ACCELERATING BUSINESS TRANSFORMATION OF ENTERPRISES BY LEVERAGING SAP

by

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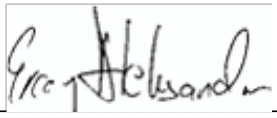

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Dedication

"Do not lower your goals to the level of your abilities. Instead, raise your abilities to the height of your goals.

You are the creator of your own destiny."

- *Swami Vivekananda*

This thesis is dedicated to my father, Late Ranajit Banerjee, who provided me the required confidence by believing on me. He unconditionally supported me in my journey for all aspects. To my mother, Kalpana, who gifted me the innovative and growth mindset gene along with a fighting spirit. My elder sister, Kakali, who has always supported me passionately in my ventures. My soulmate, Putul, who lets me do what I love and gives the required space for trying out what I want. She has always provided me courage to live life without fear and consciously act on my potential. And lastly and most importantly, to both my sons, Prithwijit and Sourajit, who motivate me to keep on competing and always inspire me to contribute more.

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ABSTRACT

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Debajit Banerjee
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Ever-transforming IT environment, increasing cloud-based applications triggering enterprises to embrace changes to adopt business transformation to stay market relevant. This transformation poses significant challenges, particularly for enterprises that have been operating complex and cumbersome legacy business systems on-premises for years. Even for those with smoothly running SAP implementations, the shift to private or public cloud environments presents its own set of difficulties. Business transformation involves a series of internal and external changes, which a company undergoes - leveraging digital technologies as per the market demand to a more agile, optimized manner. Enterprises aim to standardize, harmonize, and consolidate various business processes and system landscapes to deliver business value effectively and efficiently – without many disruptions. This paper highlights the challenges faced by enterprises when considering changes to their established legacy or SAP system landscape due to business transformation initiatives. A sincere effort made here also on how enterprise can leverage systematic approach using proposed frameworks smoothen their transformation journey using modern product/technology/service advancement from SAP.

Keywords
Enterprise, SAP, ERP, Implementation, Technology, Business Transformation

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CHAPTER I:

INTRODUCTION

1.1 Introduction

"Change is the only constant in life. One's ability to adapt to those changes will determine your success in life." — Benjamin Franklin.

This is so true even for businesses in today's dynamic world. Every industry is distinctive and has unique requirements of its' own - whether it is business processes, operations, customer-base, etc. To remain competitive in the market, businesses adopt the required changes to embrace the technology inventions and innovations on last decades. Even lot of businesses had to transform due to the recent pandemic times. Business transformation is a change management strategy which can be defined as any shift, realignment or fundamental change in business operations or processes. It attempts to align people, business process and technology of an enterprise more closely with its business strategy and vision. And this transformation, including communication, transportation, media, entertainment, healthcare, retail, manufacturing, etc. paving towards the way for how we live in the future! Digital transformation is not necessarily about digital technology, but about the fact that technology, which is digital, allows people to solve their traditional problems. And they prefer this digital solution to the old solution (Patel, 2019). Digital optimization is the process of using digital technology to improve existing operating processes and business models (Patel, 2019). In fact, digital transformation is business transformation. Some prefer to use term digital business transformation, which is more accurate as it places greater emphasis on the business aspects of the transformation (Lozic, 2019).

SAP is a highly known and recognized name in Enterprise Resource Planning (ERP) software and is considered among the best in last 50 years. SAP can be treated as an "all-in-one" solution that enterprises use to maintain all of its business operations and

processes. In today's connected world, most of companies are global and they are using SAP technologies and solutions to manage their businesses. SAP provides industry-specific solutions for almost all niches – manufacturing, finance, service, sales, human resources, retails, insurance, media & entertainment, pharmaceuticals, healthcare, etc. The full process of an SAP implementation — from project preparation to go live and support relatively time-consuming and costly in nature. As SAP deals with the organization's business critical data and can be customized as per their business processes & requirements – sometimes it may turn into more complex. According to the industry belief, if any organization running their businesses on SAP, it is pretty hard to bring any modernization. This paper highlights the modernization challenges along with the possibilities and options of business transformation by creating innovative solutions using cutting-edge SAP and non-SAP technologies and solutions.

1.2 Research Problem

Ever-transforming IT environment, increasing cloud-based applications triggering enterprises to embrace changes to adopt business transformation to stay market relevant. The challenges are huge where enterprises running complex and cumbersome legacy business systems for years – moreover running on-premises. The challenges are also existing where SAP is implemented, existing business process is running smooth already and now the business want to move in private/public cloud environment. Business transformation is the process of undergoing multiple internal and external changes, which a company undergoes - leveraging digital technologies as per the market demand to a more agile, optimized manner. Each enterprise wants to standardize, harmonize, and consolidate the various business processes and the system landscape to bring business value effectively and efficiently. This paper highlights the challenges faced by enterprises when considering changes to their established legacy or SAP system landscape due to business transformation initiatives. The problem to be addressed through this study is - using a proven systematic approach and a proposed framework, how enterprise smoothen their

business transformation journey by leveraging the modern product/technology/service advancement from SAP.

1.3 Research Purpose and Questions

Business transformation is relatively a pretty complex process that enterprises undertake to achieve their full potential, adapt to changing environments, and create value.

Enterprise-wide transformations are difficult to execute successfully. Research by McKinsey shows that less than a third of transformations achieve their goals in improving organizational performance and sustaining those improvements over time.

Enterprises often struggle with cultural change. Existing organizational culture can hinder digital transformation efforts. Additionally, adapting to new technologies requires upskilling employees and addressing skill gaps.

Most of the enterprises grapple with outdated legacy systems and complex technology stacks. Transformations that focus solely on new processes and technology without addressing legacy infrastructure risk siloed working practices and ineffective operating models.

Implementing agile methodologies can be challenging. Enterprises need to shift from traditional project management approaches to agile practices, which requires a mindset shift and new ways of working.

As customer expectations evolve, enterprises must adapt their customer experience strategies. Failing to keep up with changing customer demands can hinder transformation efforts.

Sometimes, budget constraints can play a big role in SAP implementation. Limited budgets can restrict investments in technology and talent needed for successful transformation.

Business leaders can play a crucial role in driving transformation. However, engagement levels among leaders and employees can vary, affecting the overall success of the initiative.

In summary, there is a need for a better understanding of how SAP's modern technologies and features can address the basic issues of an enterprise and a structured approach in identifying and addressing challenges to ensure a successful business transformation for global enterprises. More specifically, the following research questions need to be addressed:

1. What are the typical challenges faced by Enterprises for their SAP projects?
2. What are the current industry practice as well as research/technology advancements can be adopted by the business for their transformation?
3. What are the modern SAP products/technologies/services trigger or can help Enterprises for their business transformation?
4. How to address and resolve the challenges with a systematic approach and proposed framework for a successful business transformation leveraging SAP?

1.4 Significance of the Study

Due to the dynamic business scenario along with the rapid growth in information and technology, the need for business transformation for any enterprise is intensifying. And this is true for small-medium-big-large enterprise as well as for almost all industry or sectors throughout the world. With the market demand, lot of enterprises started their business transformation journey but at the same time, several enterprises are still hesitated to start. These trends are obvious owing to manifold dependencies - whether it is from country/industry regulations or about the uncertainties of possible business disruptions on the new way of working while current business running smooth. For example, several manufacturing or financial institutions or banking industry are always super cautious about business transformation.

Most of the enterprises generally use SAP as their main business critical system. But SAP implementation can vary due to their business processes and models. At the same time, there will be some common issues - inefficient business processes, handling change management, dilemma of selecting technology platforms/solutions, evaluating service

integrators, cost overruns, project management issues, etc. This study will be significant in identifying all these aspects and help the enterprises to meticulously plan, start, and execute their business transformation journey. This study focuses on bridging these gaps in the existing literature by examining the case studies and best practices leveraging toward a best possible framework approach for the business transformation journey for enterprises worldwide.

CHAPTER II:

REVIEW OF LITERATURE

2.1 Necessity and Trends of Business Transformation of Enterprise

A business is the coordinated endeavor of individuals or groups to create goods or services and offer them in a market to meet the needs or desires of consumers. Business involves a variety of activities and processes aimed at producing, selling, and exchanging goods and services for profit. It encompasses a broad spectrum of functions such as manufacturing, marketing, finance, operations, and management. Businesses can range from small sole proprietorships to large multinational corporations. The main objective of any business is to generate revenue and achieve profitability by delivering valuable products or services to customers.

In earlier civilizations, business transactions were conducted through various means, reflecting the economic and social structures of the time.

One of the earliest forms of trade was the barter system, where goods and services were exchanged directly without the use of money. This system was prevalent in ancient societies where money had not yet been developed or was scarce. In ancient Mesopotamia, barter was a common practice, with goods such as grain, livestock, and textiles exchanged for other goods or services.

As civilizations advanced, the use of currency became more common. In ancient Egypt, for example, the use of coins made of precious metals such as gold and silver facilitated trade and commerce.

Early civilizations developed trade routes that connected different regions, facilitating the exchange of goods over long distances. For example, the Silk Road was a network of trade routes that connected China with the Mediterranean region, allowing for the exchange of silk, spices, and other goods (Polanyi, 1957).

In Greece and Rome, early forms of banking and financial systems emerged, including lending, money-changing, and the issuance of promissory notes.

These practices laid the foundation for modern business practices and contributed to the development of complex economies and societies (Kuznets, 1971).

Traditional businesses operate mainly in physical locations such as stores, offices, factories, or warehouses. They rely on face-to-face interactions to conduct business transactions.

On the contrast, E-businesses, operate mainly online through websites, social media, and other digital platforms.

In today's rapidly evolving business environment, characterized by digital disruption, changing customer expectations, and globalization, enterprises must undergo significant transformations to remain competitive.

Necessity of Business Transformation

- Digital Disruption: The rise of digital technologies has disrupted traditional business models, requiring enterprises to transform their operations to adapt to new ways of doing business.
- Changing Customer Expectations: Customers expect seamless, personalized experiences, forcing enterprises to transform their operations to meet these demands and stay relevant in the market.
- Globalization: Globalization has increased competition and market complexities, necessitating enterprises to transform their operations to expand into new markets and adapt to diverse regulatory environments.
- Emerging Technologies: Technologies such as artificial intelligence, blockchain, and the Internet of Things are reshaping industries, compelling enterprises to transform their operations to leverage these technologies and gain a competitive edge.
- Operational Efficiency: Business transformation can lead to significant improvements in operational efficiency, enabling enterprises to reduce costs, streamline processes, and deliver products and services more quickly to market.

Trends in Business Transformation

- Digitalization: Enterprises are increasingly adopting digital technologies such as cloud computing, big data analytics, and digital marketing to improve efficiency and customer engagement (Nadkarni & Prügl, 2021).
- Agile and DevOps Practices: Agile methodologies and DevOps practices are becoming mainstream in enterprise IT departments, enabling enterprises to respond quickly to changing market demands (Senapathi et all, 2019).
- Artificial Intelligence and Automation: AI and automation technologies are revolutionizing business processes, enabling enterprises to automate repetitive tasks, improve decision-making, and enhance customer experiences (Acemoglu & Restrepo, 2018).
- Ecosystem Collaboration: Enterprises are forming partnerships and collaborations with other organizations to create value-added ecosystems, enabling them to access new markets, technologies, and talent.
- Sustainability: Sustainability is becoming a key driver of business transformation, with enterprises focusing on environmental, social, and governance (ESG) factors to drive long-term value creation (Müller & Pfleger, 2014).

Business transformation has become imperative for enterprises to stay competitive in the digital age. This research paper explores the necessity of business transformation and identifies key trends shaping the future of transformation for the large enterprises who are using SAP Technologies. This paper will also try to derive a framework for successful business transformation.

2.2 Transformation in SAP Technologies and Solutions

SAP is a global leader in enterprise software, providing innovative solutions to help businesses of all sizes and industries succeed in the digital economy. With its focus on innovation, customer success, and corporate social responsibility, SAP continues to be a driving force in the digital business transformation of large enterprises worldwide.

Before discussing the SAP's impact to other businesses – let's have a look at how transformation triggers within SAP itself.

SAP SE is a German multinational software corporation, headquartered in Walldorf, Germany, and was founded in 1972 by five former IBM employees. SAP stands for "Systeme, Anwendungen und Produkte in der Datenverarbeitung," which translates to "Systems, Applications, and Products in Data Processing" in English.

SAP is best known for its ERP (Enterprise Resource Planning) software, which helps organizations streamline their business processes, such as accounting, human resources, procurement, sales & distribution, etc. on a unified platform. Over the years, SAP has expanded its product portfolio to include solutions for CRM (Customer Relationship Management), SCM (Supply Chain Management), BI (Business Intelligence), and more, serving businesses of all sizes and industries.

SAP's flagship product, SAP S/4HANA, is an intelligent ERP suite that leverages in-memory computing to enable real-time processing of large volumes of data, helping businesses make faster, more informed decisions. SAP has also made significant investments in cloud computing, offering a range of cloud-based solutions through its SAP Cloud Platform.

SAP offers a range of business software and enterprise applications that are designed for applications, analytics, cloud, mobile, and database and technology operations. It serves clients in the areas of consumer products, oil, gas and energy, financial services, aerospace and defense, transportation, and logistics, chemicals, government, healthcare, higher education and research, media, real estate, retail, and telecommunications.

Today, operating in over 180 countries, SAP is serving more than 440,000 customers. The company is committed to helping organizations become intelligent enterprises by leveraging cutting-edge technologies such as AI, machine learning, and IoT to drive innovation and business transformation. Recently, in 2022, SAP completed 50 years in business - let's have a deep dive on transformation on the product/service portfolio and business strategy of SAP.

SAP's strategy is to help every business run as an intelligent, sustainable enterprise. As a market leader in enterprise application software, SAP helps companies of all sizes and in all industries run at their best: SAP customers generate 87% of total global commerce. SAP helps give people and organizations deep business insight and fosters collaboration that helps them stay ahead of their competition. With a global network of customers, partners, employees, and thought leaders, SAP helps the world run better and improve people's lives.

The following table clearly describes about the continuous technological improvement from SAP into their product and services to address the dynamic business & market scenario.

Table 01. *SAP Product Portfolio with Released Timeline*

Year	Product/Service	Product/Service Details
1973	Financial Accounting	Launched Financial Accounting System – RF, where R standing for "real time".
1975	Material Management	Material Management system RM/1 released.
1980	Sales & Distribution	RV, a custom development for Sales & Distribution
1981	SAP R/2	SAP R/2 launches
1986	Human Resource Management	SAP's software for human resources management is released to customers.
1989	ABAP/4	SAP launches the ABAP/4 programming environment.

1989	SAP for Utilities	The first SAP industry solution – for utilities – goes live.
1992	SAP R/3	SAP releases SAP R/3 to the market.
1993	-	SAP R/3 is ported to Sun hardware, enabling it to run on all relevant RISC platforms.
1994	-	The SAP R/3 System is released for Windows NT
1996	-	IBM's AS/400 platform supported by SAP
1996	-	SAP goes online. SAP launches its joint Internet strategy with Microsoft. Through open interfaces, customers can now connect online applications to their SAP R/3 systems.
1999	mySAP.com	mySAP.com revolution combines e-commerce solutions with SAP's ERP applications on cutting-edge Web technology.
2003	mySAP Business Suite	It is a bundle of business applications that provide integration of information and processes, collaboration, industry-specific functionality and scalability.
2004	SAP NetWeaver	SAP NetWeaver technology enables SAP to offer fast, open, and flexible business applications that support end-to-end business processes – on SAP and non-SAP systems.
2006	SAP All-in-One SAP Business One	SAP released SAP All-in-One and SAP Business One for midmarket.
2006	Duet	SAP and Microsoft present Duet - enables user to connect Microsoft Office applications quickly and easily with SAP-based business processes.

2007	SAP Business ByDesign	SAP unveils SAP Business ByDesign, a product tailored to the needs of small and midsized enterprises and SAP's first on-demand solution.
2009	SAP Business Suite 7	SAP unveils this software suite designed to help businesses optimize their performance and reduce IT costs.
2011	SAP HANA	SAP launches SAP HANA database. SAP's in-memory computing vision is now reality.
2013	SAP Business Suite on SAP HANA	This works only on SAP HANA and can't work with any other vendor's database; mitigating the limitation of those DBs and exploring 100% of the SAP HANA capabilities.
2015	SAP S/4HANA	SAP S/4HANA is the next generation of enterprise software with a new business suite. The SAP Fiori user experience (UX) for mobile devices and SAP HANA Cloud Platform for the Internet of Things also available for customers.
2017	SAP Leonardo	SAP Leonardo brings together differentiating software capabilities in machine learning, the Internet of Things (IoT), Big Data, analytics, and blockchain on SAP Cloud Platform, together with SAP experience, deep process and industry knowledge, and advanced design thinking methodology.
2018	SAP C/4HANA	The SAP Customer Experience suite, C/4HANA is next-generation CRM on cloud.
2020	SAP Business Technology Platform	SAP's industry cloud is the innovation platform and space where customers and partners build industry cloud solutions and applications that complement

		the intelligent suite built on SAP Business Technology Platform.
2021	RISE with SAP	RISE with SAP, a single offering that provides a path to the Intelligent Enterprise for every customer, no matter where they are starting from or how complex their scenario. Offered on a subscription basis, it features one point of contact for service-level agreements, operations, and support for an accelerated move of core ERP processes to the cloud.
2022	SAP Build	SAP Build is a low-code solution and a key component of SAP Business Technology Platform (SAP BTP), allows users with limited technical expertise to create enterprise apps, automate processes, and design business sites with an easy drag-and-drop interface.
2023	SAP Datasphere	SAP Datasphere is a comprehensive data service built on SAP BTP that enables every data professional to deliver more-seamless and scalable access to mission-critical business data. SAP Datasphere is the next generation of SAP Data Warehouse Cloud. It runs in every cloud and against hybrid environments.
2023	Generative AI assistant Joule	SAP launches Generative AI assistant Joule.

The transformation of technologies and solutions in SAP products and services has been significant over the years. SAP, as a leader in enterprise software, has evolved its offerings to keep pace with technological advancements and changing business requirements. Here are some key transformations:

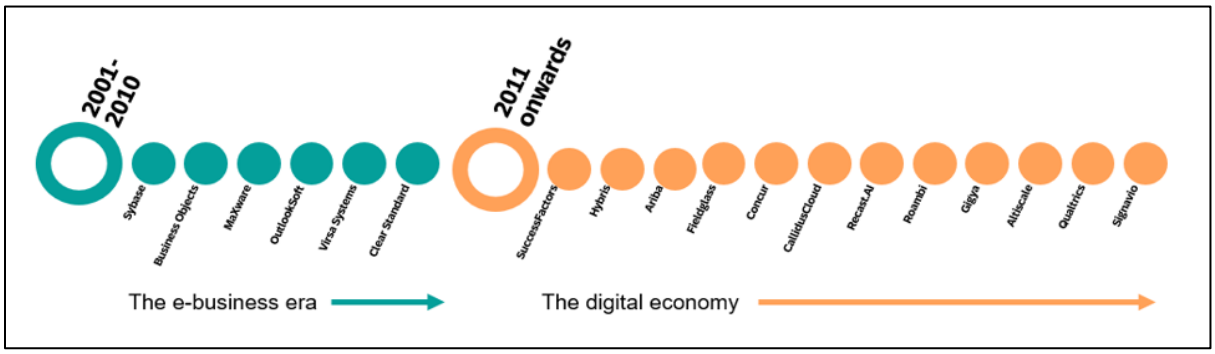
- **Move to Cloud:** SAP has shifted its focus towards cloud-based solutions. SAP Cloud Platform (SCP), later renamed as SAP Business Technology Platform (BTP) provides a platform-as-a-service (PaaS) offering, enabling customers to build, deploy, and manage applications in the cloud.
- **S/4HANA:** SAP has transitioned its ERP suite to SAP S/4HANA, a modern digital core that leverages in-memory computing for real-time processing. This allows businesses to simplify the IT landscape and processes, enabling them to make faster, more informed decisions.
- **Intelligent Enterprise:** SAP has been integrating intelligent technologies such as artificial intelligence (AI), machine learning (ML), and Internet of Things (IoT) into its solutions. This helps customers drive innovation, automate processes, and gain deeper insights from their data.
- **Industry-specific Solutions:** SAP has developed industry-specific solutions to cater to the unique needs of various industries. These solutions are tailored to address specific challenges and requirements, providing customers with a more comprehensive and effective solution.
- **Integration and Interoperability:** SAP has focused on improving the integration and interoperability of its solutions. This includes offering open APIs, pre-built integrations with third-party applications, and a unified data model to ensure seamless connectivity and data exchange.
- **User Experience:** SAP has made significant improvements to the user experience of its solutions. The SAP Fiori design language has been introduced to provide a consistent and intuitive user interface across all SAP applications, enhancing usability and productivity.
- **Digital Supply Chain:** SAP has expanded its portfolio to include solutions for the digital supply chain. This includes solutions for supply chain planning, logistics, and asset management, helping businesses optimize their supply chain operations and improve efficiency.

The large enterprises leverage the SAP technologies and continuous innovations for their own business growth.

Acquisitions help businesses by providing access to new markets, expanding product offerings, increasing market share, achieving cost efficiencies, accessing talent and innovation, diversifying risk, and enhancing shareholder value. SAP has made 52 acquisitions across sectors such as SaaS, Enterprise Tech - US, Enterprise Tech - Europe and others. The company has spent over $43B for acquisitions.

During the e-business era, real-time went online. SAP established e-business solutions that ran on Web technology, enabling cross-company collaboration.

And the tenure of the digital economy, SAP invested on modern technologies which enables real-time data access and helps redefine collaboration in business networks.



More Information: https://www.sap.com/investors/en/why-invest/acquisitions.html

Figure 01. *SAP's Major Acquisitions in last two decades*

Each acquisition has contributed to SAP's growth and transformation into a leading provider of enterprise software solutions.

Partnerships can be a strategic tool for businesses looking to expand their reach, capabilities, and competitive advantage. However, successful partnerships require clear goals, mutual trust, effective communication, and alignment of interests between the partners. SAP has formed numerous partnerships with technology companies, consulting

firms, and other organizations to enhance its product offerings, expand its market reach, and drive innovation. Some of SAP's key partnerships include:

Table 02. *Some Key Partnerships of SAP*

Partner(s)	Partnership details with SAP
Microsoft	SAP and Microsoft have a longstanding partnership, collaborating on various initiatives such as integrating SAP solutions with Microsoft Azure cloud services, enabling customers to run SAP applications on Azure.
Apple	SAP and Apple having a partnership to combine powerful native apps for iPhone and iPad with the cutting-edge capabilities of the SAP HANA platform. The joint effort delivers an SAP Cloud Platform SDK for iOS, along with a training academy, so that developers, partners, and customers can easily build native iOS apps on SAP Cloud Platform or BTP, thus providing access to core data and business processes on SAP S/4HANA.
IBM	SAP and IBM have partnered on several fronts, including cloud services, analytics, and digital transformation. IBM provides infrastructure and services for SAP applications and has integrated its technologies with SAP offerings.
Intel	SAP has partnered with Intel to optimize SAP applications for Intel's hardware platforms. This partnership has focused on improving performance and scalability of SAP solutions.
AWS	SAP has partnered with AWS to offer SAP solutions on the AWS cloud platform. This partnership has enabled customers to deploy SAP applications on AWS infrastructure.
GCP	With Google, SAP offers SAP solutions on the GCP platform. This partnership has focused on integrating SAP applications with Google Cloud services.
Cisco	SAP has partnered with Cisco to integrate SAP solutions with Cisco's infrastructure and networking technologies. This partnership has focused on enabling digital transformation and IoT initiatives.

Accenture	SAP has a strategic partnership with Accenture, a global consulting and technology services company. Accenture provides implementation, consulting, and managed services for SAP solutions.
Capgemini	Capgemini, a consulting and technology services company, provides implementation, consulting, and managed services for SAP solutions, with a focus on digital transformation and innovation.
Deloitte	SAP has a partnership with Deloitte, a professional services firm. Deloitte provides consulting, implementation, and managed services for SAP solutions, focusing on digital transformation and cloud migration.

More Information: All SAP Partners - https://sapinsider.org/vendor-showcase/

These partnerships have been instrumental in driving SAP's growth and enabling its customers to innovate and transform their businesses.

SAP has undergone a transformation to become a more agile, innovative, and customer-centric organization, offering a range of solutions to help businesses succeed in the digital economy. SAP has transformed its technologies and solutions to meet the evolving needs of businesses in the digital age. By embracing cloud, AI, IoT, and other technologies, SAP has positioned itself as a leader in enterprise software, helping businesses innovate, grow, and succeed in a rapidly changing world.

2.3 Classic SAP Implementation and Corresponding Challenges of Business Transformation

SAP has always been a major player in the business world. It provides 25+ industry-specific solutions used by many top companies including Apple, Walmart, Amazon, etc. As the largest ERP vendor in the world, SAP provides services all around the world. Hence, SAP plays significant role for the business transformation for large enterprises.

Business transformation can be explained as a strategic and intentional process undertaken by organizations to fundamentally change their business models, processes, and

operations to achieve a significant improvement in performance, competitiveness, and value creation.

For a successful SAP implementation, it enhances and redesign business processes to eliminate non-value-added activities and allow enterprises to focus on core and truly value-added activities. For instance, IBM has used ERP to reduce the processing time for updating pricing data from 80 days to 5 minutes. Chevron has used ERP to decrease its annual purchasing cost by 15%. The above examples have dramatically increased the efficiency and productivity of their businesses.

The change of the IT system is a major challenge for the business environment, the possibilities offered being diverse, the choice of the best solution being made after a broad analysis of the existing processes and how they can be adapted to the new working modes like cloud environments. SAP has attempted to combine the need for companies to change with their desire to have an ERP system that is suited to requirements.

There is a strong surge in cloud adoption as more and more companies embrace digital or business transformation to become more agile, especially after the pandemic time. But legacy systems are the backbone of heterogeneous IT landscape of most organizations which have been in business for many years. Legacy systems are often customized, and tailor made which makes it cumbersome and increases the complexity in implementing the same features which the business doesn't want to discard (Gaur, 2020).

SAP can change an organization's structure by the creation of new business processes and the reorganization of functional areas. Although the implementation may have taken years to complete, the total system change may feel sudden, and the organization becomes "paralyzed rather than energized" (Wall & McKinney, 1998, p.3).

SAP implementation is a complex process that demands specialized expertise, extensive resources, precise configuration, and strategic planning. The risk of SAP implementation increases along with the size of the enterprise – if the implementation spread across geography. Due to the complexities, the SAP implementation is commonly surrounding with cultural barriers, possibly with high failure rates.

According to The Gartner Group, 70 percent of all ERP projects fail to be fully implemented, even after three years (Gillooly, 1998).

As per the survey done, the projected statistics reveal astonishing facts on SAP implementations.

- 35% of the projects are successfully completed.
- 45% are unsuccessful either due to budget overrun or unable to deliver the required functionality within the stipulated time frame, or else completely fail to deliver.
- 20% of the projects are cancelled prior to the completion stage.

Most implementation projects fail due to lack of understanding the technology, lack of skills, lack of seasoned project manager, and/or lack of understanding customer requirements. Also lack of clarity in scope, budget, schedule, planning, and lack of solution validation, stakeholder responsibilities, etc. contributes for the SAP implementation project failure.

One of the major reasons of the above failure is the common understanding – “digital transformation does not just mean digitizing the existing one. The symbiosis between the physical and digital world (digital + physical = digical) provides completely new opportunities for value creation in all business spheres." (Rigby & Tager, 2014).

The challenges commonly encountered during classic SAP implementations can significantly impact the success of an SAP project.

Apart from the underestimating the time and effort required for SAP implementation, inadequate planning and preparation can lead to project delays and unexpected roadblocks. Insufficient allocation of skilled resources (both internal and external) can hinder progress. Even vague or constantly changing project scope can cause delays and budget overruns.

Effective communication with employees about the SAP implementation is often neglected. Failure to engage key stakeholders early can result in misunderstandings and resistance. Users need to understand the benefits of the new system. Lack of involvement

can lead to reluctance. Employees may resist adopting new processes due to fear of change or lack of awareness. Managing the change process is very critical.

Regarding technical area - data migration is the most crucial and complex part. Incorrectly migrated data can cause errors and disrupt operations. Ensuring data consistency and integrity during migration is critical.

Employees need proper training to use the new SAP system effectively. Inadequate training leads to user frustration and inefficiencies – which can hinder adoption. Different user roles require tailored training programs. Lack of post-implementation support affects user confidence.

Budget and timeline overruns are one of the major challenges for business transformation. SAP implementations can be expensive and time-consuming. Unexpected challenges and scope changes contribute to overruns. Unforeseen expenses (e.g., hardware upgrades, additional licenses) impact budgets. Technical glitches, customization challenges, or resource shortages cause project delays.

Addressing these challenges requires a holistic approach, involving effective project management, stakeholder engagement, and continuous monitoring. Organizations must adapt to changing circumstances and prioritize user adoption for successful SAP implementations.

2.4 Approach Framework of Successful Business Transformation leveraging SAP

Business Transformation changes the foundations of each company from its strategy, structure, and culture to different processes, through the capabilities and potential of digital media and the Internet.

Achieving successful business transformation is a multifaceted process that requires careful planning, strategic alignment, and effective execution. At the beginning of an international or global project, senior management must proactively determine the overall rollout strategy. This approach prevents complications that may arise from a gradual, incremental implementation.

At first, it is required to develop a clear and compelling vision for the transformation that aligns with the organization's strategic objectives (Kotter, 2012). Project team should define a comprehensive strategy that outlines the key initiatives and milestones required to achieve the transformation goals (Cameron & Green, 2015). It is a must to develop a detailed implementation plan that outlines the key milestones, timelines, and resource requirements for the transformation (Worley & Lawler, 2010).

For any successful business transformation – it must be ensured that leaders are visible and accessible, and that they communicate the importance of the transformation to all stakeholders (Cameron & Green, 2015). There should be always secure commitment from senior leadership of the organization to actively champion the transformation efforts. As per the stakeholder engagement, clear communication of the vision and benefits of the transformation to stakeholders to gain their buy-in and commitment (Kotter, 2012).

Process Optimization and System Configuration are the major milestones for any SAP implementation. Carefully identify and streamline existing processes to align them with best practices and SAP standards and then configure the SAP system to meet the organization's specific business requirements, ensuring that it supports key business processes and workflows.

Next step is Data Migration and Integration. Proper experts need to be involved to develop a data migration strategy to transfer data from legacy systems to the new SAP system (Somers & Nelson, 2001). Then integrate the SAP system with other systems and applications within the organization to ensure seamless data flow and communication (Somers & Nelson, 2001).

Testing/Validation and Quality Assurance play significant roles in SAP implementation. Project team should ensure that it meets the organization's requirements and functions as expected through proper testing. For that, better to implement a quality assurance process to identify and address any issues or defects in the SAP system before go-live.

As per the Training and Knowledge Transfer, comprehensive training to employees on how to use the new SAP system effectively is a must. Ensure that employees have the

necessary skills and knowledge to leverage the full capabilities of the SAP system in their daily work (Cameron & Green, 2015). A comprehensive change management plan will help to addresses the cultural and organizational changes required for successful SAP adoption (Worley & Lawler, 2010).

During SAP Go-Live and Post-Implementation Support, proper planning is highly required for launching the SAP system in a controlled manner, ensuring minimal disruption to business operations. Ongoing support and maintenance after go-live, including addressing any issues or concerns that arise are must for successful business transformation (Worley & Lawler, 2010).

It is always better to set clear benchmarks and metrics to track the progress and effectiveness of changes. Continuously assess performance against these standards to pinpoint improvement opportunities and implement required modifications (Kotter, 2012).

In the realm of business transformation, modernizing SAP ERP systems is akin to navigating a ship through uncharted waters. The beacon guiding this journey is often SAP S/4HANA, a new generation in the lineage of SAP Business Suites. It brings with it smoother sailing—streamlined transactions and simplified data flows — along with enhanced user experiences and innovative functionalities.

At the heart of successful deployment lies a crew committed from top to bottom: executives steering firmly at the helm (Business-Led Programs) while all hands are on deck ensuring that every ounce of value is extracted right from when sails are first hoisted (Benefits Management). Charting out proactive routes for Data Migration Planning ensures no valuable cargo goes overboard. Meanwhile, strong program governance acts like an experienced captain keeping watch over holistic delivery.

As we venture further into digital realms, harnessing cloud capabilities becomes essential; it's like catching favorable winds with advanced analytics that propel organizations forward faster than ever before. This urgency transforms into action especially among seasoned sailors—the users familiar with older versions who now must swiftly adapt their maps (upgrade strategies).

When orchestrating large-scale implementations – the tools such as PMI or Scrum can pinpoint which will best keep the transformation journey with right guidance leveraging Agile frameworks within Scrum methodologies.

Addressing the challenges requires a comprehensive approach that includes strong leadership, effective communication, sound project management, effective change management, and collaboration between business and IT teams. Successful SAP implementations focus not just on technology but also on people, processes, and organizational culture to drive business transformation effectively - minimizing disruptions to operations.

CHAPTER III:

RESEARCH PROPOSAL

3.1 Research Methodology and Data Collection Procedures for the Study

Business transformation is relatively a pretty complex process that enterprises undertake to achieve their full potential, adapt to changing environments, and create value.

Enterprise-wide transformations are difficult to execute successfully. Research by McKinsey shows that less than a third of transformations achieve their goals in improving organizational performance and sustaining those improvements over time.

Enterprises often struggle with cultural change. Existing organizational culture can hinder digital transformation efforts. Additionally, adapting to new technologies requires upskilling employees and addressing skill gaps.

Most of the enterprises grapple with outdated legacy systems and complex technology stacks. Transformations that focus solely on new processes and technology without addressing legacy infrastructure risk siloed working practices and ineffective operating models.

Implementing agile methodologies can be challenging. Enterprises need to shift from traditional project management approaches to agile practices, which requires a mindset shift and new ways of working.

As customer expectations evolve, enterprises must adapt their customer experience strategies. Failing to keep up with changing customer demands can hinder transformation efforts.

Sometimes, budget constraints can play a big role in SAP implementation. Limited budgets can restrict investments in technology and talent needed for successful transformation.

Business leaders can play a crucial role in driving transformation. However, engagement levels among leaders and employees can vary, affecting the overall success of the initiative.

So, keeping the above points in mind, mixed method approach - which is a combination of Qualitative and Quantitative research has been leveraged as research methodology for this study.

Qualitative research mainly focuses on those attributes of the entities and supports those methods and logics which are based on human understanding with observations and the respondents are evaluated in their natural background (Silverman, 2016). To achieve research objectives, a grounded theory approach has been followed in this study.

Whereas quantitative research sets out to analyze the data for trends and relationships from the gathered data using some sort of measurement. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

Quantitative data collection methods used in this study:

- Surveys - List of closed or multiple-choice questions that is distributed to a respondent in person or over the phone.

Qualitative data collection methods used in this study:

- Interviews - Asking open-ended questions verbally to respondents in person or online.
- Literature review - Articles already available in public domain from the industry-leading Enterprises.

In this research, starting with survey to find out the overall trends, followed by interviews and literature review - to better understand the reasons behind the trends.

Table 03. *Distribution of the respondents for the Survey*

Sl.#	Survey Respondents	No.	Percentage (%)
1.	**Age:**		
	< = 30 years	21	37.5%
	31 – 45 years	23	41.07%
	> 45 years	12	21.42%
2.	**Education:**		
	High School/Vocational	5	8.93%
	Bachelor	34	60.71%
	Post-Graduate	17	30.36%
3.	**Working Experience:**		
	< = 8 years	15	26.79%
	9 – 20 years	28	50.0%
	> 20 years	13	23.21%
4.	**Title / Position:**		
	Staff	25	44.64%
	Consultant / Manager	22	39.29%
	Head of Department	9	16.07%

Survey questions form has designed in such a way that responses can be collected from end users' perspective about their implementation or transformation experiences. The comprehensive survey form is attached in the appendix area of this study. To date, 56 survey responses have been collected from 49 organizations globally. As described in Table 03, the comprehensive distribution ensures a robust and reliable set of findings, reflecting diverse perspectives and experiences across multiple dimensions. It enhances the validity of the study by ensuring that the sample is representative of various age groups and professional backgrounds.

Age-wise distribution of the respondents

≤ 30 years: 21 respondents (37.5%) - This group represents younger professionals who are early in their careers. They bring fresh perspectives and are often more adaptable to new technologies and methodologies.

31 – 45 years: 23 respondents (41.07%) - This age group typically includes mid-career professionals who have substantial experience and are often in leadership or managerial roles. They balance innovative approaches with practical experience.

> 45 years: 12 respondents (21.42%) - These respondents are usually senior professionals with extensive experience. They provide deep industry insights and strategic vision.

Educational background-wise distribution of the respondents

High School/Vocational: 5 respondents (8.93%) - This segment includes individuals with foundational education, often bringing practical skills and hands-on experience.

Bachelor: 34 respondents (60.71%) - The majority of respondents hold a bachelor's degree, indicating a solid educational background that supports their professional roles.

Post-Graduate: 17 respondents (30.36%) - This group has advanced degrees, reflecting a higher level of expertise and specialization in their fields.

Years of working experience-wise distribution of the respondents

≤ 8 years: 15 respondents (26.79%) - These respondents are relatively new to the workforce, bringing fresh ideas and contemporary knowledge.

9 – 20 years: 28 respondents (50.0%) - This group represents experienced professionals who have a significant amount of industry experience and are often in key decision-making roles.

> 20 years: 13 respondents (23.21%) - These respondents have extensive experience, often holding senior positions and providing strategic direction.

Position or responsibility-wise distribution of the respondents

Staff: 25 respondents (44.64%) - This category includes employees who are typically involved in day-to-day operations and execution of tasks. They provide insights into the practical aspects of business processes.

Consultant / Manager: 22 respondents (39.29%) - These respondents are in advisory or managerial roles, responsible for overseeing projects and teams. They offer perspectives on management practices and strategic implementation.

Head of Department: 9 respondents (16.07%) - This group consists of senior leaders who head various departments. They provide high-level insights into organizational strategy and leadership.

The above variations of the respondents of the conducted survey are very much important in research because they offer a flexible and dependable method of gathering crucial data.

The interviews were conducted to gather insights on leadership, business operations, and industry-specific challenges. Table 04 summarizes the data collected from interviews with top executives across various industries. The table includes details on the industry, employee strength, interviewee role, areas of expertise, and the length of each interview.

Table 04. *Data Collection from Enterprise's Top Executives Interview*

Industry	Employee Strength	Interviewee Role	Interview Area(s) of Expertise	Length of Interview
Hi-Tech	15000	CTO	Leadership	40 mins.
Manufacturing	600	General Manager, Operation	Leadership	65 mins.
Information Technology & Services	450	Co-Founder	Leadership, Sales & Business Development	45 mins.
Hotel and Service Industry	750	Co-Founder and CEO	Leadership	35 mins.
BPO and Staffing	325	Sr. Director, Client Services	Customer Relationship Management	60 mins.
Agriculture	570	CFO	Finance	50 mins.
Travel and Tourism	250	Managing Partner	Leadership	40 mins.
Retail	2300	General Manager, IT	Information Technology	35 mins.
Information Technology & Services	1200	Director, IT	Information Technology	45 mins.
Textile Manufacturing	880	Director, HR	Human Resource	55 mins.

Ten interviews so far have been conducted offline or online mode between November'2023 and August'2024, based upon semi-structured guideline described in Table 05. This detailed explanation of the semi-structured interview guideline provides a comprehensive framework for collecting and analyzing data from top executives.

Table 05. *Semi-Structured Guideline for Interview Protocol*

Sl.#	Section	#	Questions
1.	General Information	i	About the interviewee (Name, Title/Position, Years in the profession)
		ii	About the organization (Industry, Location, No. of Employees)
		iii	Details of Transformation vision; Usage of ERP, Legacy and SAP Systems
		iv	Understanding of Business Transformation, SAP Implementation, SAP Product & Services
2.	Design and Implementation Strategy	i	Approach, model and current status of Transformation
		ii	Implementation Partner - In-house or outsourced - Vendor selection; Option of Hyperscalers
		iii	Role of Founder/CEO/CTO with regards to Business Transformation and SAP Implementation
		iv	Implementation type - department/function/organizational level; On-premises, Public, Private or Hybrid Cloud; IaaS/PaaS/SaaS
3.	Processes	i	Feasibility study for all the prospective changes & corresponding impact due to the difference between AS-IS and TO-BE processes
		ii	Decision on Phase-wise/Big-bang implementation approach along with cut-over processes
		iii	Responsibility & communication method establishment between different vendors, stakeholders - what, who, when and how
		iv	Adoption of required Supplier/Partner/Vendor processes with the organization business process and simulation testing

4.	Data Management	i	Data capture, Data categorization, Data cleansing, Data ingestion, Data consolidation and Data visualization
		ii	Define the process for collection, management, storage, integration of business data between the systems
		iii	Implementation of Data High Availability and/or Disaster Recovery depending upon the business demand; regular testing
		iv	Establish the Data Backup & Restoration strategy as per the industry standard
5.	Driving Value	i	Discussion on the major drivers for embracing SAP for the business transformation
		ii	Pressure from Stakeholder and Senior Management
		iii	Does the business process/functionality provide you with a competitive advantage in the marketplace?
		iv	If you do not have this functionality as it stands today, will it negatively impact your customers/business?
6.	Culture	i	Support from executives/organizational culture (or even geography specific culture)
		ii	Openness to new ideas and systematic approaches that challenge status quo
		iii	Enabling the Cloud mindset throughout the organization if you are moving to cloud
		iv	Level of empowerment - how decision making, and issue resolution will be managed, and timeliness will be enforced
7.	Challenges and Barriers	i	Most pressing issues you are dealing with in regard to Business Transformation

		ii	How to determine which elements of the businesses can utilize standard SAP and which processes are business critical and may need development to support?
		iii	Barriers to adoption/implementation; Buy-in from other functions/leadership
		iv	Qualified critical thinkers, Defining the Ownership and Roles/Responsibility Matrix
8.	Privacy and Security	i	Laws, Regulations and Compliance practices with regards to Industry, Business Transformation
		ii	How to handle Data Privacy and Security concerns for the organization itself during Technical Implementation?
		iii	Define the process of Ethical usage of Customer data for business analytics; proper decommissioning process after offboarding
		iv	Buy-in from Compliance office/CTO and CSO Office

This way, all relevant business transformation and SAP implementation issues will be covered in order to arrive at sound and thoughtful research findings. The table shows a semi-structured guideline applied for interviewing top executives of several enterprises. It consists of 8 major parts in order to highlight different aspects of the interview, through which comprehensive insights will be derived from business transformation and SAP implementation. The description of each part along with the contents is provided as follows:

1. General Information

i. About the interviewee: Retrieves basic information like interviewee's name, title/position, and experience years in the profession. This information will give a context and background of the responses.

ii. About the organization: Provides details regarding the organization about its industry, location, and the number of employees. This provides a contextual background for the insights from the interviewee.

iii. Details of Transformation vision: Explores the organization's vision for transformation, including the usage of ERP, legacy systems, and SAP systems. This helps in understanding the strategic direction and technological landscape.

iv. Understanding of Business Transformation: Assesses the interviewee's understanding of business transformation, SAP implementation, and SAP products and services. This ensures that the interviewee's insights are informed and relevant.

2. Design and Implementation Strategy

i. Approach, model, and current status of Transformation: Investigates the approach and model adopted for transformation and the current status of the project. This provides insights into the strategic planning and execution phases.

ii. Implementation Partner: Examines whether the implementation is handled in-house or outsourced, including vendor selection and the option of using hyperscalers. This highlights the collaboration and resource management strategies.

iii. Founder/CEO/CTO Involvement: Whether top executives like the Founder, CEO, or CTO played a role in the business change and SAP implementation process. This demonstrates leadership involvement.

iv. Implementation Approach: Determines if the implementation covered a particular department/function and organizational level or was hosted on-premises or public/private/hybrid cloud; also, IaaS/PaaS/SaaS. This provides detailed technical and operational information around the implementation.

3. Processes

i. Feasibility study: Analyzes the feasibility of the potential changes and the impact of the differences between the AS-IS and TO-BE processes. It is therefore practical and beneficial.

ii. Implementation approach: The choice between a phase-wise or big-bang implementation approach and the cut-over processes are defined. This affects the rollout strategy and risk management.

iii. Accountability & communication: This defines the methods of communication and accountability among various vendors and stakeholders, stating what, who, when, and how. This ensures proper coordination is clearly understood.

iv. Implementation of processes: This views the supplier/partner/vendor processes in terms of how they are implemented within the organization's business processes and the simulation testing involved. This ensures compatibility and efficiency.

4. Data Management

i. Data processes: Data capture, categorization, cleansing, ingestion, consolidation, and visualization are all included under data processes. This assures data quality and usability.

ii. Data integration: Data integration defines processes for collecting, managing, storing, and integrating business data between systems. It ensures the smooth flow and accessibility of data.

iii. Data High Availability and Disaster Recovery: Data high availability and disaster recovery involve strategies for regular testing. This assures reliability in data and business continuity.

iv. Data Backup & Restoration: Implements data backup and restoration procedures as per industry best practices. This will ensure protection and recovery of data.

5. Driving Value

i. Key drivers: Identifies the key drivers for SAP implementation to support business transformation. This would indicate the reasons and the expected benefits.

ii. Stakeholder pressure: Looks into the pressure from stakeholders and top management. This would indicate the force from both internal and external sources.

iii. Competitive advantage: Checks if the business process/functionality gives a competitive advantage. This checks the strategic significance of the transformation.

iv. Impact on business: Looks into the negative impact on customers/business due to the lack of functionality implementation. This underlines the need for transformation.

6. Culture

i. Executive support: Checks support from the executives and the organizational culture, including geography-specific culture. This checks the cultural readiness for transformation.

ii. Newness: This examines the readiness for new ideas and systematic approaches to the challenge of status quo. It measures the innovation climate.

iii. Cloud mindset: If a company decides to go to the cloud, this allows for an overall cloud mindset throughout the organization. It helps maintain alignment with cloud strategies.

iv. Empowerment: The examination here includes empowerment in decision-making and issue resolution. The enforceability of timeliness is also checked. This is measuring organizational agility.

7. Challenges and Barriers

i. Key problems: Indicates the most critical issues about business transformation. This shows the important issues.

ii. Standard vs. critical processes: It determines which business processes can use standard SAP and what business elements are critical and may require development. It provides a balance between standardization and customizations.

iii. Barriers to adoption: It analyzes barriers to adoption/implementation and buy-in from other functions/leadership. This indicates resistance points.

iv. Critical thinking and roles: Explains the requirement for competent critical thinker and defines the ownership/roles/responsibility matrix. This ensures effective governance and liability.

8. Privacy and Security

i. Practices on compliance: Explores any law, regulation, or practice on compliance related to industry and business transformation. This ensures legal and regulatory adherence.

ii. Data Privacy and Security: Relates to how data privacy and security could be handled during technical implementation. This ensures data protection.

i. Ethical Standard: Clearly defines how customer data, collected for business analytics, are used ethically and proper decommissioning post their departure in the system.

iv. Compliance,CTO&CSO Buy-in-Internal Process: Look at the process of compliance office,CTO and CSO; This helps in getting integrated on security as well as a rule or set compliance policy.

Attempts are being made to ensure the appropriate diversification across organizations in terms of industry (hi-tech, hotel & service, travel & tourism, manufacturing, retail, technology services, agriculture, etc.), roles of the interviewees being Co-Founder, CEO, CTO, CFO, General Manager, Director, etc. and the size of organizations ranging from 250 to 15000 employees, areas of expertise of the interviewees - Leadership, IT, Finance, HR, etc. This is aimed at reducing bias.

The CTO spoke to the strategy of leadership in a large-scale hi-tech organization on innovation and technology management. The General Manager talked about operational leadership and efficiency improvements in managing production processes in a mid-sized manufacturing firm. The Co-Founder talked about the experience of leading a tech startup, speaking to sales strategies and business development in the IT services sector. The CEO shared insights on leadership perspectives in the hospitality industry, speaking to customer service and operational excellence. The Senior Director discussed techniques for managing client relationships and servicing delivery in the BPO sector. The CFO shared insights on financial management and strategic planning within the agriculture industry. The Managing Partner shared leadership strategies and challenge in the travel and tourism sector. The General Manager spoke to the management of IT and digital transformation initiatives in an enormous retail organization. The IT Director shared his knowledge about strategy, infrastructure management, and technology adoption in the industry of IT services. The Human Resource Director spoke about human resource management, acquiring talent, and engaging employees in the textiles manufacturing industry.

This detailed breakdown of the interviews highlights the varied range of industries, roles, and expertise covered in the study. It provides a comprehensive understanding of the leadership and operational challenges faced by top executives in different sectors, contributing valuable insights to the research.

Quantitative or qualitative data by itself is not enough-it cannot prove or demonstrative anything. Data must be analyzed to show its understanding in relation to the research questions.

3.2 Data Analysis

Quantitative or qualitative data on its own is not sufficient-it cannot prove or be demonstrative of anything. Data needs to be analyzed in order to demonstrate one's understanding of it with regard to the research questions.

The enterprises, based on the survey criteria, have been segregated into five groups depending on their employee strength:

Less than 1000: 9 Nos.: This includes enterprises having less than 1000 employees.

1001-5000: 10 Nos.: This includes enterprises that have between 1001 to 5000 employees.

5001-10000: 13 Nos.: This range includes enterprises with 5001 to 10000 employees.

10001-50000: 18 Nos.: This category includes enterprises with 10001 to 50000 employees.

50000+: 6 Nos.: this category includes enterprises having more than 50000 employees.

This data indicates that there is a right-skewed distribution of enterprises with respect to employee strength. This shows that the number of enterprises will be higher with lesser employee strengths and vice versa. Economic factors, such as ease of entry barriers, government support, and niche market focus, may be some reasons for the prevalence of SMEs. Market structure, competition, and consumer demand can determine enterprise size. For example, technology and manufacturing industries may have more large enterprises, while service and construction industries may be highly dominated by small businesses.

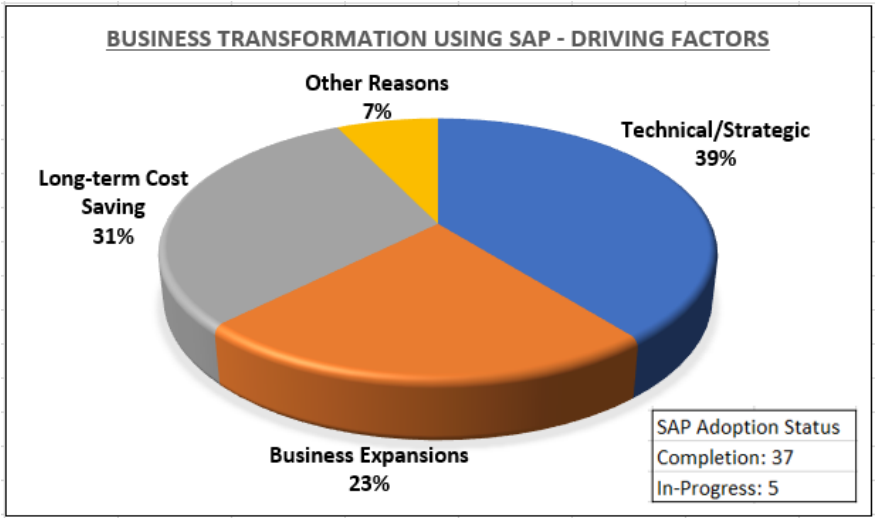


Figure 02. *Survey Results – Business Transformation using SAP – Driving Factors*

The pie chart shows that businesses adopt SAP for technical, strategic, cost-saving, and growth-related reasons.

It gives the understanding from the provided SAP Adoption Status information that completion is 37 and in-progress 5, indicating a pretty good number of SAP adoptions out of the total 56 survey respondents.

The largest share, 39%, indicates that technical and strategic considerations are the main driving factors for adopting SAP. Strong and scalable solutions offered by SAP can facilitate business processes and enhance operational efficiency. It offers a comprehensive suite of modules that can cater to various business needs, from finance and HR to supply chain and customer relationship management. SAP's integration capabilities allow businesses to connect different systems and data sources, improving data visibility and decision-making.

After the above category, the next one contributes 31% to the pie chart, indicating that businesses expect significant cost savings in the long run by using SAP. SAP can automate tasks and reduce manual efforts, hence saving costs in the long run. It can improve inventory management and reduce wastage, further contributing to cost savings.

SAP's data analytics capabilities can help businesses identify areas for cost optimization and process improvement.

The next category accounts for 23%, which shows that SAP is perceived as a tool to support and facilitate business growth and expansion. SAP can support business growth by providing scalability and flexibility. It can help businesses comply with regulatory requirements and expand into new markets. SAP's global reach and localization capabilities can facilitate international business operations.

Others- 7%: This category represents the miscellaneous factors that also contribute to the adoption of SAP. Some companies may adopt SAP because of some industry-specific requirements or because it is the best practice in the industry. Others may be influenced by peer pressure or the need to stay competitive in the market.

Now, let's go through the survey results on platform-wise SAP implementation across industries.

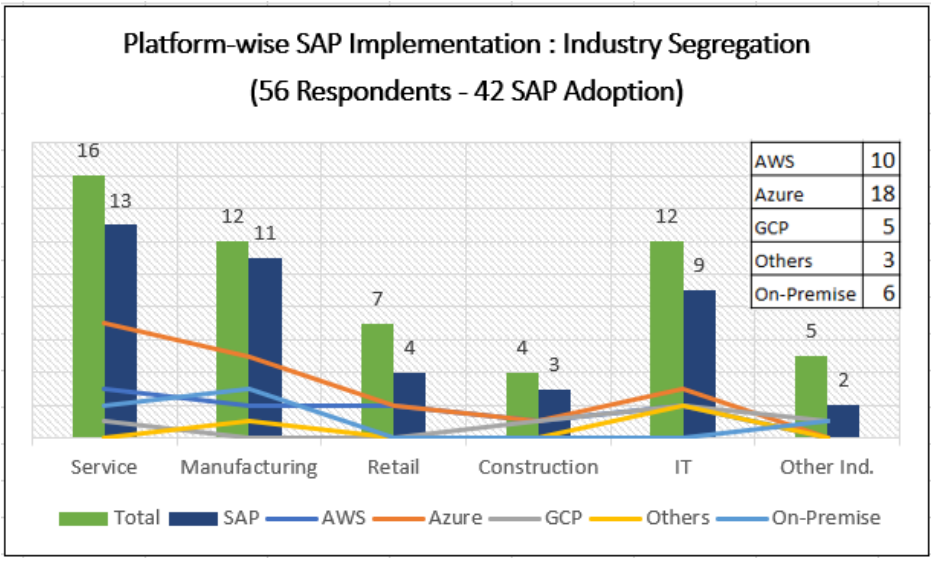


Figure 03. *Survey Results – Platform-wise SAP Implementation: Industry Segregation*

Overall Observations of SAP Adoption: In the survey, 56 respondents participated, and out of those, 42 have already adopted SAP solutions while 9 of the enterprises are in

the planning phase to implement SAP. The Service industry seems to have the highest SAP adoption, followed by Manufacturing and Information Technology (IT). Azure and AWS are the most popular platforms for SAP implementations. On-premises deployments are also important, i.e., these businesses may be doubting migration to the cloud.

AWS and Azure are leading platforms for SAP implementations across industries. The reason for this prevalence of AWS and Azure can be attributed to the recent trend of cloud computing because of scalability, cost efficiency, and flexibility. These may be due to very specific requirements related to data security, compliance, and integration needs. The presence of On-Premises deployments might indicate the presence of legacy systems that are difficult to migrate to the cloud, or decision-makers who, for some dilemma/doubts or fear of disrupting business, do not make decisions to adopt the cloud. It has been observed that most of the enterprises have inclined for cloud adoption, but executives shared their concern about a framework for selection procedure for the right or best cloud provider as all are providing almost same features.

Identifying the common challenges faced in SAP implementations and exploring potential opportunities for improvement could help organizations optimize their SAP strategies. Let's concentrate on the technical issues highlighted during the conducted survey:

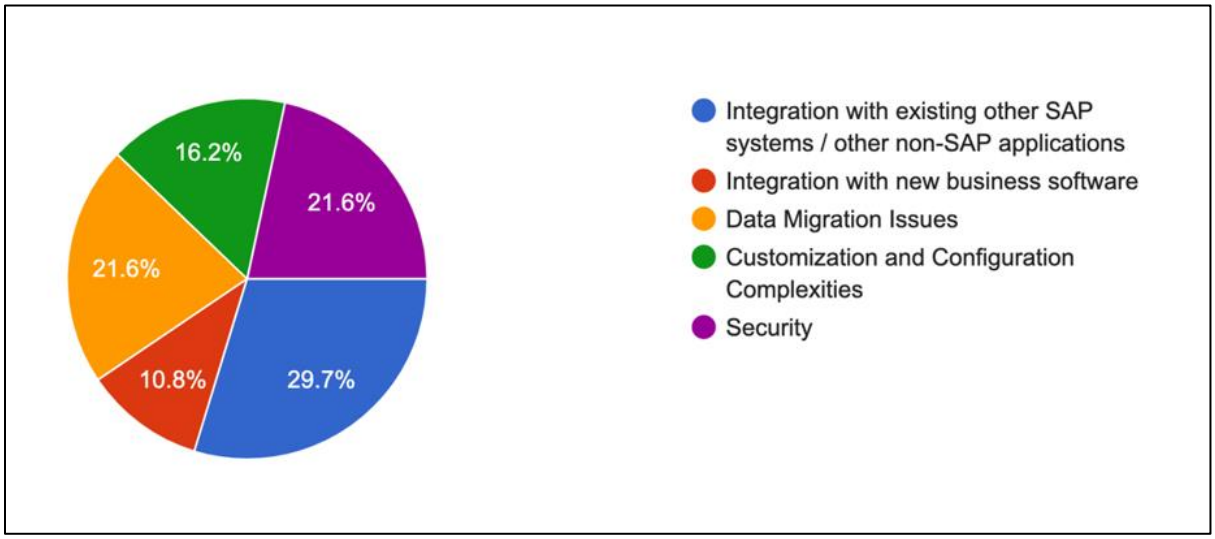


Figure 04. *Survey Results – What Major Technical Problems encountered during the Business Transformation Journey*

The pie chart below shows the responses to a survey question about SAP technical problems encountered during a business transformation journey. The chart shows that integration challenges, data migration issues, and customization and configuration complexities were some of the most common technical problems encountered along the business transformation journey. Response breakdown:

Integration Issues with already existing other SAP systems/other non-SAP applications: The issues in integrating SAP systems with already existing SAP or non-SAP applications were encountered by 29.7% of the respondents.

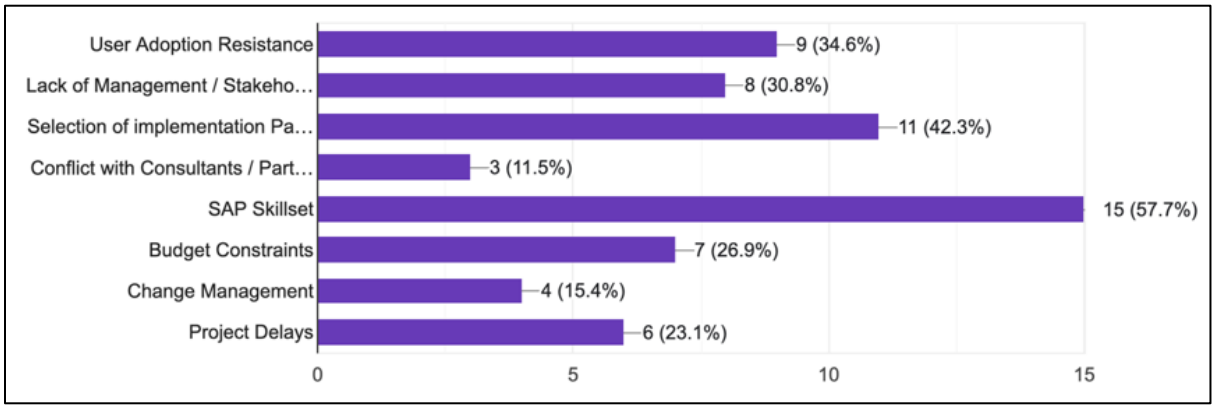
Integration Issues with new business software: Issues in the integration of SAP with new business software were reported by 10.8%.

Data Migration Issues: 21.6% of respondents mentioned that data migration issue is one of the most critical technical problems.

Customization and Configuration Complexities: The complexity in customization and configuration faced by the respondents was 21.6%.

Security: 16.2% of the respondents reported security as a major technical problem.

On the non-technical challenges, the respondents pointed to the following areas in their journey of business transformation. For this topic, multiple selections were allowed.



**multiple selection possible*

Figure 05. *Survey Results – What Major Non-Technical Problems encountered during the Business Transformation Journey*

Here is the breakdown of the responses collected: User Adoption Resistance: 34.6% of the respondents identified user adoption resistance as a major non-technical challenge. Lack of Management / Stakeholder Support: 30.8% of the respondents pointed to a lack of management or stakeholder support as a major non-technical challenge. Selection of Implementation Partner: 42.3% of the respondents cited selection of an implementation partner as a major non-technical challenge.

Conflict with Consultants / Partners: 11.5% of the respondents reported conflicts with consultants or partners as a non-technical challenge.

SAP Skillset: 57.7% of the respondents highlighted the lack of SAP skills as a major non-technical challenge.

Budget Constraints: 26.9% of the respondents mentioned budget constraints for SAP Projects.

Change Management: 15.4% of the respondents voted for change management as a major challenge.

Project Delays: 23.1% of the respondents reported project delays as a non-technical challenge.

Fundamentally, the chart demonstrates that the top three SAP skillset, selection of implementation partner, and resistance to user adoption are among the leading non-technical challenges during business transformation. This calls for a realization that these areas must be thoroughly streamlined via proper training, selection of partners, and effective strategies regarding change management for any business transformation initiative.

The following graph would indicate that almost half the respondents, 45.9%, feel a stakeholder or management involvement gap in SAP projects exists and may affect business transformation initiatives. 24.3% of the respondents feel that the involvement of stakeholders or management is adequate and they normally keep track of the SAP project activities. 45.9% disagreed, meaning they felt the involvement was not enough, or there was not regular tracking. 29.7% of the respondents were not sure whether the involvement and tracking were adequate.

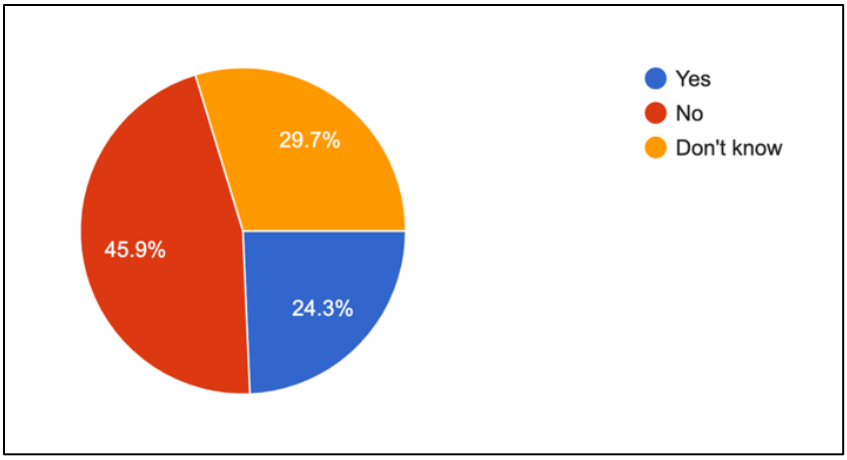
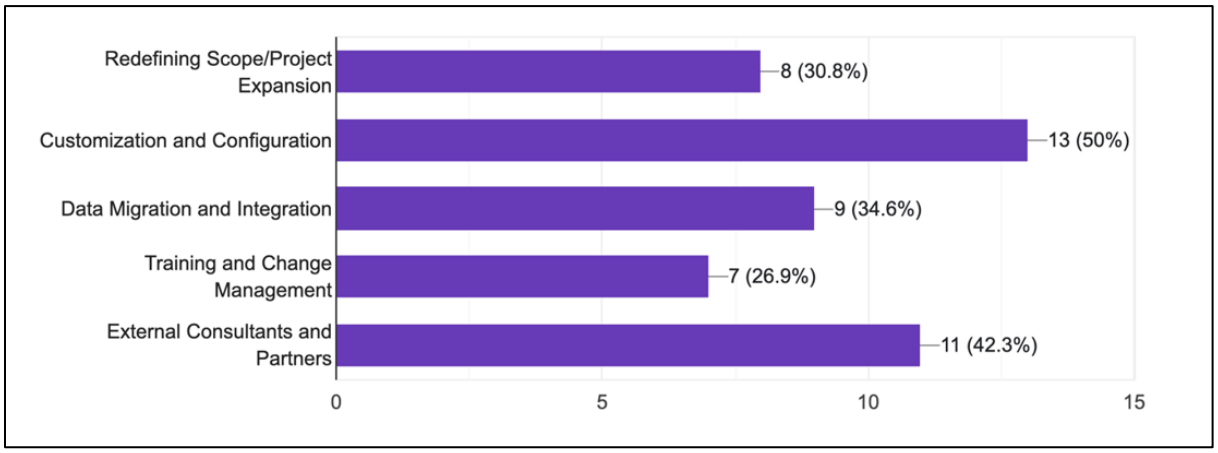


Figure 06. *Survey Results – Stakeholder/Management involvement and keeping regular track of activities*

Sometimes, SAP project cost overruns are when the money that it takes to run or complete the project exceeds the budget. The bar chart shows a survey of selected areas that contributed to cost overruns in an SAP project. For this question, multiple selections were allowed.



**multiple selection possible*

Figure 07. *Survey Results – What are the components contributed the most to cost overruns, if any*

Details of the responses are as follows:

Scope Redefining/Project Expansion: The respondents identified this as a major contributor to cost overruns by 30.8%.

Customization and Configuration: Customization and configuration were pointed out by 50% of the respondents as a major cause for cost overruns.

Data Migration and Integration: Data migration and integration were cited as a major factor in cost overruns by 34.6% of the respondents.

Training and Change Management: The majority of respondents, 26.9%, indicated that training and change management are important to prevent cost overruns.

External Consultants and Partners: About 42.3% of the respondents stated that external consultants and partners have contributed significantly to cost overruns.

Hence, the above chart shows that customization and configuration, external consultants and partners, and data migration and integration were assessed as the top three areas contributing most to cost overruns in the SAP project. This would, therefore, imply that such areas need to be carefully planned, budgeted for, and managed to avoid cost overruns in similar projects.

The conducted survey shows that while the majority of respondents, 62.1%, are somewhat or very satisfied, yet a significant portion, 37.8%, are unsatisfied with the sharing of information within the organization. This may indicate some potentiality for improvement in the way information is shared related to the SAP project.

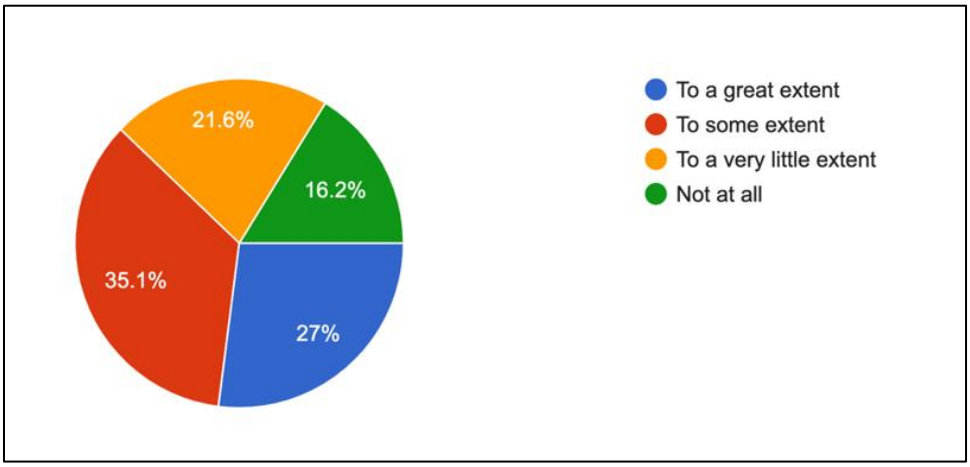


Figure 08. *Survey Results – Are you satisfied with information sharing within the organization regarding SAP Project for the Business Transformation Journey*

To a great extent: 27% of respondents are very satisfied with the information sharing.

To some extent: 35.1% of respondents are somewhat satisfied with the information sharing.

To a very little extent: 21.6% of respondents are not very satisfied with the information sharing.

Not at all: 16.2% of respondents are not at all satisfied with the information sharing.

Now let's investigate on the collected data of SAP Implementation Status and Go-Live Time Taken.

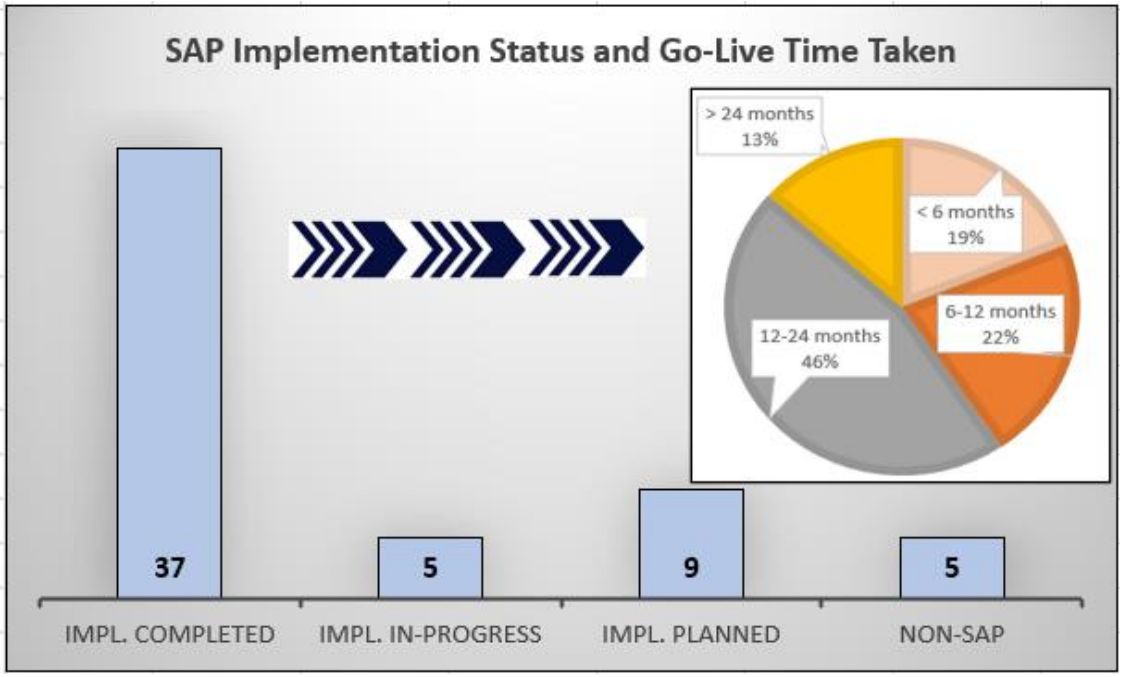


Figure 09. *Survey Results – SAP Implementation Status and Go-Live Time Taken*

The majority of SAP implementations were completed 37 out of 51, 5 in progress, and 9 were planned. Most SAP implementations took between 12-24 months to implement-46% of the complete projects, 19% completed in under 6 months, showing the speed in which some deployments happen. The others took 6-12 months-22% and the remainder,

13%, taking over 24 months-the complexity and challenging issues to be encountered, when undertaking long-term projects, also mean this.

Project Complexity: Size and complexity of the implementation - the number of modules, level of customization. Resources: Availability of resources-both skilled personnel and budget-is of prime importance for timely implementation. Organization Readiness: Level of readiness at an organizational level on aspects like change management and user training.

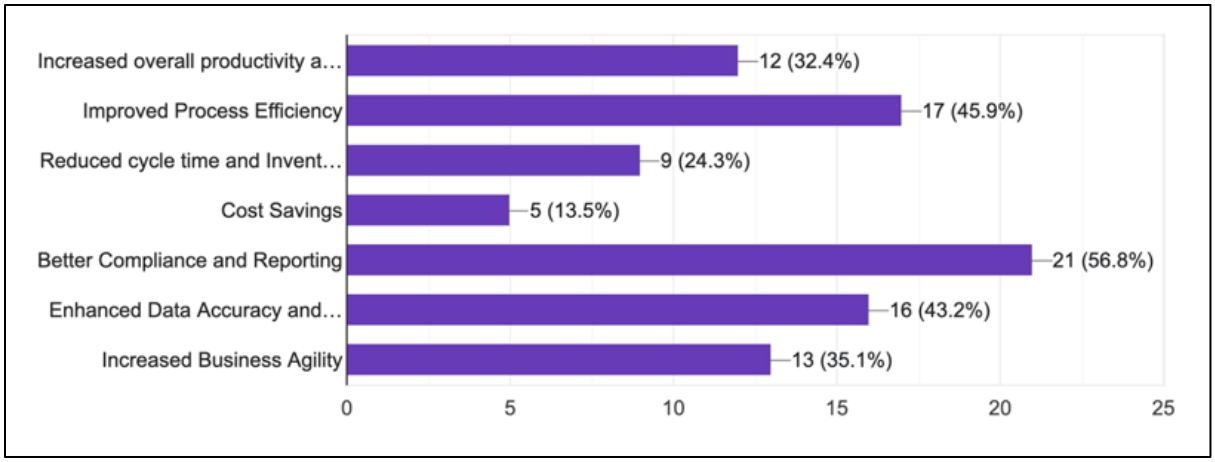
Proper Vendor Selection and Support: The level of support from the SAP vendor impacts the timeline of the project.

Unexpected issues, whether technical or due to a change in business requirements, might cause delays in implementation.

Overall, the data indicate large variability in the length of time for SAP implementations, with project complexity, resource availability, and organizational readiness the most important factors.

Some cases, the internal IT team is solely responsible for the project whereas in some projects external consultants or SAP Implementation partners are solely responsible for the project. In some implementations, both internal IT and an external consultants collaborate on the project.

Only 3 implementations are handled solely by the internal IT team, whereas they are involved in a significant number of implementations-10-they are often working alongside external consultants. Larger organizations with dedicated IT teams may be more likely to handle SAP implementations internally, while smaller organizations may rely on external consultants. Certain industries, such as manufacturing and healthcare, may have more complex SAP implementations that require specialized expertise. 57% of implementations involved SAP Implementation Partners, 24 out of 42.



**multiple selection possible*

Figure 10. *Survey Results – What specific business improvements or efficiencies for the organization have been realized post-implementation*

The second bar chart shows the result of the survey on specific business improvements or efficiencies realized after the implementation of an SAP project. The responses received are as follows:

Increased overall productivity: 32.4% of the respondents reported that overall productivity had increased.

Improved Process Efficiency: 45.9% of the respondents reported improved process efficiency.

Reduced cycle time and inventory: 24.3% of respondents reported reduced cycle time and inventory.

Cost Savings: 13.5% of respondents reported cost savings.

Better Compliance and Reporting: 56.8% of respondents reported better compliance and reporting.

Enhanced Data Accuracy and Availability: 43.2% of respondents reported enhanced data accuracy and availability.

Increased Business Agility: 35.1% of respondents reported increased business agility.

This indicates that because of the SAP project, compliance and reporting improved among a majority of respondents, efficiency of processes improved among the majority,

and the quality of data improved. Whereas only a minority had felt the reduction in costs and an increase in business agility.

Implementation might be complex, and certain necessary expertise and skills may not reside within internal IT. Such competence for SAP implementation methodologies and best practices can be found at SAP Partners, accelerating projects without increasing risks.

Presently, it is pretty tough to get standard selection criteria to evaluate the right partner out of multiple SAP Implementation Partners-even survey respondents and executives showed their concern during their interviews.

CHAPTER IV:

FINDINGS

It is obvious that by the adoption and implementation of business transformation, value creation through scenario-based decision making, operational effectiveness, and better business performance can be achieved. SAP, one of the biggest players in the ERP industry, was the first company to introduce enterprise-level ERP software to the world. SAP is renowned for its broad range of integrated software solutions, covering almost every part of an enterprise, from financials to supply chain, CRM to HR, and more. It's customizable, flexible, and scalable.

Let's look at some astonishing facts about the market dominance of SAP:

- 79% of the world's transaction revenue goes through an SAP system.
- 86% of Fortune 500 companies use SAP software.
- 80% of SAP's customers are small and medium-sized companies.
- 98% of the 100 most valued brands are SAP customers.
- 92% of Forbes Global 2000 companies are SAP customers.

Surprisingly very little attention has been given to determining the theoretical and practical success factors related to the adoption of business transformation leveraging SAP. This sets off a research gap and brings about the need for a study which explores and guides about systematic, methodical approach for business transformation by leveraging SAP products or technologies or services. The study should aim at developing a better understanding of how modern SAP technologies and features can address the basic issues of an enterprise and adopt a structured approach in identifying and addressing challenges to ensure successful business transformation for global enterprises. More specifically, the following research questions need to be addressed:

(1) First, what are the typical challenges faced by Enterprises for their SAP projects?

(2) Second, with the advancement of technology with recent times, what are the current industry practice as well as research/technology advancements can be adopted by the business for their transformation?

(3) Third, what are the modern SAP Products/Technologies/Services trigger or can help Enterprises for their business transformation?

(4) Fourth, how to address and resolve the challenges with a systematic approach and proposed framework for a successful business transformation leveraging SAP?

4.1 Research Question One

What are the typical challenges faced by Enterprises for their SAP projects?

When enterprises undertake SAP projects, often a host of challenges creep up. These challenges, while differing slightly as per industry or sector, are mostly common in nature. The complexity of these challenges needs to be dealt with properly for successful time-bound SAP projects. Business transformation being relatively a pretty complex process is nobody's denial. It goes without saying that during this journey of transformation, each and every enterprise may come across some common SAP project issues, and these are mainly as follows:

Right platform and service implementation partner finalization, large-scale data migration, scope creep, integration with existing systems, change management, resource allocation, customization, and configuration complexity, organizational resistance, user training and adoption, unexpected issues, cost and budget overruns, time management and implementation delays, post-implementation support, and maintenance.

The finding suggests that typically for SAP projects, two major categories of challenges faced by most of the enterprise customers:

(a) Soft/Non-Technical Challenges

(b) Technical Challenges

4.2 Research Question Two

What are the current industry practices as well as research/technology advancements can be adopted by the business for their transformation?

Because of fast technology advancements, so many options have mushroomed nowadays that making timely decisions could delay some of the major projects or initiatives in any enterprise. Now-a-days, due to advent of cutting-edge technologies in a very short-span of times, enterprises are getting plenty of options. Sometimes it creates confusion while taking decisions which impact enterprise-wide, ultimately influences the performance of businesses. Decision makers need to be extra cautious in segregating between the "must have" and "nice to have" approaches for selecting the best-suited technology adoption from the current market trend. Such types of decision paralysis may provoke competitive disadvantages, misalignment with business goals, overwhelm employees, and increase cost unnecessarily. Enterprises need to work on appropriate feasibility studies properly and then take on final decisions based on the following current industry trends:

- Cloud Adoption / Cloud Computing
- Artificial Intelligence (AI) and Machine Learning (ML)
- Generative AI (GenAI)
- 5G and Edge Computing
- Sustainability and Green Technologies
- Cybersecurity
- Digital Twins
- Human-Machine Collaboration

4.3 Research Question Three

What are the modern SAP Products/Technologies/Services trigger or can help Enterprises for their business transformation?

It means that with effective usage of modern SAP solutions, any enterprise will be able to acquire an extra edge over others in the market. Guidance ensures they use the latest technologies for innovating and staying ahead of their competitors. Business transformation in most cases happens when the enterprise is moving into a cloud environment from their traditional on-premises platform. These enterprises may or may not use SAP for running their business at on-premises. Depending on this, the SAP project can be green field or brown field: while a green field approach represents a complete reengineering of business systems, a brown field approach is more about upgrading the existing solutions. During the last fifty years, SAP has served its large customer base in an on-premises environment where resources and services are mostly managed and controlled by the enterprises. On the contrary, cloud is the methodology or way of accessing computing resources or services over the internet anywhere anytime, provided one has an internet connection. Cloud computing can let enterprises avoid the necessity of installation/operating maintenance of actual servers, running software applications, or managing databases. Accordingly, an enterprise should adopt the new demand or requirement of cloud-based business models, which may either be any change or fine-tune in the SAP software, maybe the change of the whole business process. In this regard an enterprise should choose best to enhance their business performance accordingly at their best capacity. This includes expert-led guidance on new SAP offerings, technologies, and services to support customers through this journey called Cloud Transformation as seamlessly as possible and assists them in pursuing business interests in an agile manner. SAP boasts one of the world's leading software companies, a vast portfolio comprising numerous products and huge end-user bases leveraging its Cloud. SAP has over 230 million cloud users, more than 100 solutions covering all business functions, and the largest cloud portfolio of any provider. Following are some of the modern SAP Products/Technologies that trigger or can help Enterprises for their Business Transformation:

- SAP HANA
- SAP S/4HANA

- SAP Business Technology Platform (BTP)
- SAP Analytics Cloud (SAC)
- SAP Integrated Business Planning (IBP)
- SAP Ariba
- SAP SuccessFactors HCM
- SAP Concur
- SAP Signavio
- SAP LeanIX
- SAP Joule
- SAP Intelligence Robotic Automation Process (RPA)

4.4 Research Question Four

How to address and resolve the challenges with a systematic approach and proposed framework for a successful business transformation leveraging SAP?

Strategic thinking and higher order cognition with a process clearly predefined, possibly repeatable, may involve reorganizing a problem into simpler terms, breaking a problem into steps, making a plan about how to proceed, and determining the best way to find a smooth journey of business transformation. It also becomes evident from the findings that most enterprises are in search of a systematic approach, probably step-by-step, toward the challenges for their business transformation journey leveraging SAP. Business transformation usually entails major process and workflow changes. The systematic approach ensures identification, analysis, and addressing of challenges in a structured manner. This reduces the chances of overlooking any critical issues and helps in developing effective solutions. Such an approach makes for clear metrics and KPIs to be defined, so the success of the transformation will be measured. This provides a basis for assessing the effect of the SAP implementation and demonstrating its value to the organization. In a nutshell, systematically resolving challenges with a proposed framework lets SAP implementations be efficient, effective, and in line with the intentions of the business. This

leads to less painful transformation, better handling of resources, and ultimately a more successful outcome.

4.5 Conclusion

Enterprises move on to transform their business to realize their complete potential, adapt to changing environments, and create value. For their business transformation journey, they face some challenges and obstacles. These must be mitigated through appropriate planning, strong project management, comprehensive training, and continuous support to make a successful and efficient business transformation journey with SAP.

CHAPTER V:

RESULT AND DISCUSSION

5.1 Result and Discussion on Findings

Today's business leaders are making critical decisions beyond traditional business models and organizational structures. The focus is on business transformation as one of the major strategies towards gaining new customers and retaining the loyalty of old customers. With rapid evolvement in technology, new advanced tools are providing valuable insights and predictions to enable leaders to make better choices in a dynamic business environment. Business transformation is an important process that helps companies to be competitive and relevant. Here are some current practices that industries are implementing for successful business transformation:

Continuous Transformation: Viewing transformation as an ongoing journey rather than a one-time event is crucial. This mindset enables companies to remain agile and responsive to market changes, technological advancements, and evolving customer needs.

Integration into Operating Rhythm: Embedding transformation initiatives into the daily operations of the business is essential. By integrating these initiatives with the company's core activities, implementation becomes smoother, and goals are more easily achieved.

Managing the Organizational Energy: Efforts should focus on specifically motivating and engaging the workforce. Engaged employees are more productive and committed to transformation efforts, which can be fostered through clear communication, achievable goals, and celebrating successes.

Aspirational Goal Setting: Setting ambitious and inspiring goals at the enterprise level can be highly beneficial. Rather than merely meeting industry benchmarks, these goals encourage innovation and drive the organization toward significant breakthroughs. Middle-level managers play a crucial role in influencing teams to ensure transformation initiatives are implemented at every level.

Purpose-Driven Leadership: Leaders need to cultivate a genuine sense of purpose to guide their strategic decisions. This approach helps align the organization's values with its transformation goals, fostering a culture of commitment and integrity.

Core Business Repositioning: This involves reassessment and realignment of the core business to meet the demands of the new market. It will lead organizations to remain relevant and competitive, as it narrows their focus on growth areas while divesting non-core assets.

Embracing ESG Principles: In the modern world, it is imperative for companies to integrate ESG principles into their business strategies. This would include focusing on sustainability, social responsibility, and ethical governance-areas of growing interest to stakeholders that may provide long-term value.

Digital Transformation: The adoption of digital technologies is necessary to create enhanced operational and customer experiences. Such technologies as AI, cloud computing, and data analytics will be able to drive processes, enhance decision-making, and unlock new business models.

These practices put together help the enterprise move through the complexities of modern business environments and achieve sustainability in growth. However, some of the major following concerns can be highlighted from the conducted survey and interviews:

- What is the best possible approach and framework for business transformation?
- How to start business transformation? What is the high-level key steps of business transformation leveraging SAP?
- How to choose the best cloud platform for the business transformation journey?
- How to select the best suited SAP Partner for implementation or business transformation?
- How to maintain our enterprise secure during the business transformation?
- How to successfully manage business transformation leveraging SAP projects?

5.2 Challenges of Enterprises for their Business Transformation and SAP Projects

Enterprises face a variety of challenges in business transformation, especially when moving from legacy systems to modern, cloud-based environments. This includes the integration challenge of new technologies with existing infrastructure, which is usually time-consuming and costly. Cloud adoption catalyzes digital transformation in that it enables enterprises to be efficient, continuously innovative, and quick to respond to market demands. Cloud adoption may be referred to as a transition wherein data, applications, or other business elements are moved from an on-premises environment to the cloud. The cloud is made up of a network of remote servers accessed via the internet and used to store, manage, and process data. There are different ways in which cloud adoption may occur: public clouds, private clouds, hybrid clouds, and multi-clouds.

Public clouds are provided as third-party providers and offer a pay-as-you-go model. Companies using the cloud can pay only for what they use. In contrast, private clouds are owned and operated by a single organization, providing more control and security compared to public clouds but at a much higher cost. Hybrid clouds bring both public and private cloud resources together and strike a balance between flexibility and control. Multi-clouds are the practice of using two or more different cloud platforms from different providers that enable organizations to leverage the best of multiple cloud services.

Basically, decisions on the adoption between a public and private cloud can depend on a combination of such critical areas as technical requirements, strategic goals, and operational considerations. Each enterprise is responsible to analyze its particular needs among cost, scalability, security, and control for picking an appropriate model of cloud deployment. Such understanding of technical functionalities definitely would aid organizations in making appropriate choices concerning an overall business strategy and goals.

Table 06. *Public Cloud vs. Private Cloud – A basic overview*

Technical and Business Aspects of Cloud Adoption		
	Public Cloud	*Private Cloud*
Infrastructure	Owned and operated by third-party service providers.	Owned and operated by a single organization.
Access	Resources are shared among multiple organizations, accessed over the internet.	Dedicated resources for one organization, often within its own data centers.
Scalability	Resources are shared among multiple organizations, accessed over the internet.	Scalable, but limited by the organization's own infrastructure capacity.
Cost	Pay-as-you-go pricing models, reducing capital expenditure.	Higher upfront costs due to infrastructure investment.
Security	Standardized security measures, though less customizable.	Enhanced control and customization of security measures.

Table 07. *When and Why you choose Public or Private Cloud for your business*

Strategic Considerations for Choosing Public or Private Cloud
Public Cloud
Why Enterprises choose Public Cloud? • Cost Efficiency: Lower upfront costs and operational expenses due to the pay-as-you-go model. • Scalability: Ability to quickly scale resources up or down based on demand. • Accessibility: Easy access to advanced technologies and global infrastructure.

- Maintenance: Reduced burden on internal IT teams as the provider manages infrastructure.

How Enterprises choose Public Cloud?

- Workload Type: Ideal for variable workloads, development and testing environments, and customer-facing applications.
- Budget Constraints: Suitable for organizations with limited capital expenditure budgets.
- Speed of Deployment: Preferred when rapid deployment and time-to-market are critical.
- Compliance Requirements: Chosen when standardized security and compliance measures suffice.

Private Cloud

Why Enterprises choose Private Cloud?

- Control: Greater control over the infrastructure and data.
- Security: Enhanced security and compliance capabilities, tailored to specific needs.
- Customization: Ability to customize the environment to meet unique business requirements.
- Performance: Consistent performance for critical applications.

How Enterprises choose Private Cloud?

- Workload Type: Suitable for stable, predictable workloads and mission-critical applications.
- Security Needs: Preferred by organizations with stringent security and regulatory requirements.
- Customization Requirements: Chosen when specific customizations are necessary for business operations.

- Long-term Investment: Considered when long-term control and investment in infrastructure are strategic priorities.

If the enterprises are opting for a public cloud, then AWS from Amazon, Azure from Microsoft, and GCP from Google are the main choices. All of the above hyperscalers in that respect have a cloud adoption framework, and customers can leverage the same accordingly.

As the organizations are considering moving away from self-managed on-premises IT solutions, it becomes important to understand different cloud computing service options. There are three main cloud computing service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). The terminology "as a service" depicts that these models are offered by third-party providers through the cloud. That means not a single hardware, software, tool, or application needs to be bought, managed, or used from an on-premise data center; rather, one can use the required resources on demand through the internet, either on subscription-based or on-consumption-based models. Let's understand exactly what the IaaS, PaaS, SaaS models actually offer to the enterprises:

Table 08. *What Enterprises expect to get under IaaS, PaaS and SaaS model offerings*

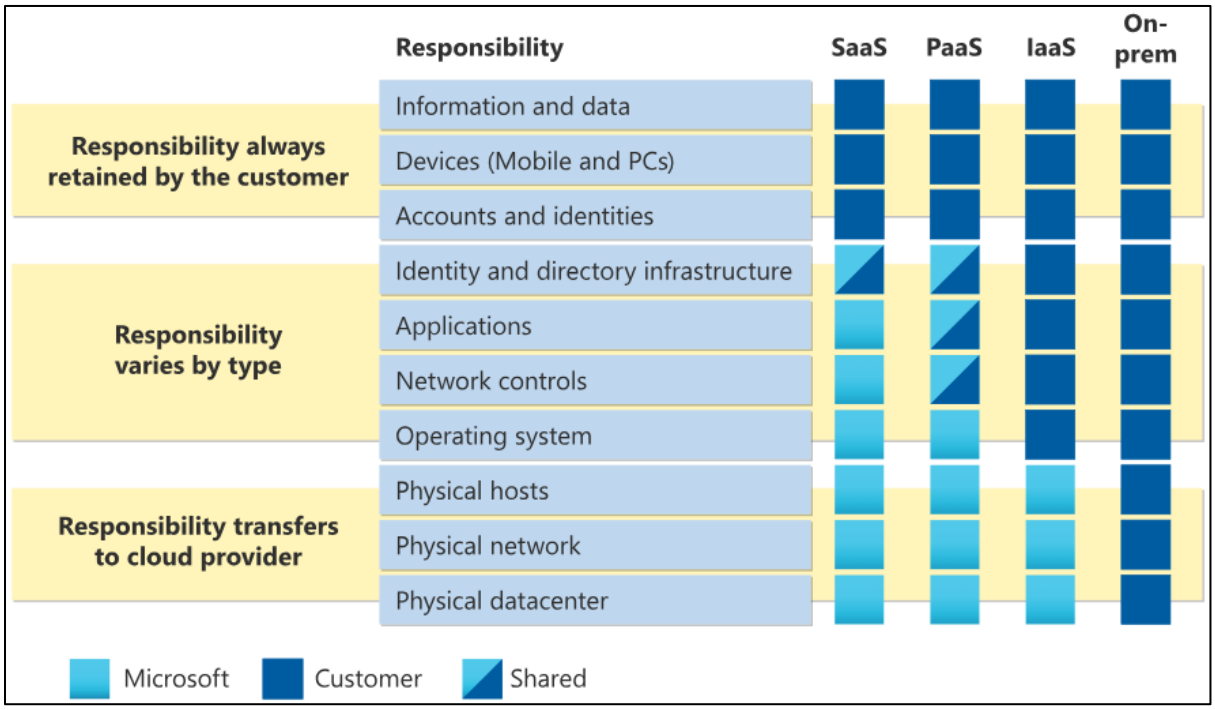
Factors	*Infrastructure as a Service (IaaS)*	*Platform as a Service (PaaS)*	*Software as a Service (SaaS)*
Level of Control and Customization	Highest level of control over infrastructure. Suitable for extensive customization.	Provides a platform for building and deploying applications without managing infrastructure.	Delivers ready-to-use applications with minimal customization.

Complexity of Applications	Suitable for complex applications requiring specific configurations and high flexibility.	Ideal for rapid development and deployment of applications with built-in scalability.	Best for standard applications like email, collaboration tools, etc.
Resource Availability	Requires significant IT resources to manage and maintain infrastructure.	Reduces need for extensive IT management, allowing focus on development.	Minimizes IT resource needs, as maintenance and updates are handled by the provider.
Cost Considerations	Pay-as-you-go model, cost-effective for fluctuating workloads.	Offers cost savings by reducing hardware and infrastructure management needs.	Subscription-based, providing predictable costs and reducing upfront investments.
Security and Compliance	Provides the most control over security and compliance, crucial for regulated industries.	Balances control and convenience with built-in security features.	Relies on the provider for security and compliance, beneficial for businesses without extensive security expertise.

By weighing these above-mentioned main factors, enterprises can identify which cloud service model best fits their needs and strategic goals.

SAP implementation services on the cloud can be used to fulfill a variety of business needs through different cloud service models: IaaS, PaaS, and SaaS. IaaS allows enterprises to host their SAP environments on cloud infrastructures for flexibility and control over operating systems, storage, and network configurations. This model is ideal

for organizations requiring extensive customization and flexibility. PaaS offers a platform for developing, testing, and deploying SAP applications without managing the underlying infrastructure. This streamlined approach accelerates development cycles and time-to-market. This is particularly beneficial for organizations focused on innovation and rapid deployment. SaaS provides pre-configured SAP applications as fully managed services, which allow businesses to use SAP software without worrying about the maintenance, updates, or management of the infrastructure. This model is ideal for companies that want to keep IT overheads at a minimum and focus on core business activities. Each model has its unique advantages, enabling enterprises to choose the best fit for their specific SAP implementation needs.



Source: Microsoft.com

Figure 11. *Shared Responsibility Model when Microsoft Azure is the Cloud Service Provider*

By carefully selecting the appropriate cloud service model, enterprises can optimize their SAP implementations, enhance agility, and drive business growth.

Typically, enterprises have multiple SAP solutions like ERP, Business Warehouse, CRM, Solution Manager, etc. and each SAP system landscape mostly 3-tier, e.g. development, quality/test, production; some have 4-tier, e.g. sandbox along with 3-tier; some may have more e.g. pre-production. Enterprise should pick and choose any of the implementation or migration approach for their SAP system in their cloud journey – Horizontal approach and Vertical approach.

The horizontal approach allows enterprises to minimize risk and maximize learning & benefits. This involved starting with low-impact systems, such as sandbox, development for all SAP systems - and then gradually moving quality and production after gaining required confidence. Whereas vertical strategy involved selecting specific systems like

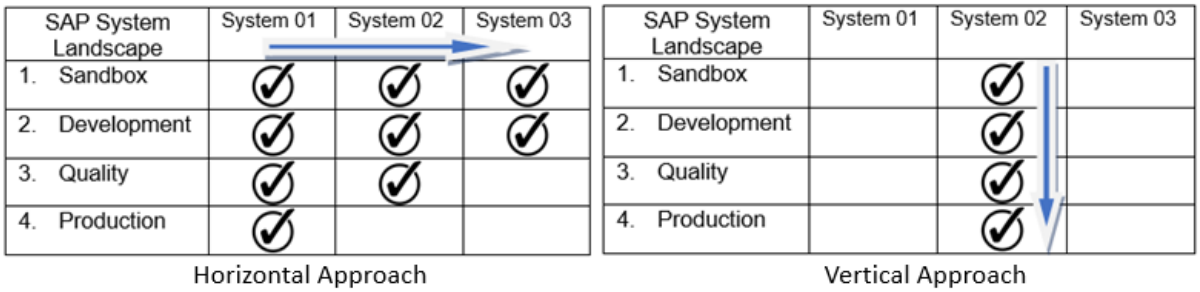


Figure 12. *Understanding Horizontal Approach vs. Vertical Approach for SAP Implementation or Migration*

Global Trade (GTS), Governance Risk & Compliance (GRC) etc., often starting with low-risk ones, and migrating their entire stack—from development to production. While selecting a specific system landscape in this approach requires proper identification of dependencies between systems, both within the SAP landscape and with external applications.

The implementation or migration to SAP systems is one of the most important steps in business transformation for an organization. Migration from the legacy systems to the modern, cloud-based environments can produce immense positive changes in operational efficiency and business agility. However, there are challenges around integration with new technologies into the existing infrastructure, ensuring data security and compliance, and

driving organizational change. SAP implementation partners are very important in the success of such projects. Since the SAP Product and Solution portfolio is huge, SAP implementation partners add value to this as they specialize in the SAP suite of solutions and tools. They bring expert knowledge and deep understanding of SAP technologies, which is necessary to tailor the system to fit an organization's specific needs and existing IT infrastructure.

The SAP implementation partner has to organize, configure, and integrate a scalable solution into an organization's existing IT infrastructure. Thereafter, a detailed analysis of current systems, data sources, reporting needs, and IT interconnections is conducted to ensure that the implemented SAP system aligns with business needs. Based on industry best practices and broad experience, recommendations are made by the partner, and the system is customized to organizational needs.

96% of the decision-makers and 95% of the employees believe effective communication is key. Organizational stakeholders are deeply engaged by SAP implementation partners to understand the business needs more effectively. Collaboration begins with discovery meetings wherein the implementation partner's team meets key enterprise personnel to discuss current processes, pain points, and business objectives. The primary goal is to tailor the SAP solution to address specific challenges and enhance operational efficiency. These discussions cover the roles of various business units, data flow, required functionalities, and expected outcomes. During these sessions, the implementation partner asks insightful questions to delve into workflows and systems, capturing the essence of business operations, understanding the reasons behind specific processes, and identifying optimization opportunities. This collaborative approach ensures the SAP solution meets the business objectives while setting up a good foundation for effective change management. The involvement of the enterprise team from the outset creates ownership and acceptance, which is so crucial for the smooth adoption of the new system.

Gartner's research shows that 67% of critical functions in an organization are not aligned with business unit and corporate strategies, which leads to inefficiencies, redundant

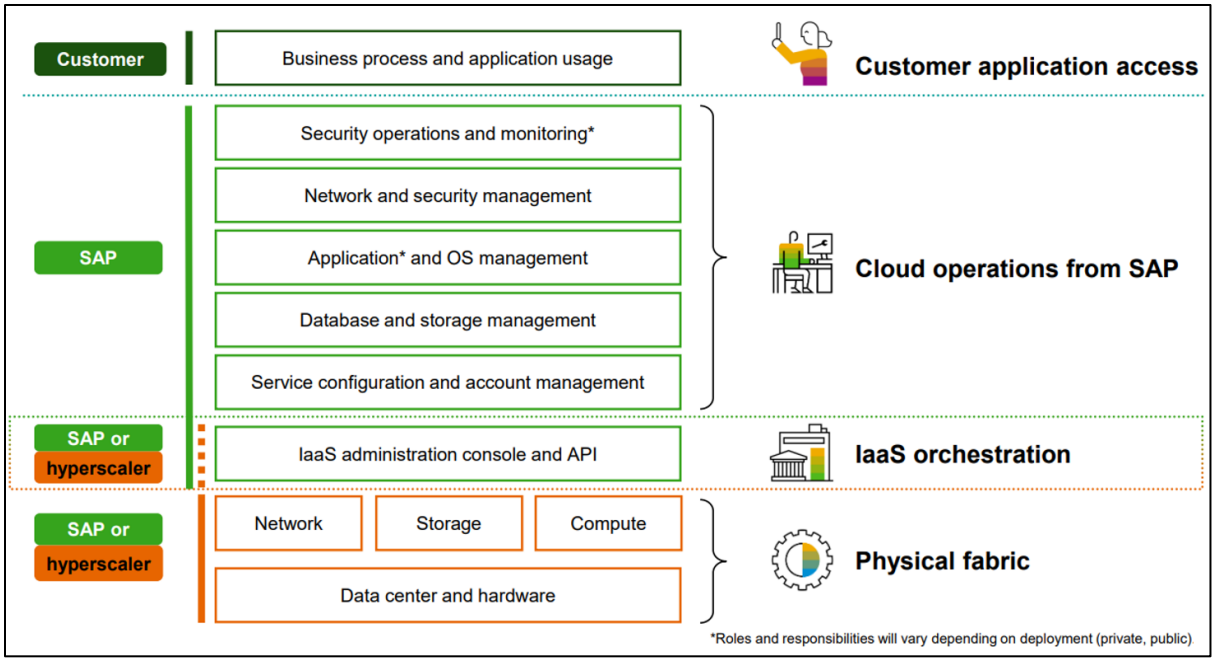
efforts, and missed opportunities. Furthermore, 88% of C-suite executives regard successful execution of strategic initiatives as critical to competitive advantage, while 61% admit that linking strategy development to execution is a challenge. It is in this scenario that SAP Implementation Partners become relevant. They implement e-business strategies that further streamline operations by implementing SAP solutions, simplify processes, reduce redundancy, and align them with corporate strategies. Alignment promotes the proper utilization of resources and ensures business functions contribute to the achievement of objectives. SAP Implementation Partners apply their vast experience in recommending best practices and strategies suitable for contexts where businesses operate. These recommendations will help reduce inefficiencies and increase agility, allowing companies to avoid common pitfalls and accelerate the benefits of an SAP investment.

The implementation partner aligns organizational objectives with SAP's analytic tools, tailoring reporting mechanisms in a way that generates actionable insights for informed decision-making. This alignment would leverage the data to drive business growth and enhance operational efficiency. The partner configures the SAP system to ensure analytics and reporting outputs reflect and support strategic objectives. For example, to optimize resource allocation, it actually tracks and reports key performance indicators concerning resource usage and productivity. Reporting automation frees up valuable analyst time to focus on analyzing rather than gathering information. With periodic reviews and updates, analytics and reporting systems are kept on pace with the business, always pointing toward strategic goals. This ongoing alignment ensures that the SAP system remains a productive tool for business intelligence, as the company grows and changes.

The SAP implementation partners help the internal team significantly during the User Acceptance Testing. UAT tests the system in an ideal controlled environment and enables the team to trace issues and get them resolved before the live deployment. This phase allows employees to interact with the system, find out problems, and handle real-life scenarios. The implementation team provides good support with necessary details, works hand-in-hand with the employees to make them proficient, and thus helps in the smooth transition.

Project documentation is vital for maintaining data quality and ensuring system accuracy, completeness, and standardization. It guides data migration and integration efforts, serving as a resource for user training, troubleshooting, and system maintenance. Despite its importance, many organizations do not prioritize thorough documentation. Comprehensive documentation covers all implementation phases, providing clear procedures to preserve data integrity and support audit and compliance processes. It contains step-by-step instructions on system configuration, workflows, data migration, and integration points, along with troubleshooting and maintenance protocols. This ensures minimal user errors and effective operation of the system.

Research indicates that highly engaged employees raise productivity up to 17%, yet only few employees are actually highly engaged. Training is the most direct manner of increasing employee engagement. SAP implementation partners will indeed conduct specific training on the configured aspects of the SAP software to ensure that the workforce is competent and confident. The "show and share" sessions help employees understand the new tools and take ownership of them. The partner acts as an implementer, thereby being very important in encouraging participation and buy-in. They conduct training and knowledge-sharing programs to prepare the team to effectively use the new SAP solutions. Depending on the type of cloud deployment that an enterprise chooses, the scope of SAP or SAP implementation will differ, represented by the figure below.



Source: SAP.com

Figure 13. *SAP S/4HANA Cloud – Shared Responsibility Model*

To meet the evolving needs of most of the enterprises, who seek greater agility for business transformation and cost-effective operations, a cloud-first technology strategy has become essential. The cloud enables rapid technological innovation, crucial for staying competitive. SAP's cloud-first approach ensures that SAP delivers future innovations through cloud ERP, maintaining its' market-leading position. Given the complexity of ERP systems, a one-size-fits-all SaaS model is not feasible. Hence, SAP provides two custom-made choices: RISE with SAP-a managed cloud service-and GROW with SAP-pure SaaS solution. This flexibility is another hallmark of how well SAP comprehends the diverse needs of the SAP customer community.

GROW with SAP - S/4HANA Public Cloud includes all the solutions and services needed to transform your business into a single contract. It integrates data, technologies, and software according to your company's needs. This is very helpful for those companies that want to move to SAP but have a smaller IT footprint or budget. As a SaaS product, SAP S/4HANA Cloud is licensed via subscription and is accessed over the Internet.

Installation and upgrades are handled by SAP, freeing up more time for your core business activities.

With SAP S/4HANA Cloud, new functionality is provided in the form of a regular innovation cycle, consisting of two main releases per year, but also including non-disruptive updates in between. Each new release upgrades the system to a higher version, with all the latest innovations from the application and technology stack.

Updates, delivered in hotfix collections, are made available continuously without disrupting the current release. This means less effort is used to update and new features can be adopted faster and more flexibly.

Special settings might be necessary in a modularly designed environment like the SAP S/4HANA Cloud for smooth integrations with multiple products in line with an integrated end-user experience. Use the RASD tool to trace the changes and improvements coming along with updates and releases.

Table 09. *When and Why you choose GROW with SAP or RISE with SAP*

GROW with SAP	*RISE with SAP*
SAP S/4HANA Cloud Public Edition	SAP S/4HANA Cloud Private Edition
It is a ready-to-run Cloud ERP that delivers the latest industry best practices and continuous innovation.	It is a tailored-to-fit cloud ERP that adapts to Enterprise's unique transformation.
Rigid in nature; not flexible as per your choice	Business can have some flexibility as per their choice
• Run on the industry standard • Accelerate business growth • Keep innovation moving	• Run on their own standard • Modernize their business • Keep the control
Best suited for businesses with smaller IT footprints or budgets looking to move to SAP.	Ideal for businesses with large organization setup and/or complex processes, SAP implementation footprints.

When the Enterprises opt for SAP S/4HANA Cloud Public Edition – the offerings include the following:

Table 10. *RISE with SAP S/4HANA Cloud, public edition – Service Offering*

BUNDLED CLOUD SERVICE	RISE with SAP S/4HANA Cloud, base ("Base")	RISE with SAP S/4HANA Cloud, premium ("Premium")	Bundled Cloud Services Limitation
SAP Build Work Zone, standard edition	X	X	For each Full Usage Equivalent of RISE with SAP S/4HANA Cloud, Customer is entitled to 1 Active User
SAP S/4HANA Cloud, Digital Access	X	X	For Base, 100,000 Documents and for Premium, 500,000 Documents per Contract Year
SAP Build Apps, Enterprise Edition		X	1 Base Package
SAP Build Process Automation	X	X	20 Standard users, 2 Advanced users, and 1 unattended automation
CPEA Voucher	If specified in the Order Form	If specified in the Order Form	As indicated in the Order Form
SAP S/4HANA Cloud for Group Reporting	X	X	For Base, 25 Entities and for Premium, 50 Entities
SAP Analytics Cloud for planning, predictive standard and professional edition, public option		X	10 Standard Users and 1 Professional User
SAP S/4HANA Cloud for Cash Management			5 Users
SAP S/4HANA Cloud for Receivables Management		X	5 Users
SAP S/4HANA Cloud for Advanced Financial Closing		X	50 Objects
SAP Ariba Central Invoice Management		X	20,000 Documents per Contract Year

Source: SAP.com

Market challenges are increasing, making it harder to supply and serve customers quickly and efficiently. More regulations and legal challenges, like sustainability goals, add to the complexity.

SAP S/4HANA Cloud Private Edition helps businesses become smarter and more sustainable in the cloud. Customers can follow their own paths, achieve quick success, and benefit from the latest innovations.

Customers migrate their ERP System to the Cloud at their own pace

Source: SAP.com

Figure 14. *A foundation to become an Intelligent Enterprise in the Cloud: Business Transformation Journey*

Success is about technology, but also structure and culture. Ever-ongoing business transformation intelligent automation, and empowering employees are crucial. Agile models free up IT for innovation and reduce maintenance. Future-ready businesses integrate technology with the strategy, ensuring resilience, security, and compliance. Standards and workflow should be automated. A company with these kinds of thoughts is way ahead. RISE with SAP helps enable cloud journeys quickly by using the latest innovations and increases the resilience of the company. It comprises of SAP S/4HANA Cloud Private Edition and SAP BTP, which are delivered with high security and availability.

More than 7,000 SAP Customers have adopted the cloud with RISE with SAP since 2021. This modular cloud ERP improves user experience, productivity, and decision-making through automation and AI. It provides deeper insights and informed choices.
When the Enterprises opt for SAP S/4HANA Cloud Public Edition – the offerings include the following:

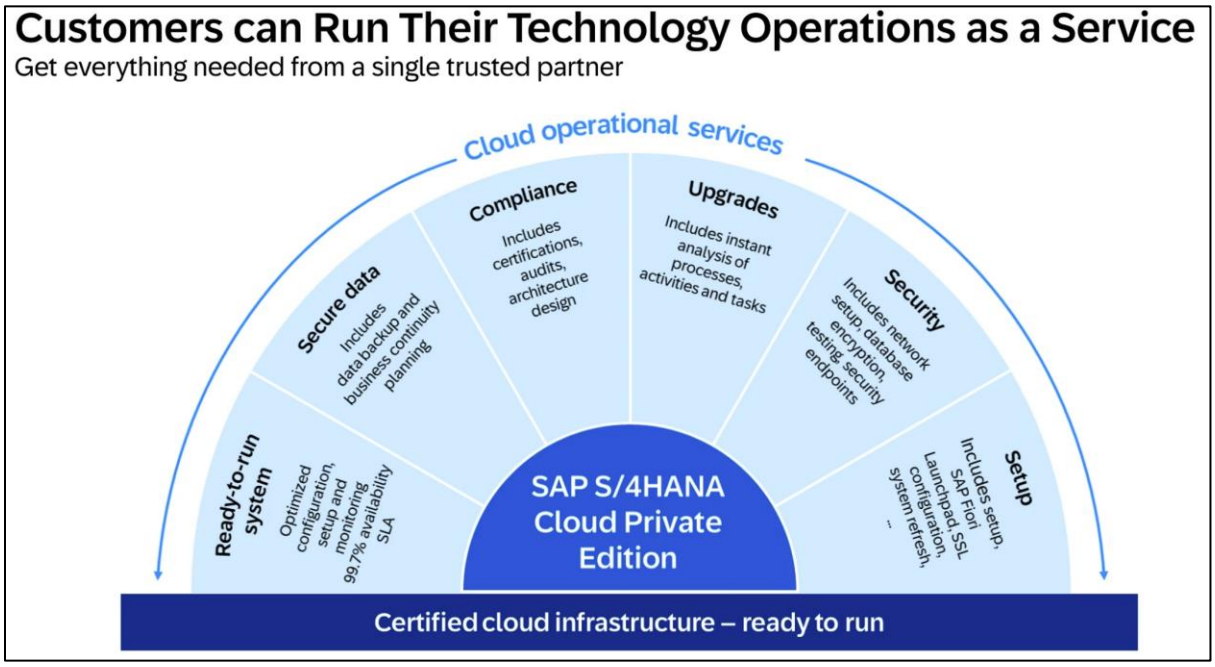
Table 11. *RISE with SAP S/4HANA Cloud, private edition – Service Offering*

Bundled Cloud Service	RISE with SAP S/4HANA Cloud, private edition, base	RISE with SAP S/4HANA Cloud, private edition, premium ("Premium")	RISE with SAP S/4HANA Cloud, private edition, premium plus ("Premium Plus")*
SAP Build Work Zone, standard edition	X	X	X
SAP BPI		X	X
Signavio PM		X	X
Signavio Collaboration Hub		X	X
SAP Build Apps, Enterprise Edition		X	X
SAP Build Process Automation		X	X
CPEA Voucher		If specified in the Order Form	If specified in the Order Form
SAP S/4HANA Cloud for Group Reporting, private edition	X	X	X
SAP Group Reporting Data Collection			X
SAP Analytics Cloud for planning, predictive edition			X
SAP S/4HANA Cloud for Cash Management			X
SAP S/4HANA Cloud for Receivables Management			X
SAP Business Network Supplier Portal			X
SAP Sustainability Control Tower			X
SAP Sustainability Footprint Management			X
SAP Datasphere			X
SAP AI Unit			X

Source: SAP.com

Customers get continuous updates, optimized processes, and better visibility into environmental impacts. Security and compliance are guaranteed with managed cloud infrastructure, while the migration program offers the necessary tools and expert guidance to make the transition seamlessly.

RISE with SAP future-proofs the business, accelerating ways of learning and adapting quicker across all devices to more efficiency and innovation.

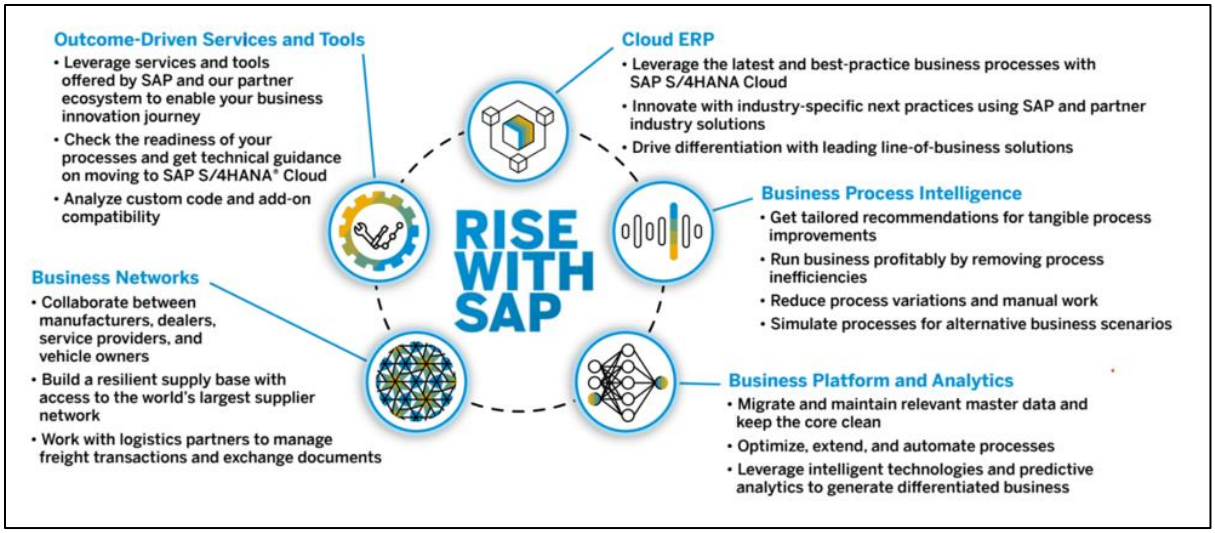


Source: SAP.com

Figure 15. *Customers can run their Technology Operations as a Service*

RISE with SAP helps businesses run agile, resilient, and sustainable finance processes, improving productivity while reducing costs. It enables business growth, better decisions, innovation, agility, and compliance. SAP S/4HANA Cloud Private Edition provides comprehensive capabilities with extended functionality to meet the needs of specific industries, yet on the same data structures and UI. AI is natively embedded to enhance the processes and user experience for faster decision-making and efficiency. RISE with SAP continuously improves processes through analysis, automation, and adaptation. With more than 50 years of experience, SAP provides solutions for various industries.

Customers of SAP can create their own apps for more flexibility. RISE with SAP reduces manual tasks and streamlines processes to focus on strategic activities in driving transformation and optimization. Figure 15. It emphasizes one vendor or provider to deliver all the required services, hence simplifying the management process. And if that provider is SAP itself – it's nothing like that. The concept of running technology operations as a service, where customers can outsource various aspects of their IT infrastructure and management to a trusted partner, e.g., SAP. This also describes an image for cloud operational service solutions, focusing on the service support for SAP S/4HANA Cloud Private Edition for various reasons: reduced operational overhead; advanced security and compliance; reduced time to market; and increasing performance in better availability of the system. Managed end-to-end services under one contract include optimized configuration, set-up, and monitoring as part of RISE with SAP from the package offered by SAP Enterprise Cloud Services. This cloud ERP ensures high availability to maximum 99.9% uptime guarantee and application service level agreements, while providing data backup and business continuity planning to safeguard critical business data and enable quick recovery in the case of disaster. SAP S/4HANA Cloud Private Edition runs on a fully certified cloud infrastructure, ready to use with no additional setup or configuration. This reduces deployment time and effort and allows businesses to benefit from SAP S/4HANA quickly. Companies can run technology operations as a service with SAP S/4HANA Cloud Private Edition and RISE with SAP. They can rely on a single trusted partner managing their technology operations, hence reducing the burden on their internal IT teams and focusing them more on core business activities. This ensures access to expertise and support that is important in effectively managing SAP solutions.



Source: SAP.com

Figure 16. *RISE with SAP as a Solution for the Business Transformation for Enterprises*

As shown in Figure 16., the RISE with SAP solution includes key products, services and tools to help the enterprises deliver on their cloud-enabled business transformation. RISE with SAP helps businesses run agile, resilient, and sustainable finance processes, improving productivity while reducing costs. It enables business growth, better decisions, innovation, agility, and compliance. SAP S/4HANA Cloud Private Edition provides comprehensive capabilities with extended functionality to meet the needs of specific industries, yet on the same data structures and UI. AI is natively embedded to enhance the processes and user experience for faster decision-making and efficiency. RISE with SAP continuously improves processes through analysis, automation, and adaptation. With more than 50 years of experience, SAP provides solutions for various industries. Customers of SAP can create their own apps for more flexibility. RISE with SAP reduces manual tasks and streamlines processes to focus on strategic activities in driving transformation and optimization. Figure 16. It emphasizes one vendor or provider to deliver all the required services, hence simplifying the management process. And if that provider is SAP itself – it's nothing like that. The concept of running technology operations as a service, where customers can outsource various aspects of their IT infrastructure and management to a trusted partner, e.g., SAP. This also describes an image for cloud operational service

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5.3 Recent Technology Trends for Business Transformation of Enterprises

Business transformation needs to incorporate current technological changes for a number of reasons:

New technologies can automate repetitive tasks, reduce errors, and make operations smoother, greatly enhancing productivity and efficiency. Artificial intelligence, machine learning, and big data are the means whereby insights on customer behavior are revealed, operations are optimized, and decision-making is enhanced for a competitive advantage in business. Digital transformation reduces operation costs through minimal use of human labor, optimization of processes, and management of resources. For example, cloud computing can reduce hardware costs and enhance scalability. With modern technologies, businesses can offer seamless, omnichannel experiences that meet the changing needs of customers and improve satisfaction. Technology makes it easier for a business to quickly adapt to market changes and customer needs, building more resiliency in operations and responsiveness to disruptions. Security measures like encryption, multifactor authentication, and network segmentation protect data from cyber threats, ensuring business continuity and trust. And finally, by embracing new technologies, new markets can be opened, with innovative products and services, promoting sustainable growth.

Let’s touched upon some current technology trends adopted by the enterprises for their transformation:

- Cloud Adoption / Cloud Computing
- Artificial Intelligence (AI) and Machine Learning (ML)
- Generative AI (GenAI)
- 5G and Edge Computing
- Sustainability and Green Technologies
- Cybersecurity
- Digital Twins
- Human-Machine Collaboration

Cloud Adoption / Cloud Computing

Cloud adoption is a strategic move that enables enterprises to be more agile, innovative, and competitive. It supports cost savings, enhances security, and fosters a collaborative and resilient business environment.

- Cost Efficiency
    - • Reduced Capital Expenditure: Traditional IT set-ups require huge upfront investments in hardware and software. Cloud computing shifts these costs to a pay-as-you-go model where businesses pay for resources utilized.
    - • Operational Savings: Maintenance, upgrades, and energy consumption by cloud providers decrease the operational load that is otherwise carried by in-house IT and thus facilitate the reduction of overall expenses.
- Scability and Flexibility
    - • On-Demand Resources: Cloud services grant an organization the ability to ramp up or dial down their resources according to demand; such situations occur during times of peak demand or work that arises unexpectedly.
    - • Global Reach: With data centers located all over the world, cloud providers can help businesses deploy applications closer to their customers, thus reducing latency and improving user experience.
-Innovation and Agility
    - • Rapid Deployment: Cloud platforms help deploy applications and services faster, thus enabling businesses to innovate and bring products to market faster.
    - • Access to Advanced Technologies: Enterprises can leverage advanced technologies such as AI, machine learning, and big data analytics without requiring significant upfront investments.
- Improved Security

• Advanced Security Features: Cloud providers invest in security with advanced features, such as encryption, identity management, and threat detection, often beyond traditional on-premises solutions.

• Compliance: Many cloud providers are compliant with global standards and regulations, making it easier for businesses to meet their compliance requirements.

- Better Collaboration

• Enable Remote Work: Cloud-based tools enable seamless collaboration among employees from anywhere, which is important in today's remote and hybrid work environments.

• Real-Time Collaboration: Shared documents, video conferencing, and project management software are some of the tools that increase productivity and teamwork.

- Business Continuity

• Disaster Recovery: Cloud services provide enterprise-class disaster recovery solutions to back up data and restore it quickly in case of an outage.

• High Availability: Cloud providers offer SLAs that guarantee uptimes and reliability, hence ensuring continuous business operations.

- Focus on Core Competencies

• Outsourcing IT Management: Moving on to the cloud means a business can outsource all the management of IT infrastructure with cloud providers, thereby allowing internal teams to focus on strategic initiatives and core business functions.

- Environmental Sustainability

• Energy Efficiency: Cloud data centers are often built to be more energy-efficient than conventional data centers, thus contributing to reduced carbon footprints.

• Resource Optimization: Cloud providers optimize resource usage, further leading to less waste and sustainability.

Cloud can facilitate business in transforming their operations, innovating, and growing on a sustainable basis.

AI & ML

Artificial Intelligence (AI) and Machine Learning (ML) are pivotal for enterprises today due to their transformative potential across various business functions. These involve how it has transformed the machine's capabilities across various lines in business. Here's why they are so vital in enterprises today:

-Aggregated Decision-Making.

• AI and ML provide enterprises the option to analyze large sets of data in a flash or within a short duration; hence, it boosts efficient decisions. Businesses can acquire viable actions from their data analyses or trends and identify prospective opportunity points and risks more prominently.

-Optimization Efficiency

• AI and ML free human resources to focus on more strategic and creative activities by automating routine and repetitive tasks. It thus increases productivity while reducing the possibilities of human error, thereby becoming a better operation.

• AI and ML allow for customized interactions based on customer behaviour and their preferences. Personalization by businesses leads to higher customers' satisfaction and loyalty in terms of recommendation and even support. Furthermore, using AI-powered chatbots as well as virtual assistants promotes 24/7 servicing of customers, thus further improving response times and the quality of customer experience.

-Innovation and Competitive Advantage

• Enterprises using AI and ML can innovate faster by creating new products and services that meet the market demands. These technologies also give an edge in competition as they allow businesses to be more agile and responsive to the changes in the market.

-Risk Management and Security

• AI and ML are crucial in identifying and mitigating risks. For example, they can recognize fraudulent activities by analyzing the pattern of transactions and highlighting anomalies. In cybersecurity, these technologies help in monitoring network traffic and detecting possible threats, thus enhancing enterprise system security.

-Scalability and Flexibility

• AI and ML solutions are highly scalable, allowing enterprises to manage growing amounts of data and complexity as they grow. These technologies are also adaptive, allowing businesses to respond quickly to changing market conditions and business needs.

-Talent Development

• AI and ML can enable employee training and development through identifying skill gaps and personalised learning paths. It facilitates talent management by aggregating the aggregate data of all the candidates and predicting job performances and fit to make better recruitment and retention strategies.

AI and ML are the key technologies for enterprises looking to improve their decision-making capabilities, enhance operational efficiency, deliver superior customer

experiences, drive innovation, manage risks, and scale effectively. These technologies enable businesses to stay competitive and thrive in the dynamic digital landscape.

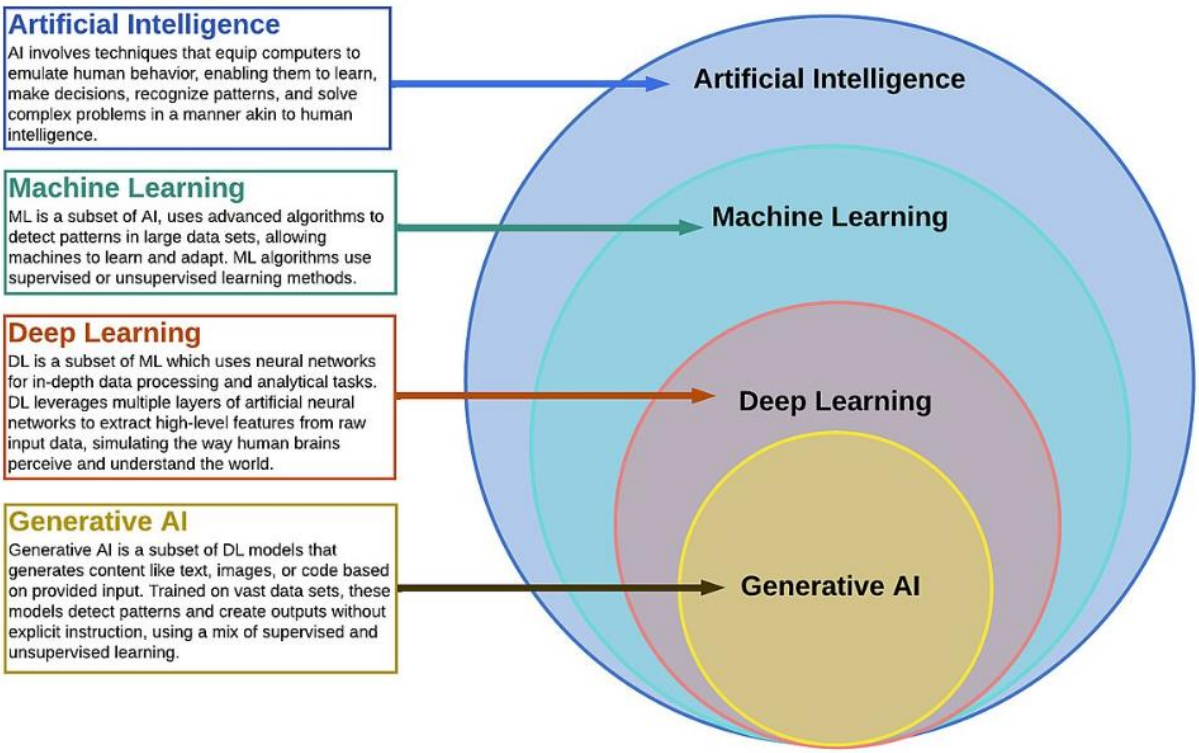


Figure 17. *A comparative view of AI and subsets of AI*

Table 12. *Scope and Use Cases of AI and ML*

Aspects	Artificial Intelligence (AI)	Machine Learning (ML)
Definition and scope	The broader concept of creating intelligent agents that can reason, learn, and act autonomously. AI can function without ML, but ML is a critical component of many AI systems.	A subset of AI that focuses on algorithms that allow machines to learn from data without explicit programming. ML is a subset of AI and relies on AI principles to function.

Goal	To create intelligent machines that can mimic human intelligence.	To develop algorithms that can learn from data and make predictions or decisions.
Technique	Includes a wide range of techniques, such as knowledge representation, search algorithms, natural language processing, and machine learning.	Primarily relies on statistical techniques and algorithms to analyze data and make predictions. It involves supervised learning, unsupervised learning, and reinforcement learning.
Data	Can work with both structured and unstructured data.	Primarily uses structured or semi-structured data.
Applications	Generally, more complex as it involves integrating various technologies. A wide range of applications, including natural language processing, image recognition, expert systems, and robotics, self-driving cars, chatbots, recommendation systems, smart assistants like Siri and Alexa.	Focuses on specific tasks and is often less complex than the broader AI systems. Specific applications such as recommendation systems, fraud detection, spam email filtering, image, medical diagnosis and speech recognition systems.

The integration of AI or advanced Generative AI in various sectors demonstrates their transformative abilities - how they redefine the limits of user interaction, creative expression, and business efficiency. AI is best suited for data analysis or routine

automation. It is very good at tasks that have clear rules and patterns, such as predictive analytics.

Generative AI or GenAI is better suited for creative endeavors. If one needs innovative solutions or highly adaptable tools, such as for digital art or advanced user interfaces, GenAI is the way to go.

Table 13. *Comparative Analysis between AI and GenAI*

Aspects	Artificial Intelligence (AI)	Generative AI (GenAI)
Goal	To create intelligent machines that can mimic human intelligence.	A subset of AI that focuses on creating new content, such as text, images, or music. To generate human-quality content, often indistinguishable from human-created content.
Technique	Includes a wide range of techniques, such as knowledge representation, search algorithms, natural language processing, and machine learning.	Relies heavily on deep learning techniques, such as Generative Adversarial Networks (GANs) and Large Language Models (LLMs).
Data	Requires large amounts of data to train models.	Requires massive amounts of data to train models, often sourced from the internet.
Applications	A wide range of applications, including natural language	Specific applications such as text generation, image generation, music composition,

	processing, image recognition, expert systems, and robotics. Practical usage: Predictive Analytics, Fraud Detection, Business Process Automation, etc.	and code generation. Mostly used for: Automated Content Creation, AI-Generated Art, Synthetic Data Generation, Automated Content Moderation, etc.

GenAI

Generative AI (GenAI) is transforming technology that deeply impacts business change in various dimensions. Here's why it is so important:

-Innovation and Creativity

It can create quality content - articles, marketing materials even art and music. This not only accelerates content production but also unlocks new avenues of creativity.

• Product Development: Based on massive data analyses, GenAI helps design new products and services, which provide innovative solutions to market requirements.

- Improved Customer Service

• Tailored Interaction: GenAI uses user data and preferences, thereby making the customer interaction significantly more personalized. This usually leads to better recommendations with improved customer satisfaction.

• 24/7 Service Support: AI-powered chatbots and virtual assistants support customers' queries 24/7, thereby improving service quality, which also decreases response times.

- Operational Efficiency

• Automate the routine work: GenAI does the automation of mundane work which includes data entry, document handling, and report generation, freeing human resources to concentrate on strategic works.

• Optimization of Process: Workflow analysis through GenAI highlights inefficiencies in processes and proposes corrective measures for streamlining them and cost saving.

- Data-Driven Insights

• Advanced Analytics: GenAI processes and analyzes large datasets to uncover patterns and insights that might be missed by traditional methods, helping businesses make informed decisions.

• Predictive Capabilities: GenAI's ability to predict trends and behaviors based on historical data allows businesses to anticipate market changes and adjust their strategies accordingly.

- Scalability and Flexibility

• Scalable Solutions: GenAI solutions can scale with the growth of enterprise and handle greater amounts of data and complexity that come with minimal redesign.

• Adaptability: GenAI solutions can bend to the evolving business environment and market situations, giving more flexibility to innovation and a way to transform.

- Competitive Advantage

• Market Differentiation: Enterprises utilising GenAI can get a competitive edge in the markets by offering differentiated products and services.

• Faster Time-to-Market: GenAI accelerates the development and deployment of new solutions, allowing businesses to bring products to market more quickly.

- Risk Management

• Fraud Detection: GenAI can detect fraudulent activities by analyzing transaction patterns and identifying anomalies, thereby enhancing security and protecting assets.

• Cybersecurity: These technologies help in identifying and mitigating cybersecurity threats by analyzing network traffic and detecting unusual patterns.

Generative AI is a really powerful tool driving innovation, helping customers, enhancing operational efficiency, and giving them a competitive advantage. With GenAI, enterprises are able to transform their operations in ways that help them get ahead of market trends to achieve sustainable growth.

5G and Edge Computing

5G and edge computing are complementary technologies that can improve performance and create new opportunities for innovation in many industries. 5G increases the speed at which data travels, while edge computing reduces the distance data must travel before it can be processed. This combination can create a smoother user experience, especially for applications that require real-time data processing.

-Enhanced Connectivity and Speed

• Low Latency: 5G technology offers much lower latency, meaning data can be transmitted and received almost instantaneously. This is essential for applications that require real-time processing, such as autonomous vehicles and remote surgeries.

• High Bandwidth: With its higher bandwidth, 5G can support a larger number of connected devices and handle more data traffic, ensuring seamless communication and data transfer.

- Improved Data Processing with Edge Computing

• Proximity to Data Sources: Edge computing deals with data closer to its sources, such as in the case of IoT devices and sensors. This minimizes back and forth data transfer to the centralized data centers, thus improving the processing speed and latency.

• Real-Time Analytics: Processing data at the edge means that businesses can run analytics in real-time and take instant decisions, which is essential for applications like smart manufacturing and real-time monitoring.

- Operational Efficiency and Cost Savings

• Reduced Data Transport Costs: Processing data locally at the edge minimizes the costs associated with transporting large volumes of data to central servers.

• Optimized Resource Utilization: Edge computing allows for more efficient use of network resources by processing data closer to its source, reducing the load on central servers and networks.

- Improved Security and Compliance

• Data Privacy: Processing data locally can improve data privacy and security as sensitive information does not need to travel across the network to centralized data centers.

• Regulatory Compliance: Edge computing assists businesses in compliance with data sovereignty regulations by ensuring that data is processed and stored within specific geographic boundaries.

- Innovation and New Business Models

• IoT and Smart Applications: The union of 5G and edge computing makes the deployment of massive IoT applications like smart cities, connected healthcare, and industrial automation possible.

• New Revenue Streams: It offers new business models and revenue streams with the support of innovative services and applications that were impossible with past technologies.

- Scalability and Flexibility

• Scalable Infrastructure: 5G and edge computing can offer a scalable infrastructure to expand with the business, enabling growth for large numbers of devices and applications with little redesign.

• Flexible Deployment: Edge computing resources can be placed in a variety of locations, including factories, retail stores, and remote sites, giving enterprises flexibility to adapt to specific business needs.

To integrate 5G and edge computing is important for enhancing connectivity; operating more efficiently through faster data processing; creating operational efficiency, driving innovation; and therefore, keeping businesses agile in a very dynamic digital landscape.

Sustainability and Green Technologies

Sustainable technology enhances social, economic, and environmental impacts. It deals with the decision on the use of technology and business practices to support long-term ecological balance and human rights.

- Environmental Impact Reduction

• Lower Carbon Footprint: The implementation of green technologies in businesses helps them reduce carbon emissions. This is achieved through

energy-efficient processes, renewable energy sources, and sustainable practices that minimize environmental impact.

• Resource Efficiency: The whole concept of sustainability emphasizes resource optimisation, reduction of waste, and promotion of recycling and reuse. In doing so, it helps to conserve natural resources, as well as cut the costs of operation.

- Regulatory Compliance and Risk Management

• Meeting Regulations: Governments and regulatory bodies are imposing strict environmental regulations. Following sustainability will ensure that these regulations are met, thereby avoiding penalties and legal hassles.

• Risk Mitigation: Business enterprises can avoid disruptions caused by environmental incidents and improve their resilience against climate-related risks by proactively addressing environmental risks.

- Cost Savings and Operational Efficiency

• Energy Savings: Green technologies will often result in huge energy savings. For instance, saving on utility bills by using energy-efficient lighting, heating, and cooling systems.

• Operational Efficiency: Sustainable practices streamline operations by reducing waste and improving resource management, leading to cost savings and increased efficiency.

- Improving Brand Image and Competitive Position

• Better Brand Perception: Those companies that place importance on sustainability often receive better reviews from customers, investors, and other stakeholders. This can improve customer retention and attract more eco-conscious customers.

• Market Differentiation: Sustainability becomes a differentiator in the marketplace, giving a competitive position to businesses compared to those not prioritizing green practices.

- Innovation and New Business Opportunities

• Green Innovation: Innovations in the field of sustainability enhance new products and services, making them ecofriendly. This may also enable access to new markets, new sources of revenue and value creation.

• Sustainable Business Models: New business models are evolved for the companies through different business models such as through circular economy practices that concern themselves with the product's life cycle and the removal of waste.

- Employee Engagement and Retention

• Attracting Talent: A commitment to sustainability can attract top talent who are looking to work for companies that align with their values.

• Employee Motivation: Employees are often more motivated and engaged when they know their work contributes to a greater good, such as environmental sustainability.

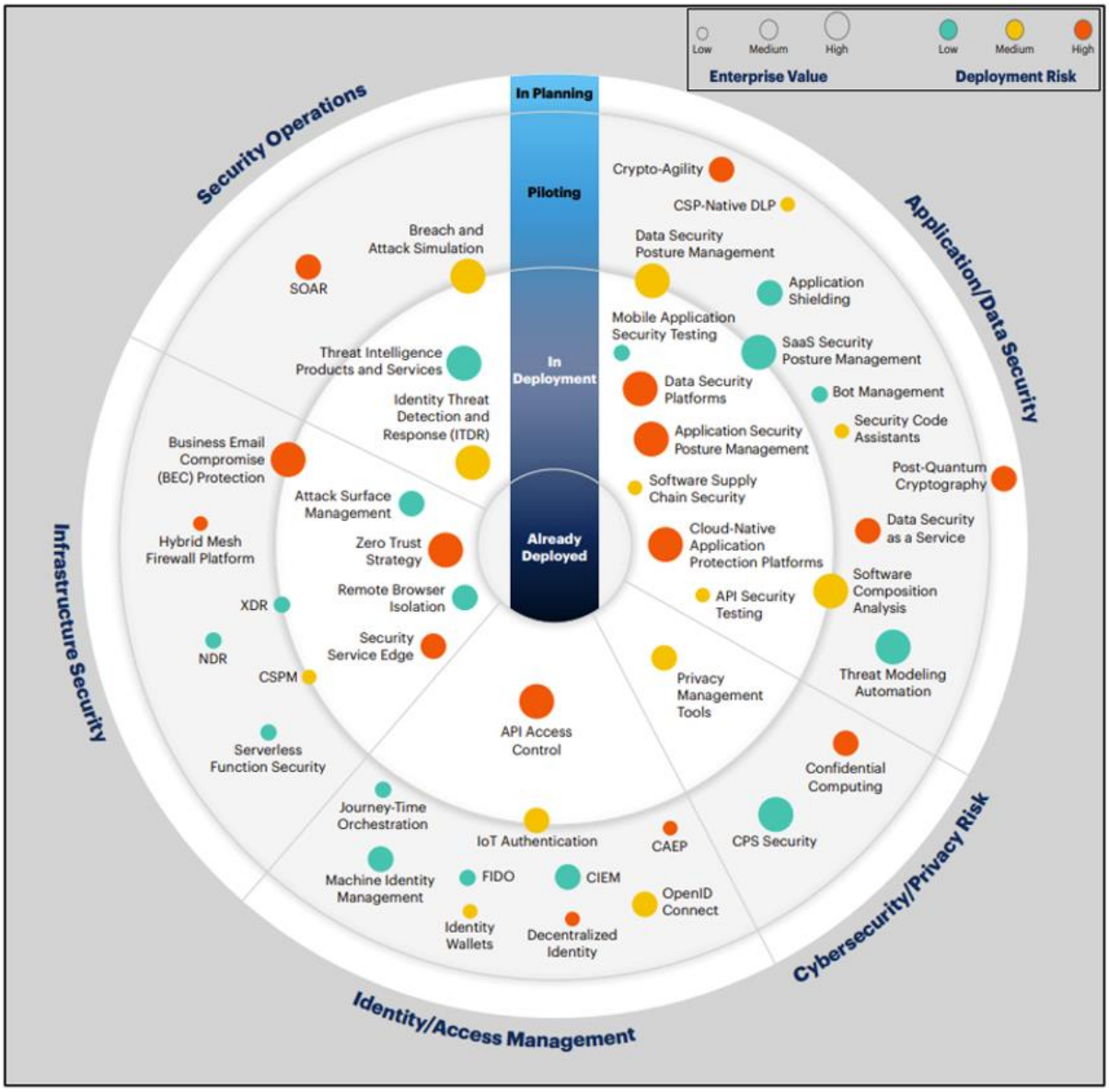
Sustainability and green technologies are critical for business transformation in enterprises. They help reduce environmental impact, ensure regulatory compliance, achieve cost savings, enhance brand image, drive innovation, and improve employee engagement. Businesses, by integrating these practices, can not only contribute to a healthier planet but also to long-term success and competitiveness.

Cybersecurity

Cybersecurity is the most vital part of business transformation as it helps guard data, ensure operational integrity, and maintain customer trust. Here are some of its importance:

- Data Protection: It is one of the essential features of cybersecurity, which protects the business data from unauthorized access, threats, and breaches. It must be kept confidential, safe, and available.

- Customer Trust: Robust cybersecurity measures protect customer trust. A breach in data may severely hamper a company's reputation and cause loss of confidence among the customers, making cybersecurity an important customer retention factor.
- Business Continuity: Cybersecurity practices are a critical component for business continuity. Protecting operations and sensitive information allows businesses to reduce disruptions and maintain operations with minimal disruption due to cyber threats.
- Regulatory Compliance: Cybersecurity regulations need to be followed for legal purposes. Businesses have to place cybersecurity measures in order to follow various regulatory requirements for not facing fines and other forms of legal consequences.
- Legal protection: Cybersecurity can protect business entities from legal fines and penalties brought by data breaches and noncompliance. It provides a safeguard on the legal side so that the required protections are covered.
- Competitive Advantage in the Digital Age: Cybersecurity can be a competitive advantage in the digital age. Businesses that prioritize cybersecurity are able to protect their assets while staying ahead of competitors who have more vulnerabilities to cyber threats.
-Digital Transformation: With digital solutions now integrated into every aspect of the business, cybersecurity is of utmost importance. It prevents the many cyber threats that can occur in a digitally transformed environment and allows digital initiatives to be safe and sustainable.



Source: Gartner.com

Figure 18. *2024 Technology Adoption Roadmap for Security and Risk Management*

The attached 2024 Technology Adoption Roadmap for Security and Risk Management from Gartner visualizes the adoption lifecycle of various cybersecurity technologies, categorized by their current state of deployment (In Planning, Piloting, In Deployment, Already Deployed), enterprise value, and deployment risk.

This perspective emphasizes the multifaceted importance of cybersecurity in the context of modern business transformation.

Digital Twin

Digital Twin is one of the latest innovations in technology that revolutionized the industry, as it almost mirrors everything of a product, process, or service.

-Enhanced Decision-Making

• Simulation and Prediction: A digital twin develops virtual images of physical assets, systems, or processes. In this regard, businesses are able to simulate different scenarios and predict the outcome of a process without disrupting actual processes. Through this, the business can be better in its decisions and optimizes its strategy.

• Optimization of Processes: The detailed view created by digital twins can further help in pointing out the areas of inefficiency. This leads to optimum processes, reduced downtime, and increased output

• Real-Time Monitoring: Digital twins are capable of real-time monitoring of assets and processes, allowing for early identification and resolution of concerns. This proactive approach minimizes disruptions and enhances general operational efficiency.

-Cost Saving

• Lower Maintenance Costs: Predictive maintenance using digital twins can predict potential failures and schedule maintenance activities before problems occur. This reduces unplanned downtime and extends the life of equipment, thus saving a lot of money.

• Resource Optimization: Digital twins help optimize resource usage by simulating different operational scenarios, thus reducing waste and lowering operational costs.

- Innovation and Product Development

• Rapid R&D: Digital twins speed up research and development because companies can experiment and prototype new products in a virtual world. This accelerates the innovation cycle and reduces the time-to-market for new products.

• Customization: Using digital twins, businesses can produce customized products and services that meet the specific needs of customers, thereby increasing customer satisfaction and loyalty.

- Enhanced Customer Experience

• Personalized Services: Using data from digital twins, companies can offer their customers personalized services and solutions. This increases the customer experience and strengthens relationships.

• Quality of Products: Through continuous monitoring and simulation, the quality of products is improved, which in turn means that customers are satisfied, and returns or complaints are reduced.

- Sustainability

• Energy Efficiency: Digital twins help optimize energy usage by simulating and analyzing energy consumption patterns. This leads to more sustainable operations and reduces environmental impact.

• Sustainable Practices: By providing insights into resource usage and waste, digital twins support the implementation of more sustainable business practices.

- Risk Management

• Predictive Analytics: Digital twins use predictive analytics to identify potential risks and vulnerabilities in operations. This enables businesses to take preventive measures and mitigate risks before they escalate.

• Scenario Planning: Companies can use digital twins to simulate various risk scenarios and develop robust contingency plans, enhancing their resilience against disruptions.

Digital twins are critical for business transformation as they enhance decision-making, improve operational efficiency, drive innovation, and support sustainability. With virtual replicas of physical assets and processes, businesses can optimize their operations, reduce costs, and deliver better products and services. This technology not only helps in achieving immediate operational goals but also paves the way for long-term strategic growth and competitiveness.

Human Machine Collaboration

The human-machine collaboration works by a combination of both workforces, humans and automated technology, aligned towards achieving common goals. This synergistic approach combines human expertise with machine efficiency, thereby being able to orchestrate the optimization of processes, enhance decision-making, and drive innovation in an organization. With AI and machine learning, organizations can focus on high-value tasks while machines handle routine or repetitive work. This collaborative model empowers organizations to achieve more with less, unlocking new possibilities for growth and transformation. Human-machine collaboration is at the center stage of the future of work. Organizations can create a more efficient, innovative, and productive workforce by combining the strengths that both humans and machines possess.

-Boosting Productivity and Efficiency

- Machines take over routine repetitive and mundane tasks so as to leave human workers concentrating their efforts on more complex and strategic pursuits. The division of tasks enhances productivity and operational efficiency in general.
- Improving Human Competencies: The use of AI and automation supports workers' ability to move their capabilities up by making the best possible decisions while improving performance.

- Fostering Innovation and Creativity

• Inventing New Solutions: Human creativity complemented by machine accuracy leads to inventing new solutions and products. Machines can analyze huge amounts of data patterns and insights and bring human creative thinking into developing new ideas and strategies.

• Rapid Prototyping: Human machine collaboration accelerates prototyping of new products and services, eliminating lengthy periods for getting a product to the market, accelerating innovation.

-Improved Decision Making

• Data-Driven Insights: Machines can process huge amounts of data and provide insight, and thus aid humans to make better decisions. This would be specially beneficial in areas such as market analysis, customer behavior, and operational efficiency.

• Applying Predictive Analytics: From historical data, AI and machine learning algorithms can make predictions about future trends and consequences. Business will be able to predict changes and strategize their change in the future.

- Customer Experience Enhancement

• Personalized Engagements: AI-based tools can analyze customer data for personalized recommendations and support. Human agents will then focus on complex interactions that call for empathy and problem-solving skills.

• 24/7 Support: Machines can provide customers with 24/7 support via chatbots and virtual assistants. Customers can receive support at any time.

- Scalability and Flexibility

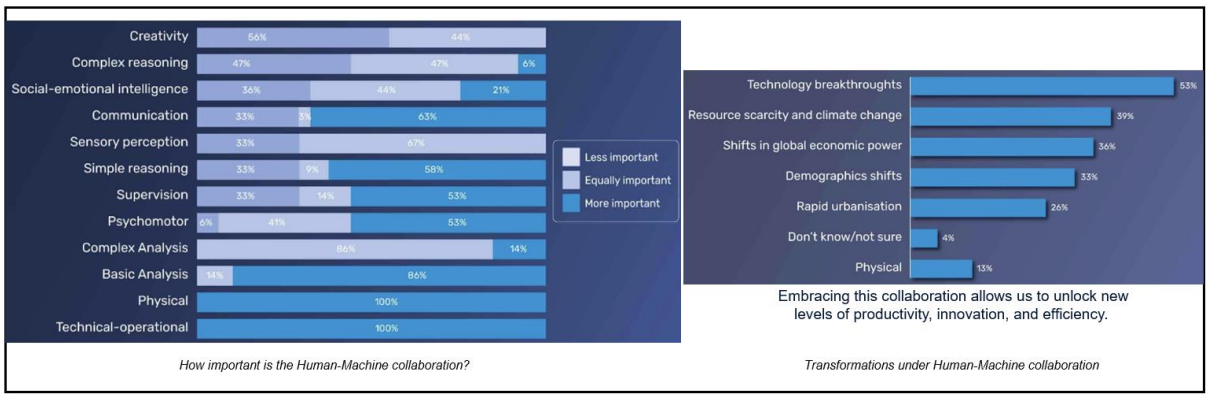
• Scalable Operations: Human-machine collaboration enables companies to scale their operations more efficiently. Machines can increase workloads without having to increase human labor proportionally.

• Adapt to Change: This partnership allows for businesses to adapt to changing market conditions and customer demands, giving them the flexibility to change and grow.

- Risk Management and Safety

• Predictive Maintenance: Machines can see equipment and predict when problems will occur, allowing for anticipation of maintenance and minimizing the risk of unexpected downtime.

• Workplace Safety: In hazardous environments, machines are able to perform dangerous tasks thereby reducing the risk to workers and improving overall workplace safety.



Source: VLinkinfo.com

Figure 19. *How Human-Machine Collaboration Drives The Future of Work?*

Human-machine collaboration is crucial for the transformation of businesses in enterprises. It enhances productivity, facilitates innovation, improves decision-making, and helps enhance the customer experience. By combining the powers of humans and machines, it allows businesses to become more efficient, scalable, and adaptable in order to be able to succeed in the future within a fast-changing digital world.

5.4 Modern SAP Solutions triggering Business Transformation

Recent trends clearly indicate that, for businesses to grow in the current times and remain in competition, they need resilience, competitiveness, and responsiveness. Hence, a whole transformation from the raw materials to final stages of customer service fulfilment is needed to be completed in the digital landscape for businesses. This also calls for modernization and innovation of traditional business models by business organizations towards meeting fast-evolving customer expectations for personalized services. According to McKinsey's latest survey, where they interviewed senior business executives, there is a clear imperative in modernizing and digitalizing the business processes and the legacies, which became stronger after the pandemic. A significant number of the respondents believe that their present business models are obsolete. Specifically, only 11% of respondents believe that their existing business models will remain economically viable through 2023. In contrast, 64% of respondents assert that their companies must develop new digital business models to ensure future viability. These findings underscore the critical need for businesses to embrace business transformation to remain competitive and responsive in a rapidly changing market environment.

Most of the businesses have been performing their businesses for quite a while; they already utilize some Enterprise Resource Planning solutions in managing their critical businesses. ERP software automates business processes, including back-office operations, financial management, sales order capture, and customer information management. The vast customer base that SAP maintains around the globe dominates and more or less popularize this segment and offers, as well industry-specific solutions catering to the needs of small, medium businesses, as well large enterprises. SAP provides the majority of the broadest portfolios of software, solutions and services; better on some to which have the capability to transform an organization to an intelligent enterprise, so that the organization in question has ease to concentrate on its business transformation.

Enterprises often leverage advanced SAP products/technologies and services to drive their business transformation. Here are some key SAP solutions that are widely used:

- SAP HANA
- SAP S/4HANA
- SAP Business Technology Platform (BTP)
- SAP Analytics Cloud (SAC)
- SAP Integrated Business Planning (IBP)
- SAP Ariba
- SAP SuccessFactors HCM
- SAP Concur
- SAP Signavio
- SAP LeanIX
- SAP Joule
- SAP Intelligence Robotic Automation Process (RPA)

At first, let us spend sometimes on SAP HANA – which is a game changer not only for SAP but also for the market, guiding the business towards innovative business models and new value propositions. SAP HANA's in-memory function introduces unprecedented levels of speed, resulting in real-time information. SAP HANA is a fast and powerful database that provides real-time analytics, data processing, and support for various applications within the SAP ecosystem. SAP HANA simplifies problem-solving and IT, innovative ideas in business, and breaks down barriers in digital world.

SAP HANA

The Multi-model database SAP HANA has brought in-memory storage rather than that via conventional disc storage. Its column oriented database architecture is an in-memory base on which it can run heavy analytics with high-speed transaction performance of a single system. For this reason, companies need to process huge amounts of data with near-zero latency - even instant data querying - by fostering a data-driven approach. SAP HANA is an in-memory database management system that excels by integrating online analytical processing (OLAP) and online transactional processing (OLTP) in a single system, while other DBMS systems fall behind with regard to performance.

Development and Features

Developed in 2010, SAP HANA has matured into a product applied by hundreds of thousands of customers worldwide. Beyond being a database server for application data storage and retrieval, SAP HANA has advanced capabilities in search and analytics as well as integrating structured and unstructured data. It also serves as an application server that allows for the development of smart, insight-driven applications through real-time data, in-memory computing, and machine learning technologies. Access is available both in the cloud and on-premises.

Simplifying IT and Driving Innovation

SAP HANA is a system which integrates multiple data management capabilities, simplifying the IT infrastructure and fostering business innovation while removing barriers to digital transformation. Unlike most traditional databases that rely on disk-based storage, SAP HANA was designed with in-memory data processing from the ground up, using other storage mechanisms where necessary to balance performance and cost. As a result, this approach ensures considerably faster retrieval times for data, which will result in split-second response times.

Applications and Innovations

Applications for high speed, where large spikes in traffic need to be dealt with are telecom networks and banking systems. New innovations on multi-core processors and the dropping price of RAM have brought in-memory databases like SAP HANA to an array of

applications like real-time analytics, predictive modeling, customer experience management, and logistics.

Benefits of SAP HANA

SAP HANA provides far more than data storage and retrieval. This is a comprehensive solution for meeting modern needs in data management. Its key benefits are:

• Comprehensive Services: It integrates database services, advanced analytical processing, application development, and data integration.

• High Speed: The response to the query is delivered within less than a second to large production applications.

• Versatility: It supports hybrid transactional and analytical processing and accepts various data types.

• Efficiency: No duplication, advanced compression, and minimized data silos help in reducing the data footprint.

• Powerful Processing: Utilize massively parallel processing (MPP) to query large datasets fast.

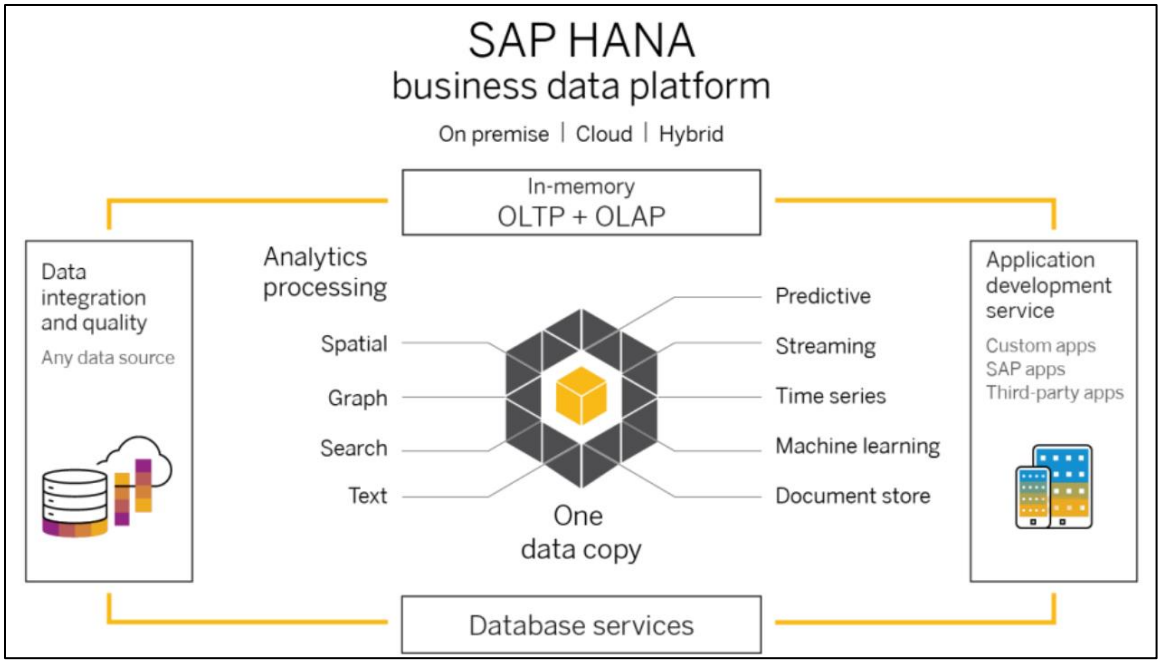
• Scalability: It easily scales according to data volume and concurrent users across distributed environments.

• Flexibility: Deploys in public or private clouds, multiple clouds, on-premises, or hybrid scenarios.

• Simplicity: Provides a single gateway to all data with advanced data virtualization.

• Intelligence: Enhance applications and analytics with built-in machine learning (ML).

• Security: Ensures comprehensive data and application security with secure setup.



Source: SAP.com

Figure 20. *SAP HANA – A Simplistic View*

SAP HANA is a cornerstone of many of SAP's flagship products and is supported by an extensive network of SAP partners and customers who have developed custom solutions to meet specific business needs. By offering a complete, fast, versatile, efficient, powerful, scalable, flexible, simple, intelligent, and secure database solution, SAP HANA plays a critical role in modern data management and business transformation initiatives.

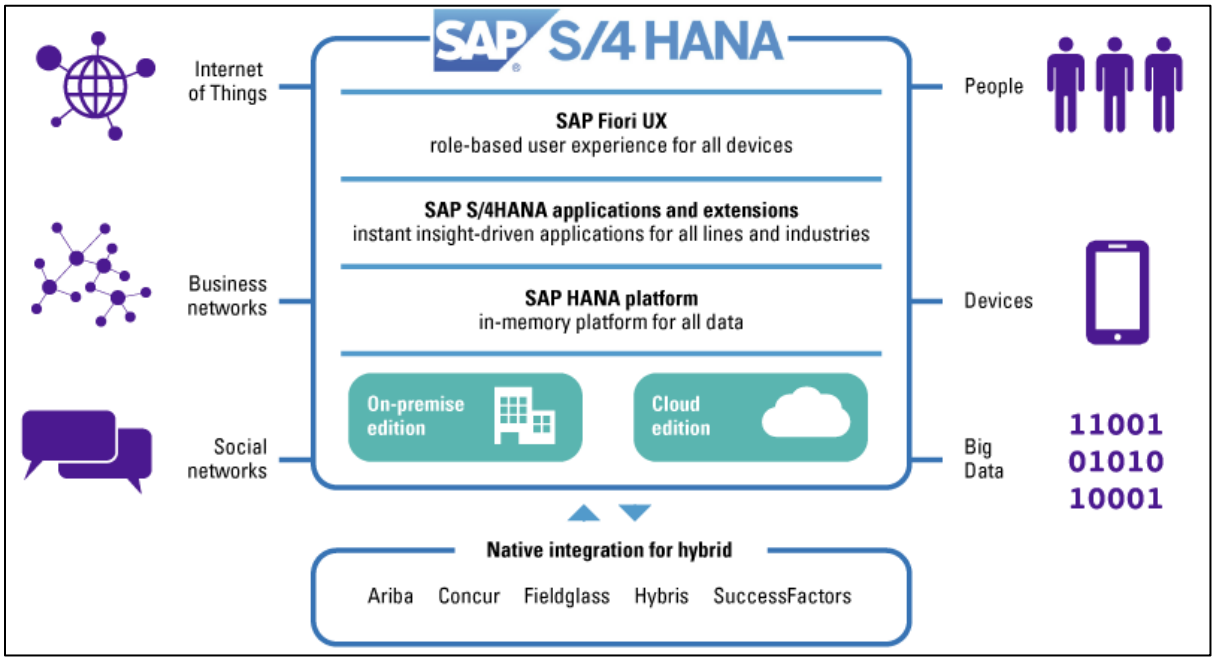
SAP S/4HANA

Enterprise Resource Planning (ERP) systems have been a core component of business activities for many years. Of all these systems, SAP is one of the leading players since the 1970s. SAP ECC (ERP Central Component), developed in the early 21st century, is widely used in small and medium-sized enterprises. The system is well-developed and essential for most companies, especially in the mid-market segment, starting from SAP R/3 of the 1990s. However, the rapid obsolescence in technology and growing business complexities pose difficult challenges in maintaining these old systems.

As for SAP ECC, it's like the traditional Nokia 6610 in mobile phones-a reliable ERP system that delivers on its expected functionality, giving businesses solidity and dependability. SAP ECC has been the bedrock for many customers through the effective running of the business.

Despite its reliability, SAP ECC fails to meet modern business demands. Emerging business models, innovations, smart integrations, cloud computing, speed, and optimal user experience are becoming increasingly vital. The business environment is evolving at an unprecedented pace, and businesses have to adapt to remain competitive.

This is where SAP S/4HANA adds value. SAP S/4HANA, the fourth generation of ERP suites developed by SAP, builds on more than four decades of experience in enterprise resource planning software. Unlike traditional relational databases, S/4HANA has a unique in-memory architecture with columnar data storage that enables faster, near real-time analytics and computational capabilities.



Source: SAP.com

Figure 21. *S/4HANA as the Digital Core for an Intelligent Digital Enterprise*

It is important to note that ECC is not the whole SAP business suite; rather, it is the central ERP component of the suite, and other non-ERP components of the suite. S/4HANA is redesigned ERP that integrates some of those non-ERP components to its core functionality.

Moving beyond simple recording of data, SAP S/4HANA offers real-time, data-driven decision support for the end user, integrating all forms of internal and external sources. This is a critical tool that will help organizations survive the digital economy. The ability to perform seamlessly in this digital landscape has compelled many businesses to assess the benefits of S/4HANA. Because of this, many firms are now considering migrating towards this modernized ERP for higher operational efficiency and competitive advantages.

Although ECC can be run on any traditional relational database management system, S/4HANA is designed to run only on the SAP HANA database. The in-memory computing, parallel processing, and better data compression of SAP HANA enable S/4HANA to read data much faster than traditional ERPs. This architecture enhances real-time OLTP and OLAP capabilities.

S/4HANA also has simplified data models that encompass various business functionalities. For example, the MATDOC table replaces over 26 others used for inventory management data.

S/4HANA features a modern, user-friendly interface through Fiori, allowing for better integration and intuitiveness. Fiori gives businesses the ability to design role-based apps that work on all devices. For instance, a company can create special apps for sales inquiries, order overviews, and sales fulfillment, granting access based on the user's role. This flexibility gives businesses the ability to deploy a variety of apps across different roles and departments, such as sales, human resources, and finance.

S/4HANA applies some technologies: artificial intelligence, machine learning, and robotic process automation and also the Internet of Things. It includes a library with thousands of algorithms for standard use cases in predictive analytics as well as advanced deep learning and extended machine libraries (EML). With its intelligent, self-learning

technology, SAP S/4HANA reduces your daily workload by automating mundane, administrative tasks. This delegation of routine tasks to the system can save a great deal of time, allowing the user to engage in strategic activities.

In contrast, ECC demands external systems such as SAP BW/BI or third-party solutions to develop data and predictive models. This makes the process a bit more cumbersome. S/4HANA's integrated approach makes it easier and faster, thereby increasing overall efficiency. With these key differences, S/4HANA is a more powerful, efficient, and user-friendly ERP solution than ECC.

-Cloud-Based Flexibility

With SAP S/4HANA, you no longer require on-premises servers. This next-gen ERP solution is cloud-based and can be accessed from any device with an internet connection. This means you can run your business at any time, from anywhere. With SAP S/4HANA, you can centralize hardware and network resources and be the digital core for business process simplification by leveraging the power of its HANA in-memory database.

-Seamless transition to SAP S/4HANA

Transitioning to SAP S/4HANA is straightforward. Just as you've moved on from using an old Nokia phone, many small and medium-sized businesses worldwide have successfully migrated to S/4HANA. These companies have seen IT become a driver of innovation. RISE with SAP – Business Transformation as a Service – ensures a smooth, controlled transition at the right pace, making the shift to this advanced ERP system effortless and hassle-free.

-Enhanced Convenience

SAP S/4HANA revolutionizes user interaction, focusing on exceptions rather than transactions. It gives you critical issues such as delayed shipments or mismatched invoices, focusing your attention on what matters most. This is good for any user, transforming the way you and your colleagues work.

-Instant Analyses and Insights

With SAP S/4HANA, standard analyses and insights are delivered right to your daily screens. This integration allows for direct, real-time data retrieval and analysis and

display, so that you can make better-informed decisions throughout the day. Imagine these insights enhancing your efficiency and effectiveness.

-Extensive Capabilities

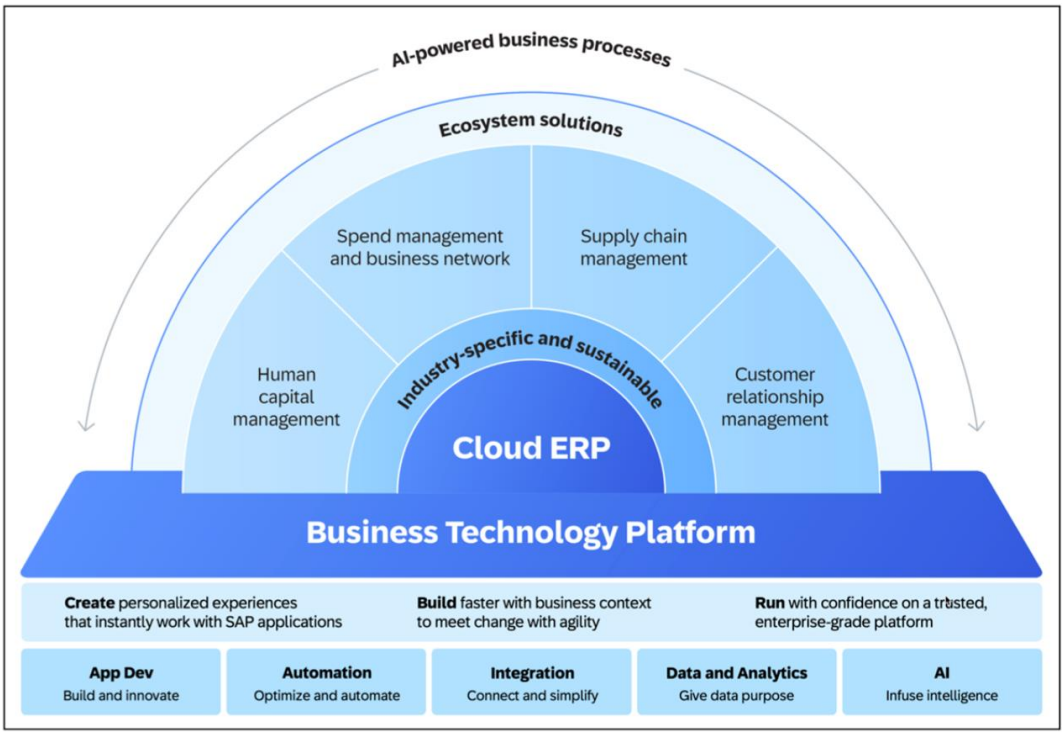
From a boxed perspective, SAP S/4HANA comes packed with numerous new features and functionalities. Whether it's exploring another innovation or even an offering with a new subscription-based business model, S/4HANA is easy to deploy for.

The businesses can take enormous jumps ahead from a generation of business system upgrades wherein they can substitute the legacy system with the next ERP generation from SAP S/4HANA.

SAP BTP

SAP BTP (Business Technology Platform) is a comprehensive, integrated platform that brings together application development, automation, integration, data management, analytics, and artificial intelligence. It assists companies in transforming their business processes and accelerating innovation, characterized by the seamless integration and extension of SAP applications.

SAP BTP is for all. Developers have the opportunity to connect, extend, and enhance mission-critical business processes quickly using the available tools. Business users can automate tasks, design flexible workflows, and create personalized interfaces through low-code solutions. Whether finance or sales, SAP BTP helps teams efficiently collaborate on planning, integrate SAP and third-party applications, and share insights across the organization. This comes from having instant access to business-context-rich information both from SAP and third-party systems. The following overview shows how SAP cloud applications and SAP BTP together work.



Source: SAP.com

Figure 22. *How SAP BTP and other SAP Solutions work together?*

SAP BTP integrates with other SAP solutions by providing an integrated environment that supports various business processes and applications. Thus, it allows for free flow of data and interoperability between different SAP systems so that the overall efficiency is maximized, and real-time insights are enabled. Here is how SAP BTP is integrated with other SAP solutions.

• Application Development and Extension: SAP BTP enables developers to build and extend applications that can interact with existing SAP systems, ensuring that new functionalities can be added without disrupting current operations.

• Data Management and Analytics: By integrating with SAP's data management and analytics tools, SAP BTP enables businesses to harness data from various sources, perform advanced analytics, and gain actionable insights.

• Offers Automation and Integration: SAP BTP promotes automation of business processes as well as integration of various applications, which helps in streamlining processes and minimizing manual effort.

• Artificial Intelligence and Machine Learning: The system houses the capabilities of AI and ML, empowering businesses to utilize intelligent technologies to improve decision-making as well as to automate intricate tasks.

• User Experience: SAP BTP allows building user interfaces that are intuitive and personalized, and thereby it ensures that the user gets the right experience to deal with SAP applications.

Thus, SAP BTP provides an interface that integrates all of its SAP solutions in a holistic way that enables business to happen more cohesively and effectively.

SAP Business Technology Platform (BTP) helps bring about following advantages to the business.

Integration: SAP BTP has pre-built integrations, APIs, and event-driven architectures, which enable the free flow of data across systems and applications. This improves data accessibility and accuracy.

Artificial Intelligence: SAP BTP uses AI to provide intelligent services. It enables businesses to use pre-trained models for specific business areas, thus improving operational efficiency.

Analytics: With advanced analytics capabilities, SAP BTP offers valuable insights that help businesses make informed decisions.

Customization: SAP BTP provides businesses with the rapid ability to build, enhance, and extend their digital landscape. It also enables creating extensions for existing solutions with great flexibility and adaptability.

Cloud Infrastructure: SAP BTP provides strong cloud infrastructure with scalability to allow business to grow and adapt to business requirements.

Security and Compliance: SAP BTP provides security and compliance features with complete comprehensiveness, safeguarding the business data and ensuring compliance.

By integrating application development, automation, data management, analytics, planning, integration, and AI in one platform, SAP BTP enables the business to innovate and function more efficiently.

SAP Analytics Cloud (SAC)

SAP Analytics Cloud or SAC combines all the business analytics capabilities by bringing together a cloud solution of business intelligence, planning, and predictive capabilities. With smart data preparation, data discovery, planning, as well as predictive analytics, SAP Analytics Cloud will be in the best position for all business sectors and organizations. Analysts can deliver new visual stories, while with SAC, IT can process the data in efficient ways. This solution provides quick answers to business-critical questions, detailed insights, and interactive visuals towards better business decisions.

Faster Business Planning

- SAC offers collective tools for the alignment of business plans along with tasks across different departments
- It allows for effective end-to-end planning at distinct business levels with high data security
- Users can create and customize their planning models according to varied business requirements

• It proves to be a single tool for data-driven analysis along with budgeting, forecasting, planning, and reporting

Intelligent Forecasting

• SAC presents an advanced forecasting experience with inherent machine learning functionality.

• It provides very accurate predictive forecasts with easily accessible results and real-time updates in intuitive visual formats.

• Users can engage in smart technology to develop multiple scenarios.

Key Insights

• Embedded advanced technologies present deep business insights that are not so easily visible to the naked human eye.

• This enables fast, efficient business decisions.

• SAC presents clear business KPIs with the current business position.

Improved Decision-Making Ability

• Integrated BI, predictive analytics, and advanced planning capabilities under a single platform provide business with comprehensive information.

• SAC delivers real-time analysis and accurate insights so that the users can make better, faster, and wiser decisions to improve the overall performance of their business.

SAP Analytics Cloud is an all-in-one end-to-end cloud solution, which puts business intelligence, augmented analytics, predictive analytics, and enterprise planning in

a single system. The key advantages of SAP Analytics Cloud include easy content viewing, access to different tools of visualizing, augmented analytics capabilities, features of financial planning, and access to trusted data due to integration with other SAP products. In a single cloud system you can analyse, ask, predict, plan, and report.

SAP Integrated Business Planning (IBP)

SAP Integrated Business Planning (IBP) is a live computation and integrated planning solution built on SAP HANA. It offers a totally cloud-based platform for sales operations, demand planning, as well as supply chain management in one place. SAP IBP permits companies to update and manage businesses end-to-end in live through seamless integration.

Business Efficiency and Accuracy

- The primary benefits that SAP IBP offers relate to rapid and accurate decision-making. It consists of inventory planning, production planning, and demand planning. By employing advanced analytics, SAP IBP gives the visibility needed in the operation of a supply chain; it also helps find the trends or risks that could affect its operations. Higher operational visibility makes human intervention into corporate systems redundant.

Strategic Pre-Planning and Risk Management

- SAP IBP allows for strategic pre-planning activities, making business firms responsive to the conditions of the market. It has sophisticated forecasting techniques and risk analysis, enabling an organization to predict and respond to unforeseen events. The benefits of SAP IBP are better decision-making, increased efficiency, and high agility. It also increases customer satisfaction, reduces cost, and improves resource usage.

Speed and Co-ordination

• The platform ensures fast processing of reliable data and fast coordination among multiple departments in an organization, which greatly influences the decision-making process.

Platform for Planning and Production

• SAP IBP offers an integrated platform designed to streamline organizational planning and production operations. It analyses business scenarios to provide insights into various operations, facilitating planning, modelling, and monitoring of supply chain tools to achieve optimal performance. SAP IBP helps determine the best responses to changing business requirements and uses collaboration tools to manage workflows and departments efficiently, enhancing interconnectivity among operational systems.

Enhanced Process Visibility

• SAP IBP increases process visibility thus assisting its customers in auditing workflows and being highly effective towards outcomes. Its interface uses big data, machine learning, and predictive analytics, resulting in real-time insights within the supply chain. Thus users can design and manipulate any level of complex scenarios to come up with the potential influences on business performance.

The three types of analytics available are:

• Descriptive Analytics: Gives insight into how performances happened earlier.

• Predictive Analytics: Gives insight as to what will happen afterward.

• Prescriptive Analytics: It prescribes actions through predictive insights.

Collaboration and Decision-Making

SAP IBP encourages collaboration for supply chain decisions in a collaborative workspace. With integrated tools, users from different departments can work toward common goals and fasten decision-making processes.

Efficiency and Cost Savings

The platform helps in efficient supply chain management through reduction of waste, error elimination, and automation of processes. It leads to increased productivity, cost savings, and accurate planning, which reduces risks.

Better Forecasting Accuracy

SAP IBP uses sophisticated analytics and machine learning models that combine different sources of data, thus helping in the more accurate forecasting of future demand and the prevention of disruption by proactive measures.

Greater Responsiveness and Agility

Supply chain visibility helps business organizations quickly adapt their strategies to shifting market conditions and customer requirements.

Real-Time Analytics

The use of real-time data makes SAP IBP enable decisions that are based on the most up-to-date information.

SAP IBP offers a very robust platform for integrated business planning, thereby increasing decision-making efficiency and agility. Advanced analytics and real-time capabilities help businesses to perform optimally and respond effectively to the dynamics of the market.

SAP Ariba

SAP Ariba is the most sophisticated procurement suite available today. It encompasses the entire source-to-pay process, which includes strategic sourcing, supplier management, procurement, working capital optimization, invoice management, and spend visibility. SAP Ariba is the leading procurement suite offering an end-to-end solution to manage the source-to-pay process, which includes strategic sourcing, supplier management, procurement, working capital optimization, invoice management, and spend

visibility. The suite is for improving the process of buying in a manner that enhances efficiency across the entire business. From the former Ariba Network, the SAP Business Network gives ways of efficient collaboration between buyers and suppliers. In its usage, it allows clients to manage transactions, strengthen their relationships, and discover new possibilities.

Advantages to Buyers

- Streamline Procurement Process: Buying organizations can automate their procurement processes from sourcing to settlement with integrated, controlled spend management so that new savings opportunities can emerge and a robust, ethical supply chain is developed.
- Improve Communication: The system will assist customers in realizing procurement transformation goals while collaborating in the cloud for improvements in customer satisfaction, to simplify the sales cycle, and improve cash flow.

Supplier Advantages

- Effective Management of Sales Cycles: Suppliers can manage their sales cycles more effectively, enhance cash flow, and grow their business by becoming part of the SAP Business Network.
- Full Connectivity: Suppliers can connect with customers already on the network, attract new ones, exchange an unlimited number of documents, and collaborate on proposals, contracts, orders, invoices, and payments.
- Improved Customer Experience: Suppliers can give customers more efficient customer experiences and receive more accurate orders by providing private catalogues.
- Real-Time Monitoring: Suppliers can track the status of documents and payments almost in real-time to enable greater transparency and efficiency.

An enterprise account on the SAP Business Network provides advanced capabilities that will help suppliers automate transactions, improve customer relationships, and expand and mature key accounts.

• Touchless Transactions: The enterprise account supports system-to-system integration with multiple customers, and it enables touchless transactions.

• Performance Assessment: Suppliers can leverage enriched data to assess performance and find new opportunities.

• Dedicated Support: The enterprise account provides more options for dedicated support to enhance the overall supplier experience.

SAP Ariba and the SAP Business Network offer a comprehensive suite of tools designed to optimize procurement processes and enhance business collaboration. By leveraging these solutions, organizations can achieve greater visibility, agility, and resiliency in their supply chains, ultimately driving better business outcomes.

SAP SuccessFactors HCM

SAP SuccessFactors HCM is a comprehensive cloud-based solution that integrates core HR and payroll, talent management, sales performance management, people analytics, and workforce planning. The solutions are critical to the growth of business by making employees the center of all organizational strategies, leveraging AI-enabled tools to meet individual needs and enhance organizational agility.

Core HR and Payroll

SAP SuccessFactors offers global solutions for core HR functions, payroll, time tracking, and benefits administration, supporting employees wherever they work. Key benefits include:

• Standardized HR Processes: Establishing consistent and harmonized HR processes across the organization.

• Productivity Enhancement: Simplifying everyday transactions to increase productivity.

• Risk Reduction: Leveraging best practices to improve financial outcomes and mitigate risks.

Talent Management

SAP SuccessFactors's talent management module lets organizations quickly fill skill gaps with powerful talent intelligence, recruiting, onboarding, performance, and compensation management. This module provides:

• Employee Journey Guidance: Supports the entire employee life cycle.

• Personalized Talent Experiences: Provides relevant and differentiated experiences.

• Performance Optimization: Improves performance, recognition, learning, and development.

• Automated Hiring Process: Streamlines hiring through global centralized processes. Employee Experience Management

SAP SuccessFactors makes it easier for employees to have the right resources and ensures proper use of benefits. The module covers:

• Engagement Improvement: This is about understanding the major drivers of employee engagement.

• Needs Response: This is the proper response to employee needs in order to close experience gaps.

Workforce Analytics

Workforce analytics in SAP SuccessFactors enhance organizational performance and improve decision-making with the aid of data-driven insights and AI-driven recommendations. This module covers:

• Strategic Alignment: Aligning HR with corporate strategy to foster growth.

• Risk and Opportunity Identification: Identifying workforce-related risks and opportunities.

• Informed Decision-Making: Leveraging people metrics for faster, data-driven decisions.

Sales Performance Management

The sales performance management module optimizes sales outcomes through better planning, automated processes, and incentive compensation management. It includes:

• Outcome Optimization: Improving planning, experiences, and insights to drive results.

• Error Reduction: Reducing payment errors and addressing disputes effectively.

• Operational Agility: Enhancing agility to support growth and manage operations at scale.

AI for Human Resources

SAP SuccessFactors uses AI to generate a dynamic, inclusive, and future-ready workforce. The AI capabilities include the following:

• Skill and Career Growth: Offering relevant suggestions for employee development

• Intelligent Workforce Planning: This involves using AI in an effort to optimize staffing based on analysis.

• Talent Identification: Linking highly qualified talent to the right opportunities.

• Enhanced Employee Experience: Enhancing employee experience through AI-powered support.

SAP SuccessFactors HCM is a powerful tool for any modern organization that facilitates HR processes, enhances the employee experience, and drives business success with data-driven insights and AI-enabled capabilities.

SAP Concur

The fully automated online and mobile software solution aims to automate and streamline business travel as well as expense management. The holistic, automated, and integrative system of SAP Concur builds on end-to-end end-end management of employee spending for better transaction visibility, and optimization of policy compliance plus higher data accuracy. Such offers a robust platform that supports the automation of travel-related expenses, thereby providing hassle-free convenience in managing business travel-related expenses. Through time, SAP Concur has made huge investments into capabilities that integrate travel, expense and invoice data from all vendors into a single platform. This facilitates easier management of employee spending by tying into the existing ERP or financial systems of organizations.

Concur Expense

Simplification of Automated, Faster Processes SAP Concur reduces complexities in the spend management process through user-friendly tools. It streamlines system implementation, reporting of expenses, and expense tracking. One View of Spend The solution offers an all-inclusive, end-to-end view of all employee spend, improving budgeting, forecasting and informed business decisions.

Concur Expense Integrated Spend Data Users can easily create, submit, and approve expense reports from a desktop, tablet, or mobile device anywhere, any time.

Concur Travel

Connected Business Travel SAP Concur connects the corporate travel management ecosystem with user-friendly tools and applications to manage travel expenses in an appropriate way.

Transparent Travel Data This platform provides visibility into all the travel data that enhances compliance, captures all trips regardless of how they book it, and supports requirements related to Duty of Care.

Intuitive Online Booking Users can plan and book business travel, monitor itinerary changes, and share travel plans via a mobile app, ensuring a streamlined travel experience.

Concur Invoice

Automated, Connected Accounts Payable SAP Concur automates vendor invoice management, reducing paper usage, eliminating manual tasks, preventing costly errors, and saving employee’s valuable time.

Electronic Invoice Capture The electronic invoice capture is integrated with existing ERP or accounting systems and connected with other vendors' solutions across the procure-to-pay lifecycle ensuring seamless invoice management.

Vendor On-Time Payments SAP Concur has the ability to track payment timing to ensure that the respective vendors are paid on time, which allows organizations to take advantage of early-payment discounts.

With the integrated approach to managing travel, expense, and invoice data, SAP Concur offers organizations a comprehensive solution for optimizing employee spending. Automation, data integration, and real-time visibility are some of the key capabilities that support improved compliance, data accuracy, and strategic decision-making.

SAP Signavio

SAP Signavio is a powerful software solution that helps to design, analyze, and optimize business processes while managing process change. The paper discusses the capabilities of SAP Signavio with its unique integration of modelling, workflow management, and analytics to support long-term monitoring and success of process adjustments.

SAP Signavio provides a comprehensive portfolio for business process management so that the organization can design and analyze as well as enhance business processes. The solution covers end-to-end process transformation with web-based tools designed for fast and scalable implementation across the enterprise.

The SAP Signavio Process Transformation Suite includes several of the most important capabilities leading to business process excellence.

-Process Analysis and Process Mining

Provides end-to-end process analysis, which is essentially required for business transformations and operation excellence initiatives.

-Process and Journey Modeling

Helps manage, model, and simulate business processes and diverse customer journeys.

-Process Governance and Automation

Supports the alignment of documented processes to both organizational and regulatory requirements

-Process Collaboration

Fosters real-time cross-divisional collaboration and further increases the efficiency of process management while engaging more stakeholders

The following are among the many SAP Signavio Process Transformation Suite components that showcase its multifaceted utility:

-SAP Signavio Process Insights

• Enables real-time monitoring of business processes, which in turn brings about improvements like lead-to-cash process optimization.

-SAP Signavio Process Intelligence

• Process mining is used to derive business insights that can improve areas such as accounts payable.

-SAP Signavio Process Manager

• Tools for modeling processes, such as simulating the purchase-to-pay process after an acquisition.

-SAP Signavio Journey Modeler

• Enables insights into stakeholder experiences, thus allowing for the creation of detailed customer journey maps.

-SAP Signavio Process Collaboration Hub

• Helps facilitate stakeholder collaboration to attain process excellence through shared insights and strategies.

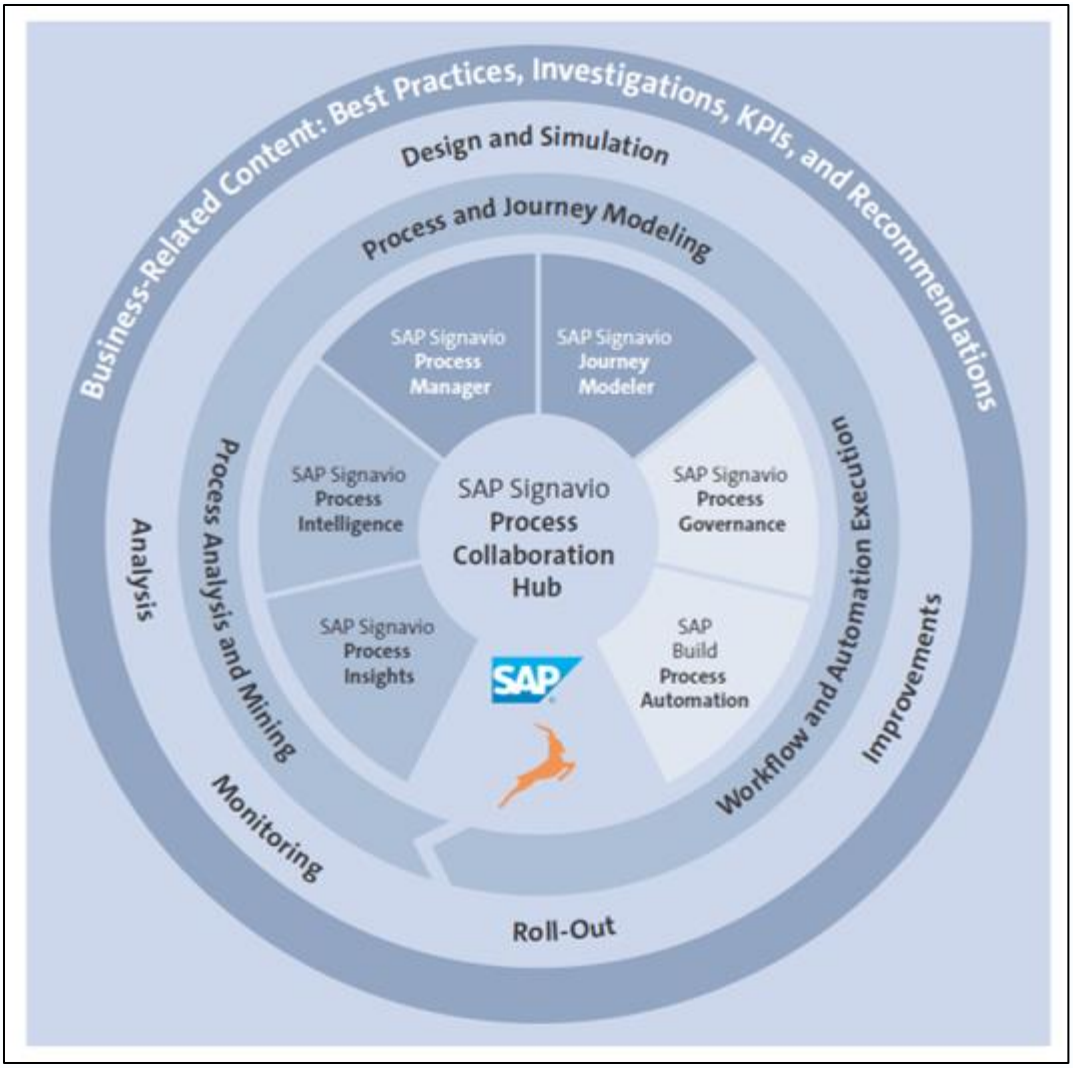
-SAP Signavio Process Governance

• Sets up workflows for approval processes and other governance needs to ensure regulatory compliance.

-SAP Build Process Automation

• Expands automation capabilities, such as automating invoice processing, to help streamline operations and reduce manual tasks.

To become even more aware of the power of SAP Signavio Process Transformation Suite, here is the picture:



Source: SAP.com

Figure 23. *Business Process Modeling with SAP Signavio*

It visualizes how the individual business process transformation solutions interact—always taking into account SAP's best practices and industry-specific suggestions for improvement.

SAP Signavio is one of the leading BPM providers through integrating sophisticated modeling, effective workflow management, and powerful analytics in one easy-to-use package. The web-based solutions allow rapid and scalable transformation of

business processes across all areas of the enterprise toward long-term success and continuous improvement.

SAP LeanIX

SAP LeanIX is a SaaS application that manages and optimizes enterprise architecture. This paper discusses the capabilities of SAP LeanIX in aligning IT infrastructure and systems with business strategy and goals. It highlights the suite's ability to document the IT landscape, plan and design architectural changes, and oversee their implementation to meet evolving business needs. EAM refers to the alignment of IT infrastructure and systems with the business strategy and goals of an organization. SAP LeanIX enables such alignment by providing a holistic view of applications, business capabilities, and the IT components involved. This would help organizations control their growing IT landscape and provide roadmaps for several strategic transformation initiatives.

SAP LeanIX provides a range of features that help implement effective enterprise architecture management through collaborative data collection, out-of-the-box integrations, and rapid insights through reports and diagrams.

-Alignment of IT Strategies with Business Goals

• SAP LeanIX supports alignment of the IT strategies with the business objectives in order to ensure that the IT investment really supports overall business goals.

-Mapping Applications to Business Capabilities

• The platform map all the applications directly to the business capabilities they support, bringing in underlying dependencies, helping to plan better.

-Ideal IT Architectures

• Design by users. The best ways to save costs and optimize the IT investment.

-Improving Integration and Interoperability

• SAP LeanIX also strengthens integration and interoperability between systems and applications thus diminishing isolates silos and increasing efficiency.

-Mitigating Security and Compliance Risks

• The platform avoids risks from security, compliance perspective in the technical debt and obsolescence, thereby ensuring a secure and compliant IT environment.

-Decision Making and Operational Efficiency

• It also helps improve decision-making and operational efficiency.

• With swift insights and detailed overviews, SAP LeanIX enables better, faster business decisions and improves operational efficiency.

The overall product SAP LeanIX is divided into three products with different focuses for enterprise architecture management:

-SAP LeanIX Application Portfolio Management

• This foundation product captures and tracks the application landscape, offering critical information related to an application's lifecycle, dependencies, technical fit and functional fit, and business impact. The product can support use cases like Application Portfolio Assessment and Rationalization by identifying redundancies and optimizing technology investments.

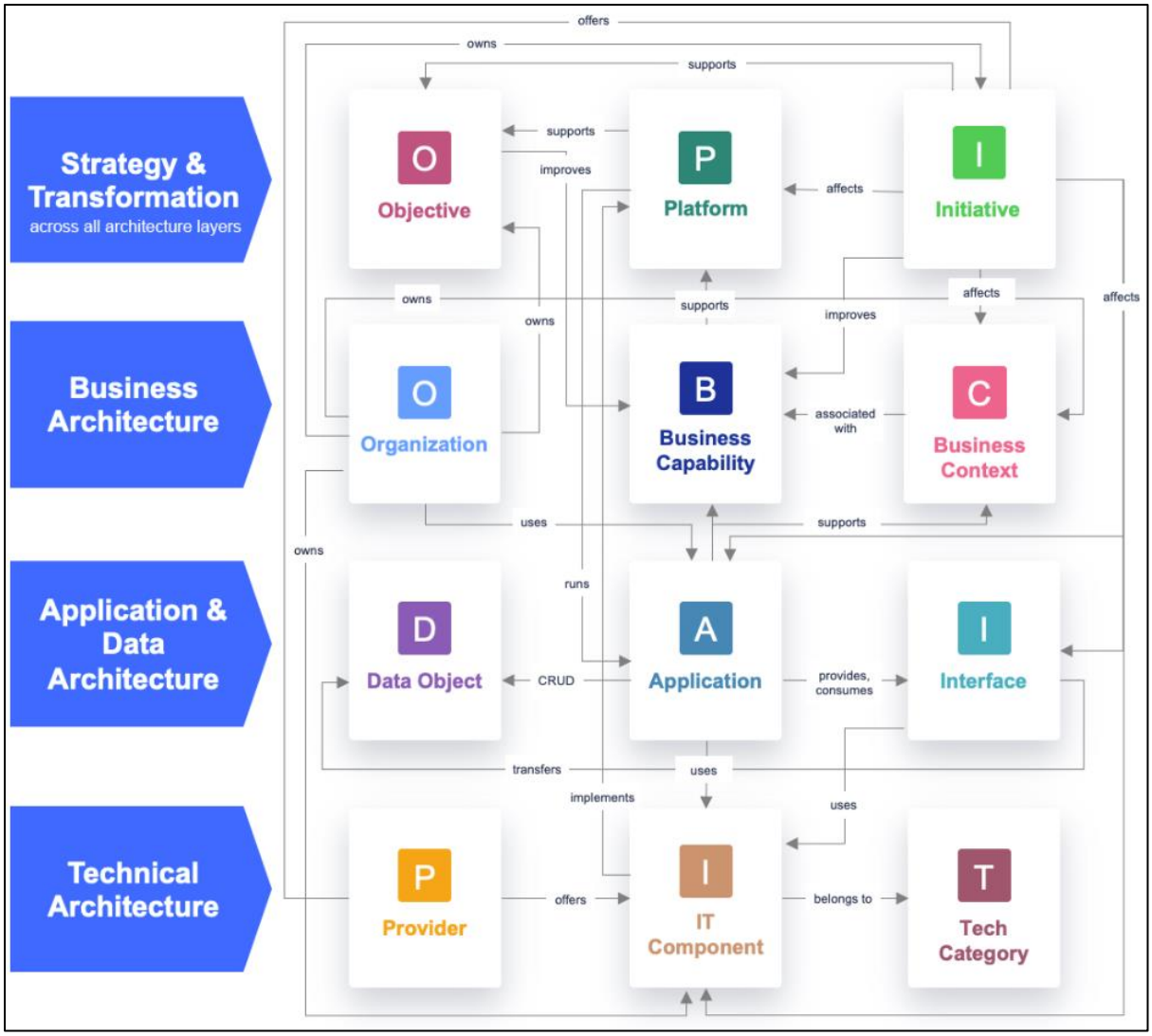
-SAP LeanIX Architecture and Road Map Planning

• A companion to Application Portfolio Management, this product provides capabilities for planning target architectures, making impacts of planned transformations visible, and monitoring the implementation of transformation initiatives. It supports usage cases like Application Modernization and ERP Transformation.

-SAP LeanIX Technology Risk and Compliance

• Extends the scope of Application Portfolio Management by facilitating discovery of infrastructure layer in the application landscape; hence it assists in the management of risks from obsolescence and technology standards, thus ensuring stability and relevance in operations, for example, Obsolescence Risk Management and Technology Standards Management.

The high-level representation of the out-of-the-box meta model below shows the associated relationships:



Source: SAP.com

Figure 24. *SAP LeanIX Meta Model*

The SAP LeanIX meta model covers all layers of enterprise architecture, allowing for structured data across four crucial dimensions to support comprehensive business transformations in strategy and transformation, business architecture, application and data architecture, and technical architecture. With a predefined meta model, organizations can achieve fast time to value, quickly transforming data into insights, insights into actions, and actions into results.

A robust tool for managing and optimizing enterprise architecture, SAP LeanIX also provides an integrated suite of tools to ensure alignment with business goals regarding IT strategies as well as improve integration and interoperability while mitigating security and compliance risks. Organizations realize control over the IT landscape and drive cost efficiencies with SAP LeanIX to support strategic business transformations.

SAP Joule

SAP Joule is redefining interaction with SAP Business Systems; it's a generative AI assistant built by SAP. Its capabilities include simplifying and streamlining tasks, providing intelligent insights, and improving decision-making processes. With an emphasis on data privacy and quality, Joule truly stands out as the secure and efficient solution built into SAP's Business Technology Platform (BTP).

Joule represents an important step in how customers will interact with the SAP business system, making each touch point more efficient and every job easier. Being designed as a generative AI assistant, Joule helps speed up the execution of any process across all SAP solutions, thus bringing comprehensive insights into easy executions.

Joule is the simplified expression of any process in various touchpoints by making every user's insight intelligent and custom-tailored, with a more personalized experience of SAP. The pool of Joule's analyzed, anonymized, and secure data comes from 28,000 global SAP customers, including 300 million SAP users. Developed in cooperation with IBM, Google, and Microsoft, the Joule uses cutting-edge technology and expertise.

Like other generative AI tools, Joule gets better and better as key information is fed in from the global SAP user community. This ongoing improvement has made Joule a foundational element of what SAP will become, poised to be the standard across all SAP products and applications, thereby altering the enterprise ERP landscape.

Some key benefits and integration provided by Joule enhance its utility across SAP applications:

-Faster Work

• Joule accelerates processes by acting as a single AI copilot, providing comprehensive insights and performing tasks across all SAP solutions.

-Smarter Insights

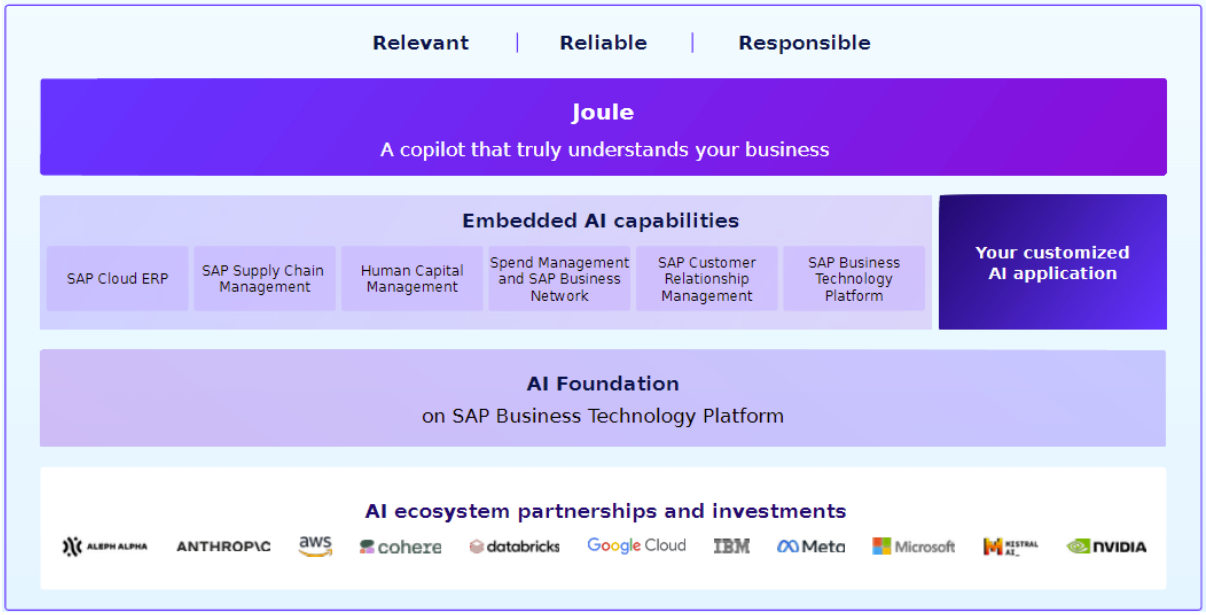
• Users get instant insights grounded in business data and enriched by contextual information, making decisions more informed.

-Better Outcomes

• Joule generates content tailored to specific roles, from job descriptions to code, improving outcomes across the business.

-Human Control

•Users maintain control over complex tasks, ensuring data privacy and security while focusing efforts on strategic activities.



Source: SAP.com

Figure 25. *SAP Joule Architecture Overview*

Joule is integrated into several SAP applications, such as HR, finance, ERP, sales, services, marketing, and commerce. It is expected that by the end of 2024, 80% of the most

commonly executed transactions across SAP business applications will be fully automated with Joule, thus highly improving operational efficiency. Joule is only available to customers of SAP's cloud applications and through RISE with SAP and GROW with SAP. This solution is not available to on-premises customers. As of September 2024, Joule can be deployed with SAP SuccessFactors, SAP Start, SAP S/4HANA Cloud Public Edition, SAP S/4HANA Cloud Private Edition, SAP Customer Data Platform, SAP BTP cockpit, SAP Build Code, SAP Product Lifecycle Management, SAP Asset Performance Management, SAP Digital Manufacturing, and SAP Integrated Business Planning. More integration options will be made available soon.

All SAP AI solutions follow the strictest standards for ethics, security, and privacy. In creating Joule, SAP follows the global AI ethics policy using the 10 guiding principles from UNESCO's Recommendation on the Ethics of Artificial Intelligence. SAP relies on enterprise-grade large language models from trusted partners, ensuring that no LLM will use your data to train or improve their foundation models. For users, Joule promises to change the game with its safe, efficient, and intelligent AI assistant to make decisions and optimize operations. As Joule continues to be developed, it will help shape the future of SAP's enterprise solutions.

SAP Intelligence Robotic Automation Process (RPA)

SAP Intelligence Robotic Process Automation represents the latest form of advanced business process automation technology, which uses virtual, software robots that are also known as digital robots or bots, to perform the most mundane and time-wasting tasks. The key benefit of this technology is enhancing operational efficiency by automating high-volume and repetitive activities.

It is programmed to take predefined actions. The bots can perform several simple and complex tasks; they can even automate procedures involving repetitious tasks.

Advanced software bots mimic human interactions, such as virtual assistants like Amazon Alexa, Microsoft Cortana, and Apple Siri.

RPA technology can perform a variety of tasks, which include:

• Routine, Repetitive: Automation of activities related to multiple data sources-MS Excel and Vendor Portal

• High volume: Automation of high-volume, recurring tasks, including data migration and approval workflows.

• Multiple Systems: Providing access to numerous applications: Web apps, RP solutions, Third Party software.

The adoption of RPA is gaining pace, and according to a report, the RPA technology is the fastest-growing segment in the global enterprise software market. In 2021, RPA revenue would be USD 1.89 billion, up from 19.5% from the year 2020.

It can be used with any application in a company's technology stack, which especially comes in handy when having to automate processes involving legacy systems where APIs are unavailable. This makes it fundamental for digital transformation initiatives.

RPA provides many benefits, including the following:

• Increased Productivity: Automating workflows for efficiency.

• Error Reduction: Human errors in data entry and processing are reduced.

• Cost Savings: Labour costs are reduced as the routine work is automated.

• Compliance Management: Ensuring regulatory compliance.

• Business Agility: Improving the ability to respond to changes in the market.

• Process Transparency: Improved visibility into business operations.

All these put together lead to improved business performance and cost savings.

-Improved Customer Experience

• RPA dramatically enhances the customer experience by ensuring that consistent service levels are maintained, even at times of peak demand. The scalability of this

ensures that human workers can focus on high-value interactions with customers which cannot be automated.

-IT and Operational Efficiencies

• RPA supports the automation of legacy system-based processes through existing GUIs instead of expensive API integrations, leading to significant IT cost savings while maintaining the existing system architecture.

• The low-code/no-code nature of some RPA tools empowers business users to automate business processes independently. Thus, the reliance on the IT departments is reduced, and employee training is simplified.

• The reduction in repetitive work. The relief from repetitive tasks allows workers to indulge in more meaningful tasks. Thereby, job satisfaction is heightened, and productivity increases and gives rise to more innovative things within the organization.

• Organizations are increasingly using RPA to automate mundane tasks, allowing employees to be more productive on higher-value activities. This strategic usage of technology enhances customer care, problem-solving capabilities, and business insights, which collectively contribute to overall success.

A recent survey shows that office workers estimate that they waste five hours weekly on tasks that could be automated. McKinsey's research indicates that at least one-third of job activities in about 60% of occupations are automatable, which really underlines the massive potential for RPA to transform business operations.

5.5 Approach and Framework for Business Transformation leveraging SAP

5.5.1 Proposed Approach and Framework for Business Transformation

An organization change framework allows for structured and systematic planning and delivery of organizational transformation. A well-defined roadmap through the transformation enables enterprises to operate in a very methodical fashion, providing the basis upon which change could be executed repeatedly with predictability. This business transformation framework is therefore very strategic because it enables enterprises to put organizational change projects in concert with the general strategy. This framework ensures that the transformation efforts are focused, efficient, and contribute directly to the achievement of long-term goals by providing a structured approach. It also focuses on Risk Mitigation and controls uncertainties in some disciplined way. This framework helps organizations identify potential challenges, develop contingency plans, and minimize disruptions during the transformation journey by outlining a structured process. This framework allows organizations to pinpoint areas for improvement, introduce focused interventions, and track progress to maintain sustained performance with competitive advantage.

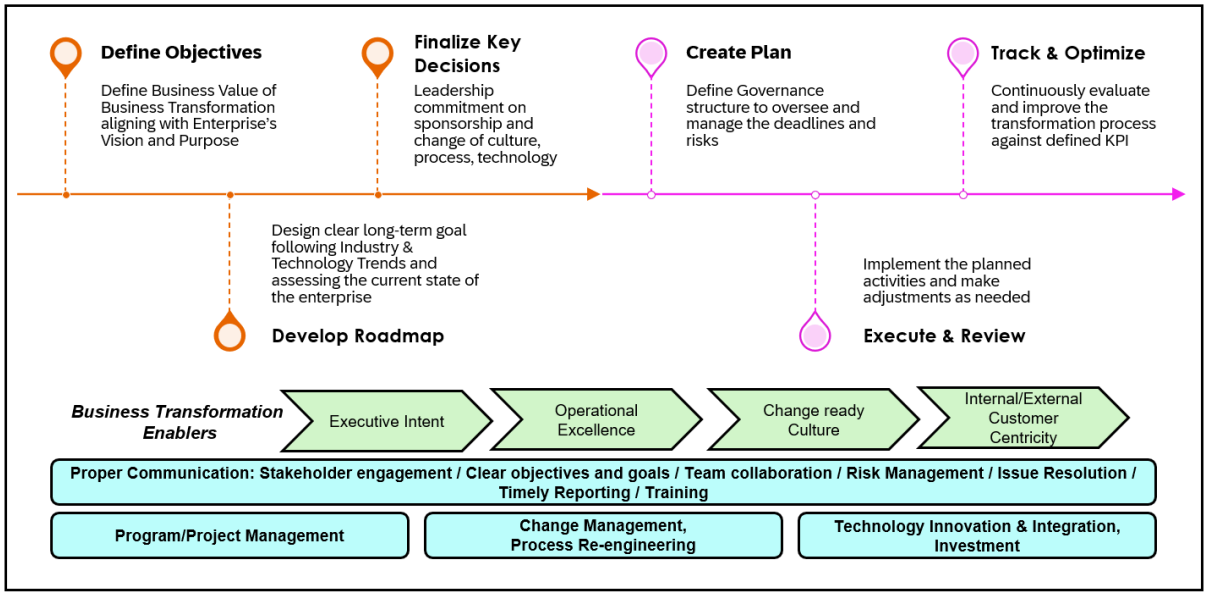


Figure 26. *Proposed Framework for Business Transformation*

The framework in Figure 26. outlines a structured approach to business transformation. The Business Transformation Strategy framework is putting a focus on the most crucial steps and enablers for successful business transformation of enterprises. It is comprised of six main phases:

Define Objectives:

• Clearly state the desired outcomes and benefits of the transformation with a clear alignment with overall organization strategy and vision. Make sure that this business transformation aligns with your core values and goals.

Develop Roadmap:

• Establish a clear and ambitious vision for the future state of the organization, taking into account industry trends and technological advancements. Assess the current capabilities, processes, and systems of the organization to identify areas of improvement. Define the new processes and workflows that will be implemented as part of the transformation.

Finalize Key Decisions:

• Focus of this stage is leadership commitment - acquire good leadership commitment and sponsorship to the change. Major decisions related to change in organizational culture, processes, and technology support to achieve the change. Set up key performance indicators to track the effectiveness of the transformation.

Create the Plan:

• Governance Structure: Develop roles, responsibility, and decision-making procedure. A detailed project with clear timelines having milestones would be developed along with risky events and their mitigation strategies to be followed.

Execute & Review:

• Carry out the execution of planned activities and change as per the overall strategic plan and roadmap. Continued monitoring of the progress undertaken, and plan adjustments for improvement as and when required are made.

Track & Optimise:

• This last phase consists of the implementation of planned activities, making necessary adjustments, continuous assessment of the transformation process against defined KPIs, and optimization for continuous improvement. Seek feedback from stakeholders to ensure alignment and support.

The above phases are based upon the three pillars -

- Program/Project Management: Use effective project management methodologies to ensure timely and efficient execution of the transformation.
- Change Management, Process Re-engineering: Implement a complete change management strategy to tackle the human side of change, which includes communication, training, and resistance management. Process re-engineering refers to the radical redesign of business processes to achieve dramatic improvements in performance, efficiency, and effectiveness.
-Technology Innovation & Integration: Leverage emerging technologies to drive innovation and improve or enhance business processes by integrations. While adopting new technologies and doing integrations, security measures need to be taken in highest priority for any enterprise. Apart from protecting intellectual properties, internal data, customer data & information, security protects organisational network against external threats such as viruses and malware, which can have severe repercussions for reputational damage and revenue/sales declines.

Effective communication with the stakeholders, well-defined objectives and goals, teamwork, risk management, issue resolution, timely reporting, and training are all critical aspects for successful transformation.

With every successful transformational project – there have to be some key enablers.

• Executive Intent: Strong Leadership support and commitment to transformation is a must. It requires involvement of stakeholders all along the process to attain buy-in and support.
• Operational Excellence: It is about operational efficiency and effectiveness to drive value and reduce costs. It should be scalable in nature. It should also be aligned with the Sustainability goals of the enterprise.
• Change Ready Culture: Innovation, adaptability, and continuous improvement should be fostered.
• Internal/External Customer Centricity: The customers are always at the centre of the transformation, keeping in mind their needs and experiences.

Following this framework and addressing the key enablers, enterprises will be able to navigate the complexities of business transformation effectively. The framework will help organizations systematically plan, execute, and monitor their business transformation initiatives, thus increasing the chances of success.

5.5.2 High level key steps of Business Transformation leveraging SAP

Before discussing about the steps, it is always better to understand first about the SAP implementation scenarios. Depending on a few key factors, such as company's use of SAP, deployment choice, the size and state of data, and organization's future business needs, there are three main scenarios to roll out SAP S/4HANA: Greenfield, Brownfield and Bluefield/Hybrid approach.

SAP Greenfield implementation is the process of implementing a new SAP S/4HANA system, which does not use any existing data and customizations. The whole system will be brand new. Some advantages of SAP Greenfield implementation are the following:

• Clean data

-Organizations can begin from scratch with clean data that will reflect the real state of their data to ensure accuracy and optimize for the business.

• Cost-effective

-At times, changing an already installed system is even costlier than beginning a new fresh start. An organization may revisit the business process to fine-tune configurations and get advantage of newer features. SAP Greenfield implementation is apt for those organizations which are new to SAP or ERP systems, have old and rigid ERP systems, and have intricate business processes.

The success of SAP Greenfield implementation is heavily reliant on proper project management, stakeholder engagement, and a deeper understanding of the organization's business processes and requirements.

SAP Brownfield is a technique used for up-gradation of an already existing SAP system. This technique is also referred to as system conversion. In this 'Brownfield' approach, the pre-existing systems are transitioned from the system onto the S/4HANA platform while retaining pre-existing data, processes, and software development customizations of the old system.

Brownfield implementations, although efficient in certain scenarios, may restrict innovation. The dependency on the existing systems and processes limits the organization's scope for exploration of cutting-edge solutions and adaptation to fast-changing market dynamics. Brownfield is best suited for customers who are looking to continue using their current solutions and want to rapidly convert to a better version.

The process includes upgrading hardware and software, optimizing custom code, and converting the SAP system. Brownfield implementation can be complex and lengthy, so it requires thorough planning and execution.

Bluefield implementation is a hybrid approach that involves building a new SAP system while incorporating some of the existing system's data and configurations. It is a migration strategy for SAP that combines the best of both the Greenfield and Brownfield approaches.

This approach enables organizations to minimize business disruption and loss of data, implement new features and functionality of SAP over time, improve data quality and performance, preserve valued configurations and data, purge unwanted or obsolete elements, and save time and investments by utilizing existing investments.

The Bluefield approach is one that requires careful planning and execution to ensure smooth transition. It can be complex and time-consuming to evaluate which processes and data to keep and which to rebuild.

Now we can focus on the high-level key steps of business transformation using SAP implementation. The following framework in Figure 27. provides a structured and comprehensive approach to business transformation leveraging SAP. It makes sure that change is focused on strategic targets of an organization and attains business objectives. Based on in-depth research for successful implementation projects of SAP globally, in different fields for the transformation journey, this model has been built. There are three paths for the overall structure that are primarily followed:

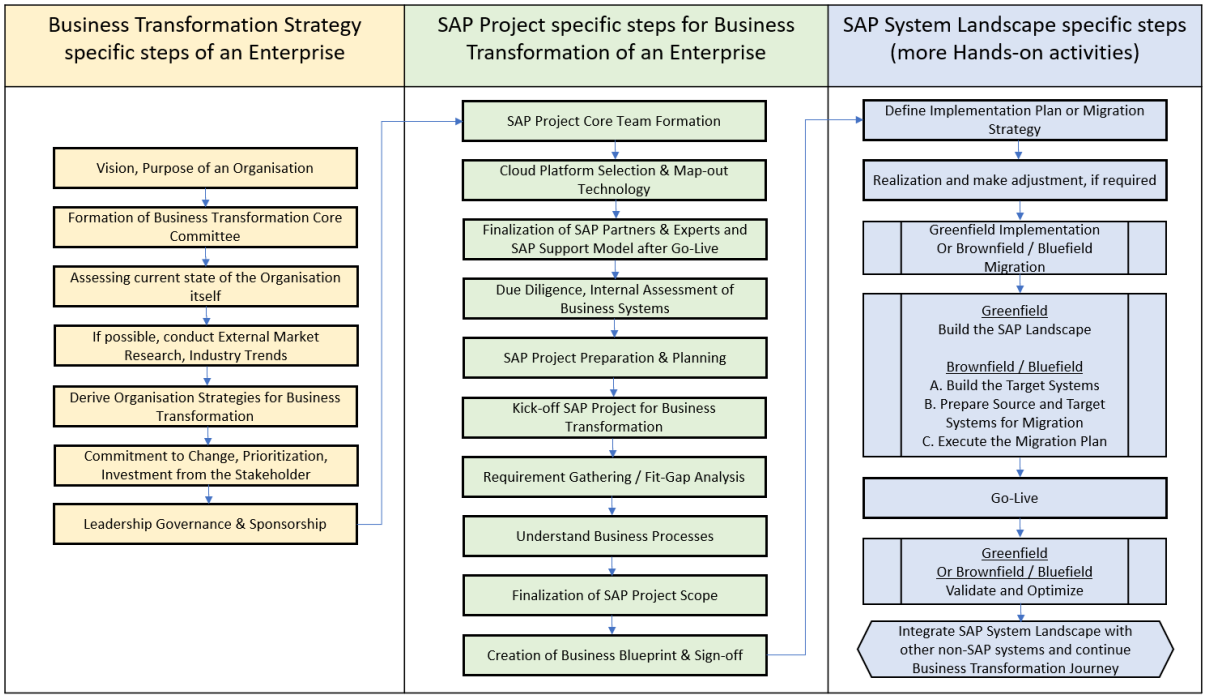


Figure 27. *Framework for Business Transformation Leveraging SAP*

Deriving Business Transformation Strategy: This track deals with all the strategic aspects of transformation through defining the vision, assembling a transformation core committee for assessing the current state as well as deriving strategies during the transformation journey.

Business Transformation Specific Steps for SAP Project: This deal with SAP specific project related activities such as forming of the core team, and selection of the cloud platform, identification of the partners, preparatory work for the project, business requirement gathering.

SAP System Landscape Specific Steps (more Hands-On activities): It is more technical in the transformation process, including an implementation and/or migration strategy, building of the system landscape, and go-live activities.

5.5.3 How to choose the Best Cloud Platform for your Enterprise's Need

During the interview with the Executives, it prevails that enterprises generally face a tough time for selecting the cloud platform. Even finalization of SAP Implementation/Migration partner from the plentiful choices of SAP Partners is also a pretty difficult job.

The Figure 28. illustrates the general framework for SAP Cloud Provider Selection Process. It articulates a structured approach toward right selection of SAP cloud providers for the cloud adoption journey of an enterprise. It could be broadly categorized into two main heads:

- Organization's Criteria: This is concerning the specific needs and issues of the organization.
- Evaluation of Potential Cloud Providers: This section is concerning assessment of potential cloud providers based on the parameters of technology, security, compliance, and service offerings.

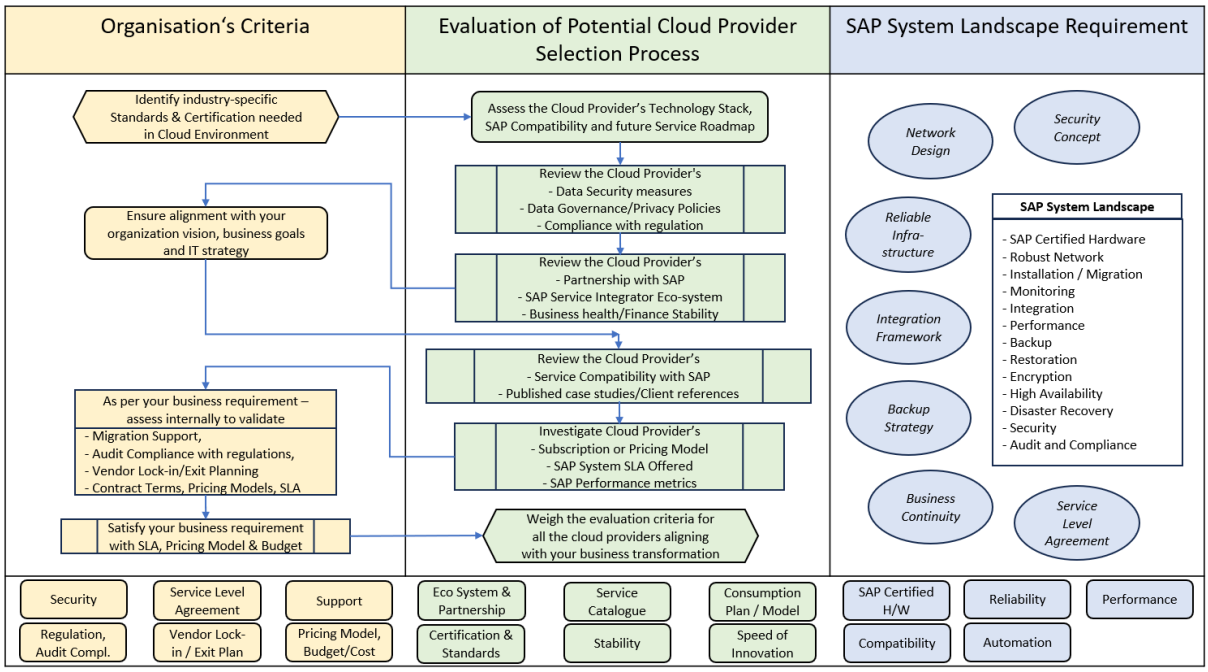


Figure 28. *Framework for SAP Cloud Provider Selection Process for Business Transformation*

There are some specific requirements provided for each part which will be necessary to consider evaluate, or research as applicable, given your business needs.

Apart from the above, the framework also highlights the key components and requirements for a well-designed and robust SAP system landscape. It emphasizes the importance of factors such as security, reliability, integration, performance, automation, backup, and business continuity. Depending upon your business needs, corresponding service level agreement (SLA) to be understand and maintained with the cloud provider.

Key Steps involved in the Selection Process

Identify Industry-Specific Standards & Certification: Know the industry-specific standards and certifications required for cloud environments. Other important factors that must be considered include regulatory compliance, data security, and privacy requirements.

Ensure Alignment with Organizational Goals & IT Strategy: Align the choice of cloud provider with the vision of your organization, business goals, and IT strategy. Other factors to be considered are scalability, flexibility, and cost-effectiveness.

Evaluate the technology stack, SAP compatibility & future roadmap of the cloud provider- Assess the technology stack that the cloud provider possesses. Ensure it supports your SAP requirement. Also, consider experience and support of the latest versions of SAP, future roadmap for SAP services of the cloud provider.

Review the data security measures that the cloud provider has put in place. This will include data governance, privacy policies, and compliance with regulations. Consider such factors as data encryption, access controls, and incident response plans.

Review the partnership of the cloud provider with SAP: Evaluate the cloud provider's partnership with SAP, including their SAP Service Integrator Eco-system and business health. Consider experience with SAP implementations, support for SAP products, and high-quality services delivery by the cloud provider.

Review Cloud Provider's Service Compatibility with SAP: It's essential to review the compatibility of the cloud provider's service offerings with the solutions offered by SAP. One would need to consider factors like support for SAP HANA, SAP S/4HANA, and other applications from SAP while making an assessment.

Investigation on implementation or maintenance cost: This includes the kind of subscription or pricing model offered by the cloud provider, ranging from upfront costs, through monthly fees to usage-based charges. The other factor also looked into is how committed is the cloud provider in using cost-effective solutions and keeping the prices transparent.

Weigh Evaluation Criteria: Weigh the evaluation criteria for all potential cloud providers based on your project requirements. Prioritize factors like the security, compliance, and performance of the cloud provider coupled with cost-effectiveness.

Select the Best Suited Cloud Provider: Select a cloud provider that best meets the needs and goals of your organization. Consider factors such as the reputation of the cloud provider, their track record and ability to deliver on time and within budget.

Overall, the above framework with the decision matrices provides a structured and comprehensive approach for selecting the right SAP cloud provider. It ensures that the cloud provider is well-equipped to deliver a successful SAP cloud implementation project.

The business world is intimidating, particularly when one has to make decisions as above. Uncertainty of the best option, handful alternatives, it becomes very challenging. A wrong decision could result in serious aftereffects and may even end up ruining your business completely. It can lead to loss, waste of resources, and even favouring competitors. The decision matrix can come as a solution to bring in clarity and confidence to one's decision-making.

A decision matrix helps simplify complicated choices by providing a structured framework to evaluate alternatives in terms of multiple criteria. It makes it easier for you to compare options, know their strengths and weaknesses, and make data-driven decisions toward optimal outcomes.

Following are the templates of unweighted and weighted decision matrices to make your decision-making process smooth with less time and effort and using fewer resources. One can customize the same according to his or her business needs and priorities.

The Table 14. shows a sample of unweighted decision matrix, where each selection criterion of nine factors has the same level of importance in the decision-making process. When all the important selection criteria are identified, then it's time to start evaluating

Table 14. *Unweighted Decision Matrix Template for SAP Cloud Provider Selection Process*

Sl#	Selection Criteria	Cloud Provider 01	Cloud Provider 02	Cloud Provider 03
#01	SAP - Technology & Service Catalogue/Offering and Roadmap	5	4	4
#02	Reliability & Performance	3	4	2
#03	Support Services	4	2	4
#04	Security Standards	4	5	4
#05	SAP Partnership & Eco-System	5	4	4
#06	SLA and Contract Terms/Conditions	2	4	3
#07	Pricing Model and Flexibility	3	5	4
#08	Cost	4	4	5
#09	Customer Feedback/Experience	4	4	3
	Final Score	**34**	**36**	**33**

Rating Scale: 1=> Poor; 02=> Average; 03=> Satisfactory; 04=> Good; 05=> Excellent.

those factors using a predetermined scale. For example, rating of each factor using a rating scale of 1 to 5, with 1 being the poor and 5 the excellent. Add the scores to each of the criteria and calculate the final score. Here, the ideal choice is Cloud Provider 02.

It is somewhat perfect for small or medium sized organizations, but it may not always the case for large & complex enterprises. For example, for a financial institution - security is the number one priority on which selection measure to be evaluated. And for a retail customer – reliability & performance and support services may be the top priorities.

Table 15. *Weighted Decision Matrix Template for SAP Cloud Provider Selection Process*

Weighted Decision Matrix Approach

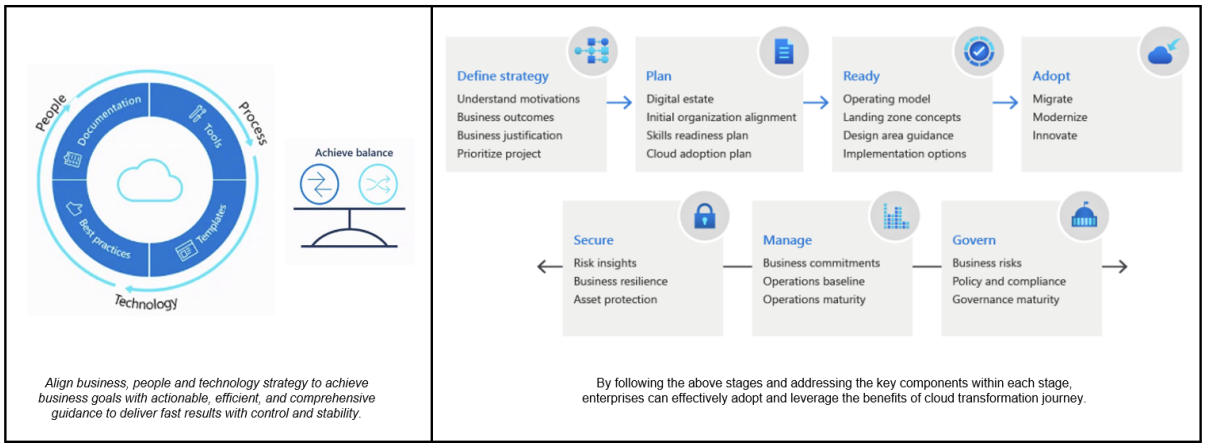
Sl#	Selection Criteria		Cloud Provider 01		Cloud Provider 02		Cloud Provider 03	
		Weighting value	Rating	Total	Rating	Total	Rating	Total
#01	SAP - Technology & Service Catalogue/Offering and Roadmap	3	5	15	4	12	4	12
#02	Reliability & Performance	5	3	15	4	20	2	10
#03	Support Services	5	4	20	2	10	4	20
#04	Security Standards	4	4	16	5	20	4	16
#05	SAP Partnership & Eco-System	2	5	10	4	8	4	8
#06	SLA and Contract Terms/ Conditions	3	2	6	4	12	3	9
#07	Pricing Model and Flexibility	4	3	12	5	20	4	16
#08	Cost	2	4	8	4	8	5	10
#09	Customer Feedback/ Experience	3	4	12	4	12	3	9
	Final Score			**114**		**122**		**110**

Rating Scale: 1=> Poor; 02=> Average; 03=> Satisfactory; 04=> Good; 05=> Excellent.
Weighting Value: 1 to 5, with 1 being the least and 5 the highest.

This time, for weighted decision matrix, as the Table 15. shows, one needs to multiply the rating score with the weighted value to get the final score for every criterion. The following is an example we can view, which has the maximum final score out of these three, making it a best choice.

Using the same type of structured process with the right selection criteria to assess and choose the correct Cloud Service Provider or Service Integrator/Partner will significantly increase the possibility of a successful project.

Those enterprises, who are inclined to public cloud for their business transformation – they can avail the cloud adoption framework from their respective hyperscaler, as per their already taken business decision. Microsoft Azure, AWS, GCP – all the public cloud providers already shared their cloud adoption framework in the public domain, based upon the best practices, learning from customer case studies.



Source: Microsoft.com

Figure 29. *Microsoft Cloud Adoption Framework for Azure for Business Transformation*

The Microsoft Cloud Adoption Framework for Azure offers a structured approach for organizations to effectively adopt and utilize Azure. It leads the organization through various stages and key components in achieving successful cloud transformation.

1. Define Strategy:

• Understand motivations: Clearly articulate the business goals and objectives for cloud adoption.

• Business outcomes: Define the desired outcomes, such as cost reduction, improved efficiency, and enhanced innovation.

• Business case: Create a business case to justify investment in cloud adoption

• Prioritize projects: Identify and prioritize the most important projects to be tackled first

2. Plan

• Digital estate: Understand the current IT infrastructure and identify what to move or modernize

• Initial organization alignment: Align culture, processes, and skills to support cloud adoption

• Skills readiness plan: Plan upskilling and training on cloud technologies and best practices.

• Cloud adoption plan: This involves developing a comprehensive cloud adoption plan and establishing timelines, milestones, and resource allocation.

3. Ready:

• Operating model: Define the operating model for managing cloud resources and services.

• Landing zone concepts: Establish foundational cloud environment, including the network, security, and identity management.

• Design area guidance: Provide an understanding of designing and implementing cloud solutions, such as infrastructure, applications, and data.

• Implementation options: Explore possible implementation approaches, such as lift-and-shift, re-platforming, and re-architecting.

4. Adopt:

• Migrate: Migrate existing workloads to Azure with appropriate migration strategies.

• Modernize: Modernize applications and infrastructure to take advantage of the capabilities of Azure.

• Innovate: Leverage Azure to develop new cloud-native applications and solutions.

5. Secure:

• Risk insights: Identify and assess potential security risks and vulnerabilities.

• Business resilience: Implement business continuity and disaster recovery plans.

• Asset protection: Protect cloud resources and data through security measures such as encryption, access controls, and monitoring.

6. Manage:

• Business commitments: Clear ownership and accountability for the cloud.

• Operations baseline: Define operational processes and procedures for managing cloud resources.

• Operations maturity: Continuously improve operational efficiency and effectiveness.

7. Govern:

• Business risks: Identify and manage business risks that are associated with cloud adoption.

• Policy and compliance: Develop and enforce policies and standards to ensure compliance and security.

• Governance maturity: Establish a strong governance framework to oversee cloud adoption and usage.

Additional Considerations:

• Human: Equip employees with cloud skills and knowledge, establish a culture that is cloud-native, provide continuous training, and support

• Process: Put in place effective processes to drive cloud operations, from deployment, configuration, and monitoring.

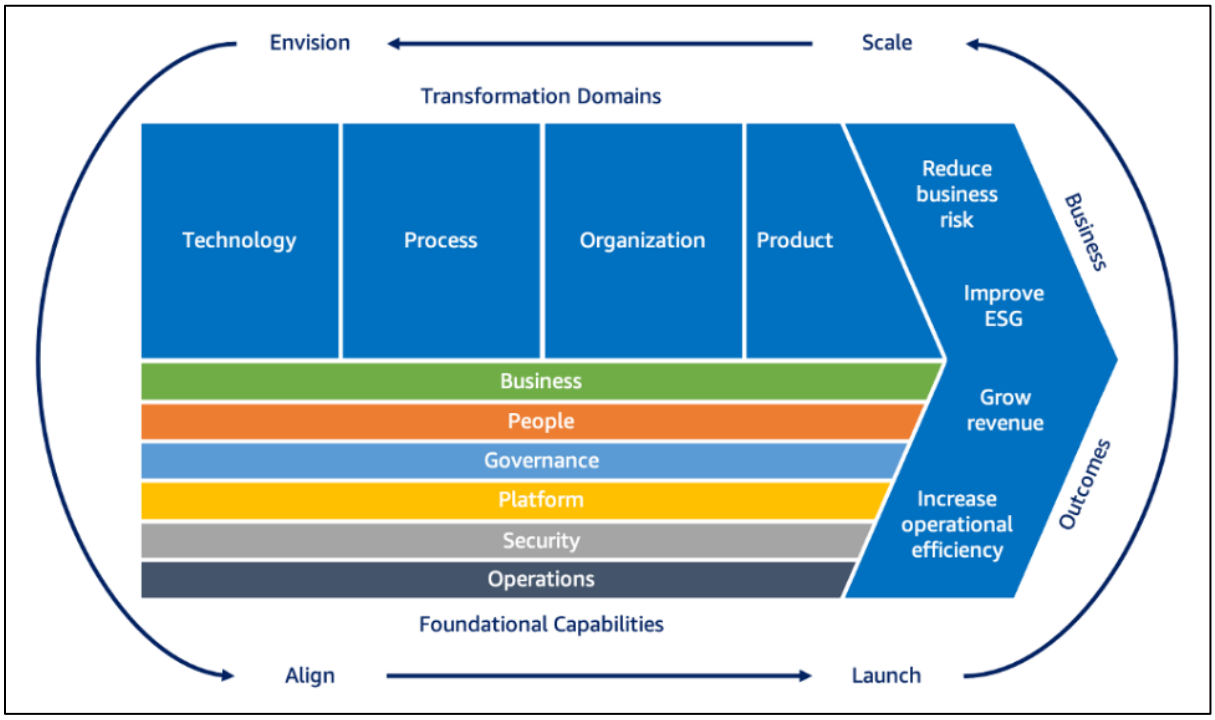
• Technology: Leverage Azure in creating scalable, resilient, and cost-effective cloud solutions.

• Documentation: Ensure complete documentation about the cloud infrastructure, applications, and processes

• Best Practices: Use best practices for cloud security, performance, and cost optimization.

Organizations can carry out effective adoption and utilize Azure in the pursuit of their business goals through improving operational efficiency and driving innovation by following the Microsoft Cloud Adoption Framework.

Those enterprises who want to start their business transformation with Amazon Cloud Services (AWS), they can follow the AWS Cloud Adoption Framework (CAF). It is a structured approach to effectively adopt and leverage Amazon Web Services (AWS) within an organization.



Source: Amazon.com

Figure 30. *AWS Cloud Adoption Framework for Business Transformation*

An iterative approach can help sustain momentum and continue to evolve your roadmap as you gain experience. The AWS Cloud Adoption Framework (CAF) recommends a four-phase, iterative, and incremental cloud transformation journey:

1. Envision Phase:

Identify and Prioritize Opportunities: Identify transformation opportunities across key business domains that align with your strategic objectives.

Associate with Stakeholders: Engage senior stakeholders who can influence and drive change.

Demonstrate Value: Tie transformation initiatives to measurable business outcomes.

2. Align Phase:

Identify Capability Gaps: Evaluate your organization capabilities from the six AWS CAF perspectives.

Surface Stakeholder Concerns: Act on any concerns or obstacles identified by stakeholders.

Design Strategies: Design strategies that would help improve cloud-readiness and organizational change.

3. Launch Phase:

Launch Pilot Initiatives: Get a few high-impact pilots running in production.

Show Incremental Value: Demonstrate tangible business benefits from the pilots.

Learn and Adjust: Use your pilot experience to adjust for the larger scale implementation.

4. Scale Phase:

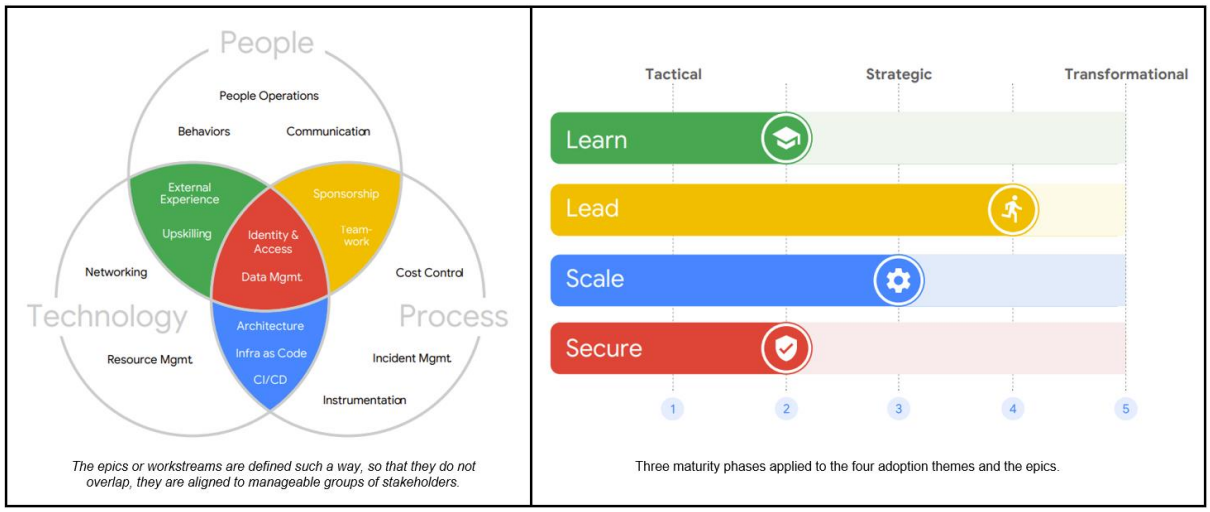
Expand Production Pilots: Extend successful pilots to realize desired business outcomes.

Realize and Sustain Benefits: Secure the continuous realization of the benefits of a cloud investment.

It is not possible for any enterprise to address all foundational capabilities simultaneously. As the business transformation is a journey, so better to develop these capabilities and enhance the cloud readiness gradually keeping the following six perspective in mind: Business, People, Governance, Platform, Security and Operations.

AWS Cloud Adoption Framework applies the AWS experience and best practices, to enable business transformation with a focus on accelerating the business outcomes through innovative usage of AWS.

Similarly, Google Cloud Adoption Framework is a structured approach to adopt and leverage Google Cloud Platform (GCP) effectively within an enterprise.



Source: Google.com

Figure 31. *Google Cloud Adoption Framework for Business Transformation*

Adoption Themes: The framework is organized around four key adoption themes:

- People: It focuses on the human element of cloud adoption, including training, upskilling, and change management.
- Technology: This covers the technical aspects of cloud adoption, such as infrastructure, security, and automation.

- Process: This addresses the operational processes and methodologies required for effective cloud adoption.
- Culture: A cloud-native culture and mindset in the organization is a must.

Maturity Phases: Each adoption theme is further divided into three maturity phases:

- Tactical: Initial phase with quick wins, proof-of-concepts, and basic cloud adoption.
- Strategic: Focuses on scaling cloud usage, optimizing costs, and establishing best practices.
- Transformational: Focuses on leveraging advanced cloud capabilities to drive innovation and business transformation.

Epics or Workstreams: These are specific projects or initiatives aligned with each adoption theme and maturity phase. Examples include:

People: Training programs, change management initiatives, and community building.

Technology: Infrastructure setup, security configuration, and automation implementation.

Process: Cloud governance, cost management, and operational excellence.

Culture: Cloud-native mindset training, collaboration tools, and agile methodologies.

5.5.4 How to Select the Best SAP Implementation Partner for your Business Transformation

The following designed framework depicted in Figure 32. outlines a structured approach to selecting the right SAP implementation partner.

Organization's Criteria: This involves understanding the organization's specific needs and challenges.

Evaluation of Potential SAP Implementation Partners: This focuses on evaluating potential partners based on their expertise, experience, and capabilities.

SAP Project Requirements: This defines the specific requirements for the SAP project, such as project management, change management, and post-implementation support.

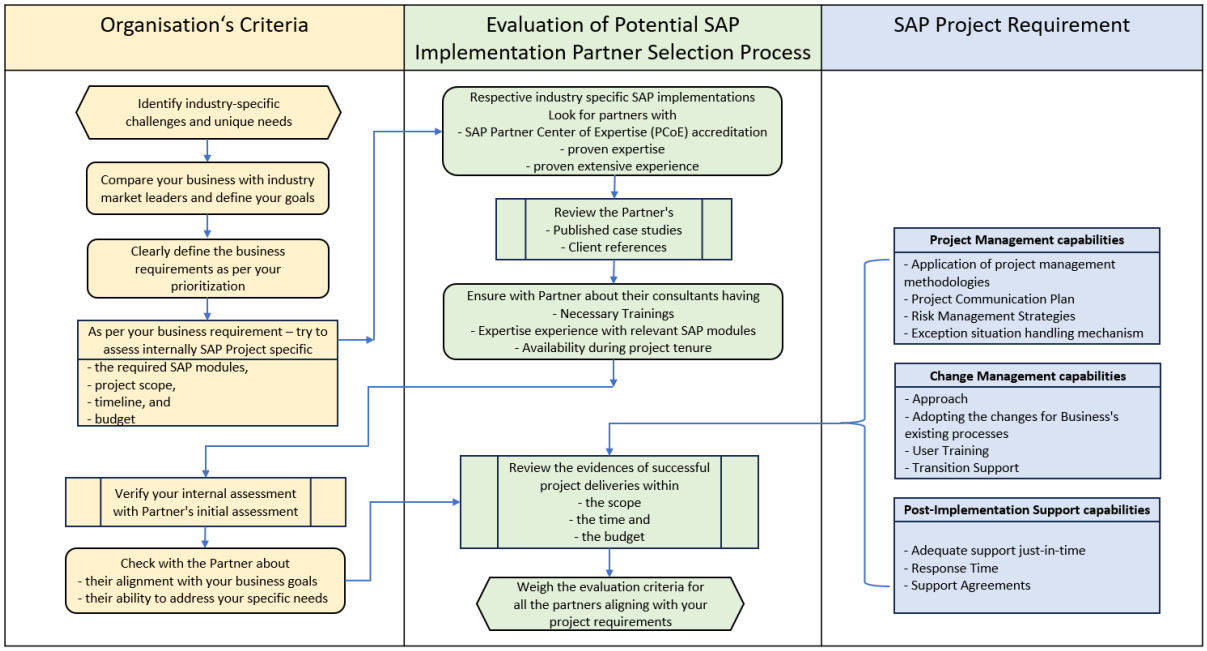


Figure 32. *Framework for SAP Implementation Partner Selection Process for Business Transformation*

Key Selection Steps

Understand Specific Challenges and Unique Needs of the Industry: First of all, understand the specific challenges and unique needs of your industry. While doing so, you also take into consideration aspects such as regulatory requirements, industry-specific processes, and competitive landscape.

Compare Your Business with Industry Market Leaders: Benchmark your organization against industry leaders. Identify areas where you want to improve and leverage SAP to achieve competitive advantage.

Clearly Define Business Requirements: Clearly articulate the business requirements, prioritizing them based on their importance. Also consider factors such as functional requirements, integration needs, and reporting requirements.

Assess SAP Project Requirements: Define and understand the specific requirements for your SAP project, including Project management, Change management and Post-implementation support capabilities perspective.

Evaluate Potential SAP Implementation Partners: Look for partners with SAP Partner Center of Expertise (PCOE) accreditation. Review the case studies and client references of the partner. Assess the project management methodologies and risk management strategies of the partner and whether it matches your requirement. Ensure that the consultants of the partner have the required expertise and experience. Verify the ability of the partner to provide adequate support and training.

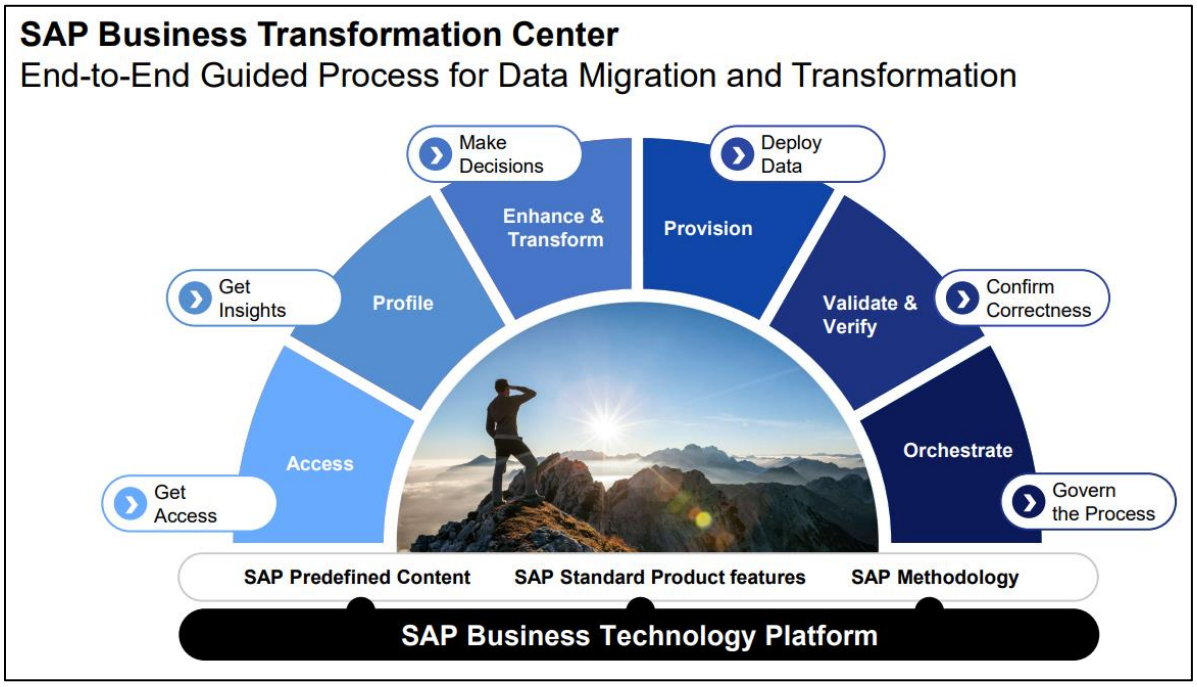
Weigh Evaluation Criteria: Evaluate the evaluation criteria for all the potential partners based on your project requirements. Most importantly, prioritize factors like the expertise of the partner, experience, and cost associated with it.

Choose the Best Fit SAP Implementation Partner: Choose the best fit partner that aligns with your organization's requirements and objectives. Consider factors such as the reputation of the partner, track record, and their ability to deliver in time and within budget.

Overall, this framework is structured and comprehensive in approach to the selection of the right SAP implementation partner. It ensures that the selected partner is able to deliver a successful SAP implementation project.

Despite of excellent SAP Partners, some enterprises are still approaching SAP itself, to guide their business transformation journey. The approach of “Customer First” triggers SAP for their new solutions and services. Enterprises they can leverage SAP’s Business Transformation as a Service for SAP RISE – which is the concept which emphasizes SAP's role in guiding and supporting customers throughout their transformation journey. It's a strategic approach that combines software, hardware, and services to help organizations accelerate their digital transformation journeys.

SAP Business Transformation Center provides a comprehensive and guided approach to data migration and transformation, helping enterprises effectively manage their data and achieve their business objectives.



Source: SAP.com

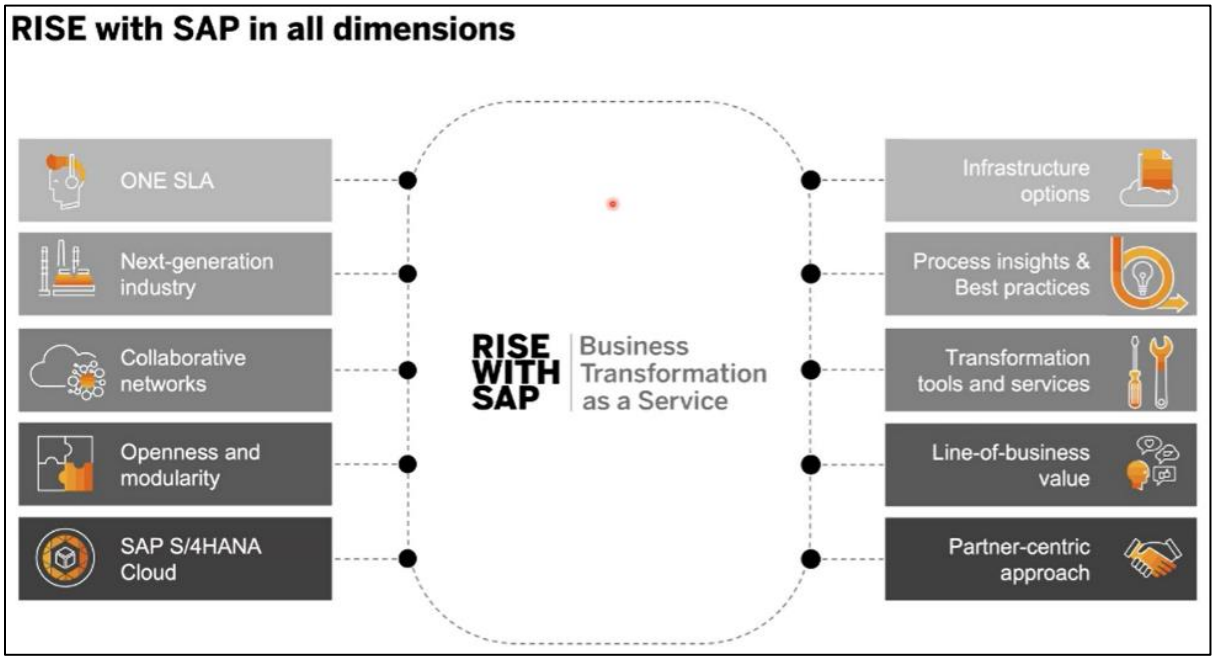
Figure 33. *Enterprise can leverage SAP Business Transformation Center*

Figure 33. illustrates the SAP Business Transformation Center - an end-to-end guided process for data migration and transformation. It is the step-by-step approach provided by the SAP Business Transformation Center to ensure a smooth data migration and transformation process.

SAP Business Technology Platform provides the basis for the SAP Business Transformation Center, which provides a set of tools and services for data migration and transformation.

Whereas the image in Figure 34. gives the "RISE with SAP" notion with the end-to-end approach toward the digitization of the businesses but on business transformation

as service. It is built on the central idea that constitutes the notion of "RISE with SAP", a broad all-in cloud business from SAP.



Source: SAP.com

Figure 34. *SAP RISE and SAP Business Transformation as a Service*

Business Transformation as a Service: The RISE with SAP model combines services that support business transformations. These services include implementation, managed services, as well as consulting to have the organization adopt the solution in the best way.

This service has a classification of the key elements such that:

It has ONE SLA representing a unified service level agreement for a seamless experience when running various SAP offerings.

Next-Generation Industry: SAP seeks to give industry-specific solutions that match the changing needs of businesses.

Collaborative Networks: The picture illustrates the aspect of collaboration between SAP, customers, and partners to produce innovation and success.

Openness and Modularity: The company promotes flexibility and customization using open APIs and modular solutions.

SAP S/4HANA Cloud: It is the central ERP offering in the RISE with SAP package. Process Insights & Best Practices SAP provides insights and best practices to optimize business processes.

Transformation Tools & Services: In order to support the act of transformation, SAP presents a variety of tools and services.

Line-of-Business Value: This aspect focuses on value creation related to specific business functions and processes.

Partner-Centric Approach: By collaborating with partners, SAP offers a comprehensive ecosystem of solutions and services.

Infrastructure Options: SAP provides flexibility in the options for infrastructure, with public cloud, private cloud, and hybrid cloud.

So, RISE with SAP is a holistic approach by SAP towards all enterprises, with aspects ranging from technology and infrastructure to business processes and collaboration.

5.5.5 How to Maintain your Enterprise Secure during the Business Transformation

Information technology is a significant role in connecting people globally in the modern world. It allows us to control and influence various elements of the planet. With the exponential growth of digital footprints, malicious hackers use information technology to compromise and destroy valuable data. They use a wide range of tactics to steal information, posing threats to businesses of all sizes and the general public.

Cyberattacks are not only a major issue but also a real threat. Cybersecurity is the process of securing digital devices and network systems against different forms of cyberattacks. It is about protecting all kinds of information in the cyber world, including personal information, intellectual property, business information inside the organization, and government data.

Cyberattacks can cause serious damage in many scenarios. Some of the most severe negative impacts include:

• Economic Costs:

Theft of Corporate Information - Unauthorized access to sensitive business data.

Theft of Intellectual Property - Loss of proprietary technologies and innovations.

Disruption of Trade - Interruptions in business operations and supply chains.

Repair Costs - Expenses incurred in restoring systems and data after an attack.

• Reputation Costs:

Decreased Trust Among Consumers - Erosion of customer confidence.

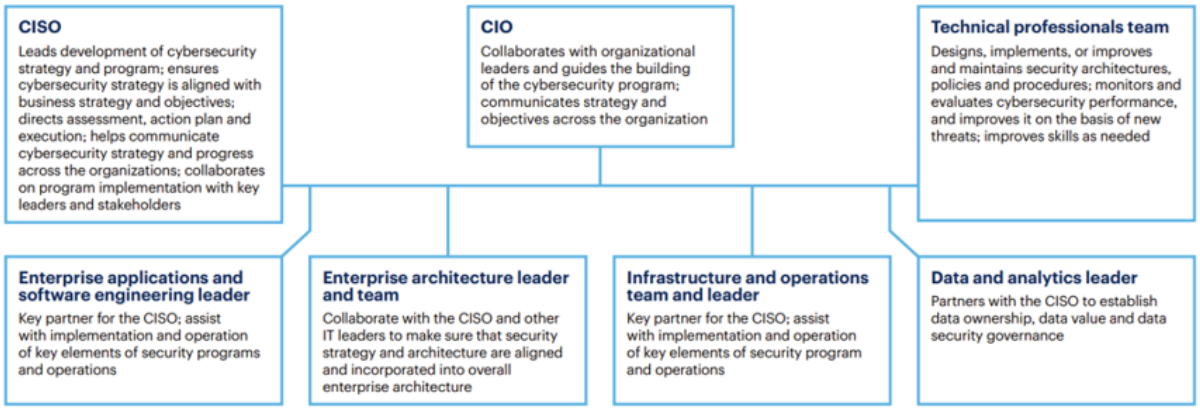
Loss of Customers - Potential decline in customer base due to security concerns

Bad Press - Negative media publicity that affects public perception.

• Regulatory Expenses:

Penalties and Fines - Regulatory compliance like GDPR can invite huge penalties for breaches.

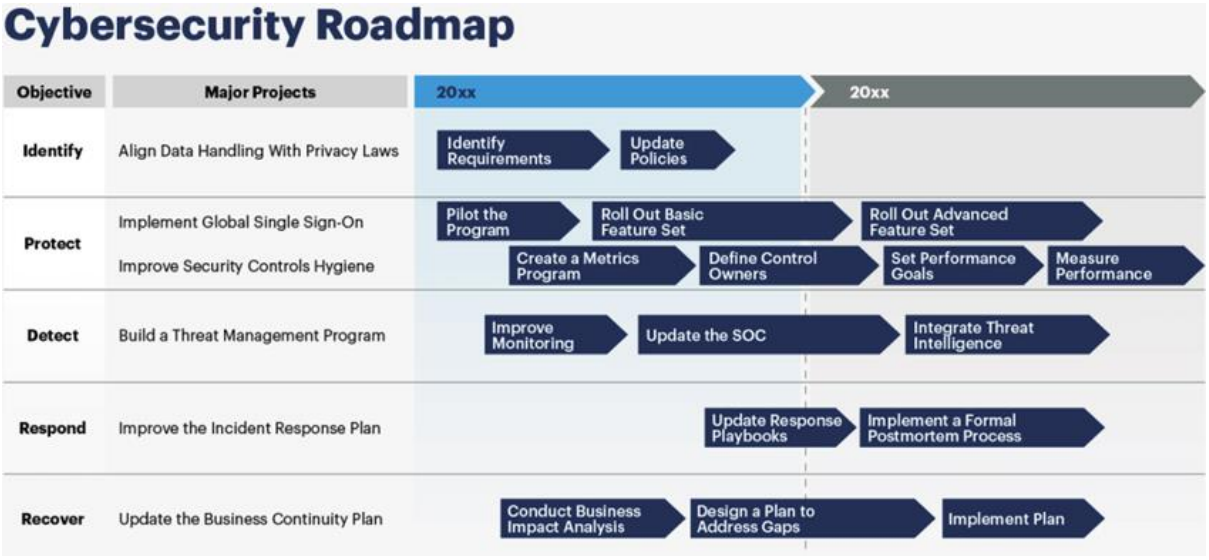
With the above reasons, proper Cybersecurity roadmap becomes a necessity for all enterprises. Balancing cybersecurity with daily business operations is a common problem for many enterprises. Most of the enterprises already understood the importance of the cybersecurity and that's why new role, Chief Information Security Officer (CISO), has emerged as a senior-level executive who oversees information security and risk management in an organization. An effective cybersecurity roadmap helps the concerned team stay focused on projects that align with business goals and mitigate risks. Managing cybersecurity risk is not the sole responsibility of the CISO; it should be a collective responsibility. If employees are properly trained and committed, they can be the greatest asset to a company in terms of cybersecurity. The most successful companies form cross-functional teams for their cybersecurity initiatives. The recommended functions to involve and their roles to ensure success in achieving milestones depicted in Figure 35.



Source: Gartner.com

Figure 35. *Cybersecurity – Who Needs To Be Involved And When?*

Cybersecurity is a vast topic and enterprise should implement a proper roadmap around this as it continuously evolving. The following Figure 36. showing a template about how to create a cybersecurity roadmap. CISOs can develop and enable this kind of a roadmap that supports risk-based decision-making while protecting against threats. But having a roadmap is not enough; risk and security must be regularly evaluated. Some key practices are:



Source: Gartner.com

Figure 36. *Cybersecurity – How To Create A Roadmap?*

Control Effectiveness Assessments: Measure the maturity of control implementations, benchmarked against peers and industry standards.

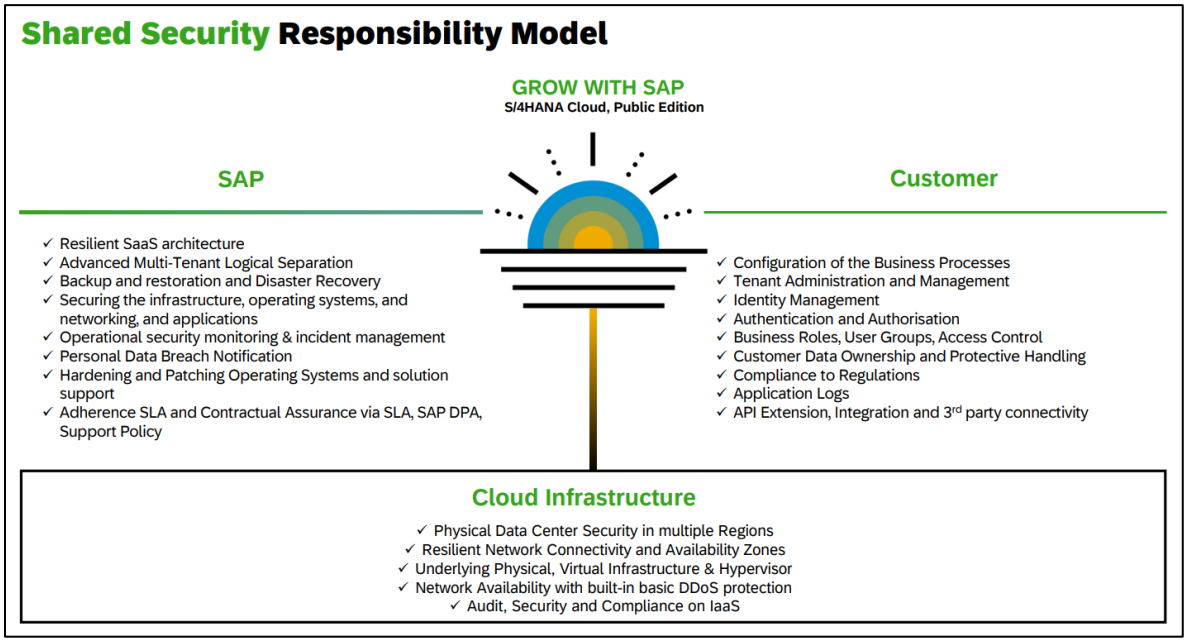
Vulnerability Assessments and Penetration Tests: Analyze the technical infrastructure for weaknesses.

Risk Assessments: Ensure investments in controls are proportionate to actual risks.

Implementation of Audit Findings: The audit recommendations must be addressed and acted upon.

Program Management Assessments: Benchmark the maturity of cybersecurity policies, processes, and programs.

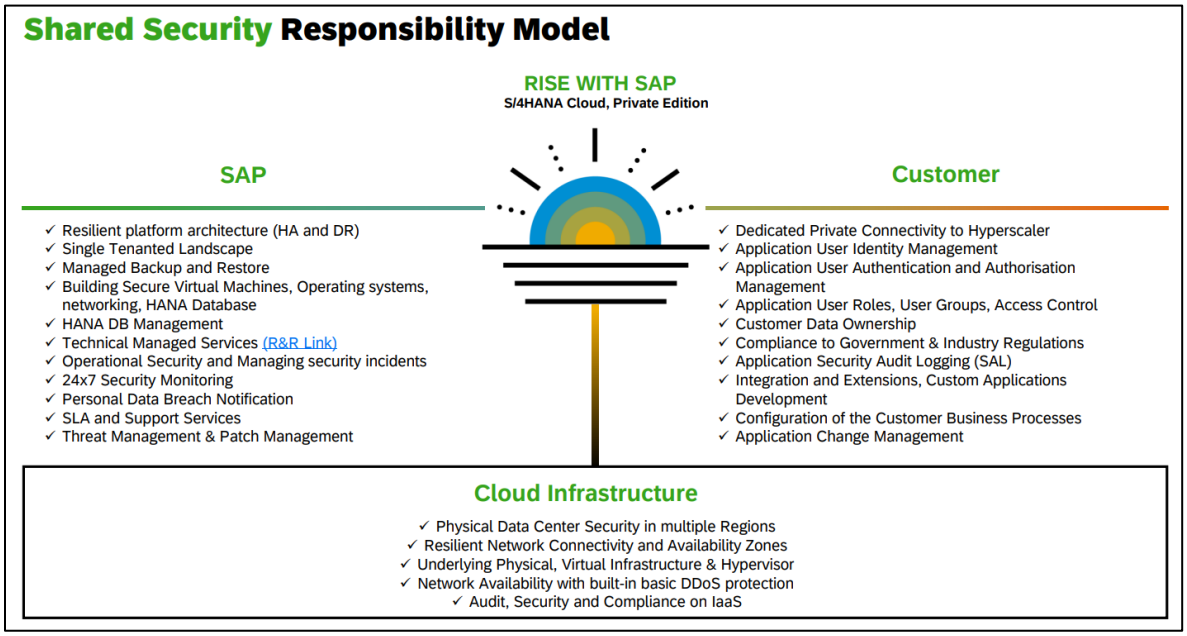
Keeping the importance of security in mind, SAP already designed the responsibility model framework for both – public and private cloud. The figure, Figure 37. shows the Shared Security Responsibility Model highlights the collaborative approach between SAP and customers in ensuring the security of SAP S/4HANA Cloud, Public Edition.



Source: SAP.com

Figure 37. *SAP S/4HANA Cloud, Public Edition - Shared Security Responsibility Model*

While the image Figure 38. illustrates the Shared Security Responsibility Model for SAP S/4HANA Cloud, Private Edition. This model outlines the security responsibilities that are shared between SAP and the customer.



Source: SAP.com

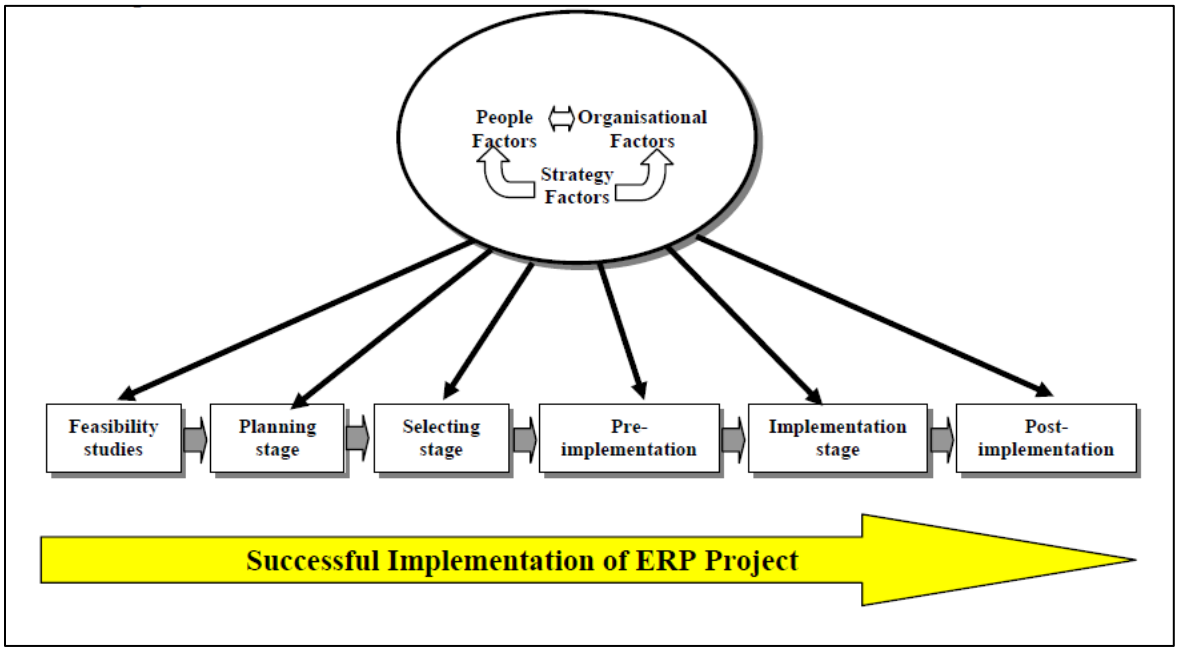
Figure 38. *SAP S/4HANA Cloud, Private Edition - Shared Security Responsibility Model*

It must be noted that customers do not have access to hyperscale provider accounts as this environment is fully managed by SAP. Customers get to access the SAP S/4HANA applications and functionalities securely on a Hyperscaler platform that is securely operated and managed by SAP.

These shared security models bring great benefit to all enterprises as SAP manages the underlying platform, patches, updates, security monitoring, high availability, disaster recovery and provides contractual assurances on SLA, personal data protection and privacy and other security assurances such as independent 3rd party audit reports. Customers can refer to SAP Trust Center for independent audit reports, standard SAP contracts, FAQ on security, data protection and privacy.

5.5.6 How to Successfully Manage Business Transformation leveraging SAP Projects

Like any other project, successful SAP project is based on appropriate and effective project management. SAP project generally requires significant amount of time and efforts – and the project spread across different phases or stages. An important part of project management is delivering a quality project on time and in full to meet the specified requirements. To deliver a satisfactory project, project manager and core team closely monitors the project's progress and quality of work during all the stages. Figure Fig. 39. shows the theoretical framework which represented by three main sets of factors, namely strategy related factors (top management commitment, clear goals focus and scope, legacy systems, and ERP strategy), people related factors (training and education, users involvement, employee's attitude and project team) and organisational related factors (effective project management, process management, change management strategy, IT maturity, computer culture, empowerment, organisational culture, and communication) (Ibrahim et al., 2008). And each of these factors are having an explicit linkage with other



Source: Proposed Theoretical Framework, Ibrahim et al.,2008

Figure 39. *The Theoretical Framework for ERP Implementation*

factors and as well as ERP implementation stages. Implementing/Upgrading or migrating SAP into the cloud for their business transformation, can present several challenges for enterprises. Other than technical challenges, there are lot of non-technical obstacles appear during this transformation journey. Here are some of the most common issues encountered during this transition:

Table 16. *Most Common Challenges of SAP Project faced by the Enterprise*

Non-Technical Challenges	***Technical Challenges***
• Project Planning and Preparation	• Data Migration
• Stakeholder Commitment / Involvement	• Compatibility and Integration Issues
• Communication Gaps and Change Management	• Customization and Configuration
• User Training and Adoption	• Performance Issues
• Budget and Timeline Overruns	• Business Continuity

Many organizations underestimate the time, effort, and resource requirement for SAP projects. Proper preparation of the project will ensure smooth transformation journey. Before taking the decision of SAP project, organizational needs should be analysed based upon the plan with a proper priority setting. Associated members should understand that SAP project is generally a large, complex and expensive project in nature, but the impact can be mostly throughout the organization. Also, every enterprise requires initial preparation across all the employees as cross-functional coordination plays a vital role for organisation-wide SAP implementation. The existing business processes should be investigated – the requirement for re-engineering and that too, at what context, before the SAP project started. For this, required skilled people needs to be involved with proper authority for the feasibility study and in the planning phase. This way organization may have a proper expectation set before the real implementation starts. It is very much crucial

to have a detailed roadmap plan which outlines all the steps having the responsible owner along with the timeline.

Proper involvement and necessary alignment are a must for SAP project stakeholders. An SAP project may have multiple modules and hence, touching cross functional topics within the enterprise. So, ensuring all the stakeholders are on the same page, with an agreed plan, is essential to avoid unnecessary conflicts and miscommunication. Any SAP project will not be successful without the management and stakeholders' involvement and adequate support. Although people in project management were given clear responsibilities, sometimes the feedback and encouragement from the management is really necessary. They should understand that just providing all human and financial resources cannot guarantee a successful business transformation.

Due to the long association and accustomed to the legacy system, employees may be the resistant to adopting SAP during the initial stage; it is also because of lack of awareness of SAP system. Effective and purpose-oriented communication is crucial during SAP project. Management, stakeholders and the project team should communicate about strategic importance, long term goal with easy and understandable fashion. Free flow of information and continuous dialogue help all the involved parties to look ahead for difficulties and determine the solutions. Managing the transition to SAP is challenging as during this project, business process also re-engineered apart from a new technical system. Enterprises often struggle with helping employees adapt to new processes and technologies. Experts within the enterprises should manage the proper balance between the following as – too much effort to redesign business processes can result later a heavy burden in reconfiguring the software and too much effort to align the existing business processes to SAP process may result loss of competitive edge. Adequate training for users is essential to ensure they can effectively use the new SAP system. Many enterprises fail to provide comprehensive training, leading to very low user adoption and which resulted major productivity issues. Other than SAP training, basic cloud computing knowledge is always welcome to build the cloud mindset within the enterprise. Managing the transition with effective communication and helping employees adapt to new processes, new systems

and tools is very much crucial for the successful adoption of SAP for the business transformation journey.

SAP implementation across the enterprise can be expensive and time consuming. Without careful budget management, SAP project can exceed its financial limits which was projected at the beginning of the project. Even change in scope, unexpected challenges may lead to delays, impacting the overall project timeline for business transformation. Lack of adequate proper monitoring, timely feedback from the organisational leadership and project team can cause budget and timeline overruns for SAP project. Clear scope definition, proper user training, and timely check can help on this type of situations. The project team can control and monitor cost incurred in every stage by counter checking with the budgeted amount.

Enterprises have already huge data due to their ongoing business at on-premises setup. Migrating data from legacy system to SAP can be problematic sometimes – if the data is incomplete, inconsistent, or inaccurate while transferring into cloud. The data migration process itself a complex and error prone. Even large volumes of data can slow down the whole migration process and may increase the risk of errors. If the data structures at source and target system are significantly different, then data mapping from the old system to the new SAP system can be more challenging. The complexity of data migration can lead to delays and additional costs. Thorough testing and validation in data migration is crucial to avoid errors in the new SAP system and it also ensures about accurately transferred data.

System compatibility plays a vital role in SAP project. Project team should ensure that the new SAP version is compatible with existing hardware and software to avoid technical issues. SAP also publish the complete list of certified and compatible physical and virtual system configuration from different server and storage vendors. Choosing a stable software version and that has excellent review from other customers can avoid extra work. Other than the business-critical SAP systems, enterprise may require other SAP systems and legacy systems to run their business. Integrating SAP with other existing legacy systems can be complex and may require some additional middleware or custom

development. For better solution, it is always good to select an experienced implementation partner who extends excellent support services during and post implementation stages.

The existing legacy systems often have custom-built features that need to be replicated or re-engineered in SAP. SAP systems often require extensive customization to meet these specific business needs. This can be time consuming and costly. Project team should properly analyse the existing business process to identify the potential improvement areas and plan accordingly. At the same time, project team should assess and select the appropriate path with minimal cost and effort to get into there. Also properly configuring the system to align with the business processes is critical. Sometimes, these configurations are complex in nature; hence, the tasks need detailed planning and proper expertise, unless it can lead to inefficiencies like performance issues and errors. Project team should ensure the new SAP system performs well under simulation load and scales with the business growth is essential. Validating the SAP system's performance and functionality after the implementation/migration ensures that it meets business requirements. Insufficient testing can lead to several issues; that's why it is essential to conduct thorough testing, including unit, integration and user acceptance testing. A new system can introduce new security vulnerabilities; the project team should ensure robust cybersecurity measures are in place from the beginning. Again, the project team should always remember that performance tuning, optimization and deploying proper security measures are ongoing tasks.

Business continuity is the most common requirement for any enterprise in todays' dynamic business world. In this competitive age, minimal business disruption is the first priority. Adapting high availability for ensuring business operations to continue smoothly and proper alternative plan is highly required to tackle disastrous situations. Having a robust backup and recovery plan in place is essential to mitigate the risk of data loss or SAP system failure for any technical or functional issue. This requires good planning and expert execution. As business needs evolving, the SAP system must be updated and adapted accordingly to meet new requirements. SAP systems require continuous monitoring, updates, and maintenance to ensure the SAP environment remain secure and efficient.

Addressing these above challenges require careful systematic planning, effective communication, and a strategic approach. As part of a standard project management approach, regular status report to all stakeholders and management in regular interval should be encouraged. The report should describe the progress made against plans, issues with reasons and corrective actions for deviations, risk mitigation plans, and a review of quality issues. It will help to ensure consistency between the projects and objectives. By implementing these strategies, one can ensure that SAP projects run smoothly and achieve their goals with efficiency to have a perfect business transformation for the enterprises.

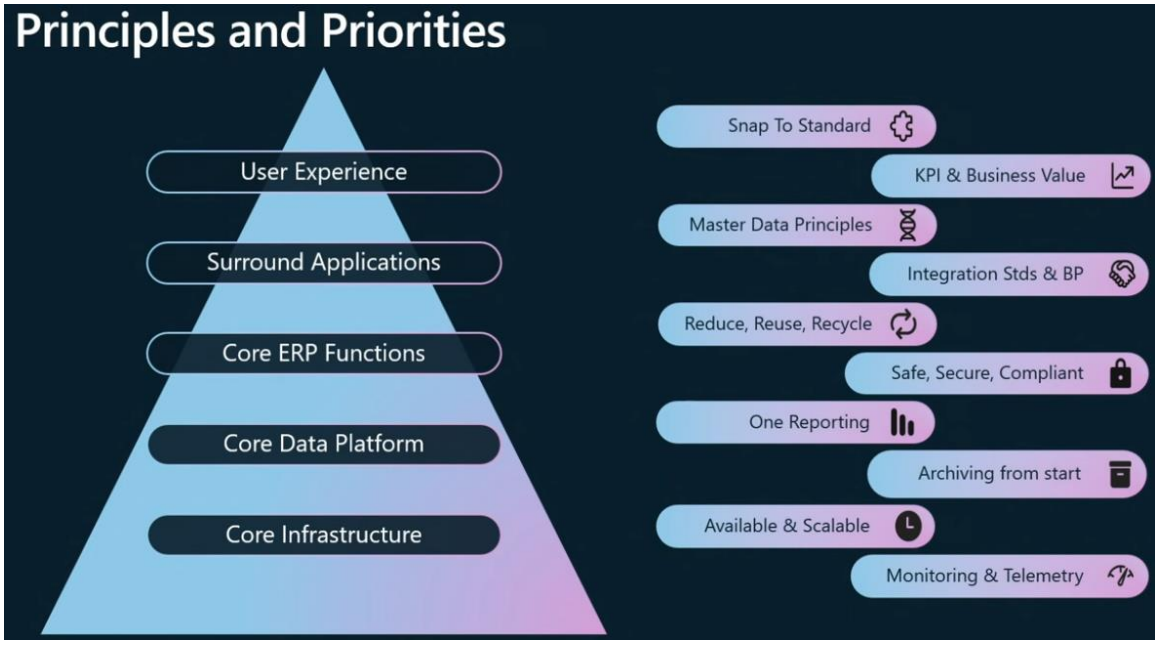
5.5.7 Successful Business Transformation leveraging SAP – Some References

Now let's discuss some of the successful business transformation journeys of some enterprises from diversified industries as case study. Every enterprise is different – they have different challenges, different business models and strategies, different sets of customers, etc. – hence the nature of SAP implementations are not identical in all. But the ultimate objective of all enterprise remains the same - focusing on new ways of working, new capabilities, and new technologies to capture untapped potential or to realize gains in growth or efficiencies.

Microsoft:

Like many enterprises, Microsoft uses SAP for many years - started the journey with SAP in 1993. At Microsoft, they implemented SAP for human resources, finance, supply chain management, commerce, and other enterprise services. The SAP environment is essential for their business performance, seamlessly integrating into most business processes. Microsoft was running SAP at Microsoft on infrastructure hosted in their own datacenters using 600 servers. And the largest SAP application, ERP/ECC of Microsoft was really huge - which comprises of 16TB of compressed database (equivalent of 50TB uncompressed), 110000 internal users, 6000 named user accounts, and with 300000 monitored jobs per month and up to 270 million transaction steps per month.

Microsoft employed a "lift-and-shift" strategy to migrate servers from their on-premises environment to Azure. This approach involved re-creating the servers as Azure virtual machines with similar resources and configurations. Then Microsoft used this pyramid-shaped framework that outlines core principles and priorities for their transformation for their SAP ERP implementation or modernization on Azure cloud. This pyramid highlights the importance of a strong foundation with core infrastructure and data platform, to support the core ERP functions and surrounding applications. The principles and priorities at each level ensure that the system is reliable, secure, efficient but agile and aligned with business objectives.



Source: Microsoft.com

Figure 40. *Framework for Core Principles and Priorities of SAP Transformation at Microsoft*

On February 2018, SAP migration is completed and since then, Microsoft is running 100 percent of their SAP applications run on Azure. As Microsoft grows almost four times in last five years - they also adopted SAP SaaS solutions integrated with their SAP on Azure deployment. Microsoft using the following SaaS modules: Integrated Business Planning, Success Factors for learning and succession, SAP Ariba for sourcing and direct networking, and SAP Concur for travel and expense management.

With leveraging Azure features and functionalities, Microsoft continues to realize the benefits of SAP modernization, including improved business outcomes, enhanced security, cost savings, agility, innovation, and sustainability. At the same time, it enhanced the customer and employee experiences.

Deere & Co. (John Deere):

For nearly 200 years, Deere & Co., also known as John Deere, has delivered recognizable green tractors as well as other construction, farming, and landscaping equipment. However, it has also become well-known for its use of data, analytics, and other digital technologies in order to deliver new products and services. John Deere is one of the early adopters of SAP HANA for their business with a transformation target from being a manufacturer to becoming a solution-based enterprise. For instance, huge amounts of data can be taken from global equipment sensors, information on how customers are using that equipment can be obtained in real-time, and a solution can be provided back to the customer in real-time. The company embeds AI into its farming equipment, so it can tell the difference between weeds and crops. It includes automation and intelligence into its machines, so they can run without drivers. And it delivers data-driven insights to its customers in the fields, helping landowners and operators manage their fields and forests more effectively and efficiently. During this journey, John Deere's investment in digital innovation driven R&D and additional IT architecture enhancements, including phasing out legacy solutions and migrating ERP and related systems to AWS cloud platform. Apart from investing SAP S/4HANA in 2016, they invested in emerging technologies such as AI, Machine Learning, IoT, Blockchain, cloud based HCM, CRM, EPM, Procurement or Treasury applications. This shift towards an Enterprise Business Capabilities-focused IT architecture involves adopting a distributed data mesh supported by API governance and microservices, seamlessly connecting legacy systems with new, modern multi-tenant CRM and Service Cloud-based solutions. By leveraging cloud technologies, John Deere's SAP landscape and Service Management System have eliminated manual effort, significantly reduced risk, provided greater visibility, and increased both speed and productivity. John

Deere is now better positioned to standardize processes and tools across enterprise applications, enabling even greater agility. It always worth to explore John Deere's strategies and programs, highlighting how the company leverages technology to maintain competitiveness and drive growth for their century-wide business transformation journey.

Hitachi High-Tech:

This global high-tech company headquartered in Japan exchanged its customized multinational business scenery by embracing SAP S/4HANA Cloud in a dual-tier public and private cloud model. With a fit-to-standard ethos, Hitachi High-Tech can now focus on supporting business innovation across its subsidiaries using the side-by-side approach on SAP Business Technology Platform. This will allow Hitachi High-Tech to leverage emerging capabilities and work with business ecosystems to quickly offer the latest features and functionality to the users in order to respond to the change in the market. The enterprise resisted altering the solution architecture to suit its needs to prepare its business operations for the future and fully exploit the best practices built into the SAP S/4HANA Cloud. Instead, the company adapted processes to suit the standard. Workflow management, and robotic process automation capabilities enable cross-system workflows with automatic task execution. SAP Fiori deployment ensured consistency in user experience across applications and intuitive self-service access to processes and reports. Business transformation has helped the enterprise with 94% reduction in customization footprint along-with 100% on-site maintenance requirements eliminated.

KAESER KOMPRESSOREN SE:

A century-old industrial manufacturing enterprise in Germany, providing services its' worldwide customers in construction, healthcare and environment sectors opted for business transformation leveraging SAP. This enterprise enabled its users to work with self-service business intelligence on a centralized global data management platform in the cloud. To achieve higher operational efficiency and services, the company used SAP BW bridge for SAP Datasphere and the SAP Analytics Cloud solution, which enable a scalable

and flexible system landscape in the cloud. The migration of on-premises based SAP S/4HANA and 10 connected systems to the RISE with SAP S/4HANA Cloud Private Edition solution has also been completed after a runtime of only six months. The company also has more flexibility now in terms of customization of reports and assimilation of different types of information in dashboards, charts, and tables. With self-service analytics and data democratization, now they can empower its business units to generate their own reports, rather than waiting for a central function. Leveraging one of SAP AI Services and SAP Analytics Cloud, Kaeser automates more than 80% of its data maintenance tasks, improve data accuracy, and achieve significant productivity gains. This success triggers the proportion of SAP Business AI in Kaeser's data project rose from less than 10% in the first year to over 30% in the third.

Bain & Company:

One of the world's leading management consultancies, serving more than 64% of the Global 500 companies, is now successfully running all of its core financials in 40 countries on SAP S/4HANA Cloud Public Edition. The enterprise has grown significantly over the past two decades, expanding its operations to over 65 offices worldwide. This would mean the support to an increase in manual and localized back-end processes, driven both by organic growth and through acquisitions. In addition, integrating acquired businesses into the broader company structure was also a challenge. To address those problems and for support to future growth, company decided to migrate to the cloud with SAP S/4HANA Cloud Public Edition. Bain & Company have chosen SAP S/4HANA Cloud Public Edition as a SaaS solution which will help future-proof technology stack; also they want to stick to standard processes, latest industry best practices and continuously delivered innovation. With a big-bang approach for their business transformation, Bain & Company simplified and standardized their chart of accounts enabling them to utilize SAP S/4HANA Cloud Public Edition, group reporting to provide the management reporting their leaders need to make timely decisions - which creates real business value and execution efficiency. Now the company want to use all the latest innovations, which

include industry best practices and new technologies like generative AI, available to them through SAP solutions.

Mahindra & Mahindra Limited (M&M):

A technology & innovation-led, global, federation of companies, which offers a wide range of products, services & possibilities, empowering people to Rise - one of India's largest companies, is a multinational federation of over 80 legal entities in more than 20 industries. The group also exists in farming, automotive, financing, hospitality, real estate, renewables, logistics, steel manufacturing, auto recycling, defence and aerospace. Of its existence of over 70 years, it has been an SAP customer for 25 years that has enabled the conglomerate to grow and be innovative continuously. That's why the move into a cloud-based, digital future with the RISE with SAP solution and SAP Business Technology Platform was so logically next. To achieve growth along with its corporate vision, the company determined that future-readiness is an aspect of overall strategy that meets these growth goals. To be prepared and thrive in the changing business environment, the emerging trends were addressed. The other trends were the end-to-end digitalization of manufacturing value chains and the use of intelligent technologies like AI and machine learning to support smart manufacturing. Better-informed decision-making, supported by predictive and cognitive analytics, was also a key priority. The business transformation at this enterprise included moving 28,400 users of the company's existing on-premises instance of SAP S/4HANA to SAP S/4HANA Cloud, private edition on Google Cloud Platform. Under the Aarohan Project, Mahindra migrated to 12TB core Scale-out RISE with SAP - which generates 50K Purchase Orders, 600K Invoices and 373K Sales Orders per month respectively. In addition, they implemented SAP BTP solutions to enable it to modernize and integrate its IT environment. Mahindra accelerated decision-making with Business Process Master (BPM), AI, ML, SAP Signavio, SAP Intelligent Robot Process Automation (iRPA), SAP Analytics Cloud (SAC), and SAP Data Intelligence Cloud and brought agility in development through API Hub and Low-Code/No-Code adoption. Business users are now empowered with SAP Build Process Automation to self-serve their

automation needs, which has saved more than 1,000 IT workdays in nine months - 35% quicker developments over traditional development using mobility, workflow, API management framework. Optimized processes in logistics and supply chain management have resulted in 20% back-order processing time reductions. And because of migrating to the cloud, all 194 on premise servers in the data center were freed up as a consequence, and what that savings in carbon equated to is planting 13,000 trees. The setup of new systems in Google Cloud Platform successfully handled the sale of over 100,000 cars in just 30 minutes.

Nestle:

Being one of the world's largest food and beverage companies, Nestle sells over one billion products every day. And with over 2,000 brands in 188 countries, its operations are as big as they are complicated. Started with SAP R/3 implementation in Nestle UK in the decade of ‘90s, Nestle had gone for region or country specific SAP implementation, e.g. Nestle SA, Nestle USA. There was a need to centralize and control data so that the financial, reporting, and forecasting numbers were more consistent and accurate to get the competitive advantage. Within these, Nestle USA case is an excellent case study for ERP implementations because it contains both successes and failures. In 1997, under BEST (Business Excellence by Systems Technology) project, ERP deployment started for Nestle USA. Although there were bumps in the road for ERP implementation, still as of 2002, Nestle USA claimed they had already realized a savings of over $325 million (Worthen, pg. 1), mostly for the supply chain improvements. Like Nestle USA's experience, implementation will throw many obstacles and setbacks for organizations, but a project can still be successful. The key difference between success and failure is the organization's ability to come together and cooperate at the tough times in order to attain a final goal that ultimately makes everyone's work easier and enhances the company's competitiveness. Even after that Nestlé USA has modernized its infrastructure by creating a centralized data lake to meet its enterprise analytics needs. Robust CI/CD, DevOps, and MLOps processes, including automated data testing, code reviews, and security vulnerability checks, have

been put in place to minimize platform failures and reduce time to production. Nestlé has selected the Microsoft Azure stack for its analytics requirements. Many siloed systems have been decommissioned because of the shift from legacy systems into a centralized data lake. This change has produced an estimated cumulative business value of over $200 million from various projects and programs in the data lake.

Long-time associated with SAP, Nestle has been wanting to standardize its global ERP systems and adopt cloud solutions from SAP to support the company's drive for the digitization of everything from advanced analytics, customer experience, sustainability tracking through to workforce and talent management. To ensure a smooth, disruption-free transition to a more dynamic, reliable, and scalable infrastructure, they selected the RISE with SAP solution under Nestle Journey to Cloud (J2C) project. The company with 275000 employees is now automated business processes across operations, brought innovative business models to global scale, and achieved greater agility and resilience through its global business transformation. Within Nestle, 15,000 managers in over 100 countries now use a common solution in the human resources area, automating 95% of review processes. This business transformation helps the enterprise to shut down 9 data centres and more than 10000 servers - which also enabled the company to migrate thousands of applications, 300 instances of SAP software, and a total of 1200 terabytes of data to the cloud.

Asian Paints:

Established in 1942, driven by its strong consumer-focus and innovative spirit, Asian Paints has been the market leader in paints since 1967. Among the "TOP 10 Global Players" in paint industries, Asian Paints, along with its subsidiaries, have operations in 15 countries across the world with 27 paint manufacturing facilities, servicing consumers in over 60 countries. They manufacture a wide range of paints for decorative and industrial use and also offers water proofing, adhesives and services under its portfolio. Leveraging their innovation journey, Asian Paints spread their presence in the Home Decor segment and offers Modular kitchens and wardrobes, Bath fittings and sanitaryware, Decorative lightings, uPVC windows and doors, wall coverings, Furniture, Fabric & Furnishings and

Rugs. They are always the early adopter of SAP Solutions; Asian Paints has used SAP software for digital transformation across a variety of business processes, including Enterprise Resource Planning (SAP Business One), Trade Promotions (SAP HANA), Customer Resource Management (SAP C4C), Business intelligence (SAP HANA), Real-time analytics with historical data (SAP HANA and SAP IQ), Supplier communication, etc.

Asian Paints started using SAP HANA in December 2011; they implemented a side-car approach for billing data to be pushed to HANA from SAP ECC for real-time analysis, thus providing insights for their sales team to manage trade promotions. In August 2014, they migrated their SAP ECC to Suite on HANA, with HANA's compression and processing speed enabling their business operations better and faster. With the implementations of SAP EWM, SAP Manufacturing Execution, and SAP MII, Asian Paints able to setup smart factories for better throughput with less human error. At Asian Paints, the "digital core" domain encompasses all essential transaction systems operating on various ERP platforms (SAP S/4 HANA, SAP B1), along with their extensions and human-to-system workflows. This domain also includes modules for Order-to-Cash, Procure-to-Pay, and Core Financial & Master Data processes.

With ever-expanding network of Asian Paints 70000 dealers worldwide, the amount of data to be dealt with increased exponentially. The analysis of sales trends and other key performance indicators for such humongous data quantities was becoming a challenge with the existing IT architecture, greatly limiting data access, visibility, and usability. Asian Paints leveraged the near-line storage (NLS) functionality of SAP IQ software to store the data more affordably, enabling real-time analytics and dramatically streamlining data-intensive tasks in SAP NetWeaver BW on HANA. The company achieved an impressive compression ratio of nearly 6 to 1, shrinking the data footprint from 180 GB in the legacy database system to just 30 GB in SAP HANA. This new architecture delivered real-time sales information and relevant KPIs, offering actionable insights to business managers. Asian Paints has gone live with the latest release of SAP S/4HANA - which was a big bang global upgrade across 12 countries with minimal business downtime.

Asian Paints selected Google Cloud's latest 16TB X4 systems for the reliability and performance needed for their largest and most demanding workloads for SAP RISE in S/4HANA Private Cloud edition.

Along with innovation, agility and adaptability can be seen as a function of the company's commitment to building strong IT and digital capabilities, in-house and with their partners. Asian Paints has effectively carried out Proofs of Concept in cutting-edge technologies such as the Internet of Things, AI algorithms, conversational chatbots, natural language translation, and 3-D visualization for home décor. By leveraging industrial sensors, automation, and social media analytics, the company has enhanced both its internal operations and customer-focused marketing efforts.

CHAPTER VI:

LIMITATION, RECOMMENDATION AND CONCLUSION

6.1 Limitation of the Study

This study is mainly done because of the global trend nowadays, which says, business transformation is a must for enterprises, regardless of any size. This study tries to find a generic approach on finding a solution in the form of a framework, which can be adopted by worldwide enterprises for their business transformation through the software, solutions and services of SAP. As the technology innovation and changing market scenario always bring new dynamics-proposed framework needs to be evaluated periodically to keep its significance. This study also concentrates on those enterprises who mainly use SAP for managing their critical businesses. The study is too generic in nature – the framework provides the overview approach of starting the business transformation and then how to manage the different obstacles during the transformation journey. It will be very interesting to find out the detailed technology and process-oriented approach for the relevance of proposed business transformation framework for a specific industry segment or sector.

6.2 Recommendations for Future Research

It can be considered a more generalized approach of finding out what are the problems and mitigating those in the course of changing the business nature of entities. For this, it has utilized some case study, interview/interactions of various personnel, and associated or connected to that business transformation. Still to ascertain a much more specific type for a specific industry or sector, one could go for separate deep dive for the particular industry or sector. Just for an example, for the financial institutions or banking industry required stringent. The result of the industry or sector-specific study will definitely

help the organizations for their future business transformation journey. Also, nowadays most organizations are global, hence how culture across the geography can influence the business transformation of an enterprise – another interesting topic to investigate further. The cloud and business transformation wave are on already but still lot of small-medium-large enterprises have dilemma on taking decision on their business transformation due to several areas – disruption handling during transformation, mindset change, workforce training, technology platform selection & deployment options, appropriate implementation partner selection, etc. The study regarding the business transformation of a specific industry or sector will help the companies belonging to that sector choose the best-suited approach for their business transformation journey.

6.3 Conclusion

In current dynamic business environment worldwide, focusing on business transformation is the only option available for an enterprise. SAP has always been a major player in the business world; 85 of the 100 largest companies in the world are SAP S/4HANA customers. Due to its 25+ industry-specific solutions, SAP, the world's leading supplier of business software solutions, has clear dominance with a huge client base of over 400,000 customers globally. The widespread adoption of SAP is the strong evidence that SAP plays a significant role in enhancing business operations on a global scale. So, it is obvious that any business transformation of an enterprise touches their SAP oriented processes, technologies and of course, people. Due to uncertain market conditions, enterprises are always on a dilemma when and how to trigger business transformation keeping their existing business, corresponding growth, and revenue intact. It is always challenging to adopt new ways of working, new capabilities, and new technologies although everybody is aware about that this is the only way forward. This research paper addresses that common pain points on how enterprises can strategies their preparations,

plans, executions for an effective business transformation - which will be able to respond to shifting market needs, seek new opportunities generated by innovation, and successfully negotiate growing regulatory complexity. Every enterprise and their business processes are different; at the same time, SAP implementation is different and complex in nature – so there is no one solution fits all requirements. Business transformation leveraging SAP involves making fundamental and often extensive changes within an organization to respond to various internal and external forces. This process enables the organization to adapt, evolve, and prosper. A framework and systematic approach need to be followed – starting from define objectives and develop a roadmap for business transformation, how to select the target platform, how to choose the best implementation/integration partner for SAP project, how to secure the cloud environment, how to address the technical and non-technical challenges during the journey, etc. For better understanding, some references also discussed in this paper for learning from the experiences. Disruptive forces such as SAP and non-SAP technological advancements, shifting consumer expectations, economic fluctuations, and global uncertainties challenge businesses across all industries. To not only survive but also thrive in this environment, businesses must embrace transformation as a strategic necessity.

APPENDIX A

SURVEY COVER LETTER

Date:

Dear Mr./Ms.

My name is Debajit Banerjee, and I am a student of Doctorate in Business Administration program in Swiss School of Business and Management (SSBM). For my research work, I have the topic titled "Accelerating Business Transformation of Enterprises by leveraging modernization in SAP Implementation". Because you are associated with SAP implementation project in your organization, I am inviting you to participate in this research study by completing the attached surveys.

The following questionnaire will require approximately 30 minutes to complete. There is no compensation for responding nor is there any known risk. To ensure that all information will remain confidential, please do not include your name. If you choose to participate in this project, please answer all questions as honestly and return the completed questionnaires promptly. Participation is strictly voluntary, and you may refuse to participate at any time.

Thank you for taking the time to assist me in my educational endeavours. The data collected will provide useful information regarding SAP implementation for the business transformation in your organisation. Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me, detail listed below.

If you are not satisfied with the manner in which this survey is being conducted, you may report (anonymously if you so choose) any complaint to Swiss School of Business and Management (SSBM), Avenue Des Morgines 12, Geneva Business Center, 1213 Petit-lancy, Geneva, 1213, Switzerland (Contact +41 22 508 77 96).

Sincerely,

[Debajit Banerjee]
+91 8553441887 / debajitb@gmail.com

APPENDIX B

INFORMED CONSENT

I volunteer to participate in a research project conducted by Mr. Debajit Banerjee, a student of Doctorate in Business Administration program in Swiss School of Business and Management (SSBM). The research is related to "Accelerating Business Transformation of Enterprises by leveraging modernization in SAP Implementation". I understand that this survey is designed to gather information about academic work only. I will be one of approximately 30 people being interviewed for this research.

1. My participation in this project is voluntary. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time without penalty. If I decline to participate or withdraw from the study, there will be no negative consequences. There are no known risks associated with participating in this study.
2. I understand that most interviewees in will find the discussion interesting and thought-provoking. If, however, I feel uncomfortable in any way during the interview session, I have the right to decline to answer any question or to end the interview.
3. Participation involves being interviewed by researcher with survey questionnaire. The interview will last approximately 30-45 minutes. Notes may be written during the interview.
4. I understand that the researcher will not identify me by name in any reports using information obtained from this interview, and that my confidentiality as a participant in this survey will remain secure. My name and other identifying information will not be included in any reports or publications resulting from this study.
5. I understand that this research study has been reviewed and approved by SSBM. If I have any questions or concerns about the study, I can contact Swiss School of Business and Management (SSBM), Avenue Des Morgines 12, Geneva Business Center, 1213 Petit-lancy, Geneva, 1213, Switzerland (Contact +41 22 508 77 96).
6. I have had all my questions answered to my satisfaction, and I have been given a copy of this consent form.

By signing below, I acknowledge that I have read and understood the information provided in this consent form and that I freely and voluntarily consent to participate in this study.

Participant Signature: *Researcher Signature:*

_____ _____

Date: _____ *Date:* _____

APPENDIX C

SURVEY QUESTIONNAIRE FORM

Name: _____ Date :(dd/mmm/yyyy) _____

Designation: _____

Company Name: (Optional) _____

Industry/Business Sector: Services / Manufacturing / Retail / Construction / IT Consulting / Other (Please specify) _____

Employee Strength: Less than 1000 / 1001-5000 / 5001-10000 / 10001-50000 / 50000+

Whether SAP is used in your company as ERP Business Solution? YES / NO

I. Project Overview

Q#01: What was the primary goal of your Business Transformation using SAP implementation? *(Select all that apply)*

- ☐ Technical/Strategic Requirements
- ☐ Process Optimization/Functional Requirements
- ☐ Business Expansion/Scalability
- ☐ Compliance and Regulatory Requirements
- ☐ Long-term Cost Saving and other financial reasons
- ☐ Other (Please specify)

Q#02: Which SAP Technologies/Solutions are your company using? *(Select all that apply)*

☐ SAP S/4HANA	☐ SAP IBP / SAP APO
☐ SAP ECC / SAP ERP	☐ SAP Ariba
☐ SAP BW/4HANA	☐ SAP Concur
☐ SAP BI / BW on HANA / SAP BW	☐ SAP Solution Manager
☐ SAP SRM	☐ SAP Signavio
☐ SAP CRM	☐ SAP Analytics Cloud
☐ SAP BTP	☐ SAP Customer Experience (CX)
☐ SAP HCM / SuccessFactor	☐ SAP Joule
☐ SAP PO / SAP PI	☐ Other (Please specify)

Q#03: Which of the following best describes your organization?

☐ Spread across different locations within a country

☐ Spread across multiple countries within a region e.g. Europe

☐ Spread across multiple regions e.g. Americas, Asia Pacific, Europe, Middle East/Africa

Q#04: SAP Implementation Details for your Business Transformation:

Implementation Type:	**Deployment Approach:**	**Deployment Option:**
☐ Greenfield / Vanilla	☐ Big bang	☐ Cloud
☐ Brownfield	☐ Phased manner	☐ On Premise
☐ Hybrid		☐ Hybrid
If Deployment is on Cloud or Hybrid, then:		
Cloud Deployment in:	**Cloud Provider:**	
☐ Private Cloud	☐ AWS - Amazon Web Services	
☐ Public Cloud	☐ Azure – Microsoft Azure	
	☐ GCP – Google Cloud Platform	
	☐ Others, please specify _____	
Current Status of SAP Implementation:		
☐ Completed	☐ In Progress	☐ Planned, yet to Start
If the SAP Implementation project status is completed/going to-be completed, then:		
Time taken from planning to go-live:		
☐ Less than 6 months		
☐ 6-12 months		
☐ 12-24 months		
☐ More than 24 months		

II. Project Implementation Process

Q#05: Who was primarily responsible for the SAP implementation?

☐ Internal IT Team

☐ External Consultants

☐ Combination of Internal Team and External Consultants

☐ SAP Implementation Partner

Q#06: Did you find it necessary to re-engineer the business processes?

☐ Prior to the implementation

☐ As part of the implementation

☐ After the implementation

☐ No re-engineering done

Q#07: How would you rate the effectiveness of the project management during the SAP implementation?

- ☐ Very Effective
- ☐ Effective
- ☐ Neutral
- ☐ Ineffective
- ☐ Very Ineffective

Q#08: Does the stakeholder or management involvement adequate in nature and keeps regular track of the activities due to SAP project for their Business Transformation?

- ☐ Yes
- ☐ No
- ☐ Don't know

Q#09: Are you satisfied with information sharing within the organization regarding SAP project for the Business Transformation?

- ☐ To a great extent
- ☐ To some extent
- ☐ To a very little extent
- ☐ Not at all

III. Training and Change Management

Q#10: What type(s) of training during SAP implementation in your organization is provided? *(Select all that apply)*

- ☐ Project team training
- ☐ End user training
- ☐ Traditional class-room training
- ☐ Web-based training

Q#11: How effective was the training provided to users in your organization?

- ☐ Highly Effective
- ☐ Effective
- ☐ Neutral
- ☐ Ineffective
- ☐ Highly Ineffective

Q#12: What percentage of users had difficulty adapting to the new system/process after go-live?

- ☐ Less than 10%

☐ 10-25%
☐ 26-50%
☐ More than 50%

Q#13: Was a formal change management process implemented during the Business Transformation using SAP rollout?

☐ Yes
☐ No
☐ Partially

Q#14: Do you think the working culture has changed completely after SAP implementation for the Business Transformation?

☐ Yes
☐ No

IV. Implementation Benefits

Q#15: What specific business improvements or efficiencies for the organization have been realized post-implementation? *(Select all that apply)*

☐ Increased overall productivity and better customer satisfaction
☐ Improved Process Efficiency
☐ Reduced cycle time and Inventory level
☐ Cost Savings
☐ Better Compliance and Reporting
☐ Enhanced Data Accuracy and Availability
☐ Increased Business Agility
☐ Other (Please specify)

Q#16: How has the SAP system performed in terms of reliability and uptime since the implementation?

☐ Excellent
☐ Good
☐ Average
☐ Poor
☐ Very Poor

Q#17: Does the past problems are resolved in an efficient manner with the help of SAP Solution implementation?

☐ Yes
☐ No
☐ Don’t know

Q#18: Rate your satisfaction with SAP implementation and Business Process Restructuring for the Business Transformation?

- ☐ Highly Satisfactory
- ☐ Satisfactory
- ☐ Average
- ☐ Dissatisfactory
- ☐ Highly Dissatisfactory

V. Implementation Costs and ROI

Q#19: How did the actual costs of the SAP implementation compare to the original budget for your Business Transformation journey?

- ☐ Significantly Under Budget
- ☐ Slightly Under Budget
- ☐ On Budget
- ☐ Slightly Over Budget
- ☐ Significantly Over Budget

Q#20: The SAP implementation project was worth the money you spend on it?

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree
- ☐ Not sure

Q#21: Has your organization realized the expected ROI from the SAP implementation?

- ☐ Yes, within the expected timeframe
- ☐ Yes, but it took longer than expected
- ☐ No, not yet realized
- ☐ Not sure

Q#22: What areas contributed the most to cost overruns, if any? (Select all that apply)

- ☐ Redefining Scope/Project Expansion
- ☐ Customization and Configuration
- ☐ Data Migration and Integration
- ☐ Training and Change Management
- ☐ External Consultants and Partners
- ☐ Other (Please specify)

Q#23: How much the SAP implementation accomplish your organization's Business Transformation strategy?

- ☐ Above 80%
- ☐ 61% - 80%
- ☐ 41% - 60%
- ☐ Below 40%

VI. Implementation Challenges

Q#24: What SAP technical problems, if any, were encountered during the Business Transformation journey?

- ☐ Integration with existing other SAP systems / other non-SAP applications
- ☐ Integration with new business software
- ☐ Data Migration Issues
- ☐ Customization and Configuration Complexities
- ☐ Security

Q#25: What were the non-technical challenges encountered during your Business Transformation? *(Select all that apply)*

- ☐ User Adoption Resistance
- ☐ Lack of Management / Stakeholder support or involvement
- ☐ Selection of implementation Partners / Vendors or Cloud Provider
- ☐ Conflict with Consultants / Partners / Vendors or Internal Conflict
- ☐ SAP Skillset
- ☐ Budget Constraints
- ☐ Change Management
- ☐ Project Delays
- ☐ Other (Please specify)

Q#26: How did your organization address these challenges?

- ☐ Additional Training and Support
- ☐ Hiring External Experts/Consultants
- ☐ Extending Project Timelines
- ☐ Adjusting Project Scope / requirements
- ☐ Other (Please specify)

VII. Implementation Partners / Vendor Collaboration

Q#27: Were there any significant issues or challenges in working with SAP or Partners or other Vendors during the Business Transformation journey?

- ☐ Yes
- ☐ No

Q#28: How would you rate the support received from SAP?

- ☐ Excellent
- ☐ Good
- ☐ Average
- ☐ Poor
- ☐ Very Poor

Q#29: How would you rate the collaboration with SAP and/or implementation partners during your Business Transformation journey?

- ☐ Excellent
- ☐ Good
- ☐ Average
- ☐ Poor
- ☐ Very Poor

VIII. Future Plan

Q#30: What are the future strategic goals for your SAP system? (Select all that apply)

- ☐ Moving to SAP new release/Upgradation
- ☐ Cloud Integration/Adoption
- ☐ Enhancing Current System Capabilities
- ☐ Expanding to New Modules/Regions

Q#31: In which timeframe, does your organization plan to expand the use of SAP to additional modules or regions to continue the transformation journey?

- ☐ Yes, within the next year
- ☐ Yes, within the next 2-3 years
- ☐ No immediate plans
- ☐ Other (Please specify)

Q#32: How prepared do you feel your organization is for any future SAP upgrades or changes to continue the Business Transformation journey?

- ☐ Very Prepared
- ☐ Prepared
- ☐ Neutral
- ☐ Unprepared

REFERENCES

Acemoglu, D., & Restrepo, P. (2018). *Artificial Intelligence, Automation and Work.* NBER Working Paper, 24196

Amazon Web Services, Inc. (2021). AWS Cloud Adoption Framework. [WWW Document]. URL *https://docs.aws.amazon.com/whitepapers/latest/overview-aws-cloud-adoption-framework/your-cloud-transformation-journey.html* (accessed 02-08-2024).

Amazon Web Services, Inc. (2021). Transforming agriculture at John Deere with SAP on AWS. [WWW Document]. URL *https://d1.awsstatic.com/events/reinvent/2021/Transforming_agriculture_at_John_Deere_with_SAP_on_AWS_ENT215.pdf* (accessed 29-11-2024).

Asian Paints (2023). Asian Paints: Annual Report 2023 - Intellectual Capital. [WWW Document]. URL *https://www.asianpaints.com/content/dam/annual-report-2023/pdf/Asian%20Paints%2022-23_Intellectual%20Capital.pdf* (accessed 25-11-2024).

BAIN & COMPANY (2020). Doing Agile Right: Inside John Deere's IT Transformation. [WWW Document]. URL *https://www.bain.com/insights/doing-agile-right-inside-john-deeres-it-transformation-video/* (accessed 29-11-2024).

Boneva, M., (2018). Challenges related to the digital transformation of business companies. In *Innovation Management, Entrepreneurship and Sustainability (IMES 2018)* (pp. 101-114). Vysoká škola ekonomická v Praze.

BUSINESS WIRE (2024). Deere & Company Digital Transformation Strategy Analysis Report 2023: Accelerators, Incubators, ICT Budget and Contracts, and Innovation Programs - ResearchAndMarkets.com. [WWW Document]. URL *https://www.businesswire.com/news/home/20240202084917/en/Deere-Company-Digital-Transformation-Strategy-Analysis-Report-2023-Accelerators-Incubators-ICT-Budget-and-Contracts-and-Innovation-Programs---ResearchAndMarkets.com ITDT-JohnDeereCase2021.pdf* (accessed 27-11-2024).

Cameron, E., & Green, M. (2015). Making Sense of Change Management: A Complete Guide to the Models, Tools and Techniques of Organizational Change (4th ed.). London: Kogan Page Publishers.

CIO (2017). Revealed: How Asian Paints leveraged digital innovations to become customer centric. [WWW Document]. URL *https://cio.economictimes.indiatimes.com/news/strategy-and-management/revealed-how-asian-paints-leveraged-digital-innovations-to-become-customer-centric/60053105* (accessed 25-11-2024).

CIO (2022). Nestlé's Enterprise Resource Planning (ERP) Odyssey. [WWW Document]. URL *https://www.cio.com/article/270680/enterprise-resource-planning-nestl-s-enterprise-resource-planning-erp-odyssey.html* (accessed 12-10-2024).

Derek S. Dieringer. (2024). ERP Implementation at Nestle. [WWW Document]. URL *https://www.uwosh.edu/faculty_staff/wresch/ERPNestle.htm* (accessed 22-08-2024).

Dr. Lily Popova Zhuhadar. (2023). A Comparative View of AI, Machine Learning, Deep Learning, and Generative AI. [WWW Document]. URL

https://commons.wikimedia.org/wiki/File:Unraveling_AI_Complexity_-_A_Comparative_View_of_AI,_Machine_Learning,_Deep_Learning,_and_Generative_AI.jpg (accessed 20-08-2024).

Esteves, J. and Pastor-Collado, J. (2001). Analysis of critical success factors relevance along SAP implementation phases. AMCIS 2001 Proceedings, p.197.

Flexera (2020). *Flexera RightScale 2020 state of the cloud report*, Flexera.

Forbes (2021). Nestlé's IT HR Transformation: Realizing Values On A Global Scale. [WWW Document]. URL *https://www.forbes.com/sites/sap/2021/11/19/nestls-hr-transformation-realizing-values-on-a-global-scale/* (accessed 14-10-2024).

Forbes (2022). John Deere And Prose: Digital Transformation Is 80% Strategy And 20% Technology. [WWW Document]. URL *https://www.forbes.com/sites/kevinomarah/2022/12/08/john-deere-and-prose-digital-transformation-is-80-strategy-and-20-technology/* (accessed 20-11-2024)

Gaur, M. (2020). ERP migration challenges and solution approach focused on SAP customers. *International Journal of Advanced Research in Computer Science & Technology*, *8*(3), pp.15-21.

Gaur, M. and Mathar, D. (2020). Business transformation challenges & solution approach in SAP ECC & SAP S4HANA system landscape optimization for divestiture driven carve out. *International Journal of Computer Engineering and Technology, 11(3).*

Gartner (2024). Build a Resilient Cybersecurity Roadmap for Your Enterprise. [WWW Document]. URL *https://www.gartner.com/en/cybersecurity/topics/cybersecurity-roadmap* (accessed 25-08-2024).

Gillooly, C. (1998). "Disillusionment", Information Week, 16 February, pp. 46-56.

Google (2018). Google Cloud Adoption Framework. [WWW Document]. URL *https://cloud.google.com/adoption-framework/* (accessed 02-08-2024).

HashiCorp (2020). Unlocking the Cloud Operating Model with Azure. [WWW Document]. URL *https://www.youtube.com/watch?v=CKf9CJa-5wk* (accessed 30-07-2024).

Ibrahim, Almahdi & Sharp, John & Syntetos, Aris. (2008). A framework for the implementation of ERP to improve business performance: A case study. Al Bustan Rotana Hotel Dubai Almahdi .M. S. Ibrahim. 1.

Kalaimani, J. (2016). Key SAP Implementation Challenges. In: SAP Project Management Pitfalls. Apress, Berkeley, CA. *https://doi.org/10.1007/978-1-4842-1389-6_4*

Kotter, J.P. (2012). *Leading Change*. Boston, MA: Harvard Business Review Press.

Kuznets, S. (1971). *Economic development, the family, and income distribution: Selected essays*. NBER.

Lozic, J., (2019). Core concept of business transformation: from business digitization to business digital transformation. *Economic and Social Development: Book of Proceedings*, pp.159-167.

Microsoft (2023). Microsoft Events - #MSIgnite: How Microsoft IT uses Azure to run a modern SAP environment | BRK248. [WWW Document]. URL *https://www.youtube.com/watch?v=nixkfXt1nEs* (accessed 19-10-2024).

Microsoft (2024). Microsoft Inside Track - Hello Azure: Unpacking how Microsoft moved its SAP workload to the cloud. [WWW Document]. URL *https://www.microsoft.com/insidetrack/blog/hello-azure-unpacking-microsoft-moved-sap-workload-cloud/#:~:text=Microsoft%20is%20heavily%20invested%20in,move%20on%20to%20something%20else.%E2%80%9D* (accessed 18-10-2024).

Microsoft Azure (2023). Shared Responsibility Model when Microsoft Azure is the Cloud Service Provider. [WWW Document]. URL *https://learn.microsoft.com/en-us/azure/security/fundamentals/shared-responsibility* (accessed 20-08-2024).

Microsoft Azure (2023). What is the Microsoft Cloud Adoption Framework for Azure? [WWW Document]. URL *https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/overview* (accessed 30-07-2024).

Müller, A.-L., & Pfleger, R. (2014). *Business transformation towards sustainability. Business Research, 7, 313–350.*

Nadkarni, S., & Prügl, R. (2021). *Digital transformation: A review, synthesis, and opportunities for future research. Management Review Quarterly*, 71, 233–341.

NASSCOM (2017). Amplify Digital - Asian Paints' Digital Transformation journey (Part 2: Operational Excellence). [WWW Document]. URL *https://community.nasscom.in/communities/digital-transformation/amplify-digital-asian-paints-digital-transformation-journey-part-2-operational-excellence.html* (accessed 26-11-2024).

Nah, F.F.H. and Siau, K. (2020). July. Covid-19 pandemic–role of technology in transforming business to the new normal. In *International Conference on Human-Computer Interaction* (pp. 585-600). Springer, Cham.

Nikhil Khandelwal (2019). How Human-Machine Collaboration Drives The Future of Work? [WWW Document]. URL *https://www.vlinkinfo.com/blog/the-future-of-work-preparing-for-human-machine-interactions/* (accessed 16-07-2024).

Nwaiwu, F. (2018). Review and comparison of conceptual frameworks on digital business transformation. *Journal of Competitiveness*.

o9 Solutions, Inc. (2023). The key learnings from Asian Paints' digital transformation journey. [WWW Document]. URL *https://o9solutions.com/videos/the-key-learnings-from-asian-paints-digital-transformation-journey/* (accessed 26-11-2024).

Patel, M. (2019). Digital Transformation vs. Digital Optimization. Medium. *https://medium.com/@maxy_ermayank/digital-transformation-vs-digital-optimization-5c86cff1567b*

Polanyi, K., Arensberg, C. M., & Pearson, H. W. (1957). *Trade and market in the early empires: Economies in history and theory.* Free Press.

Ramchand, K., Chhetri, M.B. and Kowalczyk, R. (2021). Enterprise adoption of cloud computing with application portfolio profiling and application portfolio assessment. *Journal of Cloud Computing*, *10*(1), pp.1-18.

Rigby, D.K. and Tager, S. (2014). Leading a digical transformation. Bain Co.: New York, NY, USA.

SAP (2021). Asian Paints: Transforming from Paint Chemicals to Decor Using Cutting-Edge Enterprise IT. [WWW Document]. URL *https://25122029.fs1.hubspotusercontent-eu1.net/hubfs/25122029/SAP%20Campaign%20Assets/SAP%20VRM%20Landing%20Page%20Marketing%20Assets/Asian%20Paints_%20Transforming%20from%20Paint%20Chemicals%20to%20Decor%20Using%20Cutting-Edge%20Enterprise%20IT.pdf* (accessed 25-11-2024).

SAP (2022). Microsoft Selects RISE with SAP to Drive Business Innovation. [WWW Document]. URL *https://news.sap.com/2022/03/microsoft-selects-rise-with-sap-business-innovation/* (accessed 17-10-2024).

SAP (2023). Accelerating Value: SAP and Bain Partner to Help Leaders Drive Cloud-Enabled ERP Transformation. [WWW Document]. URL *https://news.sap.com/2023/06/sap-bain-partner-cloud-erp-transformation/* (accessed 25-09-2024).

SAP (2023). Hitachi High-Tech: Mastering side-by-side development techniques to innovate in a more agile and future-ready way. [WWW Document]. URL *https://www.sap.com/asset/dynamic/2023/07/d237f8b9-7e7e-0010-bca6-c68f7e60039b.html* (accessed 13-09-2024).

SAP (2023). KAESER KOMPRESSOREN: Enhancing Staff and Partner Experiences Through Digitalization. [WWW Document]. URL *https://www.sap.com/documents/2023/11/2a0bdde3-997e-0010-bca6-c68f7e60039b.html* (accessed 29-11-2024).

SAP (2023). Nestlé S.A.: Achieving a global cloud transformation. [WWW Document]. URL *https://www.sap.com/india/about/customer-stories/nestle.html* (accessed 10-10-2024).

SAP (2023). SAP Community: Technology Blogs by Members: KAESER KOMPRESSOREN. [WWW Document]. URL *https://community.sap.com/t5/technology-blogs-by-members/kaeser-kompressoren/ba-p/13079650* (accessed 29-11-2024).

SAP (2023). SAP Innovation Awards 2023 Mahindra and Mahindra Ltd. [WWW Document]. URL *https://www.sap.com/documents/2023/04/8eeff29a-a27e-0010-bca6-c68f7e60039b.html* (accessed 26-09-2024).

SAP (2023). RISE with SAP S/4HANA Cloud, public edition - Supplemental Terms and Conditions. [WWW Document]. URL *https://assets.cdn.sap.com/agreements/product-use-and-support-terms/cls/en/rise-with-sap-s4hana-cloud-supplement-english-v11-2023.pdf* (accessed 05-08-2024).

SAP (2023). RISE with SAP S/4HANA Cloud, private edition - Supplemental Terms and Conditions. [WWW Document]. URL *https://assets.cdn.sap.com/agreements/product-use-and-support-terms/cls/en/rise-with-sap-s4hana-cloud-private-edition-supplement-english-v10-2023.pdf* (accessed 05-08-2024).

SAP (2024). All SAP Partners. [WWW Document]. URL *https://sapinsider.org/vendor-showcase/* (accessed 04-02-2024).

SAP (2024). Bain & Company Now Runs SAP S/4HANA Cloud Public Edition in 40 Countries. [WWW Document]. URL *https://news.sap.com/2024/06/bain-company-runs-sap-s4hana-cloud-public-edition-40-countries/* (accessed 26-09-2024).

SAP (2024). How Hitachi High-Tech's Greenfield Transformation Simplified Life for Its Users. [WWW Document]. URL *https://news.sap.com/2024/10/hitachi-high-tech-transformation-simplified-life-for-users/* (accessed 13-09-2024).

SAP (2024). How Kaeser Uses AI to Add Customer Value. [WWW Document]. URL *https://news.sap.com/2024/11/how-kaeser-uses-ai-add-customer-value/* (accessed 29-11-2024).

SAP (2024). Investor Relations - Acquisitions. [WWW Document]. URL *https://www.sap.com/investors/en/why-invest/acquisitions.html* (accessed 06-02-2024).

SAP (2024). Mahindra: Creating a future-ready IT infrastructure in the cloud. [WWW Document]. URL *https://www.sap.com/asset/dynamic/2024/01/0c5d0561-a27e-0010-bca6-c68f7e60039b.html* (accessed 06-10-2024).

SAP (2024). SAP S/4HANA Cloud – Shared Responsibility Model. [WWW Document]. URL *https://assets.dm.ux.sap.com/webinars/sap-user-groups-k4u/pdfs/240215_shared_responsibility_in_sap_s4hana_cloud.pdf* (accessed 18-08-2024).

Senapathi, M., Buchan, J., & Osman, H. (2019). *DevOps Capabilities, Practices, and Challenges: Insights from a Case Study*.

Silverman, D. (2016). *Qualitative Research* (4th Edition), SAGE Publications Ltd.

Somers, Toni & Nelson, K.. (2001). The Impact of Critical Success Factors across the Stages of Enterprise Resource Planning Implementations. Hawaii International Conference on System Sciences. 8. 8016. 10.1109/HICSS.2001.927129.

Stibe, A., (2019). Accelerating Business Transformation. *https://www.researchgate.net/publication/335518067.* ESLSCA Business School Paris.

Triba (2024). John Deere: From a manufacturing company to a digital company. [WWW Document]. URL *https://www.gotriba.com/en/john-deere-from-a-manufacturing-company-to-a-digital-company/* (accessed 23-11-2024).

WalkMe (2023). Nestlé delivers digital adoption and transformation at scale for 270K+ team members across 200 apps. [WWW Document]. URL *https://www.walkme.com/customer-stories/nestle/* (accessed 12-10-2024).

Wall, S. & McKinney, R. (1998). Wall-to-wall change. Across the Board, 35(5), 32-38.

Westerman, G., Calméjane, C., Bonnet, D., Ferraris, P. and McAfee, A., (2011). Digital Transformation: A roadmap for billion-dollar organizations. MIT Center for digital business and Capgemini consulting, 1, pp.1-68.

Worley, G.C. and Lawler, E.E. (2010). Agility and Organization Design: A Diagnostic Framework. Organizational Dynamics, 39, 194-204.

VIOREL-COSTIN, B.A.N.Ț.A., (2019). THE DIFFICULTIES OF TRANSFORMATION SAP ERP SYSTEM FROM ACTUAL LANDSCAPE TO S/4HANA DIGITALIZATION ENVIRONMENT. A CASE STUDY. *Annals of'Constantin Brancusi'University of Targu-Jiu. Economy Series/Analele Universităţii'Constantin Brâncuşi'din Târgu-Jiu Seria Economie, (2).*