State of

Worldwide Business Assurance

for SAP solutions – 2023

Contents

The views expressed in this report are not endorsed by SAP.

Introduction

Welcome to the second edition of Business Assurance for SAP Solutions study. While our inaugural study in 2021 found that SAP testing maturity was not where it should have been at the time, this year's study aims to gauge how the needle has moved.

As organizations increasingly shift their SAP platform to S/4HANA and other products within the SAP portfolio, it becomes crucial to guarantee smooth business operations during these transformations. Additionally, the raising need for continuous testing is a consequence of the increased cloud adoption and the need to cope with more agile approaches and more frequent updates of the applications. If you are involved in such a transition, you must consider several critical testing aspects. These include validating functional operations, ensuring performance and scalability, integrating with other cloud services and systems, securing data, and enhancing end-user experience.

In our report 'State of Worldwide Business Assurance for SAP solutions – 2023', we explore the current best practices, standards, and technologies utilized by your peers. This report aims to inspire you and your teams to develop an efficient and effective validation process for SAP implementation and transformation. We are prepared to assist you on this journey through our SAP Business Assurance services.

As you will see in this 2023 edition – in the context of digital transformation – it has become increasingly crucial to adopt an integrated view of system implementation. This report indicates that Service Virtualization has emerged as a groundbreaking testing methodology in SAP S/4HANA transformation programs. By simulating third-party systems and EDI/B2B partners, service virtualization plays a pivotal role in ensuring the systematic and exhaustive testing of all components.

This report concludes by emphasizing the urgent need for SAP API testing in Integration Platform as a Service (iPaaS) migration projects, like SAP Business Technology Platform (B2B) Integration Suite migrations. Given the inherent complexities and integration requirements of such projects, automated testing becomes an indispensable requirement.

We hope that this report inspires you to deeply examine—and continuously optimize—your SAP business assurance strategy as well as your broader quality assurance process beyond SAP. Thank you to everyone who participated in this report, both respondents and researchers.

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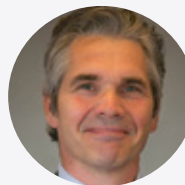
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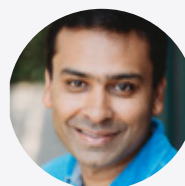
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Executive summary

In times characterized by rapid evolution of digital technologies, enterprise resource planning (ERP) systems serve as the foundation for accelerated digital transformation. As organizations upgrade to advanced ERP versions and embrace agile approaches, it becomes essential for them to develop strong processes and capabilities to ensure efficient business operations. The adoption of SAP S/4HANA and other SAP products is on the rise as organizations across industries strive to ride the digital transformation wave.

Transitioning to a different SAP version requires changes in data structures, extensive knowledge and skills, and significant change management initiatives. To ensure seamless transition and achieve the desired business outcomes in this dynamic environment, organizations must implement robust continuous testing methods to enable risk-free operational continuity across multiple platforms.

Our latest study delves into organizations' awareness of SAP versions and upgrades, implementation trends, and their readiness to overcome challenges in the evolving SAP landscape. It shows that despite the recognized importance of business assurance for SAP solutions in ensuring successful SAP transformation, many organizations lack a targeted plan and dedicated budget for this purpose.

Given the many complexities and challenges associated with SAP transformation, we have observed a growing trend of engaging with specialist service providers for SAP implementation to leverage their expertise and experience in SAP software suite and integration.

This year's study clearly establishes the critical role that specialized service providers play in assisting organizations in navigating challenges, and how there is a conscious effort to plan for automated testing and utilize integration platforms such as integration platform as a service (iPaaS) and service virtualization in SAP testing.

Our survey findings demonstrate a balanced distribution of high-intensity testing across all phases of SAP implementation. More than half of our survey respondents acknowledge the benefits of automation in testing, agreeing that it can increase efficiency by more than 50%.

Advancements in AI and ML-based solutions and the deployment of service virtualization are driving automation in SAP testing. Service virtualization offers a disciplined and systematic approach to address the complexities of SAP S/4HANA projects, resulting in optimized testing processes and seamless transition.

This year, we have also found that the adoption of integration tools and services such as iPaaS is on the rise among organizations seeking comprehensive testing. iPaaS solutions enable companies to handle complex integration during application modernization, streamline data and app administration, and facilitate interactions with legacy systems.

In line with the findings of our 2021 study, the recent survey shows that organizations are increasingly collaborating with external vendors and seeking a comprehensive business assurance service that covers the entire testing process, including non-SAP apps and integrated devices, in order to minimize lapses and delays in SAP testing. Highlighting the importance of robust business assurance further, our report includes some real-life scenarios that demonstrate the consequences of inadequate planning, lack of resources, and low level of awareness on the way to handle regular software updates from SAP by the accountable teams.

SAP environment – trends and organizations' preparedness

SAP S/4HANA has emerged as the frontrunner, surpassing SAP ECC in popularity. Businesses are increasingly realizing its benefits such as enhanced flexibility, scalability, and efficiency. With service providers playing a pivotal role in transformation, organizations are embarking on a journey to embrace SAP S/4HANA for technological advancement and operational excellence.

Key takeaways

- SAP S/4HANA has taken lead as the most widely adopted version with 39.9% of surveyed organizations currently utilizing it, surpassing SAP ECC, which stands at 33.1%

- Yet, the adoption of SAP S/4HANA remains lower than expected due to challenges associated with migrating to a new version and varying rates of adoption across different industries. At the same time, depicting a positive trend, over 93% of organizations that haven't upgraded to SAP S/4HANA have already started or plan to migrate within the next 24 months

- Talking of migrating to SAP S/4HANA, 44.7% of the organizations show a preference for the brownfield approach, leveraging their existing infrastructure and resources

- There has been a notable transition in the hosting of SAP infrastructure, as 59.8% of organizations now choose public or private cloud hosting, aiming to minimize costs and eliminate the necessity for investment in hardware

- Cloud-based SAP applications, particularly SAP S/4HANA, are experiencing increasing popularity, with 48.8% of organizations embracing them. Simultaneously, the SAP Business Technology Platform (BTP) has garnered attention, providing an integrated solution that offers customization and cost-saving advantages to 39.9% of organizations

- Among SAP implementation methodologies, Waterfall is the most preferred and accounts for 50.1% share, followed by DevOps at 26.1%; for non-SAP applications, Agile remains the most preferred method with 41.1% share

- Maintaining regular awareness of system upgrades is crucial for organizations to mitigate risks, and a notable level of awareness is evident, especially regarding SAP cloud applications. Over 57% of respondents claim to be highly informed about the regular upgrades/versions released, with SAP community (62.3%) and SAP notifications (61.5%) serving as the primary sources of information for upgrades

- More than 81% of surveyed organizations believe that they are 'completely prepared' or 'mostly prepared' to incorporate frequent SAP changes/upgrades

- During the implementation of advanced SAP versions/upgrades, the primary challenges reported are data migration (39.7%), followed by ensuring sufficient resource availability and capacity planning (34.3%)

- The primary integration-related challenge for most organizations (42.9%) is the technological disparities between SAP and non-SAP applications. This is followed by the incompatibility of SAP's proprietary programming language, application logic, and processes with non-SAP apps (34.3%)

- Organizations are increasingly recognizing the advantages of partnering with service providers, acknowledging their valuable contributions such as additional technical expertise (49.1%) and enhanced process efficiency (45.5%). Furthermore, a significant proportion (36.4%) believes that service providers play a pivotal role in ensuring uninterrupted business operations

SAP environment – trends and organizations' preparedness

The current economic environment requires businesses to be more agile and far-sighted, driving the need for an agile enterprise that can transform rapidly to keep pace with changing market dynamics and work with the rise of new business models while prioritizing sustainability.

Creating and operating a renewable enterprise plays a key role in responding to these trends for many reasons:

- the ability to connect with customers, partners, devices, and assets, and capture events and data from outside the enterprise that influences their business;

- the ability to collect and process large amounts of structured and unstructured data and get forward-looking capabilities;

- and the ability to scale up and down quickly, and to deal with the speed of change and volatility.

SAP with its 'RISE with SAP' offer, hyperscalers with their investments in enterprise application products and service providers show how market players respond to this evolution.

Rapid changes in the technology landscape make it even more imperative for organizations to think ahead, enabling CXOs to take full advantage of the new intelligent technologies and build their roadmap to transformation.

This is why, when it comes to ERP systems, particularly SAP, upgrading to advanced ERP versions, alongside building strong processes and people capabilities, is critical to ensuring a solid foundation for efficient business operations. While doing so, businesses are increasingly looking to move and keep customizations and integrations to the edge, keeping the SAP core clean. The same is evident in the change in SAP adoption trends witnessed in this year's 'Business Assurance for SAP

Solutions' study – conducted by Sogeti, Tricentis, Int4, and Capgemini with SAP customers globally – as compared with the report published in 2021. With a notable upward trend in the adoption of SAP S/4HANA and the wider SAP portfolio of products, organizations seem to be treading the right path.

In today's world, where ERP isn't the only answer and it is not the only core, business-driven transformation programs need to consider the extensive range of solutions that need to be designed, built, tested, and maintained. Such solutions can succeed only when delivering a sustainable business change that generates value. However, when it comes to business transformation, the risk and roadblocks still stand as strong.

The successful transformation approach helps minimize the challenges and risks for organizations. It starts with understanding business needs and defining a clear business case and roadmap, it is supported by a solid to-be operating model and data model, as well as a composable architecture, and industry best practice processes. It is focused on personas-based change adoption and on value realization tracking. Large- scale transformation programs, such as those we see happening nowadays, consciously plan for automated testing to cater to the continuous delivery need of the renewable enterprise

This section of the report discusses the prevalent SAP adoption and implementation trends and organizations' preparedness to deal with the challenges emerging from the evolving SAP landscape.

Slight rise in the adoption of SAP S/4HANA amid cost concerns and economic headwinds

With the numerous benefits that it claims to offer, SAP's S/4HANA is poised for growth, however it is still witnessing subdued increase in adoption. Even though our survey shows that its utilization has increased slightly in 2023 compared with that in 2021, the adoption rate is still less than expected. Even after several years of its launch, only 39.9%

of the organizations surveyed currently use SAP S/4HANA while 38.5% are still using SAP ECC and 21.6% continue to rely on SAP R/3. The slow increase in adoption can be attributed to various factors including the current economic climate, high migration costs, and regulatory barriers in some industries.
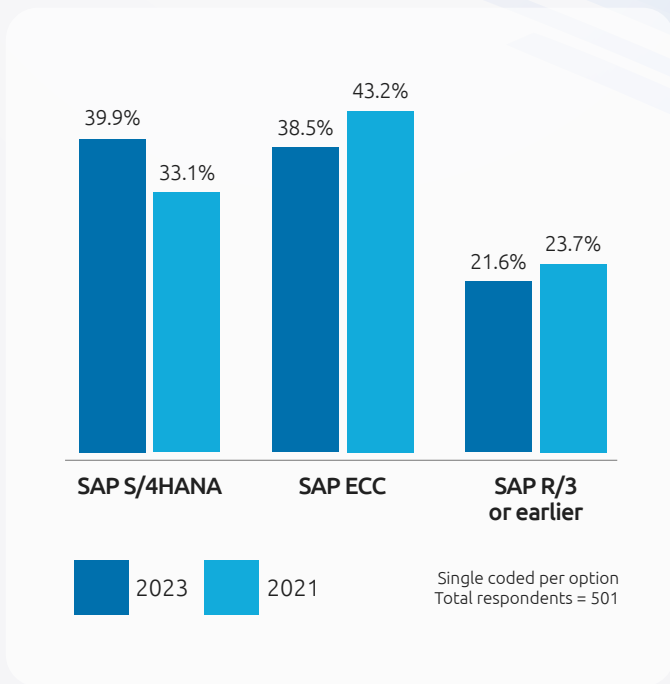
Which version of SAP is currently being used by your organization?

Particularly regarding high cost, some of the industry experts we held discussions with are of the opinion that the perceived benefits of SAP S/4HANA are often outweighed by the significant effort involved and cost incurred in testing and implementation. Besides, companies are more familiar with SAP ECC as it has been around for more than two decades and offers the most commonly used and specialized modules, along with high customization.

At the same time, shifting to a different version requires changes in data structures, extensive knowledge and skills, and large change

management initiatives. Furthermore, the penetration rate varies for different industries. For instance, highly regulated industries such as pharmaceuticals and energy and utilities witness slow adoption rates when compared with manufacturing, where the penetration rate is comparatively higher. The global economic scenario causing significant budgetary pressures is also one of the biggest factors responsible for the less-than-expected adoption rate of SAP S/4HANA.

The silver lining, however, is that the adoption rate of SAP S/4HANA is expected to increase in the coming years. As companies get more accustomed to software as a service (SaaS), they may be able to appreciate SAP's competitive pricing over the traditional perpetual offerings. Switching from a CapEx to OpEx model will allow businesses to reduce their overall spending. While an immediate move may seem expensive to most organizations, SAP S/4HANA's cloud solutions, also promoted by SAP, eliminate the need for costly data centers in the long run.

According to our survey, there has been an increase in the number of organizations planning to move to SAP S/4HANA in the next 24 months. In 2023, 93.4% of the organizations have either already begun the process or plan to do so within the next 24 months, which is higher when compared with 2021 (91.9%). Among these organizations, 25.9% are already in the process of moving to SAP S/4HANA while 37.9% plan to do so within the next 12 months and 29.6% within 12 to 24 months. Only 6.6% of businesses still do not have any plans to switch to SAP S/4HANA.

"As organizations weigh the decision to switch to SAP S/4HANA, the complexity and cost involved can present a significant challenge to justify from a business perspective. While the benefits of the new system are pronounced, the return on investment may not always justify the expenditure. However, we can expect to see an increase in adoption rates in the coming years as companies better understand the long-term cost-saving advantages of shifting from a CapEx to an OpEx model."

— Senior Director – Global SAP Application Services & Supply Chain at a global CPG firm

Preferential adoption of brownfield approach over greenfield for SAP migration

Our survey delved into the approaches employed by organizations when transitioning to SAP S/4HANA, and we found that given its relatively higher cost-effectiveness and shorter project timelines, more organizations prefer the brownfield approach (44.7%) than the greenfield approach (24.2%). Unlike the greenfield approach, the brownfield approach allows organizations to leverage their existing IT infrastructure and resources.

Simultaneously, 31.1% of organizations are using or plan to use the bluefield approach, a combination of both greenfield and brownfield approaches to selectively transition data and processes to SAP S/4HANA. This hybrid approach enables organizations to retain certain elements while reaping the benefits of a new system.

Migration in progress	25.9%
Plan to migrate within the next 12 months	37.9%
Plan to migrate within the next 12 – 24 months	29.6%
No plans to migrate	6.6%

Single coded per option
Total respondents = 301
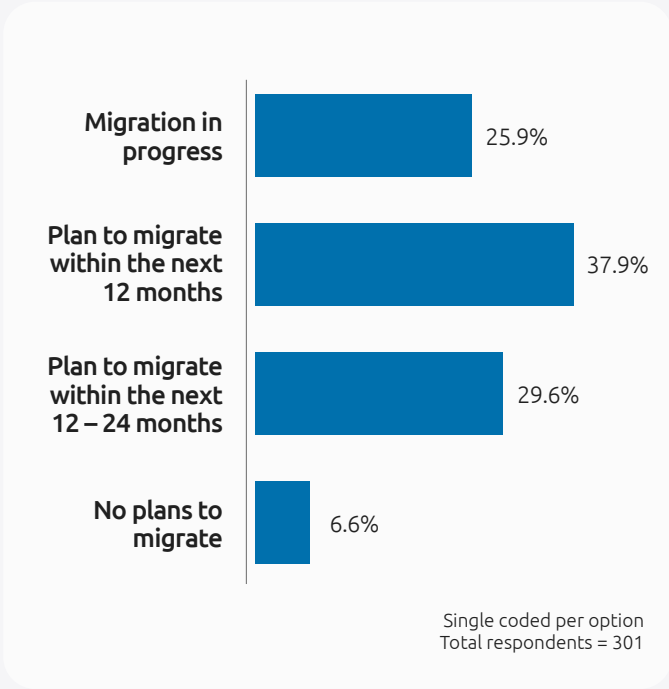
What are your plans to migrate to SAP S/4HANA?

Brownfield	Selective data transition/ Bluefield	Greenfield
44.7%	31.1%	24.2%

Single coded per option
Total respondents = 501
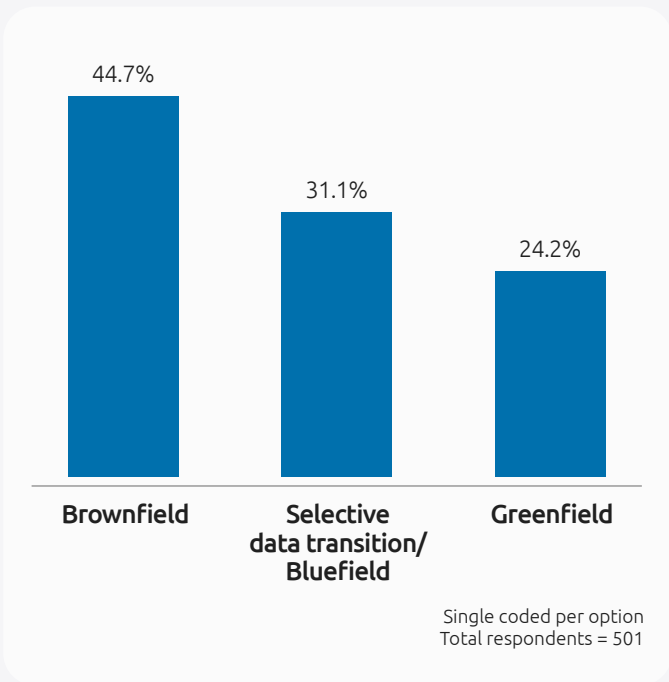
Which migration approach do/did you follow or plan to follow?

On-premise gradually giving way to private and public cloud solutions

Our discussions with industry experts have revealed that cloud-based digital platforms are gaining popularity due to their flexibility, scalability, lower upfront expenses for hardware and software, and reduced costs for maintaining on-site data centers. In the past few years, there has been a significant shift from on-premise infrastructure to public and private cloud solutions. This trend is here to stay owing to the associated cost-saving benefits, improved security features, integrated ERP software solutions, and increasing digital disruptions.

The results of our survey also demonstrate a significant shift in the way organizations host their SAP infrastructure. Showing a dip from 51.9% in 2021, only 42.1% of the organizations have stated this year that their SAP infrastructure is hosted in-house. In contrast, 59.8% of the organizations now utilize public or private cloud hosting, an increase from 41.9% in 2021. This shift towards cloud hosting can be attributed to the cost savings associated with cloud-based solutions, coupled with the elimination of the need for hardware investment and resources for managing databases.

Cloud hosting is particularly popular among multinational corporations, which require extensive network infrastructure to manage operations across multiple locations, especially ERP systems. With cloud hosting, these corporations can take ownership of their network infrastructure and more efficiently transfer data between different locations within their network, leading to significant savings in both time and cost.

The survey results also reveal that 34.9% of the organizations currently utilize a hybrid model that combines on-premise and cloud computing. This model allows organizations to manage their core systems and applications on internal servers while still taking advantage of SAP upgrades and improvements without the expense associated with a full-scale in-house software license.
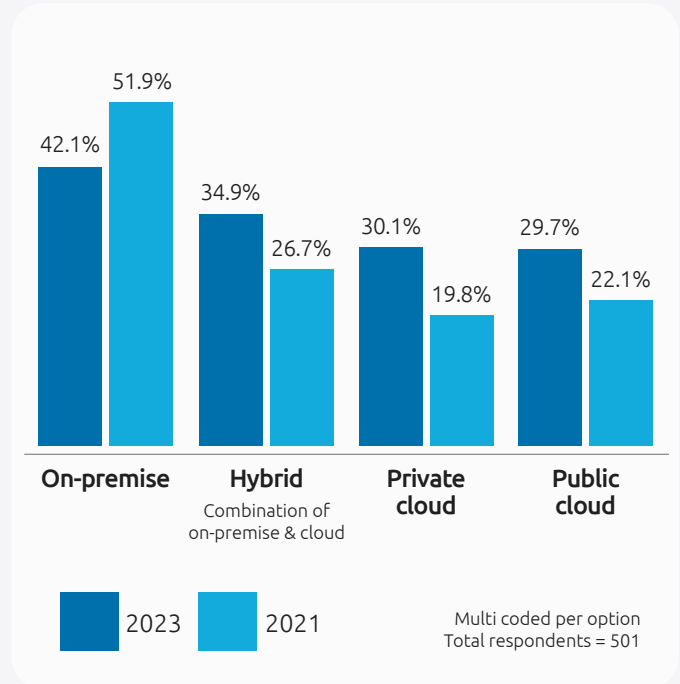
How is your SAP infrastructure housed/managed?

Among the various cloud-based SAP applications, SAP S/4HANA is the most commonly used application, adopted by 48.8% of survey respondents. This is followed by SAP IBP (39.9%) and SAP BTP Integration Suite (34.1%). Furthermore, SAP has expanded its portfolio by acquiring companies such as SuccessFactors and SAP Ariba, which offer new-generation cloud solutions to address specific business lines, adopted by 31.4% and 29.8% of respondents, respectively.

Cloud solutions provide enhanced data security through guidelines, tools, and controls that protect data, applications, and infrastructure, which is another catalyst of their rising adoption.

"The main driver behind the growing popularity of cloud solutions is the lower total cost of ownership. Cloud solutions eliminate the need to replace hardware every few years and help curb the costs of hiring resources to manage databases and datacenters. On average, cloud solutions can save businesses between 10-20% of their costs when compared to on-premise solutions. As a result, we anticipate a continued increase in cloud adoption, with cloud solutions projected to capture over 50% of the market within the next 4-5 years."

— Director – Global SAP Application Services & Supply Chain at a global CPG firm

Application	Percentage
SAP S/4HANA Cloud	48.8%
SAP IBP	39.9%
SAP BTP Integration Suite	34.1%
SAP SuccessFactors	31.4%
SAP Ariba/SAP Fieldglass®	29.8%

Multi coded per option
Total respondents = 258

Which cloud SAP applications are you currently using?

Driven by cost and customization benefits, the rise of SAP Business Technology Platform (BTP)

A notable trend has emerged in our survey results this year. We have observed that SAP BTP, which provides an integrated platform for multiple systems, enabling reduced total cost of ownership, has recently gained a significant level of traction. This does not come much as a surprise in times when businesses are constantly on the lookout for ways to improve their operations and reduce costs.

According to our survey findings, 30.5% of the companies are currently using SAP BTP while 35.7% plan to adopt it within the next 12 months, and 20.6% plan to do so within the next 12 to 24 months. The shift towards cloud-based solutions is driving the popularity of BTP, as it offers more flexibility for customization and reduces the need for on-premise infrastructure. Besides, it offers the ability for organizations to maintain their customizations and extensions within the framework, making it easier to implement new upgrades while keeping the core clean. This approach is more cost-effective than the traditional one where customizations are built with an extension on the same environment as that for SAP deployment. With BTP, companies can opt for customizations or extensions on a separate platform, creating a more flexible and efficient system.

The popularity of BTP is reflected in the low percentage of companies (13.2%) that have no plans to use it. With its multi-pronged benefits, BTP has the potential for widespread adoption in the coming years, as companies can leverage the platform to improve efficiency, reduce costs, and stay competitive in a rapidly changing business landscape.

"The adoption of SAP BTP is increasing as it offers the benefits of an integrated platform, providing easy access to multiple systems and leads to reduced total cost of ownership. It makes SAP a more flexible and modular system, allowing independent developments that are not solely reliant on the core. Additionally, there is a shift from on-premise to cloud that offers more options for customization. BTP allows organizations to maintain their customizations and extensions within the BTP framework. Furthermore, customers find this platform economically viable."

— Global Director – Data Analytics, Enterprise Architecture, Strategy, and Digital Transformation at an automotive manufacturing company

An equal split between two-tier[1] ERP adopters and slow-movers

As the adoption of cloud solutions continues to increase, businesses are turning to two-tier ERP. SAP S/4HANA Cloud has emerged as a crucial enabler for this transition, allowing businesses to establish their connected digital core in the cloud, harmonize their processes, and prepare for intelligent systems and processes. By leveraging the capabilities of two-tier ERP, businesses can automate and align their processes to improve operational efficiency, customer satisfaction, and lower process costs. Despite these advantages, 53.6% of respondents do not plan to use it while an almost equal proportion of respondents (46.4%) either currently use it or plan to do so within the next 1-2 years, highlighting its growing importance in modern business operations.

Businesses can choose between a centralized or decentralized model, depending on their specific needs. Particularly larger organizations can benefit from a decentralized two-tier ERP model, which can help them to effectively manage maintenance needs and minimize downtime. Furthermore, the model is useful for companies operating in countries with strict GDPR regulations or those planning a divestiture. Although a decentralized model may incur higher costs, it offers greater flexibility and is essential for local compliance needs.

Use of SAP BTP services already	30.5%
Plan to use SAP BTP within the next 12 months	35.7%
Plan to use SAP BTP within the next 12 – 24 months	20.6%
No plans to use SAP BTP	13.2%
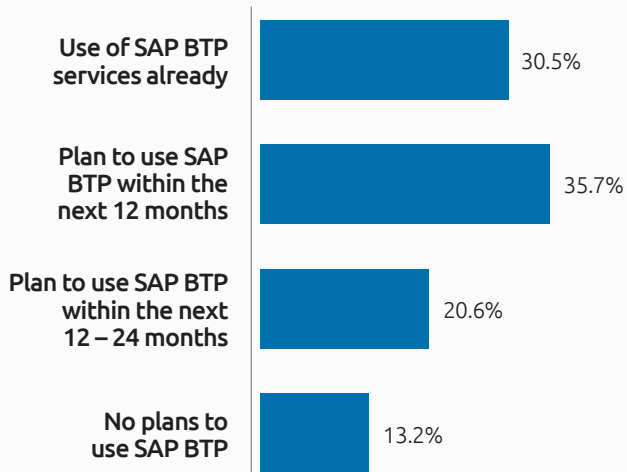
Single coded per option
Total respondents = 501

What are your plans to use SAP BTP (Business Technology Platform)?

[1] With growing cloud adoption, several large organizations are preferring the two-tier ERP strategy, under which organizations use different ERP systems for their headquarters and subsidiaries. This strategy allows organizations to shift their monolithic deployment to a decentralized federated model that provides them the needed speed and flexibility while ensuring standardization through SAP-delivered standard processes.

"Implementing a centralized or global ERP system can provide standardization, resulting in fewer interfaces and quicker implementation of standard changes. However, introducing a two-tier ERP system allows businesses the needed flexibility, alongside standardization. For example, if a company acquires a small business that differs significantly from its core business, integrating it into the central ERP system can be complicated. Larger organizations may benefit from using a two-tier ERP approach as it allows them to limit downtime requirements by providing more flexibility to perform maintenance at departmental or functional levels. Plus, the decentralized model is effective in managing maintenance needs as organizations cannot afford downtime."

— Global Director – Data Analytics, Enterprise Architecture, Strategy, and Digital Transformation at an automotive manufacturing company

Waterfall tops the list of preferred SAP implementation methodologies

According to our survey, Waterfall remains the most popular implementation and development methodology for SAP, accounting for 50.1% of the total share, followed by DevOps with 26.1%. However, for non-SAP applications, Agile is the most popular methodology with 41.1% of respondents indicating it as their preferred option, particularly in organizations or environments that require a higher degree of adaptability to user needs.

Agile methodology involves incremental changes and working in sprints, which can be challenging as it involves continuous collection of user feedback to build a minimum viable product. Notably, the lack of flexibility in SAP implementation is a significant factor contributing to the preference for Waterfall, leaving Agile and DevOps behind in terms of adoption.

Bar chart — SAP applications vs Non-SAP applications:
- Waterfall: SAP applications 50.1%, Non-SAP applications 33.9%
- DevOps: SAP applications 26.1%, Non-SAP applications 25.0%
- Agile: SAP applications 23.8%, Non-SAP applications 41.1%

Multi coded per option
Total respondents = 501

Horizontal bar chart:
- No plan to use it: 53.6%
- Already using it: 22.2%
- Plan to use within the next 12 months: 16.6%
- Plan to use within the next 12 – 24 months: 7.6%

Single coded per option
Total respondents = 501

Please select the option that best describes your organization's plans to use two-tier ERP systems

Which implementation methodology is the most frequently deployed for SAP and non-SAP applications within your organization?

SAP upgrades/versions – awareness and practices

Awareness of SAP upgrades is crucial for organizations to minimize potential risks

Keeping up with the regular upgrades released by SAP is critical for maintaining the security and stability of an organization's systems. These upgrades are necessary to address issues related to downtime, loss of productivity, and security breaches. By staying abreast, organizations can ensure that they are aware of the latest developments and are equipped to address any vulnerabilities or threats to their systems.

"Regular upgrades play a critical role in ensuring the security and stability of an organization's systems. By keeping the system up-to-date, organizations can minimize the risk of security breaches, downtime, and productivity loss. Additionally, updating the system regularly can help organizations reduce the costs and risks associated with vulnerabilities that can arise over time."

— Global Director – Data Analytics, Enterprise Architecture, Strategy, and Digital Transformation at an automotive manufacturing company
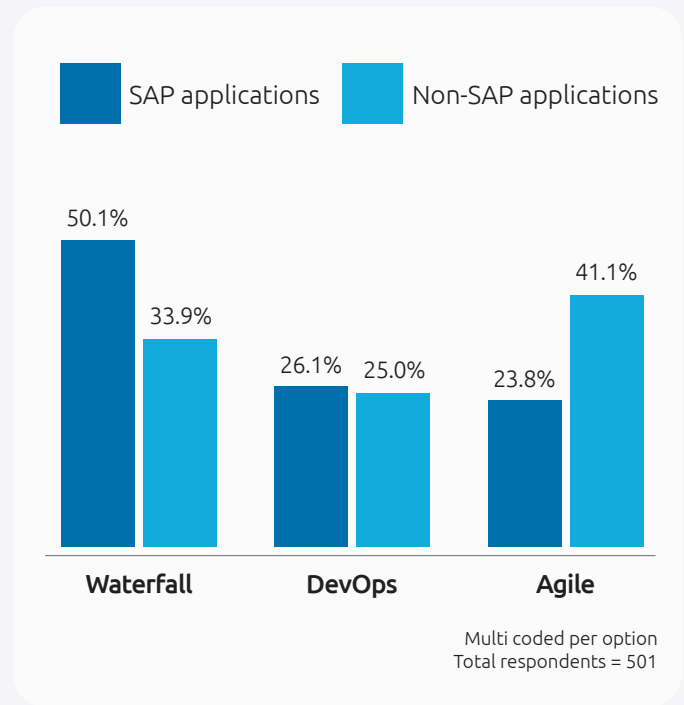
Our survey results reveal that more than 57% of the respondents are highly aware of the regular upgrades and versions released by SAP, while 39.7% have indicated a moderate level of awareness. One of the key reasons for such remarkably high levels of awareness is SAP's timely email communication to keep customers informed about the latest patches and upgrades. At the same time, upgrades that may require a step-by-step upgrade process are often characterized by delay in adoption. That said, organizations must prioritize regular SAP upgrades to ensure system integrity and avoid potential risks.

In accordance with the trend, the survey also highlights that a significant portion of respondents (65.1%) claim full awareness about upgrades for SAP cloud applications. Meanwhile, 29.5% of the firms are only aware of larger cloud releases, and a small proportion (5.4%) have denied tracking cloud upgrades at all. The data indicates that most organizations now fully realize the importance of staying informed about SAP upgrades, particularly for cloud applications where upgrades are automatically pushed and more frequent (for SaaS products every quarter). In general, awareness about SAP upgrades is vital for maintaining system security and stability, and avoiding potential risks.

Very aware	57.1%
Moderately aware	39.7%
Slightly aware	3.2%
Not al all aware	6.6%

Single coded per option
Total respondents = 501
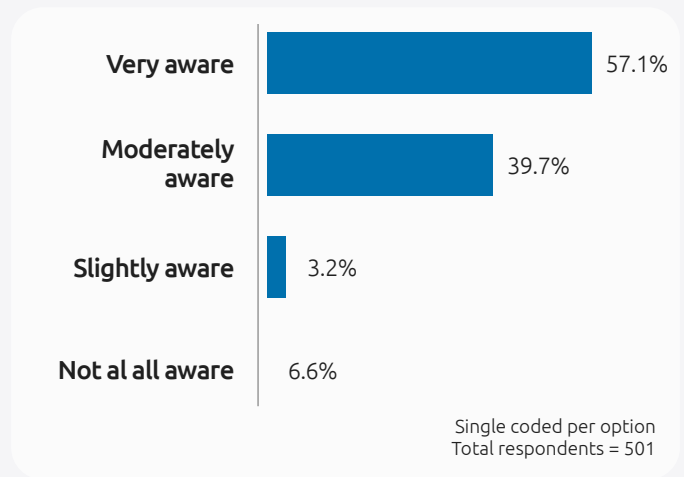
How aware are you about the regular upgrades/versions released by SAP?

Yes, fully aware	65.1%
Only about larger (quarterly) cloud releases	29.5%
No, we don't track it	5.4%

Single coded per option
Total respondents = 501
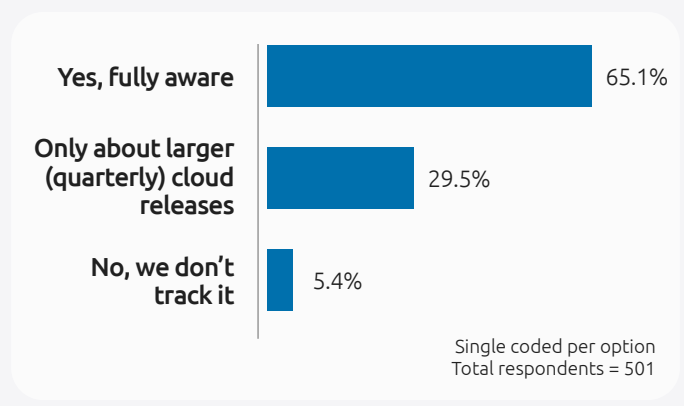
For SAP cloud applications, are you aware of SAP upgrades?

Same as the findings of 2021 survey, the SAP community (62.3%) and notifications from SAP (61.5%) are the two most popular sources of SAP upgrade-related information for respondents, followed by IT-specific blogs (48.3%) and partner websites (43.3%).

Source	%
SAP community	62.3%
Notifications from SAP	61.5%
IT specific Blogs	48.3%
Partner's website	43.1%
Technology magazines	35.7%
Social media	34.3%
News articles	25.7%
Others (email from SAP)	0.2%

Multi coded per option
Total respondents = 501
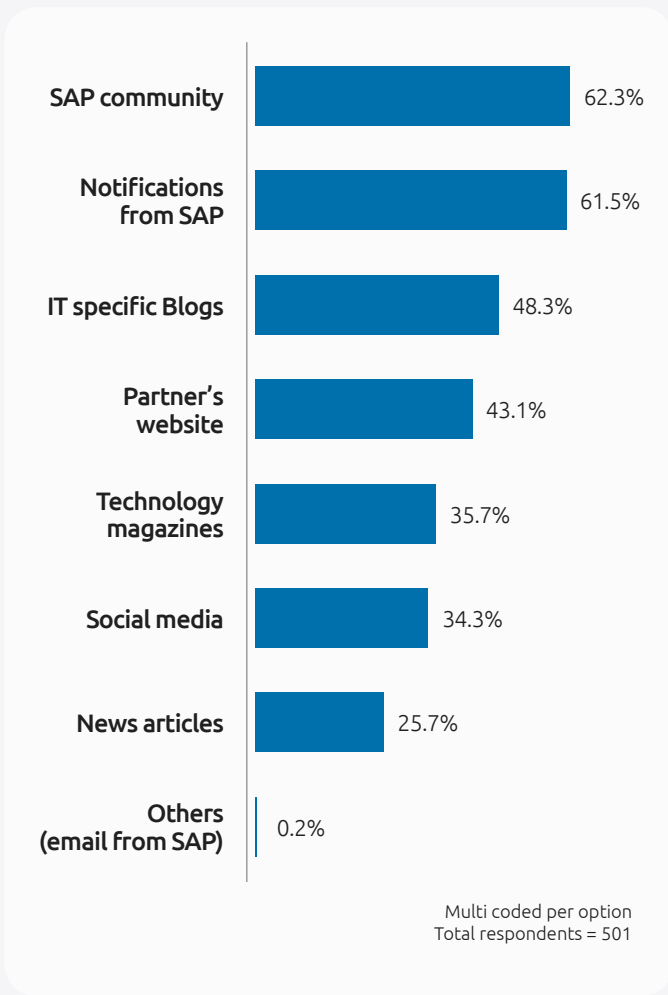
What sources do you rely on to get information on different SAP upgrades?

Monthly and quarterly upgrades most prominent

Organizations using on-premise infrastructure need to take deliberate actions to implement different SAP upgrades. Our survey shows that 44.5% of organizations incorporate upgrades to their on-premise SAP applications on a monthly basis, and 44.1% do so every quarter. At the same time, only a minority of businesses undertake daily, weekly, bi-annual, and annual SAP upgrades. Our 2023 survey shows an increase in the proportion of organizations undertaking monthly or quarterly upgrades for on-premise SAP applications (88.6%), compared with 2021 (73.3%).

Frequency	2023	2021
Daily/weekly	5.3%	8.4%
Monthly	44.5%	41.6%
Quarterly	44.1%	31.7%
Bi-annually	4.7%	14.0%
Annually	1.4%	4.1%
No fixed frequency	0.0%	0.2%

■ 2023 ■ 2021

Single coded per option
Total respondents = 211
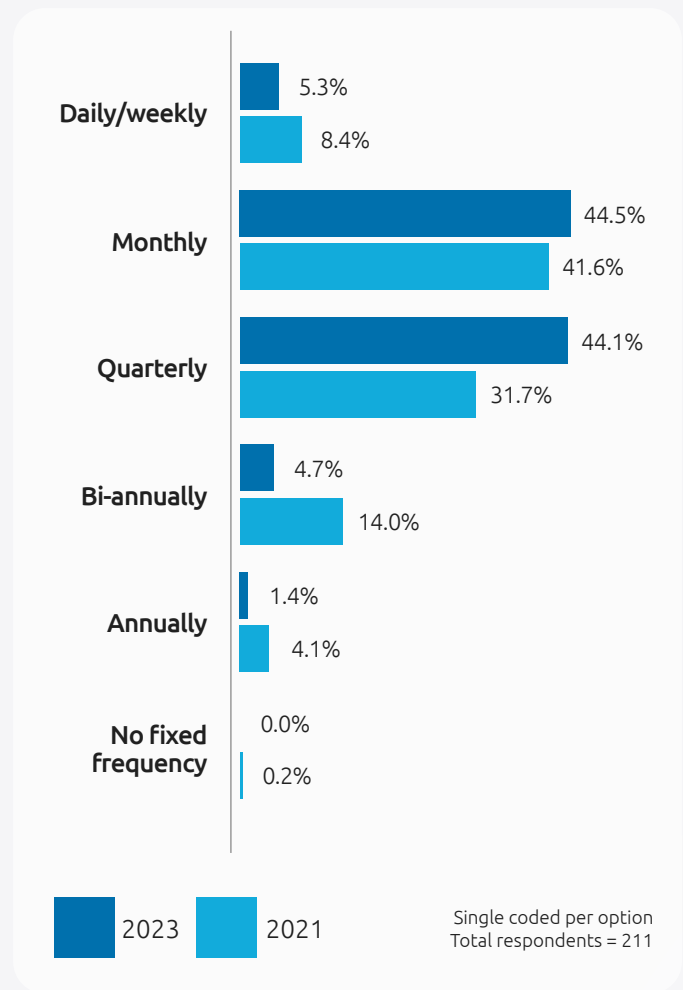
What is the frequency of SAP upgrades for on-premise SAP applications in your organization?

Rise in preparedness levels as organizations strive to stay proactive

Realizing the importance and benefits of preparedness for timely upgrades and to avoid the many risks of missing out on upgrades, a majority of the organizations (80%) are now "completely prepared" or "mostly prepared" to handle regular SAP upgrades. Interestingly, the number of respondents who stated that they are "somewhat prepared" to manage these changes decreased significantly from 24.9% in 2021 to 18.2% in 2023. It appears that more organizations are recognizing the significance of keeping their SAP systems upgraded and investing in the resources required to ensure that they are fully equipped to handle upgrades as and when they are released. This positive trend suggests that organizations are adopting a more proactive approach to SAP upgrades, which can lead to enhanced system performance.

Long way to go for complete automation in SAP change and release management processes

Automation has gained significant popularity as a solution that can help organizations efficiently manage SAP change and release processes. Automation helps organizations to streamline the entire process from development to production, including tasks such as code compilation, testing, and deployment. Consequently, it enables organizations to save time and effort while ensuring consistency across all systems and platforms. Moreover, automation provides greater visibility into the change and release process, making it easier to identify and resolve issues.

However, despite the benefits of automation, our survey shows that its adoption for SAP change and release management is still relatively low. Only 19.4% of the organizations have fully automated their processes while 37.3% have mostly automated them. It is clear that a significant proportion of the organizations (43%) still lack automation in their SAP processes. These results are consistent with the survey findings in 2021, indicating a lack of progress in this area.

Chart data:
- Completely prepared: 35.7% (2023), 31.6% (2021)
- Mostly prepared: 45.7% (2023), 42.9% (2021)
- Somewhat prepared: 18.2% (2023), 24.9% (2021)
- Not at all prepared: 0.4% (2023), 0.9% (2021)

2023 | 2021

Single coded per option
Total respondents = 501

How prepared is your organization to incorporate these frequent changes/upgrades?

"While automating SAP change and release management processes can bring substantial cost savings and improve the bottom line by eliminating manual processes, it is crucial for organizations to assess the return on investment and build a strong business case before making any such investments. By doing so, organizations can make informed decisions and maximize the benefits of automation while minimizing risks."

— Senior Director – Global SAP Application Services & Supply Chain at a global CPG firm

Industry experts have said that the low adoption rate can be attributed to several factors. For instance, while some organizations may be deterred by the upfront cost of implementing automation, others may lack awareness of the benefits that automation can bring. In addition, some organizations may struggle to find skilled resources to implement automation solutions.

Completely automated (full scope of CI/CD) — 19.4%
Mostly automated — 37.3%
Somewhat automated — 41.7%
Not at all automated — 1.6%

Single coded per option
Total respondents = 501
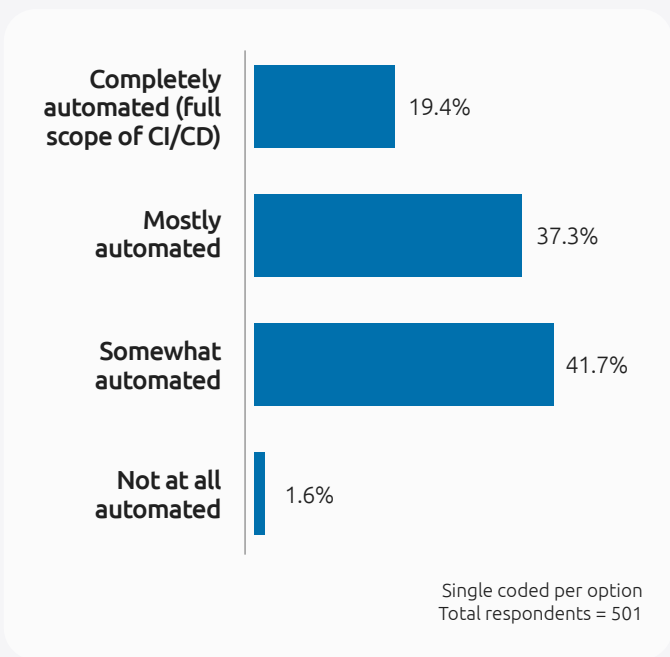
To what extent is SAP change and release automated at your organization?

Higher scalability – the most sought-after benefit of advanced SAP versions/upgrades

Advanced SAP versions/upgrades offer a multitude of benefits, not only in terms of technology but also in terms of cost, productivity, and business value. Among the many benefits, our survey results indicate that the most prominent one is higher flexibility, scalability, and versatility (53.3%). Other key advantages include improved productivity, technology modernization, faster response times and processing, and faster business value from API-led strategies.

Data migration concerns and other challenges restraining organizations from adopting advanced SAP versions/upgrades

Alongside the many benefits of implementing advanced SAP versions/upgrades, organizations face several risks and challenges. Adopting a new version or integrating a new upgrade requires proper planning and resource allocation. Moreover, without extensive evaluation and understanding, organizations may encounter multiple challenges and business risks. According to our survey, most

Higher flexibility, scalability and versatility — 53.3%
Improved productivity and operational efficiencies — 50.3%
Updated legacy infrastructure/technology modernization (IoT, Digitalization, etc.) — 47.5%
Faster response times and processing — 45.5%
Faster business value from API-led strategies — 43.9%
Advanced analytics — 43.3%
Improved/personalized user interface — 39.9%
Overall lower cost of operations — 39.9%
Business transformation — 36.3%

Multi coded per option
Total respondents = 501

What are the key benefits that are achieved from implementing advanced SAP version/upgrades?

organizations currently find the transfer of master data to a new environment (data migration) the biggest challenge with 39.7% reporting this as a major issue. The upgrade process is time-consuming and complex, and any loss of master data could be costly and detrimental to the business. Another primary challenge reported by 34.3% of the organizations is the expectation to do more with fewer resources (adequate resource availability and/or capacity planning). Other challenges encountered by organizations include data security, changes in management structure and resultant changes in priorities, pressure to implement changes faster, adequate resourcing, and budget constraints. Considering the risks associated with any of these aspects going amiss during the implementation of an upgrade, it is crucial that organizations meticulously evaluate them before migrating to advanced upgrades/versions.

Majority of the respondents continue to trust specialized service providers for their technical expertise

About 89% of our survey respondents agree that engaging a specialized service provider is an effective way to deal with the challenges that arise from implementing SAP. Most organizations that seek external support do so for the lack of functional and technical expertise internally.

Reinforcing our findings from 2021, in 2023, the survey respondents are even more convinced of the benefits of working with service providers. This year, 49.1% of the respondents stated that service providers bring additional technical expertise, compared with 44.9% in 2021. Similarly, 45.5% of the respondents are of the view that service providers help make processes more efficient, compared with 37.7% in 2021. Moreover, 36.4% of the respondents in 2023 opined that service providers are instrumental in ensuring business operations continuity, which is slightly higher than the 34.8% in 2021.

Challenge	%
Transfer of master data to new environment	39.7%
Expectation of doing more with less resources	34.3%
Data security vulnerability	33.9%
Pressure to implement changes faster	32.3%
Budget pressure	29.9%
Existing system modifications required for the introduction of new features	29.3%
Delays in testing due to lack of control of 3rd party systems and B2B partners (3PL, EDI, etc.)	29.1%
Lack of process documentation	27.9%
Lack of technical expertise	24.4%
Excessive downtime	24.0%
Change in management/ organization structure impacting priorities	23.8%

Multi coded per option
Total respondents = 501

What are the key challenges you face while implementing advanced SAP version/upgrades?

Yes
89.0%

Not Sure
6.6%

No
4.4%

Single coded per option
Total respondents = 501
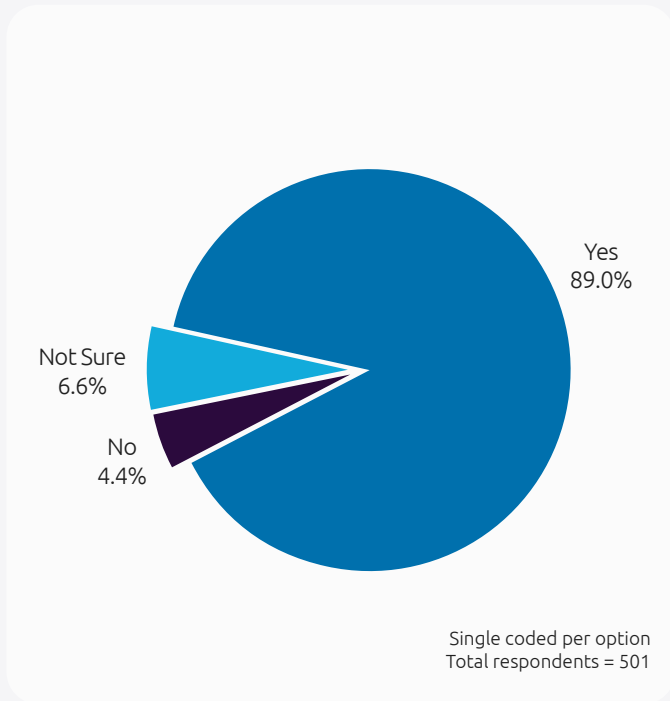
Do you feel that a specialized service provider can help overcome these challenges?

Technical expertise — 49.1% (2023) / 44.9% (2021)

Process efficiencies — 44.5% (2023) / 37.7% (2021)

Ensure business operation continuity — 36.4% (2023) / 34.8% (2021)

Less downtime — 29.1% (2023) / 33.3% (2021)

Automation — 25.5% (2023) / 31.9% (2021)

Build an SAP centre of excellence (CoE) — 20.0% (2023) / 30.4% (2021)

In-house update implementation preferred — 3.6% (2023) / 10.1% (2021)

2023   2021

Multi coded per option
Total respondents = 55
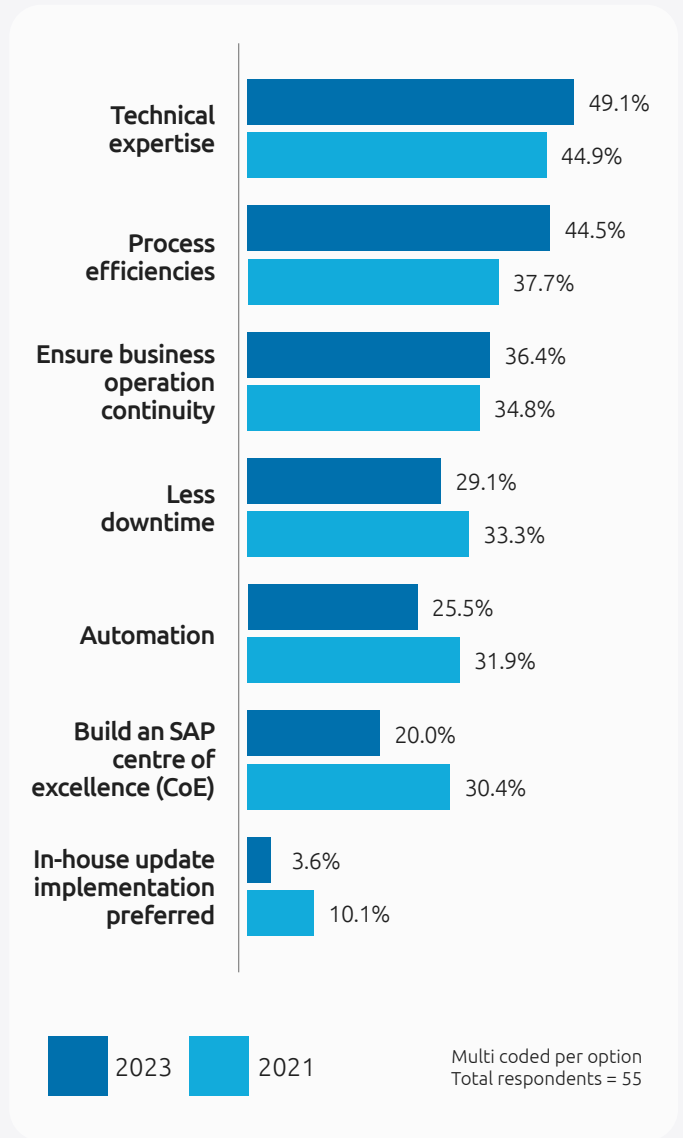
Which of the following factors will drive your organization to work with a specialized service provider to overcome the challenges experienced while implementing advanced SAP version/upgrades?

"During SAP adoption, integrating SAP applications with non-SAP applications poses various challenges for organizations. The primary obstacle arises from the fact that SAP applications utilize different technology compared with non-SAP applications. Each non-SAP application uses a distinct technology. Therefore, it is crucial to have a flexible, reliable, and affordable solution that can effectively handle the different technological challenges that arise during the integration process."

— Global Director – Data Analytics, Enterprise Architecture, Strategy, and Digital Transformation at an automotive manufacturing company

Integration between SAP and non-SAP applications

Technological differences and compatibility concerns – the top two technical barriers to the integration of SAP and non-SAP applications

Integrating SAP applications with non-SAP systems presents significant challenges for organizations, as it requires extensive system customization and infrastructure development. The majority of organizations (42.9%) consider technological differences between SAP and non-SAP applications the most significant integration-related problem, followed by incompatibility of SAP's proprietary programming language, application logic, and processes with non-SAP apps (34.3%), and frequent upgrades on cloud integration platforms – iPaaS[2] (32.9%).

Other concerns include, challenges with data harmonization, security breaches occurring through various access points, and lack of technical expertise. Using integration tools such as an iPaaS[2] or API management system involves considerable complexity, particularly when extending workflows to the cloud or scaling to support third-party applications and systems like IoT, AI, machine learning or industry 4.0. To address these challenges, organizations need a versatile, reliable SAP Application Integration solution that can easily handle various technological problems.

Lack of clarity in business expectations, ineffective change management, and insufficient accountability – key internal challenges in integration of SAP and non-SAP applications

In addition to the technical challenges, organizations have to deal with several organizational issues when integrating SAP and non-SAP applications. Our survey results indicate that lack of clarity on business expectations is the most prominent internal challenge hindering integration, with 55.3% of the respondents citing it as a concern. Ineffective change management and lack of accountability follow closely with 45.3% and 44.9%, respectively.

Before setting out on an integration journey, it is critical for organizations to establish clear goals and expectations, ensuring that all stakeholders are aligned. In addition, proper change management protocols to manage the transition and minimize disruptions to business operations, and accountability are critical to ensuring efficient integration on the business transformation journey of the company. Ensuring these key internal aspects is essential for a smooth and successful integration of SAP and non-SAP applications.

[2] iPaaS refers to integration platform as a service

Technological differences between SAP and non-SAP applications (e.g. a few being on cloud and others being on-premise — 42.9%

SAP proprietary development language, application logic, and processes not compatible with non-SAP applications — 34.3%

Frequent updates on cloud integration platforms (iPaaS) (e.g. SAP Integration Suite) — 32.9%

Frequent software updates on SaaS applications causing interfaces to stop working — 31.7%

Security breaches emerging from different access points — 31.7%

Data harmonization challenges (SAP vs. non-SAP systems) — 31.1%

SAP applications not integrated into CI/CD processes — 30.7%

Lack of testing control over 3rd party systems and B2B partners — 24.6%

Lack of technical expertise — 24.2%

Lack of process documentation — 20.4%

Multi coded per option
Total respondents = 501

What are the key technical challenges that can hinder such integrations in SAP development/implementation?

Most respondents rely on automated API testing solutions to overcome integration challenges

According to our survey results, the most effective means to address the challenges in integrating SAP and non-SAP applications is the use of automated API testing solutions with 54.5% of the respondents citing it as helpful. These solutions enable users to create test cases, generate test data, execute test scenarios, and analyze results with increased speed and agility, reduced risk, and simplified processes. Other popular approaches include using integration platforms such as SAP Integration Suite and other iPaaS solutions (50.3%), simulating third-party systems and B2B partners to separate SAP testing from third-party systems (48.5%), and utilizing centralized API management platforms for

Lack of clarity on business expectations/goals to be achieved — 55.3%

Ineffective change management — 45.3%

Lack of accountability/ownership within business functions — 44.9%

Lack of organization-wide communication — 27.1%

Multi coded per option
Total respondents = 501

What are some of the other key organizational challenges that can hinder such integrations in SAP development/implementation?

documentation and discovery (37.1%). The survey also revealed that around 60% of the respondents plan to integrate SAP applications into automated Continuous Integration/Continuous Delivery (CI/CD) pipelines while 29.9% have already done so.

Automated API testing solutions designed for SAP	54.5%
Using integration platforms solutions (e.g. SAP integration suite, other iPaaS solutions)	50.3%
Simulating 3rd party systems and B2B partners to decouple SAP testing from 3rd party systems	48.5%
Use of central API management platforms for discovery and documentation	37.1%
Performance and security testing	35.1%
Working on continuous testing practice	17.2%

Multi coded per option
Total respondents = 501

How does your organization overcome these integration challenges?

Planning to integrate in next 12 months	38.9%
Already integrated	29.9%
Planning to integrate in next 12–24 months	20.8%
Haven't decided timeframe for integration	8.8%
No plans to integrate	1.6%

Multi coded per option
Total respondents = 501
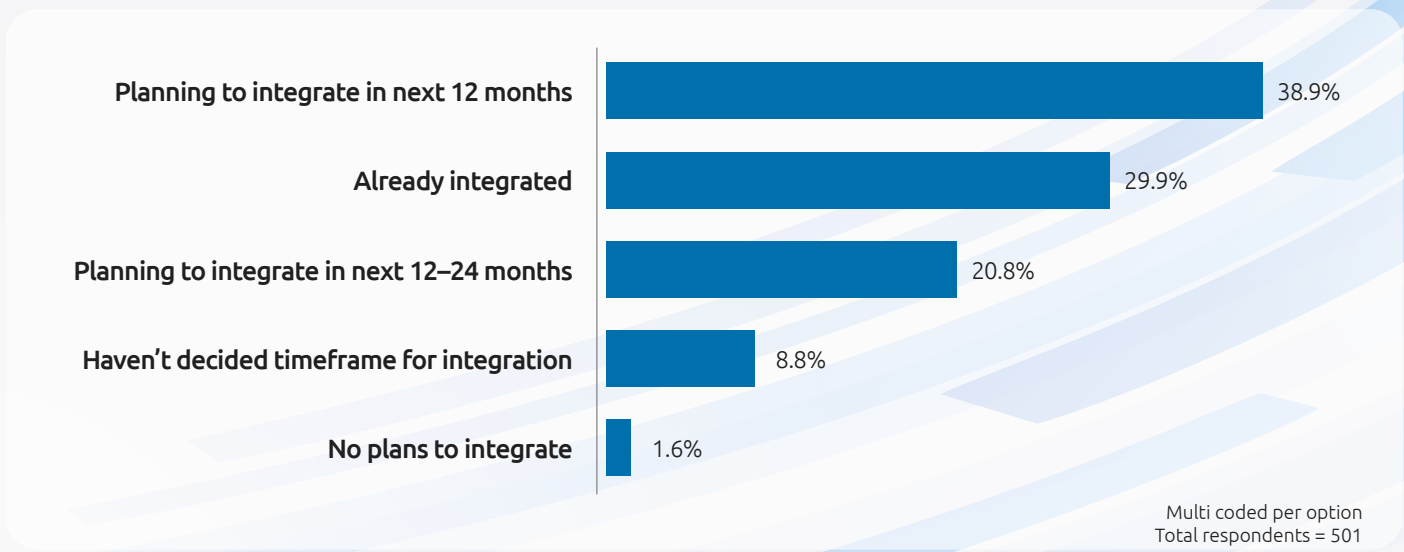
To what extent has your organization integrated SAP applications into automated Continuous Integration/Continuous Delivery (CI/CD) pipeline?

Business assurance for SAP solutions – practices and outsourcing trends

Organizations are increasingly acknowledging the valuable expertise that specialized service providers bring in SAP implementation and testing, primarily due to their technical proficiency. Engaging with such specialists enables organizations to proactively maintain their systems, ensuring that upgrades are not overlooked and any risks of downtime and production losses are nipped in the bud.

Key takeaways

- Organizations primarily rely on their IT teams (40.9%) and dedicated testing teams (27.3%) to ensure the quality of business assurance processes for SAP solutions

- As the SAP landscape becomes more intricate, there is a rising acknowledgment of the necessity for expert guidance, resulting in increased reliance on specialized service providers who possess extensive knowledge of SAP systems, processes, and technologies

- Among organizations, 37.5% opt for specialist testing service providers to ensure business assurance while 21.6% adopt a Hybrid model, leveraging both an in-house team and an external partner. Furthermore, 31.7% of organizations prefer service providers who can provide both implementation and testing services

- Performance testing is the most common use case for specialized testing service providers, with 55.7% of organizations using their services for this purpose, closely followed by API testing/ component testing with a 42.9% share

- Around 49.1% of organizations using a hybrid model for SAP testing rely on specialized testing service providers for approximately half of their SAP business assurance/end-to-end testing

- Organizations that adopt a Hybrid model are inclined to strengthen their reliance on specialized service providers for business assurance. Around 50% of these organizations plan to increase their usage of such providers in the next 24 months

- Among organizations leveraging an in-house model for business assurance, 28.3% have plans to engage a specialist service provider within the next 12-24 months while 23.9% intend to do so within the next 12 months

- This trend highlights the increasing acknowledgment of the value that specialized testing service providers bring to SAP implementation and testing processes

Business assurance for SAP solutions – practices and outsourcing trends

Despite being aware and prepared for the frequent changes, most organizations seem to grapple with issues relating to data migration, resource availability, and data security. As a result, they have to put up with delays in upgrades, resulting in limited access to new features and disruptions in system functionality. The previous section shed light on several such technical and internal challenges that organizations encounter during SAP upgrades. It is because of these challenges that the need for effective and robust business assurance practices and end-to-end testing procedures is so pronounced in SAP implementation.

Amid a competitive business environment and volatile economic conditions, the role of stronger business assurance practices has become even more vital in addressing potential business risks associated with SAP upgrades. This section aims to assess the current utilization of business assurance for SAP solutions by organizations, identify the responsible teams or departments for the same, explore the role of specialized service providers, and analyze organizations' future plans for SAP testing.

Organizations primarily rely on their IT teams to ensure the quality of business assurance processes

The importance of business assurance for SAP solutions in ensuring the success of SAP migration is being widely acknowledged. Many organizations have established dedicated testing teams for testing or business assurance for SAP solutions. Same as our findings in 2021, even in 2023, a majority of the organizations (40.9%) have stated that their IT departments are responsible for maintaining the overall quality of business assurance for SAP solutions. Simultaneously, 27.3% of the organizations have dedicated teams that are specifically tasked with conducting end-to-end SAP testing. The reliance on project quality management

teams accounts for 23.8% while functional teams assume the responsibility for business assurance for SAP solutions in 8% of the organizations.

IT team — 40.9%
Dedicated testing team — 27.3%
Project quality management team — 23.8%
Functional teams — 8.0%

Single coded per option
Total respondents = 501

Which team is responsible for overall quality of business assurance for SAP solutions/ end-to-end testing?

There is a growing recognition among organizations of the need for expert guidance in SAP implementation, given its complexity and the requirement of in-depth knowledge of systems, processes, technologies, and industry best practices. Specialized service providers offer valuable expertise and extensive experience in the SAP software suite and its integration with other systems and business processes. Moving forward, we can expect to see current and future trends surrounding the prevalence of these specialized service providers.

Outsourcing trends in business assurance for SAP solutions

Organizations exhibit greater inclination towards engaging specialized service providers for testing

Organizations encounter multiple challenges when updating existing systems or transitioning to newer versions, often due to technological differences and compatibility issues. To navigate these complexities, organizations increasingly seek external expertise, relying on specialized service providers that have the necessary expertise to perform end-to-end testing of SAP systems more effectively.

According to our survey, 37.5% of the respondents rely on specialist service providers for business assurance for SAP solutions, while 31.7% of the respondents engage with end-to-end service providers who can handle both SAP implementation and testing. At the same time, 21.6% of the respondents follow a hybrid model, utilizing both an in-house team and a specialized testing service provider. Only 9.2% of the respondents rely solely on in-house testing. Our survey findings indicate a notable trend toward the increasing use of specialized service providers offering testing services exclusively, as well as a significant rise in the prominence of end-to-end service providers offering both implementation and testing. This shift in preference is particularly evident when comparing our recent findings with that in 2021.

By specialist service providers (offers testing services only)
37.5%
36.2%

End-to-end service provides (offers implementation and testing both)
31.7%
26.9%

Hybrid model (In-house and through specialist service providers)
21.6%
27.4%

In–house
9.2%
9.5%

2023   2021

Single coded per option
Total respondents = 501

How is business assurance for SAP solutions/ end-to-end testing being conducted in your organization?

"Specialist service providers play a critical role in the migration process when moving to newer versions of SAP. When shifting from one version to another, such as BTP or BI data warehouse, it is crucial to have a service provider with extensive knowledge of testing tools, API integration, and best practices within the industry. Besides, it is essential to have some expertise in-house or a combination of in-house and specialized service providers to ensure a smooth migration."

— Head of IT Services – Supply Chain at a multinational pharmaceutical company

"Specialized service providers offer many advantages, including technical expertise that can lead to reduced downtime. However, organizations should be cautious about relying solely on providers, as doing so may not always produce optimal results. While the providers can offer testing tools and helpful advice on testing procedures, delegating complete control of end-to-end testing to them without any involvement or oversight from the organization can be risky. We are seeing an increasing trend of companies opting for a hybrid model. However, depending on the organization's requirements, it is advisable to maintain a balance between internal and external expertise. Ideally, providers should complement an organization's internal skills and resources rather than completely outsourcing the testing process. This approach allows for a partnership where both parties work together to achieve the desired outcome."

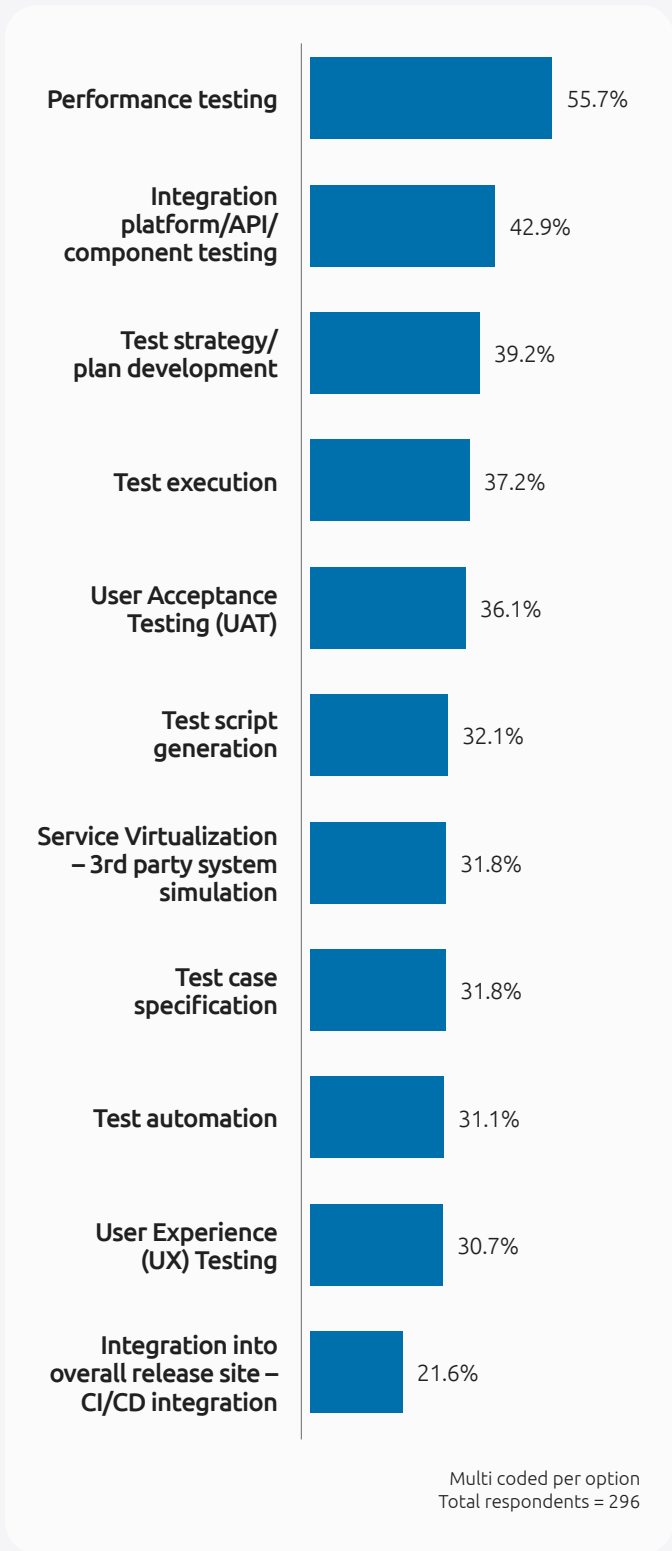— Chief Information Officer at a leading energy company

Between 2021 and 2023, there has been a clear shift in organizations' preference of specialized service providers, including those offering comprehensive support in both implementation and testing. This trend highlights the increasing prominence of service providers that can handle end-to-end processes. At the same time, the hybrid model, which combines in-house resources and external expertise, continues to be a viable option for certain organizations amid an evident inclination towards relying on specialized service providers.

Integration platform/API/component testing and performance testing continue to be the top two areas for engaging service providers

Factors such as the availability of internal expertise and resources, project timelines, and budget constraints play a critical role in determining the stages or processes in which organizations engage with SAP testing service providers.

Based on our survey findings, performance testing is the most prevalent use case for specialized testing service providers with 55.7% of the respondents utilizing their services for this purpose.

The second most common use case is integration platform/API/component testing, chosen by 42.9% of the organizations. Overlapping with the findings of our survey in 2021, these two use cases have remained the preferred choices for organizations in 2023 as well. By leveraging the expertise of service providers, organizations can ensure proactive maintenance of systems in a way that upgrades are not overlooked, and as a result prevent downtime and production losses.

Activity	Percentage
Performance testing	55.7%
Integration platform/API/ component testing	42.9%
Test strategy/ plan development	39.2%
Test execution	37.2%
User Acceptance Testing (UAT)	36.1%
Test script generation	32.1%
Service Virtualization – 3rd party system simulation	31.8%
Test case specification	31.8%
Test automation	31.1%
User Experience (UX) Testing	30.7%
Integration into overall release site – CI/CD integration	21.6%

Multi coded per option
Total respondents = 296

For which of the following activities do you engage with specialist service providers?

"Hiring end-to-end service providers offers distinct advantages such as streamlined communication and a single point of accountability. However, it is crucial for organizations to carefully evaluate and select the right provider to avoid any potential negative consequences. Choosing the wrong end-to-end service provider can result in project delays, cost overruns, and lower quality of service. Therefore, organizations must conduct a thorough analysis of potential providers to ensure that they have the necessary expertise and capabilities to meet their specific needs."

— Chief Information Officer at a leading manufacturing company

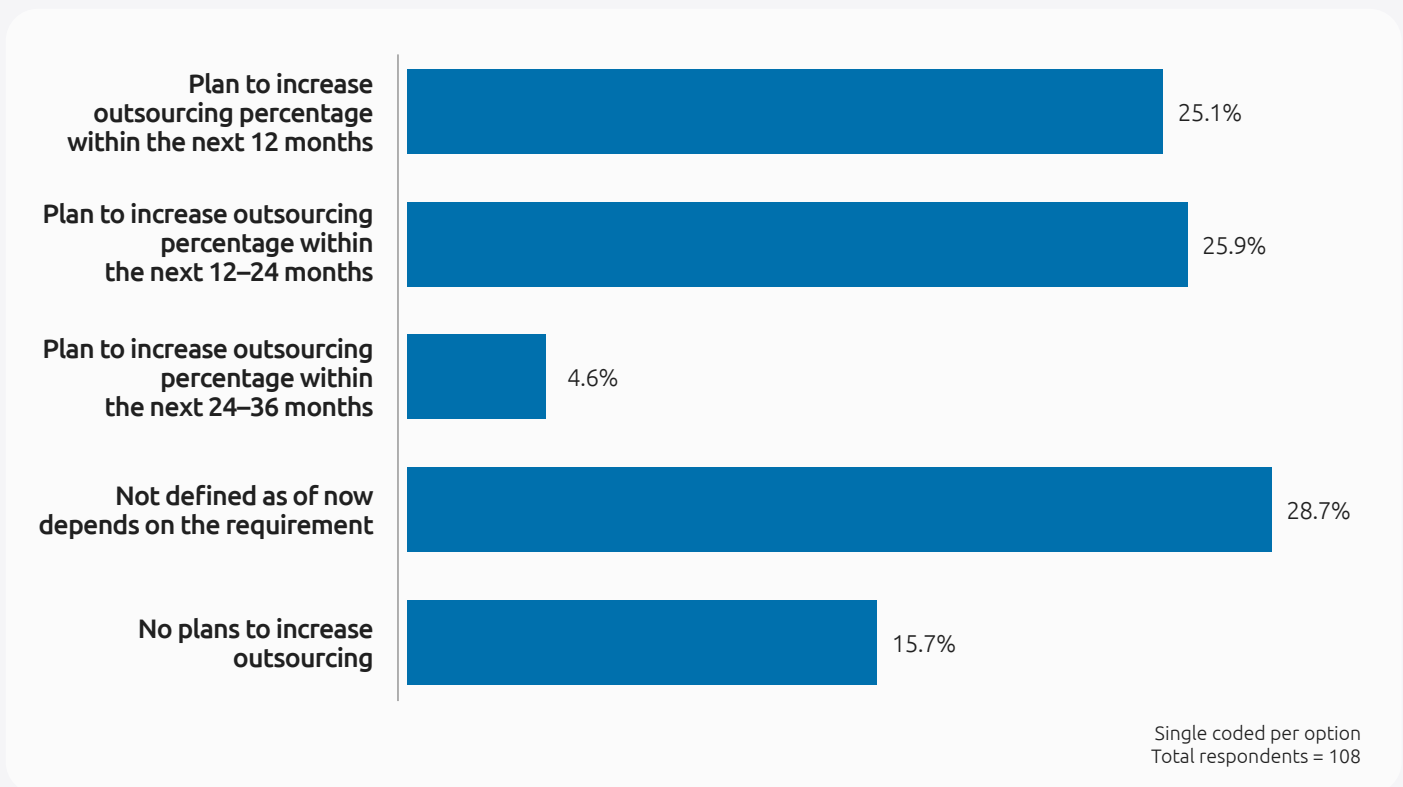| Percentage	Value
Less than 25%	9.2%
25–50%	49.1%
50–75%	36.1%
75–99%	5.6%

Single coded per option
Total respondents = 108
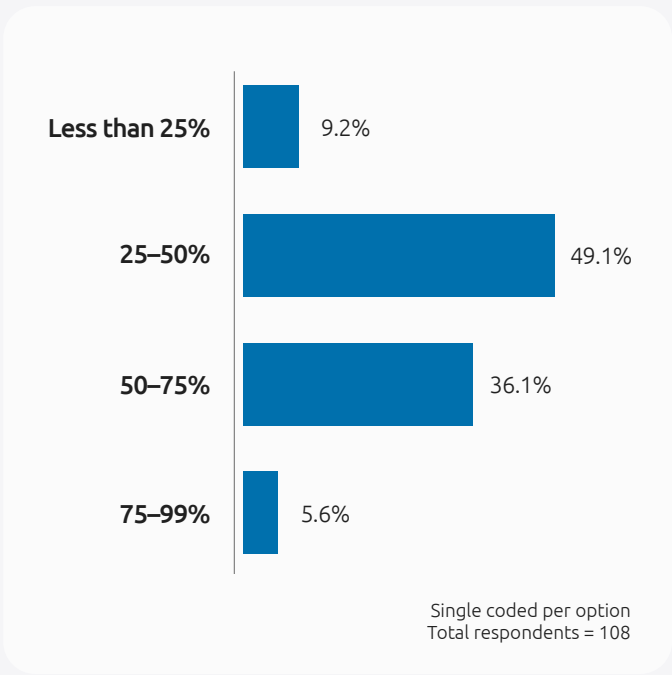
What percentage of your business assurance for SAP solutions/end-to-end testing is currently managed by a specialist service provider?

Furthermore, a deeper analysis reveals interesting insights into organizations using a hybrid model for SAP testing. Among the respondents, 49.1% rely on specialized testing service providers for approximately half of their business assurance for SAP solutions/end-to-end testing. At the same time, 36.1% of the organizations depend on these providers for 50-75% of their testing requirements while only a small percentage (5.6%) of the respondents utilize specialized testing service providers for more than 75% of their tasks.
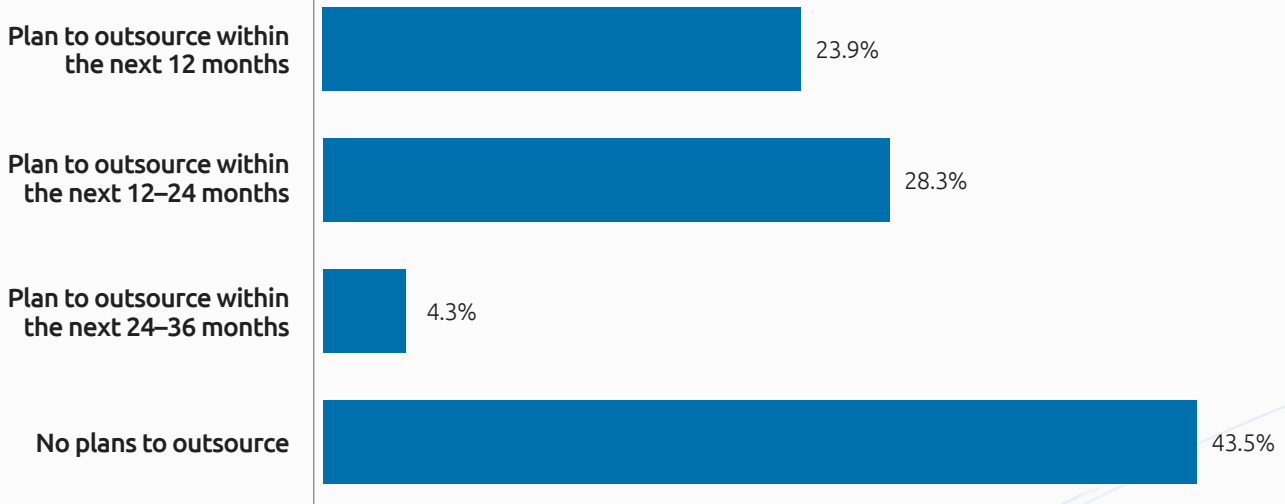
The findings indicate that a large proportion of the organizations are still only halfway on the path to fully utilizing specialized testing service providers for all of their SAP-related tasks and processes. Some inhibitions seem to be at play in restraining

organizations from doing so. Our discussions with experts have revealed that many organizations refrain from giving third-party specialists complete control of their testing process.

However, our survey also shows that among the organizations following a hybrid model, a substantial number are contemplating outsourcing their business assurance for SAP solutions to specialized testing service providers in the near future. In the next 24 months, approximately 50% of the respondents plan to leverage these providers for their SAP testing requirements. This trend closely aligns with the findings in 2021, where a similar percentage expressed an intention to increase their utilization of specialist service providers for business assurance for SAP solutions over the next 24 months.

Plan to increase outsourcing percentage within the next 12 months	25.1%
Plan to increase outsourcing percentage within the next 12–24 months	25.9%
Plan to increase outsourcing percentage within the next 24–36 months	4.6%
Not defined as of now depends on the requirement	28.7%
No plans to increase outsourcing	15.7%

Single coded per option
Total respondents = 108

What are your organization's plans for increasing the use of a specialist service provider for business assurance for SAP solutions/end-to-end testing in the next 1-3 years?

Plan to outsource within the next 12 months 23.9%

Plan to outsource within the next 12–24 months 28.3%

Plan to outsource within the next 24–36 months 4.3%

No plans to outsource 43.5%

Single coded per option
Total respondents = 46

What are your organization's plans for using a specialist service provider for business assurance for SAP solutions/end-to-end testing in the next 1-3 years?

Among those utilizing an in-house model for business assurance for SAP solutions, 28.3% of the respondents have plans to engage a specialist service provider within the next 12-24 months, while 23.9% intend to do so within the next 12 months. Only 4.3% of the respondents have plans to outsource their SAP testing in the next 24-36 months.

These findings indicate that more than half of the organizations are considering outsourcing their business assurance for SAP solutions within the next two years. This brings into spotlight a growing realization among organizations of the added value a specialist testing service provider can offer.

Business assurance for SAP solutions – approach, maturity, and automation

The need to address heightened complexity, accelerate implementation, and overcome resource limitations has fueled the adoption of automation in SAP testing. This shift is further accompanied by advancements in AI and ML technologies, which offer some highly sought-after benefits such as enhanced accuracy and continuous improvement in SAP testing. Additionally, service virtualization plays a crucial role in streamlining SAP testing processes, ensuring seamless transitions and helping organizations achieve optimal results.

Key takeaways

- More than half of the surveyed organizations (54.3%) have a dedicated budget for end-to-end testing while 45.7% have allocated a budget specifically for integration platforms

- Budget allocation for SAP end-to-end testing is distributed across various teams, with the Project Management Office (PMO) overseeing the budget in 25.5% of organizations while the SAP project team manages the budget in 25.1% of organizations

- When it comes to effective ERP implementation, only 19.2% of respondents reported allocating less than 5% of their department budget to SAP end-to-end testing. Around 56% of the organizations allocate between 5% and 15% of their budget to testing

- In contrast to the recommended practice of prioritizing testing in the early stages of SAP transformation to address potential challenges, our survey findings indicate a different pattern. A majority of the organizations (55.3%) perform SAP testing during the post-production phase, followed closely by the going live stage (52.5%)

- The survey highlights evenly dispersed responses for high-intensity testing throughout all phases of SAP deployment while 66.7% of respondents plan to increase the intensity of SAP testing during the DEV phase in the next 12 months

- Among the surveyed organizations, 32.9% of organizations have a fully automated approach to SAP testing, whereas 25.4% of organizations still rely on a manual approach, and 41.7% use a combination of manual and automated SAP testing

- Despite a growing trend toward leveraging automation, organizations seem to be adopting it at a slow pace. Approximately 42.7% of organizations have automated over 50% of their SAP testing processes

- About 61.5% of organizations believe that fully automated testing processes can result in an efficiency increase of up to 50%. Additionally, 26.5% of the respondents expect efficiency gains between 50% and 75% while 12% anticipate gains of more than 75%

- Our survey shows that 41.3% of respondents have embraced service virtualization/ simulation tools for automating their manual SAP testing processes, which offer benefits such as eliminating external dependencies, decoupling SAP testing from non-SAP applications, and yielding cost reductions

- Furthermore, service virtualization proves to be beneficial in complex SAP implementation projects, providing a more sustainable approach that reduces effort (48.9%), improves accuracy (47.1%), and enhances business processes (43.1%). Overall, AI/ML technologies and service virtualization empower organizations to optimize their SAP testing processes and achieve seamless transitions

# Business assurance for SAP solutions – approach, maturity, and automation

With growing realization about the importance of business assurance for SAP solutions, our recent study also shows positive trends in terms of the maturity level of organizations with regard to automation and the use of advanced technologies. This section focuses on the increasing significance of end-to-end testing and the adoption of automation in SAP testing processes. It explores the utilization of various tools to automate systems and processes effectively.

It also highlights the growing popularity of AI/ML-based tools in SAP testing. These tools enhance accuracy, streamline business processes, and reduce human effort. Furthermore, there are advantages of service virtualization/simulation tools, which contribute to timely releases of defect-free products, minimize coordination efforts, and improve overall accuracy and process efficiency.

Rising importance of end-to-end testing

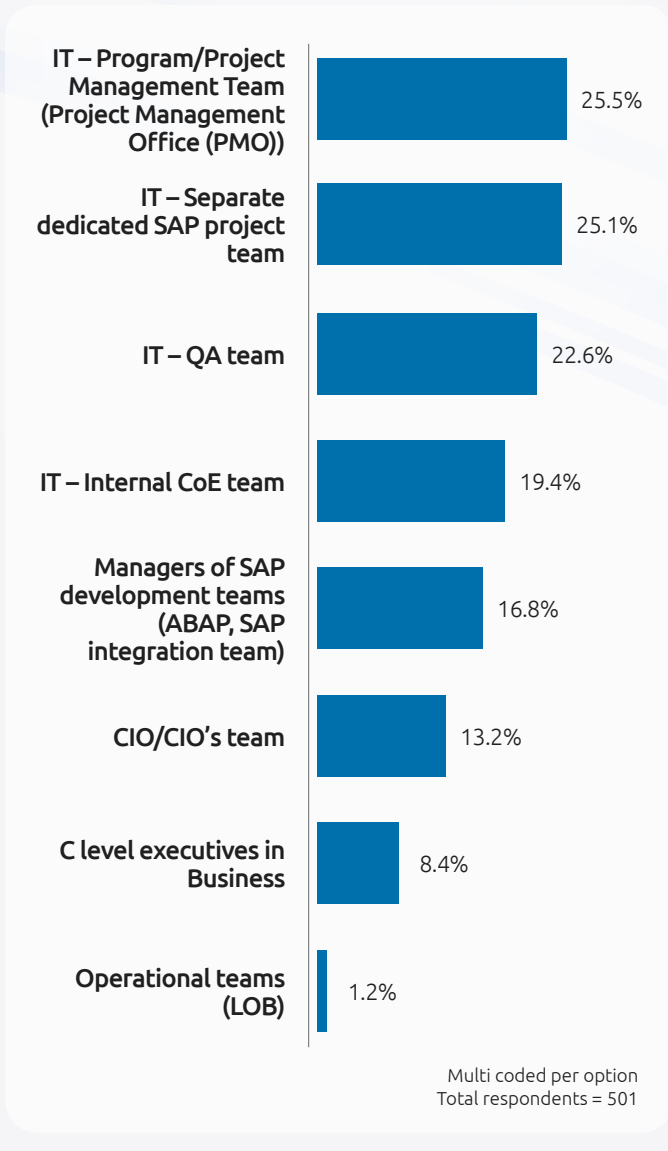### Most organizations have allocated a dedicated budget to end-to-end testing

Given the current technology landscape and the growing readiness for automation, planned and efficient testing becomes increasingly critical for successful implementation of an ERP system, highlighting the importance of business assurance for SAP solutions. With this, organizations are also well aware of the importance of setting aside a budget for SAP testing at various stages of implementation. According to our survey, 54.3% of the organizations have a dedicated budget for end-to-end testing while 45.7% have it for integration platforms. This is a notable shift from 2021, where a larger proportion of organizations were hesitant to allocate a specific budget for testing.

Integration platform/API/component 45.7%

End to end 54.3%

Single coded per option
Total respondents = 501
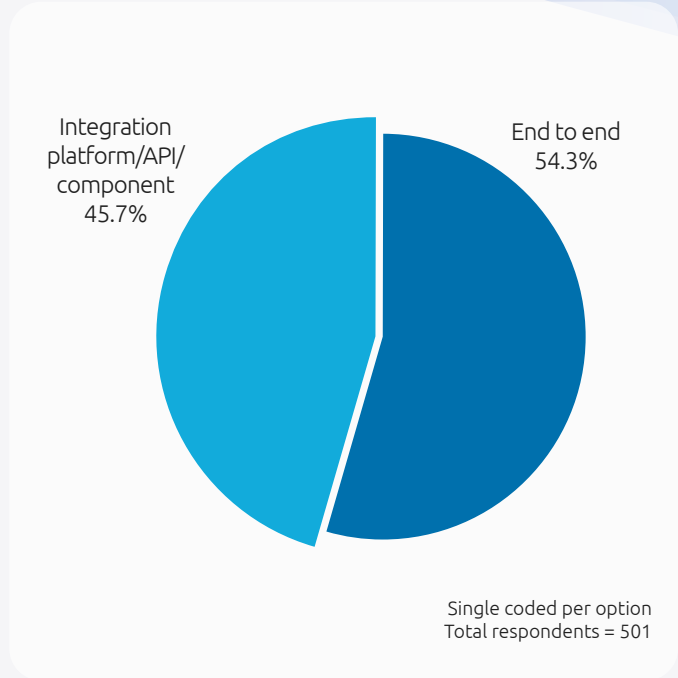
Do you have a dedicated budget for SAP testing?

Having a well-defined budget allocation strategy is crucial, and the IT department plays a vital role in managing the SAP end-to-end testing budget. This ensures efficient testing processes and effective utilization of funds. Most organizations that allocate a specific budget for SAP end-to-end testing primarily rely on the project management team (PMO) and the separate dedicated SAP project team within the IT department. This finding is in alignment with the results of the 2021 survey, indicating that these teams consistently hold the majority of the budget for SAP testing.

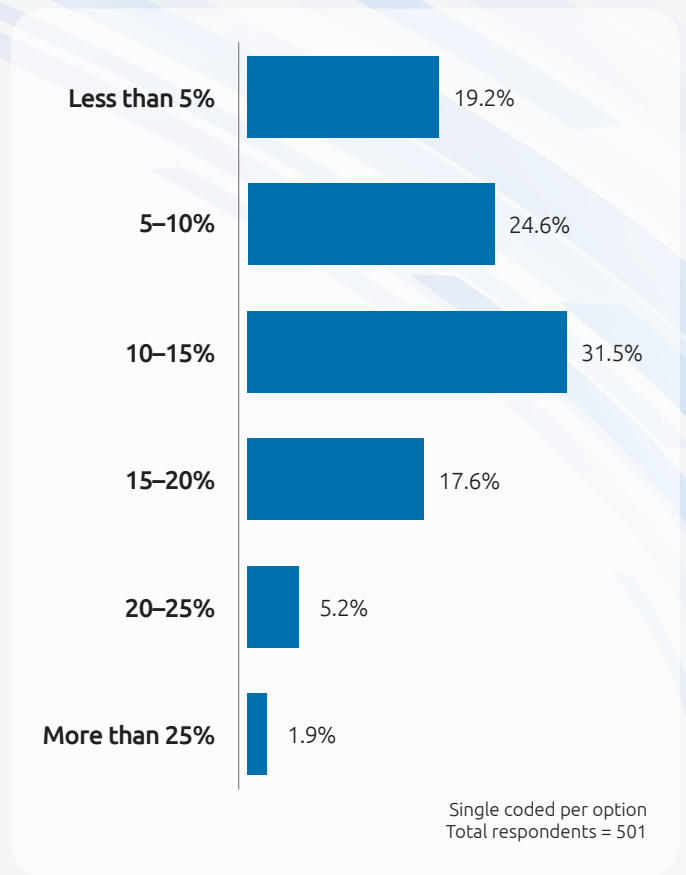In our 2023 survey, the PMO is responsible for the budget in 25.5% of organizations while the SAP project team holds the budget in 25.1% of organizations. The IT quality assurance department also plays a significant role and controls the budget in 22.6% organizations. C-level executives outside of the CIO/CIO's team or the operations team (LOB) control the budget in a very small proportion of organizations (9.6%).

IT – Program/Project Management Team (Project Management Office (PMO)) — 25.5%

IT – Separate dedicated SAP project team — 25.1%

IT – QA team — 22.6%

IT – Internal CoE team — 19.4%

Managers of SAP development teams (ABAP, SAP integration team) — 16.8%

CIO/CIO's team — 13.2%

C level executives in Business — 8.4%

Operational teams (LOB) — 1.2%

Multi coded per option
Total respondents = 501

Which department/function holds the budget for SAP end-to-end testing?

While industry experts unanimously agree to the significance of diligent testing in effective ERP implementation, in order to gain a better understanding, we analyzed the percentage of budget allocated for this purpose. Our analysis of the survey results shows that 19.2% of the organizations allocate less than 5% of their overall department budget to SAP end-to-end testing. Of the organizations surveyed, 56% allocate between 5-15% of their budget to testing while only 7.1% allocate more than 20%. Experts have opined that

one of the reasons for the low budget allocation for ERP testing may be due to underestimation of its importance, with internal IT teams often conducting testing and replicating past testing scenarios. Moreover, it is interesting to note that the vast majority of the organizations (around 98%) still allocate less than 25% of their budgets to end-to-end testing of ERP solutions, which is consistent with the findings from 2021.

Less than 5% — 19.2%

5–10% — 24.6%

10–15% — 31.5%

15–20% — 17.6%

20–25% — 5.2%

More than 25% — 1.9%

Single coded per option
Total respondents = 501

What percentage of budget is allocated to department/functions for end-to-end testing of ERP solutions?

High-intensity testing prevalent across all phases of SAP implementation

Our survey findings reinforce the significance of testing in all phases of implementation as a vital means to identify and address unresolved issues. While our survey results exhibit evenly distributed responses for high-intensity testing across all
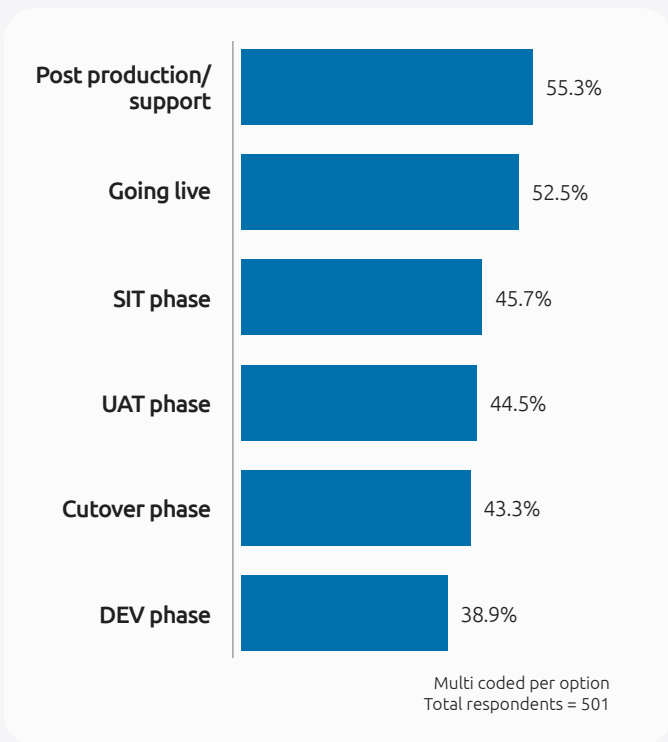
phases of SAP implementation, we observed a notable increase in testing intensity during the post-production/support phase (55.3%) and the going-live phase (52.5%), when compared with our 2021 findings.

Interestingly, industry experts advocate a different view on testing prioritization, emphasizing the development phase and UAT phase as the key areas to focus on. This is inconsistent with our survey results, which reveal that many organizations struggle with proper testing planning, and that testing tends to be concentrated more heavily in the post-production/support or going-live phases.

The observed disparity serves as a clear indication of a gap between experts' views and the actual testing practices leveraged by organizations. This discrepancy underscores the critical need

for enhanced testing planning and strategy. To address this gap, organizations should embrace a comprehensive and proactive approach to testing, prioritizing early detection and resolution of issues. By doing so, they can significantly improve the efficiency and success of their project outcomes.

As per our findings, 66.7% of the respondents plan to increase the intensity of SAP testing during the Development (DEV) phase, and 52.4% plan to do the same during the User Acceptance Testing (UAT) phase in the next 12 months. Simultaneously, 49.8% plan to intensify testing during the System Integration Testing (SIT) phase while 48% plan to do so during the go-live phase in the coming year. Notably, while the SIT phase is deemed the most complex and challenging, it is highly critical to ensure system functionality.

Phase	
Post production/support	55.3%
Going live	52.5%
SIT phase	45.7%
UAT phase	44.5%
Cutover phase	43.3%
DEV phase	38.9%

Multi coded per option
Total respondents = 501

Phase	
DEV phase	66.7%
UAT phase	52.4%
SIT phase	49.8%
Going live	48.0%
Post production/support	46.0%
Cutover phase	44.9%

Multi coded per option
Total respondents = 501

On a scale of 1-10 where 1 denotes minimal testing and 10 denotes comprehensive testing, please indicate the intensity/level of testing that your organization performs in each of the mentioned phases? Percentages are based on responses >=8 (that indicated high intensity)
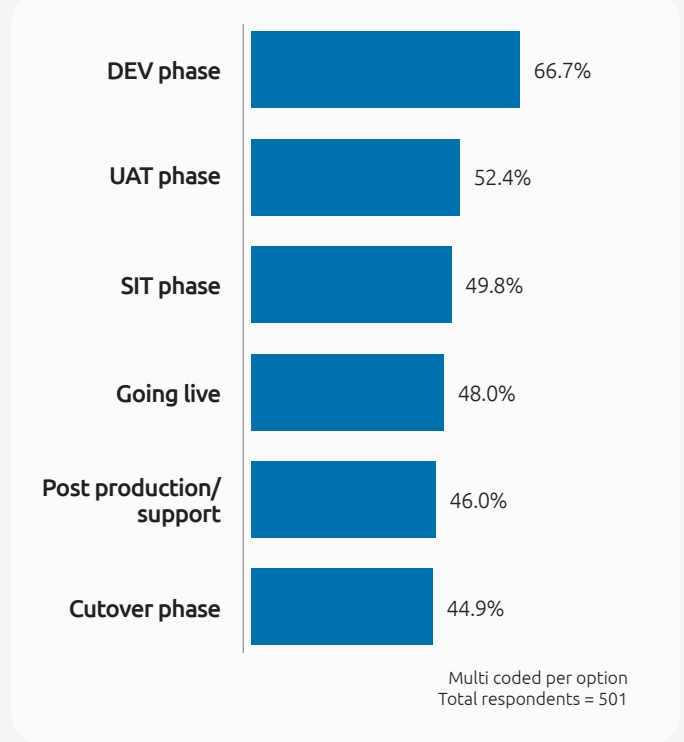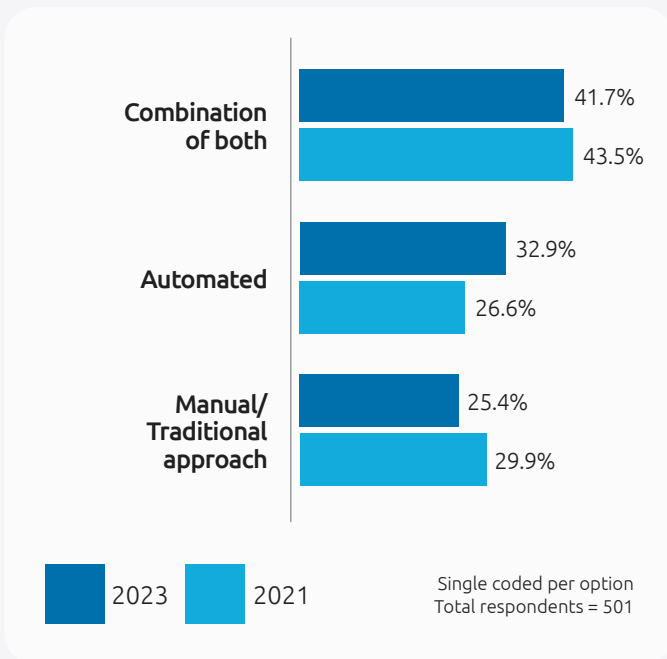
Does your organization plan to increase the intensity/level of SAP testing in the below mentioned phases in the next 12 months?

Automation in SAP testing is poised for growth in the future

Adoption of automation in SAP testing is on a rise

The adoption of automation in SAP testing has been driven by the need to tackle increased complexity, ensure faster implementation, and overcome the shortage of skilled resources. Our survey results show a steady rise in the use of automation in testing as more businesses have begun to realize its true potential.

According to our survey, in 2023, 74.6% of the organizations are using an automated or mixed approach for SAP testing, up from 70.1% in 2021. We also found that 25.4% of the organizations still rely solely on manual approaches, down slightly from 29.9% in 2021. These findings suggest that organizations are gradually shifting towards automation in SAP testing as they recognize its many advantages.
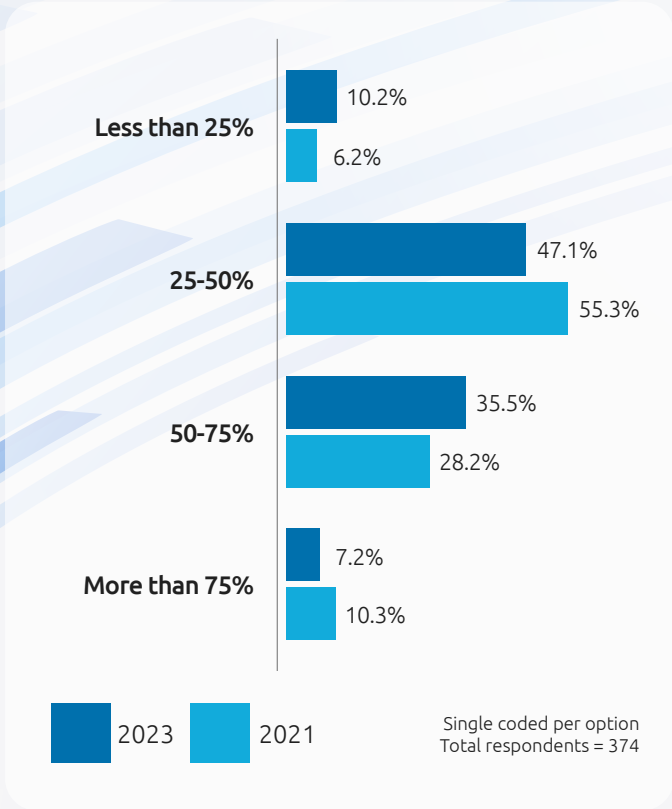
Despite the positive trends as depicted by our survey results, the adoption rate of automation in SAP projects may be relatively slower than anticipated. This can be attributed to organizations' tendency to reduce testing budgets to mitigate risks.

Our survey indicates that 42.7% of the organizations have automated more than 50% of their SAP testing processes, showing a slight increase from 38.5% in 2021. On the other hand, 57.3% of the organizations have automated less than 50% of their SAP testing processes, a decrease from 61.5% in 2021. These findings suggest that organizations are increasingly embracing automation in their SAP testing.

	2023	2021
Combination of both	41.7%	43.5%
Automated	32.9%	26.6%
Manual/Traditional approach	25.4%	29.9%

Single coded per option
Total respondents = 501

How are SAP testing services being performed at your organization?

"Automation adoption in testing is increasing, but most organizations prefer to use a combination of both manual and automated testing. This is because businesses are unaware of the potential commercial value that automated testing holds. Due to the high stakes and large costs associated with these projects, businesses feel pressurized to reduce costs, and most of them tend to do so by skimping on testing. However, it is expected to gain momentum in the coming years due to the evolving IT landscape across all kinds of organizations."

— Global Director — Data Analytics, Enterprise Architecture, Strategy, and Digital Transformation at an automotive manufacturing company

What percentage of SAP testing process at your organization is automated?

Automation level	2023	2021
Less than 25%	10.2%	6.2%
25-50%	47.1%	55.3%
50-75%	35.5%	28.2%
More than 75%	7.2%	10.3%

2023   2021

Single coded per option
Total respondents = 374

Closer examination of the level of automation integrated into systems shows that 61.8% of the respondents from the organizations utilizing automation for SAP testing have implemented it specifically for security testing. Furthermore, 54.5% of the organizations leverage automated functional testing while 47.9% of the organizations utilize automated regression testing. The data indicates that a relatively similar proportion of respondents use automation for dedicated performance/stress testing and interface/API level (automated API testing) at 44.7% and 44.4%, respectively.

Testing type	%
Security testing	61.8%
Functional testing	54.5%
Regression testing	47.9%
Dedicated performance/stress testing	44.7%
At Interface/API level (Automated API testing)	44.4%
Service Virtualization – simulation of 3rd party systems	41.4%
Complete lifecycle approach (requirement, implementation and specification)	30.7%
Portal testing	27.8%

Multi coded per option
Total respondents = 374

What level of automation have you achieved in your organization's environment?

Less than 25% — 9.4%

25–50% — 52.1%

50–75% — 26.5%

More than 75% — 12.0%

Single coded per option
Total respondents = 501
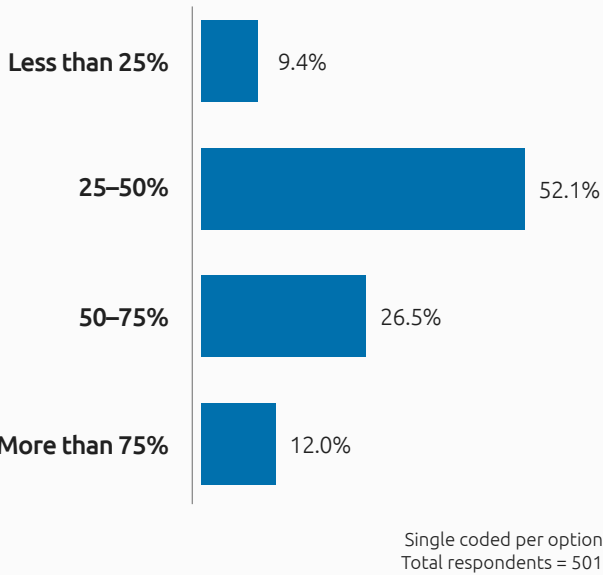
What is the estimated % of efficiency that can be gained by fully automating the testing process?

Use of AI/ML-based tools gaining prominence in SAP testing

Rising adoption of AI/ML-based tools

Advancements in AI- and ML-based solutions are catalyzing the adoption of automation in SAP testing. Our survey findings indicate a growing acceptance of these technologies for SAP testing in 2023, compared with that in 2021. Approximately 43.7% of the surveyed organizations have adopted AI/ML for automating SAP testing, marking a significant rise from the 26% recorded in 2021. However, some organizations still seem to be hesitant to embrace AI/ML tools for SAP testing owing to factors such as lack of technical expertise, limited understanding of the benefits and costs involved, and the absence of successful use cases of AI/ML in SAP testing.

"Use of AI and automation is very helpful in interface testing, not just for APIs but also for file formats used for interface between systems. It also helps to automatically test interfaces by running a library of files used in production."

— Head of IT Services – Supply Chain at a multinational pharmaceutical company

No
56.3%

Yes
43.7%

Single coded per option
Total respondents = 501
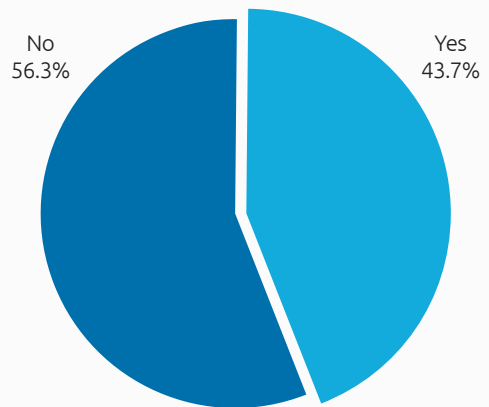
Are you using AI/ML tools for automating your SAP testing processes?

"Artificial intelligence and machine learning technologies are increasingly being used to automate SAP testing operations. The use of script-less testing in AI and machine learning results in the creation of better-quality test scenarios, and reduces project elapsed time. However, the use of AI can reduce effort and project time while assisting in loss analysis and change management."

— Senior Director – Global SAP Application Services & Supply Chain at a global CPG firm

Accuracy and continuous improvement – most sought-after benefits of AI/ML in SAP testing

The utilization of AI/ML technologies in business provides employees with the opportunity to focus on challenging, creative, and high-value tasks, eliminating the unnecessary effort required in manual and repetitive activities. Moreover, the use of AI helps enhance overall business outcomes by enhancing customer service, enabling proactive strategic decision-making, and fostering a more cohesive workforce. According to our survey respondents, the key advantages of utilizing AI/ML technologies in SAP testing include heighten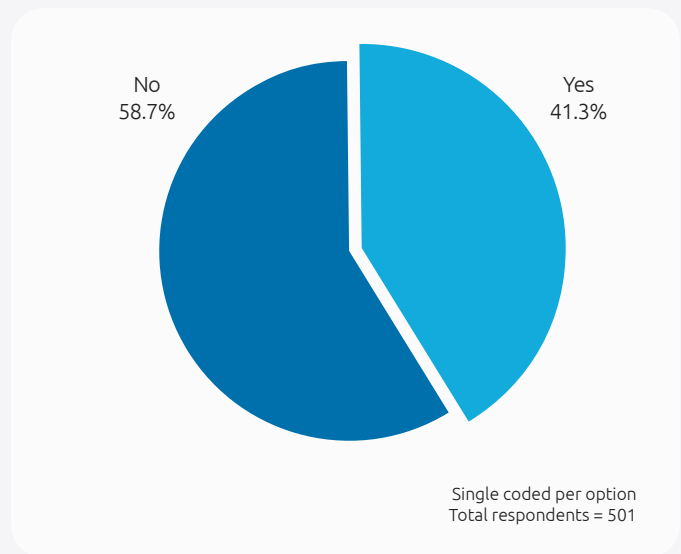ed accuracy in results (46.9%), ongoing improvement (45.7%), and reduced human effort through the automatic replication of laborious operations (45.3%).

Service virtualization streamlines SAP testing processes, ensuring smooth transition

Service virtualization/simulation tools have garnered significant attention among industry experts due to their valuable contributions in achieving defect-free product releases, ensuring timely deliveries without service disruptions. A prominent trend observed in 2023 reveals that 41.3% of the respondents have embraced service virtualization/simulation tools to automate their manual SAP testing processes. These tools offer a range of noteworthy benefits, eliminate external dependencies within SAP projects, facilitate the decoupling of SAP testing from non-SAP applications, and yield cost reductions. While comprehensive system testing in a production-like test environment may seem appealing, it is only practical for relatively simpler systems.

Benefit	Percentage
More accurate results	46.9%
Continuous improvement	45.7%
Reduced human effort by automatically replicating tedious tasks	45.3%
Business process improvement	43.5%
Identify probable causes of failure and prevent them before they occur	43.5%
Reduced costs	40.5%
Help identify critical risk areas	39.3%

Multi coded per option
Total respondents = 501

What are the key benefits of using AI/ML in SAP testing?

No 58.7%
Yes 41.3%

Single coded per option
Total respondents = 501

Are you using service virtualization/ simulation tools for automating your manual SAP testing processes?

Testing in SAP transformation projects, such as Selective Data Transitions/Bluefield or complex Brownfield projects, where numerous third-party systems and EDI/B2B partners are involved is way more complicated than it appears. Service virtualization is an effective way to deal with these complications, control costs, and ensure effective end-to-end testing in SAP S/4HANA implementation projects.

Service virtualization proves to be beneficial in addressing the challenges encountered during the implementation of SAP S/4HANA as simulating third-party systems not only reduces costs but also enhances productivity. It accelerates the implementation process by eliminating the need for coordination with multiple parties. This approach makes the implementation more sustainable by eliminating the requirement to establish matching tiers of test environments for third-party systems and allowing testing of the existing systems without requiring them to be online. According to our survey, organizations that leverage service virtualization/ simulation in their SAP testing processes report a 48.9% reduction in effort while 47.1% report achieving more accurate results, and 43.1% experience improvements in their business processes.

Benefit	Percentage
Reduced SAP functional and SAP development effort by eliminating 3rd party coordination	48.9%
More accurate results	47.1%
Business process improvement	43.1%
Eliminate external dependencies for SAP projects	42.3%
Decouple SAP testing from non–SAP applications	39.5%
Reduced costs	38.1%

Multi coded per option
Total respondents = 501
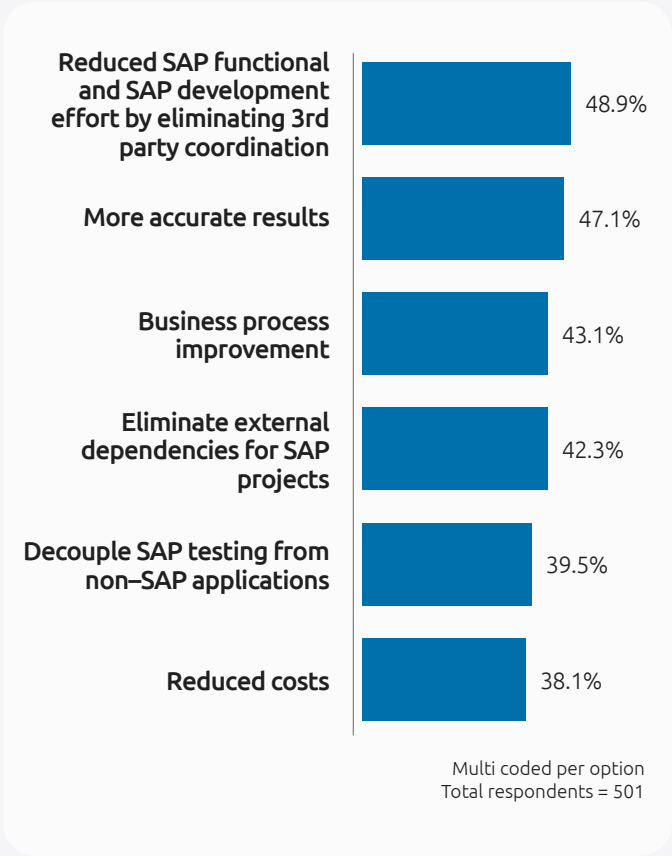
What are the key benefits of using service virtualization/simulation in SAP testing process?

In summary, service virtualization is a more effective and efficient way to conduct comprehensive SAP testing solutions. It enables a structured and systematic approach to address the complexities of SAP S/4HANA projects, resulting in optimized testing processes and seamless transition.

Business assurance for SAP solutions – challenges, gaps, and impact

The integration of SAP and non-SAP applications continues to pose a key challenge, primarily due to compatibility issues and the absence of API management platforms. To overcome these challenges, organizations prefer to implement system integration testing, involve a third-party QA team, and leverage service virtualization.

Key takeaways

- Among the complexities involved in an SAP environment, security-related aspects (information breaches) are the biggest concerns among organizations (29.1%) when it comes to business assurance for SAP solutions/end-to-end testing

- Apart from data security, the other challenges that affect SAP business assurance include the testing of cloud-native applications (28.5%), long execution times (26.1%), and generating meaningful testing data (25.9%)

- Extensive knowledge and expertise are necessary to address these challenges and enhance internal capabilities related to SAP implementation. According to the survey, approximately 32.9% of organizations have already established internal testing capabilities to tackle the challenges associated with SAP transformation. Additionally, 38.1% have made partial progress in building internal systems to address these challenges, but there are still some areas that need attention

- During the testing stage, organizations encounter multiple challenges when integrating SAP applications with non-SAP applications and other devices. Compatibility among applications is reported to be the most significant challenge as 49.5% of organizations have highlighted it. This challenge primarily arises from technological differences between on-premise and cloud-based applications, resulting in heightened complexity in data contextualization

- Furthermore, 49.3% of organizations consider the lack of API management platforms to be a key concern during the testing phase. In addition, 48.7% of organizations consider the lack of service virtualization/simulation for third-party systems during the testing phase a barrier

- The findings of our survey have also revealed that system integration testing (52.7%) and bringing a third-party QA team (52.7%) are the two most popular measures that most organizations take to overcome integration challenges during testing

- A notable proportion of organizations (32.1%) admit having severe data harmonization problems because of gaps in SAP testing and 30.9% report significant downtime or productivity losses as a result of inefficient SAP testing

Business assurance for SAP solutions – challenges, gaps, and impact

Driven by a stronger need to continuously innovate and further pressurized by SAP's announcement of ending support for SAP ECC by 2027, many organizations that were earlier reluctant to move to SAP S/4HANA have either already begun the transition or are planning to do so in the next few months. The proof of the pudding lies in our survey results. This urgent need to transition in a highly competitive, volatile, and demanding business environment is characterized by more complexities than ever.

The challenges organizations most often face during such transitions are multifold. They can range from security risks and lack of in-house expertise to customer dissatisfaction and in many a case, significant financial losses. In this section, we will delve into the key business assurance obstacles faced by organizations during SAP upgrades. Additionally, we will examine specific real-life scenarios where organizations have encountered significant challenges pertaining to the lack of planning, required resources or negligence on the part of responsible teams, resulting in substantial financial losses and other damages to business operations and customer relations.

Security vulnerability the biggest affliction in SAP implementation

In our survey findings, security-related aspects (information breaches) have emerged as the biggest concern among respondents (29.1%) during business assurance for SAP solutions/end-to-end testing. Security in SAP is a critical component, aimed at safeguarding the vital business systems used by organizations to carry out their core processes.

In addition to security, other operational and business-related challenges impact the business

assurance for SAP solutions. These include testing of cloud-native applications (28.5%), lengthy execution times (26.1%), and generating meaningful testing data (25.9%).

> "Inefficient performance testing and lack of domain knowledge among the implementation team are the key challenges in business assurance/testing. Addressing these challenges through comprehensive performance testing methodologies and building a competent team with strong domain expertise is essential for successful SAP implementation."
>
> — Chief Information Officer at a leading energy company

Industry experts have opined that apart from the above-mentioned challenges, integrating data across systems, addressing security issues, and testing cloud-native application integration are some of the other pressing issues. Overcoming these challenges requires efficient end-to-end testing, integration strategies, and building strong internal capabilities.

Internal capacity-building remains critical to business assurance

Our survey findings have revealed that developing internal capabilities continues to be the most sought-after means to tackle the business assurance challenges. About 70% of the respondents claim to have developed internal capabilities to tackle the challenges associated with SAP implementation. The finding is consistent with our 2021 survey, where 65% of the respondents emphasized the importance of the same.

Among the organizations that have developed internal capabilities, 32.9% stated that they already have robust internal capabilities to address all the challenges, exhibiting a slight increase compared with 2021. These results indicate that many firms

Security
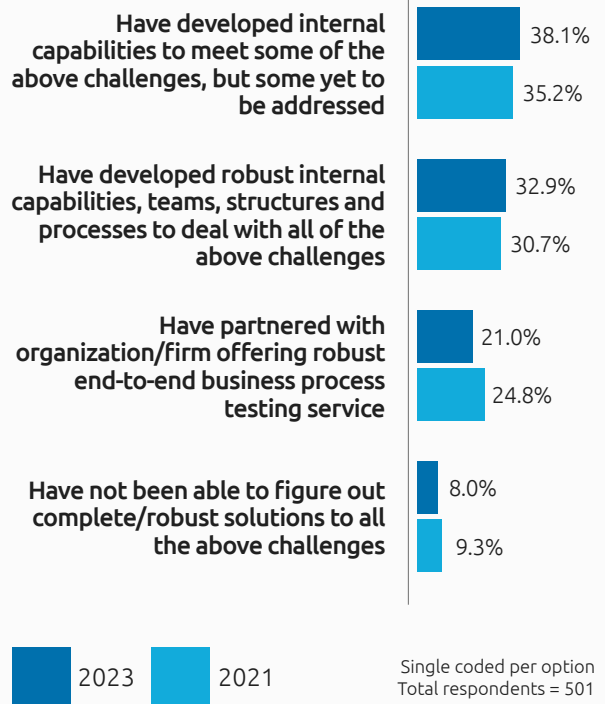(information breaches) — 29.1%

Testing of
cloud-native application — 28.5%

Long execution times — 26.1%

Generating meaningful
testing data — 25.9%

Improper monitoring and
reporting methods — 25.3%

Level of accuracy in
identification of defects — 24.8%

Downtime — 24.8%

Cost benefit analysis
of testing — 24.4%

Lack of required
skills/resources — 24.4%

Lack of clarity on scope
definition between testing and
defect management teams — 23.6%

Lack of business/
functional knowledge — 21.8%

Mismanagement in execution
of plans and phase signoffs — 20.2%

Low degree of
test automation — 16.2%

Multi coded per option
Total respondents = 501

What are the key challenges faced while implementing business assurance for SAP solutions/ end-to-end testing services?

have made progress in setting up internal processes to enhance their testing environment. It shows that organizations have worked toward ensuring the presence of competent teams, structures, and

procedures to effectively address implementation challenges.

At the same time, a significant proportion of the organizations (21%) collaborate with external vendors for reliable end-to-end business process testing services. Although this trend shows a slight decline from 2021, industry experts suggest that partnering with organizations offering strong testing services goes a long way in ascertaining successful transition or SAP implementation. They recommend that when evaluating these vendors, organizations must assess their understanding of organizational goals and the ability to navigate the project accordingly. In contrast with the organizations that have either built internal capabilities or are relying on external support, our survey results show that 8% of the organizations have still not found the ideal solution to address the challenges.

Have developed internal
capabilities to meet some of the
above challenges, but some yet to
be addressed — 38.1% / 35.2%

Have developed robust internal
capabilities, teams, structures and
processes to deal with all of the
above challenges — 32.9% / 30.7%

Have partnered with
organization/firm offering robust
end-to-end business process
testing service — 21.0% / 24.8%

Have not been able to figure out
complete/robust solutions to all
the above challenges — 8.0% / 9.3%

2023   2021

Single coded per option
Total respondents = 501

What measures are being taken by your organization to overcome these challenges?

47

Organizations continue to face significant challenges in integrating SAP and non-SAP applications
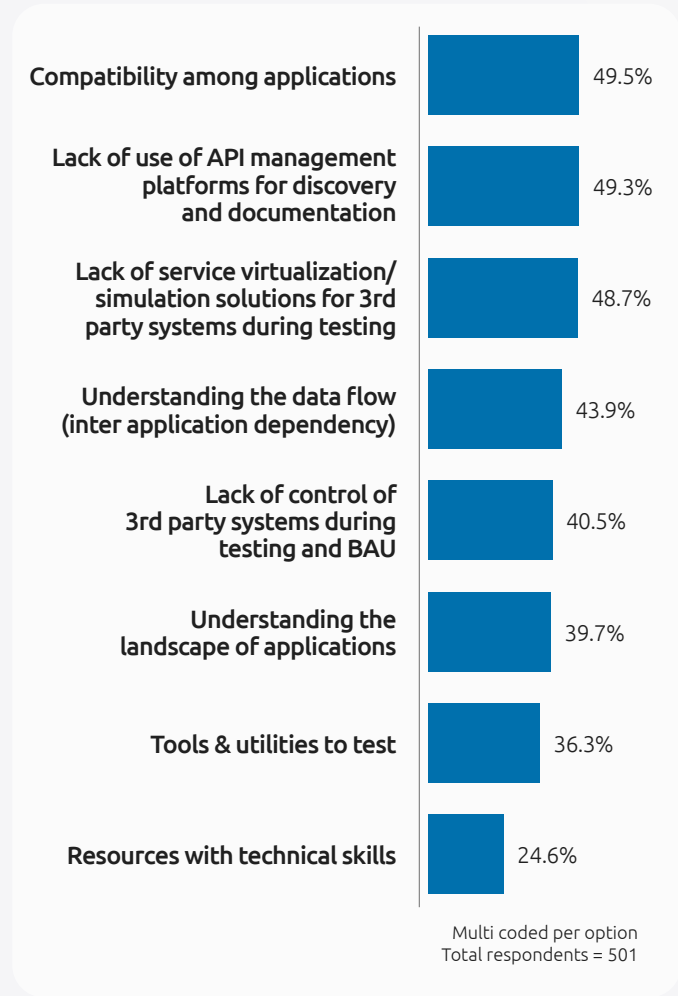
Among various other issues that organizations face when integrating SAP applications with non-SAP applications and other devices, incompatibility between SAP and non-SAP applications continues to be the most prominent concern, same as in 2021. This year, 49.5% of the survey participants identified it as their main challenge. This incompatibility arises primarily from technological differences between on-premises and cloud-based applications, leading to increased complexity in data contextualization.

Closely followed by incompatibility, 49.3% of the respondents stated that their organizations face significant challenges during testing due to the lack of API management platforms for discovery and documentation. Within that, the challenges with regard to API management platforms include inadequate release management leading to interface breakdowns, difficulties in keeping

up with multiple software releases, and the pressure to adopt new releases without complete understanding of the same. Robust release management practices, careful consideration of integration strategies, and use of service virtualization for SAP testing are some of the ways that can help organizations overcome these challenges.

Compatibility among applications — 49.5%

Lack of use of API management platforms for discovery and documentation — 49.3%

Lack of service virtualization/ simulation solutions for 3rd party systems during testing — 48.7%

Understanding the data flow (inter application dependency) — 43.9%

Lack of control of 3rd party systems during testing and BAU — 40.5%

Understanding the landscape of applications — 39.7%

Tools & utilities to test — 36.3%

Resources with technical skills — 24.6%

Multi coded per option
Total respondents = 501

"An average end-to-end business process typically involves the use of six to seven software programs that are interconnected, each with its own unique release. Businesses face the pressure to implement new releases because failure to do so can lead to system deterioration, which increases the overall management costs. This pressure often leads companies to make changes without fully comprehending the associated implications. Additionally, many service providers are actively promoting the transition to cloud solutions and no longer provide support for on-premise solutions. This further intensifies the pressure on businesses to migrate from on-premise to cloud solutions."

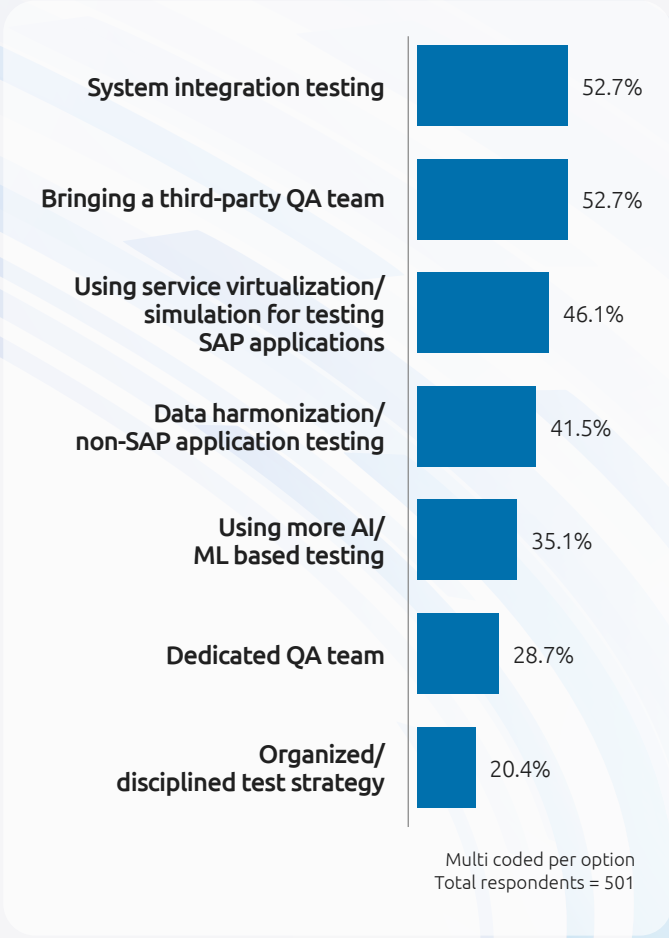— Chief Information Officer at a leading manufacturing company

What key challenges are being faced by your organization at the testing stage due to integration of SAP application with third-party non-SAP application, IOT devices, etc.?

System integration testing and engaging a third-party QA team – the most preferred solutions to integration challenges

Experts suggest that there are multiple potential solutions for integration challenges, among which a greater focus on System Integration Testing (SIT) stands out, particularly when integrating SAP with non-SAP applications. This specifically stands true for organizations with a large portfolio of non-SAP products (e.g., an oil and gas company).

Same as the findings of 2021 survey, system integration testing (52.7%) and bringing a third-party QA team (52.7%) are the two most popular measures a majority of the organizations take to overcome integration challenges during testing. Simultaneously, many companies (46.1%) use service virtualization/simulation to test SAP applications and overcome the integration challenges. Some other common measures include data harmonization/non-SAP application testing, AI/ML-based testing, establishing specialized QA teams, and following comprehensive and well-planned test strategies.
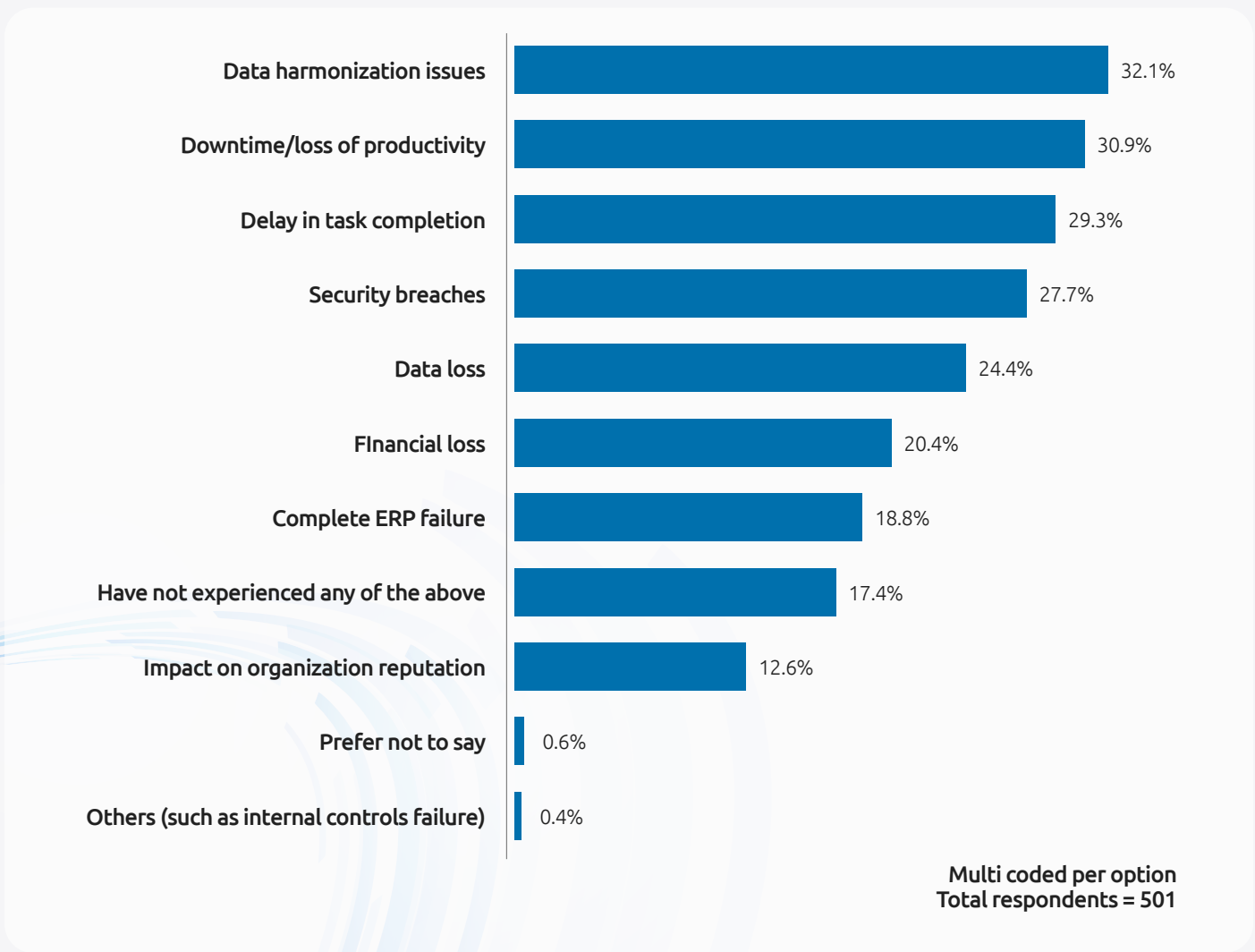
Measure	Percentage
System integration testing	52.7%
Bringing a third-party QA team	52.7%
Using service virtualization/ simulation for testing SAP applications	46.1%
Data harmonization/ non-SAP application testing	41.5%
Using more AI/ ML based testing	35.1%
Dedicated QA team	28.7%
Organized/ disciplined test strategy	20.4%

Multi coded per option
Total respondents = 501

What measures are being taken by your organization to overcome integration challenges at the testing stage?

From downtime to financial loss – the ramifications of inefficient SAP testing are multifold

Inefficient end-to-end testing or inadequate business assurance has the potential to put businesses in great trouble, with problems ranging from data harmonization concerns, prolonged system downtime, and ERP failures to financial loss and risk to reputation. According to our survey findings, a significant number of the organizations

(32.1%) have reported experiencing data harmonization problems due to gaps in SAP testing while 30.9% have acknowledged facing considerable downtime or productivity losses as a consequence of ineffective SAP testing. Additionally, other undesirable outcomes include delays in work completion (29.3%), security breaches (27.7%), and data loss (24.4%).

Category	Percentage
Data harmonization issues	32.1%
Downtime/loss of productivity	30.9%
Delay in task completion	29.3%
Security breaches	27.7%
Data loss	24.4%
FInancial loss	20.4%
Complete ERP failure	18.8%
Have not experienced any of the above	17.4%
Impact on organization reputation	12.6%
Prefer not to say	0.6%
Others (such as internal controls failure)	0.4%

Multi coded per option
Total respondents = 501

As a result of inefficient business assurance/end-to-end testing processes, has your organization experienced any of the above?

Case studies

Importance of robust business assurance for SAP solutions can also be judged with the help of case studies exemplifying the major consequences that organizations have suffered because of inefficient or non-existent SAP testing. Major breakdowns in SAP systems have led to significant losses in terms of productivity and more. Several failures have had highly adverse effects on businesses, including failing to complete tasks on schedule, breakdown in data synchronization between SAP and non-SAP applications, and security vulnerabilities.

In this first case study, we focus on the repercussions of an incident where a global automotive electronics company delayed implementing the regular upgrades and patches for SAP S/4HANA.

Case study 1: Cascading effects of an organization's inability to deploy SAP upgrades in time

SAP provides the latest SAP S/4HANA support package stack to new customers, and from thereon it is the customers' responsibility to implement any subsequent upgrades and patches as and when SAP releases them. As much as keeping pace with these upgrades is critical to businesses, more often than not organizations lag on this front, and in most cases, end up with adverse consequences.

In this company, there is always a lot at stake in missing out on the latest innovation or not being able to efficiently test and implement a system as there are about 20+ business functions and more than 7000 users that avail the ERP system at any given point in time. Besides, being in a B2B business, this company deals with large clients involving several high-value shipments that are all prone to being affected if the ERP system goes down.

Gaps

During its SAP S/4HANA implementation journey, the company struggled to regularly test and deploy the upgrades that SAP would release to address issues related to downtime/ loss of productivity, security breaches, etc. The organization remained almost 10-12 upgrades behind the latest development, as a result of which it could not take advantage of the latest upgrades despite paying for maintenance support.

A state of denial and lack of testing capabilities

Some of the key reasons the company was missing out on deploying the upgrades in a timely manner are centered around the company not being aware nor able to cope with such upgrades. First, the company did not consider the regular alerts and announcements from SAP, and secondly, it experienced a long lead time while testing the systems due to a lack of the right kind of testing platform. Moreover, the concern with regard to the associated impact of the long lead time on the 7000+ users discouraged the company from deploying the upgrades or moving to the latest versions.

Consequences

While SAP has been at its best in sending regular alerts asking organizations to upgrade their ERP systems as and when it releases a new patch, the denial and resulting delay in deploying the upgrades often leave organizations in dire straits.

Downtime

As a result of the missing upgrades, the company has had to witness three instances of a downtime of 20-30 hours over the past five years. The cumulative average downtime in this period has been almost 50 hours.

Financial loss

Each hour of downtime costs the company around US$ 100,000-150,000. As a result of the multiple instances of downtime over the past five years, it had to bear a total loss of US$ 5-7.5 million.

Performance depletion

In addition to the financial strain, the incidents of downtime have a damaging effect on performance too. The company reported around 6-7% degradation in performance in each instance where it failed to meet its SLAs due to downtime. This degradation further affected customer satisfaction, which is one of the biggest cascading effects of lags in the timely deployment of SAP upgrades.

This case study examines a company's SAP implementation journey and highlights the adverse consequences of lack of understanding of aspects related to e-invoicing and potential changes in the same, which ultimately led to delivery delays and loss of customer trust.

Case study 2: Delayed shipments and customer losses owing to lack of foresight during testing

A large consumer packaged goods (CPG) company had undertaken an SAP implementation project to improve its business processes. As part of this, it incorporated an e-invoicing process, which is mandatory in multiple countries. E-invoicing involves real-time reporting to the government for tax purposes and is essential for shipping goods. However, the company lacked understanding regarding a specific invoice format and the associated government regulations, due to which it missed incorporating certain crucial invoicing aspects during its testing process. These aspects surfaced as loopholes after the go-live phase, resulting in a multifold business impact.

Gaps

While the company had successfully conducted tests prior to the go-live phase and believed that everything was on track, issues began to arise after the system went live. The main problem emerged from the company's inability to implement e-invoicing projects seamlessly. It encountered difficulties in processing orders due to a lack of alignment with the government's real-time reporting format. Consequently, shipments were blocked for extended periods, resulting in disruptions and delays.

Insufficient understanding and expertise

The importance of comprehensive testing and a thorough understanding of government regulations cannot be overstated when it comes to SAP implementation. It is absolutely essential for businesses to anticipate potential changes in requirements and ensure alignment with the most up-to-date standards before proceeding with the go-live phase. Failure to do so can result in various negative consequences, and in this case the company suffered some detrimental impact of a lack of awareness and preparation regarding these crucial aspects.

Absence of collaborative efforts

The absence of close collaboration with government entities and a lack of consistent monitoring of regulatory upgrades can have damaging effects. It is essential for organizations to foster a culture of continuous improvement, and proactively anticipate changes in order to avoid costly disruptions and ensure customer satisfaction. By neglecting these collaborative efforts, businesses face unforeseen challenges and potential setbacks that could have been prevented through effective cooperation, vigilance, and robust business assurance in SAP testing.

Consequences

Despite the company's conviction that it had diligently adhered to proper testing procedures, the misguided confidence in the testing process led to substantial business losses, operational inefficiencies, and, ultimately, customer dissatisfaction and churn.

Business losses

The financial losses incurred by the company were a direct result of the delays in shipments. In some countries, it is mandatory to have accurate invoicing at the time of order placement. Due to incorrect invoices, the orders could not be processed, resulting in a loss of revenue.

Operational inefficiencies

The inefficient testing practices had broader operational consequences, highlighting a lack of knowledge and understanding of government requirements and a potential for any changes in the business's operating environment that may occur between the testing stage and the go-live phase. Such knowledge gaps created implementation issues that only became apparent after the system was operational, resulting in rework, wastage of time, and increased costs.

Customer dissatisfaction and churn

The company experienced customer dissatisfaction due to delayed shipments and the inability to fulfill orders promptly, which in turn increased the likelihood of customer churn and a loss of customer loyalty. Within less than three months, over 10% of customers switched to alternative providers because their expectations were not met.

This case study shows how an energy and utilities company had to bear unnecessary costs and deal with other implications to business as a result of a missed scenario in SAP testing and lack of robust business assurance while upgrading from SAP ECC to SAP S/4HANA.

Case study 3: Multifaceted impact of a missed functionality in moving from SAP ECC to SAP S/4HANA

When a leading multinational energy and utilities company upgraded its ERP suite from SAP ECC to SAP S/4HANA, it was naturally looking forward to a multitude of advantages. However, what followed post implementation and go-live of the upgraded suite left the IT team and service providers confused; and the users and customers disgruntled.

Given the size and scale of its business operations and the complexities involved in moving from an older version of SAP to the most advanced one, the company was aware of the gravity of the situation and the probable consequences if something were to go wrong. However, it was completely unaware that something very critical to its business had gone amiss during the transition.

Gaps

The biggest challenge when moving from SAP ECC to SAP S/4HANA was the lack of understanding about some of the legacy components that were critical to the company's business operations. Owing to this lack of understanding and inefficient testing, the absence of a critical module in the new suite remained overlooked, which then affected the business in several ways.

The lost module

Amid the hustle to transition to SAP S/4HANA, it was not noticed that the SAP ECC version had a specific module for mass and volume conversions, which had gone missing in the new suite. The module was critical to invoicing as it used to feed into margin calculation, and was used for both accounting and inventory management purposes. For the company, calculating the gross refining margin on a daily basis is the biggest corporate challenge, alongside ascertaining the exact inventory at the end of each day. In absence of this specific module, the company had to look for another tool and buy it off the cloud.

Consequences

Even though the company found an alternative to the mass and volume conversion functionality that was part of SAP ECC, it had to suffer multiple consequences due to missing out on its absence in the new suite during testing. One of the biggest impacts was the resulting change freeze in testing, which caused a massive delay in taking the new system live. Delayed implementation was naturally followed by various other repercussions.

Delay in go-live

The failure of the teams to proactively realize the absence of the module pushed back the go-live date by three to four weeks, leading to the inability of the business to roll out certain other changes in a timely manner. After the company realized that the specific module was missing in the new suite, it had to announce a change freeze while it looked for solutions to tackle the problem at hand.

Additional cost

The delay in taking the system live resulted in extra cost as the company had to continue to compensate the consultants and service providers for the additional weeks of their service. This added expense was about 7-8% of the total cost of the project.

Customer dissatisfaction

The impact on the invoicing process directly reflected in the form of customer dissatisfaction as a four-week delay left several of them displeased. Fortunately for the energy industry, one doesn't easily lose customers, however such a delay certainly affected the company's relationship with its customers.

This case study demonstrates the post-implementation consequences of inefficient integration testing during transitioning to SAP S/4HANA, highlighting how detrimental such lags can be to a business after the new system goes live.

Case study 4: Impact of inadequate integration testing while transitioning to SAP S/4HANA

Driven by SAP's announcement to ending the support it provides to its SAP ECC users, a leading manufacturing company had no choice but to move to SAP S/4HANA. Even though this decision was not initiated by business, the company ensured the involvement of the business teams with the IT teams to understand and incorporate their requirements in the upgraded suite. Despite these efforts, the company faced certain challenges during testing as some functions and components in SAP S/4HANA varied from those in ECC. Besides, it had to ensure that it replicates all its existing business-specific customizations in the new system.

As the company aimed to integrate the new SAP system with its other critical existing aspects, including customer data, product lifecycle management, and intelligence platforms, it had to conduct meticulous integration testing. However, the fact that its testing efforts were not efficient enough came to light only after it had taken the new system live. The resultant damage revealed itself in the form of severe consequences including financial loss and reputational damage.

Gaps

Given the scale of manufacturing, logistics and warehouse management are extremely critical to the company's business, and it was aware that ensuring data integrity and enabling seamless system integration are going to be its key challenges during SAP testing. Besides, it had the realization that if something were to get missed during testing with regard to the functionalities involved in the two critical aspects, the repercussions on its business would be daunting. Despite these realizations, certain critical scenarios related to the integration of the SAP platform with other systems were not adequately tested by the project team during the implementation and testing phase.

Inadequate integration testing

The gaps in testing arose due to a lack of knowledge and anticipation of potential scenarios by internal and service provider team members. As a result, the project team failed to adequately anticipate and account for certain scenarios during the integration testing phase. This affected important aspects such as product shipment, delivery processes, and integration with the warehouse management platform. In addition, the team missed out on parameter changes in order types, including drop shipments and regular warehouse shipments, when transitioning from ECC to SAP S/4HANA.

Consequences

As a result of the inadequate integration testing, after taking the system live, the company witnessed a failure to receive orders from customers through the electronic data interchange (EDI) system. This had a significant impact on business operations and customer satisfaction.

Delayed shipments

The issues identified after the testing phase, and lags in order placement, caused delays in shipping orders and ultimately led to order cancellations. These delays created additional operational challenges and further exacerbated the financial impact on the company.

Financial loss

The glitch that resulted in the failure to receive orders, as customers canceled their orders, was identified and rectified within one-and-a-half weeks. The estimated financial impact during this time was approximately US$ 300,000-400,000.

Customer dissatisfaction

The inability to receive and fulfill customer orders in a timely manner led to customer dissatisfaction. Even though the company did not report any customer churn, the incident left its customers displeased, highlighting the importance of thorough testing and the impact of its absence on critical business operations and customer satisfaction.

This case study shows how a pharmaceutical company faced implementation delay and had to bear other consequences as a result of lags in the planning stage involving lack of focus on SAP testing automation in an effort to save time.

Case study 5: Cons of inefficient planning and ignoring automation in the initial phases of SAP testing

When a leading US-based biopharmaceutical company decided to move from Oracle to SAP S/4HANA, it was anticipating a transition time of at least a few years. Besides, with multiple systems and processes involved, it needed robust planning for data migration and system integration. Simultaneously, the company was under immense time pressure with regard to the configuration, development, and availability of crucial tools for integration testing cycles.

ERP upgrade projects are always pressed for time and enabling automation is time-consuming. This is why, often, organizations don't initially invest enough time to enable automation and then later bear the consequences. In the short run, it may seem like it takes more time to automate, but in the longer run, automation pays dividends.

Gaps

Even though the company was fully aware of the importance and advantages of SAP testing automation, it did not consider this aspect in the planning phase considering that it will take

longer to enable automation than it would to just run through the tests manually. As it began its transition with this thought-process, it faced an enormous challenge with regard to data migration and data mapping between Oracle and SAP S/4HANA suite. The tool it was relying on for the same had failed to deliver, pushing its schedule back by several months.

The loophole in planning

To begin with, the company chose a particular tool to migrate its data from Oracle to SAP S/4HANA. Given that this data migration was not just a simple replication of data as it required the conversion of Oracle-based legacy data into SAP-specific data model, the company faced several challenges. For instance, the data mapping logic required fine-tuning to ensure accurate data transfer between the two systems. However, the company failed to get the replication and data mapping between Oracle and SAP to work correctly with this third-party tool. As an alternative, it looked for another tool that allows functional testing and security testing to be automated. This back and forth had a significant impact on the project schedule, resulting in increased effort and expense.

Consequences

Had the company planned its SAP testing better through robust business assurance practices and invested upfront in a higher degree of testing automation, it would have been able to execute system integration tests faster, working through more end-to-end scripts than it could in this scenario. Owing to the fact that it started focusing on automation only during the latter stages of testing cost it in several ways.

Delayed implementation

The gaps in planning and switching between different tools pushed back the entire implementation schedule significantly. The company's transition from Oracle to SAP S/4HANA faced a delay of six months, specifically in the phase of moving the release to production.

Data quality concerns

The company was only focusing on unit testing within system integration testing instead of executing end-to-end testing, which caused significant concerns related to data quality.

Increased expenses

The defects and the delay in taking the system live resulted in extra cost, equivalent to millions of dollars, as the company had to continue to compensate the consultants, system integrators, third-party boundary applications, and service providers for the additional months of their service.
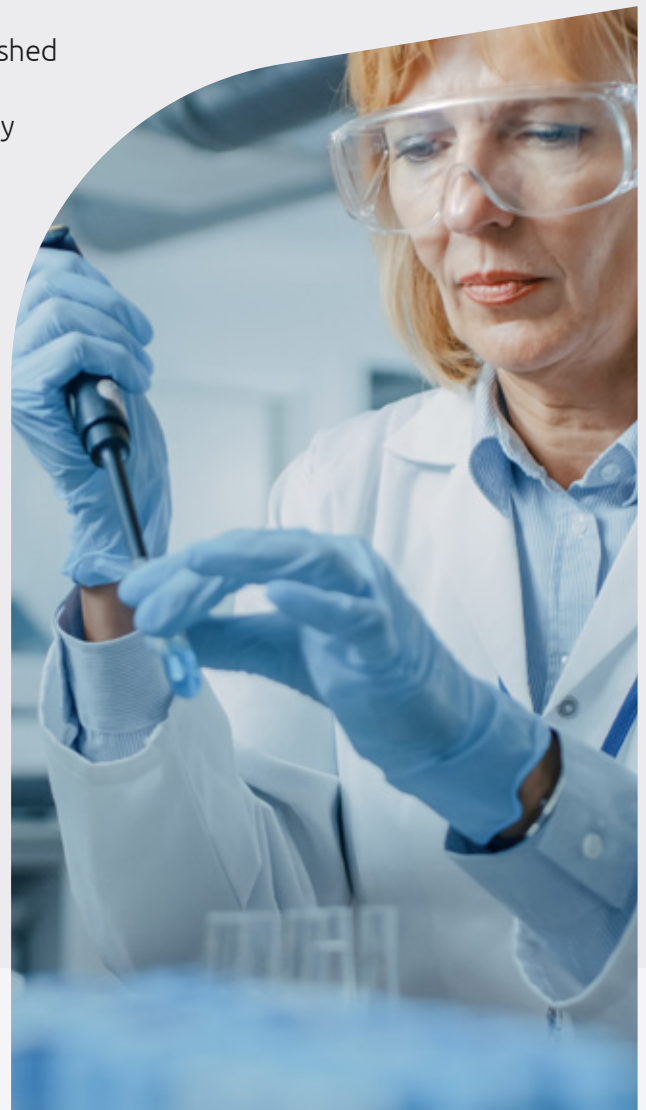
Ideal business assurance for SAP solutions – understanding customer expectations

When choosing an ideal business assurance solution for SAP transformation, organizations prioritize testing quality, test script adequacy, and the availability of automated skills and tools. Furthermore, there is an increasing inclination toward utilizing integration platform as a service (iPaaS) solutions for comprehensive testing. iPaaS offers robust security measures, supports AI technologies and automated processes, and provides API management tools for efficient monitoring of integration flows.

Key takeaways

- Organizations prefer comprehensive business assurance services for holistic support during the testing process. These services also help them evaluate the risks involved in the integration of SAP and non-SAP applications, and other devices

- According to our findings, 41.3% of the organizations agree that ideal business assurance for SAP solution caters to end-to-end business process testing, enabling seamless integration of non-SAP devices into SAP systems

- About 39% of the organizations believe that an ideal business assurance solution should offer the highest quality of testing

- Recognizing that organizations may not always possess internal access to comprehensive testing skills and tools, industry experts have acknowledged that specialized service providers can offer significant benefits to organizations with their in-depth knowledge and strong technological expertise

- Other factors that characterize ideal business assurance solutions include ensuring an appropriate level of test scripts (37.9%), such that they effectively meet the demands of the business, and having access to automated skills and tools (37.7%)

- Notably, 43% of respondents consider high-quality testing as an 'extremely important' criterion for an efficient business assurance solution for SAP

- As SAP customers prepare to upgrade from Business Suite 7/ECC to SAP S/4HANA by 2027, the need to transition from the SAP Process Orchestration platform to the SAP Integration Suite has become more pronounced

- As the SAP Integration Suite serves as a reliable and comprehensive enterprise iPaaS, supporting both API-led and event-driven integration patterns, the demand for such integration tools and services has surged further among organizations grappling with dynamic data sources and fragmented manual processes for integration

Ideal business assurance for SAP solutions – understanding customer expectations

In the previous section, we discussed how business assurance inefficiencies can prove to be detrimental to businesses in a multitude of ways. Knowing the gravity of impact of any negligence or lag in SAP testing, it is critical to also understand what ideal business assurance for SAP constitutes. To this end, it is important to examine the qualities that organizations seek in reliable business assurance solutions, and this section offers insights into the expectations that organizations have from an ideal business assurance partner.

Strong preference for one-stop solutions for end-to-end testing

Most organizations seek a comprehensive business assurance service that can support them throughout the testing process, including the evaluation of non-SAP applications and devices integrated with SAP systems. Our latest survey results are similar to the findings of the 2021 survey, indicating that organizations still prioritize comprehensive end-to-end testing, along with testing quality and level of test scripts, as factors that determine if a business assurance for SAP solution/end-to-end testing solution is ideal for their business.

As per our survey, 41.3% of the respondents believe that an ideal solution is one that enables thorough end-to-end business process testing, ensuring seamless integration. Since organizations may not always have access to comprehensive testing skills and tools internally, they often rely on external partners or service providers. Industry experts have also opined that specialized service providers with extensive knowledge and strong technical expertise can offer significant benefits.

Meanwhile, 39.1% of the respondents believe that an ideal business assurance solution should offer the highest quality of testing. Real-life scenarios can significantly differ from lab testing scenarios, and experts consider testing quality to be a crucial factor that can make or break organizational performance in various situations. It is important to proactively envision and automate real-world load testing since timing can be a concern even when everything else is technically in place.

"For a new implementation, there is no existing system to map around, and hence the effective installation of an ERP, in such a case, is heavily reliant on the knowledge of the real business context in which the system exists. For instance, in the case of greenfield operations, there are no standards to judge great performance or quality. Here, any firm would demand extremely strong competence from its service providers, along with in-depth comprehension and understanding."

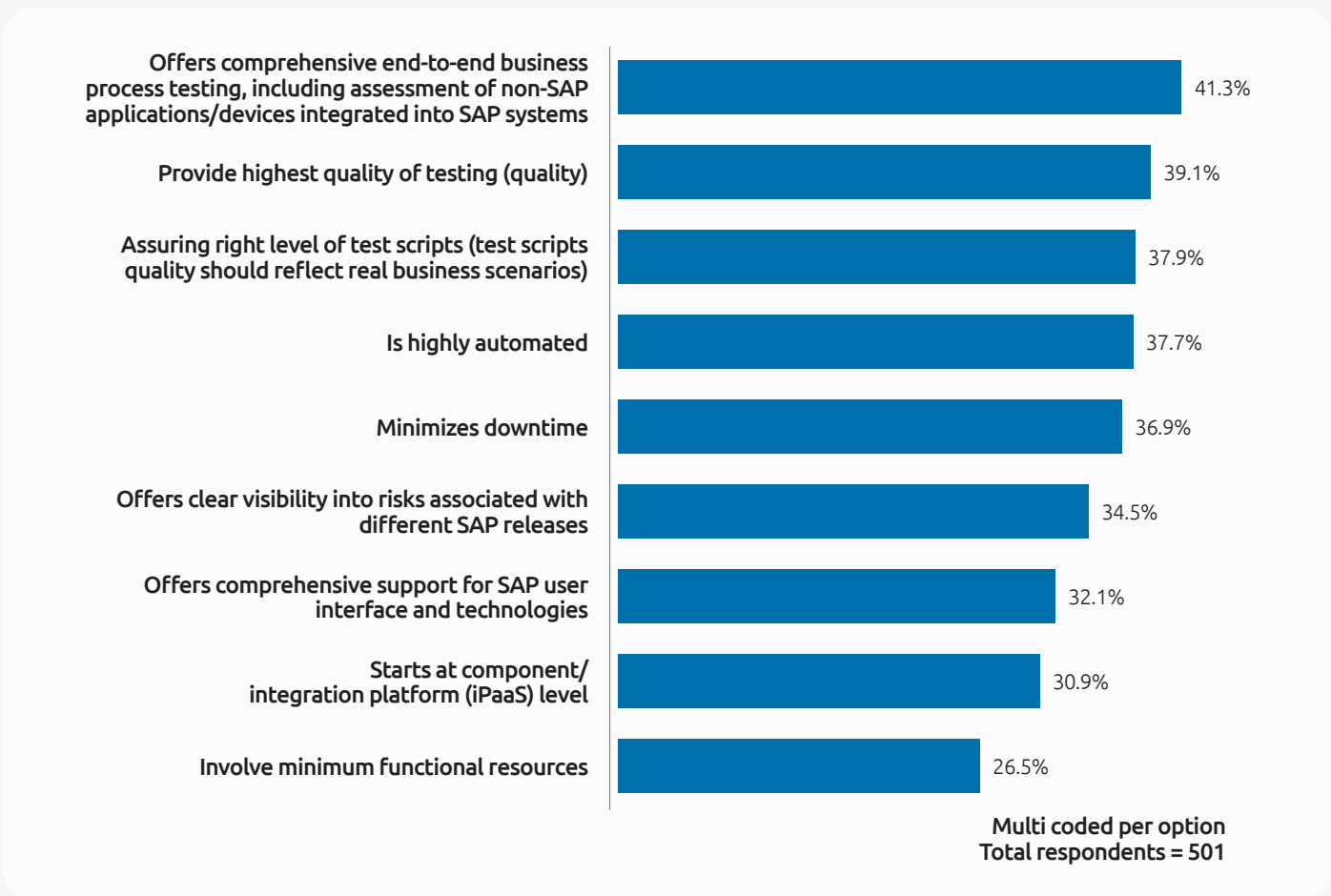— Chief Information Officer at a leading energy company

Furthermore, ensuring an appropriate level of test scripts (37.9%), such that they effectively meet the demands of the business, and having access to automated skills and tools (37.7%) are among the other key characteristics that organizations value in an ideal business assurance for SAP solution.

Growing preference for iPaaS solutions among organizations seeking comprehensive testing

Considering that organizations deploy ERP systems based on their unique requirements and objectives, the significance of different characteristics that define an ideal business assurance solution for SAP implementation can vary across different firms. Our recent survey results confirm the significance of high-quality testing, with 43.1% of the participants rating it as "extremely important". This finding is in congruence with our observations in the 2021 survey. Additionally, organizations prioritize other critical factors such as starting at the component/integrated platform level (iPaaS) (42.7%) in their pursuit of effective ERP deployment.

Testing remains a significant aspect of SAP implementation, accounting for 60-65% of the effort involved in migrations. This presents a significant opportunity for the increased adoption of iPaaS solutions in the future as organizations recognize the value of comprehensive testing to ensure successful ERP deployments while leveraging the benefits of iPaaS.

Talking of comprehensive testing, service virtualization enables new, emerging methodologies such as generative Test-Driven Development (gTDD), which use test cases from existing messages to automatically generate integration platform mapping programs using AI such as ChatGPT. This means that the development and maintenance effort of any integration scenarios can be shortened dramatically by using AI-enabled automated API testing solutions.

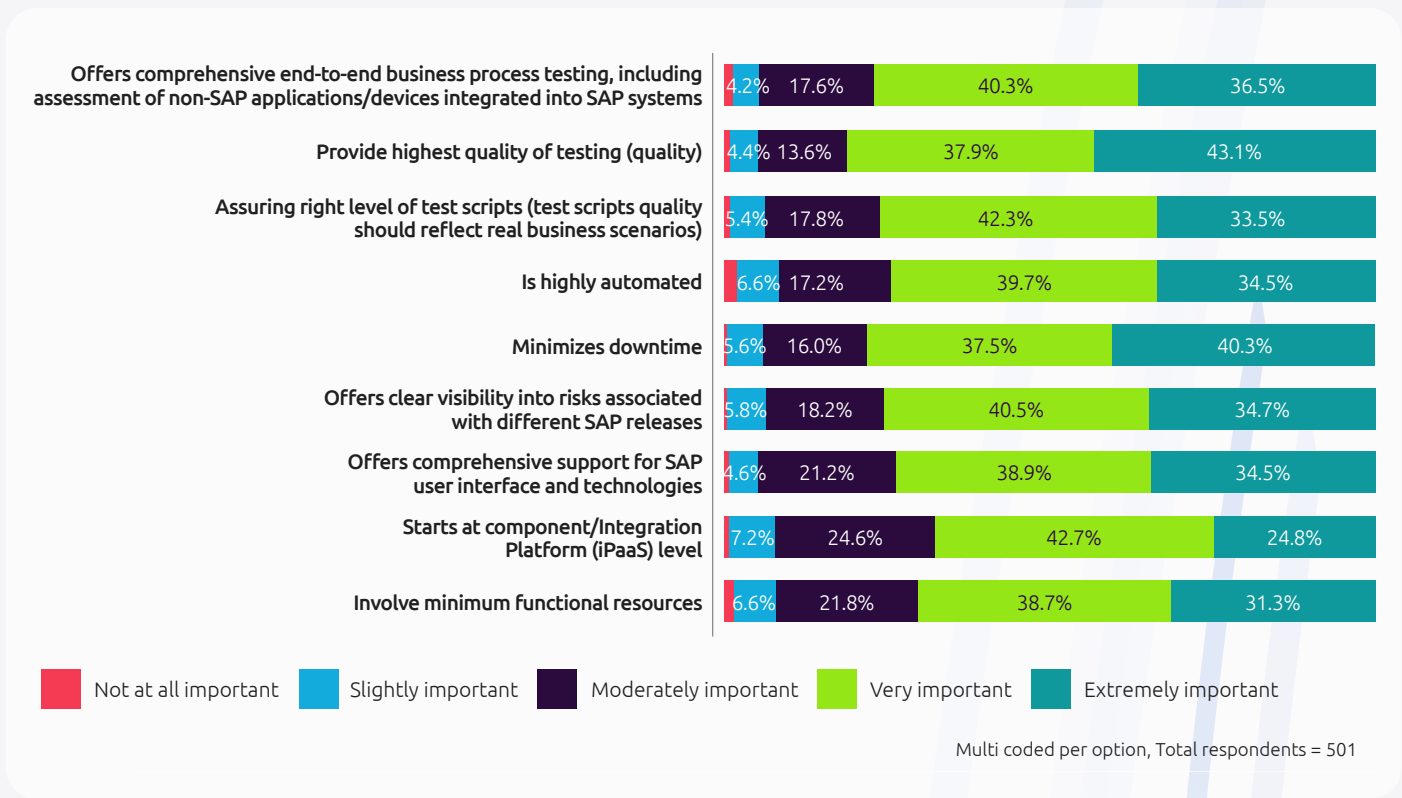| Category	Percentage
Offers comprehensive end-to-end business process testing, including assessment of non-SAP applications/devices integrated into SAP systems	41.3%
Provide highest quality of testing (quality)	39.1%
Assuring right level of test scripts (test scripts quality should reflect real business scenarios)	37.9%
Is highly automated	37.7%
Minimizes downtime	36.9%
Offers clear visibility into risks associated with different SAP releases	34.5%
Offers comprehensive support for SAP user interface and technologies	32.1%
Starts at component/ integration platform (iPaaS) level	30.9%
Involve minimum functional resources	26.5%

Multi coded per option
Total respondents = 501

What are your expectations from ideal business assurance for SAP solution/end-to-end testing solution?

Organizations are also continuously advancing their IT landscape to improve their operational efficiency and maintain or achieve market leadership. This trend has created a significant demand for iPaaS solutions that facilitate seamless data exchange and integration across applications, whether they reside on-premises or in the cloud. As SAP customers prepare to upgrade from Business Suite 7/ECC to SAP S/4HANA by 2027, the need to transition from the SAP Process Orchestration platform to the SAP Integration Suite has also become more pronounced.

The SAP Integration Suite serves as a reliable and comprehensive enterprise iPaaS, supporting both API-led and event-driven integration patterns. The demand for such integration tools and services has surged further among organizations grappling with dynamic data sources and fragmented manual processes for integration. iPaaS solutions enable companies to handle complex integration challenges during application modernization, streamline data and app management, and accelerate the integration of legacy systems. Moreover, iPaaS offers robust security measures such as encryption and authentication to safeguard sensitive information and prevent unauthorized access. It also supports AI technologies, automated processes, real-time updates, and API management tools, empowering organizations to monitor integration flows across multiple applications using pre-built connections.

Parameter	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Offers comprehensive end-to-end business process testing, including assessment of non-SAP applications/devices integrated into SAP systems		4.2%	17.6%	40.3%	36.5%
Provide highest quality of testing (quality)		4.4%	13.6%	37.9%	43.1%
Assuring right level of test scripts (test scripts quality should reflect real business scenarios)		5.4%	17.8%	42.3%	33.5%
Is highly automated		6.6%	17.2%	39.7%	34.5%
Minimizes downtime		5.6%	16.0%	37.5%	40.3%
Offers clear visibility into risks associated with different SAP releases		5.8%	18.2%	40.5%	34.7%
Offers comprehensive support for SAP user interface and technologies		4.6%	21.2%	38.9%	34.5%
Starts at component/Integration Platform (iPaaS) level		7.2%	24.6%	42.7%	24.8%
Involve minimum functional resources		6.6%	21.8%	38.7%	31.3%

Multi coded per option, Total respondents = 501

Rate the following parameters based on importance within your business assurance solution

Concluding remarks

Amid increasing realization among organizations of the numerous advantages of deploying advanced SAP versions and upgrades, the associated risks and challenges continue to prevail. The multiple challenges that organizations encounter during SAP transformation are intensifying the need for specialist service providers offering installation and testing services.

Our study shows that enterprises are more aware of the value that specialist testing service providers deliver, particularly in important areas such as integration platform/API/component testing and performance testing. Lack of functional and technical competence internally can expose organizations to operational interruptions, delivery delays, and financial losses. Considering these risks, engaging with a professional service provider is an efficient way to handle the difficulties that arise during SAP implementation or transformation. By doing so, organizations can proactively prevent downtime and production losses.

Research methodology

An integrated research methodology, combining desk research, quantitative survey, and in-depth expert discussions, was used to collect data/information for the report. The collected data/information was analyzed to reveal relevant insights and build the overall report.

Phronesis Partners, an independent market research company, deployed an integrated research methodology, combining desk research, in-depth expert interviews, and quantitative surveys to generate a robust outcome.

Desk Research

Desk research was conducted across tech journals, industry associations, SAP communities, published surveys/reports, press releases, and other relevant sources to assess existing adoption rates, challenges, strategies, and plans for SAP implementation and testing. Based on the outcome of desk research, key focus areas for further analysis were identified.
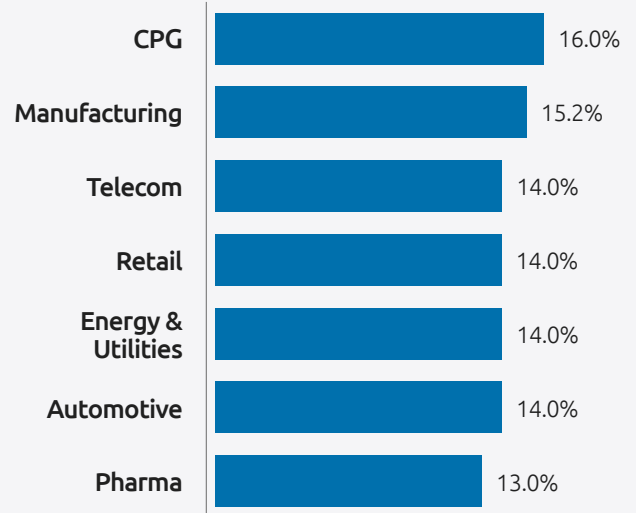
Quantitative Survey

To build an in-depth understanding of organizations' existing status, planned strategies, challenges, and expectations related to SAP implementation and testing, a quantitative survey covering 501 respondents from organizations with revenue over USD1 bn was conducted. All the respondents for this survey were involved in SAP implementation and testing within their organizations, with designations including IT director, CIO, CTO, information security head, head of SAP operations, and Vice President of Information & Technology. The respondents were chosen from across 11 countries spanning three continents and represented multiple industries, including automotive, energy and utilities, pharmaceuticals, retail and consumer goods, telecom, and manufacturing.
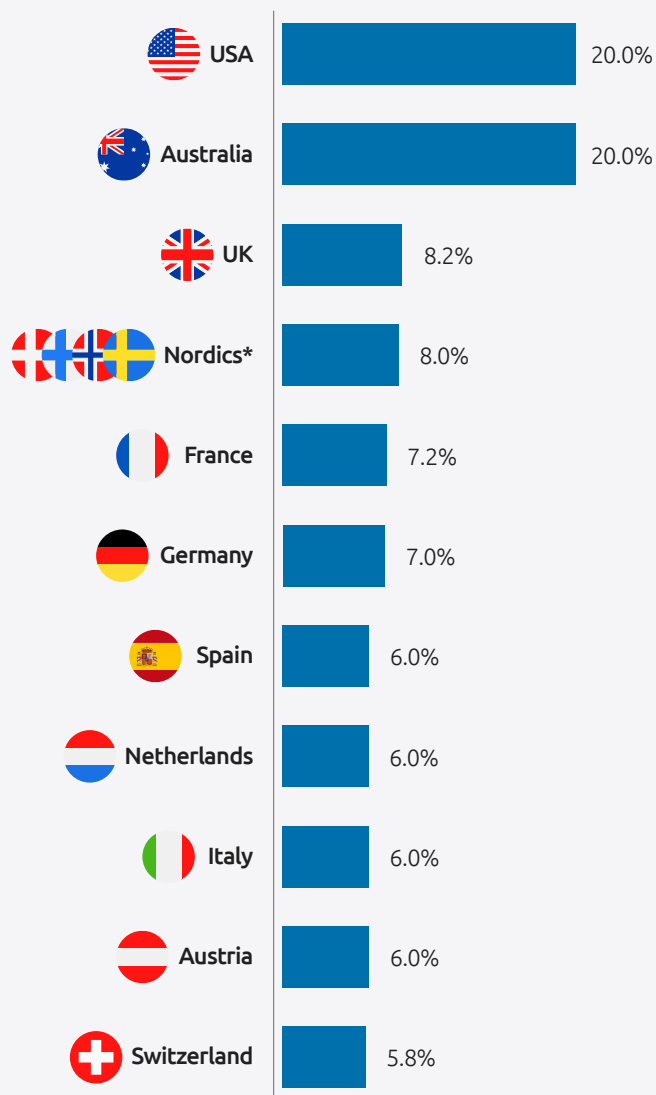
Expert Interviews

The findings from desk research and quantitative survey were further strengthened through in-depth interviews with six SAP business assurance experts from varied geographies and sectors. Each discussion lasted for 60-75 minutes and provided experts' views on the current and future outlook for SAP implementation and business assurance practices, use of technologies and automation in SAP testing, and key issues and best practices associated with SAP business assurance.

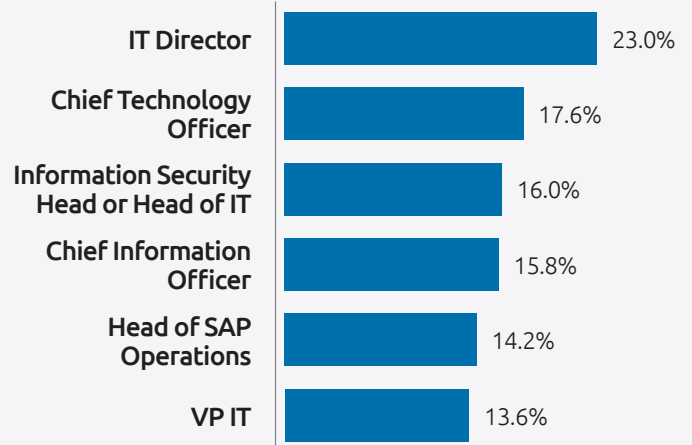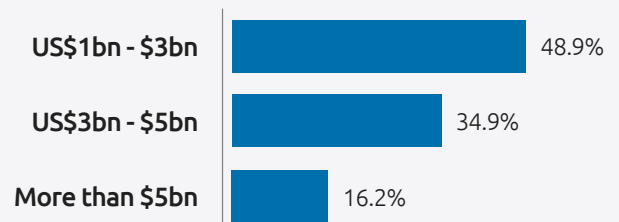# Quantitative survey demographics

Breakdown by Sector

Sector	%
CPG	16.0%
Manufacturing	15.2%
Telecom	14.0%
Retail	14.0%
Energy & Utilities	14.0%
Automotive	14.0%
Pharma	13.0%

Breakdown by Country

Country	%
USA	20.0%
Australia	20.0%
UK	8.2%
Nordics*	8.0%
France	7.2%
Germany	7.0%
Spain	6.0%
Netherlands	6.0%
Italy	6.0%
Austria	6.0%
Switzerland	5.8%

* Denmark, Finland, Norway, Sweden

Breakdown by Designation

Designation	%
IT Director	23.0%
Chief Technology Officer	17.6%
Information Security Head or Head of IT	16.0%
Chief Information Officer	15.8%
Head of SAP Operations	14.2%
VP IT	13.6%

Breakdown by Revenue

Revenue	%
US$1bn - $3bn	48.9%
US$3bn - $5bn	34.9%
More than $5bn	16.2%

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Assurance for SAP solutions -
2023

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Int4

Int4 AG is a global leader in SAP integration testing and Service Virtualization. Our core solution, the Int4 Suite, offers a comprehensive range of SAP continuous testing and service virtualization solutions. It is specifically designed to support SAP customers who are integrating their business with numerous third-party applications and EDI/B2B business partners. Int4 Suite not only accommodates Test Driven Development approaches but also isolates SAP systems from external dependencies like third-party applications and EDI partners. This reduces the cost of SAP transformation programs and ensures timely, within-budget deliveries. Our Service Virtualization solutions cut down the test infrastructure, thereby making SAP landscapes more sustainable by conserving energy and resources. It's notable that our solutions are OEMed by SAP for two RiseWithSAP integration testing services. This underscores our status as an integral part of the SAP ecosystem.

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