and supports the national industrial fabric by meeting local iron market demands and exporting surplus production to regional and international markets. The company started producing and marketing iron products at the end

of 2017, with an initial production capacity of approximately 6 million tonnes per year of concrete reinforcing bars and wire rods. The second phase of the investment program aims to produce other types of special steels for various industries, increasing the production capacity to over 12 million tonnes per year.

X company offers a wide range of steel products in terms of quantity and quality, at competitive prices, and with superior reliability. The products are manufactured using state-of-the-art, fully automated technology, with substantial production and storage capacity for finished products of various sizes.

As one of the main players in the steel industry, the company employs over 2,600 individuals and holds a capitalization of 58 billion dinars, this company's enduring legacy and operational excellence underscore its vital role in supporting the nation's industrial landscape and economic development. Figure 2.5 shows the main players in the Algerian steel industry, highlighting key companies's locations.

Figure 2.5: The main players in the steel industry in Algeria.
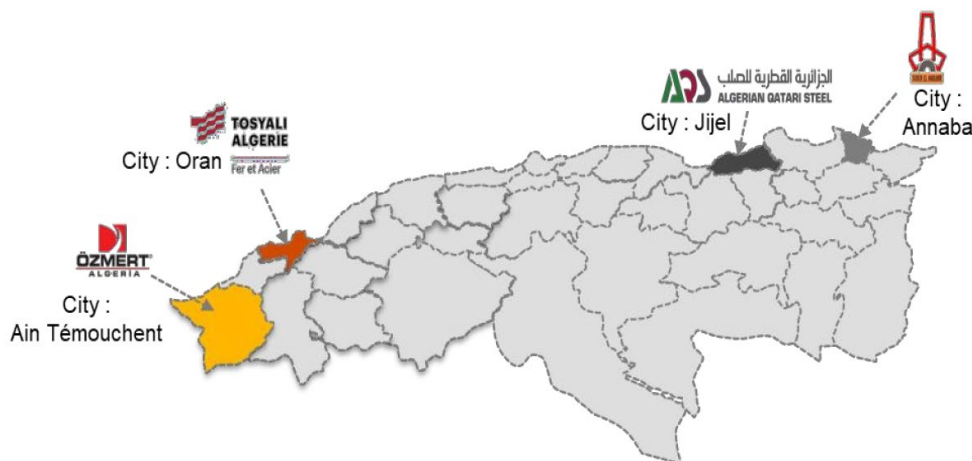
Source *Map of the main players in the steel industry. [Soraya FERHI (2023), Elaboration d'un plan stratégique pour améliorer la rentabilité d'une entreprise du minerai de fer]. P.47.*

> **Challenges faced by the steel industry in Algeria.**

The steel industry in Algeria is facing challenges such as shorter innovation cycles, customized requirements, tougher product standards, competition from Chinese exports, overcapacity in European plants, slower market growth, and stricter regulatory constraints like CO_2 regulations and sustainable development policies.[1] The steel industry in Algeria faces several challenges that align with global CEO concerns, as shown in Figure 2.6. Key issues

---

[1] *PwC Internal documents.*

include strict regulations (86%), price volatility (84%), tax constraints (78%), and political decisions (78%). Additionally, the industry is impacted by currency exchange rates (76%), geopolitical risks (76%), access to bank credit (73%), social instability (73%), and overall economic conditions (70%). These concerns reflect the specific difficulties in Algeria, such as CO_2 regulations, competition from Chinese exports, overcapacity in European plants, and slower market growth.

Figure 2.6: Key findings of Global CEO survey in steel industry

Source PwC 19the annual Global CEO survey Metals industry key findings, Redefining business success in a changing world.

➢ **Customers issues and difficulties, stimulating the implementation of an ERP**

Acknowledging these challenges emphasizes the critical necessity of implementing a robust and integrated ERP system:

• Complex, interdependent operations require a robust, integrated system.

• Diluted know-how at risk of being squandered due to the difficulty of retaining talent and the retirement of skilled workers.

• Complex performance management due to heterogeneous information sources and lack of integration.

• Difficult collaboration due to slow and difficult access to information

• Compromised reliability and security of information due to numerous manual interventions. [1]

---

[1] *Ibid.*

1.2.2. Business objectives

In this section, we outline the key business objectives that drive the need to implement an ERP system.

1.2.2.1 Motivations for SAP S/4HANA implementation

A company's motivations for implementing an ERP are many and varied, changing from company to company.[1] Before implementing an ERP system, each department in the company has its own information system and database, which can lead to redundancies and a lack of communication between functions, often due to differences between the information formats of each department, errors made by human resources or even technical problems encountered during data transfer.[2] These problems in turn cause difficulties in coordinating processes, resulting in additional costs for the company. For example, some large companies found themselves having to hire controllers specifically to analyze and correct inconsistencies between a company's various systems.[3]

To cope with these difficulties and manage the resulting dysfunctions, companies turn to ERP systems, and their motivations are often represented by different aspects that can be improved within the company.[4]

According to ROSS Jeanne in her work on ERP, the main motivations for firms adopting ERP were:

These motivations can be developed as follows

• Integrate and replace the various systems used to manage company functions and services with a single, centralized system.

• Real-time updating and improved quality and visibility of company information.

• Increased reliability of information and data obtained.

• Better communication within the company, facilitated using a single, common language.

• Could better meet customer needs and respond to competitive pressure in the marketplace.[5]

We note, however, that the motivations for implementing ERP systems differ from one company to another, depending on their situation or even their size, whether large or small.

---

[1] *ROSS Jeanne W. (1999), The ERP Revolution: Surviving Versus Thriving. Center for Information Systems Research. Sloan School of Management. Massachusetts Institute of Technology (MIT). USA: p. 2,*
[2] SLIMANI Radia (2015). Op.cit. p. 104, 105.
[3] *TOMAS Jean-Louis, (2005). ERP et PGI : Sélection, déploiement et utilisation opérationnelle. Editions Dunod, 4ème edition. Paris,p. 13.*
[4] *JUTRAS Danie, (2002). Evaluation of the adoption potential of integrated management systems in manufacturing SMEs. Université du Québec à Trois-Rivières. Canada : p 30-32.*
[5] *ROSS Jeanne W. (1999),Op.Cit. p.2.*

As figure 2.7 shows, that firms adopt ERP systems to integrate multiple systems, enhance data visibility, improve process efficiency, and better meet customer needs. While motivations can vary by company size and situation, the main goals are improved communication, reliability of information, and competitive responsiveness.

Figure 2.7: Motivations for ERP implementation
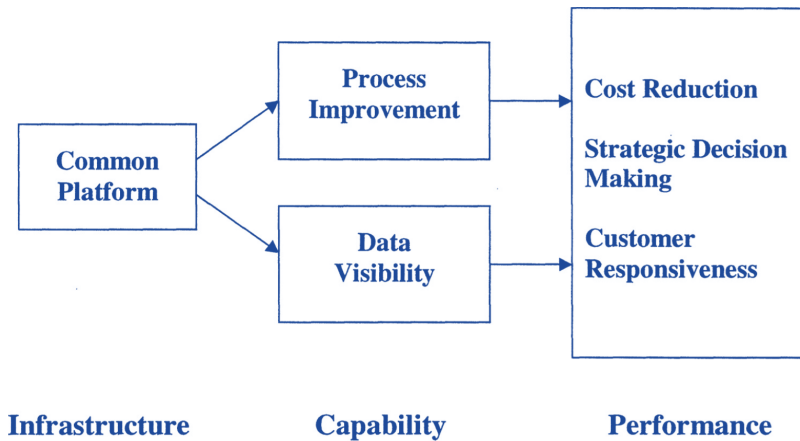
Source ROSS Jeanne W. (1999), The ERP Revolution Surviving Versus Thriving. Center for Information Systems Research. Sloan School of Management. Massachusetts Institute of Technology (MIT). USA p.13.

1.3. Project scope and timeline

In this section, we outline the project scope and timeline for the SAP S/4HANA implementation.

1.3.1. SAP S/4HANA implementation Project background

In this subsection, we provide background information on the SAP S/4HANA implementation project.

- **SAP and the Partner Organisation/Integrator** This relationship is based on licences and contracts to sell the SAP system. The partner organisation, as an integrator, is authorised to implement the SAP system for other companies, such as the end customer in this case.

- **The end customer and the partner organisation/ integrator** This is the core of the project where the partner organisation implements the SAP S/4HANA system for the end customer.

- **PwC and the end client** PwC provide AMOA (Assistance to the Contracting Authority) to the end client, providing the necessary support for the project.

- **Integrator and PwC** PwC also has a relationship with the integrator to ensure the quality of the project.

- **SAP and the end customer** SAP provide indirect support to the end customer, which could be in the form of updates, patches or troubleshooting guides that are passed through the partner organisation/Integrator.

These relationships highlight the collaborative and systematic approach required for an effective SAP S/4HANA implementation, with clear roles and responsibilities for each stakeholder. It could serve as a valuable reference point in our thesis, helping to illustrate the practical aspects of SAP S/4HANA implementation. Figure 2.8 illustrates the project background and key relationships in the SAP S/4HANA implementation.

Figure 2.8: Project background.
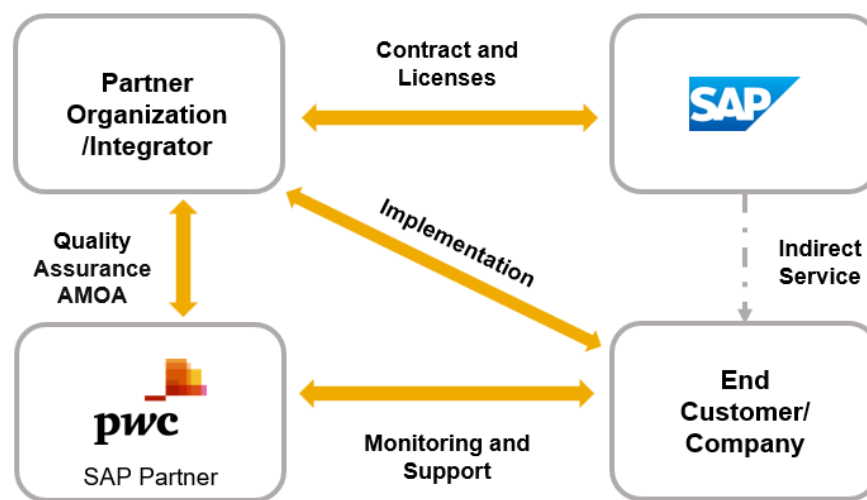
Source Done by us.

1.3.2. Scope of the ERP implementation project:

In this part, we describe the scope of the client's ERP implementation project, highlighting its key components and objectives.

➢ **Project constraints**

Implementing SAP S/4HANA for the X company can present unique constraints and challenges due to the complex nature of the business and industry-specific requirements. Some potential project constraints for implementing SAP S/4HANA in a steel company include:

- **Business process complexity** the steel industry involves complicated manufacturing processes, supply chain operations, and regulatory compliance requirements. Adapting these complex processes to the SAP S/4HANA framework can be challenging and require extensive customisation.

- **Data volume and integration** Steel companies generate vast amounts of data related to production, inventory, quality control, and equipment maintenance. Integrating and

migrating this large volume of data into SAP S/4HANA while ensuring data integrity and performance can be a significant constraint.

- **Industry-specific customisations** Steel manufacturing often requires industry-specific functionality, such as managing production schedules, handling raw material fluctuations, tracking quality metrics, and complying with environmental regulations. Customising SAP S/4HANA to meet these specific needs can be a constraint in terms of development effort and time.

- **System performance and scalability** SAP S/4HANA implementations must deliver high performance and scalability to support real-time decision making and accommodate future business growth. Ensuring optimal system performance while dealing with the complexity of steel production processes can be challenging.

- **Change management and user adoption** Implementing SAP S/4HANA involves significant organisational change, requiring employees to adopt new processes and technologies. Resistance to change and the need for comprehensive change management strategies can be constraints that affect project timelines and success.

- **Resource availability and skills gap** the steel industry may face challenges in sourcing skilled resources with expert knowledge.

➢ **Strategic modules**

Company X, as a leading player in the steel industry, began implementing SAP S/4HANA in 2019 as part of a strategic digital transformation agenda. This was the company's first venture into using SAP's advanced ERP platform. The implementation focused on key modules such as production, finance and accounting, logistics, commercial production, plant maintenance, and governance and analytics. Etc. Company X's decision to implement SAP S/4HANA emphasizes its commitment to modernizing operations and enhancing business capabilities through digital innovation. The objective of this implementation is to enhance operational efficiency, streamline processes, improve financial visibility, ensure equipment reliability, optimize workforce management, and enable data-driven decision-making.

➢ **Project deliverables**

The project deliverables for an ERP implementation such as SAP S/4HANA typically include both tangible assets, such as the implemented system itself, and various project documents that record and support the implementation process. Here's an overview of common project deliverables:

a.ERP system (SAP S/4HANA)

- Fully configured and implemented SAP S/4HANA system tailored to Company X's business needs.

- Tested and validated modules including manufacturing, finance and accounting, logistics, purchasing and supply, commercial production, plant maintenance, human resources, and governance and analytics.

b. Project Documents

- Project Charter Defines project goals, scope, roles, and responsibilities.

- Business Blueprint (BBP) Documents detailed business processes, requirements, and system design specifications.

- RACI Matrix Clarifies roles and responsibilities for project tasks and activities.

- Scoping Document Outlines project requirements, scope, and deliverables.

- Data Import Templates Specifies data migration requirements and formats.

- Phase Closure Report Summarizes project activities, deliverables, and lessons learned for each phase.

- Data Validation Document Outlines procedures and criteria for validating data integrity within SAP S/4HANA.

- Training Materials Provides user manuals, guides, and resources for end-user training.

- Go-Live Guide Provides guidance and procedures for transitioning to the new system.

- Post-Production Review Report Summarizes go-live activities, incidents, and system performance after implementation.

- Project Closure Document Final report summarizing project results, accomplishments, and recommendations for future initiatives.

These project deliverables are essential for the successful implementation, transition, and ongoing support of the SAP S/4HANA system within Company X. They provide a structured framework for project management, system design, testing, training, and documentation to ensure alignment with business goals and operational requirements throughout the ERP implementation. Each deliverable serves a specific purpose to facilitate project success, stakeholder communication, and knowledge transfer within the organization.

➢ **Data migration and integration**

Data migration is one of the most important components in a typical S4HANA project. It involves transferring data completely and accurately to the newly designed S/4 HANA system. The data can be roughly divided into two categories Master data, which includes information

such as material, customer, vendor, and bank details, transactional data, which includes purchasing contracts, sales documents, and loans, are two categories of data that are typically transferred during the data migration process [1] and Organizational data refers to the data that represents the structure and hierarchy of the organization, such as company codes, plants, storage locations, sales organizations, purchasing organizations, etc, as shown in the figure below.

A dedicated team is often established for the data migration process, which typically includes functional consultants with backgrounds in logistics and finance, an ABAP developer, an Information Steward and Data Services expert, and individuals from business units whose roles are focused on data management. [2]

The SAP S/4HANA Migration Cockpit is a tool designed for customers who have recently installed SAP S/4HANA and wish to transfer their business data from SAP or non-SAP software systems. It employs migration objects to identify and transfer the relevant data. [3]

The migration cockpit offers several key features, including the ability to create migration projects, select relevant migration objects, process any mapping tasks for the selected objects, simulate the migration before migrating data to SAP S/4HANA, and monitor the status of the migration. [4] Figure 2.9 illustrates SAP data management. Data migration in S/4HANA projects involves transferring master, transactional, and organizational data. A dedicated team uses the SAP S/4HANA Migration Cockpit to manage the process, including project creation, data mapping, simulation, and monitoring.

---

[1] *https://community.sap.com/t5/enterprise-resource-planning-blogs-by-members/data-migration-strategy-in-s-4-hana-projects/ba-p/13593589, Retrieved 24 April 2024 at 14:00 PM.*

[2] *Ibid.*

[3] *Migrate your Data – Migration Cockpit (SAP... - SAP Community. https://community.sap.com/t5/enterprise-resource-planning-blogs-by-sap/part-1-migrate-your-data-migration-cockpit-sap-s-4hana-2020-and-higher-and/ba-p/13501516.*

Migrating Data with the SAP S/4HANA Migration Cockpit. https://learning.sap.com/learning-journeys/implementing-sap-s-4-hana-cloud-public-edition/migrating-data-with-the-sap-s-4hana-migration-cockpit_aeb16d93-0368-46f9-a6cc-e8da6f629e2b. Retrieved 24 April 2024 at 14:16 PM.

[4] *Idem.*

Figure 2.9: Managing Data in SAP.
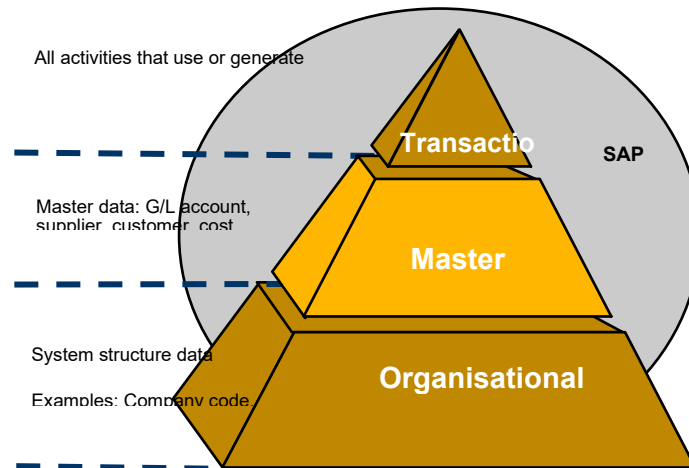
Source PwC SAP Academy Bootcamp.

➢ **Change management and training**

PwC's strategy for managing change during the SAP S/4HANA implementation involved four key areas mobilization, communication, organizational impact, and training.

- **Mobilization** PwC focused on mobilizing stakeholders and key players within the organization to support the implementation process. This involved identifying and engaging relevant stakeholders, including executives, managers, and end-users, to gain their commitment and involvement in the project.

- **Effective communication** was a fundamental aspect of PwC's change management strategy. They developed communication plans to ensure that stakeholders were kept informed and engaged throughout the implementation process. PwC placed great emphasis on transparent and timely communication, which was used to address concerns, share updates, and promote understanding of the project's goals and benefits.

- **Organizational Impact** PwC conducted an assessment and managed the organizational impact of the SAP S/4HANA implementation. A critical aspect of the change management strategy was the analysis of how the new system would affect business processes, roles, and workflows within the organization. PwC developed strategies to moderate potential disruptions, address resistance to change, and optimize organizational readiness for the transition.

- **Training** PwC implemented comprehensive training programs to ensure that end-users were equipped with the necessary skills and knowledge to use the SAP S/4HANA system effectively. Training sessions were conducted on an individual basis, with the aim of equipping end-users with the requisite skills and knowledge to utilise the SAP S/4HANA

system effectively. Training materials were developed in a user-friendly format, and ongoing support was provided to facilitate the smooth adoption of the new technology.

As we discuss above the focus of the training strategy was on the following key areas mobilisation, communication, managing organisational impact, and providing robust training. The objective was to drive successful change management throughout the SAP S/4HANA implementation. This strategy promoted stakeholder engagement, minimised resistance to change, and maximised the overall success of the project within the organisation. As shown in the figure 2.10 the change management strategy applied by the AMOA team.

Figure 2.10: Change Management, Cross-functional phase, key throughout the project.
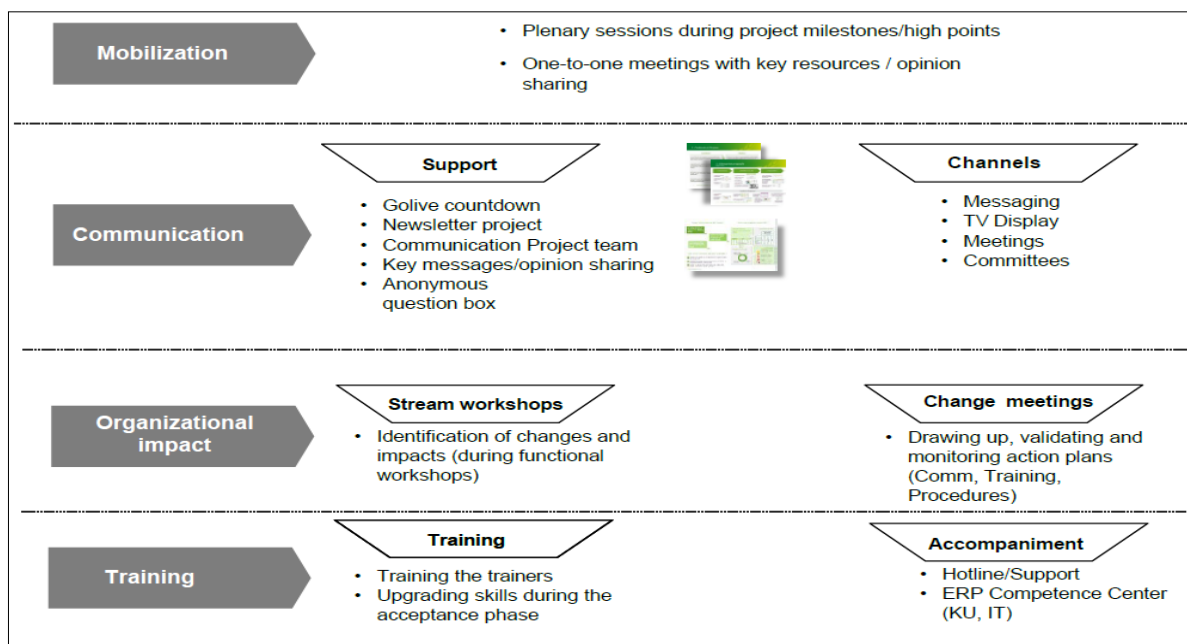
Source [PwC Internal documents].

➢ **Roles and responsibilities**

The diagram below illustrates (Figure 2.11) the roles and responsibilities of the integrator team in the SAP S/4HANA implementation at Company X. This team structure is reflected in the AMOA provided by PwC, ensuring a unified and effective approach to the project.

At the top of the hierarchy, the Sponsor, Project Director, and SAP Change Management provide strategic oversight and direction. The Project Director oversees the Project Manager for ERP, who oversees the day-to-day activities of the project.

The Functional and Technical Consultants, divided into Leaders and Seniors, constitute the backbone of the implementation process. They possess expertise in a multitude of domains, including FICO, MM/WM/EWM, SD, PP, PM, EHS, HCM Development, and Basis

Infrastructure. Their role is to configure and customize the system to align with the specific needs of Company X.

The project is managed using the SAP Activate Project Management methodology. This methodology, in conjunction with the expertise of the integrator team and the support from PwC in the AMOA, ensures a successful and efficient implementation of SAP S/4HANA, tailored to Company X's business objectives and processes. This structure not only defines clear lines of responsibility and communication but also fosters collaboration across roles, which is crucial for the success of such complex projects.

Figure 2.11: Roles on SAP S/4HANA implementation (Integrator).
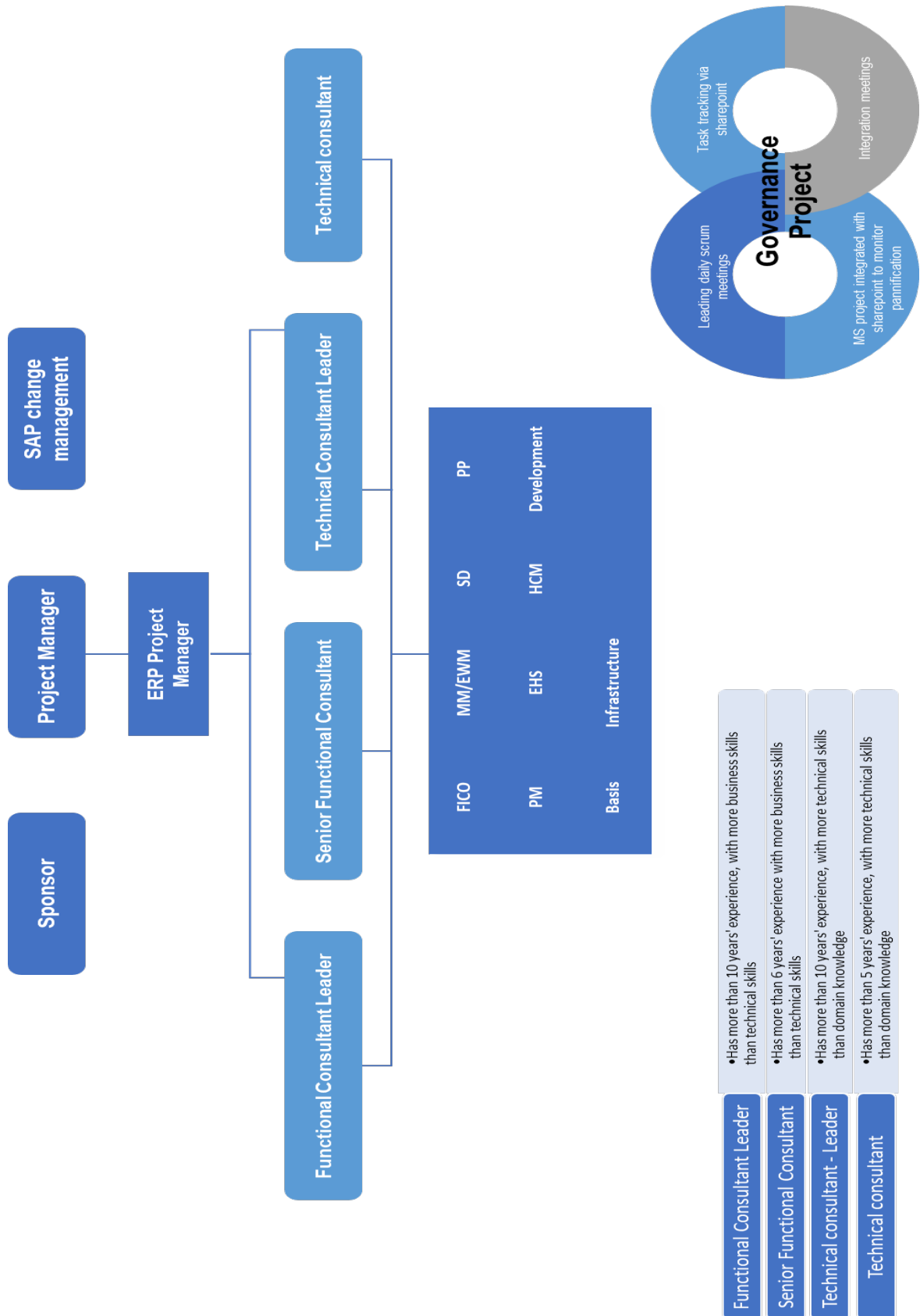
Source *[Integrator Internal documents].*

1.3.3. Timeline and budget allocated for the project

In this part, we outline the timeline and budget for the ERP implementation project at the client company.

➤ **Timeline and activate methodology application**

As shown in figure 2.12 that in this SAP S/4HANA implementation project, the (AMOA) timeline is strategically structured into distinct phases with the objective of ensuring project success. The timeline begins with the "Framing/Preparation" phase, which spans approximately three months, and is focused on defining the project scope, objectives, and key stakeholders.

Subsequently, the "Design" phase commences concurrently with the latter part of "Framing/Preparation" and continues until the fifth month. This phase is dedicated to the design of the solution architecture and the development of functional specifications.

The "Construction/Acceptance" phase commences around the third month and concludes at the eighth month with a milestone designated as "Plenary." This phase encompasses the construction of the solution, testing, and user acceptance.

The "Deployment" phase commences around the seventh month and concludes at the ninth month with the "Go Live" milestone. This phase includes the deployment of the solution in the production environment and the conduct of end-user training.

Finally, the "Execution/Support" phase commences near the end of the deployment phase and extends beyond the tenth month. Its focus is on the ongoing support of end-users and the assurance that the solution delivers the anticipated benefits. Throughout the project, various aspects are integrated into different phases, including change management, communication, technical support, logistics, and project governance. Regular meetings and activities by project committees and stream committees are indicated on the timeline. As shown in figure 12 below the macroplanning adapted to SAP S4HANA implementation project.

Figure 2.12: Macroplanning adapted to SAP implementation and PwC methodologies to meet X requirements.
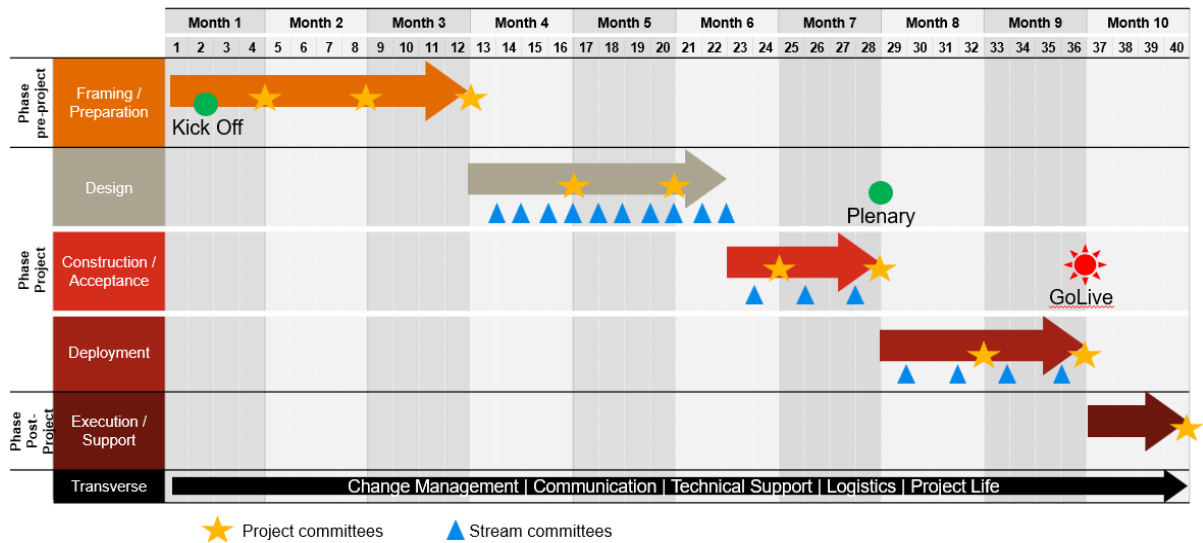

Source [PwC Internal documents].

➢ **The budget allocated for the SAP S/4HANA implementation within X**

The X company has allocated a substantial budget for the implementation of SAP S/4HANA, approximating to around 4 million euros. This budget is strategically divided into two main components AMOA and ERP implementation as shown below on figure 2.13. It's important to note that this budget does not include the cost of licenses of SAP, which is a separate expense. This significant investment underlines the company's commitment to digital transformation and operational efficiency.

Figure 2.13: The budget allocated for the project.
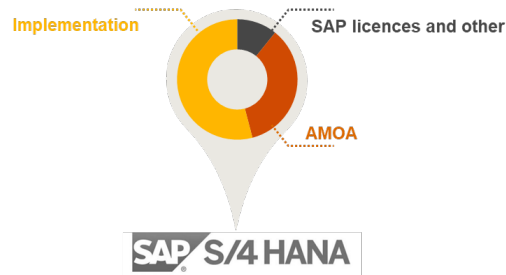
Source Done by us.

1.4. The relation between PwC and client company

PwC's Assistance services play a pivotal role in project management and governance. PwC consultants assist their company clients by managing operational tasks, facilitating communication with stakeholders, analysing requirements, defining project scope and objectives, establishing governance structures, and ensuring quality throughout the implementation. This approach enables client X to focus on strategic decision-making and achieve successful SAP S/4HANA adoption.

PwC Algeria's engagement with Company X employs a comprehensive approach to establishing effective project governance and stakeholder engagement. PwC Algeria initiates the process by identifying key players within Company X, including experts, business managers, and business process owners (BPOs), to ensure representation from all relevant areas.

Stakeholder engagement is a priority, and efforts are made to confirm responsibilities through Quality Assurance Plans (QAP), RACI matrices, and clear deliverables. The scope and objectives of the project are meticulously reviewed and comprehensively understood by all stakeholders, thereby promoting alignment and clarity from the outset. Planning is conducted in a meticulous manner to delineate project timelines, milestones, and resource requirements. A robust governance system and validation process is established to monitor progress and ensure adherence to project objectives. Furthermore, PwC Algeria establishes a Project Management Office (PMO) to oversee planning, budget monitoring, logistics, support, and resource management, thereby providing a structured framework for successful project execution. With these foundational steps in place, the partnership between PwC Algeria and Company X is positioned for an effective project launch and continued success in driving organizational transformation.

> **When designing the solution, the following steps were taken by PwC**

1. The integrator presented standard ERP processes.

2. Process validation and gap identification were conducted in workshops.

3. Deviations from the standard were analysed and arbitrated.

4. A data recovery strategy and rules were defined.

5. A scale plan was designed.

7. IT infrastructure and IS security were proposed and validated.

> **Upon acceptance of the solution, the following steps should be taken**

1. Receive and validate prototypes from the integrator.

2. Prepare functional, technical, and integration test strategies.

3. Support the company X user testing.

4. Assist users in qualifying anomalies.

5. Receive and validate parameters set by the integrator.

6. Validate the integrator's training materials.

7. Organize and supervise user training by the integrator.

> ➢ **The following steps are to be taken to execute the switchover plan and assess its readiness for go-live:**

1. Execute the switchover plan.

2. Go live.

> ➢ **Upon examination, the following tasks are to be carried out**

1. Supporting users during the first weeks after go-live.

2. Identifying functional and technical anomalies.

3. Identifying additional training and coaching needs.

4. Engaging the integrator to correct anomalies and complete training courses.

5. Documenting validated and tested business rules.

Conclusion

Examining the profile of X Company and the specific context of the SAP S/4HANA implementation project reveals a detailed understanding of the operational environment and strategic motivations behind the adoption of this ERP system. A major player in its industry, X Company go on board on the SAP S/4HANA implementation to improve operational efficiency and modernize business processes. The project scope, timeline, and constraints were clearly outlined, providing a comprehensive framework to evaluate the critical success factors (CSFs) and project outcomes. The integration of SAP S/4HANA within X Company is poised to deliver significant business benefits that align with broader strategic objectives of digital transformation and improved enterprise resource planning.

Having established the project context and objectives, the next step is to delve into the critical success factors that strengthen the successful implementation of SAP S/4HANA.

Section 2: Critical success factors for SAP S/4HANA implementation.

This section presents a comprehensive list of critical success factors (CSFs) essential for the successful implementation of SAP S/4HANA. The CSFs outlined here have been identified through meticulous analysis of relevant documents, extensive examination of case studies, and consultation with experienced SAP consultants. These factors are crucial components that can significantly influence the outcome and effectiveness of an SAP S/4HANA implementation project.

2.1. The definition of the critical success factors CSFs

Critical Success Factor (CSF) is a management term for an element that is necessary for an organization or project to achieve its mission. To achieve their goals, they need to be aware of each Key Success Factor (KSF) and the variations between the keys and the different roles Key Result Area (KRA). The concept of "success factors" was developed by D. Ronald Daniel of McKinsey & Company, who published an article entitled "Management Information Crisis" in the Harvard Business Review in 1961.[1]

In our case study, we specifically examine the critical success factors relevant to the SAP S/4HANA implementation project at PwC's client company. This involves identifying and addressing the key factors that will significantly influence the outcome and success of the SAP S/4HANA implementation, considering various organizational, technical, and strategic aspects.

2.2. The Key CSFs

Management Information Crisis by Daniel [2] is considered to be the pioneer of the introduction of CSFs. These are the fundamental elements of an organisation or project to be successful and thus, important to the achievement of one's mission and vision for the project. According to Daniel (1961), there are three to 4 six key factors that determine the success of a company and its information systems.

---

[1] *Daniel, D. Roland. (1961). Management Information Crisis. Harvard Business Review, 39(5), 111-121.Quoted in Critical Success Factors in ERP Implementation MASTER THESIS WITHIN: Business Administration," The Perspective of the Procurement System User". p.3*
[2] *Idem.*

Identifying and understanding existing factors and how they influence the project outcome can help organisations to mitigate or prevent the risk of failure [1].

This section describes the proposed CSFs for SAP S/4HANA implementation, based on the content of the literature reviews and the sources from which they draw their conclusions. The CSFs were selected after examining the frequency of their use in the literature reviews and consulting with experienced SAP consultants. We have chosen to use those CSFs that are mentioned in three or more reviews. This is to ensure that the CSFs we select can be considered critical. After examining the selected reviews, we found that several CSFs could be combined because they represented the same factor. Therefore, we categorized the factors, resulting in 11 CSFs.

2.3. Strategic, managerial, operational, and technical factors

2.3.1. Strategic and managerial factors

In this section, we delve into strategic and managerial factors crucial for the successful implementation of SAP S/4HANA.

2.3.1.1 . Clear digital transformation strategy

A digital transformation strategy in the context of SAP S/4HANA implementation projects is a blueprint for achieving future digital business objectives through the integration of new digital technologies. It includes the definition of clear responsibilities for the implementation of the strategy to effectively shape business operations.

According to the MIT Center for Digital Business and Capgemini Consulting (2011), three blocks that contribute to business model transformation are:

- Digitally transformed business (through product/service augmentation, transformation of a physical experience into a virtual/digital experience, or digital wrappers).
- New digital business (through digital products or by reshaping organizational boundaries).
- Digital globalization (through enterprise integration, shared digital services, etc.).

In our case, the implementation of SAP S/4HANA falls into the first category of digitally transformed business.

---

[1] *Huang, S. M., Chang, I. C., Li, S. H., & Lin, M. T. (2004). Assessing risk in ERP projects: identify and prioritize the factors, Industrial Management & Data Systems, 104(8),681-688. Quoted in Critical Success Factors in ERP Implementation MASTER THESIS WITHIN: Business Administration," The Perspective of the Procurement System User", p.4*

We chose this as the first Critical Success Factor in our list because having a clear digital transformation strategy will define which ERP is the best choice for the organization's specifications. By aligning the capabilities of SAP S/4HANA with the digital transformation strategy, the organization can ensure that the chosen ERP solution not only meets current needs, but also supports future growth and innovation initiatives. This strategic alignment increases the likelihood of a successful ERP implementation and maximizes the value of the SAP S/4HANA investment.

2.3.1.2. Top management support and commitment

The most relevant and critical factor identified by previous researchers is "top management support and commitment ". This concept refers to the need for committed leadership at the top management level[1].Successful ERP implementation depends very much on the active and persistent involvement of top management, and the importance of top management support in every step at all levels of the organization is critical [2].

When some companies delegate the responsibility of ERP implementation to the technical departments, they make a critical mistake that results in a failed project. The use and success of IT in organizations should include the participation of top management, as this reflects that top management is actively working with the rest of the organization towards a successful IT implementation [3].

The top management should not only be active in the implementation process to ensure progress and ultimately success. They should also be able to anticipate problems that may arise, which of course requires a great deal of knowledge about ERP systems and the implementation process [4]. Besides, that commitment needs to be underpinned by a knowledge base based not only on strategic planning and leadership, but also on technical expertise. This knowledge can

---

[1] *Finney, S., & Corbett, M. (2007). ERP implementation: a compilation and analysis of critical success factors. Business Process Management Journal, 13(3), 329-347.*
[2] *Zabjek, D., Kovacic, A., & Indihar Stemberger, M. (2009). The influence of business process management and some other CSFs on successful ERP implementation. Business Process Management Journal, 15(4), 588-608.*
[3] *Byrd, T. A., & Davidson, N. W. (2003). Examining possible antecedents of IT impact on the supply chain and its effect on firm performance. Information & Management, 41(2), 243-255.*
[4] *Motwani, J., Subramanian, R., & Gopalakrishna, P. (2005). Critical factors for successful ERP implementation: Exploratory findings from four case studies. Computers in Industry, 56(6), 529-544.*

be expressed in an understanding of the importance of delegating sufficient resources to the project for it to be successful [1] .

2.3.1.3. Business process reengineering and minimal customization

In the context of SAP S/4HANA implementation, business process reengineering (BPR) refers to the fundamental rethinking and radical redesign of business processes to align them with the functionalities and capabilities of the SAP S/4HANA system. BPR involves analysing existing business processes, identifying areas for improvement or inefficiencies, and then restructuring these processes to better fit the SAP S/4HANA system. This could mean changing workflows, decision-making processes, roles, and responsibilities to ensure they are optimized for the new system.

It's important to note that BPR in this context is not just a one-time task during the implementation phase, but an ongoing process as the organization adapts to the new system and as the system itself evolves with updates and new features. When it comes to business process reengineering and customization, it is critical to communicate to top management early on that we will align processes with SAP S/4HANA best practices. By establishing this alignment as a guiding principle, the project can maintain a focus on efficiency and optimization throughout. [2]

The business process reengineering (BPR) and adaptation are essential at various stages of an ERP implementation project [3] because it's driving many changes as shown in the figure 2.14.

---

[1] Yusuf, Y., Gunasekaran, A., & Abthorpe, M.S. (2004). "Enterprise information systems project implementation: a case study of ERP in Rolls-Royce", International Journal of Production Economics, 87, 251-66.

[2] MOULTI Meriem review on our list of CFSs.

[3] Francoise, O., Bourgault, M., & Pellerin, R. (2009). ERP implementation through critical success factors' management. Business Process Management Journal, 15(3), 371-394. Quoted in Critical Success Factors in ERP Implementation MASTER THESIS WITHIN: Business Administration," The Perspective of the Procurement System User". p.30

Figure 2.14: Reengineering drives many changes**.**
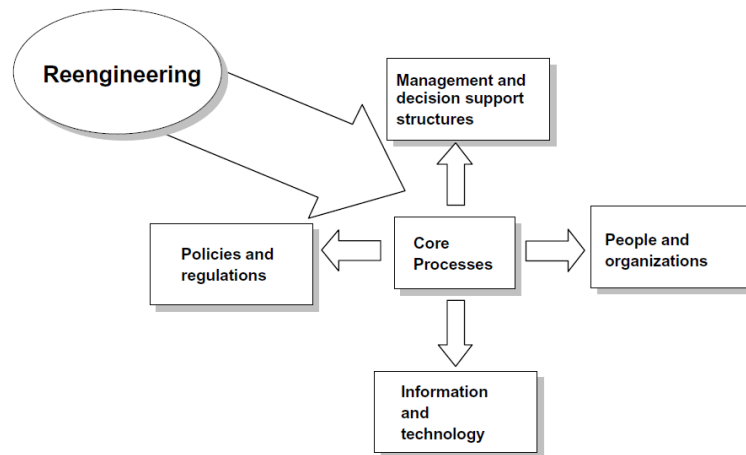
Source *Gene L. Dodaro, Brian P. Crowley (1997), Business Process Reengineering Assessment Guide, United States General Accounting Office, Accounting and Information Management Division, Version 3, P.11.*

2.3.1.4. Project management

The project management activities cover the first four stages of the SAP S4HANA implementation life cycle, from initiating the project until its closure. The approach to project management suggests that the planning and control of the SAP S4HANA implementation project is in correlation with the project's characteristics such as project size, experiences with SAP technology, and project structure.

A designated individual or team should be given the responsibility to drive success in the SAP S4HANA implementation. Once the project team is formally established, the team must subsequently define its milestones. This includes determining the critical paths of the SAP S4HANA implementation project, deciding on the project timeline, and managing the force of timely decision making.

Hence, the scope of the SAP S4HANA implementation should be established, clearly defined, and be limited. As ERP projects, like SAP S4HANA implementation, tend to be huge and inherently complex due to the extensive combination of hardware and software as well as the countless organizational, human, and political issues. A project scope that is too broad or ambitious can cause problems. Therefore, it's crucial to maintain a well-defined and manageable scope for the successful implementation of SAP S4HANA.

To enhance project management, it is of the utmost importance to actively engage business process owners in the decision-making process. This ensures that the project is aligned closely with the core objectives and requirements of the business. Furthermore, it is essential to provide

these stakeholders with a clear understanding of their roles and responsibilities throughout the project lifecycle, fostering ownership and accountability. [1]

2.3.1.5. Change management program

The importance of change management begins at the very beginning of the project and continues throughout the entire duration of the project. This involves managing the overall culture and structures of the organization, including people, organizational changes, and cultural shifts [2].

Most companies existing organizational structures and processes are incompatible with the new structure, tools, and information provided by ERP systems. Even a flexible system imposes its own logic and casts a new light on a company's strategy, organization, and culture.

To adapt, an organization may need to reengineer key business processes or create new ones to align with organizational goals [3].

Organizations can effectively manage user resistance by forming a change management team and program that includes top management and project management. This program should include procedures for ongoing feedback, performance monitoring, and accountability reporting. [4]

The transition should not begin until the entire organization is ready, and measures to reduce resistance to change should begin at the very beginning of the implementation. Employee motivation should be maintained throughout the project, and the project manager should be prepared to address change management issues. Fostering open communication channels and providing relevant SAP S/4HANA-specific training programs can help employees better understand the reasons for change and acquire the skills needed to adapt to new processes and systems. The following sections discuss these two aspects in more detail.

➢ **Open and transparent communication**

Failure to achieve fluid and open communication between top management and system users is a major cause of ERP implementation failure. A company that encourages its employees

---

[1] *MOULTI Meriem review on our list of CFSs.*
[2] *Legare, T. L. (2002). The role of organizational factors in realizing ERP benefits. Information Systems Management, 19(4), 21-42.*
[3] *Umble, E., Haft, R., & Umble, M. (2003). Enterprise resource planning: Implementation procedures and critical success factors. European Journal of Operational Research,146(2), 241-257.*
[4] *Shaul, L., & Tauber, D. (2013). Critical success factors in enterprise resource planning systems: Review of the last decade. ACM Computing Surveys (CSUR), 45(4), 55.*

to actively participate in the implementation is more successful than a company that does not. In addition, the importance of open communication in sharing the news of the ERP system change as well as the ongoing updates regarding the change[1]. In fact, cross-functional and interdepartmental coordination is of utmost importance when implementing an ERP system and having excellent company-wide communication is vital [2].Communication is an important tool for management when trying to avoid employee resistance to change. Ongoing communication throughout the organization will let the system users know what is happening, what results are to be expected, and if something goes wrong, they will be directly informed and involved in solving the problem instead of being left in confusion [3].

The time aspect of communication, although ongoing interdepartmental communication is considered important both before and after implementation, spending too much time ensuring that communication reaches everyone can be, and often is, a waste of time[4].

> ➢ **User training and knowledge transfer**

Training and knowledge transfer are critical aspects of SAP S/4HANA implementation success. Lack of user training and misunderstanding of enterprise applications appear to be two major reasons for many ERP implementation failures. ERP implementations require a great deal of knowledge to enable people to solve problems that may arise within the system[5].

If employees do not understand how the system works, they will invent their own processes by extracting parts of the system that they can manipulate. For system user training to be successful, training should preferably begin well before the implementation process begins [6]. One of the most important variables in planning for a new system is the planning of education and training programs, which, along with other variables, are important components of a successful implementation[7].

Executives often underestimate the level of education and training required to implement an ERP system and the additional costs involved, which is why, as noted above, top

---

[1] *Motwani, J., Op.Cit.*
[2] *Chen, C., Law, C. & Yang, S. (2009). Managing ERP Implementation Failure: A Project Management Perspective. IEEE Transactions on Engineering Management, 56(1), 157- 170*
[3] *Dezdar, S., & Ainin, S. (2011). The influence of organizational factors on successful ERP implementation. Management Decision, 49(6), 911-926.*
[4] *Plant, R., & Willcocks, L. (2007). "Critical success factors in international ERP implementations: a case research approach", Journal of Computer Information Systems, 47(3), 60-70.*
[5] *Umble, E., Haft, R., & Umble, (2003), M.Op.Cit.*
[6] *Idem.*
[7] *Mabert, V. A., Soni, A., & Venkataramanan, M. A. (2003). Enterprise Resource Planning: managing the implementation process, European Journal of Operational Research, 146,302-314.*

management involvement is a high priority [1].Training and education can be used as a tool to build user acceptance of the project and foster positive employee attitudes [2]. Training and knowledge transfer should be a priority from the beginning of the project, and that both money and time should be spent on various forms of education and training. By doing so, the organization helps the system users to see the benefits and the need for the new ERP system, as well as to understand how the system will change business processes [3]. Too often, employees are expected to be able to effectively operate and use the new system based on training alone.

2.3.2. Operational and Technical Factors

In this section, we explore the operational and technical factors that are critical to the successful implementation of SAP S/4HANA.

2.3.2.1. Implementation team composition and skills

Implementation team composition and skills refers to the composition of the team responsible for implementing SAP S/4HANA and the skills of the team members[4]. This is considered a CSF for SAP S/4HANA implementation because the success of the implementation depends heavily on the people involved in the project [5].

The implementation team should be composed of individuals with a mix of skills, including[124]

- **Functional business configuration expertise** Team members should understand the business processes that SAP S/4HANA will support and be able to configure the system to meet the organization's needs.

- **Technical knowledge** Some team members should have a deep understanding of the technical requirements of SAP S/4HANA and be able to handle tasks such as data migration, system configuration, and integration with other systems [6].

- **Project management skills** the team should include individuals who can plan, organize, and manage resources to successfully complete the project [7].

---

[1] *Zabjek, D., Kovacic, A., & Indihar Stemberger, (2009), M.Op.Cit.*

[2] *Finney, S., & Corbett,(2007), M.Op.Cit.*

[3] *Motiwalla, L., & Thompson, J. (2012). Enterprise systems for management. 1st ed. Boston: Prentice Hall.*

[4] *SAP S/4HANA Implementation Best Practices. https://blog.sap-press.com/sap-s4hana-implementation-best-practices. Retrieved 20 April 2024 at 19:22 PM.*

[5] *ERP Implementation Team Structure, SAP Insights. https://www.sap.com/insights/erp-implementation-team-structure.html. Retrieved 20 April 2024 at 19:29 PM.*

[6]*Idem.*

[7] *ERP Implementation Team Structure | SAP Insights. https://www.sap.com/insights/erp-implementation-team-structure.html. Retrieved 20 April 2024 at 19:22 PM.*

- **Change management skills** Implementing SAP S/4HANA often involves significant changes to business processes. Team members with change management skills can help the organization manage these changes [1].

- **Training skills** to ensure that end users can effectively use SAP S/4HANA, some team members should be able to provide effective training [2].

2.3.2.2. Dedicated IT team

In SAP S/4HANA implementation projects, the role of the dedicated IT team becomes critical once the implementation phase is complete and the AMOA and integrator teams have completed their tasks. This internal IT team, made up primarily of super users, takes on the responsibility of providing support and addressing any issues or challenges that may arise. Their role is not limited to problem resolution but extends to ongoing support and maintenance of the SAP S/4HANA system. With their in-depth knowledge and understanding of the system, they are the first line of defense against any operational issues, ensuring that the system runs smoothly. This dedicated IT team therefore plays a pivotal role in the post-implementation phase and contributes significantly to the successful operation of the SAP S/4HANA system.

2.3.2.3 Software analysis and testing

The process of examining the SAP S/4HANA system during and after implementation to ensure it meets the business requirements. It involves checking the system's functionality, performance, security, and usability. Automated testing tools are often used to streamline this process[7]. The goal is to identify and fix any issues before the system goes live. This is crucial because it helps identify and rectify issues early, ensuring the system functions as expected. It also reduces the workload after release upgrades.

2.3.2.4. Integrator support

Vendor support can include a range of services, such as providing documentation, offering technical support, delivering software updates, and advising on best practices. Good vendor support can help ensure a smooth and successful implementation. On their SAP S/4HANA journey, 78% of companies seek assistance from an Implementation Partner [3]. This is important

---

[1] *SAP S/4HANA Implementation Best Practices. https://blog.sap-press.com/sap-s4hana-implementation-best-practices. Retrieved 20 April 2024 at 19:22 PM.*
[2] *Idem.*
[3] *YASH Technologies (2022), Best Practices SAP S/4HANA Rollout, 841 Avenue of the Cities East Moline IL-61244 USA, p.1*

because it ensures the system is set up correctly and optimally, which can lead to a smoother implementation process and better system performance.

2.3.2.5. User involvement

In the context of change management and because of commonly cited failures, organizations often encounter user resistance. In many cases, users often fear that ER implementation will change their role, job status, importance, responsibilities, and access to valuable information [1]. In addition to the CSF mentioned above, i.e. training and knowledge transfer, it is important to involve users during the development of the system, to get hold of the existing knowledge of the user in areas where the team has insufficient expertise [2]. In addition, the activity of nominated user delegates, who have a solid knowledge of the organizational processes and therefore are responsible for the cross-functional requirements in the redesign of the processes, activities, and functional areas both during the initial implementation and over time[3].

However, it is necessary to consider the impact of moving from one system to another and the nature of the work in relation to specific job descriptions[4].

Nevertheless, there are two areas for user involvement when the organization decides to implement an ERP system (1) user involvement in the phase when the organization defines the needs of the ERP system and (2) user involvement in the implementation phase of the ERP systems. Regardless of which of two areas a company chooses, the system user is involved in the implementation process[5].

2.3.2.6. SAP S/4HANA success documentation

This involves documenting the goals, plans, processes, and outcomes of the SAP S/4HANA implementation. It can serve as a reference for future implementations or system upgrades. This is important because it provides a record of what was done, what worked well, and what could be improved. It also helps in tracking the progress of the implementation and measuring its

---

[1] *Shaul, L., & Tauber, D, (2013).Op.Cit.*
[2] *Francoise, O., Bourgault, M., & Pellerin, R. (2009). ERP implementation through critical success factors management. Business Process Management Journal, 15(3), 371-394.*
[3] *Shaul, L., & Tauber, D. (2013), Op.Cit.*
[4] *Finney, S., & Corbett, M, (2007), Op.Cit.*
[5] *Bhatti, T. R. (2005). Critical success factors for the implementation of enterprise resource planning (E RP): empirical validation. In the second international conference on innovation in information technology (p. 110).*

success.[1] When implementing SAP S/4HANA, key project documents such as the project charter, business blueprint (BBP), and training materials are critical to project success. The project charter establishes clear objectives and stakeholder roles, promoting alignment and accountability throughout the project lifecycle. The Business Blueprint translates business requirements into actionable guidelines for configuring the ERP system, ensuring alignment with organizational goals. Training materials provide end users with the knowledge and skills to effectively use SAP S/4HANA, increasing user adoption and system proficiency. Together, these documents play a critical role in guiding project management, system design, and user enablement, ultimately driving successful implementation and maximizing the ROI of SAP S/4HANA within the organization.

Conclusion

The identification and analysis of critical success factors (CSFs) for the SAP S/4HANA implementation at Company X revealed the essential elements required for a successful ERP project. These elements included top management support, effective project management, robust change management programs, and comprehensive training. Additionally, the importance of stakeholder engagement and the need to address both technical and operational challenges were highlighted. Understanding these CSFs provides actionable insights to optimize future ERP implementations, ensuring organizations can achieve their desired outcomes and improve overall business performance.

Moving forward, focusing on the methodological approach to data collection and analysis will be critical in validating these factors.

---

[1] *SAP, SAP White Paper, navigating a Successful SAP S/4HANA® Implementation, How SAP and Knoa Can Make the Digital Transformation Easier for Your Organization, P.6*

Section 3: Methodological approach and results of the research.

The objective of this section is to delineate the methodological approach and to present the data analysis for the study on SAP S/4HANA implementation. This section represents the methodological foundation of our research endeavour, facilitating a comprehensive examination of the critical success factors underlying SAP S/4HANA implementation within the Algerian market context. This section serves as the link between the detailed exploration of the company profile, project context, and the meticulously outlined critical success factors (CSFs) presented earlier. This methodology employs a deductive approach and a mixed-methods research strategy. The objective of our study is to offer a comprehensive understanding of the multifaceted factors that shape the success trajectory of SAP S/4HANA implementations. To this end, a combination of quantitative surveys and qualitative interviews will be employed.

3.1. Methodology and methods

In this section, we outline the methodology and methods employed in our study to achieve the research objectives.

3.1.1 Nature of the Research

The purpose of our study could be exploratory, explanatory, or descriptive. A descriptive study suggests research questions likely to begin with "Who," "What," "Where," "When," or "How," which is in line with this dissertation's research questions. Furthermore, the purpose of our study was to identify the critical success factors of ERP implementation. Our study was based on prior research and existing theories, which meant that the nature of the study was not exploratory. This would have implied more open questions to discover what is happening, nuances, and deeper insights about a topic of interest[1]. In contrast, the research aimed to determine the CSFs in the implementation of an SAP S/4HANA ERP system from a system user and SAP consultant's perspectives, which extended knowledge in existing theory. This suggested that the study was descriptive in nature. However, the objective was to provide valuable insights from the stakeholders' perspective, which required empirical data.

---

[1] *Mark N.K. Saunders, Phillip Lews, Adrian Thornhill, (2019), Understanding research philosophy and approaches to theory development ", "Research Methods for Business Students", Pearson Education, London, United Kingdom*

Consequently, the research design combined both descriptive and explanatory attributes, resulting in a descriptive-explanatory nature. [1]

3.1.2. Research Approach

In undertaking this research, a deductive approach was adopted, guided by established frameworks outlined by Saunders et al. The deductive approach involves the testing of theories through the exploration of relationships between variables [2]. As such, it was reasoned appropriate for our study, which requested to investigate the key factors influencing the successful implementation and management of SAP S/4HANA within a large company. The study drew upon existing theories and literature on SAP implementation to formulate three hypotheses that guided the empirical investigation. The formulated hypotheses are

1. Effective training experiences, change management strategies, and clear communication during SAP S/4HANA implementation positively impact user satisfaction.

2. End-user involvement in decision-making processes is crucial for the successful implementation and management of SAP S/4HANA.

3. SAP S/4HANA implementation stakeholders perceive project management, change management programs, and the composition and skills of the implementation team as critical success factors.

To validate these hypotheses, empirical data were collected through surveys administered to both SAP consultants and end-users involved in the implementation process. Through statistical analysis and interpretation of the survey results, the study aimed to provide empirical evidence either supporting or rejecting the formulated hypotheses. The outcomes of the analysis were then examined considering the initial theoretical framework, allowing for conclusions to be drawn regarding the factors influencing SAP S/4HANA implementation success. Should the results align with the hypotheses, it would provide confirmation of the theoretical statements.

3.1.3. Internship and practical experience

As part of this research, we undertook our internship with the AMOA (Assistance à Maîtrise d'Ouvrage) team at PwC Algeria. This provided a unique opportunity to observe and participate in the SAP S/4HANA implementation process directly at X company, where PwC Algeria is responsible for monitoring the implementation. The internship facilitated direct interactions

---

[1] *Idem*
[2] *Idem*

with system users, SAP consultants, and project managers, providing valuable insights into the practical challenges and success factors associated with ERP implementation.

3.1.4. Research Strategy

In accordance with the deductive approach adopted for our study, a mixed-methods research strategy was employed, incorporating both quantitative and qualitative methods to comprehensively explore the factors that influence the success of SAP S/4HANA implementations. The deductive approach typically aligns with quantitative methods and emphasizes the collection and analysis of quantifiable data.[1] Therefore, a survey strategy was selected as the primary means of data collection to facilitate the acquisition of quantifiable insights from a broad sample of participants.

3.1.5. Methods

Mixed methods research, which integrates both qualitative and quantitative strategies, is designed to explore inquiries related to gaining comprehensive insights into various phenomena [2]. In the context of our study, it will be used to understand the SAP S/4HANA implementation process at Company X. The essence of effective mixed methods research lies in illuminating the subjective meanings, actions, and social contexts of research participants as they perceive them, while providing objective, quantifiable data for statistical analysis [3].

This approach is essential to gain a deeper understanding of a research topic that is not yet fully understood, emphasizing a pragmatic standpoint in understanding the research question [4]. The quantitative aspect involved structured questionnaires for SAP consultants and system users, focusing on satisfaction levels, perceived challenges, and critical success factors.

To supplement this, qualitative interviews were conducted to capture detailed perspectives and experiences during the implementation process[5]. These interviews allowed participants to elaborate on their responses and provide context to the quantitative data.

---

[1] *Mark N.K. Saunders, Phillip Lews, Adrian Thornhill, Op.Cit.*

[2] *Creswell, John W., & Creswell, J. David (2018), Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, SAGE Publications, Inc., Thousand Oaks, California.p.337*

[3] *Johnson, R. Burke, Onwuegbuzie, Anthony J. (2004), Mixed Methods Research: A Research Paradigm Whose Time Has Come, Educational Researcher, Vol. 33, No. 7, Published by American Educational Research Association. p. 17-22*

[4] *Blank, Carol Ann LoPinto (2013), Mixed Methods in Social & Behavioral Research, Journal of Music Therapy, Published by PubMed. p,19*

[5] *Seidman, Irving (2013), Qualitative Research: A Guide for Researchers in Education and the Social Sciences, Teachers College, Columbia University, New York, and London. p,23*

3.2. Data collection and tools

This section outlines the various data collection tools used in the study.

3.2.1. Data collection tools

In this subsection, we describe the data collection tools used to collect information during the study.

3.2.1.1. Qualitative Data Collection

Initially, qualitative data collection methods were employed as:

➢ **Observation** In our daily lives, we interact with various systems and people, and these interactions greatly influence our attitudes, behaviours, and beliefs. Observations of these interactions, particularly within the context of SAP S/4HANA implementations, can provide valuable insights into the implementation process [1].

To improve our findings and methodology, and to gain insight into how various operations are performed, we decided to use observation as a data collection strategy in our research. In addition, by observing various SAP consultants and system users as they performed their tasks during the implementation, we were able to notice and collect many things that helped us with the research. For example, we were able to

- Observe the consultants and users adherence to the implementation protocol and their awareness of the importance of proper procedure.
- Assess the impact and results of the implemented SAP S/4HANA system, as well as the benefits and positive effects it has had on company X.
- Review the relevant documents in our research.

Recognize the company's response to various circumstances during the implementation and note the relationships and sense of community they cultivated.

➢ **Document Analysis**

Document analysis is a systematic procedure for reviewing or evaluating documents—both printed and electronic material. It is a way to study the operational procedures, guidelines, and

---

[1] *Sharma, Hemant Lata, & Sarkar, Chiranjit (2019), Ethnography Research: An Overview, International Journal of Advance and Innovative Research, Vol 6, Published by Maharshi Dayanand University, Rohtak.p.1-4.*

records in an organization, and it provides a complementary perspective to other research methods[1].

In our research, we utilized a variety of sources, including online platforms such as Scholar Vox, Google Scholar, and libraries such as those at HNSM, HSMDE, SHCS, and HNSSA, schools at the University Pole in Kolea. These sources provided access to a variety of literature sources, and we also used the PwC archive and database for valuable materials. This comprehensive approach significantly enriched our research, provided different perspectives, and strengthened our conclusions.Moving on to another critical aspect of qualitative data collection

➢ **Interview**

The next method we utilized was interviews to gather detailed insights from participants. Starting by defining it

• **Definition of the interviews** Interviewing is a foundational method in qualitative research, widely used in health research and social sciences, involving verbal communication to collect data on participants' attitudes, beliefs, and experiences. It is a process where qualitative interviewer, as a human being with a personal style, uses social skills to conduct interviews tailored to the research question, methodological approach, context, and participant needs [2].

The process involves building rapport and trust between the interviewer and participant, creating a productive interpersonal climate through verbal and non-verbal communication[3], maintaining open body language, and starting with easier, open-ended questions before moving to more sensitive topics. Interviewing is not a rigid process but requires flexibility, active listening, and the ability to ask different types of questions to draw out detailed responses from participants. [4]

---

[1] *Liamputtong, Pranee, (2019), Handbook of Research Methods in Health Social Sciences, School of Science and Health, Western Sydney University, Penrith, NSW, Australia, Springer Nature Singapore Pte Ltd. p.391-408*
[2] *Liamputtong, Pranee, Op.Cit. p.394-395*
[3] *Idem, p,392*
[4] *Idem*

- **Interviews with SAP Consultants**

 We chose semi-structured interviews to delve deeply into the participant's views, perspectives, and experiences, generating rich and detailed data.

Objectives of the interviews

1. The primary objective is to identify the list of SAP consultants, IT professionals, or company employees who have direct experience with the implementation and management of SAP S/4HANA. These individuals are expected to provide the most relevant and insightful information for our study.

2. By interviewing these experienced individuals, the aim is to understand the real-world challenges, strategies, and outcomes of implementing and managing SAP S/4HANA within a large company.

3. Based on the insights gathered, the objective could be to generate in-depth case studies that provide a comprehensive understanding of the implementation and management process of SAP S/4HANA.

4. To develop recommendations for best practices in implementing and managing SAP S/4HANA within large companies.

- **The selection of SAP consultants** The sample consists of five highly experienced SAP consultants who were selected from a list of SAP consultants with extensive experience in implementing and managing SAP S/4HANA.

- **Justification for selection** The consultants were selected because of their deep expertise and firsthand experience with SAP S/4HANA within the context of the company. Besides, each has an experience with SAP S/4HANA and has been involved in at least one large-scale implementation project within the company. References can be provided to validate their experience. The table 2.1 below provides a comprehensive overview of each consultant's background.

Table 2.1: The Profiles of the Interviewees.

Consultant	Job position	SAP S/4HANA Implementation experience	Interview date	Duration of the interview
Mr. K O	Team Lead	13 years	16/04/2024	20 minutes
Mr K A	SAP Senior Consultant	4 years	04/04/2024	33 minutes
Mr. B M	SAP Senior Consultant	6 years	03/04/2024	40 minutes
Mr. D B	SAP Senior Consultant	13 years	18/04/2024	30 minutes
Mrs. M M	SAP Senior Consultant	3 years	24/04/2024	24 minutes

Source Done by us.

It should be noted that while the insights from these consultants will provide valuable information, their experiences may not represent all SAP S/4HANA implementation scenarios. To mitigate this limitation, the study will also review company reports and industry publications related to SAP S/4HANA implementation.

- **Ethical considerations** All consultants have provided informed consent to participate in the study. Their identities will be kept confidential, and any data collected will be securely stored and used exclusively for the purpose of this research.

In addition to the interviews and insights gathered from SAP consultants, this research includes two key documents in the appendices. The first is a letter confirming the list of CSFs sent to the consultants (**Appendice A**). The second is a list of CSFs identified from previous case studies and research on SAP S/4HANA implementation, contextualized for Algerian companies (**Appendice B**). Readers are encouraged to consult the appendices for a more detailed understanding of more information.

3.2.1.2. Quantitative Data Collection

The next method we utilized to gather quantitative data was questionnaire. Starting by defining it.

➢ **The questionnaire**

In this subsection, we delve into the definition and structure of the questionnaire used for quantitative data collection.

• **Definition of the questionnaire**

One of the most popular tools for collecting data in social science research is the questionnaire. The goal of a questionnaire in research is to obtain relevant data in a way that is both valid and reliable. In research methodology, validity and reliability are considered important components of the accuracy and consistency of the survey/questionnaire [1]. Questionnaires are designed to collect information from participants by presenting a series of questions that may be open-ended, multiple-choice, or based on Likert scales (Our questionnaire case). They are designed to gather specific data related to the research objectives and can be administered in traditional paper-and-pencil format or online[2].

• **Definition of online survey** ROUSE defines an online survey as a questionnaire that the target audience can complete over the Internet. The typical online survey is created as a web form with a database to store the responses and statistical software to provide analytics. Individuals are frequently motivated to complete online surveys through the offer of a prize. [3]

Our study employed an online survey methodology to gather insights from participants involved in the SAP S/4HANA implementation project. In recognition of the diverse roles and perspectives within the project, we developed two distinct questionnaires, one for SAP consultants and one for system users, which were designed to address the specific needs and experiences of each group.

• **Justification of using separate questionnaires** Our study used separate questionnaires for SAP consultants and system users in the SAP S/4HANA implementation project to capture their different perspectives. This approach aims to understand the impact of success factors

---

[1] *TAHERDOOST (2016), Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research, P.28-36.*

[2] *Magen Mhaka Mutepfa and Roy Tapera (2019), "Traditional Survey and Questionnaire Platforms" in Handbook of Research Methods in Health Social Sciences, School of Science and Health, Western Sydney University, Penrith, NSW, Australia, Springer Nature Singapore Pte Ltd. P.544*
[3] *ROUSE M (2013), " Online Survey." Techopedia.https://www.techopedia.com/definition/27866/online-survey. Retrieved 10/05/2024.*

from both perspectives, filling a gap in previous studies that focused only on end users. This provides a more comprehensive understanding of the factors that influence implementation success.

- **Questionnaire for SAP Consultants** SAP consultants typically possess specialized technical knowledge and are closely involved in the design, configuration, and technical aspects of the implementation. The questionnaire for SAP consultants focused on eliciting feedback related to technical challenges, project management issues, and organizational change management strategies.

- **Questionnaire for System Users** Conversely, system users interact with the SAP S/4HANA system on a day-to-day basis, directly experiencing its functionality, usability, and impact on their work processes. The questionnaire for system users aimed to gather feedback on user satisfaction, usability concerns, training effectiveness, and any other factors influencing their experience with SAP S/4HANA.

3.3. Data collection equipment

In conjunction with the qualitative and quantitative data collection methods previously outlined, the selection of appropriate equipment is of paramount importance to ensure the efficacy and accuracy of the research process.

- Equipment for qualitative data collection included essential tools such as notebooks and voice recorders, which facilitated the documentation of detailed insights and observations gathered during interviews with SAP consultants and system users[1].

- For quantitative data collection, electronic survey platforms and paper-based questionnaires were utilized to gather structured responses from participants. Microsoft Forms provided an efficient means of administering surveys to a large sample size, facilitating data collection and analysis.

3.4. The Interview and the questionnaire guide

In this section, we discuss the interview process and the structure of the questionnaire guide utilized in the study.

➤ **The Interview**

---

[1] *Lune, Howard, & Berg, Bruce L. (2017), Qualitative Research Methods for the Social Sciences, Pearson Education Limited, Harlow, Essex.P.87*

The interview process involved contacting experienced SAP consultants and system users to solicit their insights on SAP S/4HANA implementation projects. A personalised email or letter was sent to potential participants, outlining the purpose of the interview, and requesting their participation. Once scheduled, interviews were conducted either in person or remotely, in accordance with ethical guidelines and ensuring confidentiality. During the interview, participants were asked a series of open-ended questions designed to elicit their experiences, perspectives, and challenges related to SAP S/4HANA implementation. (**Appendice C**).

➢ **The questionnaire**

The questionnaire was designed to gather structured feedback from a wider pool of participants, including SAP consultants and system users involved in SAP S/4HANA implementation projects. The questionnaire comprised a series of multiple-choice and Likert scale questions, which addressed a range of topics, including satisfaction levels, challenges encountered, and critical success factors. The questionnaire was administered electronically via platforms such as Microsoft Forms, which facilitated data collection and analysis. (**Appendice D**). Readers are encouraged to consult the appendices for a more detailed understanding of more information.

3.4.1. Choice of questions in the interview and the questionnaire guide

The questions in both the interview and the questionnaire guide were meticulously created to address specific aspects of SAP S/4HANA implementation, ensuring comprehensive coverage of relevant topics. The interview questions were designed to extract in-depth insights and perspectives from participants, while the questionnaire questions were intended to gather quantifiable data on key variables of interest.

3.5. Data presentation and analysis

In this section, we present the qualitative and the quantitative data collected from the study and provide an analysis of the findings.

3.5.1. Quantitative data presentation

As previously stated, the research employed a random sampling approach to ensure a diverse representation from different roles and departments within Company X. Separate questionnaires were utilized for each group of implementation stakeholders. We will now present our sample.

The bar chart represented in graph 2.1 shows the distribution of the 32 individuals in our sample, divided into three categories: SAP consultants, project managers, and others. SAP consultants dominate the sample with about 18 individuals. Project Managers follow with about 7, and the "Other" category includes only 1 person who indicated on the questionnaire that he or she is an AMOA consultant. This suggests a strong focus on SAP consulting within the group.

Graph 2.1: Distribution of implementation team by roles
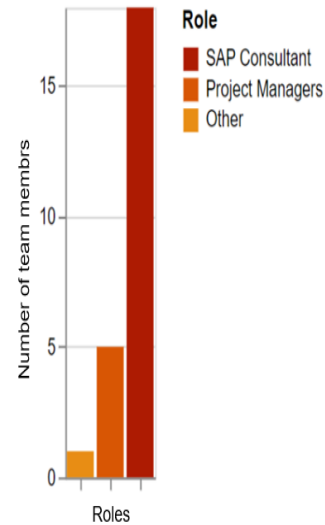
Source *Done by us using the Python library Matplotlib.*

Graph 2.2: Distribution of system users sample by roles.
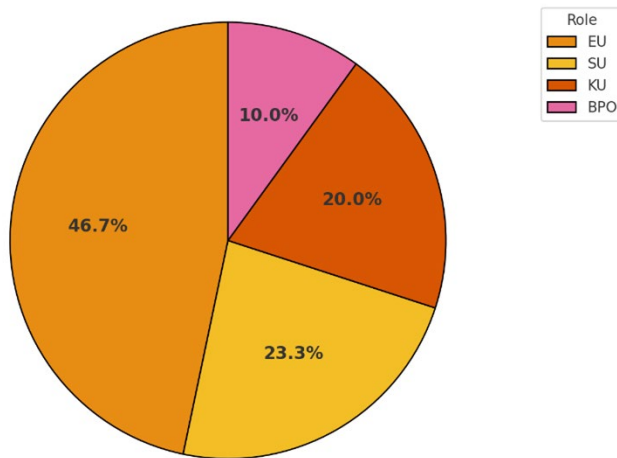
Source *Done by us using the Python library Matplotlib.*

 The pie chart presented below (Graph 2.2) illustrates the distribution of the system users based on their roles (or their relationship with the system). It shows that most participants, 46.7%, are End Users (EU). This is followed by 23.3% who are Super Users (SU), 20.0% who are Key Users (KU), and 10.0% who are BPOs. This distribution indicates that a significant portion of the sample consists of End Users, reflecting a diverse range of experience and roles among the participants.

This bar chart represented in graph 2.3 illustrates the distribution of responses of system users across various streams. HR received the highest number of responses (7), followed by O2C and S2S (5 each). P2P had 4 responses, IN2REP and EHS had 3 each, I2R and FICO had 2 each, and PL2PR had 1. The zero-response category indicates users who did not respond to the questionnaire. This chart highlights the engagement levels within the study sample across different streams.

Graph 2.3: Distribution of system users sample by stream.
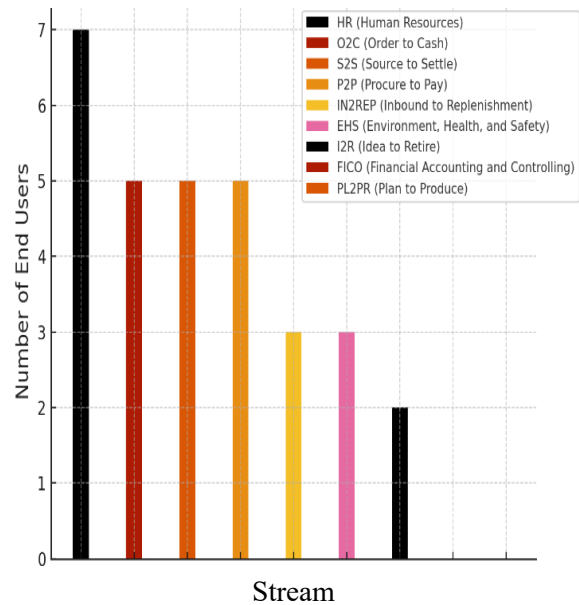
Source Done by us using the Python

Graph 2.4: Distribution of implementation team by experience in SAP S/4HANA project implementation.
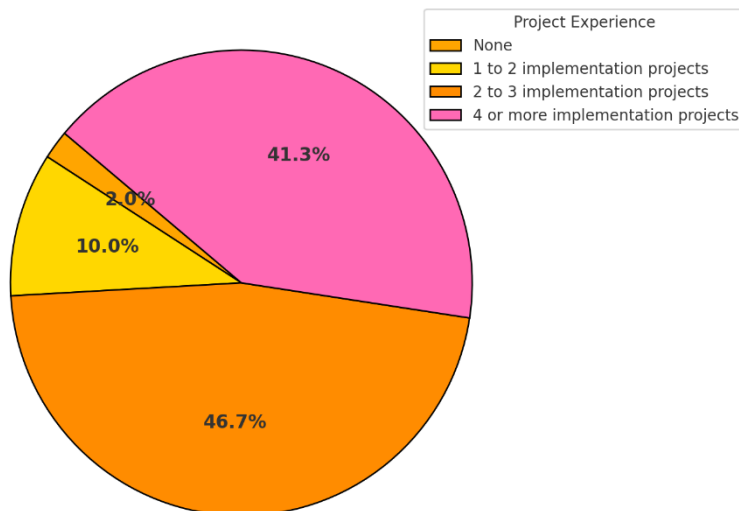
This pie chart presented in graph 2.4 illustrates the distribution of implementations project experience among participants. It is divided into four segments: 2.0% have no experience, 10.0% have 1 to 2 implementation projects, 46.7% have 2 to 3 implementation projects, and 41.3% have 4 or more implementation projects. The percentages are displayed in bold within the chart, and the legend is positioned in the upper right corner for reference.

Source Done by us using the Python library Matplotlib.

The pie chart presented below (Graph 2.5) illustrates the distribution of our study sample (system users) based on the duration of system usage in their roles. It shows that most participants, 40.0%, have been using the system for more than 2 years. This is followed by

26.7% who have been using it for 1 to 2 years, 20.0% for 6 months to 1 year, and 13.3% for less than 6 months. This distribution indicates that a significant portion of the sample has extensive experience with the system, reflecting a high level of familiarity and sustained use among the users.

Graph 2.5: Distribution of system users sample by duration of system usage in their roles.
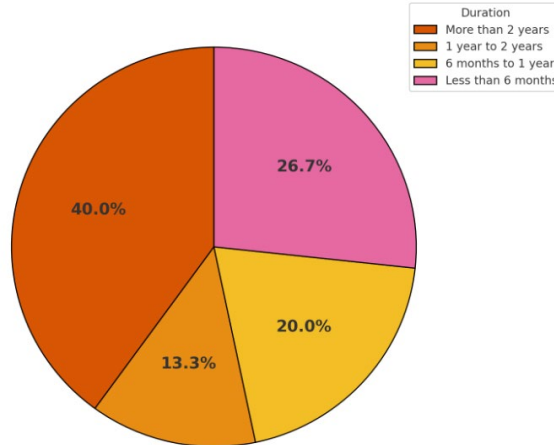
Source Done by us using the Python library Matplotlib.

.

3.5.2. Questionnaire data analysis

To test the hypotheses and analyze the data, we employed Spearman's rank correlation analysis with Python. This approach enabled us to examine the correlations between critical success factors (CSFs) and the success rate of SAP S/4HANA implementation. For each CSF from the questionnaires, we conducted a correlation analysis between the CSF and the success rate. This methodology yielded valuable insights into the relationship between various CSFs and the overall success of SAP S/4HANA implementation in the Algerian market. The Python programming language proved to be an invaluable tool for comprehensively understanding these dynamics.

> **Spearman's simple rank correlation**

There are several tools for bivariate analysis, which examines the relationship between two variables. The choice of tool depends on the nature of the variables. In our study, we analyzed the relationship between SAP S/4HANA ERP implementation success and 11 critical success factors (CSFs), all of which were non-dichotomous and ordinal.[1] Respondents rated their

---

[1] *Bryman, A., & Bell, E. (2011). Business research methods. Quoted" Critical Success Factors in ERP Implementation,The Perspective of the Procurement System User" in p.49*

perceptions on a five-point Likert scale from "Strongly agree" to "Strongly disagree." Given the ordinal nature of the variables, Spearman's simple rank correlation, also known as Spearman's rho (ρ), was used[1].

In our study, Spearman's rank correlation was employed to investigate the relationship between the success of SAP S/4HANA ERP implementation (independent variable) and various critical success factors (dependent variables). This method examines monotonic relationships, which are not necessarily linear. A positive monotonic relationship indicates that as the independent variable increases, the dependent variable also increases, though not always linearly. Spearman's correlation measures the correlation between one independent and one dependent variable. The interpretation of the data is challenging due to the varying perceptions of the Likert scale options, which must be considered in the data analysis.

3.5.3. Quantitative data analysis results

In this section, we present the findings from the correlation analysis of various Critical Success Factors (CSFs) and their impact on success rate of the SAP S/4HANA implementation. This analysis provides a quantitative assessment of the relationships between key factors and the success rate, helping to identify which elements most significantly influence the success of the implementation.

➢ **Correlation analysis results**

The correlation analysis between various Critical Success Factors (CSFs) and the global satisfaction level in the SAP S/4HANA implementation product several key insights. The results are summarized in the table 2.2 below:

Table 2.2: Correlation Coefficients between CSFs and the success rate of the implementation

CSF	Correlation (r)
Top Management Support and Commitment	0.7533
Training and knowledge transfer	0.7466
Project management strategies	0.7373
Level of Dedicated IT Support	0.6716
Clear and Transparent Communication	0.6361
Implementation team composition and skills	0.5310
Business Process Reengineering	0.3147

---

[1] *Ibid.*

End Users Involvement in Decision-Making Process	0.1282
Change management strategies	0.0938

Source *Done by us using the Python.*

Correlation analysis results conducted to key insights into the success factors of SAP S/4HANA implementation are summarized below in table 2.3, highlighting the critical elements that significantly influence implementation success:

Table 2.3: Key Success Factors Influencing SAP S/4HANA Implementation Satisfaction.

CSF	r	Interpretation	Insights
Top Management Support and Commitment	**0.7533**	This is a strong positive correlation. It indicates that strong support and commitment from top management are strongly associated with higher satisfaction levels in the SAP S/4HANA implementation.	Strong top management support is crucial for the successful implementation of SAP S/4HANA, as it ensures resource allocation, strategic alignment, and prompt issue resolution, aligning with literature that emphasizes the importance of executive sponsorship in IT project success.
Training and Knowledge Transfer	**0.7466**	This is a strong positive correlation. Effective training and knowledge transfer significantly contribute to higher satisfaction levels among users.	Effective training programs are essential for high user satisfaction with SAP S/4HANA. Continuous and comprehensive training bridges knowledge gaps, ensuring users are prepared to leverage the new system's capabilities. This finding aligns with studies emphasizing thorough training in ERP implementations to decrease resistance and enhance user competence.
Project Management Strategies	**0.7373**	This is a strong positive correlation, indicating that effective project management strategies are closely linked to higher satisfaction levels in the SAP S/4HANA implementation.	Effective project management strategies are crucial for successful SAP S/4HANA implementation. Thorough planning, clear timelines, risk management, and resource allocation help mitigate issues, ensuring the project stays on track and within budget. Organizations with robust project management practices experience higher satisfaction due to fewer disruptions and predictable outcomes, consistent with literature on ERP implementations.
Level of Dedicated IT Support	**0.6716**	This is a strong positive correlation, indicating that higher levels of dedicated IT support are strongly associated with higher satisfaction levels among users.	Dedicated IT support is vital for successful SAP S/4HANA implementation. Continuous IT support resolves technical issues swiftly, reducing downtime and maintaining system performance, especially during the transition phase. The significant impact of IT support on user satisfaction is reinforced by research highlighting the importance of adequate technical support in ERP implementations.
Clear and Transparent Communication	**0.6361**	This is a strong positive correlation, suggesting that clear and transparent communication significantly contributes to higher satisfaction levels in the SAP S/4HANA implementation.	Clear and transparent communication is essential for managing expectations and keeping stakeholders informed throughout SAP S/4HANA implementation. Effective communication aligns project goals with organizational objectives, facilitates team coordination, and proactively addresses

			concerns. This finding aligns with literature emphasizing the role of communication in minimizing misunderstandings, reducing resistance, and fostering collaboration during ERP implementations.
Implementation Team Composition and Skills	**0.5310**	This is a moderate positive correlation, indicating that the composition and skills of the implementation team are moderately associated with higher satisfaction levels.	The skills and composition of the implementation team are critical for SAP S/4HANA project success. A diverse team can handle various implementation aspects, from technical challenges to change management. While team skills are important, other factors also influence user satisfaction. Investing in a skilled implementation team is essential for navigating ERP project complexities, supported by research on team dynamics in IT projects.
Business Process Reengineering	**0.3147**	This is a weak positive correlation, indicating that business process reengineering has a limited impact on satisfaction levels in the SAP S/4HANA implementation.	Business process reengineering involves redesigning processes to improve efficiency and effectiveness. Although it contributes to project success, it is not a primary determinant of user satisfaction. Other factors, such as user training and support, have a more substantial impact on satisfaction levels. Business process reengineering remains valuable for long-term ERP implementation benefits, as highlighted in the literature.
End Users Involvement in Decision-Making Process	**0.1282**	This is a very weak positive correlation, suggesting that end users' involvement in the decision-making process has a minimal impact on satisfaction levels.	Involving end users in decision-making can foster ownership and reduce resistance to change. However, this involvement is not a significant factor in overall satisfaction with SAP S/4HANA implementation, likely due to the complexity of ERP projects where strategic decisions are made at higher management levels. User involvement should be complemented with comprehensive training and support to enhance satisfaction.
Change Management Strategies	**0.0938**	This is a very weak negative correlation, suggesting that change management strategies have a negligible and slightly negative impact on satisfaction levels.	Change management strategies help organizations transition smoothly to new systems. The weak negative correlation indicates that current change management practices may not effectively contribute to user satisfaction, possibly due to inadequate implementation or unaddressed resistance. Effective change management requires a comprehensive approach, including communication, training, and support, to mitigate resistance and enhance user adoption, as supported by existing research.

Source *Done by us.*

The bar chart shows in the graph 2.6 illustrates the correlation coefficients between various Critical Success Factors (CSFs) and the success rate of SAP S/4HANA implementation projects. The key findings show that effective project management strategies, strong top management support and commitment, and comprehensive training and knowledge transfer are the most influential factors, with correlation coefficients of 0.7533, 0.7466, and 0.7373,

respectively. Dedicated IT support and a skilled implementation team are also significant, with correlation coefficients of 0.6716 and 0.6361, respectively. In contrast, factors such as business process reengineering and change management strategies have a lower impact, indicating the need to prioritize higher-ranked CSFs to achieve successful implementation and high user satisfaction.

Graph 2.6: Correlation Coefficients results between CSFs and the success rate of the implementation.
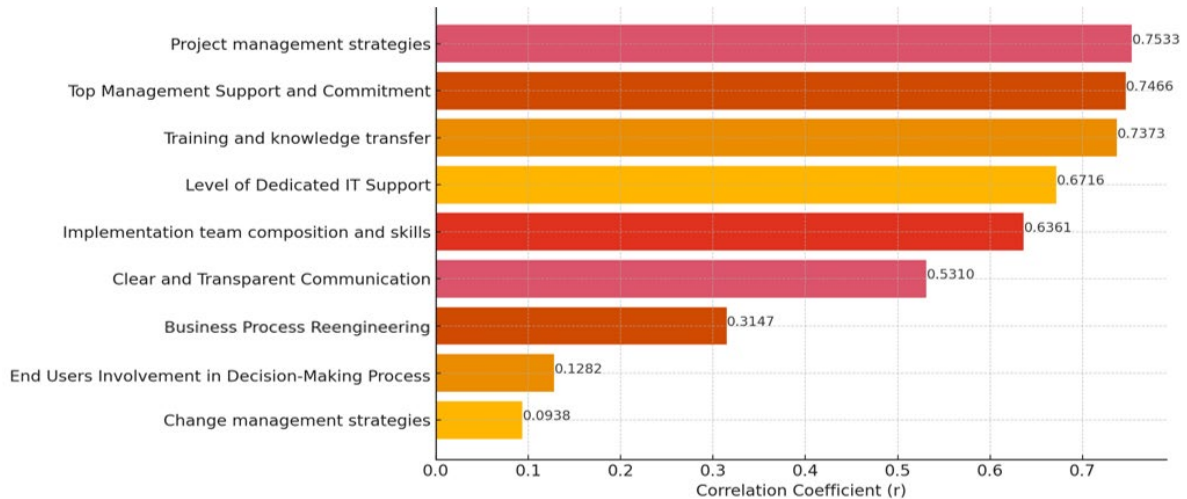
Source Done by us using the Python library Matplotlib.

3.5.4. Qualitative data analysis results

Qualitative data analysis is a systematic examination of non-numerical data with the objective of uncovering patterns and insights. In SAP S/4HANA implementations, the analysis of responses from experienced consultants reveals critical success factors and challenges. This study synthesizes insights from five SAP consultants to identify key elements for successful implementations and offers actionable recommendations for organizations.

The bar chart in Graph 2.7 shows the average ratings of key factors identified by the consultants. The study identified effective project management as the most crucial factor, with an average rating of 4.8. This emphasizes the importance of rigorous planning and agile methodologies. Top management support and clear communication were also identified as crucial factors, with an average rating of 4.6. This indicates their essential roles in resource allocation and stakeholder alignment. The composition and skills of the implementation team were rated at 4.4, which indicates that these are vital for minimizing issues and enhancing

success. It is evident that continuous, hands-on user training, with an average rating of 4.2, is of major importance for the effective utilization of the system.

Graph 2.7: Average Ratings of key factors by SAP Consultants.
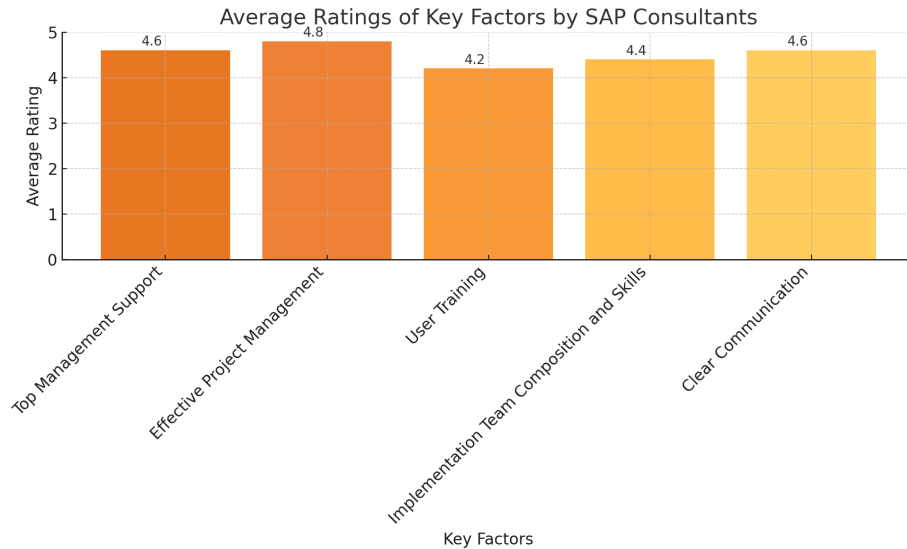
Source Done by us using the Python library Matplotlib.

The word cloud presented in Figure 2.15 clarify the pivotal themes identified by SAP consultants alignment, continuous training, effective implementation, troubleshooting, seamless integration, a skilled team, and robust project management. These elements collectively drive successful SAP S/4HANA implementations, thereby providing actionable recommendations for organizations aiming to optimize their projects.

Figure 2.15: Word cloud of themes identified by SAP consultants.

Source Done by us using the Python library Matplotlib.

Based on the qualitative data analysis of responses from experienced consultants regarding SAP S/4HANA implementations, the word cloud visually below the table 2.4 represents the

critical success factors and challenges identified. Providing an interpretation of the key elements highlighted in the word cloud.

Table 2.4: Interpretation of themes identified by SAP consultants.

Factors	Insights
Alignment	Ensuring that the project's objectives and goals are aligned with the organization's overall strategy is important.
Training	Continuous and hands-on user training is essential to ensure that users can effectively utilize the new system. This is reflected in the importance of 'training' in the word cloud.
Implementation	The process of implementing SAP S/4HANA requires meticulous planning, rigorous project management, and the adoption of agile methodologies.
Troubleshooting	Addressing and resolving issues promptly is key to maintaining project momentum and avoiding delays. Troubleshooting skills are vital for minimizing disruptions during the implementation phase.
Integration	Seamless integration of the new system with existing processes and systems is necessary for a smooth transition.
Team	The composition and skills of the implementation team are of great importance because skilled and well-coordinated team can minimize issues and enhance the overall success of the project.
Continuous	Ongoing efforts and regular assessments are required to maintain project alignment and address emerging challenges.
System	Understanding the technical and functional aspects of the SAP S/4HANA system is fundamental.
Project Management	Effective project management is highlighted as the most crucial factor, emphasizing rigorous planning, risk management, and the use of activate agile methodologies.
Management	Strong management support is essential for securing resources, aligning stakeholders, and driving the project forward.

Source *Done by us.*

3.6. Critical Factors in SAP S/4HANA Implementation Success

The implementation of SAP S/4HANA is contingent upon the deployment of effective project management strategies. The implementation of a comprehensive planning process, accompanied by the establishment of clear timelines, risk management strategies, and the allocation of resources, serves to mitigate potential issues and to ensure that projects remain on track and within budget. It is similarly vital to provide dedicated IT support, which facilitates the prompt resolution of issues, thereby reducing downtime and maintaining system performance during the transition phase.

The establishment of clear and transparent communication channels allows for the management of expectations and the dissemination of information to stakeholders throughout

the implementation process. This facilitates more effective coordination among teams and enables the proactive addressing of concerns, thereby reducing the potential for misunderstandings, and fostering a collaborative environment.

Overall, the project has been a remarkable success, with 80% of stakeholders reporting high levels of satisfaction. This result is due to strong leadership, comprehensive training, effective project management, dedicated IT support, and clear communication. We calculated this based on mid-term data, measuring global system user satisfaction across functionality, usability, performance, support, and training, the radar graph represented in Graph 2.8 illustrates these findings clearly. This comprehensive assessment ensured the system's efficiency, reliability, and ease of use, resulting in high stakeholder satisfaction.

It should be noted that change management programs include training programs and the establishment of clear and transparent communication channels.

Graph 2.8: Factors contributing to the overall satisfaction of the system users.
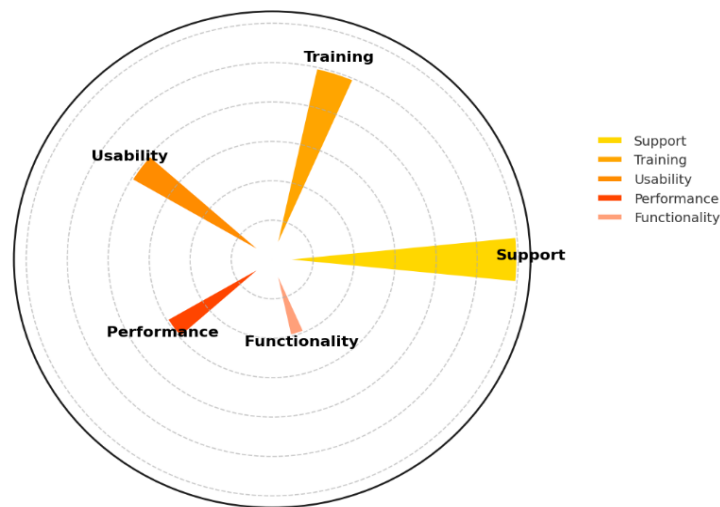
Source Done by us using the Python library Matplotlib.

Conclusion

The methodological approach employed for this research integrated both qualitative and quantitative methods to comprehensively investigate the SAP S/4HANA implementation at Company X. Through in-depth interviews, questionnaires, and data analysis, the study effectively captured the experiences and perspectives of system users and consultants. The findings indicate that training, change management, and clear communication play a significant role in influencing user satisfaction and the overall success of ERP implementations. The

empirical data collected provides substantial support for the hypotheses, thereby establishing a robust foundation for the recommendations and conclusions drawn. This rigorous methodological framework ensures the reliability and validity of the research outcomes, thereby offering valuable contributions to the field of ERP implementation and management.

Having set out the methodological approach and presented the research findings, it is now imperative to integrate these insights into a unified general conclusion that captures our study.

General conclusion

General conclusion

This research focused on implementing SAP S/4HANA within the Algerian market context. The objective was to identify critical success factors (CSFs) influencing the successful deployment of SAP S/4HANA within X company, which were then analysed to provide actionable insights for future implementations.

In the first part of the literature review, we began by discussing the fundamentals of ERP systems and specifically focused on SAP S/4HANA. We explored various aspects of ERP implementations, including the challenges and strategies employed in different organizational contexts. Our focus revolved around the architecture, business benefits, and migration strategies of SAP S/4HANA, as these formed the core subjects of our research.

To carry out our research successfully, we initially chose a mixed-methods approach. This involved both quantitative and qualitative methods, where structured questionnaires were distributed to system users and SAP consultants, followed by semi-structured interviews to gain in-depth insights. The study was conducted with the support of the PwC Algeria AMOA team, the integrator team, and X Company, providing a comprehensive perspective on the implementation process.

By conducting our surveys and interviews, we obtained a comprehensive list of critical success factors. These factors served as the foundation for our subsequent data analysis. They provided a solid framework for evaluating and measuring key aspects of our research. This enabled us to gather data and insights in a systematic and structured manner, facilitating a thorough analysis of the phenomenon under investigation.

In order to answer our research questions, based on a review of prior studies and the findings of our own questionnaires and interviews, we identified a list of determinant CSFs which were Clear digital transformation strategy, Top management support and commitment, Business process reengineering and minimal customization, Project management, Change management program, User training and knowledge transfer, Implementation team composition and skills, Dedicated IT team, Software analysis and testing, Integrator support, and User involvement.

We have three from this list of determinant CSFs included in a hypothesis we had proposed, thereby partially rejecting the first hypothesis. **Hypothesis 01 Effective training, change management strategies, and clear communication positively impact user satisfaction.**

Through our analysis, we found that effective training and clear communication positively impacted user satisfaction, confirming these parts of the hypothesis. However, the correlation for change management strategies was poor, leading us to reject this part of the hypothesis. While the support of the PwC AMOA team and integrator team highlighted that while change management is crucial, its impact varied significantly across different projects, and different stages of the project leading to inconsistent results.

This leads to the verification of our second research hypothesis, which states that **Hypothesis 02 End-user involvement in decision-making processes is crucial for successful implementation.** Our findings rejected this hypothesis, indicating that user involvement in decision-making was critical in the early stages of system implementation but not throughout the entire process. Because we conducted the study in the final stages of the project, the quantitative data did not confirm the hypothesis. Evidence from the PwC AMOA team, the integrator team, and X Company showed that early end-user participation ensured the system met their needs, reducing resistance and increasing satisfaction and acceptance. However, involving end-users later in the project did not significantly affect the overall success of the implementation.

As a result, we can confirm the third and final research hypothesis. **Hypothesis 03 SAP S/4HANA implementation stakeholders perceive factors such as project management, change management programs, and implementation team composition and skills as critical success factors for SAP S/4HANA implementation.** This hypothesis was confirmed through our qualitative data, indicating that these factors are indeed perceived as crucial by the stakeholders involved in the implementation process. The skills and composition of the implementation team, as noted by the PwC AMOA team and integrator team, were essential in navigating the complexities of the SAP S/4HANA implementation. Effective change management strategies, which includes training programs and the development of communication channels, were important. Additionally, strong project management capabilities were essential for handling challenges and delivering successful outcomes. Teams with diverse expertise and robust project management skills were better equipped to ensure the success of the implementation.

The identification of these critical success factors allowed us to establish key recommendations that are relevant to successful SAP S/4HANA implementations. By aligning

these recommendations with organizational goals, companies can ensure smoother transitions and more effective ERP deployments. These recommendations include:

- Ensure comprehensive training for all users on the new system to boost user satisfaction and productivity, and actively engage them in the implementation process to tailor the system to their needs and minimize resistance.

- Maintain transparency and keep all stakeholders well-informed to foster trust and manage expectations effectively.

- Select team members with diverse expertise and robust project management skills to ensure efficient project management.

- Define a clear digital transformation strategy for the company and keep its staff well-informed from the beginning of the digital transformation journey, as this is a crucial step for successful implementation.

- Encourage future learners and job seekers to engage with the universe of information systems, recognizing its pivotal role in the future of business management, and promote the development of multifaceted skills to prepare them for diverse roles within the information systems landscape.

The utilization of a mixed-methods approach in this research allowed us to comprehensively evaluate the SAP S/4HANA implementation by considering multiple factors, thus providing a more accurate understanding of the implementation's success. This approach enabled us to identify specific determinant attributes and translate them into relevant success factors, ensuring the focus was on key metrics aligned with the unique goals and objectives of the organization.

These insights facilitated data-driven decision-making and targeted interventions to optimize efficiency and user satisfaction. Ultimately, our dissertation has provided a better understanding of the critical success factors and key elements essential for successful SAP S/4HANA implementation. By emphasizing effective training, clear communication, user involvement, and skilled implementation teams, organizations can significantly enhance the success rate of their ERP projects.

However, this research is not without its limitations. The limited sample size and specific focus on the Algerian market may restrict the generalizability of the findings. Furthermore, the difficulty in obtaining comprehensive project data from all participants and the variation in the impact of change management strategies highlight the necessity for further investigation into

contextual factors influencing effectiveness. Despite these limitations, the dissertation underscores the importance of critical success factors in ERP implementations and their implications for overall project success and organizational performance.

The involvement of the PwC AMOA team, the integrator team, and X Company has been invaluable in understanding the complexities of SAP S/4HANA implementation. Given that SAP S/4HANA implementations can cost millions of euros, identifying, and understanding these critical success factors from the beginning of the implementation process is incredibly valuable. This foresight can help organizations avoid common difficulties, ensure smoother project execution, and maximize the return on investment.

It is our hope that our modest research will draw attention to the importance of these critical success factors, which are crucial for the successful deployment of ERP systems like SAP S/4HANA. By doing so, we aim to contribute to the body of knowledge that supports more effective and efficient ERP implementations, ultimately benefiting organizations by saving costs and enhancing project outcome.

Bibliography

Books

Avasant (2024). "*SAP S/4HANA Services 2023–2024 RadarView ™*". Avasant, Los Angeles.

Bakde, P., & Gupta, R. (2023*). "SAP IBP for Supply Chain Certification Guide – Application Associate Exam"*. SAP PRESS, Walldorf.

Dean Davison, Richard Cavallaro, Adrienne Capaldo, A Forrester Total Economic Impact™ Study Commissioned by SAP (September 2019), "*The Total Economic Impact™ Of SAP S/4HANA Cost Savings and Business Benefits Enabled by SAP S/4HANA*".

Eric Kimberling, Third Stage Consulting Group LLC. (2018), "*The Definitive Guide to a Successful SAP S/4HANA Digital Transformation*".

Jason Westland (2007), "*The Project Management Life Cycle*" by Jason Westland (A book review by R. Max Wideman), AEW Services, Vancouver.

Hayes, J. (2018). "*The Theory and Practice of Change Management*". Palgrave Macmillan, London.

Kammaje, K. K., & Palavalli, M. K. (2023). *"SAP Extension Suite Certification Guide– Development Associate Exam"*. SAP PRESS, Walldorf.

Kalakota Ravi, Robinson Marcia (1999), "*E-Business Roadmap for Success*", Addison-Wesley, Reading, Mass. Harlow.

Karl M. Kapp, William F. Latham, Henny Ford-Latham (2001), "*Integrated Learning for ERP Success A Learning Requirement Planning Approach*", St. Lucie Press, Boca Raton, FL.

Kloppenborg, Timothy J. (2009), "*Contemporary Project Management*", South-Western CENGAGE Learning, Mason, OH.

Mark N.K. Saunders, Phillip Lews, Adrian Thornhill, (2019), *"Understanding research philosophy and approaches to theory development ", "Research Methods for Business Students"*, Pearson Education, London, United Kingdom

Mohammad A. Rashid, Liaquat Hossain, Jon David Patrick (2002), "*The Evolution of ERP Systems A Historical Perspective"*, Idea Group Publishing, USA.

Monk, E. F., & Wagner, B. J. (2012). *"Concepts in Enterprise Resource Planning."* Boston Cengage Learning.

Musil, J., Santhanam, S., & Denecken, S. (2020). "*SAP Activate*" (2nd ed.). SAP Community Press, Walldorf.

O'Leary, D. E. (2000), "*Enterprise Resource Planning Systems Systems, Life Cycle"*, Electronic Commerce, and Risk, Cambridge University Press, Cambridge.

Pougkas, S. (2023). *"SAP S/4HANA Financial Accounting Certification Guide – Application Associate Exam* ". SAP PRESS, Walldorf.

ROSS Jeanne W. (1999), "The *ERP Revolution Surviving Versus Thriving*", Center for Information Systems Research, Sloan School of Management, Massachusetts Institute of Technology (MIT), USA.

Sanket Kulkarni (2019), "*Implementing SAP S/4HANA A Framework for Planning and Executing SAP S/4HANA Projects"*, Apress Media LLC, Pune, Maharashtra, India.

Saueressig, T., & Maier, P. (2023). *"Business as Unusual with SAP How Leaders Navigate Industry Megatrends"*. SAP PRESS, Walldorf.

Sachan, N., & Jain, A. (2020). *"Warehouse Management with SAP S/4HANA Embedded and Decentralized EWM".* Rheinwerk Publishing, Inc.

Singh, V. (2017), "*Implementing SAP S/4HANA Manage Your SAP Projects with SAP Activate"*, Birmingham Packt Publishing Ltd.

Sven Denecken, Jan Musil, Srivatsan Santhanam (2022), "*SAP Activate Project Management for SAP S/4HANA and SAP S/4HANA Cloud"*, (Second Edition) (SAP PRESS), Rheinwerk Publishing, USA.

Thomas F. Wallace, Michael H. Kremzar (2001), "*ERP Making It Happen The Implementers' Guide to Success with Enterprise Resource Planning"*, Wiley, New York; Chichester.

Journals and Articles

Al-Mashari, M. (2001), "P*rocess Orientation through Enterprise Resource Planning (ERP) A Review of Critical Issues"*, Knowledge and Process Management, Vol. 8 No. 3.

Bryman, A., & Bell, E. (2011). Business research methods.

Byrd, T. A., & Davidson, N. W. (2003), "Examining *Possible Antecedents of IT Impact on the Supply Chain and Its Effect on Firm performance"*, Information & Management, 41(2).

Chen, C., Law, C. & Yang, S. (2009), "*Managing ERP Implementation Failure A Project Management Perspective",* IEEE Transactions on Engineering Management, 56(1).

Dezdar, S., & Ainin, S. (2011), "*The Influence of Organizational Factors on Successful ERP Implementation*", Management Decision, 49(6).

Esteves, J., & Pastor, J. (2001). "*Enterprise resource planning systems research An annotated bibliography. Communications of the Association for Information Systems",* 7(1).

Faraj, S., & Azad, B. (2012). *"The materiality of technology An affordance perspective"*. In Paul M. Leonardi, Bonnie A. Nardi, & Jannis Kallinikos (Eds.), Materiality and Organizing Social Interaction in a Technological World, Oxford University Press, Oxford.

Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., & De Colle, S. (2010). *"Stakeholder Theory The State of the Art"*. Cambridge University Press, Cambridge.

Finney, S., & Corbett, M. (2007), *"ERP Implementation A Compilation and Analysis of Critical Success Factors",* Business Process Management Journal, 13(3).

Francoise, O., Bourgault, M., & Pellerin, R. (2009), *"ERP Implementation through Critical Success Factors' Management"*, Business Process Management Journal, 15(3).

Gene L. Dodaro, Brian P. Crowley (1997), *"Business Process Reengineering Assessment Guide",* United States General Accounting Office, Accounting and Information Management Division, Version 3.

Huang, S. M., Chang, I. C., Li, S. H., & Lin, M. T. (2004), *"Assessing Risk in ERP Projects Identify and Prioritize the Factors"*, Industrial Management & Data Systems, 104(8).

Legare, T. L. (2002), *"The Role of Organizational Factors in Realizing ERP Benefits"*, Information Systems Management, 19(4).

Li Fang Sylvia Patrecia (2005), *"Critical Success Factors for ERP Implementation and Upgrade",* Journal of IT and Business Renewal, Jonkoping International Business School.

Mabert, V. A., Soni, A., & Venkataramanan, M. A. (2003), *"Enterprise Resource Planning Managing the Implementation Process"*, European Journal of Operational Research, 146.

Marnewick Carl, Labuschagne Les (2005), *"A Conceptual Model for Enterprise Resource Planning (ERP)"*, Information Management & Computer Security, vol. 13, no.2. DOI10.1108/09685220510589325.

Motwani, J., Subramanian, R., & Gopalakrishna, P. (2005), *"Critical Factors for Successful ERP Implementation Exploratory Findings from Four Case Studies"*, Computers in Industry, 56(6).

Muscatello, John R., Small, Mark H., & Chen, I. J. (2003), *"Implementing Enterprise Resource Planning (ERP) Systems in Small and Midsize Manufacturing Firms"*, International Journal of Operations & Production Management, vol. 23, no. 7.

Nah, F. F.H., Lau, J. L.S., & Kuang, J. (2001). *"Critical factors for successful implementation of enterprise systems".* Business Process Management Journal, 7(3).

Plant, R., & Willcocks, L. (2007), *"Critical Success Factors in International ERP Implementations A Case Research Approach"*, Journal of Computer Information Systems, 47(3).

Shari Shang, Peter B. Seddon (2000), *"Assessing and Managing the Benefits of Enterprise Systems The Business Manager's Perspective"*, Information Systems Journal, Published online by Cambridge University Press 05 February 2012.

Shaul, L., & Tauber, D. (2013*), "Critical Success Factors in Enterprise Resource Planning Systems Review of the Last Decade"*, ACM Computing Surveys (CSUR), 45(4).

Umble, E., Haft, R., & Umble, M. (2003), *"Enterprise Resource Planning Implementation Procedures and Critical Success Factors"*, European Journal of Operational Research, 146(2).

Venkatesh, V., & Bala, H. (2008). *"Technology Acceptance Model 3 and a Research Agenda on Interventions".* Decision Sciences, 39(2), pp. 273-315.

Yusuf, Y., Gunasekaran, A., & Abthorpe, M.S. (2004), *"Enterprise Information Systems Project Implementation A Case Study of ERP in Rolls-Royce",* International Journal of Production Economics.

Conferences

Ahmed, A., Zairi, M. and Alwabel, S. (2003), "*Global Benchmarking for Internet and E-commerce Applications*", Proceedings of the First International Conference on Performance Measures, Benchmarking and Best Practices in New Economy, Business Excellence 2003. May, University of Minho Guimaraes, Portugal.

Bhatti, T. R. (2005), "*Critical Success Factors for the Implementation of Enterprise Resource Planning (ERP) Empirical Validation*", In the Second International Conference on Innovation in Information Technology.

Holland, C. P., Light, B. and Kawale, P. (1999), *"Beyond Enterprise Resource Planning Projects Innovative Strategies for Competitive Advantage*", Proceedings of the 7th European Conference on Information Systems, Copenhagen Business School, Copenhagen, Denmark. Quoted in Mohamed Zairi, Angappa Gunasekaran.

University Dissertations

ABBAOUI .M, AGHCHMI. R, KABLI. W (2014*), « Enterprise Resource Planning (ERP) »,* Université Mohammed V Agdal, Rabat.

FERHI.S, (2023) *« Elaboration d'un Plan Stratégique pour Améliorer la Rentabilité d'une Entreprise du Minerai de Fer »,* Master's thesis, Ecole Nationale Polytechnique, Algeria.

FROUFE .S (2015*), "Contribution of Logistics Risk Management to the Evolution of ERP (Enterprise Resource Planning) Integrated Information Systems in the Post-Implementation Phase Longitudinal Approach Applied to the Aeronautical Sector",* Université du Havre.

HOADJLI .H (2010), *"An Approach to Integrating Agents into ERP",* Université Mohamed KHIDER, Biskra.

Neupane.G (2020),*" A Project Plan for the Implementation of S/4HANA ",* Thesis Industrial Management, CENTRIA University of Applied Sciences.

SIOUDA. G, *"The Contribution of ERP to Improving Company Management"*, master's thesis, Ecole des Hautes Etudes Commerciales d'Alger (EHEC), Algiers.

SLIMANI. R (2015), *« Le pilotage des changements organisationnels et managériaux induits par l'implantation d'un SMQ et d'un ERP Cas de l'entreprise publique ALCOST Béjaïa »*, University of Béjaïa, Algeria.

Websites

https//www.ey.com/en_us/consulting/intelligence-realized-rethinking-the-sap-s-4hana-transformation

https//www2.deloitte.com/uk/en/pages/digital-transformation/articles/saphana-key-things-to-understand.html

https//www2.deloitte.com/uk/en/pages/consulting/articles/selective-transformation-for-moving-to-sap.html

https//www2.deloitte.com/uk/en/pages/digital-transformation/articles/saphana-key-to-transformation-success.html

https//www.sap.com/insights/erp-implementation-team-structure.html

https//blogs.sap.com/2020/12/08/the-beginners-guide-to-sap-activate-best-practices-guided-configuration-and-sap-activate-methodology

https//experience.sap.com/fiori-design-web/launchpad

https//www.divalto.com/dossier-logiciel-erp/erp-logiciel/logiciel-de-gestion-erp/etapes-logiciel-erp

https//vu.fr/CkNQg

https//www.oracle.com/fr/applications/peoplesoft

https//www.pwc.com/gx/en/services/alliances/sap.html

https//www.sap.com/africa/about/company.html

https//www.sap.com/france/products/technology-platform/hana/what-is-sap-hana.html

https//www.sap.com/france/products/technology-platform/netweaver.html

https//www.sap.com/products/technology-platform/hana/what-is-sap-hana.html

https//www.sap.com/products/technology-platform/netweaver.html

https//www.selecthub.com/erp-software/peoplesoft-vs-sap-erp

https//support.sap.com/content/dam/SAAP/SAP_Activate/S4H_155.pdf

https//www.sastrageek.com/post/asap-methodology

https//cromosit.com.br/what-is-sap-hana-understanding-the-difference-between-sap-hana-and-sap-s-4hana

https//assets.kpmg.com/content/dam/kpmg/ch/pdf/should-we-migrate-to-en.pdf

https//news.sap.com/africa/2021/01/s-4-hana-migration-can-be-an-opportunity-rather-than-a-challenge

https//vu.fr/EVFYJ

https//blog.sap-press.com/sap-s4hana-implementation-best-practices

https//www.softwareconnect.com/erp/history

https//logistique-pour-tous.fr/le-MRP-et-ses-evolutions

Appendices

A. Letter

Subject Request for expertise confirmation on SAP S/4HANA implementation success factors in the context of Algeria

Dear **SAP Consultant name**,

I hope this email finds you well.

I am currently pursuing my master's degree, focusing on SAP implementation projects within the Algerian context. I am reaching out to you due to your extensive experience in SAP implementation projects.

As part of my research and thesis, I have compiled a list of Critical Success Factors (CFS) specific to SAP S/4HANA implementations in Algeria. This list offers a contemporary analysis and addresses the unique challenges and priorities associated with SAP S/4HANA projects in Algeria.

The factors have been categorized based on their priority and impact on project outcomes. My aim is to ensure these factors are aligned with real-world experiences and industry best practices, particularly within the Algerian framework.

Attached to this email, you will find the list of CFSs for your review and feedback. Your expertise and insights will be invaluable in verifying the accuracy and relevance of these factors. Additionally, I welcome any suggestions or insights you may have regarding their classification or any additional factors that should be considered.

Your input will not only enhance the quality of my research but also provide valuable guidance to practitioners and researchers in the field of SAP S/4HANA implementation in Algeria.

Furthermore, I would like to invite you to participate in an interview at your convenience to discuss these factors in more detail and gain deeper insights from your experience. Your participation would significantly enrich the findings of my research.

Thank you for considering my request and for your willingness to contribute to my research. I look forward to your feedback and insights.
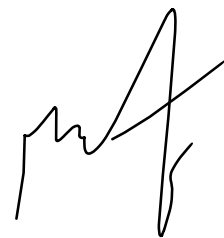
Higher School of management and digital economy

| +213 56 66 20 69 | aghezal_etd@esgen.edu.dz

E-Business

Best regards

GHEZAL Amina

B. CSFs list

الجمهـوريــة الجـزائـريــة الديمقـراطيــة الشعبيــة
Ministry of Higher Education and Scientific Research
وزارة التعليـم العالـي والبحث العلمـي
People's Democratic Republic of Algeria

HIGHER SCHOOL OF
MANAGEMENT AND
DIGITAL ECONOMY

H.S.M.D.E

المـدرسـة العليـــا
للتسـيير والاقـتصـاد
الـرقـمـــــي

Through extensive document analysis, case study reviews, and insightful discussions with SAP consultants, I have compiled a list of critical success factors (CSFs) categorized by priority. I believe that these identified CSFs are essential elements for ensuring the success of any SAP S/4HANA implementation project.

1. Clear digital transformation strategy:

A well-defined strategy that outlines the objectives, scope, and expected outcomes of the digital transformation journey using SAP S/4HANA. This strategy should be aligned with the organization's overall business goals and objectives.

2. Top management support and commitment:

Strong support and commitment from senior management to the SAP S/4HANA implementation project. This includes providing resources, removing barriers, and championing the initiative across the organization.

3. Project management:

Effective project management practices that ensure the SAP S/4HANA implementation stays on track in terms of scope, schedule, budget, and quality. This includes planning, organizing, controlling, and leading the project team.

4. Change management program:

Implement structured processes to manage organizational change resulting from the implementation of SAP S/4HANA. This includes managing resistance, driving buy-in, and ensuring a smooth transition.

5. Dedicated IT team:

After the implementation and when the AMOA team and the integrator team have completed their work, the customer's dedicated IT team takes over the responsibility of supporting and resolving any issues or difficulties that may arise. This internal IT team, composed primarily of super users, plays a critical role in the ongoing support and maintenance of the SAP S/4HANA system.

6. Business process reengineering and minimal customization:

Evaluate and redesign existing business processes to align with SAP S/4HANA best practices, minimizing the need for customizations that can complicate future upgrades and maintenance.

7. Implementation team composition and skills:

Ensure that the implementation team is composed of individuals with diverse skills, including functional, technical, and domain expertise, required for a successful SAP S/4HANA deployment.

8. Open and transparent communication:

Establishing clear communication channels between stakeholders, project teams, and end users to facilitate information sharing, issue resolution, and alignment throughout the implementation process.

9. User training and knowledge transfer:

Provide comprehensive training and support to end users to ensure they have the skills and knowledge needed to effectively use SAP S/4HANA in their day-to-day activities.

10. Software analysis and testing:

Conducting thorough analysis and testing of SAP S/4HANA software to identify issues, validate functionality, and ensure the solution meets the organization's requirements prior to deployment.

11. Vendor support:

Leveraging vendor support from SAP to access expertise, resolve technical issues, and receive guidance throughout the SAP S/4HANA implementation.

12. User engagement:

Actively engaging end users throughout the implementation process to gather feedback, address concerns, and tailor the SAP S/4HANA solution to their specific needs and workflows.

13.SAP S/4HANA success documentation:

I have observed that among the critical success factors for SAP S/4HANA implementations, clear and comprehensive documentation such as project charters, RACI, scoping documents, and business blueprints. Etc are particularly important. These documents serve as foundational elements that ensure transparency, alignment, and successful project outcomes.

C. Interview guide

Interview guide.

Hello, my name is Amina GHEZAL, and I'm currently in my final year of studying e-business at HSMDE-Kolea. As part of my academic journey, I am conducting research for my dissertation titled **'Monitoring the Implementation and Management of SAP S/4HANA within a Large Company.'** This study focuses on understanding the various aspects of implementing and managing SAP S/4HANA within a corporate setting. Your participation in this research is invaluable, and all responses will be treated confidentially. Thank you for your time and contribution.

1. Can you please provide an overview of your experience with SAP S/4HANA implementation projects?
2. Based on your experience, what do you consider to be the most critical success factors for SAP S/4HANA implementation in the context of Algeria?
3. How do you assess the level of top management support and commitment in SAP S/4HANA implementation projects?
4. Could you elaborate on the role of effective project management practices in ensuring the success of SAP S/4HANA implementation projects?
5. From your perspective, what are the key challenges encountered during SAP S/4HANA implementation, and how can they be addressed?
6. How important is business process reengineering and minimal customization in the context of SAP S/4HANA implementation?
7. Can you discuss the significance of user training and knowledge transfer in facilitating successful SAP S/4HANA adoption?

8. In your experience, what role does open and transparent communication play in SAP S/4HANA implementation projects?

9. How do you ensure vendor support and collaboration throughout the SAP S/4HANA implementation process?

10. From your observations, what documentation practices contribute to the success of SAP S/4HANA implementation projects?

I would like to express my sincerest gratitude to all the participants who so generously shared their insights and expertise for this study. Your contributions are of great value and will significantly enhance research on the implementation and management of SAP S/4HANA within a large company. The responses and feedback provided by participants will be subjected to meticulous analysis to yield meaningful and pertinent findings. I would like to express my gratitude once more for your time and invaluable input.

D. Questionnaires

For implementation team

Success Factors in SAP S/4HANA Implementation (C)

25 mai 2024

Welcome to our SAP S/4HANA Implementation Survey! Your insights will help us understand key success factors. Thank you for participating!

1. What is your role in the SAP S/4HANA implementation project? *
- ◯ Project Manager
- ◯ SAP Consultant
- ◯ Autre

2. How many SAP S/4HANA implementation projects have you been involved in? *
- ◯ None
- ◯ 1 to 2 implementation projects
- ◯ 2 implementation projects to 3
- ◯ 4 or more

3. On a scale of 1 to 7, how would you rate the following factors in SAP S/4HANA implementation within ___? *

	1	2	3	4	5	6	7
A clear digital transformation strategy at the beginning of the SAP S/4HANA implementation	◯	◯	◯	◯	◯	◯	◯
Top managment support and commitment	◯	◯	◯	◯	◯	◯	◯
Business process reengineering	◯	◯	◯	◯	◯	◯	◯
The project management strategies	◯	◯	◯	◯	◯	◯	◯
Change management strategies	◯	◯	◯	◯	◯	◯	◯
Clear and transparent communication	◯	◯	◯	◯	◯	◯	◯
Implementation team composition and skills	◯	◯	◯	◯	◯	◯	◯
The software analysis and testing processes	◯	◯	◯	◯	◯	◯	◯
End users Involvement in the decision-making process.	◯	◯	◯	◯	◯	◯	◯
The success of the documentation related to the implementation	◯	◯	◯	◯	◯	◯	◯
Integrator support	◯	◯	◯	◯	◯	◯	◯
Dedicated IT support	◯	◯	◯	◯	◯	◯	◯

5. Were end users adequately trained and educated during the implementation? *
- ◯ Yes
- ◯ No
- ◯ Maybe

For System users

1. EN- What is your stream within the organization? *
FR- Quel est votre rôle au sein de l'organisation ?
- ◯ HR
- ◯ FICO
- ◯ O2C
- ◯ S2S
- ◯ P2P
- ◯ IN2REP
- ◯ EHS
- ◯ PL2PR
- ◯ I2R

2. EN- How long have you been using SAP S/4HANA in your role? *
Fr-Depuis combien de temps utilisez-vous SAP S/4HANA dans le cadre de vos fonctions ?
- ◯ Less than 6 months
- ◯ 6 months to 1 year
- ◯ 1 year to 2 years
- ◯ More than 2 years

3. EN- Please select your role in relation to the SAP S/4HANA system *
FR-Veuillez sélectionner votre rôle par rapport au système SAP S/4HANA
- ◯ BPO
- ◯ SU
- ◯ KU
- ◯ EU

4. EN-On a scale of 1 to 5, how would you rate the SAP S/4HANA implementation in your company, considering following factors? *
FR- Sur une échelle de 1 à 7, comment évaluez-vous la mise en œuvre de SAP S/4HANA dans votre entreprise, compte tenu des facteurs suivants ?

	1	2	3	4	5
The clarity of the implementation strategy	◯	◯	◯	◯	◯
Top management support and commitment	◯	◯	◯	◯	◯
The effectiveness of the communication	◯	◯	◯	◯	◯
the effectiveness of the project management strategies employed	◯	◯	◯	◯	◯
The composition and skills of the implementation and Pwc team	◯	◯	◯	◯	◯
The quality of the implemented system in terms of data accuracy and reliability	◯	◯	◯	◯	◯
The availability and usefulness of documentation related to the SAP S/4HANA implementation	◯	◯	◯	◯	◯
Level of dedicated IT support	◯	◯	◯	◯	◯

5. EN-How satisfied were you with the training and knowledge transfer provided during the implementation? *
FR- Dans quelle mesure avez-vous été satisfait de la formation et du transfert de connaissances dispensés au cours de la mise en œuvre ?

	Not at all satisfied	Moderately satisfied	Satisfied	Very satisfied	Extremely satisfied
Quality of training materials	◯	◯	◯	◯	◯
Clarity of training sessions	◯	◯	◯	◯	◯
Accessibility of training resources	◯	◯	◯	◯	◯
Effectiveness of trainers/instructors	◯	◯	◯	◯	◯
Availability of post-training support	◯	◯	◯	◯	◯
Overall satisfaction with the training experience	◯	◯	◯	◯	◯

6. On a scale of 1 to 5, where 1 indicates the system was very difficult to learn and 5 indicates it was easy, how would you rate the ease of learning to use the SAP S/4HANA system? *
Sur une échelle de 1 à 5, où 1 indique que le système a été très difficile à apprendre et 5 qu'il a été facile, comment évaluez-vous la facilité d'apprentissage de l'utilisation du système SAP S/4HANA ?

1	2	3	4	5

6. How would you assess the composition of the implementation team in terms of competence and balance? *

	Incompetent	Limited Competence	Moderately Competent	Competent	Highly Competent
Skill diversity within the team	○	○	○	○	○
Experience level of team members	○	○	○	○	○
Adequacy of technical expertise	○	○	○	○	○
Ability to collaborate and communicate effectively	○	○	○	○	○

7. Do you have any suggestions for improving future SAP S/4HANA implementations?

Entrez votre réponse

7. EN-On a scale of 1 to 5, please indicate your level of satisfaction with the SAP S/4HANA system?
FR- Sur une échelle de 1 à 5, veuillez indiquer votre niveau de satisfaction à l'égard du système SAP S/4HANA ?

	1-Not at all satisfied	Moderately satisfied	Satisfied	Very satisfied	5-Extremely satisfied
Usability	○	○	○	○	○
Functionality	○	○	○	○	○
The SAP S/4HANA system in meeting your daily tasks and responsibilities	○	○	○	○	○

8. EN-Did you notice any changes in business processes ? *
FR- Avez-vous constaté des changements dans les processus opérationnels?

1	2	3	4	5

9. EN-What technical challenges have you encountered while using SAP S/4HANA? (Select all that apply) *
FR- Quels sont les défis techniques que vous avez rencontrés lors de l'utilisation de SAP S/4HANA ? (Sélectionnez toutes les réponses qui s'appliquent)

- [ ] Internet connectivity issues
- [ ] Slow system performance
- [ ] System crashes or freezes
- [ ] Difficulty accessing or navigating the system
- [ ] Errors or bugs within the software
- [ ] Security concerns
- [ ] Lack of technical support
- [ ] Autre

10. EN-What other challenges have you encountered while using SAP S/4HANA?
FR- Quels sont les autres défis que vous avez rencontrés lors de l'utilisation de SAP S/4HANA ?

Entrez votre réponse

11. EN-Were potential risks and issues adequately addressed during the implementation? *
FR- Les risques et problèmes potentiels ont-ils été traités de manière adéquate au cours de l'implémentation ?

- ○ Yes
- ○ No
- ○ Maybe

12. EN-Based on your experience, would you recommend the SAP S/4HANA system to others, with 1 being 'Not at all likely' and 5 being 'Extremely likely'? *
FR-Sur la base de votre expérience, recommanderiez-vous le système SAP S/4HANA à d'autres personnes. 1 signifiant " Pas du tout probable " et 5 signifiant " Extrêmement probable " ?

1	2	3	4	5

13. EN-How would you rate the success of the SAP S/4HANA implementation project at your company? *
FR- Comment évaluez-vous la réussite du projet de mise en œuvre de SAP S/4HANA dans votre entreprise ?

1	2	3	4	5

Glossary

Term	Description
SAP Fiori	SAP Fiori is a user experience (UX) designed for SAP customers to enhance their interaction with various SAP solutions. All SAP Fiori apps are built using SAPUI5, a UI development toolkit for HTML5 that provides a consistent programming model for both desktop and mobile applications.
ABAP	It's a high-level programming language developed by SAP for building business applications in the SAP environment. It allows developers to create and modify SAP applications to meet specific business requirements.
Third-party integrations	The incorporation of software or services developed by external vendors into the SAP system.
Business processes	Business processes in SAP are predefined sequences of tasks aimed at achieving specific objectives within the system. These processes guide users through standardized workflows, facilitating. effective resource utilization and operational excellence.
End to end.	In the context of business processes, "end-to-end" signifies the full lifecycle or journey of a process, holding all its stages, steps, activities, and interactions from beginning to end.
Agile project management	Agile project management means applying Agile principles to SAP implementation projects.

Table of Contents