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SAPinsider Benchmark Report

Enterprise Cloud Deployment: State of the Market

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Research Partner

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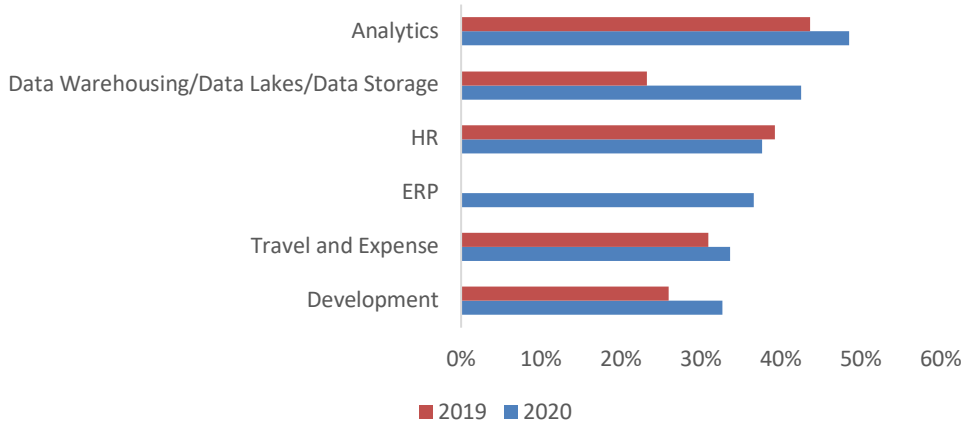
Executive Summary

Digital transformation and the deployment of applications in the cloud has been a key topic of discussion within the enterprise software market for several years but that conversation has been accelerated by the global events of 2020. Organizations whose workforces had been entirely on-site have had to quickly convert to a remote work environment. Many of those companies have scrambled to address critical infrastructure changes and implement cloud-based applications to provide faster and more reliable access for remote users.

To determine whether changes in the business environment this year have impacted cloud adoption, SAPinsider surveyed 116 members of our community in Q3 and Q4 of 2020. The purpose of the survey was to determine what is critical to their cloud deployment, which cloud providers and deployment models they are using, and what workloads they are running in the cloud. For the second year in a row, analytics was the top workload that respondents were running in the cloud (49%), followed by data warehousing and storage (43%) and Human Resources (38%) (see **Figure 1**).

Figure 1: What workloads are you currently running the cloud?



Source: SAPinsider, October 2020

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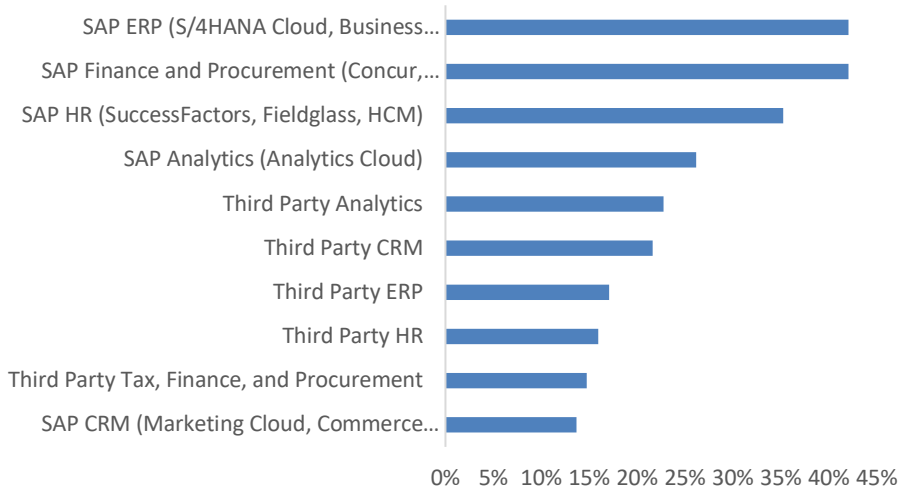
> Working in the cloud provides us with agility in the form of being able to provision very quickly and develop solutions faster while being secure. Newer technologies such as serverless and containers are an example of this. Scalability is also something that comes in easily with cloud solutions.
>
> **~ Sr Director Data Ops, Medical Device Manufacturer**

Overall, the top six workloads showed an increase in usage in 2020 over our 2019 research. Cloud based-ERP workloads was a new entry to the list and was chosen by more than one third of respondents (37%). Correlating this response with another question from the survey, the most popular SaaS application that respondents reported they are running is SAP ERP solutions (see **Figure 2)**.

Figure 2: Which SaaS applications are you running?



Source: SAPinsider, October 2020

While SAPinsider research on Deployment Approaches for SAP S/4HANA indicates that fewer than 10% of respondents are planning on running SAP S/4HANA in a SaaS environment, applications such as SAP Business ByDesign and SAP BusinessOne are popular ERP solutions for small and medium size enterprises. Unsurprisingly, SAP Finance, Procurement, and HR solutions make up the remainder of the top three SaaS applications in use by respondents, especially given the popularity of applications like SAP SuccessFactors, SAP Concur, and SAP Ariba in the customer base.

When asked to identify the cloud vendors they were using, survey responses differed from past surveys. In 2019, 70% of respondents indicated that they were primarily using SAP as a

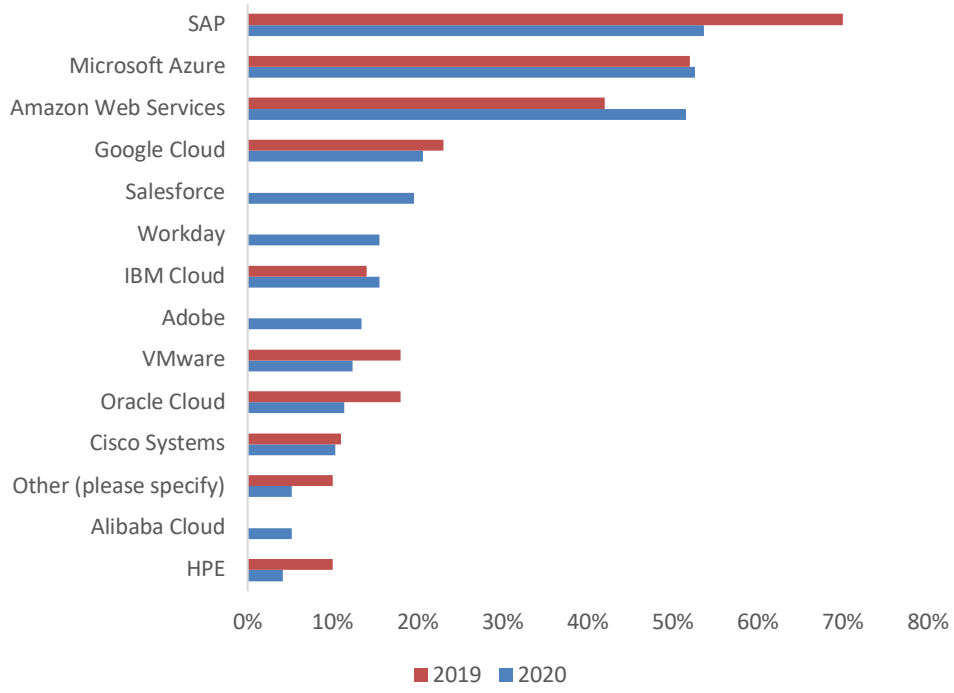
SAP EXPERTS PERSPECTIVE

"Cloud deployments have accelerated drastically this year, with many more people implementing cloud rather than on-premise applications. Customers need new solutions deployed rapidly, and cloud solutions offer both standardization as well as rapid innovation."

~ Tomas Fertig, CEO, Seidor US

cloud provider. In this year's survey, slightly more than one half of the survey respondents indicate that they are using SAP as part of their cloud infrastructure, as seen in **Figure 3**.

Figure 3: Which vendors are you using as part of your cloud infrastructure?



Source: SAPinsider, October 2020

Both Microsoft Azure and Amazon Web Services have seen an increase in usage among survey respondents when compared with our 2019 research. Salesforce (20%) and Workday (15%) – two choices not included in the 2019 survey – both showed significant usage.

This year's survey revealed several other trends regarding respondents' plans for their enterprise cloud deployments, including:

- 99% of respondents now indicate that they are running at least some solutions in the cloud, an increase of 7% from 2019.

- Respondents indicated that the most important criteria when selecting a cloud vendor are price (66%) and security (61%).
- The number one goal respondents hope to achieve by deploying cloud-based applications is that of increased flexibility and scalability (66%).
- Respondents said that they are most influenced in their choice of cloud vendor by their own research (49%), their organization's internal infrastructure policy (47%), and by SAP (46%).

Required Actions

Based on the responses we received in the survey, organizations should make the following plans around their enterprise cloud deployments:

- **Determine the KPIs and business objectives that cloud-based applications should positively impact.** When considering cloud-based deployments, survey respondents said that they were hoping to deliver new capabilities (48%), limit operational costs (47%), and integrate existing applications into the cloud (46%). But before performing any implementations, these objectives should be delineated and KPIs created to measure their success.
- **Define strong policies around cloud cost and data security.** While cloud systems can offer the possibility of reducing infrastructure costs and providing additional flexibility, it is possible for those costs to increase rapidly without effective guidelines in place. Identifying and creating policies around cost and security early in the process will help avoid future concerns.
- **Investigate cloud-based solutions that will improve the flexibility and scalability of existing solutions and systems.** Two thirds of respondents

implementing solutions in the cloud are looking to achieve additional flexibility and security for their organization. Whether this is through having additional computing capacity when required, or the ability to make new systems available quickly, SAPinsiders should ensure that when they are evaluating cloud-based deployments that they take make these requirements a priority.

- **Create benchmarks to determine whether system performance is consistent when implementing cloud-based solutions.** 87% of respondents indicated that it was important or very important that workloads perform consistently regardless of platform. When implementing cloud-based solutions, SAPinsiders should have benchmarks in place to compare this performance and ensure that there is consistency with existing solutions.

Chapter One: Enteprise Cloud Deployment Overview

Over the last few years, SAP has focused on the transition to becoming an enterprise cloud company, something that was emphasized even further with the strategy update released in conjunction with its Q3 2020 results. Some of this focus has resulted in an increased emphasis on deploying cloud versions of applications such as those associated with SAP S/4HANA Cloud, but there has also been a change to make some applications only available in the cloud, such as with SAP Analytics Cloud. But beyond SAP's plans, many organizations have been using cloud-based solutions far longer than they have been offered by SAP and have been doing this because they want access to functionality not available in older on-premise technologies, or want to reduce IT costs or increase deployment flexibility. But whether or not organizations are accelerating cloud-based deployments, the cloud is increasingly important for businesses globally because that is where enterprise software innovation is happening and it cannot be ignored as organizations plan for the future.

Best Practices Model – DART

SAPinsider grounds all its research insights in our proprietary DART model. This research model provides practical insights that connect business **D**rivers and **A**ctions to supporting **R**equirements and **T**echnologies. Drivers represent internal and external pressures that shape organizational direction. Organizations take Actions to address those Drivers. They need certain people, processes, and capabilities as Requirements for those strategies to succeed. Finally, they need enabling Technologies to fulfill their Requirements.

In this report, business focus on digital transformation and the pressure to modernize infrastructure to lower IT costs and simplify IT emerged as the key business drivers. To satisfy these drivers, respondents indicated that they are taking actions to redesign IT platforms and architectures to lower costs and increase flexibility, are prioritizing business and IT

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> "The ability to add and remove resources at will for new projects or PoCs has definitely allowed us to be flexible and more scalable in meeting business demands. With a new server build or refresh of QA data being done very quickly it has also accelerated some of our testing efforts."
>
> **~ Senior Director, SAP COE Software Developer**

workloads in the cloud, are investigating cloud-based solutions that will provide functionality on-premise systems lack, and are creating an ROI, cost, and risk model for the cloud.

In order to make their cloud deployments successful, respondents know that they need data storage and protection requirements, the ability to scale flexibly and quickly, a strategy for integrating cloud-based applications, a plan for cloud-based data encryption and protection, and strong SLAs with cloud partners. Respondents use or plan to use a wide range of SAP and partner tools and technologies to support these requirements for their cloud deployments.

Respondents' answers to our survey and interview questions revealed clear trends, which are summarized in **Table 1** and will be examined throughout this report.

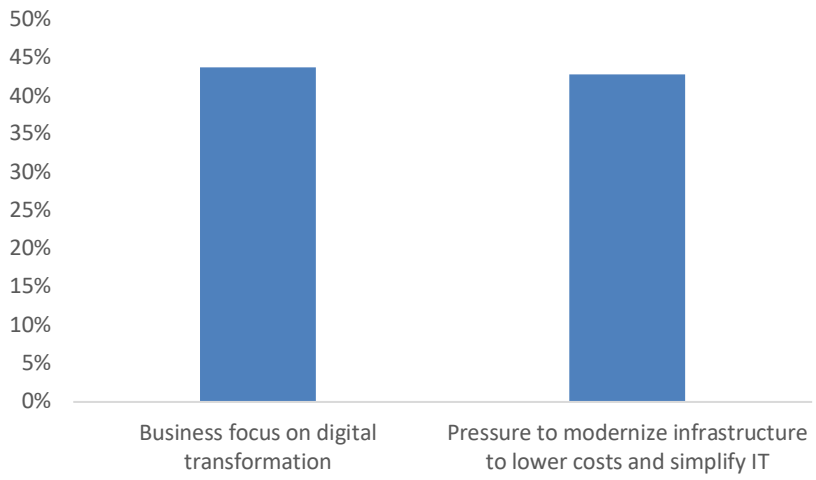
Table 1: DART model framework for enterprise cloud deployment

Drivers	Actions	Requirements	Technologies
• Business focus on digital transformation (44%) • Pressure to modernize infrastructure to lower costs and simplify IT (43%)	• Redesign IT platform and architectures to lower costs and increase flexibility (68%) • Prioritize business and IT workloads in the cloud (44%) • Investigate cloud-based solutions that will provide functionality on-premise systems lack (38%) • Create an ROI, cost, and risk model for the cloud (35%)	• Data storage and protection requirements (78%) • Ability to scale flexibly and quickly (75%) • Strategy for integrating cloud-based applications (75%) • Plan for cloud-based data encryption and protection (72%) • Strong SLAs with cloud partners (71%)	• Cloud development tools (89%) • Cloud database and data services (88%) • Cloud backup and recovery (88%) • Encrypted/secure connectivity (88%) • Virtualization technology (87%) • Data encryption tools (86%) • Dedicated connections to cloud providers (86%) • Middleware (81%) • Cloud AI and machine learning (80%) • Learning services (79%) • Data lakes (76%)

What Drives Cloud Deployment?

A significant number of respondents (44%) said that the business focus on digital transformation was their main driver for enterprise cloud deployment, aligning with other research that SAPinsider has done over the last year. A slightly smaller number (43%) said that the pressure to modernize infrastructure to lower IT costs was almost as important (see **Figure 4**).

Figure 4: Top drivers for enterprise cloud deployment



Source: SAPinsider, October 2020

2020 has seen an increase in cloud adoption while investment has declined in on-premise systems, a trend that is tied to the increase in remote working arrangements. While digital transformation is simply the adoption of digital technologies to transform services or businesses by replacing older or manual processes, it has become increasingly synonymous with adoption of cloud technologies in recent years as they represent a new, digital way of doing business. But digital transformation is the main driver for cloud deployment, just as it is driving SAP S/4HANA transformation as seen in SAPinsider's SAP S/4HANA Finance and Business Case for SAP S/4HANA research earlier this year.

SAPEXPERTS PERSPECTIVE

"Moving to the cloud allows organizations to reduce infrastructure and administration costs as well as access innovations without the constant need for complex and expensive upgrades and updates. It also eliminates the higher up-front costs of an on-premise implementation."

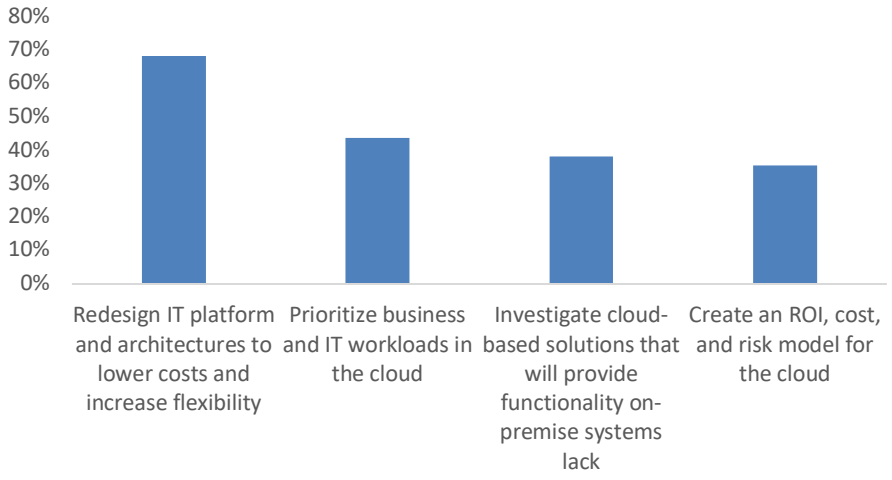
~ Tomas Fertig, CEO, Seidor US

Beyond the focus on updating and replacing older processes is the pressure to modernize infrastructure to lower costs and simply IT at the same time. While deploying cloud-based solutions provides the transformation of older software and processes, organizations also need to reduce legacy debt and reduce the costs associated with running these newer systems. An important part of this is also the simplification of their IT landscape and cloud-based solutions help play a role in this modernization.

How Do Customers Meet Their Business Drivers?

Over two thirds of the survey respondents (68%) said that they were redesigning IT platforms and architectures to lower costs and increase flexibility (as seen in **Figure 5**). This directly supports the driver of modernizing infrastructure to lower costs, as well as supporting an organizational shift and digital transformation plans.

Figure 5: Top strategies prioritized to address the top drivers of change



Source: SAPinsider, October 2020

Slightly less than half (44%) of respondents stated that they are taking the step of prioritizing business and IT workloads in the cloud. Prioritizing workloads in the cloud supports the

organization's goals for digital transformation and can also simplify IT infrastructure. It is also directly connected to the move away from new on-premise deployments that has occurred this year.

Survey respondents (38%) are also investigating cloud-based solutions that will provide functionality that on-premise systems lack. As organizations move forward with digital transformation plans, they are looking to reduce legacy debt in systems like security and compliance and to replace those with newer cloud-based solutions that include additional analytics or data storage capabilities that may not be available in existing on-premise systems.

The final top strategy — selected by just over one third of respondents (35%) — is the creation of an ROI, cost, and risk model for the cloud. If organizations are to modernize infrastructure and lower costs, they must understand exactly how a shift to the cloud will impact overall cost, ROI, and data exposure they may not have had in existing on-premise systems. And while cloud-based systems nearly always offer a much lower initial investment cost, particularly around licenses and infrastructure investment, organizations are well advised to understand how ongoing cloud subscription fees may be higher than traditional maintenance and support costs in the long term.

Key Takeaways

Based on our research with respect to enterprise cloud deployment, the following takeaways are clear:

- **Focus on cloud initiatives that will support digital transformation objectives.** New cloud initiatives should be designed to support the overall digital transformation goals of the organization. This will not only allow for greater sponsorship and support of those cloud objectives, but will also support a greater desire across the organization to see these cloud initiatives completed successfully.

- **Evaluate cloud deployment costs beyond the initial investment.** The goal of many organizations when moving workloads to the cloud is to modernize infrastructure while lowering costs. However, while cloud applications may be cheaper than the high cost of purchasing an on-premise system, their ongoing usage fees can eventually trend towards those of an on-premise system if not monitored and planned for ahead of time.
- **Compare functionality between on-premise and cloud-based systems.** With SAP's development efforts being focused on cloud-based tools and solutions, it may seem as though cloud solutions have functionality that on-premise systems lack. While that may eventually be true due to regular releases and updates, organizations should compare features and functionality to determine whether the critical features they need are available in cloud-based solutions.
- **Accelerate cloud deployment by creating a coordinated architecture.** To ensure that planned cloud deployments proceed smoothly and that new systems fit in well with existing technologies, ensure that a coordinated architecture plan is created when deployment of cloud applications is conceived.

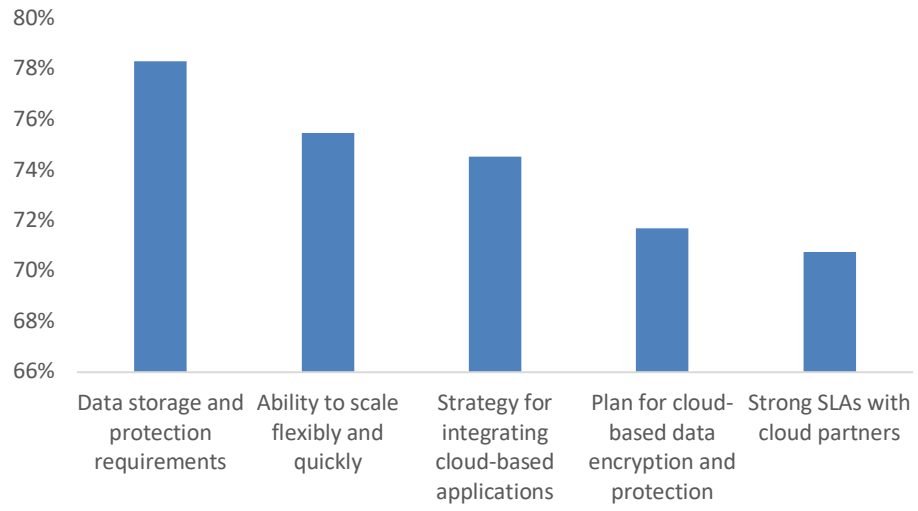
Chapter Two: How Do SAP Customers Approach Cloud Deployments?

Once organizations have decided to implement cloud-based solutions, there are many steps they need to take in order to make it a reality. Some of this is related to determining how these new systems will be connected to the existing infrastructure, since they likely will not be completely stand alone. Other considerations involve how data in cloud will be stored and protected. Organizations also need to determine the service level agreements they have with their chosen cloud vendors.

Top Cloud Deployment Requirements

Respondents to the survey selected data storage and protection requirements as their top requirement for integration, with 78% indicating that this was important or very important to their success (see **Figure 6**).

Figure 6: Top cloud deployment requirements



Source: SAPinsider, October 2020

Data storage and protection requirements are part of the risk model that must be created when moving to the cloud and is

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"For us, it was all about getting out of legacy infrastructure and applications and replacing them with either infrastructure in the cloud or with a pay as you go on-premise infrastructure with application portability between cloud and on-premise so that we can have the option of best infrastructure as well as lower costs of maintenance."

~ Sr Director Data Ops, Medical Device Manufacturer

a key issue that organizations must address as part of any digital transformation plans. One third of survey respondents (33%) were concerned with how large SAP systems and volumes of data will be handled, whether all data willl be moved, and if historical data will be kept in a different location. These are questions that must be determined when moving workloads to the cloud.

The second most important requirement selected by respondents was the ability to scale flexibly and quickly (76%), something easily achieved with cloud systems since memory and processing power can be added and removed as needed. This aligns closely with efforts to simplify IT and redesign architectures to increase flexibility and is the main goal that respondents (66%) said that they hoped to achieve in deploying cloud-based applications.

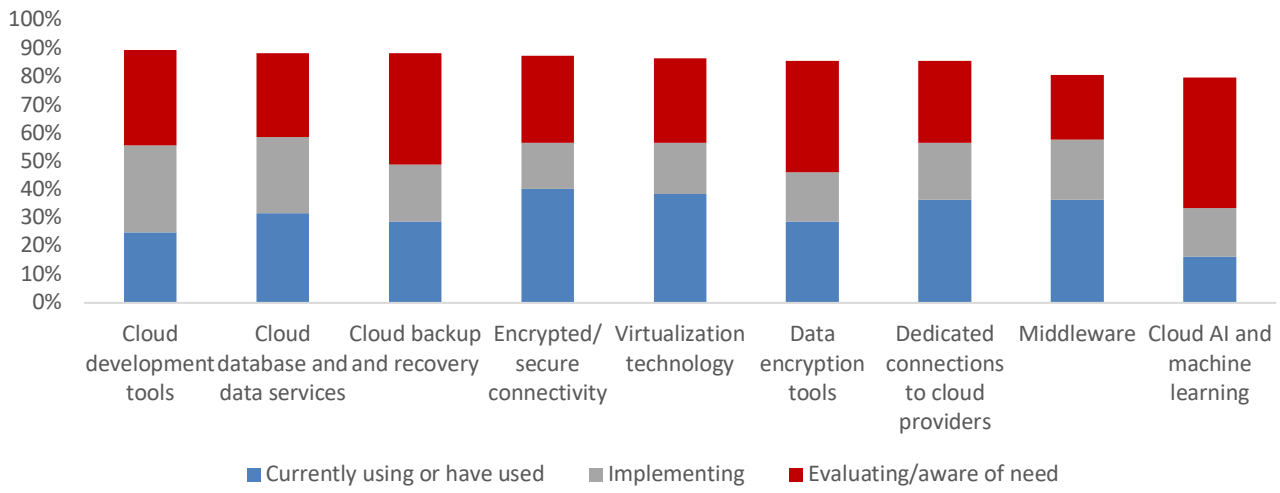
Survey respondents also see a need for a strategy for integrating cloud-based applications (75%). This strategy is critical when organizations are prioritizing cloud-based workloads, redesigning IT architectures, and modernizing infrastructures as part of a digital transformation. This aligns closely with data from the Integration Tools and Strategies for SAP S/4HANA report which showed that 69% of respondents were using integration tools for cloud-based or cloud-resident data.

Other top requirements included having a plan for cloud-based data encryption and protection (72%) and strong SLAs with cloud partners (71%). Organizations have seen the problems that have occurred with data breaches in the marketplace, (such as those reported by Marriott) and want to ensure that their data is properly protected and encrypted to prevent that from happening to them. Almost as critical is the need to ensure that systems are constantly available with little or no downtime, which requires strong service-level agreements with all cloud partners, whether they are smaller managed service providers or larger public cloud providers.

Which Tools Do Respondents Use in Their Cloud Deployments?

The survey indicated that encrypted/secure connectivity (40%), virtualization technology (38%), dedicated connections to cloud providers (37%), and middleware (37%) are the most commonly used technologies today. A majority (88%) of respondents want to ensure that the connectivity with their cloud-based data and solutions is encrypted and secure, underscoring the requirement for cloud-based data encryption and protection (see **Figure 7**). A nearly equal number (87%) of organizations see the advantage that the cloud offers from a virtualization standpoint (scale, flexibility, cost) and are adding to those respondents who are moving on-premise workloads into scalable virtualized hardware.

Figure 7: Popular technologies included in cloud deployments



Source: SAPinsider, October 2020

In order to ensure that workloads perform consistently regardless of platform, over one third of respondents are already using dedicated connections to cloud providers, with nearly half (49%) either implementing or aware of the need for this connectivity. These connections are especially critical for real-time data synchronization with their on-premise systems

that will not immediately be taken offline as new deployments happen in the cloud. And while middleware is seeing lower investment than other cloud technologies, having this connectivity piece can help bridge the gap between on-premise systems and newer cloud-based applications for many customers.

Most investment will go into cloud development tools (64%) and cloud AI and machine learning (ML) (63%). While many organizations are starting their cloud journeys with out-of-the-box solutions, 31% are implementing and 34% are aware of the need for cloud development tools that will allow them to create and extend new cloud applications that will provide additional flexibility and functionality to the enterprise applications they are deploying. And although only 16% currently use them today, 17% are implementing cloud AI and 46% are aware of the need in this space if they are to gain benefits like data management and control, better decision making due to accelerated data analysis, and potential cost savings through the elimination of on-premise infrastructure. Cloud systems are also ideally suited for training AI and ML algorithms, since these require a large amount of data and processing power that is more readily stored, accessed, and scaled in cloud environments.

Cloud database and backup services, along with cloud backup and recovery, are key requirements that must be addressed by organizations storing data in the cloud. Some of these services may be already available to those deploying in the cloud, depending on which options they are choosing in their cloud deployments. However, those who are using IaaS or PaaS implementations — as is the case with many deploying SAP S/4HANA — need to ensure that these are in place as they may not be part of their SLA.

Key Takeaways

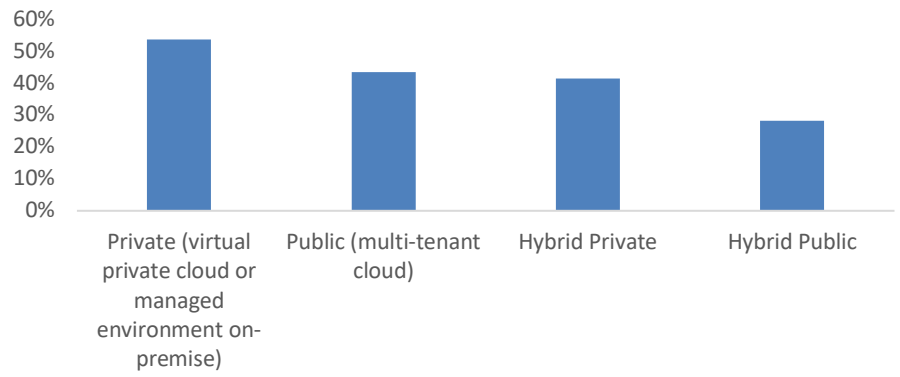
When it comes to equipping organizations with the capabilities and technologies required for an effective cloud deployment:

- **Determine early how data will be stored and protected in the cloud.** As soon as organizations begin to plan enterprise cloud deployments, they should make plans for how the data associated with those deployments will be stored and protected. Creating this risk model early is critical.
- **Create plans for how data will be moved to and integrated with cloud-based applications.** On average, respondents in our Integration Tools and Strategies for SAP S/4HANA research used only one tool for integrating cloud-based and cloud-resident data, but 19% used three or more. In order to avoid unnecessary complexity and to ensure that data from on-premise systems is moved into the required cloud applications and vice versa, architect the integration process before the data is moved.
- **Coordinate connectivity between on-premise and cloud-based systems.** In parallel with how data will be integrated, there should also be plans for streamlining the movement of data between the cloud and on-premise systems. An example of this might involve a dedicated or encrypted connection to a cloud provider. This is especially important if any sort of real-time transfer of data is required, such as a transfer to analytics tools or systems from which critical business decisions are made.
- **Implement plans for business continuity.** Whether it is high availability or disaster recovery plans supported by public cloud providers or data backup and recovery options for a managed environment on-premise, business continuity is a critical requirement for any cloud deployment.

Chapter Three: Required Actions

The cloud computing model most used by respondents was that of a private cloud (54%), either as a virtual private cloud running with a managed service provider or a managed environment on-premise (see **Figure 8**). This was followed by public, or multi-tenant, cloud environments (43%), and then hybrid private (41%) and hybrid public (28%) models.

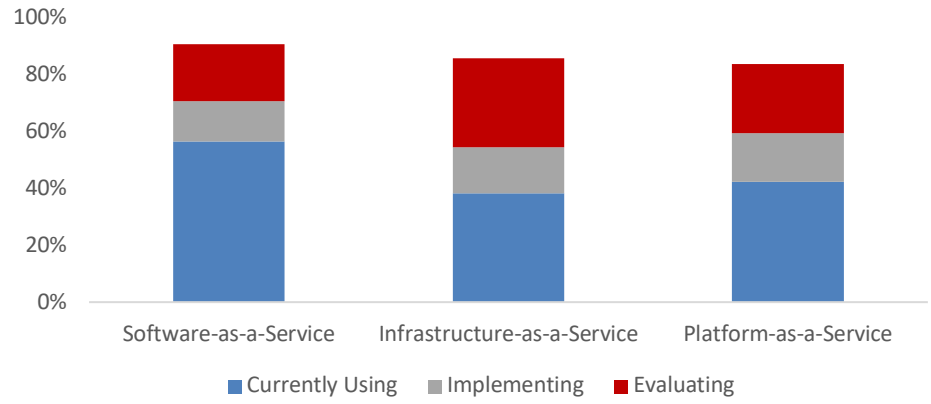
Figure 8: Which cloud computing models are you using?



Source: SAPinsider, October 2020

In looking at cloud service models, SaaS models were currently in use by more respondents (57%) than either PaaS (42%) or IaaS (38%) models (see **Figure 9**).

Figure 9: Which cloud service models are you using?



Source: SAPinsider, October 2020

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"We were recently in a hosted environment. Scalability and the ability to add resources to existing landscapes was very cumbersome. There was no clear visibility to resource consumption. By going to the cloud, we can adapt and add to the landscape in a more regulated and speedy way for any new SAP initiatives."

~ Senior Director, SAP COE Software Developer

Combining this data with the information mentioned earlier where applications such as SAP Business ByDesign, SAP BusinessOne, SAP Concur, SAP Ariba, and SAP SuccessFactors are the most used SaaS applications by survey respondents, it makes sense that members of the SAPinsider Community are more likely to be using SaaS applications than any other cloud service model.

Even though IaaS represents the cloud service model that is used least, more respondents plan on investing in solutions in this space than in PaaS solutions. This correlates with the fact that 86% of those planning their deployment approaches for SAP S/4HANA plan on using an on-premise license for their implementation, but only 28% plan on deploying on-premise. These businesses need an IaaS environment for that deployment.

Steps to Success

Our research reveals that SAP customers should apply the following key steps around enterprise cloud deployments:

- **Continue to expand cloud knowledge and skillsets to fully benefit from cloud investments.** To fully capitalize on the benefits of enterprise cloud deployments, organizations should continue to invest in skill sets such as Linux, cloud development, AI and ML, information security, and cyber security. Having knowledge in these areas will empower organizations to most effectively utilize the data and systems they have running in the cloud.
- **Develop architecture plans for integrating cloud-based technologies and infrastructure with on-premise systems.** Even though cloud-based systems can offer rapid deployment of systems without needing to create an architecture plan of how it will be integrated, performing this step will allow SAPinsiders to determine where and how data will flow into these new systems, how the

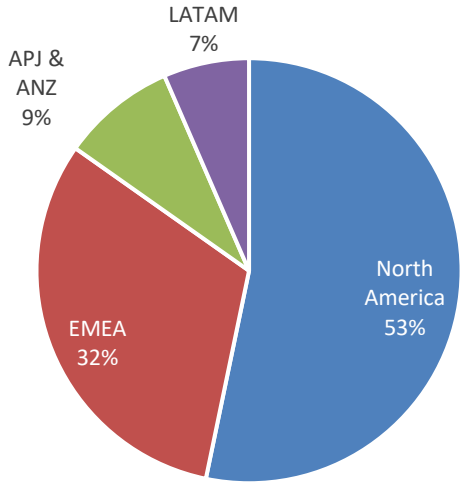
security perimeter will be extended to include them, and how licensing and access control can be established.

- **Investigate requirements for ensuring cloud data is protected and encrypted.** While SaaS solutions offer some levels of security, organizations may be unaware that this is not the case for every cloud deployment. Requirements should be established around cybersecurity, risk mitigation, audit, and even cloud vendor choice to ensure that cloud-resident data is appropriately protected.
- **Evaluate cloud development tools and cloud AI as potential areas for future investment.** Cloud-based AI and ML offers many opportunities for organizations to leverage the data and processing capabilities that they have in cloud deployments such as predicting customer churn, detecting fraud, optimizing supply chain, or building personalized products. Evaluating these areas will allow SAPinsiders to capitalize on the investments they have already made in the cloud.

Methodology

In Q3 and Q4 of 2020, SAPinsider examined the experiences of businesses and technology professionals related to their enterprise cloud deployments. Our survey was administered to 116 members of the SAPinsider Community and generated responses from across a wide range of geographies, industries, and company sizes. Respondents completed an online survey and provided feedback in customer interviews that questioned them on topics such as:

- Which cloud computing models are you currently using or planning to use?
- What criteria are the most important to your organization when selecting a cloud vendor?
- Who influences your choices when it comes to cloud solutions and platforms?



The demographics of the respondents included the following:

- **Job function:** Functional areas reported by respondents include: Information Technology (77%), Business Development/Sales (7%), Research & Development (3%), Supply Chain Management (3%), Finance (2%), HR (2%).
- **Market sector:** The survey respondents came from every major economic sector, including: Software and Technology (36%), Industrial (27%), Public Services & Health Care (17%), Financial Services (8%), Retail, Distribution &CPG (6%), Hospitality, Transportation, and Travel (6%), and Media & Entertainment (2%).
- **Geography:** Of our survey respondents, 53% were from North America, 32% were from Europe, the Middle East, and Africa, 9% were from Asia-Pacific, Japan, and Australia, and 7% were from Latin America.

Appendix A: The DART™ Methodology

SAPinsider has rewritten the rules of research to provide demonstrable deliverables from its fact-based approach. The DART methodology serves as the very foundation on which SAPinsider educates end users to act, creates market awareness, drives demand, empowers sales forces, and validates return on investments. It's no wonder that organizations worldwide turn to SAPinsider for research with results. The DART methodology provides actionable insights including:

- **Drivers:** These are macro level events that are impacting an organization. They can be both external and internal and require the implementation of strategic plans, people, processes and systems.
- **Actions:** These are strategies that companies can implement to address the drivers impact on the business. These are the integration of people, process and technology. These should be business first but fully leverage technology enabled solutions to be relevant for our focus.
- **Requirements:** These are business and process level requirements to support the strategies. These tend to be end-to-end for a business process.
- **Technology:** There are technology and systems related requirements that enable the business requirements and support the overall strategies that the company is taking, they must consider the current technology architecture and provide for the adoption of new and innovative technology enabled capabilities.

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