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MOST SAP CUSTOMERS ARE MOVING SOME SAP

WORKLOADS

TO THE CLOUD

FLEXIBILITY, SCALABILITY, AND FASTER DEPLOYMENT CONTINUE TO DRIVE THE MOVE TO THE CLOUD; MAKING SURE THAT DATA IS SECURE AND COSTS ARE EFFECTIVELY MANAGED ARE INCREASINGLY CRITICAL

Robert Holland
VP & Research Director, SAPinsider

We have seen an increase in the number of organizations that are running at least some solutions in the cloud since **2019**, when we began tracking cloud trends occurring in the SAPinsider Community. While research in previous years has revealed that the number of enterprise workloads in the cloud has been increasing, our **2021** research focuses on how SAP workloads are being impacted by this trend. What we found is that 88% of SAPinsiders are running at least some of their SAP workloads in a private, public, or hybrid cloud environment. Of the 12% who are running all their SAP workloads on internal infrastructure, or in a managed environment on-premise, nearly two-thirds say that they plan to move those workloads to the cloud within two years.

The business drivers behind the move towards cloud-based infrastructure remain largely the same

as they did in 2020. What has changed is that there is now a much greater focus on ensuring that any data moved to the cloud is secure. This is combined with a need to manage the ROI and costs that are involved with moving data away from traditional on-premise environments.

Which SAP Workloads Are Moving to the Cloud?

Our research shows that workloads most likely to be running on either internal infrastructure or a managed environment-on premise are: manufacturing solutions; older enterprise ERP solutions like SAP ECC or SAP Business Suite; data warehousing solutions like SAP Business Warehouse; planning solutions; and financial solutions. In each instance at least 40% of the survey respondents were running these workloads in on-premise infrastructure.

Figure 1 Which Factors Are Part of Your Decision to Move SAP Workloads to the Cloud?
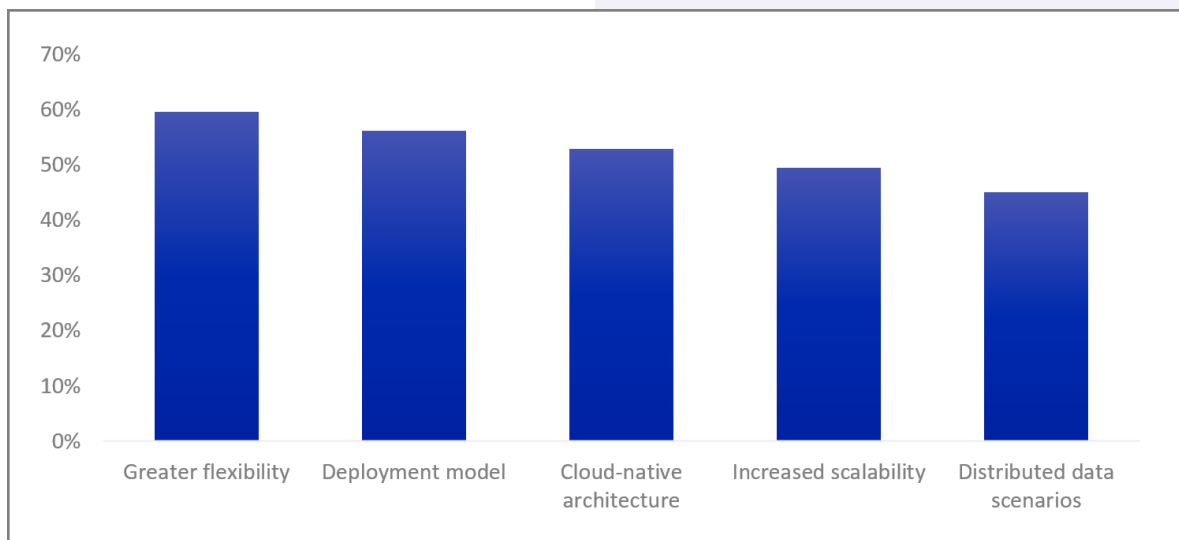
Workloads most likely to be running in a private or hybrid private cloud environment are travel solutions, likely SAP Concur running in an SAP managed environment, and customer relationship management (CRM) solutions. More than half of the respondents using these solutions said that they were running them in some form of private cloud. Solutions which were also likely to be running in private cloud environments included the SAP Business Technology Platform (BTP), probably in SAP HANA Enterprise Cloud; SAP S/4HANA; procurement solutions; supply chain solutions; and SAP HANA.

When looking at the public or hybrid public cloud, the workloads that were most likely to be running in that environment were SAP S/4HANA, with 49% of respondents running the solution indicating that it was running in a public cloud environment; HR solutions like SAP SuccessFactors; procurement solutions like SAP Ariba; the SAP BTP; and e-commerce solutions. Apart from SAP S/4HANA, between 40% and 43% of respondents running these workloads said that they were likely to be running in a public cloud environment.

Unsurprisingly, no respondents using travel solutions, procurement solutions, e-commerce solutions, or RISE with SAP were running these workloads on internal infrastructure. However, a third of those using e-commerce solutions said that they were running them

in managed environments on-premise, and a quarter of those using procurement solutions said that same thing. This would most likely be SAP HANA Enterprise Cloud but might also be a storage-as-a-service offering from one of SAP's large hardware partners.

Why are SAP Workloads Moving to the Cloud?

In choosing to move SAP workloads to the cloud, the primary goal that most organizations want to achieve is around greater flexibility (see **Figure 1**). Slightly less than two thirds (60%) of respondents indicated that this was a factor behind moving SAP workloads to the cloud, which corresponds with the fact that 52% of respondents said they plan to measure the success of their cloud initiatives by looking at whether they have achieved increased flexibility and scalability.

Also highlighted in Figure 1 is that organizations are looking for a way in which they can leverage the cloud deployment model. This is very important because according to the same research, the main business driver behind moving to the cloud is "business focus on digital transformation requires cloud-based deployments." The cloud deployment model — especially the ability to be able to pilot and deploy applications more quickly — is also one of the top ways in which organizations

88%
of SAPinsiders are running some SAP workloads in the cloud

will measure success. In all, 47% of survey respondents said that faster deployment of applications was a measurement they would use to determine project success (**Figure 2**).

The cloud deployment model also plays into the fact that 75% of respondents said they expect the cloud can resolve their high availability (HA) issues. Some are looking to achieve this by using a hybrid deployment model (both hybrid private cloud and hybrid public cloud deployment models were popular among survey respondents). Others may be using multiple cloud providers to achieve their HA goals, as demonstrated by our finding that most respondents who were using a public cloud provider for their SAP workloads tended to be using more than one. Some may be running different solutions on different providers, while others may be running a development or test system on one provider and running production on a second provider. Either way, cloud deployment models coupled with cloud-native architecture are very important reasons for organizations to choose the cloud.

It's notable that the top criterion for measuring the success of their cloud initiatives, according to respondents, is reduced costs. Respondents are also measuring flexibility and scalability, whether they are able to deploy applications more quickly, whether there is an increase in operational efficiencies, and whether security improves. These measurement criteria were also important for organizations when selecting a cloud service provider. The top three criteria used by respondents when making this choice were service level agreements (SLAs), data center locations, and security.

Protecting Vital Data

Beyond the business drivers that are pushing organizations toward cloud-based infrastructure and the actions that they are taking to address these drivers, respondents have requirements that they must meet. The two most important of those requirements are a plan for cloud-based data encryption and protection (85%), and data storage and protection requirements (79%) (see **Figure 3**). This directly connects to the fact that the need to protect access to sensitive and confidential data was the number one driver behind the SAPinsider Community's current **cybersecurity efforts**. With more and more organizations reporting cybersecurity and ransomware attacks, or responding to credentials being compromised within the organization, it is no surprise that securing data in every environment is critical. And particularly in the cloud.

While these security-focused requirements were important in our previous research, there was a near

Figure 2 How Will You Measure the Success of Your Cloud Initiatives?
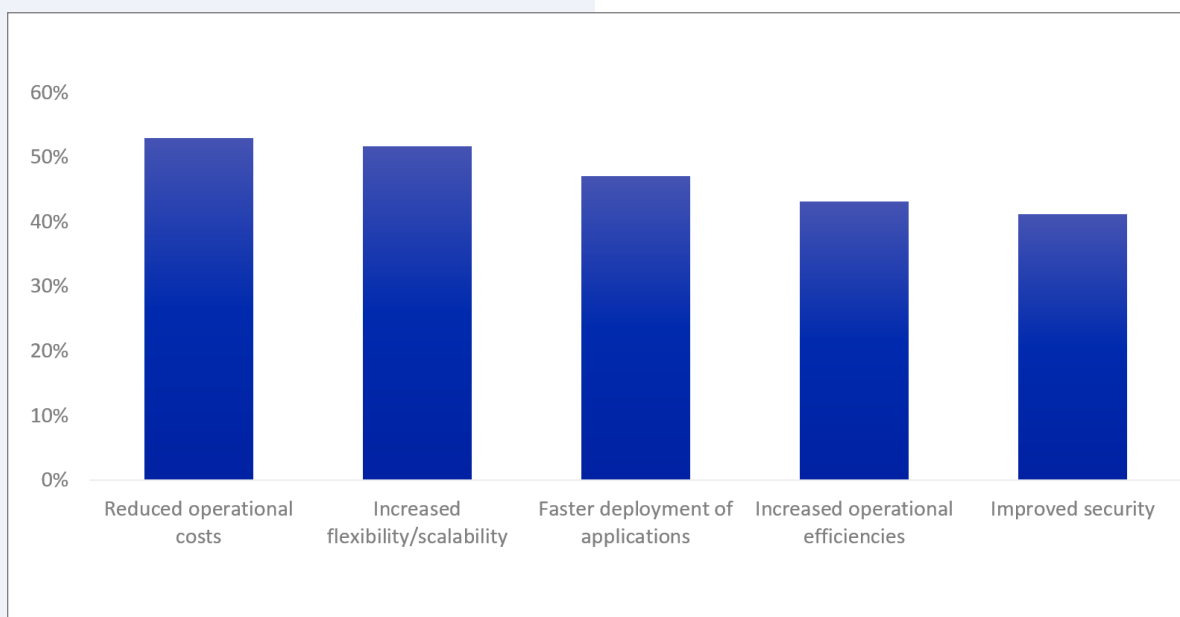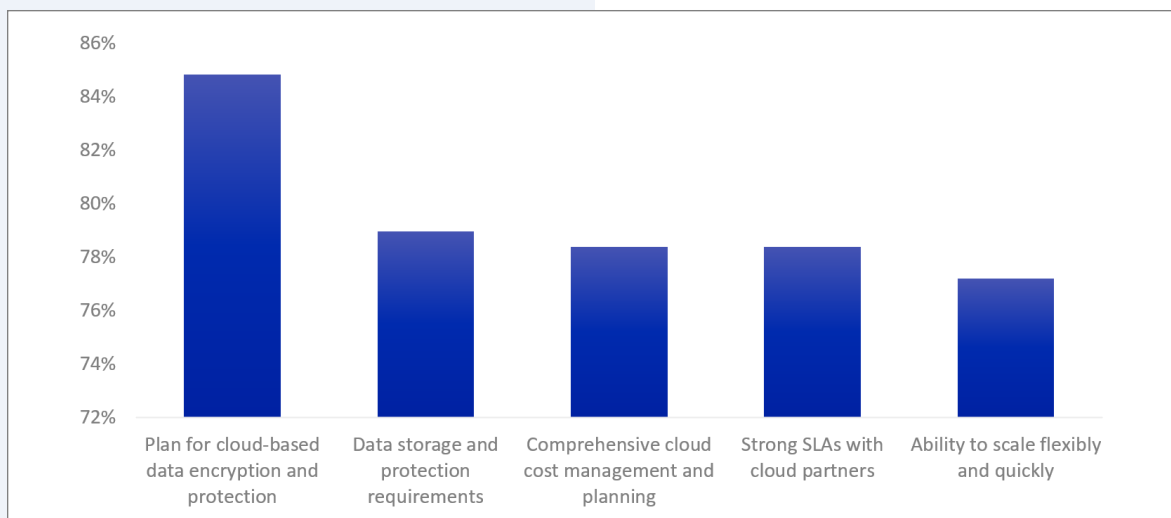
Figure 3 Top Requirements for Cloud Deployment

20% increase in the number of respondents who said that having a plan for cloud-based data encryption and protection was important or very important to their cloud deployment strategy when compared to 2020. This moved the requirement from fourth in 2020 to first on the list in 2021. Similarly, data storage and protection requirements also saw an increase in the number of respondents selecting it. While the increase was only a small one year over year, this still made data storage and protection requirements the second most important requirement for respondents.

Managing Costs

A new requirement facing organizations that was not on the list in 2020 but was the third most important in 2021 was that of comprehensive cloud cost management and planning. Selected by 78% of respondents as being important or very important to their cloud deployment strategy, this supports the strategy of creating an ROI, cost, and risk model for the cloud and makes it clear that organizations are concerned about managing the cost of their cloud initiatives.

While a shift to cloud-based infrastructure can offer an immediate benefit to organizations that are looking to implement new solutions without the need for significant capital expenditure on internal infrastructure, the operational expenditure can add up over time. This can be especially true when cloud systems can be spun up quickly, often without the direct involvement of IT teams.

Putting in place comprehensive cost management and planning can provide the guidelines that will help ensure that costs do not exceed plans, allowing organizations to experience the benefits of the cloud without as many concerns about cost overruns.

A Measured Move to the Cloud

This data reveals that organizations are taking a more measured approach to cloud deployment. Unlike 2020 when many companies saw the need to move enterprise workloads to the cloud as quickly as possible to support new business environments, today they are looking to understand and manage cost and ensure that their data is secure as they perform that move. For some workloads this will be within the next year, but for other workloads the move to the cloud is up to two years away as organizations plan their moves more thoroughly.

For analytics and business intelligence (BI), HR, and even SAP ECC, the greatest proportion of respondents plan to move these solutions within the next year. For e-commerce, procurement, CRM solutions, and planning workloads, most respondents said that the move is planned for the next two years. This likely reflects that not only is the workload moving to the cloud, but a new solution may be implemented at the same time which requires more planning. This is different from SAP ECC, for example, where the move to the cloud may be a more straightforward lift and shift. ■

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 **Implement a plan for securing cloud-based applications before you start deployment.** One of the most important steps that you can take with any move to the cloud is to put a security plan in place before rolling out any applications. Not only will this ensure that your data is properly secured with your cloud services provider, your connectivity channels are secured, and you understand how integrations with other solutions will be managed; it also has the potential to accelerate your cloud deployments. If these plans are not in place, you can waste significant time by needing to come back and address security challenges, delaying what may be a time-sensitive rollout. Get your security plans in place first to prevent interruption .

2 **Understand how you will plan and manage the cost of your cloud deployments.** Many organizations rushed to implement cloud-based solutions without fully understanding what the cost of running those applications over an extended period would be. Setting up a plan for comprehensive cloud cost management will help control the cost of your cloud deployments, but it will also help you achieve expense goals that are an important part of a move to the cloud. Doing this as part of a broader ROI, cost, and risk model that involves working with cloud providers to understand charges, ensuring that internal teams cannot roll out cloud-based systems without approval, and rolling out guidelines for cloud usage will help ensure that you meet the cost-related measurements for cloud success.

3 **Use a measured approach when moving to the cloud.** The benefits of the cloud are significant. They include increased flexibility and scalability, the ability to deploy applications quickly, and the fact that cloud-based solutions can provide new and improved functionality. But SAPinsiders should ensure that they understand what benefits cloud-based deployments will bring, as well as how they will manage costs and security, before beginning a project. A measured approach up front will put in place the requirements for success in the long term, and offers the potential to eliminate risks that could result from moving in haste.

RANDSTAD

LOOKS TO THE CLOUD TO IMPROVE EMPLOYEE EXPERIENCES

THE MORE ENGAGED EMPLOYEES ARE, THE BETTER IT IS FOR MAXIMIZING BUSINESS SUCCESS IN THE LOW-MARGIN, COMPETITIVE HUMAN RESOURCES SERVICES MARKET

Alex Soto
Editor, SAPinsider

Remote work is here to stay. According to a **National Bureau of Economic Research** report, an estimated 20% of the U.S. labor force will continue to be remote after the pandemic. Randstad, a global human resources services leader sitting at the forefront of remote workforce trends, understands that an organization ill-equipped to increase employee productivity and engagement risks falling behind.

Earlier this year, to maintain its competitive edge and maximize its employees' success in the new world of remote work, Randstad created a state-of-the-art self-service environment that improves employee experiences, while increasing employee productivity, lowering turnover, and reducing cost of services.

According to Detlef Richter, Manager IT Back Office Applications at Randstad Deutschland, speed and agility in back-office processes are essential for creating modern employee experiences, which, according to **SAPinsider's State of Human Experience in the Workplace Benchmark Report**, is taking on a new level of strategic and business urgency thanks to the shift to remote work. Employee experience describes the values workers place on their employment. For example, work-life balance and job security are ranked almost as high as compensation for adult-age workers, according to **Randstad's Employer Brand Research 2021** report.

Richter is in Germany, helping to lead Randstad's effort to modernize its IT back-office processes, which rely heavily on a combination of SAP technology and Google Workspace applications. Back-office activities include order taking, invoicing and cash collection, employee lifecycle and payroll, finance and the supporting processes, purchasing goods, and taking care of tax and accounting processes.

Randstad uses SAP ERP on-premise with managed services from NTT DATA Business Solutions (formerly known as itelligence) for its back-office processes. The company is looking to modernize its SAP landscape and move its on-premise back-office processes to the cloud.

"I think moving to the cloud means more standardization because you can limit the configuration to mainly customization, so you have to stick to the

standard," Richter says. He sees this as a positive. "This is also a good thing because you don't pile up so much technical debt."

Recognizing the Treasure Within

When Richter started the project, the perception among Randstad's executives was that the company's database was too slow. But Richter explained to them that using SAP technology in the right way and modernizing where appropriate was more effective than purchasing new technology in many cases.

By elevating the strategic role of the back-office for the business and getting executives to see the value of SAP technology, including its reliability, auditability, usability, speed to data, and decision-making functions, Richter helped make the business case for the digital transformation effort. When the executives recognized the treasure from within, they decided to invest in the modernization effort. An initial requirement was to put more memory into the current system to improve its speed immediately. The memory update provided more time to develop solutions to further enhance the system, which eventually led to an investigation of SAP HANA and cloud opportunities.

Then, it was determined that the tools required to connect its office universe of tools and its on-premise SAP systems were prone to errors and too complex for users, which included job seekers, temporary, permanent, and remote workers, and the company's employees responsible for back-office activities such as employee onboarding, running payroll, and customer account management.

"There are so many different processes for staff, customers, and talent, which create complexity," Richter says. "You need a lot of people and time to do all the professional services that the company delivers."

To bridge the gap between SAP's and Google's universes, Richter understood that creating less friction between the two worlds was essential. He explains that the organization's mobile universe encompasses digital mobility, everywhere access, modern workflows, and 100% cloud-based tools. On the other end, there is the on-premise world encompassing systems such as SAP ERP and SAP BW/4HANA. He notes that the characteristics of these on-premise tools include security, high availability, a high grade of automation, error-free payrolling and invoicing, safety, and scalability. To remove friction, the team built a highly flexible, scalable IT infrastructure for back-office operations

using on-premise SAP technologies and integrating it completely and seamlessly with the Google applications used daily. He explains that whether a user is pulling data from Google Analytics or SAP Analytics, the aim of the integration was to make it so seamless that it becomes invisible to the user.

"Users do not have to think too much about the interdependencies between different data," he says. "What we did was make the complex things as simple as possible."

He explains that the benefits of this digital integration include improved workflows, highly optimized processes, lower costs, and an enhanced user experience. Digital tools and integration are necessary to balance the fast pace of change in an industry with typically low margins and heavy competition, he concludes.

Simplifying Complex Processes in a Human-Centered Business

Another aspect of the company's business is its small to medium-sized enterprise (SME) customers, encompassing employers across various industries. He

AT A GLANCE

Digitizing human resources processes and services provides more modern experiences for Randstad's customers, job candidates, and employees.

Randstad builds SAP cloud platform pilot projects that have already proven to be productive.

Empowered executives and users report the benefits of modernizing back-office systems with SAP technology.

Randstad is investing in opportunities to modernize its SAP landscape and move on-premise back-office processes to the cloud.

SNAPSHOT

RANDSTAD

Company details: A leading provider of professional services in the HR services industry

Employees: 34,680 (average) corporate employees operating in 75 countries around the world

Annual revenue: €20.7 billion

Headquartered: Amsterdam, Netherlands

SAP Solutions: SAP ERP, SAP S/4HANA, SAP BW/4HANA, SAP HANA, SAP Process Integration

Industry: Information technology, engineering, finance and accounting, healthcare, human resources, legal, life sciences, manufacturing, logistics, and office and administration

explains that SMEs typically lack the resources to invest in technology innovation.

"Their processes are largely driven by paperwork and include many person-to-person interactions," he says. "Our aim is to eliminate paperwork wherever possible — this is what drives us and what drives the industry."

Back-office processes need to be as digital as possible because it offers convenience to everyone involved in the employment process — from the company's employees helping connect talent with businesses to job-seekers who sign their employment contracts and submit timesheets. He emphasizes that as back-office processes are digitized, with SAP technology at the core, it's important to remember that professional human services is a human business.

The human element is central to the company's approach to digital transformation.

"We want to make sure the business maintains a human touch," he says.

One way to achieve this aim is to make job-related activities faster and more straightforward.

"If you are an employee, you don't want to go into the back office or to the head office to sign the paperwork," he says. "You want to do it all from home, or from anywhere, without ever having to visit the office."

The ease and convenience of digital tools help to improve user experiences, which is core to attracting and maintaining a top-shelf talent network.

"Every person is different, and every human has a different story or perspective. You have to take care of the customer and, as much as possible, individualize and enhance the experience for everybody," he says.

Convincing Internal Users to Adopt

Creating an entirely digitized end-to-end solution that automates, streamlines, and simplifies the user experience meant that the system needed to seamlessly deliver services across desktop and smartphone platforms.

But like the organization's executives, internal users were also not so receptive to the idea of change, at first. Richter and his team developed tools with user-friendly screens to simplify their work and eliminate back-office

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 **Engage executives in the innovation process.** Communicate in practical terms the business case for digital transformation using SAP systems. Highlight how key updates can help improve the performance of current processes to help executives see the value of modernization.

2 **Create quick wins to overcome barriers to adoption.** Introduce new functionalities piece-by-piece without switching off old functionality to help users experience for themselves the benefits of a modernized system.

3 **Recognize the value of moving SAP systems to the cloud.** With SAP Cloud as a technical foundation for transformation, organizations can reap rewards such as greater elasticity to expand, greater standardization to move away from heavy customization, and improved speed and data security.

process complexities. To help overcome this barrier to adoption, he introduced the tools piece-by-piece without switching off the old functionality.

"We always gave users the choice to use new or old functionality, when possible," he says. He explains that once users saw the differences in functionality, it became an easy decision. Users were convinced of the benefits and adopted the new system.

"The key is to listen to people, talk to the people, listen to their complaints, and bring them together to try to drive it forward," he says.

Paving the Way to SAP in the Cloud

Randstad is investigating the move to SAP S/4HANA Cloud because of three key benefits: greater flexibility to expand, moving away from heavy customization, and improved speed and data security.

The organization's SAP Cloud pilot projects have already proven to be productive. For example, as part of one pilot project, the team developed an app for workplace safety inspections.

"We built an app on the SAP HANA Cloud where we do safety investigations of the workplace," Richter says, explaining that onsite workplace visits in Germany are required. The app has a structured form that connects with SAP ERP, and the users can go through it directly from their smartphones, right onsite.

Today, Randstad is embarking on a new journey by undergoing a RISE with SAP project. SAPinsider will share insights from this project in a forthcoming article.

Richter has come a long way since he had to convince the organization's executives and users of the benefits of modernized SAP technology. Back-office process automation is now helping to support the organization's strategic business growth goals without adding headcount.

"More can get done with the same amount of people so that the company can grow without having to increase support staff," he says. ∎

ENABLE BUSINESS OUTCOMES WITH **ENRICHED DATA**

Fred Donovan
Senior Editor, SAPinsider

Organizations want to better understand and leverage the data they have. Unfortunately, they often do not know how much cloud elasticity they will need to get the most out of that data. And they usually do not want to put additional systems in place that add more complexity to their landscape.

According to **SAPinsider's SAP Integration Landscape Benchmark Report**, the complexity of customers' SAP landscapes is growing: A majority of respondents said they were integrating an average of seven business solutions with their enterprise resource planning (ERP) system and were using an average of four integration tools to perform these integrations. Around 90% of respondents said that they needed to support non-SAP to SAP integration scenarios, and fewer than 10% of respondents said that their current integration strategy is completely meeting their needs.

SAPinsider interviewed Edy Sardilli, Global Alliances and Strategic Business Development Leader at Google Cloud, and Alison Hettrick, Head of SAP Solution Management at Google Cloud, to better understand this challenge and how Google Cloud is addressing it.

Many organizations are struggling to enrich and process their data to gain business insights for better decision making, Sardilli says. To give SAP customers tools to integrate their systems with non-SAP systems and to better consume and enrich their data, Google Cloud is launching Google Cloud Cortex Framework. This framework will offer scenario-driven reference architectures, analytic templates, sample deployment content, accelerators, and integration services.

"The challenges with data are tremendous. You don't want a customer dealing with data integration services and data wrangling daily. If you can arrange that data for them, that becomes super helpful. In addition, our customers ask, can you deliver content accelerators and actual outcomes for my business so that I don't have to build it and iterate it myself?" Sardilli says.

Sardilli adds that by using Google Cloud Cortex Framework, companies have much less to worry about with regards to how the target data model and data extraction happens — they only need to adjust the model to make sure the business serves customers or partners effectively.

"When customers want to extend the content and create a new data view, or use case, they should be able to do that without having to worry about the inner complexities of a data warehouse," he says.

Hettrick adds that Google Cloud Cortex Framework will provide "ready-to-run, pre-delivered data management code and views that leverage BigQuery,

which customers can easily install and deploy. We'll also include sample datasets and reporting templates in Looker to help them get started."

She says that Google Cloud Cortex Framework will enable the delivery of business outcomes using enriched data from SAP and other data sources such as Google trends, weather, and syndicated data sets. SAP customers will be able to deploy data solutions faster, take advantage of data management best practices, and achieve business outcomes more quickly.

"Instead of something taking weeks or months to deploy, we can help customers understand the right technologies and solutions that should be included in the data and analytics reference architecture," she says.

"For example, Google Cloud Cortex Framework offers pre-built data marts for customers for common operational reporting and analytics scenarios in sales and distribution, including order management and fulfillment, so that they do not have to start from scratch. And that translates into a lot of savings and benefits in terms of the knowledge, know-how, and time and effort to implement," she adds.

The goal of Google Cloud Cortex Framework is to take the guesswork out of how to assemble and combine the technologies of Google along with the SAP ecosystem to accelerate business value and incorporate ready-to-run

accelerators so SAP customers can become more efficient and nimble, Hettrick says.

Google Cloud Cortex Framework Scenarios

Google Cloud Cortex Framework scenarios provide SAP customers with architecture patterns, sample deployment content, partner-provided integration services, as well as deployment templates and training content.

The scenarios are based on a set of standardized raw data source tables and views that support a data foundation in BigQuery for SAP as well as broader enterprise, community, and public data sets. On top of that, Hettrick says, Google Cloud is building and deploying a set of sample Looker blocks to accelerate delivery of reporting. Sardilli relates: "Our customers are asking us, what's the best technology to do change data capture, for example, from SAP tables to BigQuery? It becomes an overwhelming decision-making process for them. They're asking us, can you please tell me what the recommended best approach is? Can you evaluate the different technology and technology partners and guide us with SAP and non-SAP data going forward?"

"We're delivering our first release of Google Cloud Cortex Framework set of data mart accelerator content for customers looking to take advantage of our petabyte

scale cloud data warehouse, BigQuery. We're delivering more than 40 modeling views that handle a lot of the key areas of interest such as sales and distribution with SAP data," Hettrick says.

"There will be additional views that extend the value of SAP data with other data sets such as weather, Google Search trends, and other kinds of information. We're also delivering demand impact alerts leveraging our artificial intelligence and machine learning capabilities that focus on how we can provide additional demand signals that might otherwise not be considered and can help organizations to better shape demand," Hettrick adds. The scenarios are delivered as packaged solutions that include technologies from Google Cloud, SAP, independent software vendors, and system integrator partners to reduce overall time, complexity, and costs.

"The Cortex Framework allows our customers to adapt content quickly and build new scenarios across lines of business such as supply chain, and industries such as consumer packaged goods, retail, and manufacturing. We're putting together a reference architecture to help integrate with the SAP ecosystem," Sardilli says.

Google Cloud Cortex Framework Use Cases

Sardilli says that customers are also seeking help to stand up use cases and are looking for a partner to deliver content, accelerators, and outcomes for their business, so they don't have to build it and iterate it themselves.

"You can think of Google Cloud Cortex Framework as a set of building blocks and blueprints by which we can provide knowledge, expertise, and best practices on how to assemble the technologies from Google Cloud, SAP, and our partners to help our customers accelerate capabilities," Hettrick relates.

"Our initial focus will be around the SAP Business Suite, specifically SAP ERP Central Component (ECC) and SAP S/4HANA customers. Our goal is to work with data at the transactional level and be able to combine that with some of the additional data sets that Google Cloud is providing and delivering," she says.

One of the first areas that Google Cloud Cortex Framework will be available for SAP customers is consumer-focused scenarios.

"SAP customers can integrate SAP data quickly with Google Cloud data signals, trends, ads, and commerce information. By integrating this information and providing advanced machine learning and insights

around this data, they will be able to do more dynamic things in today's world, especially around supply chain and commerce," Sardilli says.

"We want to take SAP operational data and integrate it with commerce data and other data to make sure that we're getting a good 360-degree view of what's happening with the consumer in the channel," he adds.

Hettrick says that by using Google Cloud Cortex Framework, customers can realize business benefits and establish an incremental approach to continuous delivery of innovation to their business.

"Google Cloud Cortex Framework incorporates SAP technologies and can leverage SAP components along with Google Cloud components to connect SAP and non-SAP systems," explains Sardilli.

Hettrick adds, "For customers that want more expansive access to larger data sets, contextual data, and related information, we look at Google Cloud Cortex Framework as a combined reference architecture to take advantage of the best of Google's and SAP's technologies."

"Google Cloud recognizes the importance of heterogeneity, flexibility, and openness, and that's part of our core guiding principles. And most importantly, we focus on the customer first — what's important for our customers to be successful," she says.

Hettrick says that with Google Cloud Cortex Framework customers tell her they see efficiencies in time, effort, and cost. They also are excited for additional scenarios beyond the baseline framework that is planned for release.

"From a reporting and analytics perspective, customers will have ready-to-run content that will range from order fulfillment, customer snapshots, to inventory and other topics. We are also providing a demand-shaping scenario, which focuses on how we can provide demand signals that might not be considered otherwise for more complete demand forecasting," she says.

SAP Customers Moving to the Cloud

Sardilli says that all SAP customers can benefit from Google Cloud Cortex Framework, regardless of where their SAP environment resides — on premise or in the cloud. According to SAPinsider's research report **Enterprise Cloud Deployment: State of the Market Benchmark Report**, more SAP customers are running analytics, data warehousing and storage, and human resources in the cloud. The report surveyed 116 members of the SAPinsider community and found that

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 As SAPinsider research shows, more SAP customers are running analytics, data warehousing and storage, and human resources in the cloud. Google Cloud Cortex Framework can help you leverage your cloud capabilities for data storage and analytics.

2 Employing advanced data analytics can create business value and improved decision-making. Organizations can lower platform costs, improve data query and reporting capabilities, and increase operational efficiencies using data analytics. Using a tool like BigQuery can help organizations integrate, aggregate, and analyze big data from SAP enterprise applications.

3 Consider using pre-packaged solutions, such as RISE with SAP and Google Cloud Cortex Framework, to aid in the move to the cloud, particularly if you are a small or medium-sized enterprise that does not have the IT resources to carry out the move using internal resources. These solutions can save you time and money and significantly reduce the complexity of cloud migration and delivery of industry leading analytics and operational reporting.

almost all the respondents are running some solutions in the cloud and that they want to gain increased flexibility and scalability by moving to the cloud.

The main drivers of the move to the cloud were a business focus on digital transformation and pressure to modernize costs and simplify IT infrastructure. The top four Software-as-a-Service (SaaS) applications that respondents reported they are running included SAP ERP solutions (like SAP S/4HANA Cloud), SAP finance and procurement solutions (like SAP Concur), SAP human resources solutions (like SAP SuccessFactors), and SAP Analytics Cloud.

Google Cloud Cortex Framework can integrate SAP data with Google data and third-party data and enable SAP customers to leverage the cloud and machine learning to gain business insights from the data.

"What cloud brings to the table is you can integrate and build these data pipelines better, and you can manage these data resources without having to manage them, in other words, a serverless architecture. So, you can bring data together and not worry about how it computes and how it gets stored. In addition, the cloud gives elasticity and scale to carry out these data analytics use cases," Sardilli explains. Customers running SAP on any public or private cloud or on-premise can connect and integrate with Google Cloud Cortex Framework and leverage the platform capabilities and ready-to-run scenarios delivered via Google Cloud's strategic partner ecosystem, he concludes. ■

DELIVERING COMPETITIVE ADVANTAGE VIA CLOUD-BASED SAP

WORKLOADS

Alex Soto
Editor, SAPinsider

Organizations today are transitioning their SAP workloads to the cloud to achieve greater flexibility and scalability. Benefits of this move include increased efficiency, improved productivity beyond the initial transition, and the ability to deploy applications more rapidly than on-premise infrastructure supports.

While the underlying thread that enables successful cloud adoption is technology, digital transformation requires cooperation between leaders across business and technology functions. Defining what infrastructure will be needed is primarily driven by business-specific programs. For example, when building a business case to move SAP S/4HANA workloads to the cloud, what performance, availability, and resilience are required?

SAPinsider recently had the opportunity to sit with Chris Ceska, an SAP Solutions Leader in the Azure Applications and Infrastructure Global Black Belt Team at Microsoft, Damien Johnson, Chief Architect for the Global Customer Success Organization, SAP, and Ramesh J. Chougule, SAP Cloud and Digital Leader at Infosys.

According to this group of experts, key discussions that organizations should have around moving SAP workloads to the cloud include business leadership, complexity, and consumer trends. In addition, infrastructure, integration, cost improvement, and sustainability must also be considered.

Connecting Technology With the Business Vision

When considering a cloud transition the question is: What do organizations need to bring all the technology requirements together to deliver expected business outcomes?

KEY TAKEAWAYS

Connecting your business vision with your cloud transformation plans is one of the most important steps in moving SAP workloads to the cloud if you are to achieve success beyond the initial deployment.

Determine what your KPIs for success will be as you are building your business case. This will allow you to ensure that you are not only achieving your goals, but can demonstrate ROI.

Establishing a digital transformation program means that business and technical leaders must align on cloud adoption and go beyond just technology requirements. But it is up to the business to determine the path forward. Chougule explains that business leaders, such as chief marketing officers, are responsible for what

Microsoft

[Microsoft](#) enables digital transformation and supports organizations moving to cloud-based technologies and infrastructure. They partner closely with SAP to help customers accelerate their cloud journey.

their function will look like in two years. Their business perspective will help determine the prerequisites of how a technology should be used to deliver business value.

The feedback from the business is then shared back to the CIOs and CTOs of an organization. It is in this layer of leadership that technical and architectural details will be hashed out.But organizations should also consider the people aspect to digital transformation. According to Johnson, organizational change management matters just as much today as traditional change management.

"When you're looking at the big picture, you are effectively working with and enacting across a larger footprint," he says. "It's not just the traditional SAP team that the involvement expands across. There is more than just getting the software deployed and making sure people are being trained."

He explains that the whole aspect of the business-driven process in digital transformation is just coming to the forefront. And it can be a complex process. Therefore, business leaders will likely need guidance from technical leaders to determine the requirements of a solution.

Managing Complexity and Consumer Trends

Data governance coupled with organizational change management have become essential components for dealing with complexity. If these aren't included in your

project, an organization can end up with an unwieldy environment, according to Ceska. "You can actually be doing more harm than good in the end," he says.

Macro-economic changes, such as business model evolution, can make an already complex process even more challenging to handle. As businesses reevaluate their technology infrastructure, that long-term view is vital in determining how the cloud can help organizations build up resiliency ahead of forces beyond the control of a business, like the disruptions caused by the COVID-19 pandemic.

"But you need to ensure that things are sufficiently open that customers experience the benefits," Ceska says.

For example, a center point in decisions about technology infrastructure is digital consumerism and how consumer behavior has changed over time, according to Chougule.

Modernizing Infrastructure

Whether an organization is moving SAP workloads or has already done so, the focus becomes how to transition technical personnel from maintaining legacy systems to building out skillsets to maximize the value of Azure inside their organization.

In terms of the value the cloud delivers from a technical standpoint, CIOs and CTOs worry less about security as the business scales and evolves because moving to the cloud helps overcome these issues.

Ceska explains that not having to set up infrastructure for monitoring, security, or backup is a key benefit of an Azure service. "You're able to get through that first wave of getting implemented, and then it opens up opportunities," he says.

No longer having to manage an infrastructure layer reduces administrative overhead and can even reduce redundancy in the application layer itself. According to Johnson, it also provides the flexibility to redeploy resources toward innovation and address real business challenges, such as improving operational processes.

Frictionless Integration

However, the digital transformation journey is not one-size-fits-all. Each organization will face different interactions when integrating internal systems with the external data elements on the cloud.

Creating a frictionless enterprise is a key for organizations moving their SAP workloads to the cloud to boost productivity, according to Chougule. He uses an example of sales agents creating orders without having to log onto an SAP solution. These kinds of business transactions are made possible by integrating conversational AI and Microsoft Teams, resulting in increased productivity.

In another example, he explains how this type of integration simplified his own processes. He received an email requesting a response to a question about performance appraisals: "Do we want to update the goals, or retain them?" He logged into Microsoft teams and answered the question while on the backend SAP closed the appraisal. There was no need to directly connect to an SAP system.

"It's as simple as that," Chougule says. "You can see a huge amount of productivity improvement in the day-to-day work and activities all across the spectrum of businesses."

"The fact that both platforms are being leveraged from an interaction point, as well as acting as a transaction point, is one of the biggest advantages of running SAP on Azure," says Johnson.

This type of frictionless integration made possible by running SAP workloads on Azure creates a singular data fabric that allows organizations to extract business value without wholesale movement of data from one platform to the other, according to Johnson.

KPIs, Cost Improvement, and Sustainability

When creating a business case for moving SAP workloads to Azure, it is essential to look at KPIs across various functions. Determining the financial and productivity benefit of the effort means looking at how things operate at the micro-level.

"For example, when we analyze order-to-cash, we clearly look at the gas bill rate and the delivery time," says Ceska. "We also may look at how much time it takes to close the period."

These types of questions help determine opportunities for improvement at the operational micro-level. Having this information is necessary to define KPIs and determine how moving SAP to the cloud can help meet business objectives. Traditionally, KPIs and metrics revolve around improvement and cost savings. For example: How can leveraging new technologies around cloud adoption open opportunities to reduce the cost of maintaining aging infrastructures and databases?

When considering a cloud transition the question is:

WHAT DO ORGANIZATIONS NEED TO BRING ALL THE TECHNOLOGY REQUIREMENTS TOGETHER TO DELIVER EXPECTED BUSINESS OUTCOMES?

"Driving this adoption, or modernization of SAP for that matter, one clear strategy is cost takeout," Chougule says.

He explains that customers often pay large sums of money to maintain underutilized legacy hardware. According to Chougule, the option to leverage a public cloud, like Azure, pays off for organizations as they scale up to meet business requirements.

Chougule highlights that moving SAP workloads to the cloud has gained momentum because customers can see an immediate cost-savings benefit.

In addition to cost savings, sustainability is a new type of KPI increasingly added to the mix of many organizations looking to reap the business rewards of digital transformation.

Ceska says he often gets the following question from customers. "How do I reduce cost, and how do I do it in the most sustainable fashion?"

This connects back to the idea that changing consumer buying patterns are a big business driver in technology decisions in digital transformation programs. Customers are looking for sustainable products, so companies want to meet that need by improving sustainability in their procurement, distribution, and other business processes.

"More and more customers are asking about sustainability," Johnson says. He explains that in the past, it was all about the cheapest way to get material to a consumer. "Now, they want multiple routes, not necessarily the cheapest and fastest, but the most sustainable," he says.

No Need to Reinvent the Wheel

Among the business benefits of moving to a public cloud provider is operating with more flexibility and scalability. Additionally, the cloud environment provides a consumption-based model that enables organizations to modernize their data state while keeping an eye on operational expenditures. For many organizations, moving to SAP S/4HANA has become critical because of the business value that it brings. When done in combination with cloud transformation, this can free up resources for innovation projects to drive further business value.

"Customers are looking at both the business tier and technology tier to provide innovation, scale, and speed," says Ceska. "Running SAP on Azure can help integrate technology at the business process level."

The low code aspect of cloud technology is a further added benefit, he says. For example, he highlights the ease of accessing sentiment analysis, leveraging speech text analysis capabilities from the Azure platform, and hooking that directly into the SAP Customer Experience portfolio. But for this sort of transition to be successful, the focus must be on clarifying the business value and expectations that the technology will deliver.

"It's not only about moving running SAP S/4HANA in the cloud. It's also about modernizing the data state to deliver business value," Chougule says.

For example, a supply chain organization preparing to move data to the cloud from traditional on-premise

applications needs to think about how the migration can optimize their supply chain performance and provide better customer insights.

"An interesting part about this journey to the cloud is the business innovation layer residing in SAP S/4HANA," says Johnson. "When you're ready to flip the switch and move over to running a fully digital SAP S/4HANA world, all the work that you've done with regard to data platform integrations carries forward. You don't have to reinvent the wheel." ■

WHAT DOES THIS
MEAN FOR SAPINSIDERS

Leveraging cloud-based solutions can not only bring flexibility, scalability, and increased resiliency from a technical standpoint, but it can create the opportunities needed to drive significant business process transformation. But how should SAPinsiders make the most of cloud transformations that they undertake beyond the initial deployment?

1 **Ensure that your cloud transformation is directly connected to your business vision.** Many organizations have moved workloads to the cloud so that they can leverage the infrastructure improvements that it brings while reducing the cost of internal IT. But only when the business vision is connected directly to technological change can organizations maximize the benefits that a cloud transformation brings. Ensure that your business leaders are involved in laying out the roadmap for their own organizations as your technology leaders plan infrastructure changes.

2 **Leverage the services that your cloud provider offers to provide additional benefits.** Each cloud provider has services that you can use to enhance your SAP solutions. Ensure that you not only understand what these are, but that you leverage the opportunities that these present in order to provide additional value. An example of this is the way in which SAP applications integrate with conversational AI and Microsoft Teams to increase productivity. Each cloud provider has different services that can be used to enhance your SAP solutions, so ensure that you not only explore but leverage these.

3 **Implement KPIs that will help you measure and track the success of your cloud initiatives.** While flexibility and scalability is a key factor in organizations starting cloud initiatives, it is important that you determine how you will measure success when building your business case. Many organizations expect reduced IT costs, faster deployment of applications, or increased operational efficiencies, but you should map and understand which KPIs you will use and what they mean to your organization if you are to ensure success.

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For Enterprises, Digital Transformation Means

CONTINUOUSLY LEARNING & EVOLVING

Alex Soto
Editor, SAPinsider

Virtually every business across industry verticals — banking and finance, manufacturing, retail, consumer packaged goods, logistics, energy resources, utilities, and life sciences — needs to undergo digital transformation.

But not every business senses how changes in digital technology, such as cloud and artificial intelligence (AI), the evolution of consumerism, and disruptions caused by the pandemic, are creating make-or-break opportunities in the global business climate.

Take for example businesses across the U.S. that permanently shut down their doors due to the uncertainty and disruption caused by the COVID-19 pandemic. According to a recent **Federal Reserve Board study**, there were roughly 200,000 more business closures in the first year of the pandemic than in previous years, pre-pandemic.

Businesses that pivoted to online models within weeks of the pandemic shutdowns to provide their products and services demonstrated the resilience and agility to remain afloat, and some even thrived, according to Ramesh J. Chougule, AVP, SAP Cloud and Digital Lead

at Infosys. Companies that did not invest early in the latest digital technology did not have the means to meet consumers where they live — the digital world.

Chougule uses an example of a photography company that, instead of reinventing its business, remained steadfast in its old ways.

The company lacked insight into how the market was changing and how its products were being consumed, resulting in missed growth opportunities, Chougule explains. In contrast, another retail company took a different approach, making huge, strategic investments in intelligent e-commerce technologies over five years along with a shopping services arm that transformed many internal processes.

"These moves helped this retailer understand its customers and adopt a business model that helped the company be ready as the pandemic disrupted the whole retail sector," Chougule says.

Strategic technology investments helped the company build a shopping service that enhanced the entire value chain. It connected consumers with a seamless experience, from ordering to doorstep delivery. The business experienced growth and became more

Ramesh J. Chougule
AVP, SAP Cloud and
Digital Lead, Infosys.

profitable in a year, even as the pandemic affected its brick-and-mortar locations.

Chougule explains that a critical component of the customer's strategy was migrating most of its applications to the cloud, then integrating its internal data with external data channels to understand consumer behavior, changing patterns, and preferences.

"The technological stack on the demand side and supply chain side, combined with its excellent fulfillment engine, made this new business model operational and successful," Chougule says.

This use case offers a great example of a core philosophy at Infosys: that every enterprise has to be live, nimble, and intelligent.

Being agile and responsive and having the sense to address threats and disruptions coming from unexpected places is what Infosys calls "The Live Enterprise."

Infosys has taken a step ahead on this journey to develop technology-specific solutions, such as its Live Enterprise with SAP offering, which is built on SAP S/4HANA industry templates. Infosys is recognized by SAP as a **global strategic partner**. The solutions and capabilities provided by the Live Enterprise with SAP offering were developed to complement SAP's latest business-transformation-as-a-service offering, RISE with SAP. It includes **Infosys Catalyst** and **Innov8**, part of **Infosys Cobalt**.

With intelligence at its core, Infosys, a next-generation digital services and consulting company with operations in more than fifty countries, is keen on helping its customers to digitally transform their businesses through an approach that integrates technology, digital agility, and an always-on learning focus.

Confronting the Challenges Within

While digital transformation is top-of-mind for many enterprises, the reality is that business leaders often have difficulty sensing what's happening now and seeing the future to respond quickly and instinctively, according to Chougule.

He explains that the character traits of a live enterprise include agility with an intelligent digital core that can derive insight from data to facilitate business improvements, sometimes on the fly.

At the enterprise level, being intelligent, nimble, and sentient is vital to taking hold of growth opportunities when disruption occurs.

According to Chougule, the primary barrier to becoming a live enterprise through digital transformation comes from within — more often than not, old ways of thinking.

"If an organization is sentient enough, it can sense the changes taking place to respond and quickly model its processes and technologies to transform itself," Chougule says.

With his 21 years at Infosys helping customers in their digital transformation journeys, Chougule focuses on what customers can and should do to become nimble organizations that thrive on change.

He says that organizations that continuously learn and evolve and aim to become more resilient, efficient, agile, and innovative get a competitive advantage.

It's why he thinks organizations should be more like startups. He explains that startups are agile and do not have as much inertia as larger, established organizations.

He explains that organizations that are overly process-centric lose the acumen towards learning new things, and the ability to sense instant changes and respond swiftly.

Sometimes standardization becomes too complex rather than simplifying the execution, and as a result, companies lose the benefits of standardization and miss becoming nimble in their processes, he says.

External Factors Driving the Adoption of the Live Enterprise Approach

Four primary reasons drive organizations to embrace the live enterprise approach: digital consumerism, social media, disruption, and technology evolution.

"Businesses need an intelligent core to constantly sense, respond, and evolve to challenges brought on by

> These moves helped this retailer **UNDERSTAND ITS CUSTOMERS** and adopt a business model that **HELPED THE COMPANY BE READY** as the pandemic disrupted the whole retail sector."

digital consumerism, social media trends, and evolving technology," Chougule says. "Otherwise, they risk losing their competitive edge." The Live Enterprise with SAP offering helps businesses attain the intelligence in their core processes.

The rise of the digital consumer. Over the last 10 years, people have changed the way they buy goods and services. This shift in consumer behavior is changing the way enterprises operate. A side effect of digital consumerism is personalization — consumers demand to have products and services that fit their unique needs and wants. Companies have started looking at very customized products and services catering to an individual as a segment of their consumer base.

Social media as influencer and informer. Consumers go on social media to express what they want. Companies that listen to and understand their customers on social media channels can align their offerings to meet consumer preferences. The input provided by consumers is also critical in defining different business models that can adapt based on what customers are saying.

Disruption like never before. The pandemic has taught companies that having resilience built into their business model is essential to survive. However, to thrive, an organization needs to develop alternative business, supply chain, and financial models with agility built in, allowing the organization to transform and change and overcome disruption and sustain the business throughout the event.

The impact of technology evolution. Technology evolution on the compute and storage sides has more organizations considering a move to the cloud. As a result, the cloud has taken center stage, and enterprises are thinking about how the technology will be consumed using cloud technologies. And along with the cloud, AI and machine learning have given birth to the possibility of deriving instant and intelligent insights that were not feasible earlier.

"All of these things at a microeconomic level have made every organization think and rethink how they want to operate over the next 10 to 20 years," Chougule says.

Future Roadmaps Defined by SAP S/4HANA + Cloud and AI

Which technologies does an organization need to adopt to really bring about the benefits of a live enterprise?

The lack of clarity around business innovation for operations, technological complexities involved, selection of specific use cases for intelligent enterprise, and the cost and timeline parameters make this

BECOMING NIMBLE THROUGH
AGILE PRINCIPLES

Infosys' Live Enterprise Suite combines technology with process agility to help organizations quickly address the changing market demands in the near term.

"When building the live enterprise model, Infosys looked at what was needed for organizations to operate in tomorrow's world," Chougule says.

He explains that Infosys takes a deep dive into a customer's current state to understand what it needs to become digitally active or digitally native. The next step involves defining new business models using digital technologies. Infosys then helps the customer implement those technologies.

A key is to bring in the right mix of standardization and core-competitive, custom processes that help companies become nimble and flexible enough to respond to customers very quickly, while bringing in technology assets to get these elements into operations as soon as possible, Chougule says.

He explains that getting to the granular details of a plan and then rigidly executing the entire program over two to five years is a philosophy of the past.

"Today, we need to be agile and bring modern philosophies, such as DevOps, into the execution of the program."

Chougule explains that agility and DevOps are at the center of nearly every part of customers' digital transformation journey, and they apply to every type of work Infosys conducts for its customers: consulting, implementation of technology, such as SAP, and support and maintenance.Infosys aims to apply these principles to a customer's entire program, but this is not always possible. "Sometimes for a program, such as an SAP implementation, it becomes very difficult to apply these principles to the entire program," Chougule says.

In this scenario, Infosys applies the principles to select areas of a program. In multiple SAP implementations, Infosys has applied Agile and DevOps model to the realization phase of the program delivering significant cost benefits to client.

"We apply the Agile and DevOps methodologies to essentially develop the application, test it very quickly, bring it to the users swiftly, and then go to the next sprint, so on and so forth," he says. "That has been the philosophy of the way we operate."

question difficult to answer for some enterprises, Chougule says.

Data is key to illuminating the path.

"Organizations generate a lot of data, but they fail to learn from that data or fail regarding their business operations on a day-to-day basis," Chougule says. "Organizations need to microscopically look under the data and apply AI technologies to create new intelligence out of it."

Chougule thinks that SAP S/4HANA is a technology that has arrived at the right time as the nature of business has changed. However, customers also have multiple

questions when it comes to adopting SAP S/4HANA. For example, should adoptions of SAP S/4HANA and the cloud be done together or sequentially?

"SAP customers are facing a question around the exact business case for SAP S/4HANA and how it will help their organization transform into an intelligent enterprise," he says.

He uses the example of large conglomerates to explain.

"As they've grown multiple times in the form of acquisitions, traditional growth, or organic growth assets, these companies started building up multiple

SAP instances. Over time, the complexity of their SAP landscapes has become so huge, that the cost and effort to manage those instances is extremely high," he says.

In the example of a company undergoing multiple acquisitions over many years and different geographies, he explains that companies often implemented custom processes. The resulting patchwork of systems creates issues, such as lack of visibility and control.

Essentially, this complexity increased operational costs and created management overheads, he says.

"The core innovation of SAP S/4HANA is a huge turning point for customers on how they are going to see their ERP landscape evolving in the future, creating opportunities to simplify their landscapes, reducing the number of instances and overall costs of maintaining those instances, and developing opportunities for organizations to become nimble," Chougule says.

But that's just one side of the story. With SAP S/4HANA as a technical core for innovation, cloud roadmaps take center stage, Chougule explains.

"Every CIO and technology leader has started thinking about how they are going to consume cloud and get rid of their in-house data centers," he says.

He explains that this has two parts. First is the quick cost advantage. Organizations can consume Software-as-a-Service as it is required and eliminate the capital expenditure investment which they need to have in the software and hardware in-house, he says.

The second part is the nature of new technologies that are cloud centric as the intelligent technologies are built in and around cloud.

He explains that the cloud platform is hosting external data, making that available for organizations to consume. The integration of internal and external data, the cloud, and intelligent technologies makes it possible for customers to derive a higher level of business intelligence in business operations to make the right decisions and gain a competitive advantage.

"SAP S/4HANA and cloud have come at the right time, almost at the same time, and become sort of one integrated story," he says. "Infosys' offering of Live Enterprise with SAP brings the application, cloud, and services components together to provide a seamless experience to our clients."

Within the next decade, he sees the future of the SAP landscape evolving. "Many customers will simplify their SAP landscape, implement one or few SAP S/4HANA instances, and, at the same time, adopt the cloud," Chougule predicts.

"Most SAP S/4HANA implementations are going to be on the cloud, and enterprises will create roadmaps to integrate it with new open-source or AI technologies to derive the intelligence in business operations by combining the data from internal sources, such as SAP S/4HANA, as well as external sources."

A Live Enterprise Embraces Always-on Learning

Infosys knows from experience the importance of learning in digital transformation. The company embarked on this approach as it went on its own digital transformation journey to reinvent itself and become more agile.

"The Live Enterprise brings in the culture, process, and technologies all together to keep always-on learning as a central philosophy of the organization," says Chougule.

From a business model perspective, Infosys determined that a live enterprise is one that adapts to become a learning company.

Chougule highlights Infosys' deep focus on education within the company itself.

"The symbolic entity of our learning culture has been the largest corporate university in India, and probably in the world," he says. "We house 15,000 people at any point in time to train them in one single facility."

Core to the always-on learning philosophy is the company's focus on cloud and AI.

"Everything we do, every technology we work on has a certain component coming in from the cloud and AI perspective," he says. "Today, more than 50% of our organization is trained and certified on cloud technologies and AI because that's the future." ∎
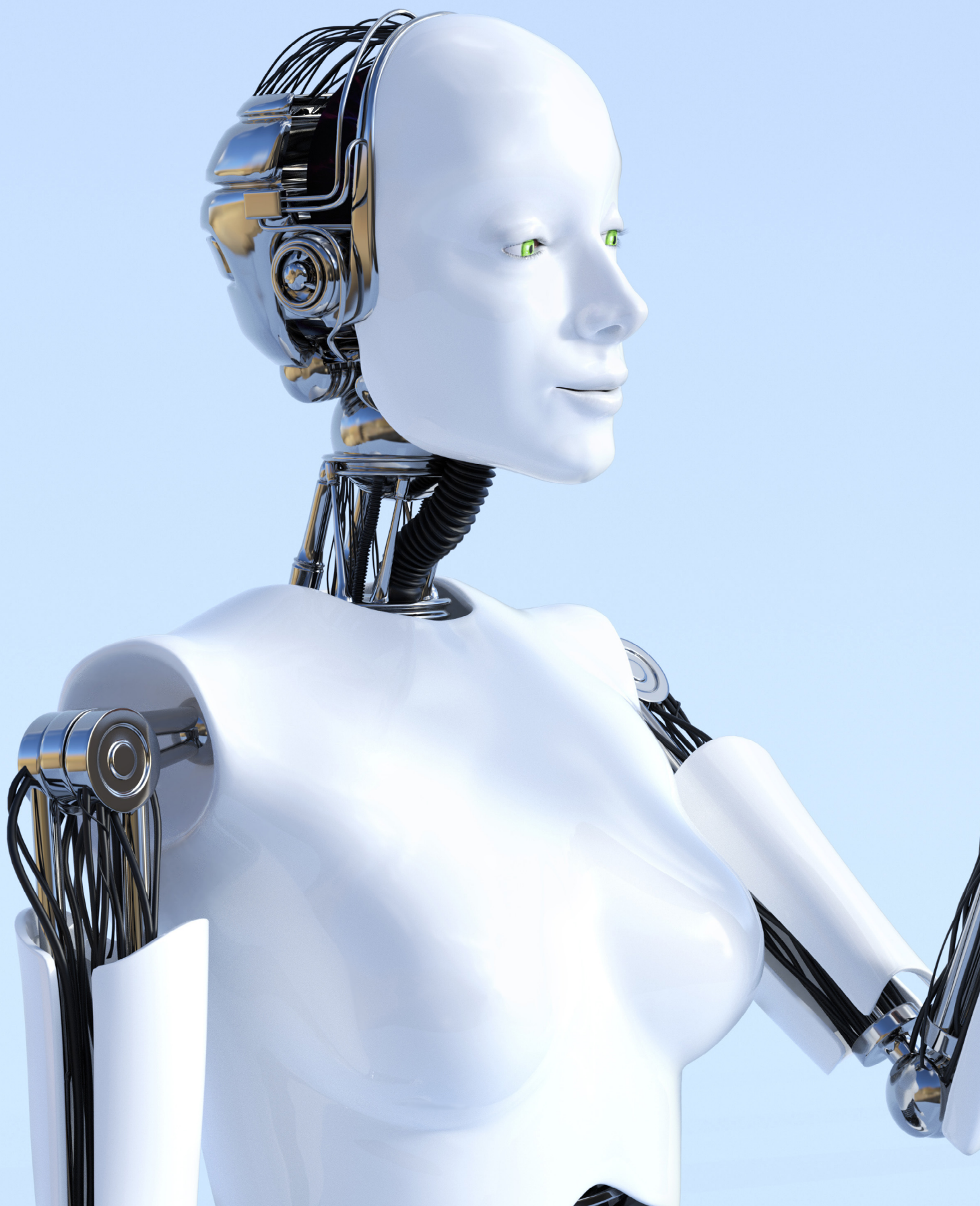
AI-BASED AUTOMATED IMPACT ANALYSIS CAN

CUT SAP S/4HANA TRANSITION COSTS

ACCORDING TO OREN PELEG, DIRECTOR OF PRODUCT MANAGEMENT AT PANAYA, REDUCING THE SCOPE OF CONVERSION TASKS BY USING AI-BASED AUTOMATED IMPACT ANALYSIS CAN CUT COSTS ASSOCIATED WITH MOVING TO SAP S/4HANA

Fred Donovan
Senior Editor, SAPinsider

Panaya's Director of Product Management Oren Peleg says that organizations can reduce the costs of their SAP S/4HANA implementation by using automated impact analysis supported by artificial intelligence (AI) to limit the scope of conversion tasks.

A recent report by Panaya, **Mega Analysis for SAP S/4HANA**, finds that close to half of conversion tasks performed during an SAP S/4HANA transition are for objects that aren't used. Eliminating these objects from the project will reduce both the time needed for conversion and the overall project cost.

Panaya's analysis also shows that one-third of potential conversion tasks have a low impact on the business, so they can potentially be "scoped out" of the conversion. "There are different levels of conversion task priorities; at Panaya we rate them from low to medium to high. The low impact ones are usually things related to information and tasks, which are not 'must do' during the conversion itself," Peleg observes.

Overall, Panaya notes that organizations can reduce their conversion task scope by nearly 40% using AI-based scoping. When adding auto code corrections on top, the effort can be reduced even more and result in up to a 60% savings in total effort.

Thirty percent of impacted points of entry into business operations, such as SAP transactions, reports, interfaces and so on, are related to financial and controlling modules. Another 20% of affected business entry points are related to material management, logistics, and production planning modules.

Planning Is Crucial to Reduce Risks

In addition to the risk due to the number of conversion tasks, the move to SAP S/4HANA can also be risky because of the complexity involved. To do it successfully, you need the right plan and the right tools.

"You need to plan upfront and look into the details. It's a big project and a risky one," says Peleg.

A main risk among several, according to Peleg, is encountering problems that you did not anticipate after going live. "There are plenty of examples of companies moving to SAP S/4HANA without fully understanding the impact on their business, and they suffered financial losses and customer churn," he relates.

SAPinsider's Vice President and Research Director Robert Holland says that SAPinsider's research supports this need to educate business teams on the impact of the move. The 2021 **Deployment Approaches for SAP S/4HANA Benchmark Report** showed that more than three-quarters of respondents said that educating users on the capabilities of SAP S/4HANA was important or very important to their deployment. "Understanding these capabilities can be difficult because organizations struggle to picture how this solution is going to work on a day-to-day basis and how it's going to impact their processes."

Peleg cites other risks making the move to SAP S/4HANA, such as missing the project go-live date and the overall cost. Usually, projects are planned with specific downtime scheduled. If a company misses a go-live date, that will cause significant delays and additional expenses. And, if a company isn't clear in advance what it needs for the project, it risks going over budget. For large companies, this can run into millions of dollars.

Another challenge of transitioning to SAP S/4HANA is moving to SAP's in-memory database, SAP HANA. To move from any database to SAP HANA requires conversion tasks and performance tuning to utilize SAP's high-performance database fully," Peleg says. "If you keep your code as it is, you will not utilize this very sophisticated database," he adds.

Custom Code Makes Up More than One-Third of Conversion Tasks

More than one-third of the overall conversion tasks in the project are related to custom code and routines. SAP customers customize their systems and modify configurations to ensure the business processes in their ERP system meet their needs.

Holland observes that "one of the things that has provided a huge amount of flexibility for SAP systems in the past is that you can pretty much write whatever code you want to achieve what you need. But one of the problems with putting customized code in place is that it's harder to upgrade because every time you upgrade, you potentially break that customization that's in place."

In addition, SAP S/4HANA provides automation, which is much more effective in a standardized environment. Thus, many of those doing an SAP S/4HANA deployment are looking to either eliminate or significantly streamline the amount of custom code used in their system so that they can fully leverage the automation capabilities available in the new environment, Holland adds.

Impact Analysis Can Help You Prepare

Panaya can help organizations with their SAP S/4HANA transition, says Peleg, by examining SAP systems inside and out: SAP customers' standard code being changed and the custom code modifications that need to be done.

Panaya provides a solution that is tailored to the customer's own system and usage, Peleg says. Panaya's **Change Intelligence for SAP S/4HANA** works across the entire SAP S/4HANA journey: from evaluation of the implementation to post-implementation go-live and on-going activities, he notes.

The company's solution covers more than 70 different types of tasks and corrections and incorporates SAP tools data output into its tools and analysis, providing many more capabilities and holistic view on top of those tools.

Peleg reports that the concept behind Panaya's current campaign, "Impact Analysis Done Right," means that Panaya does not just stop at the impact analysis stage. "We also provide the execution tools in one holistic solution, both for the corrections and testing activities. To do the implementation and system conversion in the best way, we provide built-in automatic fixes where thousands or tens of thousands of custom code lines can be corrected automatically with a click of

a button. We also provide the full project management built in the solution."

Peleg describes Panaya's impact analysis as an engine that analyzes the effect of an SAP ECC or SAP S/4HANA upgrade or SAP S/4HANA system conversion to show what will break, what will change, what needs to be fixed and how, and what should be tested.

He explains that customers need to validate the business processes during the testing phase and then how to manage and handle defects, including testing with multiple business users. Often, Panaya works with multinational companies with locations around the world. These companies, says Peleg, need to synchronize their business process testing among globally dispersed business users. Panaya's testing capabilities advertise a way for business users to perform user acceptance testing cycles either from the office or home without a major impact on their daily work.

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 **More companies are making the move to SAP S/4HANA.** Digital transformation is essential these days, especially with the COVID-19 pandemic situation. Recent SAPinsider research found that a majority of respondents reported being somewhere in the process of moving to SAP S/4HANA, whether they are currently using it, implementing it, evaluating the business case, or running proof of concepts or pilots. Only 23% currently have no plans to migrate to SAP S/4HANA. This data indicates that you need to prepare for the journey, regardless of what phase you are in.

2 **Before you move to SAP S/4HANA, focus on getting business engagement and buy-in from the teams that will be most impacted by the conversion.** According to Panaya, the most impacted business entry points are those related to financial and controlling modules and material management, logistics, and production planning modules.

3 **Scope your conversion tasks to prioritize which tasks need to be done immediately and which can wait or be dropped.** An SAP S/4HANA transition can have thousands or even tens of thousands of conversion tasks that impact your business processes. Effective scoping can mean the difference between success and failure.

SAP *S*/4HANA CLOUD ABAP ENVIRONMENT

DEVELOP EXTENSIONS BASED ON STABLE INTERFACES AVOIDING ADAPTATION EFFORTS FOLLOWING A VERSION CHANGE WITHIN THE SAP S/4HANA CLOUD ABAP ENVIRONMENT

Karl Kessler
VP of Product Management, SAP AG

Over the last decades, SAP has always looked for new ways to empower modern enterprises to run their core business processes very efficiently while adapting their standard processes to their market needs in a very flexible fashion. Traditional SAP Business Suite customers have thoroughly used all available technologies to extend SAP's standard offering. Wherever possible, the customers have used predefined extension points in the SAP software. They even modified the SAP applications to their own needs if stable extension points were missing.

However, this freedom of choice comes at a significant price whenever life cycle management tasks such as SAP upgrades or support package implementations have to be carried out. Custom extensions need to be merged into the newly delivered SAP version. SAP has developed very specialized tools to help with this process such as the Modification Assistant, and the transaction SPAU (process after upgrade), but the overall process is time-consuming, error prone, and costly.

Clean Core Philosophy

As a consequence, SAP recommends to its customers to follow a clean core strategy after their transition to SAP S/4HANA, which means to keep the SAP S/4HANA core as clean as possible and implement all extensions to the core on the SAP Business Technology Platform (BTP) in their preferred programming language (Java, node.js, or ABAP) using well-defined SAP S/4HANA APIs that are properly documented in SAP API Business Hub. There is nothing wrong with this approach, and as a matter of
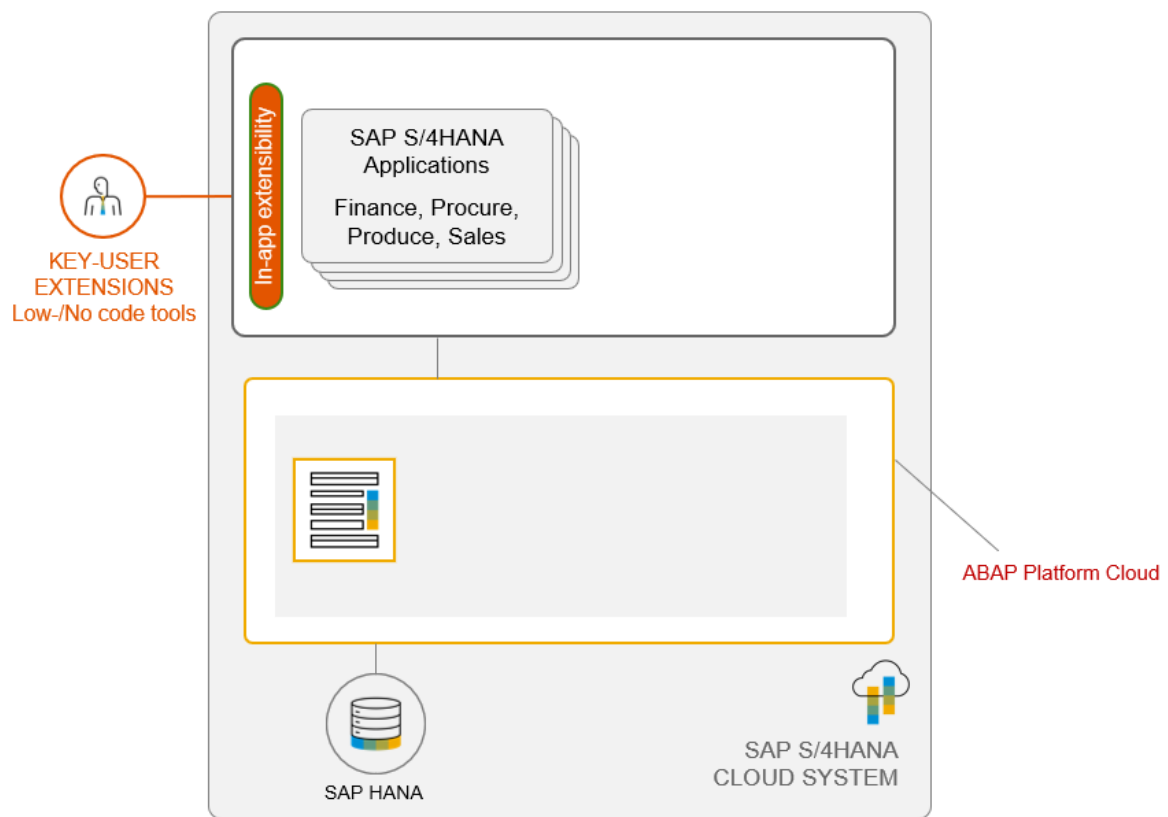
Figure 1 SAP S/4HANA Cloud extensibility today – Key user extensibility

fact, many partner solutions and decoupled extensions work this way.

While SAP BTP is the perfect start to build innovative cloud applications optimized for SAP HANA, it requires remote access to SAP S/4HANA resources. Depending on the nature of the extension, this can lead to complex side-by-side deployments, especially if the extension is tightly coupled with the SAP S/4HANA core with frequent access to SAP S/4HANA resources.

Key User Extensibility

Extensions that add simple fields to the user interface and custom logic, such as a Business Add-In (BADI) to a standard business process cannot be implemented using a side-by-side pattern. Therefore, SAP has provided the so-called key user extensibility tools (often referred to as in-app extensibility), which allow extension of SAP S/4HANA applications using a SAP Fiori-based tooling environment.

Key users can extend a running SAP Fiori application entering a corresponding author mode ("Adapt UI") directly from the SAP Fiori launchpad. They can change the layout of the screen and add new fields on the fly, which are saved and retrieved as part of the application without writing a single line of code. While these tools do not require coding skills, they are limited since

they cannot fully access the underlying context of an application like a programmatic extension would allow.

Building Extensions on Top of Released APIs and Objects

The natural next step is to find a way to extend an application directly on the SAP S/4HANA stack without disrupting the life cycle. This can only be achieved based on a software layer that exposes publicly released APIs (such as ABAP classes) and publicly released objects (such as domains, data elements, and core data services) that remain stable during software version changes.

Improper use of SAP objects by custom extensions is not allowed and will be rejected by the ABAP compile-time and runtime environment. Modifications are completely forbidden. The benefit for the extensions should be paramount: No adaptations are required after a version change since all used SAP objects and APIs remain compatible. Custom and partner code continues to run without any changes.

Need for a Developer Extensibility Option for SAP S/4HANA Cloud

It's important to look in more detail at the existing extensibility options for SAP S/4HANA Cloud and how a new developer extensibility fits into the picture.

Figure 2 SAP S/4HANA Cloud extensibility today – Steampunk
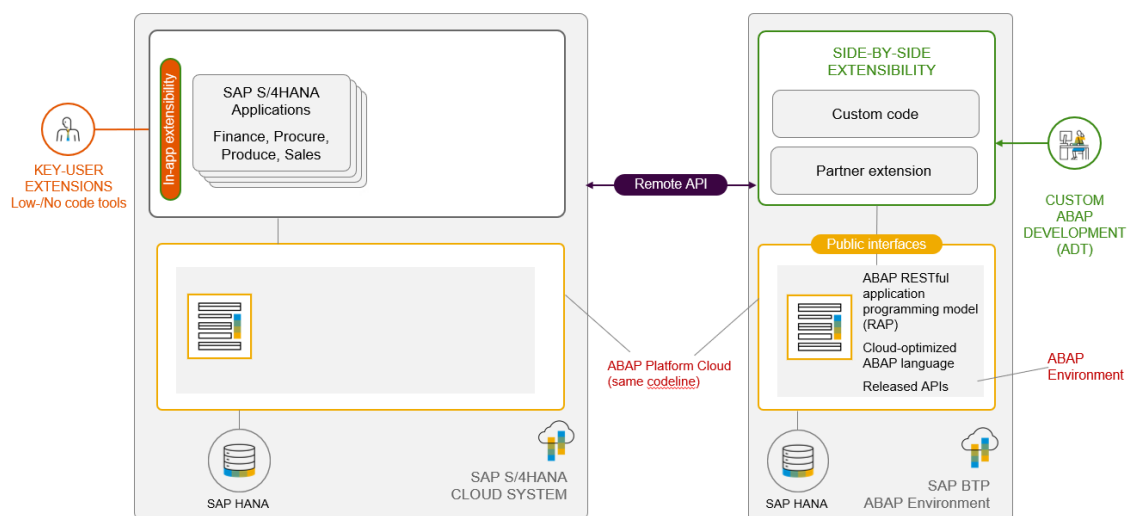
Figure 3 SAP S/4HANA Cloud ABAP Environment - Embedded Steampunk

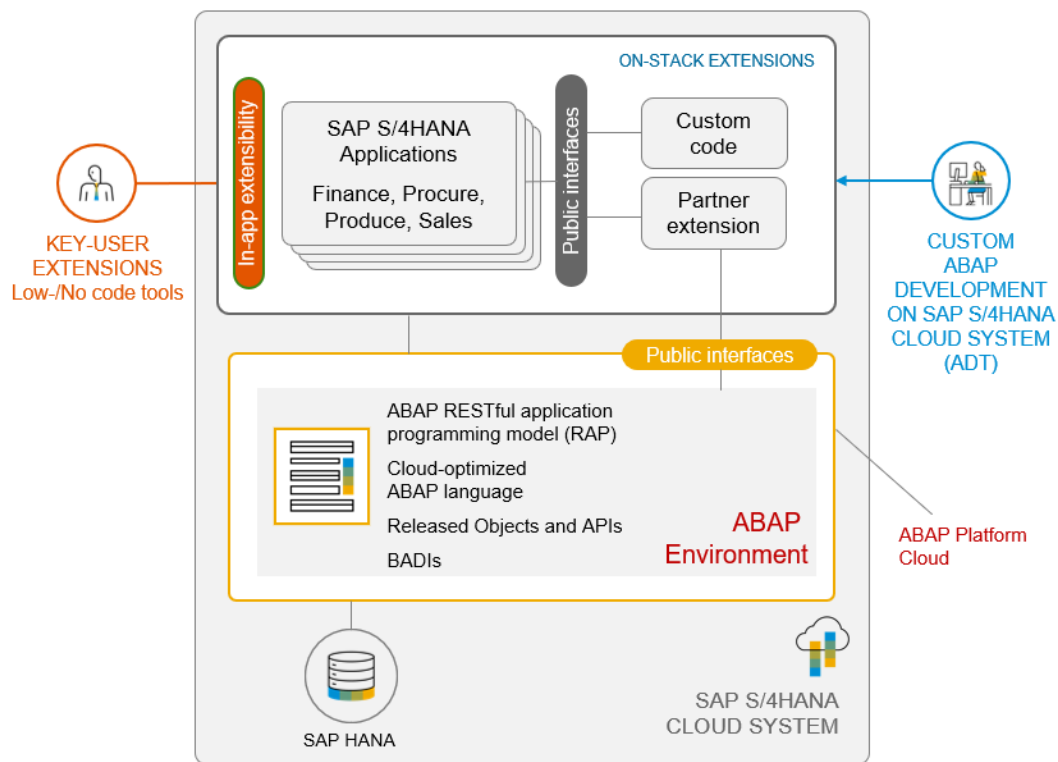**Figure 1** shows an SAP S/4HANA Cloud system. Technically, the SAP S/4HANA Cloud applications such as Finance, Procure, Produce, and Sales are implemented based on the ABAP platform cloud stack. Inside this stack the ABAP VM executes the applications and accesses the underlying SAP HANA database. The only way to extend the SAP S/4HANA Cloud applications is by means of key user extensibility tools. A power user can access these SAP Fiori-based tools in the SAP Fiori launchpad. He or she can create new custom fields, custom business objects, change the layout, etc. Extensions are created in a separate SAP S/4HANA Cloud system instance and then transported to the productive system instance without manual interaction by the power user.

Figure 2 shows how to extend SAP S/4HANA Cloud using a side-by-side extensibility approach powered by SAP BTP. In the diagram, SAP BTP, ABAP environment (project nickname "Steampunk") is shown, but the approach also works similarly with Java or node.js. Like SAP S/4HANA Cloud, SAP BTP, ABAP environment is based on SAP HANA. Customers and partners can develop and run their extensions using public interfaces of the underlying ABAP platform cloud stack.

Applications are written using the ABAP RESTful application programming model, which builds on top of core data services adding transactional capabilities, service exposure and binding for consuming SAP Fiori applications. Customers and partners use the ABAP Development Tools to connect to an SAP BTP ABAP environment system instance and create their ABAP development artefacts. Whenever such an extension application needs to access the SAP S/4HANA Cloud system, it must call a public remote API from SAP API Business Hub.

Both SAP S/4HANA Cloud and SAP BTP, ABAP environment are based on the same ABAP platform

cloud innovation codeline. All innovations that have been created for SAP BTP ABAP environment are technically present as part of the SAP S/4HANA Cloud technology stack in principle (they were basically hidden so far).

Figure 3 shows the new SAP S/4HANA Cloud ABAP environment. Developers use the ABAP Development Tools for Eclipse to directly connect to the SAP S/4HANA Cloud system. Customers and partners can develop their extensions directly on the SAP S/4HANA Cloud technology stack using the RAP programming model and the cloud-optimized subset of the ABAP language. Like with SAP BTP, ABAP environment, customers and partners can use the public interfaces of the underlying ABAP platform cloud stack. In addition, they can use the public interfaces and released objects of SAP S/4HANA Cloud locally.

Comparison of Extensibility Options

The extensibility options for SAP S/4HANA Cloud are highlighted in **Figure 4**. The on-stack extensibility options (key user extensibility and developer extensibility) are shown in the two joint columns on the left. The side-by-side extensibility options powered by SAP BTP are shown in the column on the right. As we have seen, the key user extensibility offers low code/no-code tooling access, creating custom fields and maintaining the layout.

Developer extensibility is well-suited for tightly coupled extensions. Customers and partners can directly access the released SAP S/4HANA Cloud business objects without the need for remote access or data replication. Side-by-side extensions on SAP BTP can be written in ABAP, Java, or node.js. Access to SAP S/4HANA Cloud objects requires remote access using a public API test tool for SAP S/4HANA Cloud from SAP API Business Hub.

The Road Ahead

Now that the concept of SAP S/4HANA Cloud is laid out, the question arises what happens to SAP S/4HANA on-premise. Of course, the traditional way to build ABAP-based extensions in that on-premise environment remains. Customers are not forced into a new extensibility model. However, the advantage to build an extension on stable public interfaces should be obvious.

To gather experiences with the new model, SAP works together with customers and partners in an

Figure 4 Extensibility Options for SAP S/4HANA Public Cloud

	Custom development integrated in SAP S/4HANA Cloud		Custom development on SAP Business Technology Platform
	Key User Extensibility	Developer Extensibility	Side-by-Side Extension
Scenario	Smaller Low-/no-code extensions of SAP solutions	Tightly coupled more complex extensions and apps	Loosely coupled extensions and apps
Target environment	Fully integrated in SAP S/4HANA Cloud stack		SAP Business Technology Platform
Use cases	UI field layout, custom forms and templates Custom analytics via CDS views Custom Business Objects Custom business logic using Cloud BADIs	ABAP based … custom app development extensions of SAP S/4HANA Cloud solutions partner extensions	Custom or multitenant applications ABAP and non-ABAP (Java, Node.js,) development SaaS solutions developed by partners Apps for separate target groups
Persona	Key user	ABAP developer	Developer
Benefits	Fully managed and integrated in SAP S/4HANA Cloud No or only very basic development skills required	Development of extensions inside the SAP S/4HANA Cloud system No remote access and data replication Use and extend released SAP S/4HANA Cloud objects	Decoupled extensions independent of SAP S/4HANA Cloud operation and lifecycle management

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 **Enhance developer extensibility.** With SAP S/4HANA Cloud ABAP environment, SAP adds developer extensibility to SAP S/4HANA Cloud.

2 **Connect tools to SAP S/4HANA.** Customers and partners can directly connect to SAP S/4HANA Cloud with their ABAP Development Tools for Eclipse.

3 **Access to business objects through APIs.** Developers can access the business objects of SAP S/4HANA Cloud by means of local released APIs.

4 **Enable a new programming model.** SAP enables the ABAP RESTful application programming model for SAP S/4HANA Cloud.

early adopter project in the second half of 2021. The feedback will be incorporated into the ABAP platform cloud technology stack. SAP will offer the developer an extensibility option based on stable interfaces also for SAP S/4HANA on-premise systems and likewise for SAP S/4HANA Cloud, private edition as part of the RISE with SAP initiative. Customers and partners can then choose to use this option also in on-premise, resulting in a single codebase approach for cloud and on-premise over time.

adaptation efforts after a version change. ABAP developers can directly connect and carry out on-stack development tasks similarly as in the on-premise world. After successful introduction in SAP S/4HANA Cloud, this approach will also be introduced as an extension option in SAP S/4HANA on-premise so that customer and partner code can be designed in a deployment-neutral fashion (both cloud and on-premise). With the theory fully captured, **click here** for concrete extension examples using the tools described in the article. ■

Summary

In this article, we introduced the SAP S/4HANA Cloud ABAP environment, which provides ABAP developers with full ABAP development tool access to released SAP S/4HANA Cloud business objects and extension points. These interfaces are guaranteed to be stable, removing

AUTOMATED MACHINE
LEARNING IN THE CLOUD

Kumar Singh
Research Director, Data, SAPinsider

It has been more than eight years since AutoWEKA, the first free and open-source machine learning library, was released in 2013. It is not surprising then that automation of the data science process has been around for nearly a decade, but these tools have evolved extensively in recent years. The initial technologies were mainly focused on algorithm selection and hyperparameter tuning, which helps automate aspects of the work done by data scientists. They are not, however, practical for the day-to-day work of a data analyst.

AutoML tools have evolved into the democratization of data science. They now include a broader scope, encompassing the automation of the entire data-to-insights pipeline — from cleaning data to tuning algorithms through feature selection and feature creation, even operationalization. And now, with the advent of the cloud, the case of AutoML has become much more substantial. This article will explore:

- Why the need for Automated ML has been fueled by the cloud
- What are the Automated ML solutions offered by hyperscalers
- What are some of the critical aspects SAPinsiders need to be aware of when strategizing about Automated ML in the cloud.

Why AutoML in the Cloud?

As the amount of information owned by organizations took off (and continues to do so) and grew exponentially, those businesses often found themselves trapped with data insights that increased only linearly, unable to leverage the massive amounts of information at their disposal. Organizations are increasingly looking to the cloud for data management infrastructure due to the likeability, scalability, and flexibility that data management in the cloud allows.

The next step is making the best use of the massive amount of data generated by organizations. And this is where artificial intelligence (AI) and machine learning (ML) tools come into the picture. However, organizations need more than just access to insights from these models; they need these insights fast.

Accelerated modeling is critical for the move into Enterprise AI, and it's a function of scale — using more data for more data projects, at a faster rate, with the purpose of automating everything. While having a cloud-based infrastructure is undoubtedly a critical part of achieving all this, there is also a need to implement in combination ML models operationalized by self-service analytics programs. Another factor is that hiring exponentially more data scientists, who are not only expensive but extremely difficult to find and hire, is a big challenge for most companies. As a result, many organizations are shifting toward developing more and more citizen data scientists to support rapidly accelerated data efforts and a growing number of ML projects in production, fueled by the cloud.

AutoML, or augmented analytics, allows citizen data scientists to do more advanced work, allowing data scientists to work on more specialized tasks. Citizen data scientists (analysts or business users) can produce more valuable (and less mundane) results. This arrangement benefits the business because a large staff of citizen data scientists produces more data projects supported by data scientists or accelerated AI modeling.

Leading Cloud-Based Analytics Tools

While the market for AutoML tools is getting crowded rapidly, the three leading hyperscalers lead the pack in terms of having the end-to-end capability desired in Automated ML solutions. We will cover the Automated ML tools from these hyperscalers in this section. Please note that this is not a comparison or ranking but an alphabetical listing of key features of Auto ML solutions from the three leading hyperscalers:

- AWS SageMaker AutoPilot
- Azure AI Automated ML
- Google Cloud AutoML

AWS Sage Maker AutoPilot

Amazon SageMaker Autopilot covers the entire MLOps pipeline. With this tool, you can automatically build, train, and tune ML models in an intuitive interface while maintaining complete visibility and control. SageMaker Autopilot explores different models to determine the best model based on the data and the problem type. You can also quickly deploy the model directly to production in just one click or iterate on the recommended solutions with Amazon SageMaker Studio to further improve the model quality. Some of the critical features of AutoPilot are:

Automatic data pre-processing and feature engineering. SageMaker Autopilot automatically fills in missing data, provides statistical insights about columns in your dataset, and automatically extracts information from non-numeric columns, such as time and date information from timestamps.

Automatic ML model selection. Based on your data, Amazon SageMaker Autopilot infers the type of prediction that is most appropriate, such as binary classification, multi-class classification, or regression. Then, SageMaker Autopilot explores high-performing algorithms such as gradient boosting decision trees, feedforward deep neural networks, and logistic regression, training and optimizing hundreds of models based on these algorithms to find the model that best fits your data.

Model leaderboard. You can review all the ML models Amazon SageMaker Autopilot automatically generates for your data. Using the list of models, you can view metrics such as accuracy, precision, recall, and area under the curve (AUC), as well as review model details, such as the impact of features on predictions, and deploy the model that is most suitable for your use case.

Feature importance. SageMaker Autopilot generates an explanation report, developed by Amazon SageMaker Clarify, that helps you to explain how the models created by SageMaker Autopilot make predictions. In addition, you can identify the percentage contribution of each attribute in your training data to the predicted result. The higher the percentage, the stronger the impact of that feature on your model.

For a detailed review, you can visit the product page: **https://docs.aws.amazon.com/sagemaker/latest/dg/whatis.html.**

Azure AI Automated ML

Azure AI Automated ML tool is another best-in-class tool that enables users to automatically build and deploy predictive models using the no-code user interface or an SDK (used chiefly by developers). This tool also covers the end-to-end model development pipeline. It can help with data pipelines and preparation, creating ML models customized to the input data and helping refine the underlying algorithm and associated hyperparameters. The Automated ML functionality increases productivity across the end-to-end ML pipeline. Some of the key features of Azure Automated ML capabilities are:

Drag-and-drop functionality. Users have access to features like the designer, which has modules for data transformation, model training, and evaluation, making it easy to create and publish ML pipelines.

Automated ML algorithm selection. Allows users to rapidly create accurate models for classification, regression, and time-series forecasting. To avoid these models becoming models where the users do not know what the underlying algorithm is and how it works, the feature uses model interpretability to help understand how the model was built.

Data labeling. Data preparation is a significant pain point in ML model development, and there are features to make this task easier and accelerate the process. It helps users prepare data quickly, manage and monitor labeling projects, and automate iterative tasks with ML–assisted labeling.

Responsible machine learning. Get model transparency through training and inferencing with interpretability capabilities. Assess model fairness through disparity metrics and mitigate unfairness. Help protect data with differential privacy and confidential ML pipelines.

For a detailed review, you can visit the product page: **https://azure.microsoft.com/en-us/services/machine-learning/automatedml/.**

Google Cloud Vertex AI

Google Cloud's AutoML solution allows users to train high-quality ML models seamlessly and easily, with minimal ML expertise. Just like other hyperscalers, it offers a range of sub-products that allow users to run a wide range of AI modeling approaches on various types of data. The key features of Vertex AI, the solution that is essentially a unified platform to build, deploy, and scale models, can be described using some of the essential components of model building and deployment:

Training. Models can be trained on Vertex AI using AutoML or using custom training if you need more customization options available in AI Platform Training. In custom training, you can choose different machines

to power your training jobs, enable distributed training, use hyperparameter tuning, and accelerate using GPUs.

Deployment. Vertex AI allows you to deploy models and get an endpoint to serve predictions. You can deploy models whether the model was trained on Vertex AI or not. Like other hyperscaler products, this is a key feature as it allows you to migrate models seamlessly.

Data labeling. Data labeling jobs let you customize ML models by labeling a dataset you plan to use for training. You can request a label for your video, image, or text data. This accelerates the model development timeline extensively.

Feature Store. This is a fully managed repository for storing, serving, and sharing ML feature values. Feature Store takes care of all underlying infrastructure to support the functions mentioned. You can use it for storage and compute resources, for instance, and scale it easily as needed.

For a detailed review, you can visit the product page: **https://cloud.google.com/automl.** ◼

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 **Differentiate data scientists from citizen data scientists.** For non-data scientists to effectively participate in data projects, there needs to be a significant mindset shift around data tooling. Citizen data scientists often do not possess advanced feature engineering skills, parameter optimization skills, algorithm comparison skills, etc. However, as AutoML and, more importantly, augmented analytics technologies emerge, not everyone involved in the data pipeline needs to know about these skills — parts of the channel can be automated. It is, however, critical to understand where exactly you need to use data scientists versus citizen data scientists.

2 **Drive usability, stability, and transparency.** When leveraging cloud-based AutoML solutions to put the power of ML in the hands of citizen data scientists, they must meet these three criteria. If you are looking at other options, you need to be aware of usability, stability, and transparency. An easy-to-use system should be accessible to non-developers with little technical expertise. Ensure that the method you choose provides context-sensitive help and explanations for different parts of the data process, as well as a visual, code-free user interface. To execute augmented analytics, users must have access to a system that can be used from one end of the data pipeline to the next. An accurate description of the algorithms used provides citizen data scientists with the knowledge they need to develop trust in the outcomes and determine if they are appropriate for the project at hand.

3 **Leverage adaptability as the secret sauce.** The idea behind augmented analytics, which is a tool primarily used by citizen data scientists, is that they can contribute to data projects independently, but that doesn't mean that those projects will not be used by others (namely data scientists). An automated system needs to serve as a starting point for custom development and dedicated learning by data scientists. The outputs, for example, should be able to be translated into Python code for complete learning, including feature transformation and cross-validation. Of course, it cannot be understated that adding these features to augmented analytics or the AutoML platform does not mean anyone can create models and push them into production without oversight, review, or input from someone specialized in the field (such as a data scientist).

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ACCELERATING THE
AUTOMATION
JOURNEY

HOW LIVE PROCESS CONTENT IN SAP WORKFLOW MANAGEMENT CAN AMPLIFY BUSINESS PROCESS AUTOMATION

Milton Rodrigues, *Product Manager and Solution Expert for SAP Workflow Management, SAP,* **Archana Shukla,** *Senior Product Manager, SAP,* **Stephan Schluchter,** *Product Manager for SAP Workflow Management, SAP*

It may be a bold statement to say that business processes "run the world," but there's truth to it. As evidence, look inside your organization. How many encounters do you have with processes, and the applications that support them 24/7, daily? The answer is every time you interact with suppliers, customers, and other organizations.

Standard business processes are essential for keeping the wheels of your organization turning – connecting different stakeholders and running dedicated business applications, like SAP S/4HANA or SAP ERP. These vital processes help organizations ensure the right goods are produced, customers receive their orders, invoices are paid, leave requests are approved, employees receive proper salaries, and more.

In addition to standard business processes, organizations must consider how workflows run across organizations, people, and business applications – either embedded as standard workflows in applications or as extensions and across different lines of business. These workflows, created to differentiate or function as

extensions to standard business processes, can be tricky to work with, especially when it comes to automation.

Is your workflow working seamlessly and as efficiently as possible? Is it traceable and running without too many errors? If not, how can you overcome these issues?

In this article, we highlight how SAP Workflow Management, including live process content packages, can help simplify and accelerate the journey. You will read about non-standard workflows, the role of process automation to reduce business complexity in the last mile of automation, and how to access live process content packages.

Addressing Business-Critical Needs with Live Process Content Packages

SAP Workflow Management provides capabilities to digitize workflows, automate and extend business processes, manage decision logic, gain end-to-end process visibility, and configure process variants in a no-code environment. It allows organizations to create workflows and extensions, include business rules,
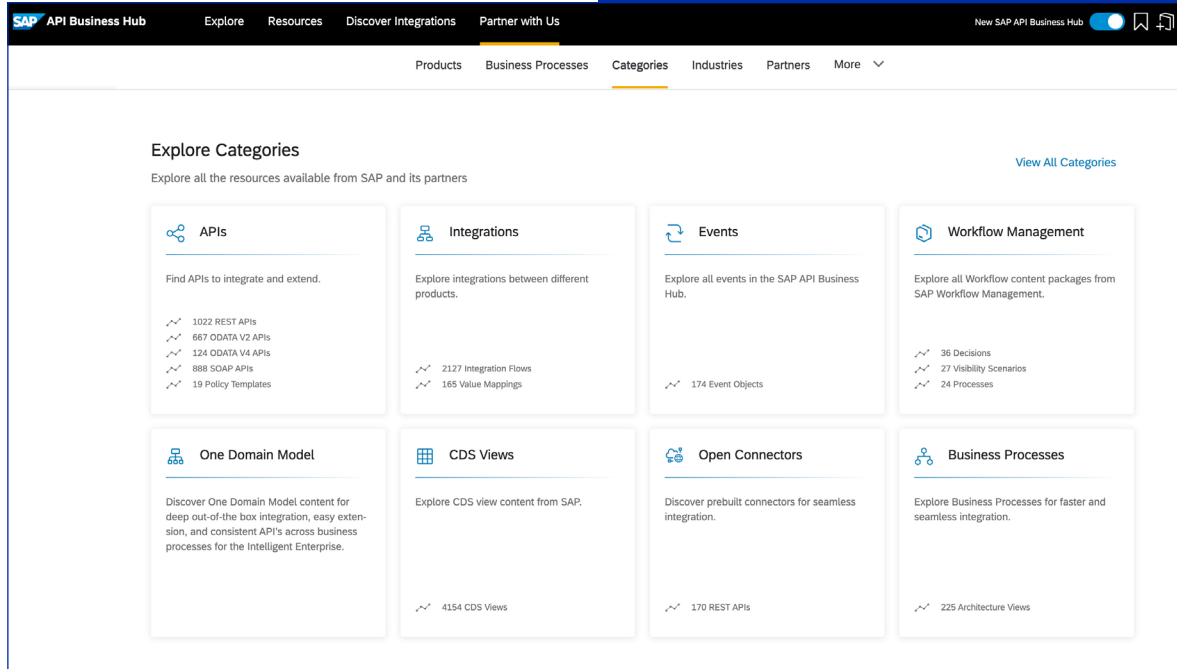
add essential approval levels, run conditional logic for specific workflow variants, and more.

A key benefit of SAP Workflow Management is that it enables enterprises to address business-critical changes flexibly, without the need to know any technical language or IT tools – low-code/no-code (LCNC) in action. This process flexibility capability provides opportunities for:

- Developers and business users to flexibly adapt changes to workflows and decisions in an LCNC environment.
- Organizations to enrich existing business processes with intelligence by introducing visibility to end-to-end business processes, spanning multiple systems.
- Business experts to leverage the capabilities of SAP Integration Suite to connect SAP line-of-business applications — with each other and with SAP Workflow Management for business process orchestrations.

Not every organization wants to build non-standard workflows from scratch every time. The release of SAP Workflow Management introduces common, adaptable patterns to help organizations accelerate the automation journey. These patterns, which contain pre-built process templates, workflows, user interfaces, decision logic, and visibility scenarios, are based on very common use cases from SAP customers and partners.

Agility and Flexibility to Create Business Processes

SAP solutions like SAP Ariba, SAP S/4HANA, and SAP SuccessFactors provide standard processes for customers. But most organizations require customization and extensions beyond what these standard processes offer out of the box.

What's more, the agility and flexibility to build or enhance business process capabilities on the fly are increasingly becoming a business imperative for customers. Customers also benefit and succeed overall by digitizing workflows and transforming existing (or net new) processes into intelligent workflows. SAP has worked with process and solution experts to address the challenges and discover scopes of enhancements and extensions in the standard processes, providing

accelerators that add flexibility, extensions, and intelligence into the existing business processes.

With the release of SAP Workflow Management, we introduced these accelerators as live process content packages for different use cases. The live process content packages, which also contain applications such as UI5 Tooling and UI5 Automation Designer, the SAP Cloud Application Programming Model, and integration flows for SAP Integration Suite to support relevant content, are published in the **SAP API Business Hub**.

Live process content packages address different needs, here are a few examples:

- Capital expenditure approval
- Purchase requisition approval in SAP ERP
- Manage invoices without purchase order in SAP ERP
- Manage purchase info record in SAP ERP
- Visibility into SAP Ariba procurement operations
- Document-centric approval process

- Manage sales order approvals in SAP S/4HANA
- Manage credit block on sales orders in SAP S/4HANA

To expand on what these live process content packages represent, let's take a look at an example using the sales and distribution capabilities in SAP S/4HANA.

In a typical lead-to-cash process flow, the process can be configured for internal approval (via flexible workflows) or external approvals after the user creates a standard order. When the user processes a sales order, the system can automatically carry out essential functions, such as pricing, availability check, credit limit check, etc. A credit limit check failure is an exception in the process, and the order is blocked for further processing until the block is removed.

Additional packages cater to automation of approvals of sales orders, credit memo request, sales quotations, and more.
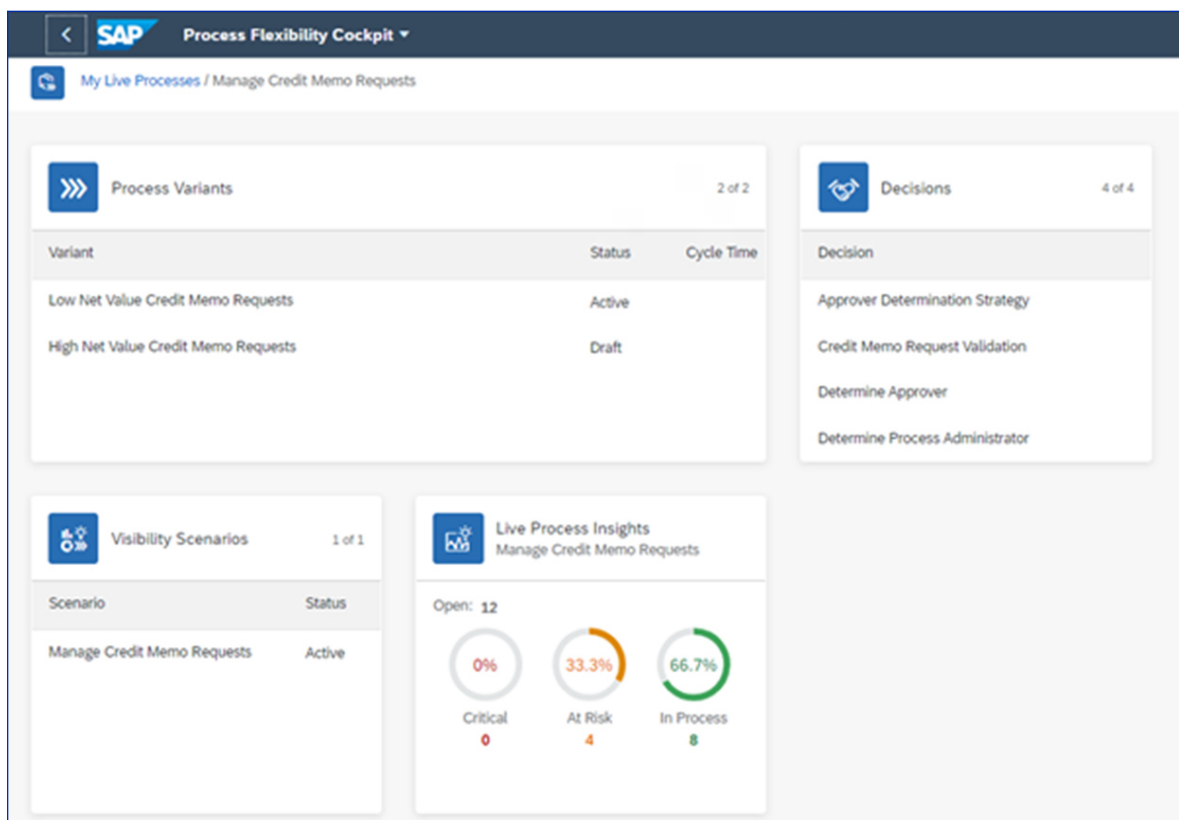

Figure 2 Access no code configuration tools in the Process Flexibility Cockpit

Live process content packages provide reusable process steps or workflows to validate, perform approvals on the respective standard orders, and subsequently release or reject them in SAP S/4HANA. Additional validations can be performed using business rules, providing flexibility to determine the processors for the approval tasks. Process variants can be created and dynamically triggered with the help of start conditions. Similarly, steps within each variant can also be executed or skipped based on step conditions, bringing in granular flexibility.

Process visibility offers out-of-the-box insights into key process performance indicators like open sales orders, approval cycle time, the number of credit blocked sales orders, etc. It is packaged with integration content and an event mesh that enables event-driven architecture that automatically creates a workflow in SAP Workflow Management based on the start conditions.

Developers, business process experts, and even citizen developers can create process variants, edit business rules, and enhance the visibility scenarios – resulting in changes to the process and the process dashboard – on the fly and without any coding. Live process content packages are all plug-and-play with SAP S/4HANA, so there are no additional standard orders development requirements.

The packages address flexible automation, insights to end-to-end heterogeneous processes, document-centric workflow capabilities, and easy-to-implement business decisions in various business processes that can benefit from these capabilities.
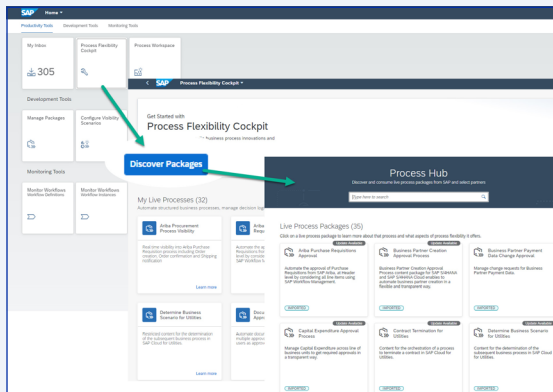
How to Access and Use Live Process Content Packages

Live process content packages contain references to digital workflows, decisions, process visibility scenarios, user interfaces, and cloud application programming model modules. Developers – typically business process experts or citizen developers – can discover, import, configure, and set up content packages in the Process Flexibility Cockpit through the Process Hub. Here is where a user can leverage LCNC configuration tools to:

1. Flexibly extend and adapt workflows running in their packaged applications.
2. Manage process variants and decision logic.
3. Model process performance indicators to track business-critical KPIs in real time.
4. Get end-to-end insights on the processes.

Based on the business need and use case, some content packages have an accompanying SAP UI5 application template that can be used with minimal configurations or as a reference to build your own application. Examples include **Managing Invoices without Purchase Orders** and **Managing Approvals for Capital Expenditures**. Other packages have configurations to easily plug and play the content with SAP S/4HANA or SAP ERP Central Component, using the SAP Event Mesh and accompanying integration content where relevant. Each package comes with descriptive material to guide the user to set up and use the content. How can a user identify and configure the live process content package? Let's use an example of a business process expert with the urgent need to address external approvals for credit memo requests in their SAP S/4HANA Cloud system. In this scenario, a business process expert may take the following steps:

Figure 3 Access live process content packages directly

Access the Process Hub via the Process Flexibility Cockpit. Here, a business process expert can view all the available and relevant content packages.

Figure 4 Select the desired live process content package
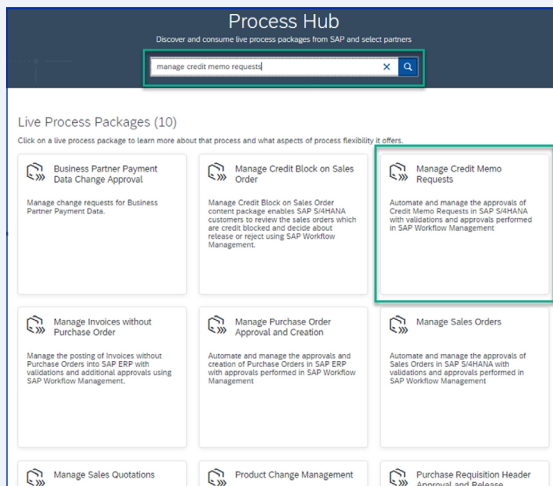
Search for the right package. The business process expert looking to manage external approvals on credit memo requests in SAP S/4HANA can do a simple search for "manage credit memo request" (or relevant information) in the Process Hub. The search will produce a list of all available relevant packages.

3
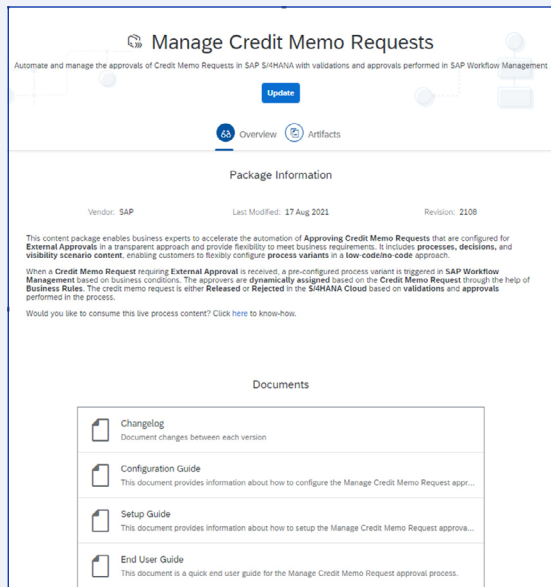
Figure 5 Overview of the package

Choose and import the package. The search results will display a box titled "Manage Credit Memo Request." After selecting it, the business process expert can import the package. Note that if the package is already imported, you have the option to configure them or update them when an update is available.

4
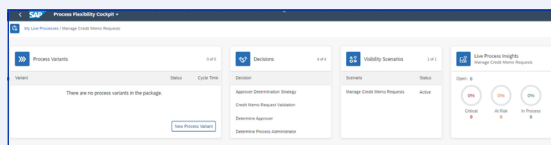
Figure 6 From this screen, you can configure process variants, decisions, and visibility scenarios.

Process Flexibility Cockpit. The selected package is brought into the business process expert's Process Flexibility Cockpit. The user can perform subsequent actions (creating process variants, modifying decisions, modifying visibility scenarios, and getting insights into end-to-end business processes) right from the cockpit.

5
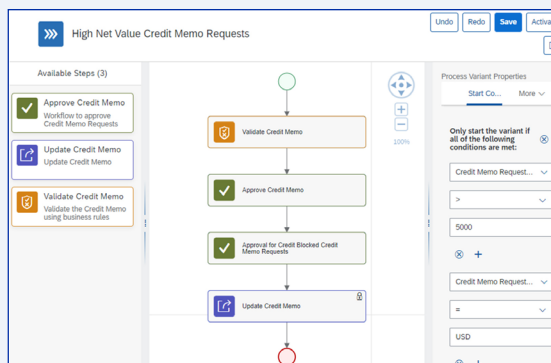
Figure 7 Just drag and drop and the process variant is ready

Creating a process variant. With the content package in the cockpit, the user can create and/or maintain existing process variants to cater to changing business requirements. Using the Manage Process Variant application to create a process variant, simply drag and drop the required process steps from the available steps, configure the steps, and activate the variant.

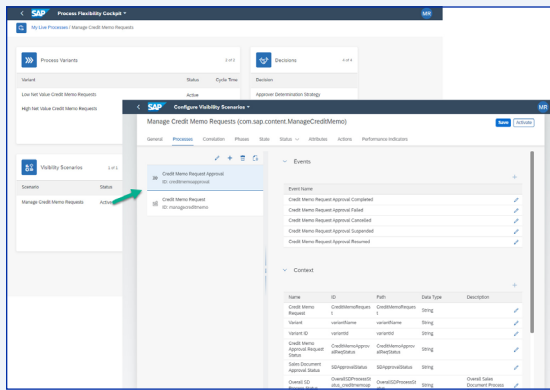**Figure 8** Step properties to control whether a step should be used or not

Start conditions provide instruction on which process variants are triggered and the steps that should be executed based on conditions. Figure 7 shows an example of a variant where a two-step approval will be triggered if the total net amount exceeds 5,000, and the transaction currency is in U.S. dollars.

Start Conditions and Step Conditions. Step-level conditions allow more granular flexibility on the process variant. Based on the business object's data, these step level conditions determine whether a step should be triggered or skipped. As displayed in the High New Value Credit Memo Requests example in **Figure 8**, an additional approval step can be explicitly triggered if the request is credit blocked.

Figure 9 Manage decisions and include the needed business rules

Manage business decisions. With the Manage Decisions application (see **Figure 9**), a business process expert can view, modify, and activate business decisions. By definition, a decision consists of one or more policies, and each policy consists of a collection of rules.

Figure 10 Use business rules to assign suitable processors during execution

Assign possible processors. A common requirement for any approval process is assigning suitable processors for the task. With a business decision such as Determine Approver (see **Figure 10**), the business process expert can define and assign the right user group/person to the task based on values from the business object.

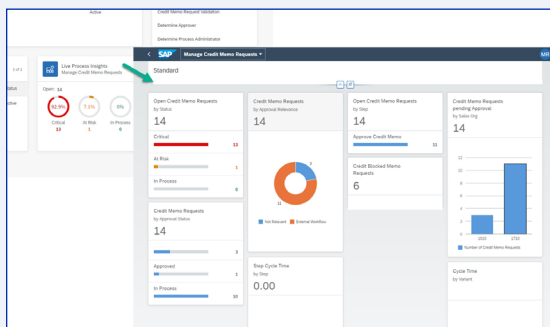**Figure 11** Get end-to-end visibility for your workflow

Figure 12 The dashboard is automatically generated

Manage insights. The Process Flexibility Cockpit provides an overview of your business scenario with insights on the process: all credit memo requests in a configured SAP S/4HANA system are in the example below. Process Visibility gives real-time visibility on the requests in your configured SAP S/4HANA system in this case. While the package comes with out-of-the-box visibility, with Configure Visibility Scenarios (see **Figure 11**), a user can enhance the scenario with desired metrics and process performance indicators.

Activate the changes. Once the changes are activated, they will reflect in the Visibility Scenario of the process. Live process insights can be viewed directly within the Process Flexibility Cockpit and provisioned to the right people in the SAP Fiori launchpad. Navigating into it will display the process workspace for the scenario.

Live Process Content Package In Action

Once you've done all the above, your content package is ready to be used in a productive environment. In the following (see **Figure 13**), when a new credit memo request is created in your configured SAP S/4HANA systems, if it is marked for external approval and the order reason matches the configured reason for approval request, then the relevant process variant is triggered based on the start conditions.

The approval task is assigned to the task owner – the package's business rules decide this. The task owner will receive the task in the My Inbox application with all the details to approve or reject the request (see **Figure 13**).

When the request is approved, it is released for further processing in the SAP S/4HANA system. The approval status will show "Released" as the status of the Credit Memo Request (see **Figure 14**).

Figure 13 Work on the tasks in the My Inbox application, approve or reject them

Figure 14 Once the workflow is approved, the credit memo is released in SAP S/4HANA
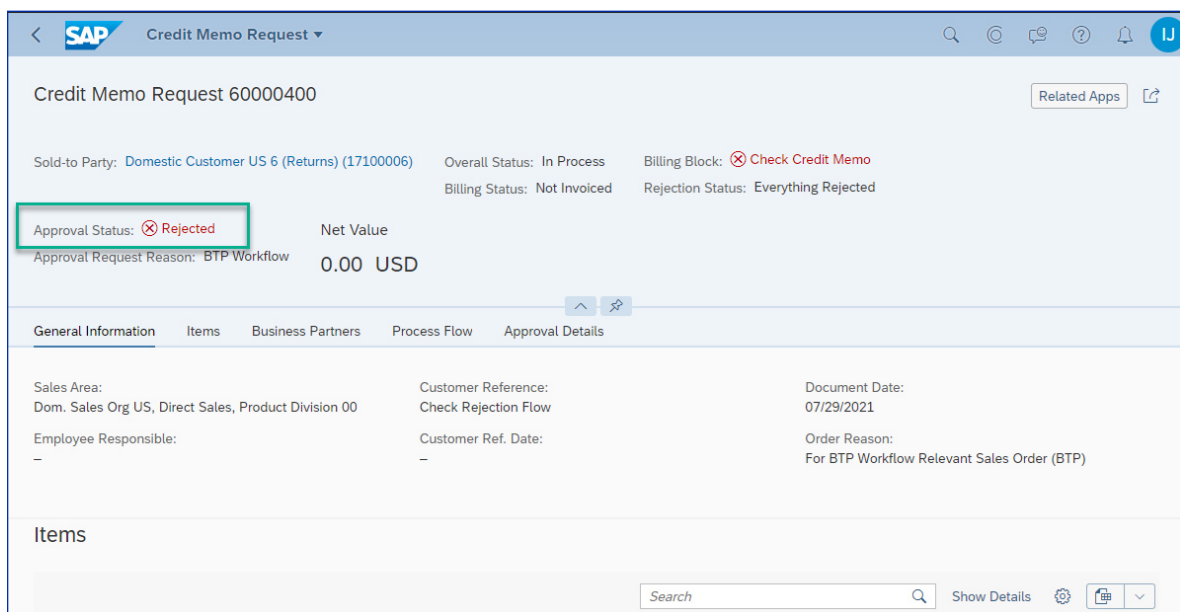
Figure 15 Rejected credit memo request

Similarly, when rejected, the approval status is updated as "Rejected" (see **Figure 15**).

Using live process content packages will fundamentally accelerate your automation efforts. You can now start enhancing the process to include bot automation as digital workers or digital assistance. One option would be to leverage SAP Conversational AI to create a chatbot that will help the business user run the process, drive the right decisions, and get the needed context details at the right time.

Combining SAP Workflow Management with bots created or also pre-built with SAP Intelligent Robotic Process Automation can eliminate mundane, repetitive tasks in a business process or use automation to extract data from different data sources, like emails,

spreadsheets, and documents as images, for example, to trigger the start of a workflow. The following resources provide use cases and opportunities worth consideration and guidance on how to get started with accessing and using live process content packages:

- The tutorial, **Discover and Configure Live Process Content with Workflow Management**, provides an overview of how to import and set up a sample workflow content package into your landscape.
- The blog, **Compendium of SAP Workflow Management Missions**, sheds some light on some of the published packages and provides guidance on setting up, configuring, and consuming them.
- Explore all available live process content packages for SAP Workflow Management in **SAP API Business Hub.**

Figure 16 The content package developed by IBM – access the description via SAP API Business Hub
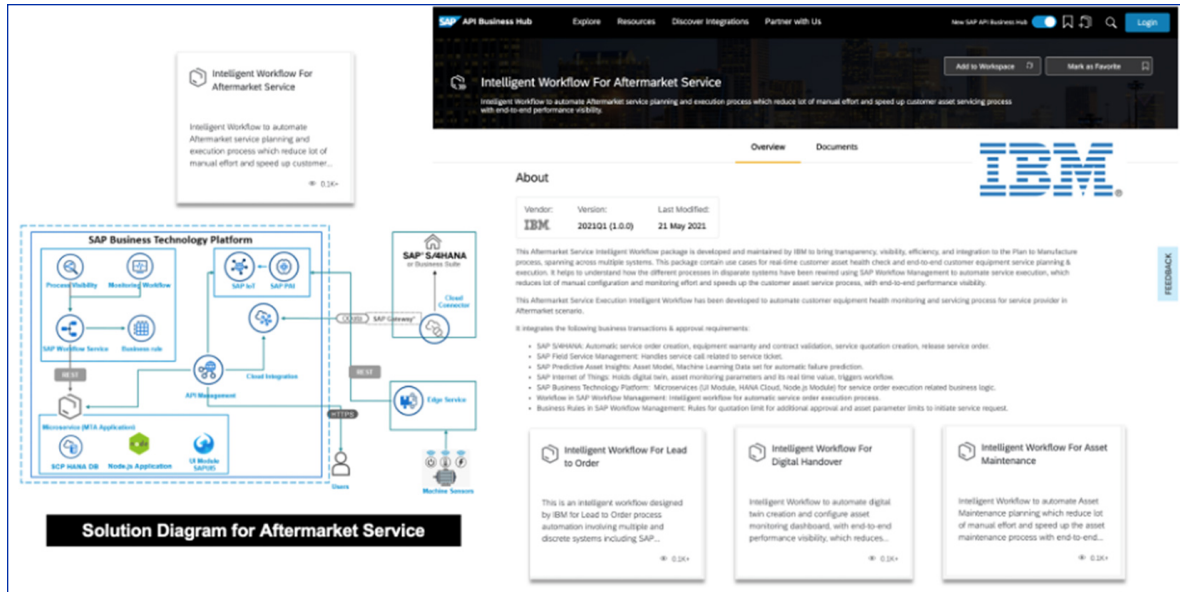
A Partner Ecosystem For Industry-Specific Demands

The SAP Partner ecosystem is vital in expanding and scaling the automation and adoption of end-to-end business processes across different industries. These partners have the needed expertise, skills, and domain knowledge to deliver unique complementary solutions to meet market demands. Customers are looking for updated versions of the SAP solutions without profoundly disrupting their existing investment. Partners can integrate with new technologies and services to re-invent existing processes, helping customers increase value, create unique experiences, and open new avenues of business transformation.

The SAP and IBM Evolution partnership is one such initiative to deliver unique end-to-end cloud-based solutions and derive effective business transformation across different industry verticals. The first set of solutions from IBM targets the industrial machinery and components (IM&C) industry, focusing on lead-to-order and plan-to-manufacture processes. IBM has released four live process content packages in SAP **API Business Hub** based on the IM&C industry. These content packages are designed and built using SAP Workflow Management. They orchestrate and automate

workflow and processes across disparate systems like SAP S/4HANA, SAP Field Service Management, SAP Internet of Things, SAP Sales Cloud, the SAP Customer Experience portfolio, and more. These solutions offer increased productivity and customer satisfaction to address industry-specific demands (see **Figure 16**).

The new redesigned content, based on SAP Business Technology Platform services and industry-cloud solutions, enables clients to modernize automation of processes and decision making. The content helps provide advanced insights to identify bottlenecks, seamlessly integrate across systems, and extend the existing capabilities in SAP applications with the latest technologies.

Combining the partner ecosystem and SAP's offerings in process automation is the start of a new journey to deliver industry-ready pre-delivered workflow content packages that help customers become fully automated and intelligent enterprises.

Which scenarios would you like to see SAP or SAP Partners implement as pre-built content? Share your feedback or join the conversation in the **SAP Community around SAP Workflow Management**. ◼

MODERN, DIVERSE
IT ENVIRONMENTS
NEED NEW AUTOMATION

**DEVIN
GHARIBIAN-SAKI**
Chief Solutions Officer
Redwood Software

Fred Donovan
Senior Editor, SAPinsider

Today's IT landscapes are becoming more diverse as IT leaders adopt new applications to better support their business requirements, and as the infrastructure itself becomes a hybrid blend of cloud and on-premise infrastructure. These changes impact the types of processes that run, where they run, and how they interface with the SAP ecosystem.

For example, customer records in the SAP enterprise resource planning (ERP) system may be linked with records in Salesforce and with data and reports from the SAP ERP system published to a business intelligence (BI) tool like Tableau or PowerBI.

One major change creating IT landscape diversity is an increase in adoption of hybrid cloud deployments. Recent **research** from SAPinsider revealed that among SAP customers, more organizations are selecting a hybrid private cloud environment for their SAP S/4HANA deployments. The report analyzed deployment approaches for SAP S/4HANA and the cloud strategies of SAP customers in this area.

This growing diversity is driving a need for better automation and orchestration, says Devin Gharibian-Saki, Chief Solutions Officer at Redwood Software.

"Automation is the glue that keeps this landscape operating effectively. It doesn't matter what your landscape looks like; it needs to be glued together," Gharibian-Saki says. Automation connects the diverse applications and services that the business depends on and that IT is responsible for. With the right automation strategy and tools, IT can ensure that everything runs smoothly even as the landscape evolves, he adds.

Gharibian-Saki says that the more diverse the IT landscape becomes, the more important automation becomes. The right kind of automation enables event-driven processes that can be orchestrated end-to-end from a single pane of glass.

"Every customer today expects an immediate response, which means that everything you do from a business process perspective has to adapt to those demands. You have a more complex IT landscape, and you need to bring it together so it can be data-driven and real-time," he says. Wherever possible, he says, automated processes should start when an event

According to Devin Gharibian-Saki, Chief Solutions Officer at Redwood Software, automation is the glue that makes diverse IT landscapes operate seamlessly and effectively.

occurs, such as new data or files becoming available, instead of scheduling to an arbitrary time.

End-to-end orchestration is also increasingly important in a more diverse IT landscape, he continues. The interface points are where the automation system becomes the "glue," replacing manual and inefficient integration or coordination. By gluing all of the systems involved in a process together with automation, IT gains more visibility and control over everything that happens. That means IT can more reliably deliver service and performance to the business and use the end-to-end views to identify opportunities to build in self-healing or eliminate performance bottlenecks.

When and Where to Focus Automation

Gharibian-Saki recommends that companies consider automation at the beginning of significant IT projects, like migrating to SAP S/4HANA, rather than as an afterthought.

"If you don't start designing and shaping your processes with automation in mind, you lose a lot of potential, and you also lose a lot of money doing things two or three times," he says. "You should weave automation into the general rollout program to leverage the efficiency and process improvement aspects of your whole IT transformation." He also advises having an automation system in place that supports hybrid cloud deployments before beginning the migration.

"An automation tool is best if it is invisible. It should work reliably, and you don't have to think about it. If you have to have a team of 20 people that constantly press buttons to keep the automation running, or you constantly need to fix it because it is breaking all the time, it doesn't fulfill its purpose," he adds. "The automation glue should be invisible, but it also needs to be flexible."

For existing processes, Gharibian-Saki also recommends that companies revisit how they have automated their core value-chain processes, such as

production planning and manufacturing, forecasting and replenishment, or billing and invoicing. These essential processes can often be streamlined to replace rigid schedules with event-driven automation and build in self-healing that handles expected issues automatically without human intervention.

As an example, Gharibian-Saki says that the capabilities provided by SAP Integrated Business Planning (IBP) applications for Supply Chain can be enhanced through automation. He suggests that by applying automation and orchestration SAP customers can bring planning data into the cloud more efficiently and more frequently, realizing better and faster planning capabilities with SAP IBP. Those improvements can improve productivity and reliability, with higher cost-savings and customer satisfaction as the end result.

Automation Boosts Supply Chain Performance

To highlight how Redwood helps its customers with automation, Gharibian-Saki points to a specific customer example. Salling Group, Denmark's largest retail group, reported in a case study published by Redwood that prior to using Redwood's software-as-a-service (SaaS)-based automation solution, its existing scheduler lacked supply chain visibility and error alerting, making it difficult to respond to critical situations and monitor its system environment. Delays affected order fulfillment, forecasting, and replenishment of warehouses and stores. The customer also reported that its scheduler exposed them to a risk of high outsourcing costs for maintenance.

As a result of using Redwood's solution, the Salling Group reported that it is now able to connect and automate its end-to-end supply chain processes across its entire SAP ERP landscape and has significantly reduced costs by minimizing the need for outsourced support. With automation across the supply chain, all activities are consistent and accurate so staff can detect and fix errors up front with less effort and downtime, and customers and stores get the products they need.

"There are so many things that can break in such a large and complicated process and stop the business. Our solution glues them together to allow customers like Salling Group to overcome these breaking points," Gharibian-Saki says.

Read the full case study here.

SaaS Automation Significantly Reduces Costs

Redwood Software provides automation as SaaS, which Gharibian-Saki says can help free up the IT organization to deliver value-added work instead of maintaining the automation system.

"With SaaS, you don't have to buy and operate the hardware, and you don't have to operate the database and the operating system," he says. "You can focus on the automation instead of administration."

He refers to another client, a global energy services company, that decided to move its entire IT infrastructure to the cloud, beginning with its on-premise automation solution. The company reported in a case study published by Redwood that it chose Redwood's SaaS solution for its immediate cost reduction, saving an estimated quarter of a million dollars on server hardware, management, and support.

By using Redwood's solution, the company reported that it also optimized the number of monthly executions by a third — from three million to two million — improved efficiency and reduced complexity, shortened the time for security access audits from days to hours, and decreased the time for system upgrades from hours to minutes. The company is now able to run the entire organization's automation with one full-time employee and a few part-time contractors.

"Moving from on-premises to Redwood's cloud solution was the closest and most true version of a 'lift and shift' I have seen in my 25 years in IT. We were able

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1   **Consider working with different cloud providers for your applications, data repositories, and infrastructure orchestration technologies.** According to **Denodo**, companies that select this multi-cloud approach choose it to avoid getting locked into a single vendor. Keep in mind how you will automate your core value-chain processes in that more diverse IT landscape. Research the best tool for your automation needs.

2   **Plan ahead.** Adding automation into your major IT projects as an afterthought can cost you time, money, and productivity. Instead, be proactive and include automation in the planning of your next IT initiative.

3   **Don't be swayed by market misconceptions about cloud-based automation.** Not every cloud-based solution is SaaS and not all process automation is RPA. Make sure that you understand your automation needs carefully and consider using a SaaS-based workload automation solution for your migration to SAP S/4HANA.

to seamlessly turn off on-premises and flip over to the cloud with minimal, if any, impact to our customers," the company's automation team lead was quoted as saying in the case study.

Read the full case study **here**.

Dispelling Misconceptions in Automation

Gharibian-Saki notes that there are some misconceptions in the area of workload automation around cloud, SaaS, and robotic process automation (RPA).

He cautions to be aware of "cloud washing," where an automation vendor positions itself as a SaaS provider, but its "cloud" solution runs on a virtual machine in a public or private cloud and still needs to be operated and maintained by the customer's staff.

"If a vendor just takes their software and deploys it in a virtual machine that happens to be in the cloud, it doesn't mean it's SaaS. It's the same software; it's just installed somewhere else. It still has overhead costs. The customer has to operate it and put staff on that to look after the virtual machine and to be responsible for the software," he says.

In addition, he notes that RPA is sometimes portrayed or perceived as an alternative to workload automation. While he agrees that RPA is a great addition to the IT automation toolkit, he adds, "When companies look at their true business requirements, they find that a modern workload automation platform like Redwood is more robust, resilient, scalable, and cheaper than using RPA products at scale." ■

COMPLEXITY DRIVES DEMAND FOR CLOUD-BASED

FINANCE
TECHNOLOGY

Ogo Nwanyanwu
Research Director, SAPinsider

The current business landscape requires multinational organizations to move at the speed of real-time transactions. Recent societal volatility is a significant catalyst for the current global economic uncertainty facing organizations today. This uncertainty is driving complexity across the business landscape.

In response to this complexity, organizations are prioritizing business transformations of core finance functions and moving to cloud-based SAP ERP deployments. Data from our **benchmark state of the market report** on SAP S/4HANA Finance and Central Finance points to "pressure to reduce the cost and complexity of financial processes" as the top driver impacting the SAP S/4HANA finance strategy of SAP customers. A move to the cloud represents the new standard for simplifying complicated and expensive technology infrastructures that support core finance and accounting functions.

For many organizations, the foundational elements of their digital transformation strategy begin with a greenfield conversion of all or brownfield conversion of some core business functions housed in SAP ERP and non-SAP systems to the cloud.

Organizations can choose an SAP S/4HANA conversion implementation to deploy on-premise or in the cloud. C-suites depend on SAP ERP systems to manage costs, sustain growth, and mitigate risks at high-performance levels. Resiliency and flexibility are also required in today's operational model to support these tasks amid new daily threats.

Moving Past TCO Discussion in SAP S/4HANA Cloud Conversions

SAP S/4HANA Cloud deployment can support improved system reliability and availability at scale, as cloud providers such as Amazon Web Services, Google Cloud Platform, or Microsoft Azure invest

heavily in business continuity and disaster recovery solutions. For organizations that manage multiple subsidiaries integrated with SAP S/4HANA, SAP hosts its own Software as a Service (SaaS) solution. The cloud provider is also responsible for new features, data storage, and security. These offerings help large organizations achieve a smaller IT footprint by removing the costs of maintaining hardware, software, networks, and technical talent.

In the past, total cost of ownership (TCO) reduction often defined the core value proposition for transitioning all or parts of an organization's financial core system to the cloud. In this current business landscape, transitioning to the cloud has become less about reducing TCO over the long term and more about achieving return on investment (ROI) in the short and medium term. By shifting to SAP S/4HANA Cloud deployment, organizations can allocate resources to innovation rather than legacy system maintenance.

Strategic Evolution Requires Digital Transformation

Demand for innovation stems from evolving business models and the need to market new products to engage customers where they live (e-commerce) and how they live (mobile). Accelerating trends in digitalization and globalization call for new methods of working with vendor partners (e-invoicing) to meet the demands of modern marketplaces. Government policies, regulatory frameworks, and revenue authority enforcement are increasingly more direct, comprehensive, and invasive regarding corporate engagement (e-filing; environmental, social, and governance reporting).

The global economy continues to change rapidly, forcing decision makers at multinational corporations to plan and execute more strategically than ever before. These business pressures are triggering a demand from C-suites for real-time visibility across organizations to enhance the current insight-generation and decision-making methodologies.

Yet, many companies are challenged by complicated core systems and require digital transformation to remain competitive. Increasing transaction volumes across disparate systems with varied data models are exposing inefficiencies within outdated technology foundations. Large multinationals can leverage the universal journal in SAP S/4HANA to centralize business activity recording, streamline finance processes, and deliver information quickly across the

organization. Finance transformations via the cloud provide organizations with the capacity to uncover more impactful insights and quickly distribute critical information.

Financial Transformation Facilitates Move to the Cloud

According to SAPinsider research, increasing real-time visibility into finance and operations is one of the top strategies organizations leverage with SAP S/4HANA Finance to transform core finance and accounting functions.

Here is a list of several core finance functions organizations are prioritizing in a move to cloud-based solutions for improved centralization, standardization, and transparency:
- Financial planning
- Profit tracking
- General ledger
- Accounts payable/accounts receivable
- Fixed asset management
- Risk management
- Multi-currency management
- Tax management
- Reporting and analysis

In addition to improved finance functions, cloud-based finance solutions are increasing the efficiency of finance and accounting professionals forced to work remotely in virtual teams. The pandemic redefined the workforce model, as finance and accounting professionals can work from anywhere at any time with any device. Quick access to data and the efficient transfer of information across the organization can reduce errors and improve the accuracy of end-to-end core finance processes. The elimination of low-value repetitive tasks, coupled with better workflow orchestration, can enable organizations to allocate resources to higher-value, more strategic work. Cloud-based finance management solutions provide real-time content updates to support operational controls and help optimize workflows previously designed for an in-office workforce structure.

Cloud Transition Offers a Roadmap to Next-generation Finance Function

The most crucial element of deploying cloud-based finance management solutions is to better collect, manage, and manipulate data across the organization. The volume and variety of data that

WHAT DOES THIS MEAN FOR SAPINSIDERS

1 **Change management is critical.** Finance and accounting professionals are human, and most humans need convincing to adopt change. Even if your organization is ready to move to the cloud and embrace the next-generation finance function, the workforce may be well behind the curve, so it is essential to evaluate the critical role of change management across the organization.

2 **Financial processes need to be re-imagined.** Organizations should constantly re-think every process and task to achieve optimization in concert with evaluating a move to the cloud. Processes developed for constrained physical offices and work hours should be stress-tested and future-proofed. Cloud-based SAP ERP systems such as SAP S/4HANA Cloud benefit from faster development and implementation cycles, supporting an organization focused on continuous innovation.

3 **Prioritize ROI at the right speed.** In a perfect world, business leaders would prefer a total cloud conversion of their core system all at one time. However, organizations are unique and complex, with several lines of business voicing varied requirements and time schedules that all demand consideration. Brownfield conversions with SAP S/4HANA Central Finance offer decision makers the opportunity to pursue a more flexible approach to financial transformations in waves or stages. A more deliberate approach can limit interruptions and downtime for some organizations while leading to better strategic and quantitative outcomes.

ERP systems are required to process continues to accelerate. Organizations are prioritizing best-in-breed solutions across specific finance processes, including reconciliation and indirect tax determination. C-suite leaders at multinational organizations are faced with the emergence of new threats and new business needs. Some challenges are addressed with current resources, while others call for novel solutions to address the threat or need. Cloud-based finance solutions provide a clear roadmap to automate routine tasks, standardize data models, and centralize financial information. This creates the foundation for building intelligent finance functions throughout the organization to address new and emerging threats and meet needs in real-time.

SAP S/4HANA Finance can enhance an organization's end-to-end financial processes with intelligent automation solutions leveraging robotic process automation and machine learning to deliver valuable insight. Artificial intelligence-enabled capabilities offered via cloud-based finance management solutions provide a roadmap to the next-generation finance function. The rapidly changing global economy is constantly producing new challenges. These challenges continue to reinforce the accruing value proposition of organizations in favor of a cloud-based technology ecosystem, as defined by near-term ROI via resource efficiency, workforce productivity, operational resilience, and business agility, rather than long-term TCO reduction. ■

WALGREENS BOOTS ALLIANCE, INC.

UNDERGOES A RETAIL FINANCE TRANSFORMATION TO DRIVE INNOVATION

WHAT STARTED AS A TECHNOLOGY PLAY TO REPLACE OLD LEGACY SYSTEMS WAS REIMAGINED TO "HOW CAN WE DRIVE MORE INNOVATION, CREATE VALUE, AND TRANSFORM OUR BUSINESS?"

Susan Fisher,
Contributing Writer

Shifts in what and from where consumers purchase are creating disruption and innovation across product development, sales channels, and supply chains. Having products consumers want, readily available and at a profitable price point has never been more challenging.

Walgreens Boots Alliance's (WBA) ability to continue to deliver exceptional customer experiences in over 9,100 Walgreens stores in the United States and through expanded omnichannel capabilities requires efficient processes and real-time visibility into operations. A transformation initiative is underway to modernize the company's core business processes so access to better data in real-time empowers all levels of the organization to manage greater complexity.

SAP S/4HANA is WBA's modern ERP digital foundation, replacing a highly customized legacy core. The phased implementation is initially focused on finance, retail, supply chain, and inventory management.

"With over 9,000 stores, we'll have the world's largest retail implementations of SAP S/4HANA of this scope globally," Mark Slater, VP, Platform Information Officer, Business Services, WBA, says. SAP S/4HANA has been rolled out to all 9,000+ stores and with noticeable improvements as a result of capabilities enabled by SAP. Hosted on Microsoft Azure, which provides the infrastructure to scale with tremendous volume, SAP S/4HANA has streamlined processes, analytics, and decision making, and is providing greater accuracy and confidence in the data due to more rigorous controls, governance, and training.

The integration of SAP Customer Activity Repository's retail applications module with SAP S/4HANA underpins innovation. The module feeds all point-of-sale (POS) transactions into SAP S/4HANA, acting as an automation engine and providing real-time visibility into inventory, reports, and dashboards. Additionally, core SAP S/4HANA reports provide analytics as well as extracts to

other data lakes, allowing WBA to integrate with multiple data sources. According to Slater, leveraging other SaaS tools to achieve advanced predictive planning is on the horizon.

Transformation Shapes a Modern Customer and Employee Experience

Process automation and improved visibility into better data are shaping a modern experience for WBA customers and employees.

In retail stores, automation of inventory management and document processing is enabling WBA's store employees to spend less time on manual tasks and more time engaging with customers and other higher-level tasks. Automation is helping with decisions around more effective labour deployment too.

Microsoft Azure delivers improved performance and data centralization, according to Slater, that helps

KEY TAKEAWAYS

- SAP S/4HANA modernizes business processes for greater innovation.

- Integrating finance, retail, supply chain, and inventory management functions to keep pace with market complexities.

- Communication, continuous training, and change management are essential to complex technology investments.

SNAPSHOT

WALGREENS BOOTS ALLIANCE, INC.

Headquarters: Deerfield, Illinois

Industry: Retail and wholesale pharmacy

Employees: Over 450,000 globally

Revenue: 121,982 million US dollars (FY2020)

Company details: WBA is a global leader in retail and wholesale pharmacy, with over 170 years of service, and over 21,000 stores in 11 countries

SAP Solutions: SAP S/4HANA, SAP S/4HANA Finance, SAP Customer Activity Repository, SAP Ariba, SAP Concur

"WITH OVER **9,000 STORES**, WE'LL HAVE THE **WORLD'S LARGEST RETAIL IMPLEMENTATIONS OF SAP S/4HANA** OF THIS SCOPE GLOBALLY."

MARK SLATER
VP, Platform Information Officer - Business Services, Walgreens Boots Alliance, Inc.

provide better customer service. Azure also provides flexibility in scaling when WBA starts to see consumer trends, positioning the company for the future.

Procurement is experiencing greater agility from better insights to what and how consumers are purchasing which helps WBA keep pace and meet growing complexity in its customers' needs like real time visibility into the demand for PPE, masks, and sanitizer during the peak of the pandemic. Further benefits include increased sales velocity, better return on inventory, and margin protection, as well as improved forecasting and inventory management.

Automating manual invoicing was a top priority since the 9,100-store retail chain generates between two and six million invoices monthly. This was all done manually prior to the roll-out. OpenText Vendor Invoice Management (VIM) for SAP Solutions, SAP Ariba, and electronic data interchange technology support this automation. VIM and the invoice matching capabilities of SAP Ariba have reduced errors and issues and help protect margins from a COGS standpoint.

Finance colleagues are in a much better position by month end as the close process becomes more automated with less reconciliation and data clean-up during the close, enabling them to focus on analytics and decision making. Through the in-flight implementation of BlackLine, labour-intensive processes like manual journal entries will be automated, and month end time to close will continue to improve as SAP S/4HANA has now been rolled out to all stores.

BlackLine has helped with account reconciliation, WBA's close, and getting the balance sheet wrapped. Rolling out additional SAP S/4HANA Finance capabilities will continue to advance process automation moving

WBA closer to a "lights out finance" approach enabled through SAP solutions.

Revenue leakage, margin improvement, COGS improvement, Sales General & Administrative (SG&A) expense reduction, working capital improvement, and controls/compliance improvement are key levers to drive business value at WBA, and a way to benchmark for ongoing measurement as the company continues to invest in its SAP S/4HANA ecosystem.

Ecosystem partners include GenPact and Tata Consultancy Services (TCS). GenPact is WBA's Finance Shared Services partner and is relied on for expertise in process transformation, automation, and thought leadership

TCS is WBA's application and technology management partner, instrumental in ongoing run operations and process improvement, including input into the SAP S/4HANA roadmap.

Accenture provided advisory, planning, and delivery support to WBA's recent SAP S/4HANA implementation. ■

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 Set realistic expectations among the business user community because there is a lot of complexity. Consider if other products are compatible, the time commitment required, and what value users will receive.

2 Appreciate the need for continuous training. Slater is bullish on continuous training to support employees to best use the system which helps the organization realize its full potential. "SAP is more rigid with business rules, validation, and substantiation which provide a lot more confidence in the data. Continuous training supports the best chance of having good data."

3 Build on the foundation and investment made in SAP S/4HANA and ask "where can we drive more value"?

Birgit Starmanns is the Global Head of the Office of the CFO Center of Excellence (oCFO COE) Thought Leadership Strategy and Programs in the Global Center of Excellence for Finance and Risk at SAP, focusing on market-facing content and programs. Her experience includes the go-to-market of new finance and risk solutions that leverage new technologies such as machine learning and cloud and the business benefits they can bring to organizations and finance. Her functional experience is in finance and management accounting, including SAP S/4HANA Finance, as well as core SAP ERP and SAP EPM. Starmanns has over 30 years of experience across the oCFO COE, solution marketing, solution management, strategic customer communities, and management consulting organizations. Starmanns holds a BA and MBA from the College of William and Mary. She is the co-author of the SAP Press book Accelerated Financial Closing with SAP, and the SAP Labs guidebook Product Costing Scenarios Made Easy.

MACHINE LEARNING

Enables SAP Cash Application Automation

SAP CASH APPLICATION HELPS AUTOMATE THE APPLICATION OF RECEIVABLES TO INCREASE EFFICIENCY AND TO REDUCE MANUAL TASKS BY USING MACHINE LEARNING

Birgit Starmanns
Global Head of oCFO COE Thought Leadership Strategy and Programs, SAP

Machine learning helps finance and risk teams increase automation and handle exceptions, streamlining business processes and reducing manual errors. As opposed to rules configured in tables — which are often never revisited, even when the business environment changes — machine learning means just that: the system learns how to handle exceptions based on historical transactions as well as on any human, manual actions taken to deal with exceptions in the past.

The first of many machine learning applications in the finance and risk portfolio in SAP S/4HANA Finance is SAP Cash Application, which streamlines the clearing process of open items for accounts receivable (A/R) transactions. When new transactions come into the system that result in exceptions, the machine learning application takes that prior information and decides on the course of action, such as a proposal for review or an automatic clearing posting.

To begin, let's look at A/R and the importance of SAP Cash Application.

SAP Cash Application as Part of the A/R Process

The traditional process of A/R spans several steps, as shown in **Figure 1**. As a contract or sales order is created, there is a credit check against the customer, but there is no impact to general ledger accounts in the Universal Journal. Once approved, normal logistics processes take place to fulfill the sales order, whether the manufacturing or assembly of a customized product or the sale of a product already in stock. Once the product is shipped, resulting in a financial posting against the cost of goods sold (COGS) account, the A/R process then creates an invoice, which is considered in working capital and cash flow analyses. Payment is made by the customer, which may or may not include collections and dispute activities. Once payment has been received, it is posted in A/R and cleared against the invoiced amount.

The clearing of the open A/R line items is based on rules that have been configured within SAP S/4HANA Finance, including payment terms and tolerance levels to ignore minor differences. However, there may be many situations in which there is no one-to-one match, within the specific tolerance level, between the invoiced amount and the payment received from the customer. This could be for several reasons: the information provided with the payment may be incomplete, a reference number to the order may be missing, payment advice documentation is not legible, or duplicate master data records for the customer may exist. Alternately, there may be discrepancies in the amount paid. For example, the customer may have paid for more than one invoice in one payment, the payment received is a

Figure 1 Traditional A/R process

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it can also be transcribed using natural language processing and then used as input.

Once the machine learning algorithm is applied, many exceptions to the open items can be cleared. A company may choose to allow the application to post these cleared items automatically, as long as they meet the designated confidence level, such as 90% certainty that the logic applied has resulted in the correct proposal. This tolerance level can be configured in SAP Cash Application. Other companies may choose disallow automatic postings, choosing to examine the line items that would have been posted and then manually release them. Typically, after some time, most companies do allow the system to post these items automatically. This leaves only a fraction of the line items that must still be handled manually as true exceptions.

SAP Cash Application is built on SAP S/4HANA Finance, leveraging both the core A/R processes and the machine learning engine. It has been available in the public cloud since release 1802 and on-premise since release 1709. A special adapter has now been built to allow the application to run against SAP ECC 6.0, with EHP7+.

Now that we understand the capabilities of SAP Cash Application as part of the overall A/R process, let's take a look at how the machine learning engine is trained to create the appropriate algorithms.

Training the Machine Learning Engine

Before implementing SAP Cash Application, the machine learning engine must be trained to learn and incorporate knowledge of prior transactions and how exceptions were handled, even when handled manually. **Figure 4** highlights the process of training the machine learning engine.

Training begins with the incorporation of historical information, which includes business partner information such as the customer ID and customer name, bank master data, and product master data. Additional transactional information includes prior electronic bank statements, notes and payment advice records, payer bank account information, and core financial accounting documents in the Universal Journal.

The machine learning engine builds an algorithm by learning the correct decision criteria, tolerance of values, and the priority of applying them against incoming payment transactions. Then, with the preliminary algorithm created by the machine learning engine, this logic is used iteratively on new data sets. The system again learns with feedback from the finance team on which recommendations are appropriate and which are not.

partial payment, there may be discrepancies based on currency conversions, or the customer may have taken an unallowed discount or paid without taking advantage of an available discount. In these and other situations, the clearing process is not straightforward, and the finance or shared services teams responsible for A/R will need to reconcile these exceptions manually. In some cases, this means reaching out to the customer.

The standard clearing process is based on the rules in configuration tables in SAP S/4HANA Finance. To reduce the number of exceptions, SAP Cash Application was developed as a next step that includes machine learning to clear as many of these remaining open items as possible. As shown in **Figure 2**, SAP Cash Application is able to act on a variety of inputs to the machine learning algorithm to clear open A/R items.

Line items for clearing can come into SAP S/4HANA Finance in multiple ways, including open receivable line items resulting from the sales order process, which may be entered manually, or records imported from a bank statements file or a lockbox file. In addition, the processing of unstructured data for payment advice information is also incorporated bySAP Cash Application, as shown in **Figure 3**. The format could be a PDF, a scanned document, an image, or an email. In these situations, optical character recognition (OCR) is used to read the input documents and extract the key information to populate transactions in the system. If the unstructured data is an audio file, such as a voicemail,

Figure 2 SAP Cash Application uses machine learning to clear A/R items that were not able to be cleared through the standard configured rules
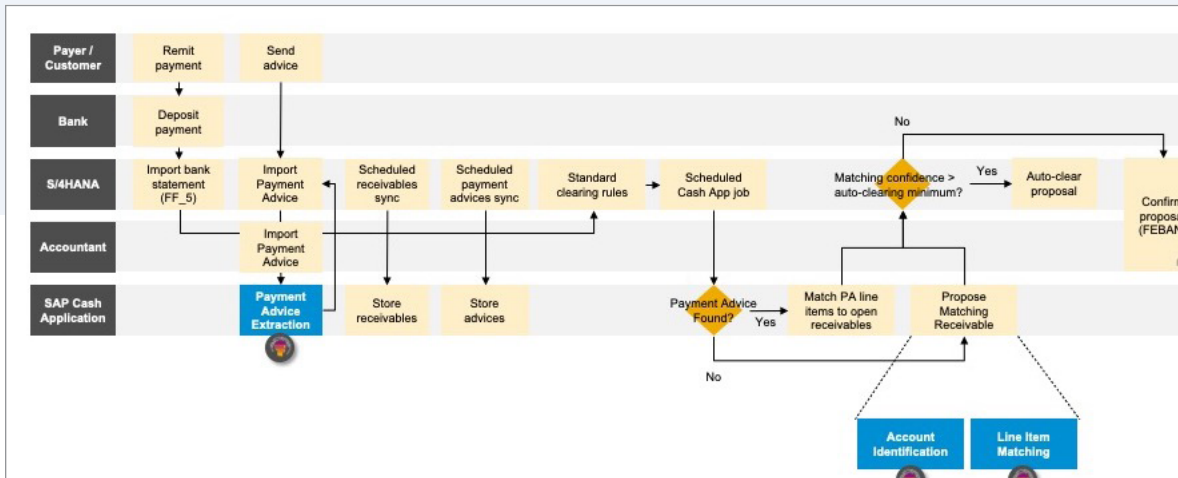
Figure 3 Payment Advice Extraction for SAP Cash Application allows unstructured data to be incorporated into the A/R process
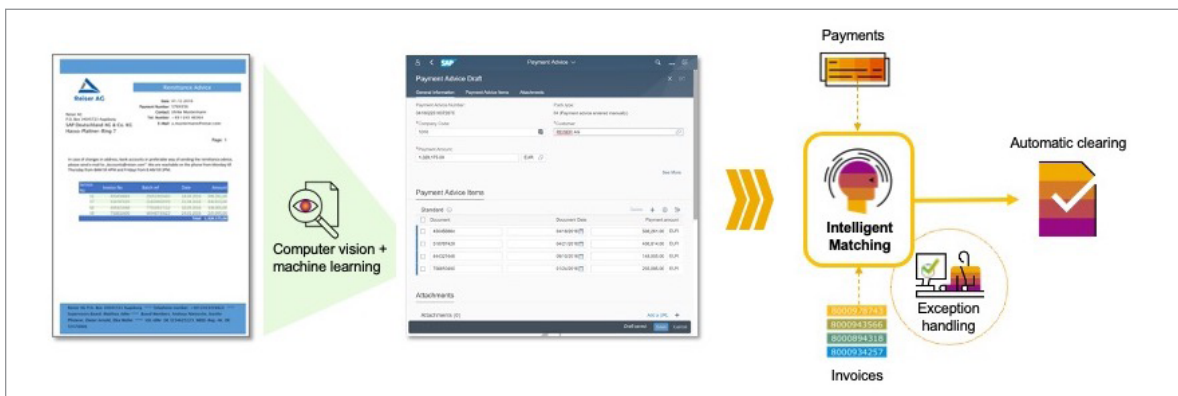
Figure 4 Training of the machine learning engine involves incorporating historical information, iteratively processing this logic on new data sets, and incorporating feedback to refine the algorithm to make the correct inferences on the receivables open items
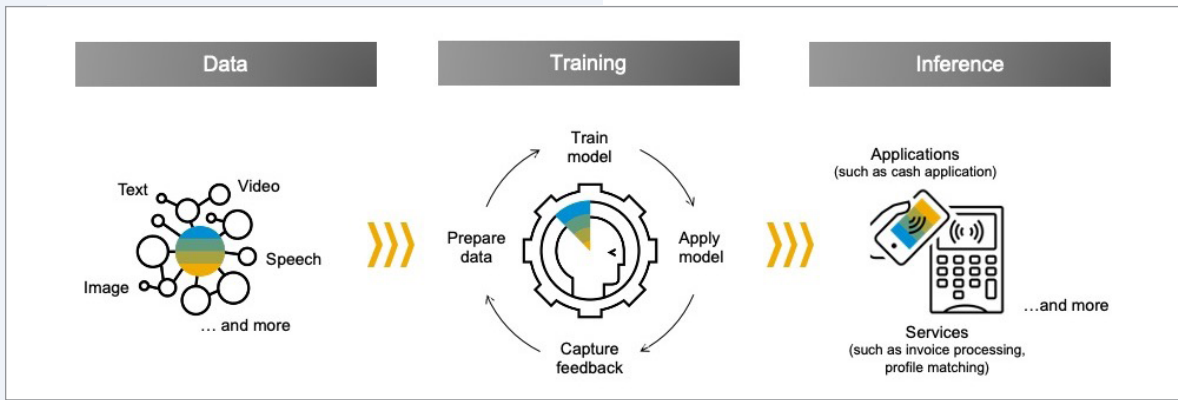
Figure 5 Machine learning is applied for Payment Advice Extraction for SAP Cash Application, and then during the processing of A/R clearing by SAP Cash Application, using account identification and line-item matching


Figure 6 In importing a bank statement, the matching criteria are defined under the Condition section, which can be supplemented with additional machine learning algorithms

Figure 7 A proposal of items to be cleared is shown; these items were previously identified as exceptions

Figure 8 At a transaction level, the different criteria — shown here are the payment amount, customer name, and reference number — are all matched for a high level of confidence

Once this iterative training cycle has been completed, the logic is used to infer the correct actions. For example, with no match of a business partner in an incoming record, the correct customer number can be inferred from bank statements by matching the reference number of a particular transaction.

Once trained, it is not necessary to "re-train" the machine learning engine in the future. While new exceptions may result after a change in business processes or the business environment, the system learns how to handle these exceptions on an on-going basis and incorporates them to refine the algorithm used to match receivables where there are future similar exceptions.

SAP Cash Application has embedded the machine learning engine that is part of the SAP AI Core, which is delivered in the SAP Cloud Platform. The application, while residing in the cloud, can run against both on-premise and cloud implementations of SAP S/4HANA Finance.

Next, let's take a look at how to verify that SAP Cash Application made the correct decision for clearing open items that initially had exceptions.

Explainable Artificial Intelligence in SAP Cash Application

SAP Cash Application brings information from different actors together, as shown in **Figure 5** on page 74. Input of the payment comes from the payer (customer), either directly or through the bank. The information is stored in SAP S/4HANA Finance for receivables management. Machine learning is applied during the processing payment advice documents, as well as during the core processing of SAP Cash Application. With this type of automation, the accountant does not need to process all transactions manually, so there is only a limited need for intervention, such as manual imports of payment advice documents and confirming any remaining clearing proposals by the system. Ultimately, only a subset of transactions will remain that require true exception handling; once they have been manually cleared, the machine learning engine uses these actions as input into refining its algorithm.

SAP Cash Application can be set up with specific criteria for matching even as the data comes into SAP S/4HANA Finance. When a file is imported, such as a bank statement (see **Figure 6** on page 74), individual conditions can be specified for the matching logic to process clearing. In addition, when the Activate rule for automation parameter is turned on, machine learning is automatically leveraged to apply more sophisticated logic beyond the standard reprocessing rules and the defined conditions.

After the SAP Cash Application solution has run, the list of items to be cleared is displayed for each transaction, as shown in **Figure 7** on page 74. It is possible to allow the application to clear and post these items automatically, or they can be reviewed by a finance team member who can then release each item to be posted.

Once matching has taken place, a log explains the artificial intelligence (AI) rules and the features that influenced the match (see **Figure 8** on page 74), which also has the benefit of providing auditability for the clearing process with SAP Cash Application.

Now that we have seen the process of clearing and how the logic of the machine learning algorithm is applied, let's take a look at a special case of SAP Cash Application for high-volume usage-based scenarios.

SAP Cash Application for High-Volume Use Scenarios

Most recently, a version of SAP Cash Application has been released for use in Billing and Revenue Innovation Management scenarios, usually involving high-volume, consumer-based business scenarios. Examples of the use of this version include invoicing for consumption-based billing used in industries such as utilities and telecommunications; billing for services, subscriptions, and loyalty programs; complex solution order management, which includes both products and services; and complex multi-party billing that involves a revenue share with partners. It is now possible to leverage the machine learning of SAP Cash Application, add-on for contract accounting, which was released in the fourth quarter of 2020.

Summary

SAP Cash Application helps automate the application of receivables to increase efficiency and to reduce manual tasks. Benefits include a lower error rate; lower cost of processing A/R transactions, including in shared services environments; and fewer exceptions that need to be handled manually, thereby increasing the productivity of finance teams. Ultimately, this reduces the days sales outstanding (DSO), a key performance indicator for many companies. Ultimately, this application frees up the time of finance teams to be a more strategic partner to the business.

For more information about SAP S/4HANA Finance, including customer stories, please visit **https://www.sap.com/products/erp-financial-management.html.** And for information about SAP Cash Application, visit **https://www.sap.com/products/cash-application.html.** ■

LEVERAGING THE **OLD** WITH THE **NEW** REVEALS OPPORTUNITIES FOR

FORECAST
OPTIMIZATION

John Yuva
Editor, SAPinsider

In the northern German city of Lübeck, red brick medieval architecture provides a glimpse of its historical prominence between the 12th and 16th centuries. Lübeck remains home to an active seaport and its famous marzipan confectionary treats. Sharing in the city's rich history is H. & J. Brüggen KG (Brüggen), a company founded 153 years ago with a single mill operation before opening a second mill in Lübeck in 1886. Growth and innovation are Brüggen hallmarks that continue to this day with its production of private label cereals and muesli bars.

As a family-owned, privately held company, Brüggen's long history includes a series of significant milestones. At the end of the 1990s, for example, the company's board of directors made the strategic decision to produce private label cereals for global supermarket retailers. Brüggen now manufactures a large number of cereal brands and delivers to over 90 countries, with five global production sites in Germany (two locations), France, Poland, and Chile.

Just as critical a milestone is Brüggen's supply chain management transformation that began in 2008 and continues to evolve as the company expands its product offerings and global reach. Martin Gries, Head of Supply Chain for Brüggen, says that when he joined the company in 2007, SAP R/3 Enterprise was the solution of choice — now SAP ERP Central Component (ECC). However, "having SAP" and "using SAP" are two different things.

Early Days of Transformation

Despite the company expanding and integrating new processes, Brüggen wasn't leveraging its SAP software. Gries recognized opportunities for efficiencies and essentially reimplemented the use of Brüggen's enterprise ERP solution in the material management area. "Our production planning was done in spreadsheets, causing a media break because every production planner has its own Excel plan with a sequence for each machine," Gries says. "The left hand must plan in spreadsheets while the right hand changes production orders in SAP."

A production plan is needed for each production/packaging machine (line) so that the production teams know what they have to produce to fulfill customer orders. A good sequence planning for each machine reduces the set-up and cleaning time between different production orders.

Gries says Brüggen started using the capacity planning and detailed scheduling functions directly in SAP, replacing the need to use spreadsheets. A change

in the planning board in SAP causes the production order and all the components to automatically reschedule. Thus, the purchasing department knows material requirements earlier due to planning board changes. "It resulted in a much faster process and reduced the possibility of errors that occurred using spreadsheets," Gries says. "Spreadsheets no longer have influence on our work because we're able to do our jobs in SAP."

Forecasts Drive a Mindset Shift

The initiative to reintroduce and reengage the company with Brüggen's enterprise SAP ERP solution was a success, Gries says. However, the next stage of Brüggen's supply chain management transformation required an even greater shift in mindset.

According to Gries, management often relied on their experience and gut feelings when making business decisions. While that mindset might work successfully for a smaller organization, it's far less reliable for a large company with expanding plant operations in Poland and France.

As the number of products grew, so did the number of customers. This posed a potential disruption to Brüggen's "magic triangle" where customer service level,

efficient production, and necessary inventory define the company's supply chain management approach. Thus, the need for accurate forecast figures became essential.

Gries says because the business is more and more promotion driven, customer lead times are much shorter. However, the lead times from suppliers are growing longer as Brüggen buys more product from the source. Dried fruit or banana chips are not coming from Germany but from all over the world.

"There are these two directions where we experience short lead-time pressure from customers but longer lead times from suppliers because we're buying in larger volumes at the best price and quality direct from the farmer. When you buy globally, it's imperative to have good forecast figures or you risk not purchasing enough or buying too much."

Thus, Gries says Brüggen requires the best forecast for each product to allocate its limited production capacity in the most efficient way. Because the market lead time is shorter than Brüggen's own lead times (e.g., production and supplier lead times), the company must produce against the forecasted figures. "To reach a high service level for our customers we need accurate information to avoid overstock or out-of-stock situations," Gries says.

MANDY KLIMT
Supply Chain Performance Manager, Brüggen

MARTIN GRIES
Head of Supply Chain, Brüggen

What does product growth and forecast requirements mean for SAP technology within Brüggen? SAP R/3 Enterprise existed in 1999 when Brüggen was a much smaller company with one factory. Gries says the company's growth led to a tenfold turnover increase as well as sales volumes five-times higher than two decades ago.

In response, many new processes were introduced or revised in SAP. Gries says new SAP tools such as the demand planning module of SAP Advanced Planning and Optimization were implemented. SAP add-ons were also purchased for production planning and material planning (e.g., SAP MRP monitor to classify all the company's materials within an ABC/XYZ classification) to achieve optimal results. Once these functional optimizations were implemented, Gries says it was time to make the processes in SAP measurable.

Transparency Leads to Sustainable Results

Gries says that in Germany, companies are not as driven by key performance indicators (KPI) as those in the United States. As the complexity of Brüggen's business grew, it needed to rely on data and not gut feelings.

"It was vital to establish a different mindset within the company to use KPIs and dashboards to drive the business forward. We researched the market to find a suitable business intelligence (BI) solution," Gries says. "Our requirement was to implement corresponding analyses/dashboards and an automated report dispatch from our department without having to rely on our limited IT resources."

The answer to Brüggen's BI needs was found with Qlik, an end-to-end cloud data integration and data analytics solutions provider. Brüggen relied on Qlik's QlikView application until 2019 when the company transitioned to Qlik Sense to leverage the app's responsive design and dashboards across multiple user interfaces.

Mandy Klimt, Supply Chain Performance Manager at Brüggen, creates the relevant KPIs and dashboards for the entire supply chain and brings transparency to the complex SAP processes through Qlik Sense analytical capabilities.

One of the biggest benefits of SAP on the business is the ability to standardize supply chain processes across all of Brüggen's plants, providing a solid foundation to measure data against the same methods and procedures, Klimt says. Using Qlik Sense, Gries and Klimt can now compare the results and establish benchmarks that were not possible in the past.

Within Qlik Sense, Klimt says the company implemented three different KPIs to measure forecast results:

H. & J. Brüggen KG (Brüggen)

Headquarters: Lübeck, Germany

Total employees: ~2,000

Global reach: Products delivered to more than 90 countries

Industry: Food Manufacturing & Processing

Revenue: ~400 million EUR in 2020

Third-party solutions: Qlik Sense

Company details: H. & J. Brüggen KG, headquartered in Lübeck (Germany), is one of the leading European manufacturers of muesli, cereals, oat flakes, and bars, as well as other high-quality cereal products. It sells products for its customers (private label) as well as under its own brand in over 90 countries worldwide. The mid-sized family company, which has been in existence since 1868, is led by the managing partners Hanno, Jochen, and Johannes Brüggen. Brüggen produces at five production sites worldwide (2 x Germany, France, Poland, Chile). Customers are national and international retail chains, as well as manufacturers of branded goods and companies in the food processing industry.

SAP solutions: SAP ECC 6.0, SAP Advanced Planning and Optimization, demand planning module, SAP Extended Warehouse Management

Forecast Accuracy: Compare the demand planning figures with the as-is invoice quantities. Here, Brüggen compares different planning dates with the actual quantities sold. The most important comparison is the so-called M2 comparison (i.e., the company compares the planning from two months ago with the sales).

"This forecast accuracy is decisive for us, as we still have to take delivery times, etc., into account," Klimt says. "Nevertheless, we also calculate the M1 comparison (i.e., how were the planned figures in the previous month compared to the actual sales in the current month)."

Value Added: Method comparison between manual forecast versus system forecast. Since SAP-APO demand planning allows Brüggen to automatically create a forecast for the future based on past data, the demand planner should ideally only change the plan when there is new information from the customer/market.

"With the key figure 'added value,' we can measure whether the manual overriding has really added value

or whether the planner should rather rely on the system forecast," Klimt explains.

Bias: Tendency or structural overplanning or under planning. Sometimes there is a tendency among demand planners to plan too optimistically. Therefore, it makes sense to show whether or to what extent there was structural overplanning or underplanning in order to be able to take measures.

"We need high forecast accuracy to know the correct quantity of needed raw materials and to effectively negotiate contracts with our suppliers for the entire quantity of the next year," Klimt says. "The more accurate the demand planning figures are, the less need for buying on the spot market, where prices are usually higher."

"In addition, we also concentrated on the articles with a very high quantity and a low forecast accuracy," Klimt adds. "The demand planner can then concentrate on a small number of articles, resulting in supply chain leverage."

Demand Planning From MRP to Delivery

How does Brüggen achieve its demand planning goals throughout the manufacturing process? Klimt provides a detailed overview of the key segments from material requirement planning through customer delivery.

Material requirement planning. For its material requirement and capacity planning, Brüggen uses SAP ERP ECC 6.0. To analyze its inventory stock, Gries and Klimt created a Qlik Sense App called the Inventory Optimization Cockpit (IOC) to help minimize the company's waste and optimize its stock structure.

"Usually in SAP it is not possible to execute the requirement planning for different plants at a glance," Klimt says. "In our IOC, we can see overstocks in one plant and out-of-stocks in another plant. Thus, we can create intercompany orders to move the goods from one plant to the other plant to avoid external buying and destruction of goods where an overstock occurred."

Purchasing. To analyze its suppliers, the purchasing optimization cockpit was created in Qlik Sense. With this app, Klimt can analyze the on-time/in-full (OTIF) for each purchase order and supplier.

"More reliable suppliers support a smoother production planning without any adjustments," Klimt says. "Furthermore, we analyze the development of the average (Ø) lead-time and have a full spend management."

Production. Klimt says it's optimal if the planned production orders are produced on time and in full quantity. This process is also measured with the help of the key figure OTIF. In the production areas, the focus in the past was more on producing a certain quantity per day in total. But not whether the individual production order was delivered to the warehouse on time and in full quantity as planned.

"With the KPI OTIF, which we measure for each individual order, a change of mindset has taken place here as well. This, in turn, helps us to fulfil customer orders even better than before," Klimt says.

Delivery to customers. Since the customer is at the center of all Brüggen's processes, Gries and Klimt also evaluate the service level (OTIF) for its customers. They compare whether the customer order maintained in SAP has been fulfilled with the desired date and desired

quantities according to each position. Furthermore, the supply chain management team can review the planning strategy against the desired delivery time. The team can easily identify materials where the XYZ classification is in the material master data "Y" category (meaning variation in demand) and the requested delivery time is short — to change them from "Make To Order" to "Make to Stock," Klimt explains.

"The information is available in SAP in individual transactions/programs and with the help of Qlik analysis, we can bring the data together at a glance," Klimt says. "Thus, we are able to increase the service level through better master data settings. At the end of the day, it's not just another tool. We're using Qlik Sense to produce measurable benefits."

Since using Qlik on behalf of SAP, Klimt says Brüggen has achieved the following results:

- Increased its forecast accuracy by up to 7%.
- Reduced structured overplanning and underplanning by a surprising 27%, allowing for a greater focus on goods in demand and capacity to produce new items.

- Saved 300,000 euros by preventing out-of-stock and overstock situations through organized intercompany orders — plants now share overstocks to avoid unnecessary external buying.
- Improved purchasing department's supplier service level for packaging in the last year by 7%.
- Elevated customer service level by 5% compared to the starting point in 2017.

With the usage of Qlik Sense, Gries and his team can better address complexity in the supply chain more efficiently. He says the team can also measure where it sees some correlation between its three main goals: high service level, efficient production, and lowest cost of inventories.

"With the transparency of these figures, we can achieve sustainable rewards through a weekly report to management — with everyone striving for a positive number. This is a motivating exercise because if you regularly measure your processes, you know whether things are going in the right direction," Gries says. ∎

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 Companies don't necessarily need the latest products or add-ons from SAP to achieve their business goals. In the case of Brüggen, it was reengaging with the ERP enterprise solution and leveraging the capabilities of the system. Don't just "have" SAP in your enterprise, "use" SAP in your enterprise to its fullest potential.

2 From a supply chain point of view, an XYZ classification is critical in knowing which articles have regular consumption versus those with average consumption. With that knowledge, optimize your parameter settings for production and requirement planning to prevent an understock or overstock environment. Leverage your demand planning tools for maximum inventory optimization.

3 Change management can't be understated when a company requires a major shift in operating processes or business approaches. Whether it's encouraging employees to use SAP software or no longer rely on an antiquated approach to data collection and reporting, there must be a value proposition to influence employees to embrace and adopt the change. Brüggen accomplished quick wins to prove the benefits of using new and existing technologies for greater efficiencies.

DON'T LET YOUR
SUSTAINABILITY
FOOTPRINT
LEAVE YOU BEHIND

Sustainability reporting is becoming a requirement for enterprises across the world to address climate change and societal issues.

John Yuva
Editor, SAPinsider

Sustainability was once primarily associated with green initiatives. Today, the term "sustainability" encompasses several environmental, economic, and societal issues, such as affordable and clean energy, reduced inequality, and zero hunger, that require the world's immediate attention. As one critical group of actors among many, corporations are on the front lines driving sustainable development across the globe.

One such corporate actor is Ravensburg, Germany-based FORCAM, an information technology and services company focused on digitizing smart factories for customer innovation. SAPinsider had the pleasure to sit down with co-CEOs for FORCAM Andrea Rösinger and Oliver Hoffmann to discuss the criticality of global sustainability and how SAP customers can make an impact.

Q: **There are two European initiatives focused on corporate sustainability today. What are the United Nations' (UN) Sustainable Development Goals (SDGs) and the European Union's (EU) Green Deal initiatives and FORCAM's involvement?**

The UN's Department of Economic and Social Affairs oversees the SDG initiative. There are a set of 17 SDGs focused on a variety of environmental, economic, and societal issues. Because of our partnership with SAP and its commitment to and alignment with goal 17, SDG 17, "Partnerships for the Goals," we saw this partnership as a collaborative opportunity and to expand this ecosystem by working jointly with our customers on sustainability. It's critical that companies map where they can deliver across the 17 SDGs and communicate those efforts to customers.

We're also focused on goal 12, **SDG 12**, "Responsible Consumption and Production," which ensures that resources are consumed and used sustainably and efficiently to avoid waste. Resource-efficient production is already on the agenda today. Key performance indicators (KPI) such as overall equipment effectiveness help manufacturers measure how efficiently they use their resources and indicate optimization potential.

Furthermore, we have selected goal 8, SDG 8, "Decent Work and Economic Growth," which promotes full and productive employment and sustains inclusive and sustainable economic growth. Providing transparency on the shopfloor, empowering frontline workers to make informed decisions, and thus, create an inclusive work environment with sustained employment is one of the benefits of data-driven manufacturing.

A continuation of the UN's SDG initiative is the EU's Green Deal. The initiative was established in December 2019 and seeks to achieve a climate neutral continent by 2050. Many companies have signed up for the sustainable development goals of the Green Deal, yet they face many challenges providing transparency as required by the initiative, notably for all their different production facilities worldwide. Companies need to find the right data and make it transparent — that's a key element.

The Green Deal and regulations on the EU and at the global level will demand transparency about the sustainability footprint of goods and efforts to decrease the CO_2 impact on the environment. Data-driven transparency will become paramount in transforming production within companies and the world at large.

Q: How are the UN and EU sustainability programs driving change in company operations?

These programs are requiring companies to gain transparency about their own energy consumption as a starting point. With increasing awareness for a sustainable economy, companies are focusing on the CO_2 footprint of their purchased and finished goods. The UN and EU programs also speak to the rising consumer demand for sustainable products.

The issue is becoming a central purchasing decision criterion driving the need for transparency around equipment efficiency, energy consumption, and waste — all targeting a sustainable production process that includes the end consumer. The ultimate goal for these businesses is to have that transparency across the supply chain (suppliers and customers) about their production processes.

Q: What technological approach must companies take to gain transparency into their production systems and meet sustainability goals and requirements?

Machine data is now the foundation for all technologies and data-driven decision making. Thus, a connectivity solution must provide the capability to connect all machines — regardless of the machine's longevity on the shop floor. Moreover, the connectivity solution must understand the signals and give them meaning.

Sustainability reporting based on valid and actual data requires collecting energy consumption of the production process, and the ability to attribute this to the individual product produced. This provides the transparency needed to uncover potential energy savings and calculate the carbon footprint of each product. Furthermore, it allows the tracking of the company's optimization efforts and its impact on the bottom line.

To achieve the full data picture, it's critical to integrate brownfield machines that are 20, 30, and 40 years old that remain in production. These machines were designed to produce high-quality products at a high volume, not for delivering data. It's a challenge integrating these machines for analytics to gain that global view on sustainability. That's what our solution is designed to do.

As many as 60% of companies still operate using brownfield machines. Replacing these machines with modern equipment enables companies to further innovate. The connectivity layer is critical. It's what we call FORCAM FORCE EDGE connectivity. We include a machine repository template to quickly connect brownfield machines. If you only extract the data from modern machines for the last five or seven years, that's just a subset of data. For this initiative to be successful, you need data from every machine in the network as part of your comprehensive global sustainability report.

Q: How are companies using data from production processes and can they leverage the cloud?

Our customers have been requesting one single source of truth for their shop floor data which allows informed decision-making. The truth for data-driven manufacturing with sustainability data is coming from the machines on the shop floor. Companies can utilize the data for sustainability use cases not only for energy efficiency or energy monitoring, but also waste, material efficiency, and stand still machines.

FORCAM has a partnership with SAP for FORCAM FORCE EDGE, an application for machine connectivity of the shop floor. FORCAM FORCE EDGE is getting deployed from the SAP Business Technology Platform and will support cloud and hybrid environments. In addition to cloud solutions, we also support SAP's on-premise solutions with FORCAM FORCE EDGE, referred to as SAP Manufacturing Suite.

The FORCAM FORCE EDGE application is sending data from brownfield machines, including sustainability data from the machines to SAP Digital Manufacturing Cloud. Also, bidirectional production scenarios are supported between SAP Digital Manufacturing Cloud, SAP Manufacturing Suite, and FORCAM FORCE EDGE. In SAP Digital Manufacturing Cloud personas, we can benchmark the business units and their plants in an enterprise based on the data benchmarking sustainability progress in the facilities.

SAP Digital Manufacturing Cloud insight analytics helps us achieve that. With sustainability use cases, we continue our work to address the challenges that manufacturers face. In SAP Digital Manufacturing Cloud, customers can develop a life-cycle assessment, allowing compliant reporting. The goal is to help manufacturing companies start small, achieve initial results, and then scale their efforts through use cases. Most of our clients are pursuing a sustainability strategy with key performance indicators to become CO_2 neutral. With

FORCAM FORCE EDGE, we are providing machine data for sustainability reporting in production.

Overall, the FORCAM FORCE EDGE solution accelerates the transformation of manufacturers, achieving an end-to-end transformation for data-driven manufacturing or Industry 4.0 with a composition of FORCAM FORCE EDGE and SAP Digital Manufacturing Cloud and SAP Manufacturing Suite. The architecture of the composition and the use cases have been aligned between SAP and FORCAM on the basis of the reference architecture of the Open Industry 4.0 Alliance.

Q: What are the realizations and lessons learned thus far?

One thing we need to keep in mind is that it's not just about monitoring the energy consumption of machines. That is only one part. It's more important for companies to tie their energy consumption with their products. With SAP technology we can bring machine data from across all the ERP systems and know from the reporting that this product requires X amount of energy to produce per day or product need. The biggest challenge is achieving an overall life-cycle analysis of the product. There are so many customer opportunities with a cradle-to-grave assessment. It's valuable from both an individual company perspective, but also when the data spans across the supply chain. ■■

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 **Operate responsibly and report your environmental footprint.** The time is now to ensure critical first-tier suppliers are operating responsibly and reporting on their environmental footprint. The Green Deal and the Sustainable Development Goals initiatives represent a new normal for how global companies and their supply chains will be measured for their sustainable development involvement and progress.

2 **Expect more corporate initiatives deriving from consumer sentiment.** Consumer expectations are helping to drive corporate and supply chain response to sustainability initiatives and commitments. As end users, people want to know the companies they purchase from are environmentally responsible.

3 **Upgrade your equipment to ensure accurate and comprehensive machine data analysis.** Companies should invest in modern machines capable of network connectivity and Internet of Things solutions to produce regular data reporting and analysis. Brownfield equipment could be a liability for companies in the coming years.

INSTILL OPERATIONAL AGILITY

INTO YOUR ORGANIZATIONAL FABRIC

John Yuva
Editor, SAPinsider

Companies face an onslaught of marketplace volatility, requiring an approach that balances people and technology. The market landscape is in a state of rebuilding. Raw material shortages, supplier insolvencies, and a host of other issues pose challenges to companies and their supply chains. Those enterprises that have adapted have one thing in common — **operational agility**. The ability to leverage their SAP solutions and partner

applications with transparency and real-time decision-making keeps them on a growth trajectory.

SAPinsider sat down with Peter Rifken, Principal Solutions Consultant for Quickbase, a no-code operational agility platform, to share his thoughts on the concept of operational agility, particularly as it pertains to supply chain strategies. Rifken understands first-hand how critical real-time insights and automation are when bridging complex processes and disparate systems across an organization and supply chain. Rifken has significant experience working with Fortune 500 manufacturing operations, many of which are SAP customers, and implementing no-code technology into their digital environments. What separates Quickbase from other providers is bringing together connectivity, governance, data, and reporting into one environment for employee accessibility — where a variety of skill sets may exist.

Criticality of Operational Agility

In his role, Rifken says he sees companies fall into one of two buckets: reactive or proactive. Within a reactive enterprise, outside forces dictate how the organization responds, whether it's spikes in customer orders, supply chain shortages, or equipment breakdowns. However, proactive companies look to the future to identify risks and work backwards to better prepare for what that potential future brings.

"Proactive companies often realize that it's the coordination of people and resources at the very edge of the business — with the teams closest to the actual problems — that are most critical to solving both day-to-day challenges and preparing for the risks down the line," Rifken says. "And we think of operational agility as the ability to handle the day to day but also have the preparation in place for the bigger risks in the future."

Process improvement and team coordination has a significant impact on agility. Rifken says he measures an organization's operational agility by examining three areas of the business:

1. Ability to extend and customize Core Systems such as SAP and Salesforce
2. Bridge-point solutions, such as CRM and PLM, that solve a core set of business problems
3. Last-mile tools and solutions at the employee-desk level, like paper, pencils, spreadsheets, and Access databases.

Rifken suggest practical steps teams can take to begin the process. "Put together a task force to build a strategy that bridges those three. In most cases, those bridges don't exist in companies. We see individual business technologists trying to solve problems at the edge, needing information from the core and one-off systems," Rifken says. "Instead, focus on putting together the people and the processes to form a strategy that solves problems in the short term — the quick wins. Ultimately, you're on a journey to a larger transformation that achieves agility."

Connect and Integrate Core Systems

More organizations are taking a top-down, centralized approach to achieve transformation, explains Rifken. One that involves investing in core systems to make developers more productive — a classic model where technical teams write code and work on core systems. However, he says companies fail to understand how to balance the core systems and large migrations, such as SAP S/4HANA, while enabling those at the edge of the business to innovate and self-serve.

"We're seeing demand from that side of the business for tools that connect and integrate with those core systems," Rifken says. "You see this with companies that are growing fast and aggressively, where they're buying several one-off tools to stitch together workflows. There are only extracts coming out the core systems as a result. It has led to conversations about the need to create bridges across systems."

This is where Quickbase can help teams extend their core systems. Rifken says a company's source of truth is its SAP solution. The Quickbase platform connects to SAP and allows employees to add their own fields, reports, roles, and permissions on top. As part of the connection lies the ability to bring information in from other core systems. The platform automates manual workflows by importing spreadsheets into Quickbase and eliminates the need for paper-based business processing. One integrated platform combined with a very fast in-memory database retains the information and tracks it within a workflow/integrated engine. Thus, the platform can pull information from other systems while also connecting to Outlook and tools like Slack and Microsoft Teams. Layered on top is the reporting and dashboarding to build customized reports and charts in one place, says Rifken.

"We have a very granular permissioning model, allowing you to define as many roles as you want and what fields those roles have access to and what dashboards they land on," Rifken says. "So, we've got those capabilities and make it available in a no-code manner. Anybody can really create solutions without the technical know-how."

PETER RIFKEN
Principal Solutions Consultant, Quickbase

Citizen Development Movement

The ability to create solutions without a technical background is what lies behind the citizen **development** movement. Rifken defines citizen development as the idea of giving almost anybody the ability to automate nearly anything in both a self-service and governed way. He describes a long tail of technology, application, and automation needs within the business that cannot be addressed by core IT teams. In an ideal model, there is a close partnership between the technology teams and the business teams within the enterprise. However, until there's a handshake with IT, companies should avoid allowing anyone from using low-code, no-code tools to start building and automating.

"If you empower those teams to solve their own problems, you can reduce the burden on core teams, enabling them to turn their focus on more strategic projects — but in a manner that avoids increasing the risk in your business. The no-code movement is simply the idea that something in a classic environment requiring a developer to accomplish, such as setting up a website or a database or creating a form, can now be pushed to the business," Rifken says. "The business can then create those and to their own exact specifications. And when there's a change or a customization required, they can do it themselves. The cycle of submitting a requirements change, sending it out, and receiving it incorrectly is eliminated."

Yet, there are misconceptions about citizen development. Rifken says the way he thinks about low code versus no code is that **low-code tools and**

platforms help coders code faster, develop faster, and deploy faster. There are many products and platforms in the marketplace servicing the IT developer space, but they still require a coding skill set. Those tools are sometimes associated with no-code-type tools. However, Rifken is targeting the business technologist, citizen automator persona who doesn't have a coding background but wants to solve their own problems using a no-code tool in a visual drag and drop-type environment. The simplification of no-code tools separates them from more developer focused low-code options.

Supply Chain Use Case

How are companies using a no-code solution? The need for operational agility coupled with Quickbase's platform is often seen in supply chain quality contexts. Consider a company that utilizes its SAP solution to track purchase order requisitions and supplier defects. While SAP tracks potential defects, there can be 10, 20, or 30 milestones created as part of the service level agreement (SLA) between the company and its supplier to coordinate key deliverables. If a supplier defect does occur, Rifken says there's coordination between the two entities to resolve the defect — often called corrective action tracking.

"Deliverables of an SLA are custom workflows that are almost cost prohibitive to build out standard in SAP or invest in an external module. Instead, it's often created within Excel," Rifken says. "However, we've found a lot of success in giving companies a flexible environment to work with the core SAP data, but then create that coordination layer between the supply chain quality team and the supplier to work through those tasks, report on them, and ensure they're getting done within a defined timeframe."

Operational agility is at the core of supply chain planning and execution. Rifken adds that many of Quickbase's customers seek a holistic picture of their suppliers to build a more **resilient supply chain**. How do KPIs roll up with regard to supplier defects, parts availability, and the like in an overall scorecard? How agile is the company in the face of supply chain disruption? Is there a second or third source for raw materials? If not, is there a process in place to quickly identify and approve new suppliers? These are all areas where customers are using SAP and Quickbase to both track and streamline processes to prepare for an uncertain future. Companies need a contingency plan. To get there, Rifken advises loading every supplier into the application. The next critical step is adding all the regulations and controls,

ensuring that everyone is adhering to these controls. Use the application to highlight the company's risks, as well as manage the action plan. For example, is the company single sourcing a critical part? What is the action plan to secure a second source and the multitude of steps necessary to accomplish it? Rifken says all these steps require coordination across different teams from product development to manufacturing to legal.

"This process has many moving parts, which is where we see a lot of inflexibility, tools, and systems. We try to bring all that together where there's a scorecard, a contingency plan, business logic, and controls and regulations," Rifken says. "And cross-functional teams must coordinate together to move all the pieces through the process."

Lessons Learned on This Journey

The complexity is real. Terms like operational agility and digital transformation are overwhelming because there's too much associated information for any one person to digest. Rifken says most companies are just beginning their journey to learn how to transform. First

and foremost, however, is that transforming is not just tools and platforms, it's culture and mindset.

"You have to think of this as a people, problem, challenge opportunity as well as a tools and platform, problem, challenge opportunity. We're talking habits and developing muscles. The most important thing with any habit is taking that first step or making a small change," Rifken says. "With those small changes come quick wins that lead to larger changes and bigger wins."

Assembling the right roles and business units is critical to identifying and solving the right problem quickly, Rifken advises. The first challenge is always the most difficult. However, once that first win occurs, companies are surprised by what can be accomplished in a year to five years.

"In the literature, there's often a five- or 10-step plan to completing a digital transformation. Companies often see themselves as way behind the curve in what they've accomplished," Rifken says. "However, take comfort in knowing that everyone's on a journey. The most important step isn't to have it all figured out, but to take a step and move forward." ■

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 **Avoid trying to standardize one platform to rule them all.** To have organizational agility, it begins with a strategy, principles, and culture. The solution is a combination of tools and platforms that are flexible enough to meet the evolving needs of that strategy.

2 **Begin with a cross-functional group or task force.** Any change typically involves five to 10 key individuals that can really affect change and align on a business case.

3 **Simplify the problem.** Too many companies try to boil the ocean with a big change effort. The advantage of no code and citizen automation tools is the ability to solve smaller problems very quickly. Solving a problem quickly creates a mindset shift and momentum toward a culture of operational agility and continuous improvement.

4 **Build a pilot and test out the solution.** Solve for a business challenge, but keep the timeframe to three to six months, or shorter depending on the problem addressed. Shorter timeframes translate to quicker wins.

ENTERPRISE-CLASS
DEMAND PLANNING AT AGILENT TECHNOLOGIES

IMPLEMENTING GIB FORECAST ENABLED AGILENT'S PATHOLOGY DEPARTMENT TO REPLACE PROCESSES BASED ON EMAIL AND SPREADSHEETS WITH AN AUTOMATED, FUTURE-READY SOLUTION

Matt Gillespie
Contributing Writer, SAPinsider

Agilent Technologies produces analytical instruments, software, and consumables for use in life sciences and other laboratories. The company has grown dramatically in recent years, both in new and existing geographies. In addition to organic growth, Agilent has acquired a number of companies to add capabilities to its analytical portfolio. Such growth has caused Agilent's pathology division in particular to experience a rapid expansion of sales, but also revealed that the division had outgrown its demand planning practices, which were largely manual and based on desktop productivity software, instead of a true enterprise solution.

Driven by a need to better support its expanding demand pipeline, the division determined it needed to implement a solution with greater ability to scale and more flexible statistical modeling. By increasing the efficiency and sophistication of its demand planning and therefore forecasting, Agilent targeted optimizing inventories, supply readiness, and capacity planning.

Discovering the Requirements for a Smarter Supply Chain

The division's spreadsheet-based methodology included many manual steps that added little value but consumed significant resources, eating into operational efficiency.

Analysts would run queries against SAP ERP Central Component (ECC) and downloaded data into Microsoft Access databases, which they then reformatted and transferred to spreadsheets for analysis with formulas and macros. As the queries grew larger, data downloads became prohibitively slow, and crashes of the Access databases became more frequent. The analysis itself was limited to relatively simple operations such as calculating numeric averages. More sophisticated algorithmic methods, as well as factors such as seasonality and trending, were beyond what could practically be implemented in a spreadsheet.

Ross Fasco, SAP Supply Chain Architect at Agilent, summarizes, "The business case was really that we couldn't sustain the current Access and spreadsheet-based process; with the growth that was occurring, the manual process just wasn't going to work."

Distinguishing between one-time events versus long-term trends was identified as a key forecasting capability that needed improvement. For example, the COVID-19 pandemic almost instantaneously reshaped the global marketplace in unprecedented ways and with unclear long-term effects. Like many companies around the world, Agilent experienced a dramatic fall-off in sales around the end of the first quarter of 2020, as economies responded.

This event was largely an example — albeit an exceptional one — of a demand anomaly, rather than a long-term shift. The division had to ensure that its forecast models did not mistakenly weight those

SNAPSHOT

AGILENT TECHNOLOGIES

Headquarters: Santa Clara, California (global)   **Employees:** ~ 16,300

Annual Revenue: $5.16 billion (2019)

Company details: Manufactures and provides instruments, software, services, and consumables to analytical scientists and clinical researchers worldwide.

dramatic events as a seasonal change or a permanent inflection point. Fasco suggests that their legacy forecasting model would have fallen short: "We would have identified these outliers, but it would have been via a very slow, manual process. It would have seen the drops in March and April, and it could have said, 'I'm going to plan for you not selling as much in March and April 2021,' but that's not accurate. It could have been a drop because of the pandemic."

By enhancing the statistical methods to generate forecasts, the company planned to tune its production and distribution pipelines to be as proactive and efficient as possible. Improved visibility and control over the statistical calculations that go into demand planning lie at the heart of these requirements.

Data science provides mathematical approaches and adjustments that can help avoid such missteps, but spreadsheets were simply not created for that depth of analysis. Fasco points out that an important function of the demand planner is to apply one's intimate knowledge of products and markets to refine the accuracy and utility of forecasts. To do so, he says, "there are quite a few things they can do to really get the forecast to be fine-tuned."

Analysts may manipulate what historic data is used, make adjustments to respond to current market conditions, or control a wide-range of other factors.

While doing so necessarily adds a layer of complexity to the calculations, standardized and efficient ways to manipulate the statistical models remain an important capability in the analyst's toolbox. The Agilent team determined that the ability to make full use of such statistical methods was critical to the success of their forecasting solution.

Bringing Together the Business and Technology Cases

Globally, the company operates a single SAP ECC instance across some 25 manufacturing sites and 15 distribution centers, as well as widely distributed stocking locations and service depots. The SAP supply-chain footprint at Agilent also includes SAP Ariba procurement software, SAP Manufacturing Execution, SAP Advanced Planner and Optimizer, and other solutions, across operations such as procurement, demand planning, and production planning.

To execute and maintain the best demand planning possible to support the company's acquisitions-based growth strategy and its impact on its pathology division, Agilent needed what Fasco describes as "a professional tool to drive fact- and analytics-based updates of forecast."

For further supply chain intelligence and control, Agilent had already integrated several GIB modules

with its SAP environment. GIB Operations Cockpit plays an especially important role in material requirements planning (MRP) to ensure smooth day-to-day operations. "We use GIB Operations Cockpit for MRP exceptions and operational procurement. It functions essentially as a cockpit for the MRP controller to view supply/demand across multiple logistics centers and manufacturing plants. The company uses GIB Inventory Optimization in one site currently, to review the day's supply and inventory levels. The GIB alert monitor ties all the GIB components together, providing the Controller with better situational awareness and revealing potential delays and shortfalls in one comprehensive grid."

Agilent's existing GIB investment helped the pathology division make a strong technology and business case for adopting GIB Forecast for demand planning. The Agilent team recognized that ease of integration offered a compelling benefit, without requiring dedicated hardware or adoption of unfamiliar application programming interfaces (API). In addition, GIB Forecast loads directly into SAP ECC without introducing a separate interface, so that from the business users' point of view, GIB is simply part of the familiar SAP environment that they already work with every day.

Streamlining and Deepening the Demand-Planning Process

After about a six-month implementation, Agilent's pathology division brought GIB Forecasting into production. An early outcome was that the division's business users no longer had to manually prepare and cross-correlate data from massive spreadsheets, a resource-intensive process that scales poorly. Relieved of those repetitive tasks, team members can place more focus on higher-value work. Before human staff gets involved, automated processes have loaded the data, then run forecast models and outlier analysis against it. Fasco says, "they just show up, and then they can start actually doing value-added tasks of getting the data right."

With the data preparation and preliminary analysis done for them, team members can focus on refining the models to get the best outputs possible. Business analysts may adjust forecasting procedures or manipulate parameters to guide the model's behavior. Thus, staff members within the pathology division are able to redirect their focus from data preparation to data modeling, offering more value to the company overall.

The division's forecasting implementation also enables a self-service modality for business super-users. These users can make configuration changes directly to the production system to modify forecasting procedures, without involving IT. In addition to empowering the business units, this approach accelerates the pace of change, so that demand planning conducted by the division can rapidly adapt to circumstances, guided by the people who know that data best.

Greater process control by business users is a significant benefit to Agilent's pathology division as a result of its recent GIB implementation, which creates end-to-end visibility and continuity over the forecast lifecycle. Anyone with authorization can examine a forecast to see what model and data were used to generate it, as well as add data about relevant events such as a trade show or sales promotion. Thus, for example, Fasco states, "there's full transparency now between what the demand planner is doing with the data and what the actual planner — a production planner for example — is going to do to execute that plan."

Agilent refers to this quality of integration as "natural conversion," from planning to execution. At a practical level, the approach has been especially valuable for maintaining and adjusting the division's forecasts during the course of a month. The GIB alert monitoring module enables business users to create custom alerts that inform them when actual results are trending outside set ranges relative to the forecast. Agilent uses those alerts to guide dynamic adjustments to forecasts that fine-tune production for cost-efficiency.

Conclusion

Greater forecast sophistication and process transparency within the pathology division has enabled collaboration and consensus among business units, as they look ahead together. Modernized demand planning has improved processes and empowered users. Analysts can easily enhance forecasts with real-world considerations, while users in various roles can incorporate inputs from across business units. As a result, forecasting draws from a more comprehensive view of the business, ultimately creating a more nuanced and accurate view of the future, for better efficiency. ■

Achieving Productivity Gains Through Improved

EMPLOYEE EXPERIENCE

Goes Beyond Human Resources

Craig Powers
HCM and GRC Analyst, SAPinsider

What motivates companies to invest in improved employee experience? In our recent research on **The State of Human Experience in the Workplace**, the most significant driver was the rise of remote workforces due to the COVID-19 pandemic. In addition, the most common objective of employee experience management for our respondents' organizations was increasing productivity. The top actions respondents' companies are taking to reach that objective include optimizing self-services and investing in technology to improve worker productivity.

So, while companies are concerned about creating better cultures and better work environments that help attract and retain employees through employee experience management, ultimately, they are expecting any investment in experience to be paid back in part through more efficient and productive workers.

That takes some of the sentimentality out of employee experience, but organizations are still facing investment roadblocks in the form of budget and prioritization. For example, in our general State of the Market survey earlier this year, investment in human resources technology was the lowest priority among all areas. That's an issue for employee experience because it often falls on HR departments to lead experience initiatives.

However, while HR is often leading employee experience management, it's hardly something that HR can do alone, especially when directly impacting worker production. The role that HR plays in experience more often includes planning and measurement rather than execution. HR functions such as performance reviews, pulse surveys, and exit interviews can give insight into employee experience and determine what works and what is needed for improvement. It falls on other areas of the business to create positive experiences.

The Cloud Brings New Experiences and New Challenges

Many companies have gradually adopted cloud technologies to fit specific areas of need, such as talent management. This cloud adoption has led to hybrid technology stacks — both on-premise and in the cloud tools used concurrently — with a potentially greater number of applications for employees to access. Hybrid and heterogeneous application landscapes can also mean different experiences depending on the tool organizations are using.

Take, for example, the areas of governance, risk, and compliance (GRC), and security. Our **latest GRC research** examined how companies are approaching user access and identity management while migrating to SAP S/4HANA. We found that, like with employee experience strategies, employee productivity was among the top objectives for user access and identity management

efforts. However, in the case of user access and identity management, productivity is tied to getting employees into the applications they need to do their jobs. In user access and identity management, increasing productivity is about balancing security measures and employee experience. Technologies such as passwordless authorization are enabled to keep secure access while also allowing the workers to get into their applications efficiently. With the advent of cloud technologies, users have more touchpoints and more passwords to remember.

There are many more examples depending on your business where improving employee experience has little to do with HR. For example, employee experience could be how your workers in the field enter the data they collect each day or the ability for warehouse employees to locate inventory. Still, as our research shows, HR leads employee experience strategy because it is HR that measures the effectiveness of employee experience changes. In essence, while other departments should take an active role in checking the pulse and sentiment of employees and learning about their experiences, they are willing to leave this responsibility to HR instead.

HR leaders will need to make it clear that experience touches every department. When HR leaders get backing from other groups for experience transformation, they help overcome the budget and prioritization roadblocks that can hamper a company's ability to improve employee experiences through processes and technology. ▪▪

WHAT DOES THIS MEAN FOR SAPINSIDERS

1 **Unifying experiences across applications — not just HR tools — is important.** To use the GRC example again, our survey data showed that companies which consider themselves above their peers in user access and identity management were more likely to integrate user and access and identity management as part of digital transformation and across their heterogeneous application landscapes. This integration helps companies create holistic user access and identity management strategies and provides a consistent access experience for employees.

2 **Think of employee experience as something broader than HR — but HR can lead experience improvements.** Your HR team has data on employee experience — likely through annual surveys, exit interviews, and performance reviews. To get a complete picture of experience, tap into other resources — such as application usage trends. Find out exactly what your employees do each day from qualitative and quantitative perspectives. In the end, you can look to HR to bring this information together and recommend experience improvements based on their people-centric expertise.

3 **Identify your experience gaps that impact productivity.** HR teams are often focused on improving the experience of accessing HR data, as this was usually something only HR teams could reach in the past. This gated access to information meant employees had to go through HR to access PTO requests, salary data, or other information, which can be a productivity bottleneck for HR and the employee. Many organizations have been successful in rectifying this issue through manager and employee self-service access to data. To emphasize the previous bullet point, ask where else do these experience challenges exist in the organization. What issues do employees encounter every day while working that impact productivity? Then you can start to figure out how to fix them and work towards achieving the goal of higher employee productivity.

MITSUBISHI

Heavy Industries Unifies People Data at 134 Companies with SAP SuccessFactors

Craig Power
Research Analyst, SAPinsider

Knowing who works for you, what exactly each employee does, what goals are tied to each individual, and how each employee fits into organizational goals can be achieved simply enough on a departmental level. Attaining such granular employee details across an entire company, however, can be a challenge. Access to a total view of its workforce can enable a business to build employee lifecycle experiences that enrich its workers through consistent recruiting, onboarding, career development, and succession strategies. That keeps top talent around longer.

Achieving a holistic view of the workforce can be a massive challenge under normal circumstances for a global organization like Mitsubishi Heavy Industries (MHI), which is made up of 90,000+ employees across more than 170 companies in 34 different countries. Achieving visibility into its global and diverse workforce beyond just headcount — a mandate from company headquarters — became even more difficult with the COVID-19 pandemic and the shift to remote work.

In order to learn more about its employees on a global scale and enable a proper mechanism for growing talent internally, MHI sought to standardize as much as it could. This included implementing a single

human capital management (HCM) system — SAP SuccessFactors Employee Central — for all companies under its umbrella.

"You have to think about what metrics you want and what data feeds those metrics, and is that data being used efficiently and consistently across the globe or not?" Beccy Casasent, Senior Director of HR Operations at MHI Shared Services America, says.

With the goal of achieving a global workforce view, MHI set out to standardize and centralize its systems primarily led by its own internal staff.

Establishing a Standardized HR Model and Implementing SAP SuccessFactors

Prior to implementing a single HCM system, MHI's companies ran many disparate HR applications. It was typical for each company to send in spreadsheets with employee data either monthly or quarterly. This led to inconsistent HR data and limited HR reporting on a global level. In order to accomplish its mandate of global employee visibility,

MHI needed to align its reporting and KPI requirements across all its business units, as well as create global standardized and shareable HR and talent

management processes. This would allow one company that achieved positive recruiting results to share that capability with other companies.

The company also created a centralized shared HR support structure to accommodate everyone around the globe that would help accomplish its goal.

MHI implemented a single instance of SAP SuccessFactors Employee Central globally as the HR system of record. Employee Central had already been used by companies located in the United States, along with SAP SuccessFactors talent management modules to encourage unified talent processes. Employee Central and the talent management modules were rolled out across 134 companies over the course of two years, on time and on budget.

The SAP SuccessFactors project has largely been driven internally at MHI, with the company's own staff doing much of the implementation work. Casasent estimates that this approach has saved "millions of dollars" over sourcing the primary work from a system integrator.

However, MHI wasn't totally on its own. IBM worked as a key support partner to provide strategy guidance on the global project and helped with language barriers

AT A GLANCE

MHI sought to unify employee data across than 170 companies in 34 different countries.

The company standardized HR systems globally with SAP SuccessFactors.

The project was rolled out in waves and 134 companies were completed in two years under budget.

Support from partners such as IBM and internal leadership helped MHI align IT with business needs and save money.

in non-English speaking countries. For example, IBM China had its own project team in China that worked closely with MHI.

A local consulting firm in Houston, one with which MHI already had an established relationship, provided staffing assistance. "It was lucky for me that they were available, because I could not have done this project without them," Casasent says of the local firm.

The Challenges and Lessons Learned

Rolling a system out to 134 companies in 25 countries is a challenge itself, but there were other roadblocks along the way that MHI needed to navigate. Standardization was the goal, but also created a "big shock" for some companies that had unique HR requirements. Meeting those requirements without

changing the system and jeopardizing the whole driving force behind the project was something to overcome.

Some companies, particularly in Japan, don't enter new hires into SAP SuccessFactors. Instead, they must use their current payroll system. To meet this requirement, MHI's project team built an interface that transitions new hire data into the global standard format and integrates into SAP SuccessFactors, allowing those companies to use talent modules.

It would have been a major logistical feat likely never seen before for all 134 companies to go live on SAP SuccessFactors Employee Central at once, so MHI broke down the project into four waves. Naturally, every company wanted to be in the last wave. To combat that, MHI established a global engagement team separate

SNAPSHOT

MITSUBISHI HEAVY INDUSTRIES, LTD.

Headquarters: Tokyo, Japan

Revenue: $35 billion (2020)

Industry: Engineering, Electrical Equipment, Electronics, Aerospace, Defense

Company details:

- Comprised of 170+ companies in 34 countries
- Began as a ship repair business in 1884
- Now serves 13 different industries, creating a range of products from home air conditioners to power plants, cruise ships, fighter planes, and even sports arenas.

SAP Solutions: SAP SuccessFactors Employee Central, SAP SuccessFactors talent management modules (including Performance & Goals, Recruiting, Onboarding, and Succession & Development)

from the implementation team. Global engagement's task was to sell the early wavers on Employee Central and get them involved in the process.

Finally, MHI learned that building acceptance of the SAP SuccessFactors system was critical to getting the project off the ground. MHI's implementation team did a tour to meet people on-site and establish relationships, physically traveling from region to region and spending time in each location. According to Casasent, having a project driven by an internal team with support from partners provided benefits as well, including maintaining unique business and process knowledge.

"You've got to understand the business to implement SAP SuccessFactors the best and most effective way," Casasent says. ◼◼

WHAT DOES THIS
MEAN FOR SAPINSIDERS

1 **Think big.** Global, standardized SAP SuccessFactors Employee Central implementations are possible, even at companies with many different organizations spread across dozens of countries.

2 **Create specific teams** to engage and sell the benefits of an implementation project early to convince early adopters. It's common for various groups and subsidiaries to want to be the last wave of an implementation, but someone must go first. Having a dedicated group to help with change management can help streamline the project down the line.

3 **Don't compromise** on process standardization at the expense of actionable data. This will enable your company to realize the benefits of talent management modules, no matter the location or division.

4 **Establish relationships** with key players around the globe to help circumvent eventual challenges, including language barriers and adoption roadblocks.

MARTIN MUELLER

Martin Mueller obtained an engineering degree from HFT Stuttgart and went on to hold various positions in application development and product management in Germany and abroad. He joined SAP in July 1998 and worked in SAP Business Information Warehouse development until June 2000. Mueller has been responsible for pre-sales and program management for SAP's various security products for more than 15 years, focusing on cybersecurity for the past six.

ARNDT LINGSCHEID

Arndt Lingscheid studied mechanical engineering at the Rheinische University of Applied Sciences in Cologne. He then worked in Germany and abroad in the areas of SAP NetWeaver Basis administration, ABAP application development, and ABAP product development. Beginning in 2007, Arndt served as product manager for various SAP add-on products and, then in 2013, became Pre-sales and Product Manager for SAP security add-on products. During that time, he audited many SAP systems worldwide. In September 2019, he became Product Manager for SAP Enterprise Threat Detection at SAP SE. Since January 2021, he has served as Solution Owner for SAP GRC–Security.

ATTACKERS TARGET APPLICATION LAYER TO STEAL

"CROWN JEWELS"

Arndt Lingscheid, *Global Solution Owner Cybersecurity and Data Protection, Product Management at SAP Labs and* **Martin Mueller**, *Presales and Program Manager, SAP Security Suite, SAP Labs*

Cyberattacks on the application layer, such as SAP S/4HANA systems, are becoming more popular because of the valuable resources organizations store there.

Despite the increase in attacks, companies are not allocating resources to combat these threats.

According to a **report** by the Ponemon Institute, there is a vast gap between the security risk and the allocation of spending to application security. Based on a survey of 634 enterprise IT and security practitioners, 38% of respondents said that the level of risk to applications is high, but only 17% of the data protection and security budget is allocated to application security.

The situation today is very different from 20 years ago. Then, cyberattacks on SAP systems were rare. A company running SAP software had a closed IT environment. Today, the company is connected to the internet and running systems on-premise and in multiple cloud environments.

The most critical data is very often stored in SAP applications. To implement digital transformation, more and more open application programming interfaces (APIs) are being used. Employees use the internet and have multiple devices. External partners and consultants join and leave the company on an ongoing basis, some never to return.

New business processes for suppliers, customers, and partners are constantly developing. The protection of the most important data stored in SAP systems is becoming critical. Therefore, new security concepts are necessary to protect the "crown jewels" stored in SAP systems. Companies need to deploy real-time detection and response to deal with the rise in attacks against the SAP application layer level. Let's have a look at some examples of these attacks:

- A newly published SAP software vulnerability was exploited to access critical data two days after SAP issued a patch.
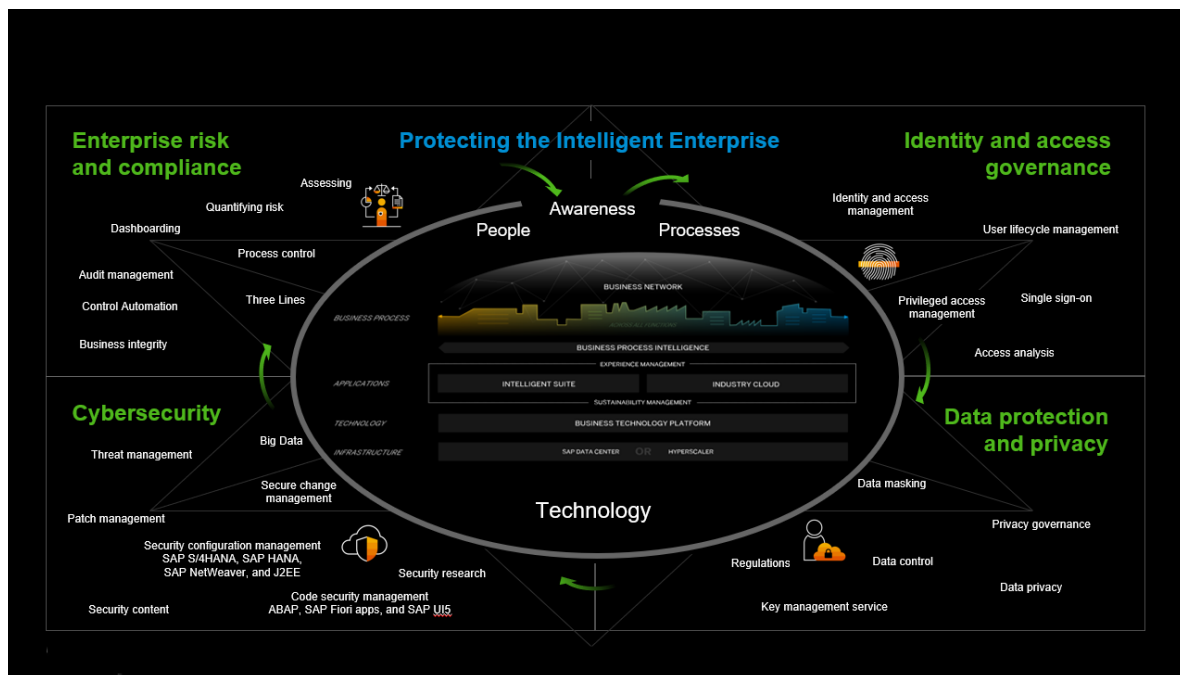
Figure 1 Protecting the Intelligent Enterprise

- A brute force attack was used to access SAP software with super-user permissions.
- External consultants disregarded security policies and worked as developers in a productive system.
- Business was interrupted for several days because an external partner deleted an SAP software-based business table.
- A privileged user manipulated their salary.
- Identity theft occurred with a user login at the same time in different locations.
- Information about new products stored in SAP software applications appeared on the internet before product launch.

Protecting the Intelligent Enterprise

An enterprise will only be able to defend itself against these attacks if everyone within the organization is aware of security and protecting the crown jewels, which are often located in the application layer. For robust defense, awareness needs to be the gatekeeper when you look at the four quadrants of protecting the intelligent enterprise (**Figure 1**):

- Identity and access governance
- Data protection and privacy
- Cybersecurity
- Enterprise risk and compliance

When a highly privileged user is created within identity and access management, the threat management tool must have the information to monitor the privileged user appropriately. The threat management tool then informs the technology within data protection to mask critical information in the user interface to prevent it from being seen or downloaded. Another example would be that data can be automatically masked according to attribute-based access or the location from which information is accessed.

This critical information needs to be processed and communicated to the enterprise risk and compliance tool to give executives, such as the chief information security officer (CISO), visibility to make the right
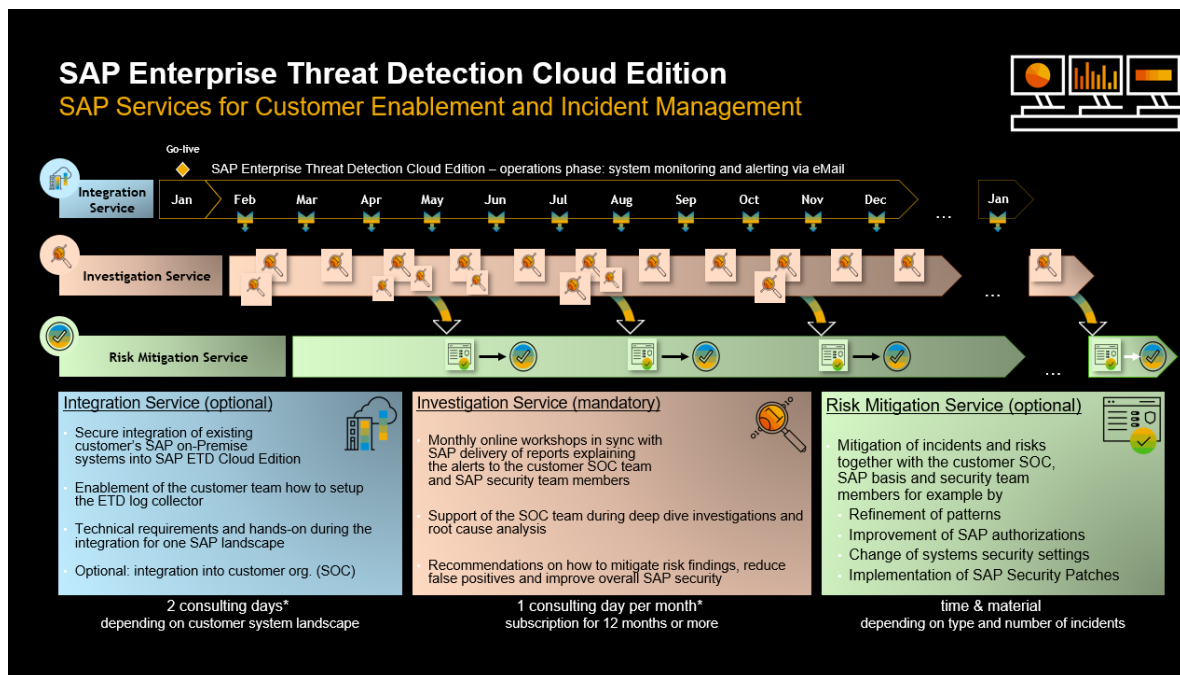
Figure 2 SAP Enterprise Threat Detection Cloud Edition

decisions at the right time, based on quantifying risk and presenting and correlating it within an appropriate dashboard.

Securing the Crown Jewels

Organizations need to go beyond preventive measures and deploy real-time detection and response to protect their critical data.

SAP Enterprise Threat Detection, cloud edition, which became available in July 2021, provides transparency into suspicious user behavior and anomalies in SAP business applications to identify and stop security breaches in realtime. It uses automated processes based on SAP HANA technology to track hacker activity using predefined and easily customizable attack path patterns.

The managed service provides customers with a 24/7 security monitoring service. This avoids the need to build a large security team with appropriate availability and deep security knowledge. Nevertheless,

Reporting: Example Investigation Protocol – Compliance Violation

SOC_ETD_Agent@sap.com created the investigation.
14/04/2021 15:49:00 PM UTC
Investigation with Description 'SAP_ALL Compliance violation' created. Status set to 'OPEN'. Severity set to
'HIGH'. ManagementVisibility set to 'NOT_NEEDED'. Processor set to 'SOC_ETD_Agent@sap.com'.
SOC_ETD_Agent@sap.com made changes to the investigation.
14/04/2021 15:49:00 PM UTC
Alert '139385' added to investigation
SOC_ETD_Agent@sap.com made changes to the investigation.
14/04/2021 15:49:00 PM UTC
Alert '139606' added to investigation
SOC_ETD_Agent@sap.com made changes to the investigation.
14/04/2021 15:49:00 PM UTC
Alert '138947' added to investigation
SOC_ETD_Agent@sap.com added a comment.
14/04/2021 17:18:37 AM UTC
Investigation Result : We have noticed that in system ABC/000 the user ADM05 assigned the following critical
authorization SAP_ALL to user JOE_SMITH. The assignment was done from host LaptopAdm05 in the time
interval 14/04/2021 15:45:00 - 14/04/2021 15:55:00
Action: Please check from your side in the system ABC/000 if this was an approved and intended activity.

Figure 3 Reporting: Example Investigation Protocol — Compliance Violation

Reporting: Example Investigation Protocol –Segregation of Duties

SOC_ETD_Agent@sap.com created the investigation.
20/07/2021 15:49:00 PM UTC
Investigation with Description Assign user to ADMIN user group in System ABC/000 created. Status set to
'OPEN'. Severity set to 'HIGH'. ManagementVisibility set to 'NOT_NEEDED'. Processor set to
'SOC_ETD_Agent@sap.com'.
SOC_ETD_Agent@sap.com made changes to the investigation.
20/07/2021 15:49:00 PM UTC
Alert '139395' added to investigation
SOC_ETD_Agent@sap.com made changes to the investigation.
20/07/2021 15:49:00 PM UTC
Alert '138957' added to investigation
SOC_ETD_Agent@sap.com added a comment.
20/07/2021 15:52:37 AM UTC
Investigation Result : We have noticed that user JOE_SMITH has been assigned the user group ADMIN by user
ADM05 in system ABC/000 with IP 10.20.30.40 on 20/07/2021 14:18:37 AM UTC.
This user group is considered as ADMIN, which should be limited to administrators and power users only. We
made an analysis on user granted with this privilege and we didn't detect any further activity up to 24 hours after
this granting (or state the activities performed by granted user).
ACTION : Check if user JOE_SMITH is authorized to belong to this group, if not kindly act accordingly and
investigate.

Figure 4 Reporting: Example Investigation Protocol — Segregation of Duties

Reporting: Example Investigation Protocol –User type change

SOC_ETD_Agent@sap.com created the investigation.
20/07/2021 15:49:00 PM UTC
Investigation with Description: User type change background to dialog in System ABC/000 created. Status set
to 'OPEN'. Severity set to 'HIGH'. ManagementVisibility set to 'NOT_NEEDED'. Processor set to
'SOC_ETD_Agent@sap.com'.
SOC_ETD_Agent@sap.com made changes to the investigation.
20/07/2021 15:49:00 PM UTC
Alert '139395' added to investigation
SOC_ETD_Agent@sap.com made changes to the investigation.
20/07/2021 15:49:00 PM UTC
Alert '138957' added to investigation
SOC_ETD_Agent@sap.com added a comment.
20/07/2021 15:52:37 AM UTC
Investigation Result : We have noticed that user Tech03 has changed user type from Background to Dialog in system ABC/000
with IP 127.0.0.1 on 20/07/2021 14:18:37 AM UTC. These kind of changes should be only done by previous authorization. We made
an analysis on user that was affected by it and we didn't detect any further activity up to 24 hours after this.
ACTION : Check if user Tech03 is authorized to belong to this type, if not kindly act accordingly and investigate.

Figure 5 Reporting: Example Investigation
Protocol — User Type Change

the customer should have sufficient expertise to understand the alerts and execute the predefined security procedures.

SAP Enterprise Threat Detection, cloud edition, is suitable for all sizes of customers. Small- and medium-sized enterprise (SME) customers might decide on the cloud edition because of the issues about velocity and costs. Large customers might choose the cloud edition for the same reasons or because of an overall go-to-cloud strategy.

The solution provides alerts based on patterns in the following categories:

- Access to sensitive information
- Critical system configuration changes
- User management and privileged user management
- Critical system communication
- User login management

The managed service is available in two different approaches: baseline and extended services. The baseline service includes:

- 24/7 monitoring of your SAP environment
- Checking for 60 standard attack path patterns
- Risk-based and prioritized alerting
- Monthly reporting of all incidents and all log data

Examples of Alerts and Responses

The baseline service creates alerts leading to investigations by agents (security experts) working in the security operations center. Example 1 (**Figure 3**) shows a true positive based on a compliance violation (SAP_All assignment by User JOE_SMITH). In the example, the customer gets the information about who is responsible for the SAP_All assignment to User JOE_SMITH. In addition, the customer receives the alerts and the corresponding logfile information. As a result of this report, the customer still needs to mitigate the risk internally, using the actions described in the report. This can be done by the customer or by a service provided by a partner or SAP.

Let's have a look at another example (**Figure 4**). The investigation protocol shows user JOE_SMITH has been assigned to the user group ADMIN. In addition, the customer gets the information about who made the assignment and when it was done, based on alerts and logfile information, including the steps that should be taken to mitigate the risk.

Another example shows how important the user patterns in the background are. **Figure 5** displays an example where an investigation was created because a user type was changed from a technical user to a dialog user. This example highlights the importance of the content patterns that are part of the product. New and updated content patterns are provided by SAP as part of the managed service.

Example 4 shows that the agent created an investigation based on a download of a critical filename (**Figure 6**). A pattern automatically created an alert because the file with the name "Password" was downloaded. Based on the data in the alert, the agent decided it was a false positive because the downloaded

Reporting: Example Investigation Protocol – False Positive

SOC_ETD_Agent@sap.com created the investigation.
14/04/2021 15:49:00 PM UTC
Investigation with Description 'Data download with suspicious Filename' created. Status set to 'OPEN'. Severity set to 'MEDIUM'. ManagementVisibility set to 'NOT_NEEDED'. Processor set to 'SOC_ETD_Agent@sap.com'.
SOC_ETD_Agent@sap.com made changes to the investigation.
14/04/2021 15:49:00 PM UTC
Alert '139385' added to investigation
SOC_ETD_Agent@sap.com made changes to the investigation.
14/04/2021 15:49:00 PM UTC
Alert '139636' added to investigation
SOC_ETD_Agent@sap.com added a comment.
19/04/2021 07:18:37 AM UTC
Investigation Result: False positive, filename was "Passwordmanager-Readme.txt" not a password containing file.

Figure 6 Reporting: Example Investigation Protocol — False Positive

file was a readme.txt file with no password information. No critical data was downloaded.

Currently, the managed service is only offered within the European Union. A roll-out of the service to other regions is already planned. Depending on customer requirements, additional data centers and provisioning of the service can be added.

With the next version of the service, SAP plans to give customers an additional management report, which will provide an easy-to-use dashboard view of the cybersecurity status of their SAP landscape (**Figure 7**). The example shows a comparison of the investigations created by the agents in the last two months. A similar report showing the number of alerts will be available as well.

In addition to the baseline service, SAP will begin offering the extended service in the first quarter of 2022. The extended service includes the baseline service features along with committed response times, individually adapted security analysis, and customized service level agreements (**Figure 8**).
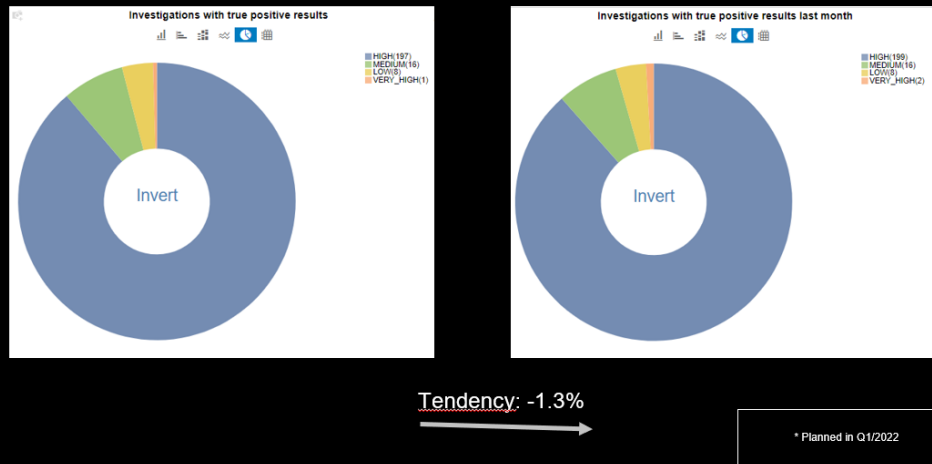
"Security is a top priority for SAP. We know some of our customers don't have in-house security operations centers to monitor and protect their mission-critical applications from ever-growing cybersecurity threats," says Thomas Ruhl, Head of Product Management for Customer Innovation and Maintenance at SAP.
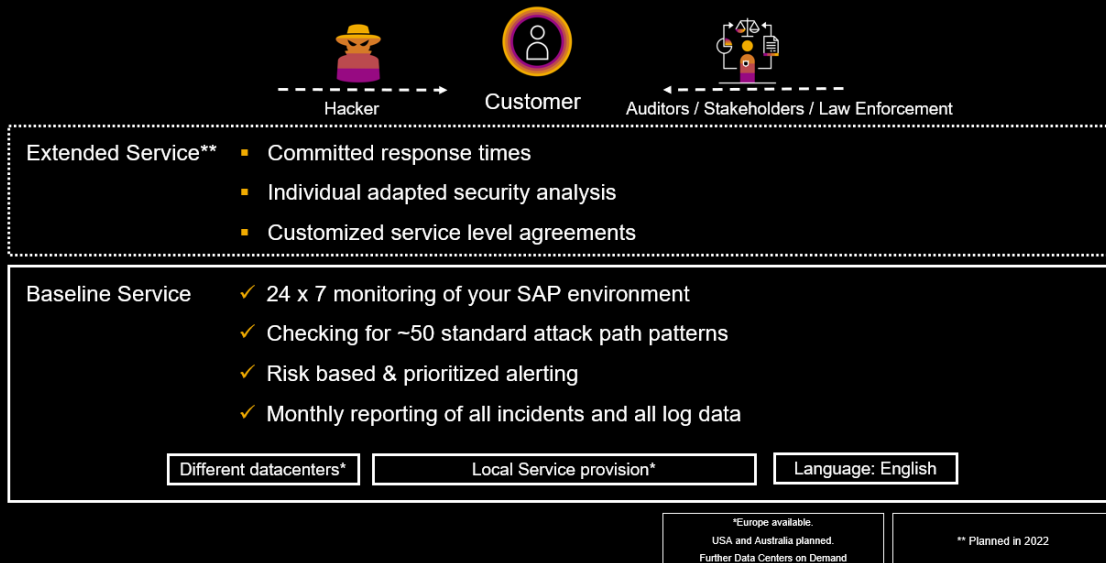
"That's why we released SAP Enterprise Threat Detection, cloud edition: a solution that bundles powerful software and a managed service by SAP security experts to defend against cyberattacks and safeguard their business," he adds.

SAP customers understand the severe problem of application security and are looking for a solution to stop cyberattacks. In response, SAP developed a monitoring tool to detect attacks on SAP applications called SAP Enterprise Threat Detection. Using the same technology, SAP now delivers a managed service based on this proven technology. ■

Top: **Figure 7** Reporting: High Level Investigation Overview
Bottom: **Figure 8** Protecting the Crown Jewels

NEW &
NOTEWORTHY

Announcements from SAP and SAP Partners

SAP OFFERS PARTNERS PAY-AS-YOU-GO OPTION FOR SAP BUSINESS TECHNOLOGY PLATFORM
www.sap.com

SAP is now offering partners a pay-as-you-go licensing option for SAP Business Technology Platform (SAP BTP), as well as a free tier of services, to enable them to develop and demonstrate SAP BTP-based solutions without a significant upfront financial commitment. Previously, SAP licensed SAP BTP to partners through an annual enterprise contract or a subscription license. With the new payment structure, partners will have a lower cost barrier to create their intellectual property (IP) on SAP BTP. Partners can license the entire platform or individual SAP BTP products and services based on their needs.

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IBM UNVEILS IBM POWER E1080 SERVER FOR HYBRID CLOUD ENVIRONMENTS
www.ibm.com

IBM has launched its new IBM Power E1080 server design for hybrid cloud environments. The server, powered by the IBM Power10 processor, set a performance record for SAP applications in an 8-socket system, achieving over 174,000 2-tier benchmark users. "The IBM Power10-based E1080 is an ideal platform for clients looking to modernize by running SAP applications in hybrid cloud environments," said Lalit Patil, CTO, Enterprise Cloud Services and HANA Enterprise Cloud, SAP. IBM is also launching a new tiered Power Expert Care service to help customers protect their systems against cybersecurity threats and achieve higher system availability.

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AMAZON BUSINESS INTEGRATES WITH SAP ARIBA'S SPOT BUY PURCHASING
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Amazon is partnering with SAP to enable employees to access the Amazon Business marketplace from SAP Ariba while ensuring compliance with corporate purchasing policies. By integrating Amazon Business into SAP Ariba's Spot Buy purchasing capability, employees can buy general business goods while providing users access to hundreds of millions of new items on the marketplace. The partnership will use search application programming interfaces so users can search for items and receive results from Amazon Business, along with other online stores, e-commerce providers, and direct sellers, directly within SAP Ariba.

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SAP TEAMS WITH DEDIQ TO LAUNCH SAP FIONEER VENTURE
www.sap.com | www.dediq.com

SAP has set up a joint venture with Dediq called SAP Fioneer, which expands SAP's financial services software offerings. SAP Fioneer aims to extend the SAP for Banking and SAP for Insurance portfolios to cover...

banking and insurance processes end-to-end, SAP said. The venture is meant to enable SAP customers to innovate by combining advanced technology with development expertise and a network of partners and colleagues. It will have operations in more than 10 countries in Europe, North and South America, and the Asia-Pacific region.

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SAP Acquires SwoopTalent IP to Improve Talent Data Intelligence
www.sap.com | **www.swooptalent.com**

SAP has acquired the intellectual property (IP) of SwoopTalent, a talent data intelligence firm, for an undisclosed consideration. SAP plans to embed the IP, which includes data analytics and machine learning, in its SuccessFactors Human Experience Management Suite. SwoopTalent's artificial intelligence-powered technology combines, analyzes, and trains data from different human resources systems and workflows to provide a holistic view of an organization's workforce. Several SwoopTalent engineers have also joined the SAP SuccessFactors team.

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SAP Launches Solution to Help Firms Calculate Carbon Footprints
www.sap.com

SAP has unveiled its SAP Product Footprint Management solution that enables companies to calculate carbon footprints for their products across the value chain. The solution, built on the SAP Business Technology Platform, is part of a portfolio of sustainability-related business applications that enable firms to lower their carbon emissions and provide information to regulators. SAP Product Footprint Management integrates data from solutions that govern production processes with master data from SAP business applications and calculates the environmental impact of various production scenarios.

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Capstone Mining Selects RISE with SAP to Consolidate ERP Tech
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Vancouver-based Capstone Mining Corp. has selected RISE with SAP as part of an effort to consolidate its enterprise resource planning (ERP) technology and improve flexibility and scalability. The company plans to implement SAP S/4HANA Cloud on Microsoft Azure, moving from SAP ERP Central Component (SAP ECC) by the end of 2021. The RISE with SAP implementation is expected to enable the transition across its mining operations and provide a unified view of its overall business operations.

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SAP Appoints Coletta as Chief Investor Relations Officer
www.sap.com

SAP has named Anthony Coletta as the company's Chief Investor Relations Officer to replace Stefan Gruber, who has decided to leave SAP. Before being promoted on Oct. 1, Coletta served as Chief Financial Officer of SAP North America. He joined SAP in 2006 after serving in leadership positions in finance and strategy at Siemens and Thyssen Krupp. He holds master's degrees in economics and applied foreign languages from Sorbonne University in Paris.

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