SAP S/4HANA

Mapping Your Journey to SAP S/4HANA®

A Practical Guide for Senior IT Leadership

June 2022

ASUG

DSAG

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Foreword by ASUG

ASUG believes that if you're an SAP customer who wants to grow and accelerate your business, remove inefficiencies, reduce technical debt, and take advantage of the latest capabilities of SAP® software for your business, then you need to move to SAP S/4HANA®.

It is our contention that the decision about the "ERP of the future" should not just center on a technical upgrade to SAP S/4HANA. It should be about how best to prepare a company's business for the future.

While it felt like everything changed in 2020, one thing didn't: the need for world-class business software at the core of your organization. Our member research finds that there's a number of SAP customers who are charting their path to SAP S/4HANA right now. And it's documents like this one that can help plan the journey. If you're in the early stages, use it as a catalyst for conversation with your colleagues. If you're already in progress, use it as a guide to ensure your team is headed down the right path.

Please know that ASUG and the other global user groups are here to help all SAP customers make peer-to-peer connections. Because there's no reason for any SAP customer to ever have to go it alone when it comes to SAP decisions – especially with SAP S/4HANA.

Geoff Scott
CEO, ASUG
July 2021

Foreword by DSAG

DSAG appreciates this guide to support decision-makers in our community as they forge their future strategies. It addresses many of the questions SAP customers face when planning their SAP S/4HANA transformation projects. We at DSAG, in recent years, have raised many similar questions, such as "How do our members get better support on their way to SAP S/4HANA?" "What preparatory measures are required prior to moving to SAP S/4HANA?", "How do we decide between a new implementation and a conversion?", and more.

While in the past SAP has provided answers and assistance to customers for some of these questions, step-by-step guidelines on how companies should prepare for their SAP S/4HANA projects were not available.

Therefore, we support SAP's initiatives to assist their customers in the move to SAP S/4HANA, in particular SAP S/4HANA Value Starter Engagement, developed and successfully launched in collaboration with DSAG, as well as the wider SAP S/4HANA Movement program. We see this guide as a valuable reference for SAP customers on their journey to SAP S/4HANA.

Christine Tussing
DSAG Board member for transformation management IT
July 2021

Introduction
CHARTING YOUR WAY TO SAP S/4HANA

SAP has long been an undisputed market leader in the ERP space. Today, we are excited to see how SAP S/4HANA helps companies around the world become intelligent enterprises. As hundreds of new SAP S/4HANA systems go live every month, we see more and more customers asking us for guidance on how to start the **journey to the new digital core**. That's why we decided to write this paper as a very practical, condensed, down-to-earth guide for executives, project managers, decision-makers, and senior IT leadership.

The guide has been composed by members of SAP product teams, subject-matter experts, and consultants – in collaboration with ASUG (Americas' SAP User Group) and DSAG (the German-speaking SAP User Group) – to share with you the combined experience from over 10,000 projects we have seen so far. It has three parts. "Part One" is dedicated to the key decisions to be made when planning your approach to your SAP S/4HANA transition. "Part Two" covers the pivotal elements of a successful project setup. And "Part Three" provides you with the most essential technology knowledge. This guide is not about our product. It's about you, our customers, and the challenges you face, the decisions you have to make, your aspirations, and your success.

Today, one can hardly imagine running a business without an ERP system. Yet interestingly enough, an ERP has become such a commodity that its value often gets overlooked while the "total cost of implementation" and "total cost of ownership" dominate discussions. In the same way, we don't regard roads and bridges as valuable assets until we find ourselves in a place without any.

Like any other infrastructure, an ERP ages and accumulates technical debt with the ever-increasing intensity of integration, data volumes, change requests, and work-arounds. At the same time, the business processes designed around the technology limitations of the past keep standing in the way of new best practices that can be implemented much more efficiently with the new technologies. All that, in combination, leads to a point where you have to take the next evolutionary step.

For many customers, SAP S/4HANA transition programs start with a debate on how to approach the project and what options to consider. Most of them swiftly come to the conclusion that the company's vision, readiness to change, and ability to manage these changes play a much bigger role than any technology aspects. We couldn't agree more.

Irrespective of your chosen transition option, the way you set up and manage your project will determine your ability to turn SAP's innovations into your company's advantage. It will also decide if, in a few years from now, your new system will become subject to yet another "back-to-standard" program – or if it will provide the business agility and speed to outplay the competition through the full automation of business processes; user experience based on voice, vision, and messaging; analytics on new data types; and new levels of insights.

They say experience is the enemy of innovation. It takes rigor and stamina to focus on and leverage the new opportunities. We sincerely hope that the following chapters will help keep you on track throughout your journey to the new digital core.

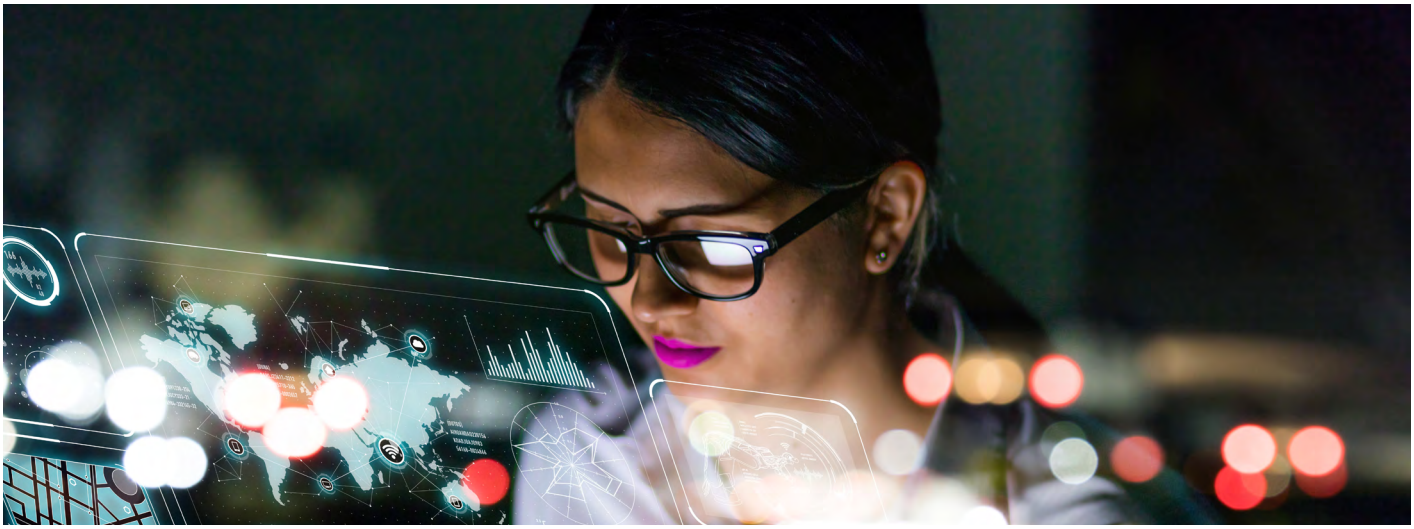
Part One

STRATEGIC CHOICES

KEY TAKEAWAYS

"Part One" of this paper guides you through the key decisions you must make when planning your approach to the SAP S/4HANA transition. In summary, it focuses on the following points:

- The way you plan and execute the SAP S/4HANA program will substantially influence your ability to adopt next-generation business processes and use the new capabilities of SAP products.
- Customers of the SAP ERP application must decide between system conversion and new implementation. There are eight main considerations that determine this choice.
- Selective data transitions encompass a variety of scenarios that go beyond the standard options. All these require specialized services from SAP or our partners and often entail more effort and cost compared to the standard options.
- One-step is the preferred scenario for conversions.
- After a conversion, you have to plan for an innovation phase.
- Using SAP standard content as a baseline for system design in new implementations helps to establish a fit-to-standard and clean-core-by-design mindset.
- The SAP S/4HANA for central finance solution is a perfect fit for companies in which a central financial department is a key component of the current or future business and enterprise architecture. However, the perception of SAP S/4HANA for central finance as a "first stepping-stone" in a transition to SAP S/4HANA in just any landscape is misleading.
- SAP S/4HANA Cloud supports a number of scenarios for a two-tier architecture.
- For customers who plan to continue using their SAP ERP Human Capital Management (SAP ERP HCM) solution for the foreseeable future, SAP plans to offer a new on-premise HCM option.



CHOOSING BETWEEN SYSTEM CONVERSION AND NEW IMPLEMENTATION

The way you plan and execute the SAP S/4HANA program will substantially influence your ability to adopt next-generation business processes and use the new capabilities of SAP products. Needless to say, making the right choices here is of paramount importance.

With a **new implementation**, you build a new SAP S/4HANA system and either cut over to the new system (the so-called "big bang" scenario) or migrate the individual business units sequentially from your legacy SAP ERP application to the new system ("a phased rollout").

With a system conversion, you turn your existing SAP ERP system into an SAP S/4HANA system. Technically, the system conversion is a one-step procedure with a single downtime that is comprised of the following:

- For SAP ERP on any database: a database migration to SAP HANA® 2.0 (a new database system)
- A conversion of the data from the SAP ERP data model to the SAP S/4HANA data model
- A software upgrade, that is, replacing SAP ERP application code with SAP S/4HANA application code

For SAP ERP powered by SAP HANA, transition to SAP S/4HANA is an in-place upgrade. An upgrade from SAP HANA 1.0 to SAP HANA 2.0 may also be required as an extra step.

Our records over the past three years show that the vast majority of SAP ERP customers decide on either conversion or new implementation – in almost equal parts. We estimate that about 10% choose other options because of their specific situations and requirements, and the share seems to be increasing (see the section on "Selective Data Transitions" for more details). In the end, there is no right or wrong. Each customer needs to choose the option that best allows them to continuously adopt SAP innovations in the future.

In practice, we have seen that the choice between conversion and new implementation is largely determined by the eight considerations identified in Figure 1. Not all of them may be equally important in every case. However, they help you understand the essential trade-offs.

GREENFIELD? BROWNFIELD? BLUEFIELD?

Don't be confused by the rainbow of colors that some IT service providers use when referring to the various transition paths to SAP S/4HANA.

For example, they may refer to "greenfield" for new implementations, "brownfield" for system conversions, or "bluefield" for selective data transitions. But these definitions are not always clear-cut. When you hear such color-coded terms, ask your conversion partner to confirm their definition so you know exactly what they mean and how this translates to the standard SAP terms.

Figure 1: Key Considerations Influencing System Conversion Versus New Implementation

Do current business processes support your long-term strategy?

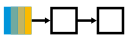
Strategic redesign of the business processes suggests a **new implementation**.

Can you adopt SAP standard content, or will you retain past customizations?

A move to standardization brings agility, suggesting a **new implementation**.

Is your move to SAP S/4HANA® driven by the business or IT?

IT-sponsored projects are typically **conversions** to SAP S/4HANA, which lay the foundation for incremental innovation projects driven by the business.

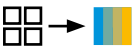


Can you convert from the SAP ERP application to SAP S/4HANA in a single step?

Single-step **conversion** is possible for SAP ERP 6.x (any enhancement package) single-stack, Unicode systems. Systems that don't fulfill these criteria have likely experienced little maintenance in the past years. If the system can't be converted in a single step, a new implementation is likely a better choice.

Do you require previous transactional data in the new system?

The requirement to retain **all** data in the system is a very strong indication for **conversion**. Alternatively, consider a **new implementation** while replatforming your current SAP ERP data on commodity hardware or leveraging data retention solutions.



Are landscape consolidation and process harmonization key value drivers?

Consider a **new implementation** and consolidate the required configuration and data into that new system.

Do you have a high or low number of interfaces to other systems (SAP and third-party)?

The higher the number of interfaces, the stronger the case is for **conversion**.

Can your company sustain a multiyear innovation plan with incremental innovations?

If incremental innovation is part of your company's philosophy, **a system conversion** followed by innovative projects will lead to the desired outcome. If you are uncertain whether a multiyear innovation plan can be sustained, **a new installation** is the only chance to harvest the full value.

Do Current Business Processes Support Your Long-Term Strategy?

If your long-term strategy implies the need for business process redesign in the business areas considered key to strategic growth, or the ones expected to deliver substantial cost savings, this is a strong indication for a new implementation.

If your SAP ERP system today takes no advantage of best practices or relies on dated functionality (for instance, business areas instead of profit center accounting), a new implementation is a better choice. Likewise, if you run an oversized, overcomplicated, historically grown system, a new implementation is a more attractive option.

Can You Adopt SAP Standard Content, or Will You Retain Past Customizations?

SAP standard content is an umbrella term for SAP Best Practices packages, the enterprise management layer for SAP S/4HANA, and additional line-of-business (LoB) and industry-specific content. Through SAP standard content, we provide you with support for preconfigured and comprehensive business processes.

If you plan to make extensive use of SAP standard content, a new implementation is a better choice.

By contrast, if you see your custom enhancements and modifications as a major asset supporting your company's unique way of operating and intend to preserve them, a conversion is a more attractive option for you.

Is Your Move to SAP S/4HANA Driven by the Business or by IT?

It's virtually impossible to start a business transformation out of an IT project. IT-sponsored projects are typically system conversions that lay the foundation for later innovation projects driven by the business.

Can You Convert from the SAP ERP application to SAP S/4HANA in a Single Step?

Technically, single-step conversion is possible for SAP ERP 6.0 (any enhancement package) single-stack, Unicode systems; but database and OS-level restrictions may apply. Systems that don't fulfill these criteria have likely experienced little maintenance in the past years. In practice, systems with dated software release levels may require somewhat more effort than the ones recently updated.

If the system can't be converted technically in a single step, a new implementation is a better choice, because the combined cost of an upgrade to SAP ERP 6.0 or a Unicode upgrade followed by a conversion to SAP S/4HANA would be prohibitively high. Moreover, combining two upgrades in a single maintenance window will most probably exceed the maximum system outage your business can afford.

The second factor to consider here is your rollout strategy. If you plan to roll out the system on a company-code-by-company-code basis, then a new implementation approach is a better option. However, if this rollout strategy is a precaution rather than a hard constraint, you should take into account the implied cost of integrating the old and new system landscapes, such as for intercompany scenarios, master data synchronization, and consolidation. Often, putting more attention on testing is a far more effective risk mitigation strategy.

Do You Require Previous Transactional Data in the New System?

When choosing between conversion and new implementation, the requirement to retain all data in the system is a very strong indication for a system conversion. The first response is often, "Yes, we do need all data in the new system." However, you should challenge this standpoint and design a data strategy that takes into account the available technological alternatives. (See the section on "Selective Data Transitions" for details.)

Are Landscape Consolidation and Process Harmonization Key Value Drivers?

For companies with a track record of mergers and acquisitions, it's often easier for different divisions to agree on a new neutral set of best practices than to debate which of the current ERPs should become the consolidation target. In this case, opt for a new implementation and consolidate the system configurations and data required to start business operations into this new SAP S/4HANA system.

Do You Have a High or Low Number of Interfaces to Other Systems (SAP and Third-Party)?

In new implementations, interfaces have to be (re)developed and tested, especially interfaces to third-party solutions. With a system conversion, adjusting existing interfaces typically takes less effort.

Thus, a high number of interfaces in the current system makes a stronger case for conversion. However, before settling on this decision, consider the new integration technologies SAP offers, especially the SAP Integration Suite and the Integration Advisor capability within SAP Integration Suite. See the "SAP Integration Suite and Integration Advisor" section in "Part Three."

Can Your Company Sustain a Multiyear Innovation Plan with Incremental Innovations?

Although this aspect is entirely nontechnical, it may in the end overturn all of the above considerations. If incremental innovation is part of your company's philosophy, a system conversion followed by innovative projects will lead to the desired outcome. However, other companies may not deem themselves capable of persistently executing a multiyear plan because they expect a shift in focus or a major change in strategy. In such cases, a new implementation is the only chance to harvest the full value of SAP S/4HANA.

ONE-STEP VERSUS TWO-STEP DEPLOYMENT AND RISK MITIGATION

Every project needs to develop a risk mitigation strategy. In our experience, the risk in system conversion projects is best mitigated by taking these measures:

- Using appropriate change management to mitigate the changes introduced by simplifications
- Scheduling preparation projects appropriately (see sidebar)
- Reassessing the quality of the master data (especially customer and vendor data) and archiving dispensable transactional data prior to the project
- Planning and executing conversion test cycles carefully in a production-like environment
- Ensuring user enablement

For more on these and other project aspects, see "Part Two" of this guide.

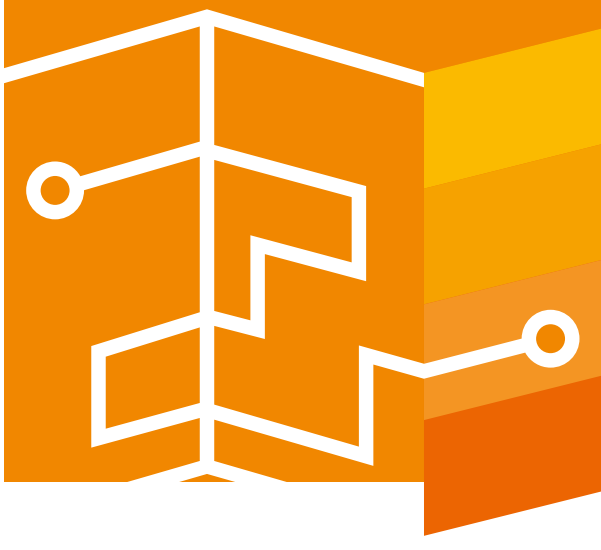
On the contrary, taking a "multistep approach" does not mitigate the transition risk while increasing the total cost of implementation.

PREPARATION PROJECTS

When composing a road map, it's helpful to distinguish between the mandatory and optional preparation projects.

With SAP S/4HANA, certain outdated functionality in the SAP ERP application is no longer available. Mandatory preparation projects are those that replace such functionality with a successor capability or solution. The most frequent one is the mandatory implementation of the business partner data model. Other mandatory changes, such as replacing the revenue recognition functionality in the sales and distribution (SD) module of SAP ERP with the SAP Revenue Accounting and Reporting application, or the real estate classic functionality with the real estate flexible functionality in SAP ERP, are far less frequent.

Optional preparation projects are the customer's decision, such as migrating to the new general ledger (G/L) functionality or archiving. (See the "System Conversion Projects" section for more information about the new G/L functionality.)



Doesn't Mitigate Risk: Migrating to SAP ERP powered by SAP HANA First

Companies that adopted SAP ERP powered by SAP HANA soon after its release in 2013 have reaped the benefits early and will experience a significantly easier conversion to SAP S/4HANA. For companies still running SAP ERP 6.x systems on any database today, migrating to SAP ERP powered by SAP HANA followed by a system conversion to SAP S/4HANA would imply a near-double effort, leading to higher costs.

From a purely technical point of view, the transition from SAP ERP 6.x on any database to SAP ERP powered by SAP HANA includes an enhancement package upgrade, an SAP NetWeaver® technology platform upgrade, and database migration. The hardware investment, effort of potential functional redesign, testing, and change management are comparable to those of an SAP S/4HANA project.

Given the combined impact on the timelines and budget, you need to argue very well on what risks you would mitigate by migrating to SAP ERP powered by SAP HANA followed by a system conversion to SAP S/4HANA.

Doesn't Mitigate Risk: Upgrading to EHP 8 First

As we pointed out above, converting systems with older software release levels may take somewhat more effort compared to converting recently updated systems. However, this has no profound impact on your project's risks.

Thus, upgrading a system to SAP enhancement package 8 (EHP 8) for SAP ERP 6.0 can hardly be considered a "step towards SAP S/4HANA." On the contrary, the associated cost may be hard to justify if you plan to implement SAP S/4HANA soon enough.

SAP has extended the mainstream maintenance of the core SAP Business Suite 7 applications until the end of 2027, followed by optional extended maintenance until the end of 2030.

For a comprehensive overview and description of the restrictions and impacts of this maintenance extension, see SAP Note 1648480, "**Maintenance for SAP Business Suite 7 Software Including SAP NetWeaver**."

Doesn't Mitigate Risk: Process-by-Process Rollouts

Irrespective of the chosen option, the only recommended unit for rollouts is the company code. Rolling out SAP S/4HANA process by process (or module by module) may not be impossible from a technical point of view, but it is extremely challenging and, therefore, not recommended by SAP. In practice, it leads to complex interim integration scenarios that are hard to sustain for even the most skilled IT operations teams.

If conversion as a "big-bang event" is deemed too risky, consider a new implementation with a phased rollout strategy on a company-code-by-company-code basis.

CENTRAL FINANCE

The SAP S/4HANA for central finance solution has been explicitly designed for the needs of enterprises that have multiple ERP systems in their landscape, as well as a central finance and controlling department serving all business divisions. The capabilities of the solution make it a perfect fit for a divisional setup with operational finance on the divisional level, and central financial reporting and consolidation on the corporate level.

Architecturally, SAP S/4HANA for central finance comes into the landscape as a new, additional SAP S/4HANA system that receives financial transactions replicated from other SAP and third-party systems. In a typical setup, multiple source systems are connected to an SAP Landscape Transformation Replication Server, which, in turn, is connected to one SAP S/4HANA for central finance system. For readers interested in SAP S/4HANA for central finance, we highly recommend starting with **Central Finance FAQ**.

For those companies in which a central financial department is a key component of the current or future business architecture, SAP recommends starting with SAP S/4HANA for central finance and planning for the system conversions of each of the source SAP ERP instances later on.

However, the perception of SAP S/4HANA for central finance as a "first stepping-stone" in a transition to SAP S/4HANA in just any landscape is misleading. In particular, companies with a single SAP ERP instance should retain their landscape design and focus on the standard options.

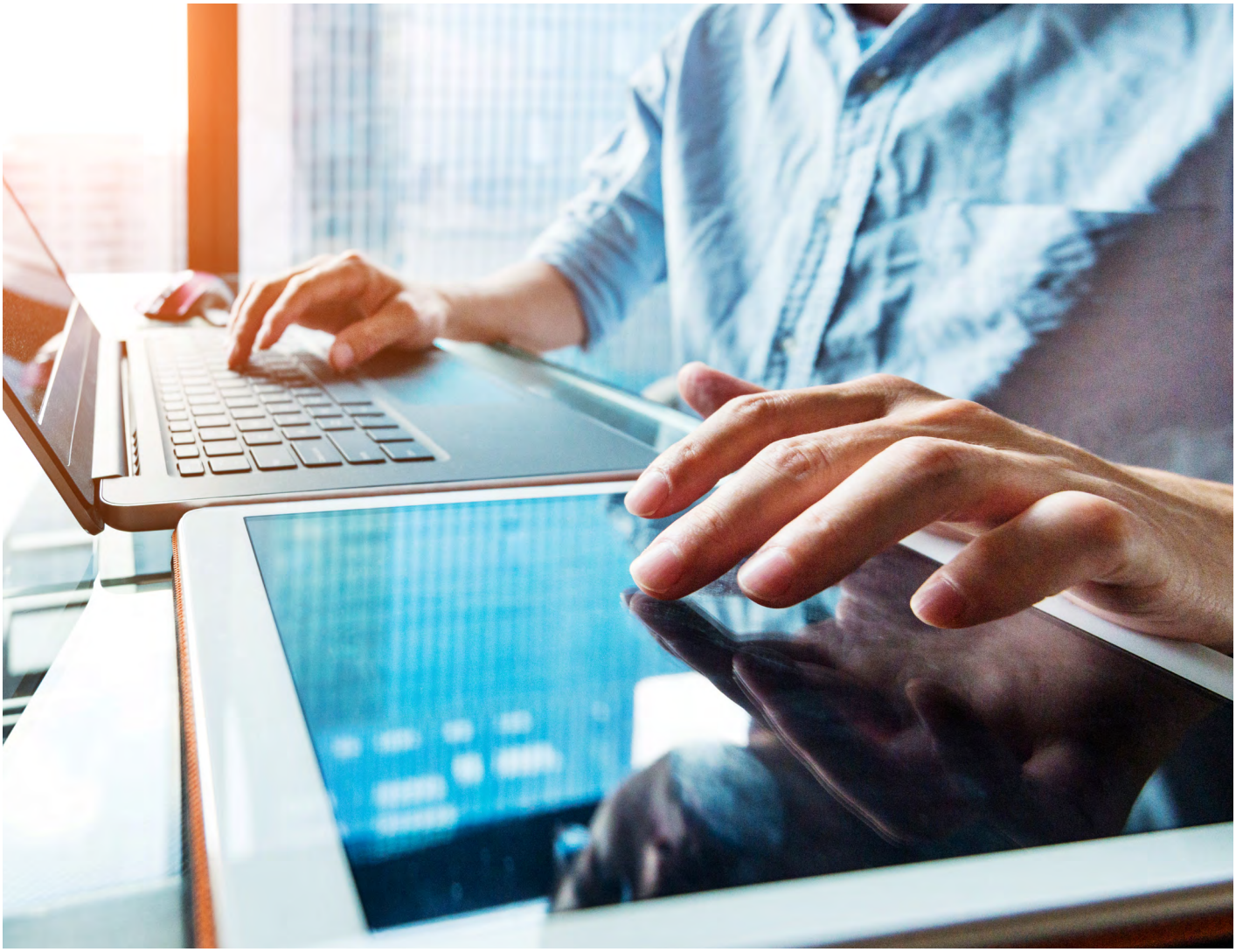
HCM ON-PREMISE OPTION FOR SAP S/4HANA

While an increasing number of SAP customers are migrating to SAP SuccessFactors® solutions to accelerate their digital HR journeys, SAP also recognizes that every customer's transformation is unique and must be undertaken at each customer's own pace.

For customers who plan to continue using their SAP ERP Human Capital Management (SAP ERP HCM) solution for the foreseeable future, SAP plans to offer a new on-premise HCM option. This option is based on SAP ERP HCM with a comparable functional scope. It is intended to be deployed alongside or embedded with SAP S/4HANA. The option is planned for availability in 2022.

That implies that you can plan for the conversion of your SAP ERP with embedded HCM to SAP S/4HANA now – without the pressure to decide on the available architectural options for HCM, including payroll functionality.

Learn more about our HCM on-premise option for SAP S/4HANA in SAP Note 2273108.



COMPATIBILITY PACKS

With the introduction of SAP S/4HANA, SAP aimed at achieving two goals: delivering a modern, disruptively new ERP suite that takes our customers through the next decades while allowing current SAP ERP customers to adopt it a nondisruptive manner. Compatibility packs are the commercial expression of this strategy.

With compatibility packs, SAP grants a limited usage right to on-premise customers of SAP S/4HANA to use certain classic SAP ERP functionalities in their SAP S/4HANA installation. That is, provided they have licensed the applicable solutions as set forth in their license agreements. This usage right is granted to the installed-base as well as net-new customers until December 31, 2025. For three compatibility scope components – customer service (CS), transportation (LE-TRA), and production planning for process industries (PP-PI) – the usage rights for these components' compatibility scope items are granted until the end of 2030.

As of March 2021, SAP provides a road map for all compatibility pack items. For most of these items, SAP is going to offer, or has already offered, alternatives. There are only six for which SAP decided not to offer an alternative solution, as a result of very low usage.

SAP intends to provide alternatives for the outstanding items by the end of 2023, so that customers have time to replace the corresponding functionality. SAP is very conscious of customer efforts to adopt the alternatives, and we have asked the associated development teams to build bridges where possible.

With the compatibility packs, the effort to adopt SAP S/4HANA is generally not increased: it is simply split into two phases:

1. If an alternative capability exists for the relevant compatibility scope when you start the project, SAP generally recommends that you adopt the alternative as soon as you move to SAP S/4HANA.
2. In other cases, that is, if the alternative is planned or is on the road map, the relevant changes need to become part of a subsequent upgrade of your SAP S/4HANA system.

Learn more about compatibility packs in the SAP Note **2269324** and in the blog by Jan Gilg, Head of SAP S/4HANA Development, "**The Future of Compatibility Packs in SAP S/4HANA**."

SYSTEM CONVERSION AND INNOVATIONS

System conversion is a well-guided process supported by several tools and utilities provided by SAP for both analysis and execution. As mentioned above, nearly half of SAP ERP customers opt for a conversion. That's why SAP continuously optimizes the tools to assist customers in the conversion process and to eliminate manual labor through automation. (See "Part Three" of this guide for more details.)

Most notably, a system conversion preserves your assets, including data, processes, and custom code. However, you should assess the perceived value of these assets very diligently. The new technologies, new business practices, and a changed business environment may have rendered some of these obsolete.

Since SAP S/4HANA is a new product, a conversion is significantly more than an upgrade. Systems that have been kept up-to-date will experience less impact because most simplifications continue the road map of the corresponding strategic developments in SAP ERP. Still, a close examination of the simplifications and the associated technical and functional impact will be an important part of every conversion project.

The SAP Fiori user experience (UX) enables access to many SAP S/4HANA innovations. You should introduce the new UX for a set of business roles, or even just for a single one, to demonstrate and prove its value and to attract other groups of business users. (See "Part Two" for more information.)

Ultimately, system conversion not only increases your readiness to innovate, but also sets the stage for subsequent business transformation. Having made this first step, you have to continue on this path to leverage the new functionality to the full extent and thus bring the innovations to your company.

NEW IMPLEMENTATIONS

We mainly see two business contexts in which customers prefer new implementations. The first is business model changes that imply rethinking the way a company makes money. Such changes raise new demands on the capabilities and agility of an ERP, so a new implementation becomes a natural choice. The second context is intense business process reengineering, such as consolidating from numerous order-to-cash process variants to just a few.

In either case, a new implementation provides you with the ability to:

- Build the new system with SAP standard content as a foundation
- Build the new system with a "clean core"
- Roll out the solution on a company-code-by-company-code basis to worldwide locations rather than a "big bang" approach

The former two stand for what SAP refers to as a "cloud mindset."

SAP Standard Content as a Foundation

SAP standard content is an umbrella term for SAP Best Practices packages, the enterprise management layer for SAP S/4HANA, and additional LoB and industry-specific content. Through SAP standard content, we provide you with support for preconfigured and comprehensive business processes.

Using SAP standard content as a foundation for system design means applying a fit-to-standard approach instead of writing a blueprint from scratch or reworking a legacy design. It has at least three advantages. First, it allows for much faster implementation, such as a more than 60% reduction in the length of the solution design phase and an overall 45% reduction in the implementation timeline.[1] Second, it results in a higher "fit to standard" by cutting down the custom development efforts, which leads to substantial savings in the ongoing operations, such as 5%. Third, since SAP standard content is built to cloud standards, by using it for your new implementation on premise you are, at the same time, preparing for a future move to the cloud.

Read more about SAP standard content in "Part Two" of this guide.

Clean Core

In practical terms, keeping the core clean means:

- Applying a zero-modification policy from the project's first day
- Eliminating enhancements that are redundant to standard code and functionality, as well as "clones" of standard code
- Using released APIs only
- Leveraging the in-app extensibility of SAP S/4HANA to its full extent
- Employing the capabilities and services offered by SAP Business Technology Platform (SAP BTP) to build larger extension applications
- Using SAP Integration Suite

Read more about the clean-core paradigm in "Part Two" of this guide.

1. The Total Economic Impact™ of SAP Model Company, a commissioned study conducted by Forrester Consulting on behalf of SAP, July 2020. These results are for a composite organization.

Company-Code-by-Company-Code Rollout

As stated above, the only recommended unit for rollouts is the company code, which is the smallest business unit used to represent a company for external accounting. Most implementation strategies start with one pilot unit and continue rolling out the solution in waves that bundle multiple closely related units. For instance, a company may choose to start with its German headquarters, continue with its North American and Latin American operations in the second wave, onboard its locations in Central and Eastern Europe in the third wave, and so one. Another popular approach is to onboard one complete business division after another.

Such a strategy can only be realized within a new implementation. This is because a conversion applies to the whole system and, thus, to all units contained in it.

Even though your rollout strategy may not be fully defined, you should seek to deploy the standard content for all planned countries or business units up front when initially building your new system. Adding standard content after your system goes live requires significant manual labor.

SELECTIVE DATA TRANSITIONS

So far, we have discussed the standard options of new implementation and system conversion. From a technical viewpoint, a new implementation means that the software is installed first, and then the data required to start business operations is loaded using the SAP S/4HANA migration cockpit. By contrast, with a standard conversion procedure both the software and the data are converted in a single step.

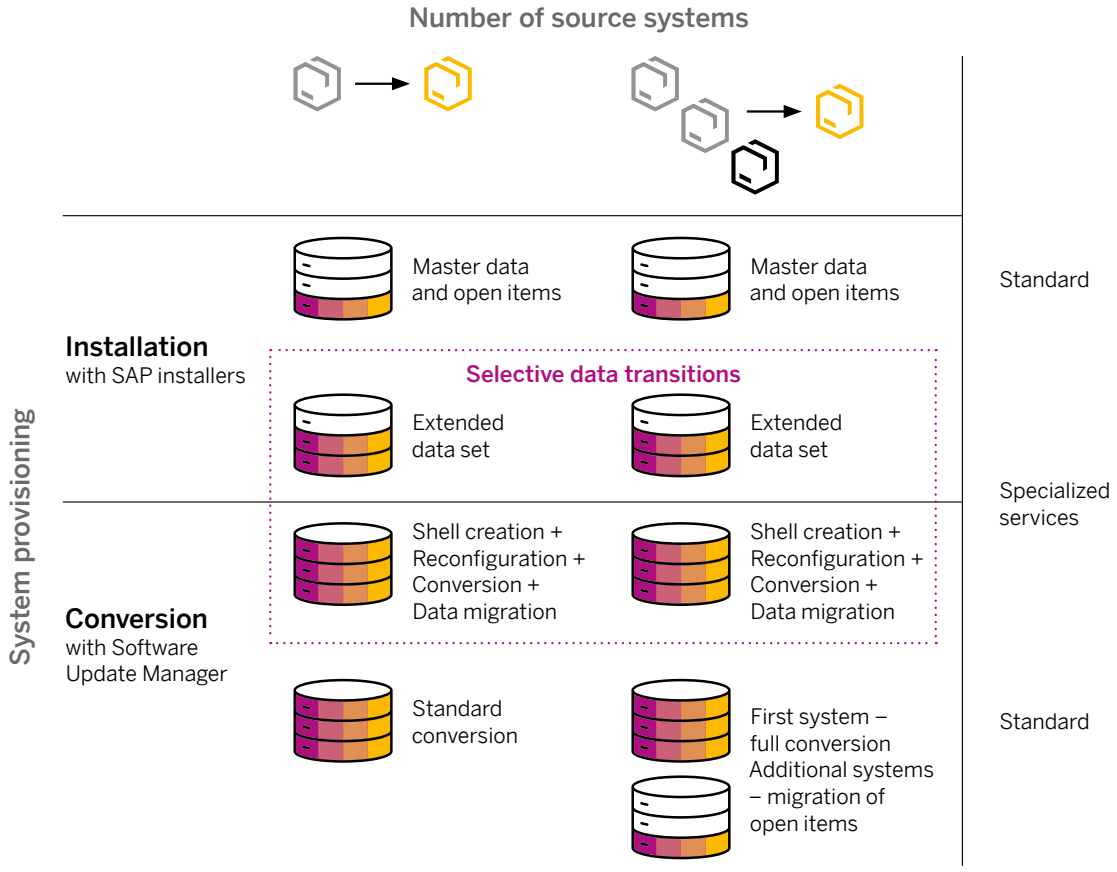
Selective data transition is an umbrella term that refers to scenarios that go beyond the standard options of system conversion and new implementation (see Figure 2). It comprises a host of options that you need to evaluate carefully.

There is a great variety of scenarios for selective data transition, and the variety of reasons why some companies may look into these is greater yet. One way to structure these scenarios is by answering the following questions:

- Does your IT landscape have more than one ERP system? If so, do you intend to consolidate them?
- How do you build the target system? Should it be through a new installation or a conversion?
- How will you migrate the data to the new system – and how much data must you migrate?

Discussing all these scenarios is beyond the scope of this document. Nevertheless, the examples in Figure 2 should give you some insight into the nature of selective data transitions.

Figure 2: Selective Data Transitions with Complex Scenarios Framed with a Dotted Line



Example 1: ERP Landscape Consolidation

One common situation is a consolidation of multiple SAP ERP systems into one. A standard transition path is either:

- Implementing the new system based on best practices followed by loading master data and open items from all source systems
- Converting one of the systems and loading open items from the others

If your requirement is to load historic data from all SAP ERP systems that are subject to consolidation, you will have to resort to a selective data transition and employ specialized tools and services.

This pattern sometimes appears in the context of mergers and acquisitions, when an organization needs to integrate the SAP ERP system of an acquired entity into an SAP S/4HANA system. (See the sidebar below.)

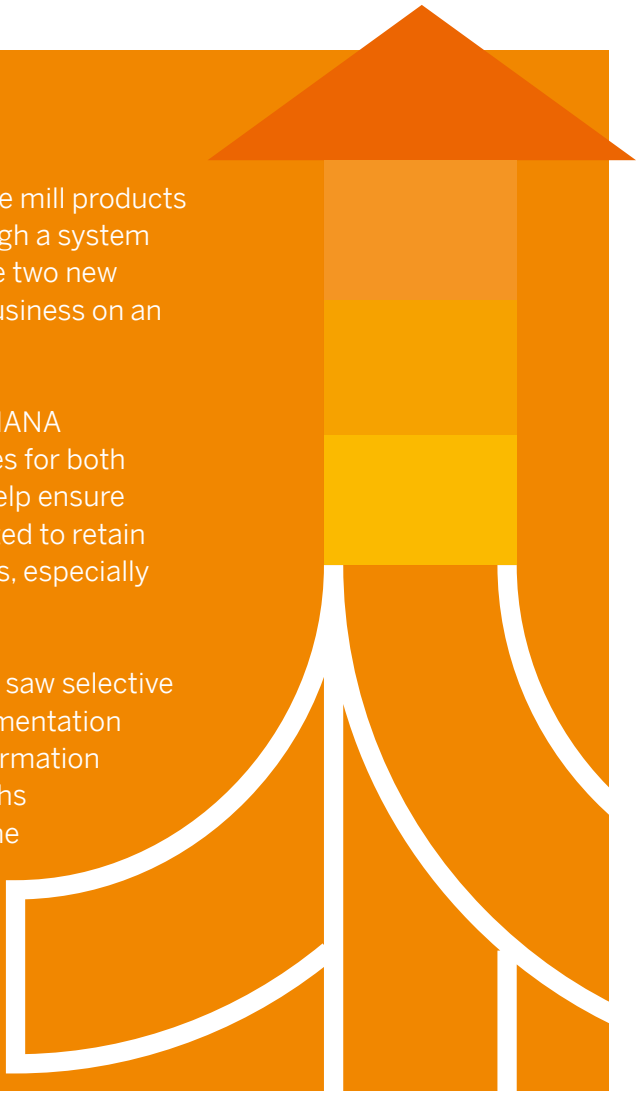
CASE STUDY: SUPPORTING M&A INTEGRATION

Preparing for future expansion and growth, a global player in the mill products and mining industry implemented SAP S/4HANA in 2017 through a system conversion. About a year later, the company set out to integrate two new factories acquired from a European firm that was running its business on an older release of the SAP ERP application.

Each factory was to receive its own company code in SAP S/4HANA ("company code split") and to assume the new global processes for both logistics and finance, including new accounting principles. To help ensure smooth integration and business continuity, the company wanted to retain access to the factories' historic data in the logistics applications, especially material management and plant maintenance.

Given the combination of these requirements, the project team saw selective data transition as an attractive option and chose SAP as implementation partner. The combined team leveraged SAP Landscape Transformation software to migrate the master data as well as the last 12 months of selected transactional data at the table level, while loading the financial open items through regular postings.

The project took 10 months with three test cycles, followed by a productive migration.



Example 2: The Shell Approach

If the system is deemed to be in good shape, a project team may seek an approach on how to change only a part of the system configuration or functionality, while retaining the rest unaltered. Examples for such selective changes could be to restructure the chart of accounts or to introduce the new general ledger (G/L) functionality with a ledger solution for parallel accounting. Thus, you can say that selective data transition combines multiple projects into one, which certainly shortens time to value while increasing complexity.

Technically, such an approach includes these steps:

1. Performing a shell creation from the current SAP ERP
2. Performing corresponding customizing and configuration changes in this shell system for the simplification list items
3. Executing a standard system conversion of the shell system
4. Performing corresponding customizing and configuration changes in the SAP S/4HANA system to implement improvements and innovations
5. Loading the data

This approach is within the realms of standard as long as you load master data and open items using the SAP S/4HANA migration cockpit.

However, loading historic data into the new system entails an extra effort and use of specialized tools and services. Therefore, you should first evaluate if you can achieve the same outcome through a preparation project followed by a standard system conversion. SAP and its partners provide well-established services for such preparation projects, such as migration to the new G/L functionality, reorganization of the chart of accounts, or merge of controlling areas.

OPEN ITEMS

The term "open items" stands for financial open items, but it also includes balances, stocks, open sales and purchase orders, and other business objects. More generally, it refers to the initial data set required to start business operations. When loaded with the SAP S/4HANA migration cockpit, some business objects have limitations. For example, partially delivered sales orders cannot be migrated along with the corresponding completed deliveries. Such orders have to be closed in the old system first.

HISTORIC DATA

Historic data means completed and closed transactional data (for example, fulfilled and fully billed sales orders, purchase orders, or plant maintenance orders), as well as partially closed documents (for example, partly delivered sales orders).

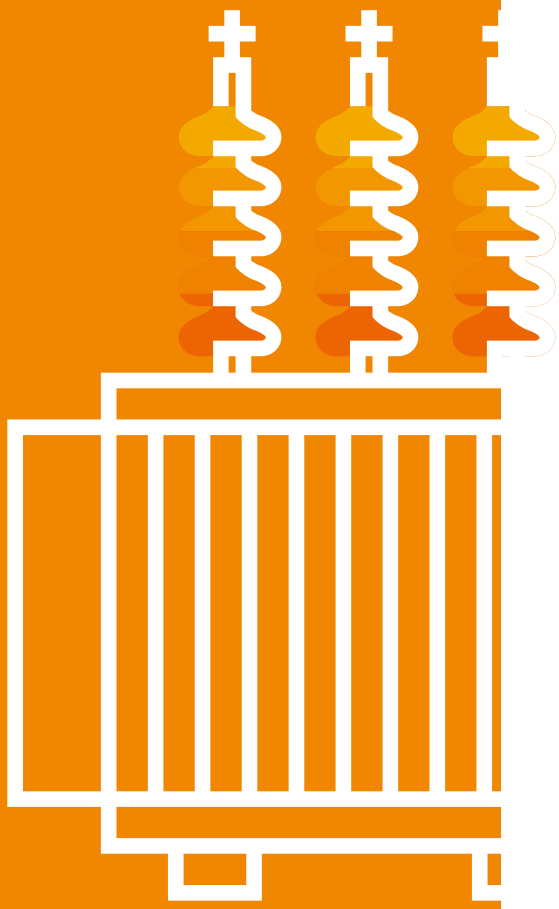
Example 3: New System, Historic Data

Another reason for choosing selective data transition is to replace an outdated system with a new one built upon best practices, in addition to the ability to assure maximum business continuity by loading certain historic transactional data.

A new implementation may eliminate the need for preparation projects, such as business partner implementation, and thereby significantly shorten the project timeline. (See the sidebar below.)

CASE STUDY: SAFEGUARD BUSINESS CONTINUITY WITH HISTORIC DATA

As a German utility company considered replacing its SAP ERP system with an SAP S/4HANA system, the decision didn't take long. Both business and IT shared the view that converting the current heavily customized solution wouldn't be the right option.



Although technically up to date, over the years, the solution had accumulated a high number of inactive company codes and a very significant number of custom developments. Implementing the business partner data model and transferring from the classic general ledger to a new general ledger functionality was expected to take more than a year.

Therefore, they decided on a new implementation of SAP S/4HANA 1809 based on best practices for utilities from SAP.

As a rule, energy and utility companies have to manage hundreds of thousands of different assets involved in power generation, transmission, and distribution. Therefore, the plant-maintenance functionality and data are key to their business operations. To assure business continuity, the company decided to apply selective data transition to load the historic data into the newly built system.

Most of the master data, accounting objects, stocks, and asset accounting objects for selected company codes were extracted from the old system and transferred to the new one with the help of SAP S/4HANA migration cockpit in combination with some custom programs. At the same time, the company leveraged dedicated consulting tools from SAP to load the relevant historic plant maintenance orders along with some other logistics and controlling data (such as plans and actuals) for previous fiscal years on the table level.

Through the data migration workstream, the company scheduled three test cycles prior to migrating to production and successfully completed the work within nine months.

Historic Data: Understand What's Fuel and What's Ballast

In selective data transition scenarios, the crucial debate is on how much historic data to retain. There is a wide range of arguments and different requirements. Like a race car driver, you need to understand when this data is fuel and when it's ballast.

Here are three guiding questions:

- **What data do you really need to start your business operations?** You need to have absolute clarity about what business objects you need and why. You may find that you don't actually need everything you thought you needed.
- **How well do you understand the mechanics of data migration?** SAP S/4HANA migration cockpit uses standard application logic to provision the data. Likewise, the Software Update Manager tool applies software vendor logic to convert the data in place during a system conversion. The tool to migrate the data from an SAP ERP system into another SAP S/4HANA system has to apply exactly the same logic. Note that this is always a project solution as there is no standard tool to migrate historic data. In complex scenarios, the data is migrated at database-table level, which requires an exceptionally deep knowledge of both the data structures of and complex dependencies between the business objects of SAP ERP. Failing to understand these dependencies poses a high risk of data inconsistencies.
- **What implications would it have on the project's budget?** In an SAP S/4HANA implementation, the actual innovation topics most likely need to be funded from the same budget as the preparation projects or complex data migrations. Finding out the most cost-effective way may be challenging. When migrating historic data, the extra cost comes not only from the specialized services you need to purchase but also from extensive testing that is required for complex, selective data transition scenarios, such as three end-to-end integration tests on migrated productive data.

There are options to consider before you decide to choose a selective data transition:

- Replatforming your current ERP on low-cost hardware while granting business users read-only access to it
- Leveraging data retention solutions with inexpensive archive technologies that allow data retention for a fraction of the cost

If your company's needs lead to a selective data transition, we strongly advise you to engage SAP or our partners who have the necessary tools and knowledge.

Selective Data Transition Community

In 2019, SAP founded a partner community to work on the quality standards and common approaches for selective data transitions and, thus, better serve the customers choosing this scenario. The member partner companies use their own tools and products among other solutions.

SAP is a hosting member of this group but does not endorse, certify, or recommend a specific solution, approach, or product to carry out a selective data transition. SAP takes no liability and accepts no contractual obligations resulting from use of these products.

- Read KBA 3018442 for more information
- See the "Selective Data Transition" page in the SAP Support Portal destination

CLOUD OPTIONS

SAP is the only vendor whose cloud and on-premise offerings rely on the same technology; share the same code line, data entities, and analytical structures; and offer the same user experience.

Being in the ERP business for over 40 years, SAP understands that a cloud ERP has to offer much more flexibility than the average cloud solution usually does. To satisfy this demand, SAP S/4HANA provides the industry capabilities companies require and the cloud benefits they want.

There are two cloud offerings:

- SAP S/4HANA Cloud is a software-as-a-service (SaaS) solution that provides the industry capabilities companies require and the cloud qualities and simpler solution life-cycle management customers expect.
- SAP S/4HANA Cloud, private edition provides the full SAP S/4HANA functionality while offering the highest flexibility and extensibility options running on a hyperscaler infrastructure.

Companies with a clear and committed cloud strategy have to look into the following key aspects when evaluating SAP S/4HANA Cloud offerings:

- Functional scope – the supported business processes as well as regulatory, industry, and localization support plus required partner add-ons
- Standardization versus extensibility and configurability – what options and extensibility mechanisms can be used to enhance the standard processes
- Deployment and operations – how the complete solution is provisioned, managed, and operated from an IT point of view and the transition options that are available

The table on page 25, Key Aspects for the Evaluation of SAP S/4HANA Cloud, summarizes the key differences between the SAP offerings.

Follow these steps when considering implementing SAP S/4HANA Cloud:

- Ask your SAP sales representative or partner to perform a digital discovery assessment for you. SAP partners can register here
- Make yourself familiar with the SAP Extensibility Explorer tool for SAP S/4HANA Cloud
- Explore released APIs for SAP S/4HANA Cloud in SAP API Business Hub
- Explore the implementation road map for the SAP Activate methodology.

RISE WITH SAP | Business Transformation as a Service

With the RISE with SAP offering launched in January 2021, SAP makes it easier for you to take your business-critical applications into the cloud in the way that works best for you, wherever you are starting from or however fast you want to go. It is a single offer on a single contract that includes:

- One of the following variants hosted on the infrastructure provider of choice:
  - RISE with SAP S/4HANA Cloud, private edition
  - RISE with SAP S/4HANA Cloud
  - RISE with SAP S/4HANA Cloud and experience management
- SAP Business Network Starter Pack (limited access edition) for unified access to SAP's supplier, logistics, and asset intelligence networks for collaboration with your trading partners
- Business process intelligence to analyze how your processes perform, get tailored recommendations, and benchmark them against industry standards
- Consumption credits for SAP Business Technology Platform (SAP BTP, formerly SAP Cloud Platform), which you can spend on the platform services of your choice
- Access to learning and tools to support the transition from your current ERP environment

Find **more information** about the RISE with SAP offering.

Key Aspects for the Evaluation of SAP S/4HANA® Cloud

	SAP S/4HANA Cloud – our public cloud offering **Software as a service (SaaS)**	**SAP S/4HANA Cloud, private edition SaaS**	**SAP S/4HANA On any infrastructure**
	FUNCTIONAL SCOPE		
Scope	Configurable, standardized processes and best practices for finance, human capital management (HCM), procurement, sales, and more. See Feature Scope Description document for SAP S/4HANA Cloud	Full scope of SAP S/4HANA software including line-of-business (LoB) and industry processes, supporting 25 industries See Feature Scope Description document for SAP S/4HANA	
Add-Ons	Certified public cloud add-ons allowed	Only certain add-ons qualified for SAP S/4HANA allowed	Any SAP or partner add-ons offered for SAP S/4HANA allowed
Industry Support	Support for industries comprising consumer products, discrete manufacturing, energy and natural resources, financial services, public services, and service industries	Support for all industries	
	STANDARDIZATION, EXTENSIBILITY, AND CONFIGURABILITY		
Standard Configuration	SAP® Best Practices packages included	Customers can use SAP standard content, including: • SAP Best Practices • Enterprise management layer for SAP S/4HANA • Additional LoB and industry-specific content	
Extensibility	SAP S/4HANA in-app extensibility, embedded custom code, and side-by-side extensions through SAP Business Technology Platform	All extensibility options; modifications not recommended but possible	
Customization	Central business configuration cockpit	Full access to traditional customizing through the implementation guide (IMG)	

	SAP S/4HANA Cloud – our public cloud offering **Software as a service (SaaS)**	**SAP S/4HANA Cloud, private edition SaaS**	**SAP S/4HANA On any infrastructure**
		DEPLOYMENT AND OPERATIONS	
Implementation	New implementation	New implementation, conversion, selective data transition*	
Software Updates	Two upgrades per year, managed by SAP	Annual upgrades recommended; minimum upgrade frequency of one upgrade in five years (to stay within the mainstream maintenance)	Annual upgrades recommended
Deployment Infrastructure	Infrastructure as a service (IaaS) – SAP data center, Microsoft Azure, Alibaba, or Google Cloud Platform	IaaS – Microsoft Azure, Google Cloud Platform, or Amazon Web Services	Customer data center, traditional hosting providers, or IaaS provider
Licensing	Software subscription		Perpetual license
Infrastructure Management	By IaaS provider	By IaaS provider	Individual agreements
Technical Operations	SAP	SAP	Individual agreements
Application Management Services	SAP	Partner, customer, or SAP Enterprise Cloud Services	Individual agreements
Support	SAP Enterprise Support services included	SAP Enterprise Support included	SAP support offerings

*A service offering from SAP, depending on the type of SAP S/4HANA Cloud offering and the contractual terms

Consider Hybrid Two-Tier Architecture

As stated above, SAP S/4HANA and SAP S/4HANA Cloud share the same code line, data entities, and analytical structures. This, along with the default integration scenarios, opens up new possibilities for a sustainable hybrid two-tier architecture.

A hybrid two-tier architecture spanning a company's headquarters operating SAP S/4HANA and its subsidiaries equipped with SAP S/4HANA Cloud is an alternative to the traditional ERP template approach (see Scenario A in Figure 3).

This scenario applies equally well to newly acquired entities and the existing subsidiaries with comparably simple processes. You should closely examine this option, especially if your company pursues an aggressive merger and acquisition (M&A) strategy or if its IT landscape already includes multiple federated SAP ERP systems.

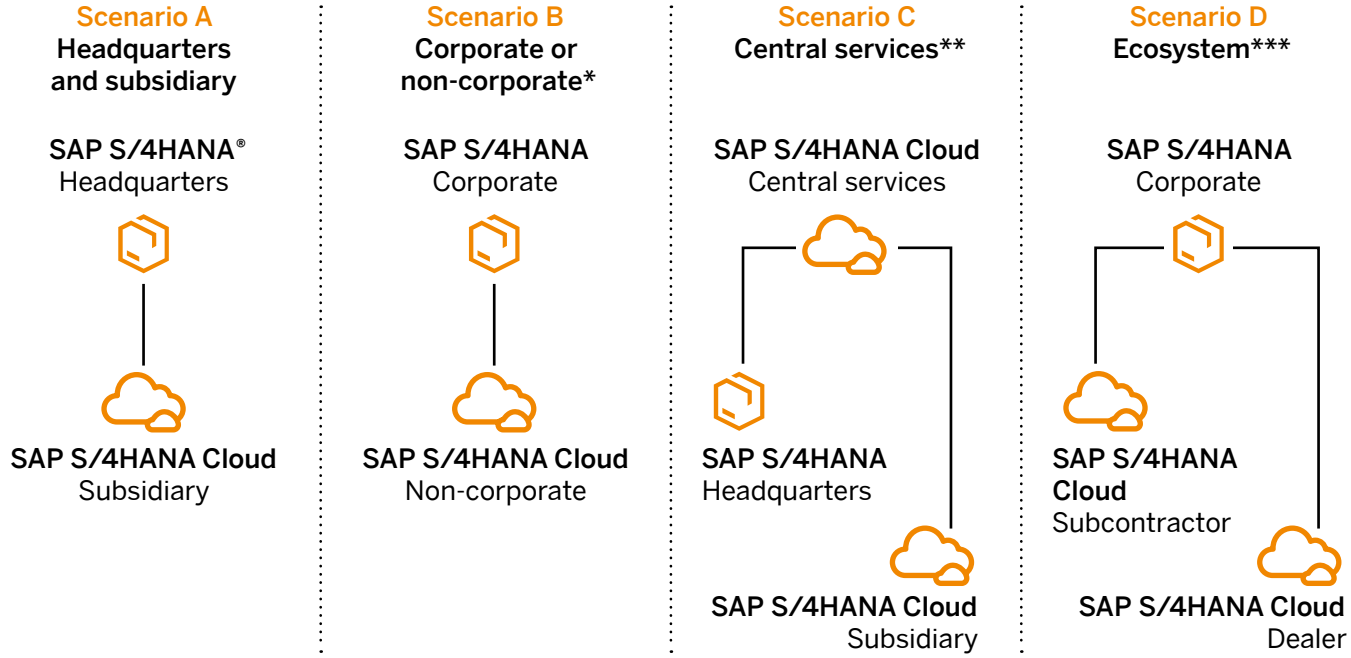
The default integration scenarios delivered with SAP S/4HANA Cloud also enable further scenarios for hybrid two-tier architecture, as shown in Figure 3.

IN-APP AND SIDE-BY-SIDE EXTENSIBILITY

With the in-app extensibility framework introduced with SAP S/4HANA, business experts gain the ability to implement key types of customer extensions on their own. Examples include creating custom business objects with a generated user interface (UI), adding custom fields with processing logic to business objects, adding simple operational reporting, creating custom printout and e-mail forms, and more.

The second pillar of SAP's new extensibility concept is the side-by-side extensions, that is, custom applications interacting with SAP S/4HANA through a defined set of public APIs or operating on replicated data. For details on the APIs available with SAP S/4HANA Cloud, visit **SAP API Business Hub**.

Figure 3: Hybrid Two-Tier Scenarios with SAP S/4HANA® Cloud



*Corporate or non-corporate scenario – for largely autonomous business units or divisions; very attractive if your company fosters entrepreneurship and innovation through the "corporate startup" model
**Central services scenario – to enable central provisioning of certain business services, such as a procurement hub
***Ecosystem – to enable business collaboration with vendors, subcontractors, or dealers

Traditional ERP Template Approach Versus Two-Tier Architecture

	Traditional ERP Template Approach	Two-Tier Architecture
Financial Reconciliation	Reconciliation performed inside one system	The universal journal model in SAP S/4HANA® eliminates the need for reconciliation.
Financial Planning and Consolidation	Consolidation (for example, with the SAP® Business Planning and Consolidation application or other solutions) Standard interfaces exist Need to be set up by the headquarters' IT team	In Scenarios A and B in Figure 3 (HQ/subsidiary or corporate/non-corporate): SAP Business Planning and Consolidation or other SAP solutions In Scenario C (central services): Deployment through the built-in consolidation functionality of SAP S/4HANA Cloud Standard data sources and interfaces are available as solution's scope item. The setup is carried out by SAP's cloud delivery team.
Master Data Harmonization	Usually with the SAP Master Data Governance application or homegrown solutions	Built-in data replication framework for simple master data replication SAP Master Data Governance or more-sophisticated capabilities
Intercompany Processes	Within the same system, through intercompany transactions (that is, between the headquarters company code and subsidiary company code) Complex integration required for federated ERP landscapes	Smooth sales-order-to-purchase-order automation and billing-to-supplier invoice automation delivered by SAP
Reporting and Analytics	Usually through the SAP Business Warehouse (SAP BW) application or homegrown solutions	• SAP BW • SAP Analytics Cloud solution
SAP-to-SAP Integration*	Needs to be set up and managed by the headquarters' IT team	Built-in default integration scenarios managed by SAP
SAP-to-third-party integration**	Needs to be built, set up, and managed by the headquarters' IT team	

*For instance, SAP S/4HANA Cloud to the SAP Business Planning and Consolidation application, SAP Ariba® solutions, or SAP SuccessFactors® solutions
**For instance, SAP S/4HANA Cloud to a third-party warehouse management system or third-party logistics providers

Industry Cloud

For decades, SAP has been known for its industry solutions complementing and enhancing SAP Business Suite applications with the specific functionalities and support for best practices in the comprehensive processes in industries such as utilities, oil and gas, or automotive. As a rule, these solutions were shipped as add-ons and required careful planning when deployed in combinations.

Over the past years, we witnessed numerous emerging industry trends, transformation of business models, and blurring of industry lines. Therefore, as we carried over these industry capabilities from the classic ERP into SAP S/4HANA, we decided to reintegrate them into the core for a more cohesive architecture and easier deployment.[2] Our second fundamental architectural decision was the introduction of SAP's industry cloud to enable the innovation and transformation in the most-agile parts of our customers' businesses.

Our industry cloud stands for modular cloud applications built by SAP and partners on SAP Business Technology Platform, based on common architecture and development guidelines, using a common data model, and integrated through standard APIs. Today's examples include SAP Intelligent Trade Claims Management, SAP Intelligent Returns Management, or SAP E-Mobility. These solutions optimize and extend the comprehensive processes of SAP S/4HANA with the next practices.

Consult the resources listed below to see how the parts of your business undergoing a transformational change can leverage the available and planned industry cloud solutions.

- Industry Cloud page offers access to numerous industry white papers.
- Industry Cloud road map outlines the road maps of the individual applications.

Where to Find More

To learn more about two-tier ERP and the corresponding architectures, see the "Two-Tier ERP with SAP S/4HANA Cloud and Deployment Possibilities" white paper.

For a comprehensive architectural discussion, we highly recommend the white paper "Elements for Designing a Transition Road Map to SAP S/4HANA."

2. See SAP Note 2943206 for industry solution restrictions in SAP S/4HANA.

Part Two

INGREDIENTS FOR PROJECT SUCCESS

KEY TAKEAWAYS

Although new implementations and conversion projects are very different by nature, there are a few subjects you shouldn't leave to chance in either case. In "Part Two" of this guide, we elaborate on these subjects, focus on the specifics of conversion projects and new implementations, and conclude by highlighting the essential aspects of the project setup.

For all SAP S/4HANA implementation projects, follow these best practices:

- Build up your team's skills. This will pay off economically and in many other ways.
- Assure architectural due diligence. Review the five key topics in the "Architectural Due Diligence" section below that your architecture team can't afford to neglect.
- Understand, explore, and leverage SAP standard content in both new implementations and conversions.
- Redesign your business processes for in-memory computing. This is about rethinking, not about doing the same things faster.
- Make sure that your development team fully understands the new software development concepts and technologies.
- Recognize that SAP Fiori is more than a new Web user interface (UI). Establish an adoption strategy for SAP Fiori, and appoint a user-experience lead to carry it out.
- Curate your master data prior to the transition to SAP S/4HANA.
- Make sure that there is enough focus on pertinent hardware planning and performance testing.

For conversion projects, consider the following recommendations:

- Take care of your financial data and understand the plans of your finance team to leverage the new G/L, parallel accounting, and document split capabilities.
- Realize that conversion test cycles are the backbone of your project. Follow the guidelines to establish a successful project plan.
- Check the compatibility of your add-ons in advance and decide how to deal with each add-on before the conversion.
- Scrutinize your simplification items and pay close attention to the ones that require a business decision or a preparation project.
- Take advantage of the opportunity to reassess and clean up your custom code. Decide what you need and delete the rest.

For new implementations, we suggest that you:

- Use SAP standard content to organize show-and-tell workshops for business users.
- Don't lift-and-shift your custom code to the new system.
- Define the scope for data migration as early as possible. Make sure your team knows the capabilities of the SAP S/4HANA migration cockpit and reassess the capabilities of your current extract, transform, and load (ETL) solution.

During project setup, remember the following:

- Apply the three pillars of practical governance by setting up a project steering committee, joint design authority, and architecture governance board.
- Make sure you are familiar with SAP Integrated Delivery Framework, the SAP Activate methodology, and SAP-qualified packaged solutions from SAP partners.
- Consider estimating the duration of your project in one of the following ways: You can either use a past project, or take the median value as a baseline and adjust it by evaluating the key influencing factors.

BUILD YOUR SKILLS

The enablement of users and teams is a significant building block in a project's success. In practice, there are two major benefits:

- Faster deployment: organizations providing more training can usually achieve shorter project timelines because of team efficiency.
- Increased satisfaction with the deployed solution: well-trained employees are more likely to become proficient with the their SAP solution faster and be more satisfied with it.

A perfect start for any conversion project team member is to take the following two courses on the openSAP platform:[3]

- Key Functional Topics in a System Conversion to SAP S/4HANA
- Key Technical Topics in a System Conversion to SAP S/4HANA

Furthermore, the SAP Learning Journey interactive guides below are a great resource for the SAP ERP experts on your team to efficiently upskill their ERP business knowledge:

- SAP S/4HANA Finance – Financial and Management Accounting – Upskilling for SAP ERP Financials Experts
- SAP S/4HANA – Sales – Upskilling for SAP ERP Experts
- SAP S/4HANA – Sourcing and Procurement – Upskilling for SAP ERP Experts
- SAP S/4HANA – Manufacturing – Upskilling for SAP ERP Experts

Likewise, the SAP S/4HANA – Application Lifecycle Management SAP Learning Journey can help your IT team become proficient with SAP S/4HANA.

In addition, SAP Training and Adoption services offer certifications for SAP professionals, such as consultants or business users. An SAP certification helps validate the expertise of your staff and is recognized globally.

Users of SAP S/4HANA have access to standard enablement content directly through in-app learning. In addition, a license of the SAP Enable Now solution allows customers of SAP S/4HANA to customize this content. SAP Training and Adoption and the SAP partner ecosystem can support customers and provide content production and enhancement services.

For more information on user enablement, visit the SAP Enable Now solution site.

For teams that want to gain a hands-on experience and understand the essential steps within a conversion, SAP offers a free boot camp, "10 Steps to SAP S/4HANA." This boot camp is available to customers and partners.

Finally, for those who prefer self-paced learning, SAP provides a set of system images as a learning environment for SAP S/4HANA system conversions, which can be provisioned through the SAP Cloud Appliance Library tool. For more information, visit this blog.

3. More than 21,000 participants from over 100 countries attended these courses in 2018 and more than 20,000 in 2020. On average, the courses were rated 4.49 out of 5 stars.

ASSURE ARCHITECTURAL DUE DILIGENCE

Transparency in both functional and technical architecture is one of the key success factors for your project. Make sure your architecture team applies the necessary diligence when working on these five tasks:

- Understand what SAP ERP functionality is currently in use, and how it maps onto the functional capabilities of SAP S/4HANA and other SAP solutions. Use the SAP Transformation Navigator tool as your starting point.
- Request a deployment stack ("system's bill-of-materials") from your architecture team for both the old and especially the new system, including hardware, operating system, SAP HANA revision, and the software components' release levels. This information must be accurate and up-to-date.
- Have a plan on how to deal with the installed third-party add-ons. For each add-on, make a conscious decision about whether it can be kept, replaced with standard functionality, or uninstalled.
- Create landscape diagrams depicting the landscape for each conversion cycle. Make sure that these reflect both the connectivity to the satellite systems and the transports and software deployment.
- With very few exceptions, the standard interfaces to and from other SAP Business Suite applications are not impacted by conversion. Nevertheless, ask your teams to reassess the satellites while paying special attention to cross-platform and cross-vendor integration.

REDESIGN YOUR PROCESSES FOR IN-MEMORY COMPUTING

SAP S/4HANA provides companies with breakthrough technology and brings a new software architecture that exploits this technology to the utmost degree. However, this is of little benefit if a company uses a 2021 system to run its business processes in the same fashion as in the 1990s.

In the past, many steps in a business process executed in a traditional ERP system were actually performance work-arounds aimed at overcoming the limitations of the databases and the hardware. These steps included data preparation, replication, aggregation, and reconciliation – all of which collectively entailed long process-execution times, outdated information, and reactive process-exception handling.

When such "band-aid processes" are used long enough, it becomes increasingly difficult to tell apart the actual business purpose from the workarounds. In fact, you may have to learn anew how to design business processes with the new degree of freedom provided by SAP S/4HANA. The first step is to understand that performance isn't all about doing the same things faster.

With SAP S/4HANA, you have a system that is designed to enable information workers to make decisions on the fly. Through the underlying SAP HANA database and the new data model, it largely eliminates the need for work-arounds. This means you can turn a process into an instantaneous self-service that operates directly on the original data set and helps you to prevent process exceptions through instant responses to what-if simulations. As expensive data preparation steps and batch jobs become superfluous, the processes can be shortened to hours instead of days.

Cue Card for In-Memory Computing Process Design

Business Processes	Analytics and Reporting	Business Practices
• Where did we design the processes around performance impasses? • Which processes are too slow? • Where does outdated information cause process exceptions or rework? • Which processes have not been implemented because of performance requirements or data volume?	• Where was it particularly difficult to define the correct reporting architecture? • Which processes require variations of existing aggregates? • Where is a drill-down from reports to transactions missing? • Where do we have frequent change requests for reports? • Where did we oversimplify the data model? • Where do users resort to spreadsheets?	• Where can real-time information and processes make a difference to the business? • Where do end users run an "informal" process through help-yourself tools? • What did we disallow because of system performance constraints? • What scenarios did business users request that we judged to be unfeasible?

Another key element is embedded analytics, which is an exceptionally cost-efficient model for operational reporting. Rather than collecting all requirements to present the data in a way that suits everyone (and often failing to do so because of the complexity and trade-offs), you can now easily afford to offer specific views for each user. This way, downloading data to spreadsheets becomes a thing of the past. Needless to say, this saves the costs of "shadow IT" and also helps improve compliance.

Here are some rather general pieces of advice to conclude:

- To find the opportunities for process innovation, you need to ask the right questions. You may want to start with the ones listed in the "Cue Card for In-Memory Computing Process Design" table on page 35.
- Have an open discussion on how far the users' actual ways of working resemble the initial blueprints. At times, it is truly impressive how often people work around or outside of the system and only enter the data at the very last moment.
- Be persistent. Raise interest by showing what's possible. Be assured that your business users will be able to extrapolate what you have shown and to build on these ideas. You should also be prepared to find that some of your peers remain constrained by their experience with the old technology. If that happens, recall the quote attributed to Mr. Henry Ford (rightly or not), "If I had asked people what they wanted, they would have said faster horses."

RELY ON THE ROLE-BASED SAP FIORI UX

SAP Fiori is the go-to user experience for SAP S/4HANA. SAP Fiori launchpad offers a role-based, single access point for business users to access all UIs of SAP S/4HANA with the consistent SAP Fiori look. This includes SAP Fiori apps, transactions in the SAP GUI interface, Web Dynpro for ABAP® applications, and Web Client user interfaces for the SAP Customer Relationship Management (SAP CRM) application.

Business users can access many innovations in SAP S/4HANA through SAP Fiori apps that support key processes, such as sales order fulfillment, general ledger accounting (including displaying journal entries in T-account view), group reporting, central procurement, and predictive material and resource planning. Users can gain real-time insights and monitor key concerns of their business domain using embedded analytics, such as overview pages and analytical list pages. They can also access SAP S/4HANA innovations through services within SAP Fiori launchpad, such as enterprise search, or intelligent automation use cases such as situation handling. Therefore, customers who don't implement SAP Fiori and continue to use SAP GUI as their primary UI will have only a limited benefit from the innovations in SAP S/4HANA.

The UX paradigm of SAP Fiori differs fundamentally from the classical transaction pattern. Instead of big multipurpose transactions, SAP Fiori offers a navigation network of task-oriented UIs interconnected through SAP Fiori launchpad content. Selectively implementing only some individual SAP Fiori apps not only breaks the user experience but also results in very high implementation costs. In short, SAP Fiori apps are not designed to be used individually.

Therefore, SAP recommends the following role-based approach to implementing SAP Fiori:

- Always implement complete business roles and not just single apps
- Copy the SAP-delivered business roles and catalogs and adjust them to your needs

To explore the business roles and related SAP Fiori apps, visit the SAP Fiori apps reference library.

You can control the pace of your transition to SAP Fiori. You can start with as little as introducing SAP Fiori launchpad as a single entry point for business users and choosing a single business role as a first showcase for SAP Fiori apps. The lighthouse scenarios with **SAP Fiori apps** highlight those scenarios and business roles for which SAP Fiori offers a new user experience and immediate benefits that were not available in SAP Business Suite software. You can go about the process as follows:

- As a first step, introduce your business users to the new capabilities. The following videos provide a good overview:
  - For any users: **SAP Fiori user experience for SAP S/4HANA**
  - A video for **procurement specialists**
  - A video showing the **power of search**, for sales representatives
  - A video for **accounts receivable specialists**

  You can find more videos in this **video series**.
- Use the SAP S/4HANA 30-day fully activated **trial appliance** to demonstrate the new capabilities to the business in workshops. This appliance includes an activated set of SAP Fiori roles and a demo guide.
- Once your sandbox system is ready, use the **task lists for rapid SAP Fiori activation** to quickly experience the business roles delivered by SAP. That's a starting point for analysis and content adjustment of SAP Fiori launchpad. Use the content manager for SAP Fiori launchpad to adjust the launchpad content to your specific needs.
- Establish the UX as a workstream of your project, which should be at the same level as functional and technical workstreams. Appoint a user experience lead role in your project team to take responsibility for the UX strategy, including common UX components such as SAP Fiori launchpad, enterprise search, and My Inbox. Further UX architecture tasks include designing the home page for business roles, coordinating with technical and functional architects, and giving guidance on app activation and extension.
- Plan for the **tailoring of role-specific home pages** that define how apps are organized and grouped on SAP Fiori launchpad. You need to define these from a business perspective, reflecting the way that users in your organization work, as well as their most important tasks.
- Make an additional effort for authorization management in your project planning. Front-end roles, that is, the assignment of SAP Fiori catalogs to user roles, control the visibility of apps on SAP Fiori launchpad. Users see apps only if they are authorized to use them. That's a crucial difference from the menu-based approach in SAP GUI.

LEVERAGE THE NEW EFFICIENCIES OF ABAP

ABAP has seen a tremendous evolution over the past decade. The new language constructs help you achieve more with less. The core data services (CDS) are the most advanced concept for enterprise data modeling and database-centric applications to date (see Figure 4). Together with other technologies, they have enabled SAP to rearchitect one of the largest products in the history of software, and it will boost the productivity of your ABAP development team too.

Make sure your team has grasped the new paradigm for database-centric enterprise applications: code-to-data instead of data-to-code. Applying code pushdowns to the most resource-consuming reports can result not only in a performance boost but also in a remarkable reduction of resource consumption. Ask your development team about the new development technologies from SAP. Setting up an ABAP technology boot camp can be a worthwhile first step on the way to the latest technologies.

Figure 4: The Evolution of the ABAP® Programming Language and Core Data Services

1995

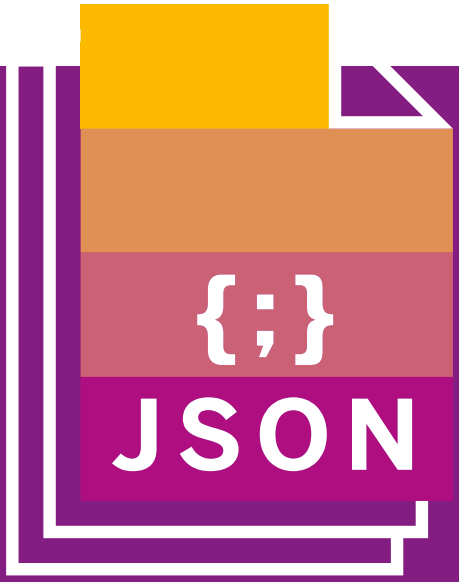
```
SELECT * FROM Employee INTO TABLE it_empl WHERE orgunit = 4711.
LOOP AT it_empl.
    WRITE it_empl-id.
    WRITE it_empl-name.
    SELECT * FROM Addresse INTO TABLE it_addrs WHERE id = employees-id.
    LOOP AT it_addrs.
         IF it_addrs-type = 'HOMEADDR'.
            WRITE it_addrs-zipcode.
         ENDIF.
    ENDLOOP.
ENDLOOP.
```

2018

```
SELECT id, name, homeAddress.zipCode FROM Employee
INTO TABLE @DATA(result) WHERE orgunit=4711.
```

HIGHLIGHTS OF THE ABAP PROGRAMMING LANGUAGE

- Simplified and enriched ABAP syntax with in-line declarations, advanced table operations, and JSON support
- Broader coverage of the SQL standard, code push-down support, and flexible consumption of core data services (CDS) modeling entities and roles
- SAP HANA–centric development with CDS views and code breakouts with ABAP-managed database procedures
- ABAP channels and ABAP daemons for real-time events, support for industrial Internet of Things (IoT) scenarios, and machine-to-machine (M2M) communication



APPLY THE POWER OF SAP BUSINESS TECHNOLOGY PLATFORM

SAP Business Technology Platform is SAP's strategic development and integration platform. It is also the only platform where your team can leverage the existing ABAP skills along with Java, node.js, and other technologies.

SAP BTP brings a wide set of services designed for enterprise applications. These are offered in a number of data centers from several infrastructure providers around the world. You can choose the locations for your accounts according to the compliance policy in your company. Moreover, you can choose between a subscription-based license model with a predefined set of services and a consumption-based license model for flexible consumption of any service on a pay-as-you-go basis.

You can use SAP BTP for your SAP S/4HANA project in the following three ways.

Integrate

To enable SAP S/4HANA integration:

- Use SAP Integration Suite as the integration layer for on-premise-to-cloud and cloud-to-cloud integration.
- Use standard prepackaged integration content for SAP and third-party system integration. SAP Integration Suite provides more than 1,100 integration scenarios including government, business-to-business (B2B), and third-party software integration.
- Use the Open Connectors capability for tight integration into more than 160 third-party cloud applications.

Extend

To create extensions:

- Use SAP BTP to keep your core clean and to reinforce the associated policies. Use released APIs and avoid native access to non-public APIs. This will pay off in future upgrades.
- Check the SAP Store site for SAP solutions and Certified Solutions Directory for available partner solutions.
- Use SAP BTP, ABAP environment to leverage the ABAP skills of your development team.
- Rely on the wider developer community to build Java or node.js applications and extensions. Make sure you use the SAP S/4HANA Cloud software development kit (SDK) and SAP API Management technology.
- Use SAP BTP as a central platform for extending all SAP products (whether SAP S/4HANA, SAP SuccessFactors solutions, or any other).

Innovate

To support innovation:

- Use SAP BTP to quickly create minimum viable products and proof-of-concept apps for your business. Connecting these "playground" accounts to the systems with test data will help convince the business more than anything else.
- Combine the platform's mobile services and intelligent technologies with third-party data and services from our partner ecosystem to quickly create new apps.

Make the Right Connections

Whichever use case you decide to start with, connect your SAP BTP account to your SAP S/4HANA landscape (on premise or cloud) and your identity provider. This is essential for side-by-side extensibility and will make your innovative apps truly productive from day one.

To explore what other customers have done with SAP BTP, visit the SAP Discovery Center site to get inspiration for your own new apps.

MANAGE YOUR RICEFWS

As you might be familiar with from the 1990s, the acronym RICEFW stands for "reports, interfaces, conversions, extensions, forms, and workflows." Regardless of the transition scenario, these need to be managed meticulously, just as it has been for migrations to SAP R/3 software or SAP ERP.

Develop an early understanding of the full scope of RICEFW objects in your current system. Catalog them and track which ones require adjustment or replacement, which ones are outdated and can be deleted, and which ones are new. Make sure not to underestimate the importance of this task while dealing with simplification items and conversion activities. Neglecting it will most certainly result in a failure of the first integration test and frustration of the users.

When categorizing RICEFWs, consider the new technological options in the following **table** and leverage these for either new developments or the ones that require considerable rework.

Traditional RICEFW* Versus New Technologies

Traditional RICEFWs	New Technology
Reports (Analytics)	• Real-time analytics and KPI tiles with SAP® Smart Business cockpits, and drill-down analysis with the Analysis Path Framework service in SAP S/4HANA® embedded analytics • Custom analytical application with multidimensional reporting in SAP S/4HANA • Other SAP Fiori® apps, such as Overview Pages and Analytical List Pages • SAP Analytics Cloud solution
Reports (Automation)	• SAP Intelligent Robotic Process Automation services
Reports (Applications)	• Custom applications on SAP Business Technology Platform (SAP BTP) with SAP Web IDE and SAP Extension Suite, decoupled from the core through open APIs and event brokering using the SAP Event Mesh capability (formerly the SAP Enterprise Messaging service) • Custom SAP Fiori apps deployed either on SAP BTP or SAP S/4HANA (any deployment)
Interfaces	• Extension of standard OData services or creation of new ones based on custom core data services (CDS) views with SAP S/4HANA in-app extensibility • SAP Integration Suite • SAP Application Interface Framework tool (part of SAP S/4HANA) • Event brokering using SAP Event Mesh
Conversions	• SAP S/4HANA migration cockpit for data load
Enhancements	• Custom business logic with SAP S/4HANA in-app extensibility • SAP Extension Suite, SAP Event Mesh
Workflows	• SAP S/4HANA flexible workflow • SAP Workflow Management service
Forms	• SAP S/4HANA output management: custom forms with Adobe LiveCycle Designer with OData as data source
Custom Tables	• Custom business objects with generated UI with SAP S/4HANA in-app extensibility
Modifications	• You shouldn't have to make any. In-app extensibility in SAP S/4HANA covers a wide range of business requirements for UI adaptation and business logic.
User Interface	• SAP Fiori and SAPUI5
Performance	• SAP HANA® code pushdown

*Reports, interfaces, conversions, extensions, forms, and workflows

EFFICIENT STRATEGIES FOR CUSTOM EXTENSIONS

Read more about the efficient strategies for your custom extensions in our free white paper, "**Custom Extensions in SAP S/4HANA Implementations – A Practical Guide for Senior IT Leadership**."

CURATE YOUR MASTER DATA

Implementing the Business Partner Data Model

A system conversion requires you to implement the business partner data model in SAP ERP. However, the well-known "Customer" and "Vendor" master data objects are still available in SAP S/4HANA and continue to be used in sales, logistics, and financial transactions.

SAP S/4HANA puts very high-quality standards on master data and coerces these through an extended set of check rules. You need to correct technical inconsistencies found by these checks prior to the transition to SAP S/4HANA, regardless of the transition scenario. It's important that you curate your master data before, and not during, the project.

For systems with high amounts of master data and quality issues accumulated over decades, this may take a considerable effort. Make sure to assign a team lead and charge them with the preparation and execution of these tasks:

- Archive unnecessary master data records, such as those pertaining to inactive customers and vendors
- Identify and eliminate duplicates
- Standardize the master data
- Extend the master data records with fields that are relevant for SAP S/4HANA
- Learn from business users how they employ customer and vendor account groups and use this information to guide the design of the business partner data model
- Discuss the new number ranges with business users to allow enough time to agree on a new concept
- Document the business partner concept, including the current usage of account groups mapped to business partner groupings and business partner roles
- Consult the **FAQ** and the **Cookbook** on customer vendor integration (CVI). The cookbook offers a step-by-step guide, including options for implementation activities.
- Employ CVI_COCKPIT to guide you through the implementation process. Read this **blog** on how it helps you.
- Use customer vendor Integration analysis offered as part of the SAP Readiness Check tool (see **Figure 5**)

Cleaning Address Data

Errors in customer and vendor address data are a common issue. Integration between the master data consistency check report and SAP Data Quality Management, microservices for location data can help by automatically finding a correct postal address and proposing the correction (see **Figure 6**). See **this comprehensive blog** for more information.

Figure 5: Customer Vendor Integration Analysis in SAP® Readiness Check Tool

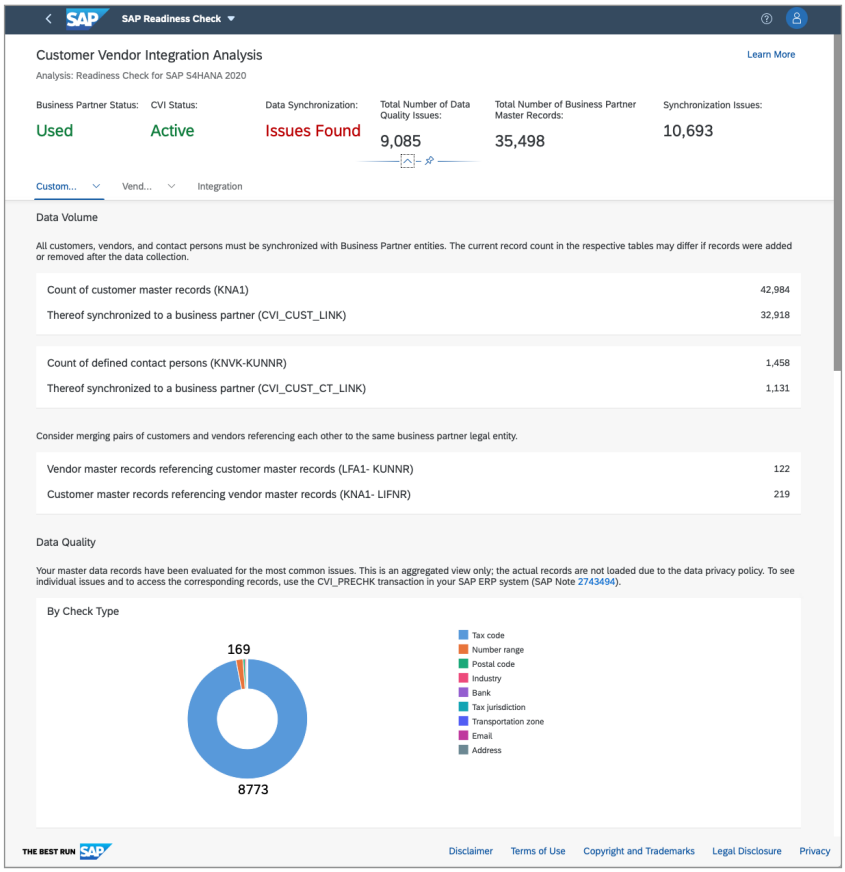
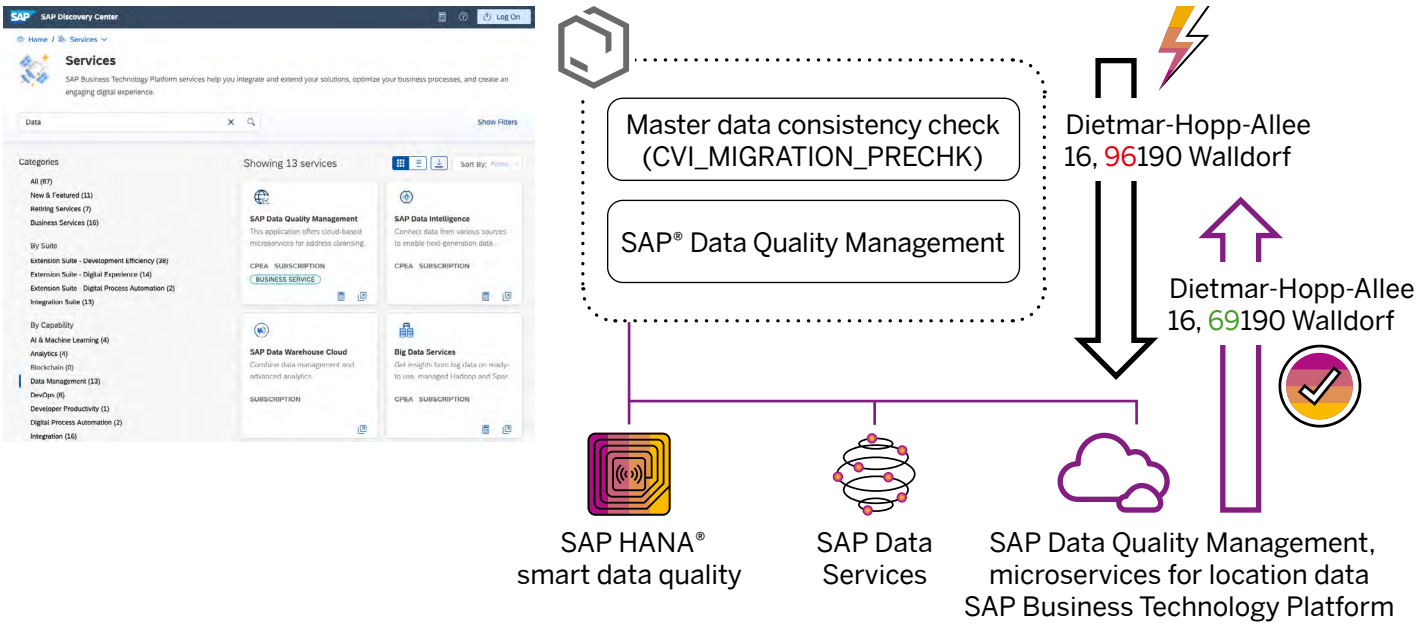


Figure 6: Cleanse Your Address Data with Microservices for Location Data



Sustaining the Quality of Your Master Data

Last but not least, consider implementing the SAP Master Data Governance application, as it helps you to not only curate the master data but to also keep it in good shape.

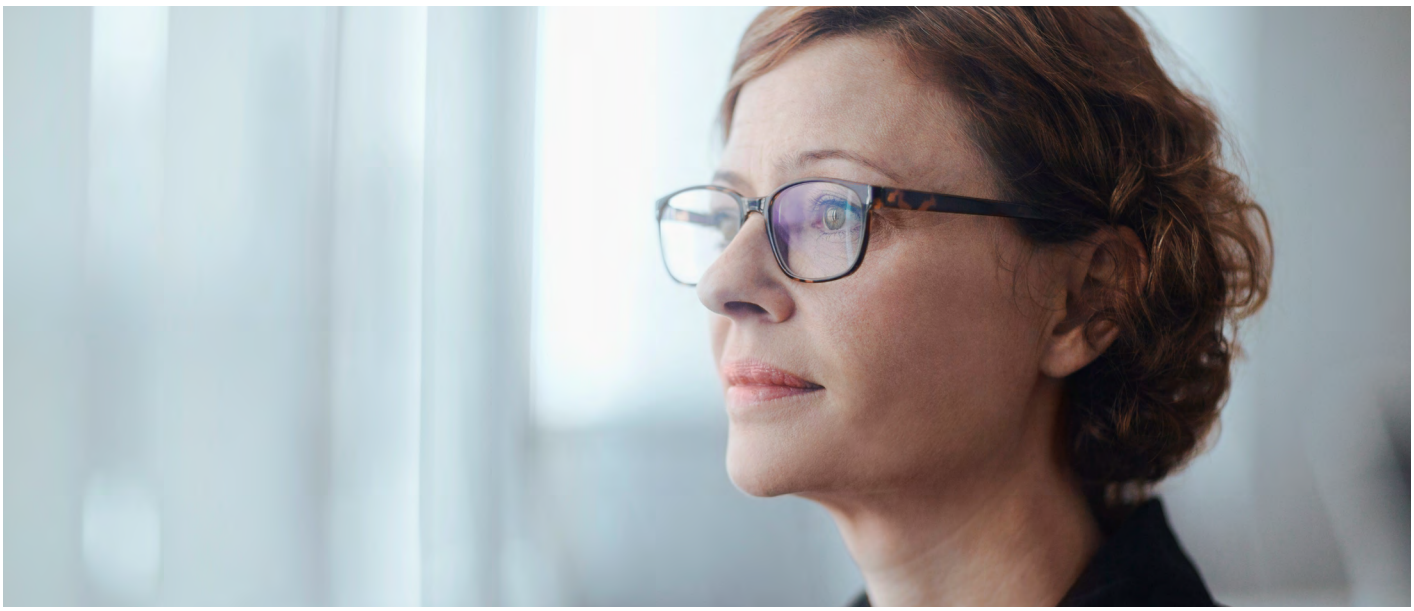
Corrupt or incomplete master data causes disruptions to the business processes and errors in the analytical applications. SAP Master Data Governance supports you with these four functions:

- Central governance: The solution takes control over master data creation and updates it as it employs a set of staging tables and workflows to enforce relevant quality checks.
- Mass processing: This offers a guided process for applying mass changes with data selection, quality checks, and change activation.
- Consolidation: When the master data is created at several sources without a common set of quality checks, the solution helps you standardize the records and consolidate them to a logical best record.
- Data quality management[4] (embedded): You can use a set of ready-made analytical reports to assess the quality of your master data. Correction of the discovered quality issues can be triggered through a master data governance workflow.

SAP Master Data Governance is optimized for SAP S/4HANA and is part of its software stack; however, an additional license is required for use.

SAP Master Data Governance allows implementation of the above concepts for different master data types in phases, for instance, starting with the business partner and proceeding with materials and equipment. Likewise, you can work out a phased plan for connecting other SAP and third-party systems to SAP Master Data Governance.

Learn more about the centralized and distributed deployment variants in the "Deployment Recommendations for SAP Master Data Governance" document.



4. Do not confuse with the SAP Data Quality Management add-on for SAP ERP.

PERTINENT HARDWARE PLANNING

Pertinent hardware planning must factor in these aspects:

- Regular annual data-volume growth
- Business growth
- New system functionality
- Data volume reduction

Regular Annual Data-Volume Growth

Think ahead and plan your hardware for the next three to four years. Use the current system statistics to estimate the regular annual data-volume growth.

Business Growth

Understand the plans of your business for the next years and the implied requirements for the hardware. Take into account the planned mergers and acquisitions and understand the associated post-merger integration plans. Estimate how these new business entities will increase the system workload and expected volume of master or transactional data.

New System Functionality

Review other projects in your portfolio that plan to introduce a new functionality and estimate the associated system workload and data footprint. Consult your solution architects who assess the simplification items to understand the impact on your solution landscape. Pay close attention to the functionality that will be reintegrated from other solutions, such as the SAP Advanced Planning and Optimization component or stand-alone warehouse management systems, into SAP S/4HANA.

Estimate the workload and data footprint of the planned major custom developments. Pay special attention to CDS views.

Data Volume Reduction

The following two tasks can help you to reduce the data footprint and, hence, the memory size of the SAP HANA database server:

- Follow the good old advice from SAP: archive your old data and do housekeeping. According to practitioners, you can reduce the data volume in an ERP more than significantly. Start with the SAP_BASIS tables as they are often among the largest tables in a system. Make sure these tables are archived or reorganized regularly.
- Delete obsolete tables after the conversion. Use the obsolete data handling tool in SAP S/4HANA for this.
- SAP provides the Quick Sizer tool to help you with planning hardware requirements. In new implementations, use the tool for all application components to establish a baseline for your sizing and adjust it with the above considerations.

Here is some practical advice:

- As was the case with SAP ERP, sizing has to be done for both the database server and the application servers.
- There is no fixed CPU-to-RAM ratio for SAP HANA systems; you must size both parameters individually.
- Use the SAP Readiness Check tool for SAP S/4HANA to get a sizing report for the database server. Enrich the results with the above considerations.
- Use Quick Sizer to estimate the additional analytical load from SAP Fiori apps.
- Use Quick Sizer for new embedded functionality in SAP S/4HANA, such as SAP Transportation Management or SAP Business Planning and Consolidation.
- Repeat hardware sizing several times during the project.

PERFORMANCE TESTING

System performance is one of the project's go/no-go criteria and, thus, must be managed rigorously. As a matter of fact, a volume test remains the one and only way to ascertain that the solution is ready for productive load. However, performance and volume tests only deliver a reliable result when constructed and executed diligently – that is, with an appropriate scope and correct measurements, on a hardware identical to that of the production system, and with production-like data in terms of volume and quality to recreate a production-like system load.

Here are the most essential lessons learned from the volume and performance tests conducted for some of the largest SAP systems:

- Involve business users well in advance to agree on the objectives, scope, and sign-off criteria of the performance test.
- Experience shows that the root causes for 60% of performance issues reside in custom code, especially in complex CDS views.
- Activate SQL Monitor in the system from the moment it is handed over to the project. Having its data readily available will help your team to resolve the reported issues in a timely manner.
- Regardless of the deployment option, perform a single-execution performance test for most business-critical transactions and activated SAP Fiori apps. Work with key users to identify the most business-critical transactions to include in the scope of the performance test.
- Plan for sufficient time in the course of the project for both the test and the optimization. Don't assume the results of the first performance test will fully meet your expectations.
- SAP Fiori performance is a result of an interplay of multiple technology components: the app itself, network infrastructure, front-end OS, and Web browser. It is worth testing the performance of SAP Fiori apps from different physical locations.
- Constructing a day-in-the-life test, that is, a test to recreate a typical system load, is extremely difficult and may not be achievable with the given resource constraints. However, in practice, you can compose a good load mix through a combination of:
  1. Main load drivers – that is, programs or transactions consuming the largest share of both CPU and database time. You can easily identify these through the system's statistics.
  2. Most time-critical business process steps – that is, the transactions and reports with variants that should be completed within a given time frame on a given data volume
  3. Other applications that business teams deem performance-critical

Treat the volume and performance test as a full-fledged project and consider involving an experienced partner. Think of it as a litmus test of your project. Most of the time, you can predict the project outcome by just examining the performance test setup.

SYSTEM CONVERSION PROJECTS

This section covers the key elements of a successful system conversion, including how to handle your financial data, conversion test cycles, add-ons, simplification items, and custom code.

Take Care of Your Financial Data

There are two facts that many conversion projects are late to realize. First, financial line items increase runtime during the conversion. With more than 1 billion financial line items in the BSEG table (which stores accounting document information in SAP ERP), the project needs to employ either the downtime-optimized conversion option or the minimized downtime service from SAP to complete the conversion within an acceptable system outage window.

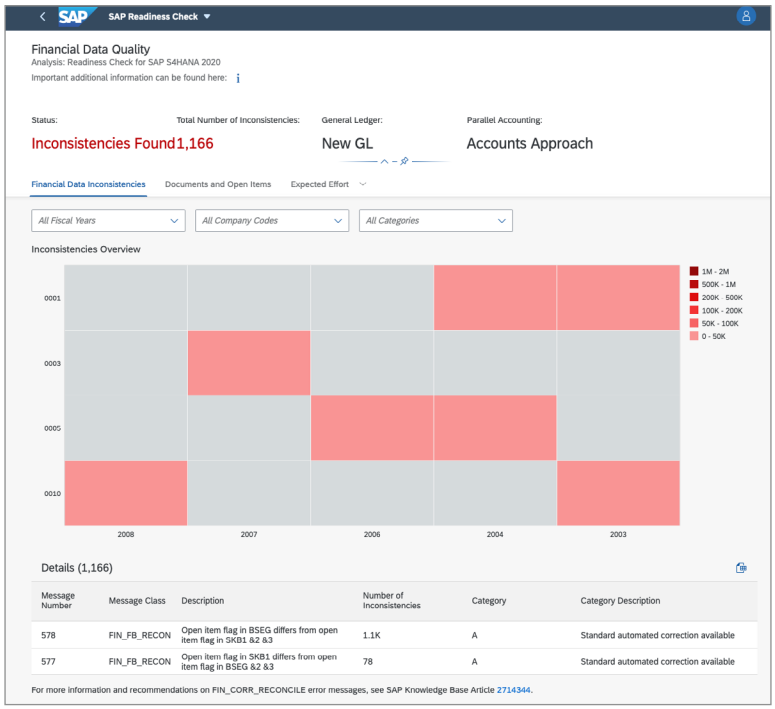
Secondly, among hundreds of millions of records in the old finance (FI) data model that your system would have accumulated over decades, there may be some that are technically inconsistent. A frequent example is missing open items for an open-item managed account. You need to work out a plan together with your accountants for how to resolve these.

For any system with a significant FI data footprint, SAP recommends running such an analysis prior to the conversion project. SAP Notes 2887318 and 2896400 give you the ability to do so. See KBA 2714344 for recommendations on how to deal with the most-common error messages.

The SAP Readiness Check tool offers a comprehensive analysis of your finance data based on the same data analysis reports (see Figure 7).

Consequently, archiving financial data will have two positive effects. On the one hand, it will shorten the downtime and possibly make the desired system outage window achievable with the standard conversion option. On the other hand, your team will likely have fewer technical inconsistencies to fix in the past fiscal years' data.

Figure 7: Analysis of Financial Data Quality in SAP® Readiness Check



The plans of your finance team to leverage the new G/L, parallel accounting, and document split capabilities may also have a major influence on your project. (See the following table for a summary of available transition options.) Note that you can currently only switch from the accounts approach to the ledger approach for parallel accounting by implementing the new G/L functionality prior to conversion.

Providing a transition path from the accounts approach to the ledger approach after a conversion is on SAP's road map.

Make sure the options and future implications are clear to both the business decision-makers and the solution architects to make a conscious decision. Other new functionality, such as asset accounting and new cash management, are also important; but unlike the aspects described above, they won't affect the general structure of the project.

Available Transition Options in Finance with SAP S/4HANA® (2020)

In Use Today

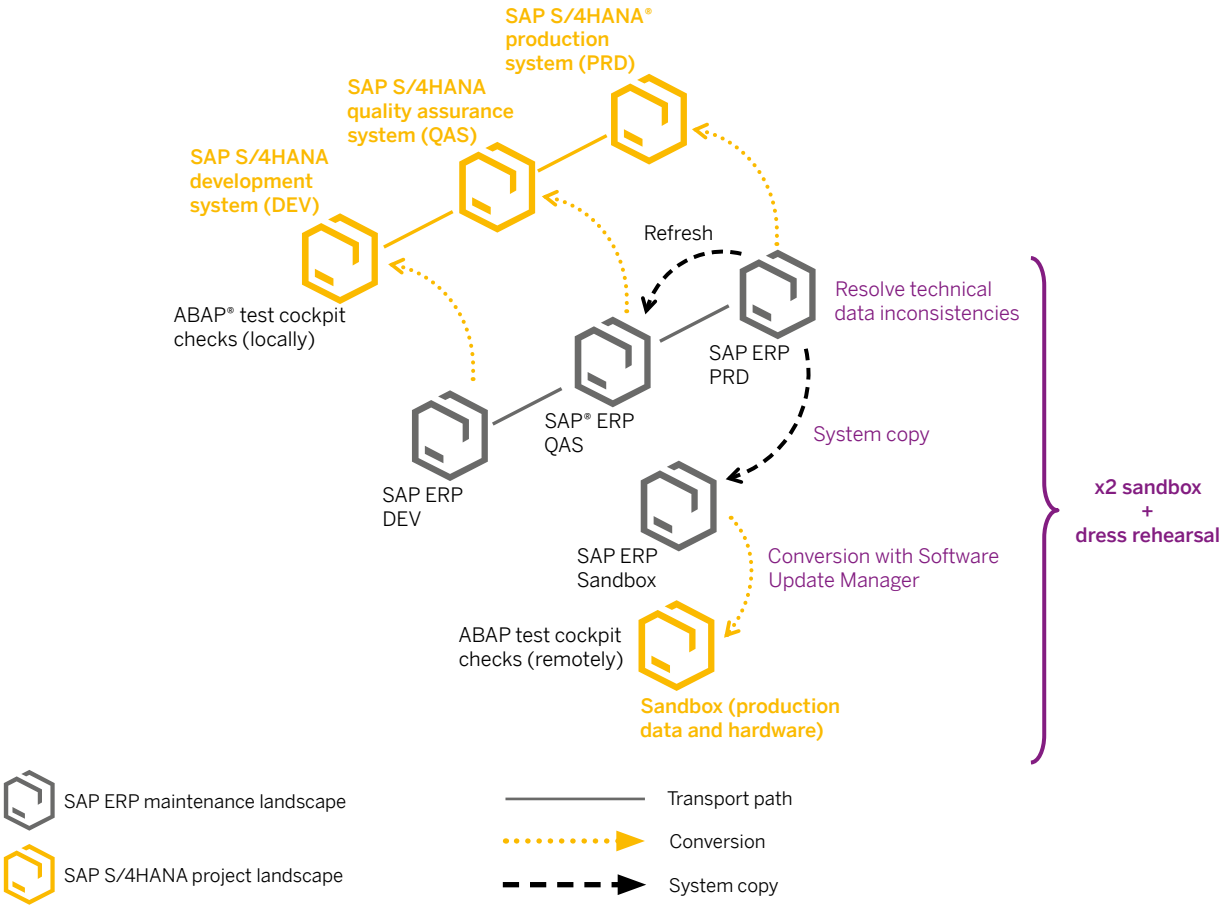
General Ledger (G/L)	Parallel Accounting Ledger Approach Vs. Accounts Approach	Document Split	Transition Options
New G/L	Ledger approach	Yes	System conversion
New G/L	Ledger approach	No	1. System conversion 2. Subsequent implementation of document split
Classic G/L	Accounts approach	No	1. System conversion 2. Subsequent implementation of document split **Currently not possible:** Change from accounts approach to ledger approach **Options today:** a) Implement the new G/L functionality before conversion. b) Perform system conversion and keep the accounts approach. Please be aware that any new features and functions in parallel accounting will be based on parallel ledgers, not the accounts approach. Providing a transition path from the accounts approach to the ledger approach after a conversion is on SAP's road map.
Classic G/L	No parallel accounting	No	1. System conversion 2. Subsequent implementation of document split 3. Subsequent introduction of a new G/L

Conversion Test Cycles

Conversion test cycles are the backbone of a conversion project (see Figure 8). Follow the guidelines below to establish a sustainable project plan:

- Test your first conversion with a copy of the production ERP with the standard Software Update Manager conversion procedure and understand the individual phases, steps, and associated runtimes. Be prepared to see a long runtime of the first-pass conversion on a larger system.
- Using a copy of the current production system as a source system in the first conversion cycle is nonnegotiable. Using a production-like hardware for the target SAP S/4HANA system in this cycle is highly recommended, especially to obtain the realistic execution times and make a reliable estimate of the expected business downtime. Conducting the first conversion cycle on a development system certainly helps your team to comprehend the technical procedure but won't take them any further. Thus, let your team find potential problems early and track the resolution.
- Carefully execute all functional preparation steps already in the first sandbox cycle. Do not skip or short-cut activities impacting subsequent steps in the conversion procedure to get a full picture of the required tasks.
- Have a detailed project plan for each conversion cycle. Improve and refine it with each iteration.
- Create a conversion runbook. Use it to log all required functional and technical activities in a conversion cycle and the associated completion times.
- After the first conversion cycle, use the Technical Downtime Optimization tool to explore the runtimes and how to optimize them. Negotiate with business users to determine what system outage window is acceptable and decide on the technology option: standard conversion or downtime-optimized conversion.
- Having chosen the option, plan for at least two additional conversion test cycles with production data and production hardware. One of these cycles should also include tests on the connected satellite systems to validate the integration.
- Once the new development (DEV) system has been built, keep the change requests for the current solution to a minimum ("system freeze"). You need to reimplement the changes manually in the new DEV system. There is no automated retrofit.
- Create the first version of the cutover plan (that is, an end-to-end sequencing of activities for the cutover weekend) for the quality assurance system (QAS) conversion cycle and refine it. It must become perfect by the time of production conversion.

Figure 8: Conversion Cycles in a Three-System Landscape



Baseline Plan for System Conversion in a Typical Three-System Landscape

	Standard	Downtime Optimized
1st Sandbox	• Create or refresh the source sandbox system with a copy from the production system. • Execute Software Update Manager in "prerequisite check extended" mode to make sure all prerequisites are met. • Perform standard conversion of the sandbox including finance conversion. • Analyze and evaluate possible technical data inconsistencies in finance. Resolve as many technical data inconsistencies in finance as possible and complete the conversion. • Resolve all critical technical data inconsistencies in finance in the production system. • Connect the new sandbox to the development system. Use the new SAP Fiori® app "Custom Code Migration" to perform the scoping and prepare the deletion of unused custom code. Perform custom code analysis with the ABAP® test cockpit remotely on the development system to understand the impact and plan the necessary custom code adaptation. • Use the Technical Downtime Optimization tool to explore the runtimes and how to optimize them.	
2nd Sandbox	**Optional for small systems** • Refresh the source sandbox with a copy from production • Repeat standard conversion, apply lessons learned for runtime optimization	• Refresh the source sandbox with a copy from production • Perform downtime-optimized conversion, reusing finance customizing from the 1st cycle
Development System (DEV)	• Perform standard conversion, use the prepared transport to delete unused code • Use the local instance of ABAP test cockpit to check the custom code and apply the ABAP quick fixes	
Quality Assurance System (QAS)	• Refresh QAS – unless it already contains a recent copy of production or there are data restrictions (for example, QAS requires a very specific set of test data) • Perform a standard conversion of the QAS	
Optimization (Sandbox)	**Optional for small systems** • Production hardware for the SAP HANA® database • Conversion runtime optimization – if required	• Production hardware for SAP HANA database • Conversion runtime optimization and fine-tuning
Trigger Test, Load Verification, and Finance Online Conversion **Production System (PRD)**	N/A	• Execute downtime-optimized conversion on production system until the downtime phase • Test trigger creation and replay
Dress Rehearsal	• Production hardware for the SAP HANA database • Exact execution of the cutover plan on a PRD copy • Include satellite systems	• Production hardware for SAP HANA database • Exact execution of the cutover plan • Trigger and data replication test in PRD • Downtime tasks executed on PRD copy • Include satellite systems
PRD System	• Standard conversion and cutover	• Downtime-optimized conversion and cutover

Add-Ons

According to our records, three out of five SAP ERP systems have third-party add-ons.

Use SAP Readiness Check for SAP S/4HANA and the maintenance planner tool available through SAP ONE Support Launchpad at least six months prior to the project's start to draw up the list of currently installed add-ons. Ask the architecture team to prepare a simple catalog listing these add-ons, together with the answers to the following questions:

- Who is the add-on's vendor? Is it SAP or an independent third-party software vendor?
- Is the add-on's compatibility with SAP S/4HANA confirmed by the vendor (or certified by SAP), and if so, for which SAP S/4HANA releases?
- Is the add-on functionality still required?
- Is a corresponding functionality available in SAP S/4HANA?
- Is there an upgrade or uninstallation package available for this add-on?

For the add-ons provided by SAP or sold through SAP's price list, you can request the current status and the compatible versions directly from SAP. For add-ons provided by other software vendors, you should establish contact with these providers, inform them about your plans to convert to SAP S/4HANA, and ask for a compatible version. The sooner you do so, the more time the vendors have to respond accordingly.

You can check the current certification status of your add-on in the **Certified Solutions Directory** or use SAP Note **2861669** to access the list of certified add-ons for a specific SAP S/4HANA release.

Depending on the answers to the questions above, formulate a plan about how to deal with each of the installed third-party add-ons:

- Keep it in the system
- Uninstall
- Start the project with the highest release of SAP S/4HANA for which this add-on is available
- Contact **SAP's customer care program** to help you with a resolution

If the vendor's company ceased to exist or the vendor cannot technically offer a deinstallation, you can attempt deinstallation of this add-on on your own by creating a specific deinstallation configuration with the standard SAINT tool.[5]

For more information, see the **SAINT documentation**.

5. Be advised that this may not work for arbitrary add-ons and that possible side effects may not be covered by SAP.

Know Your Simplification Items

Use of the functionality offered by SAP ERP varies greatly from one system to another. However, on average, the simplification check report identifies some 50 to 80 simplification items as relevant for a given system – out of the more than 600 currently in SAP's simplification list.

Here is some practical advice on organizing the work:

- Execute SAP Readiness Check for SAP S/4HANA at least six months in advance of the planned project to give your team time to assess the changes and associated impact.
- Scrutinize the relevant simplification items and pay close attention to the topics that involve business decisions and, possibly, entail a business process redesign or require preparations and changes in the existing ERP system. An example is the succession of the foreign trade functionality available as part of standard material management in SAP ERP by the SAP Global Trade Services application.
- Incorporate the respective action items into the corresponding work packages per project phase (before, during, or after conversion) and start the execution. Don't wait until the first sandbox conversion cycle.
- Some simplification items have corresponding consistency checks. Attach high priority to the issues reported by those as "yellow" and "red." You must resolve the red ones before triggering the conversion with Software Update Manager.
- Repeat the check with /SDF/RC_START_CHECK prior to the first conversion cycle.

For practical guidance on how to work with simplification items, read this excellent **blog**.

SIMPLIFICATION ITEMS

Through its approach to building SAP S/4HANA, SAP is rearchitecting its solution for modern business processes. Rearchitecting a solution that has been growing over the past 25 years and has, at points, evolved into different data structures and architectures means that we also have to decide on one data structure and architecture as we move forward. This is the only way that we can prepare the solution for increased simplicity and faster innovation cycles.

That being said, SAP is taking on responsibility for managing the impact of these decisions.

To enable our customers to better plan and estimate their path to SAP S/4HANA, we have created a "simplification list" for SAP S/4HANA. In this list, we describe in detail, on a functional level, what happens to individual transactions and solution capabilities in SAP S/4HANA.

The simplification list is a collection of individual "simplification items" that focus on what needs to be considered throughout an implementation or system conversion project from the SAP ERP 6.x application to SAP S/4HANA.

You can access the complete catalog **here**.

Custom Code: Rethink and Clean Up, Not Just Rework

Over the past years, many long-term SAP customers have heavily extended and modified their SAP solutions. There are SAP ERP systems with a few million lines of custom code.[6]

Take the transition as an opportunity to clean up your system. Put "clean core" and "zero modifications" on the list of your project's goals and ensure that all impacted custom code objects are either adapted or deleted during system conversion (see Figure 9).

The custom code workstream should have these three major work packages:

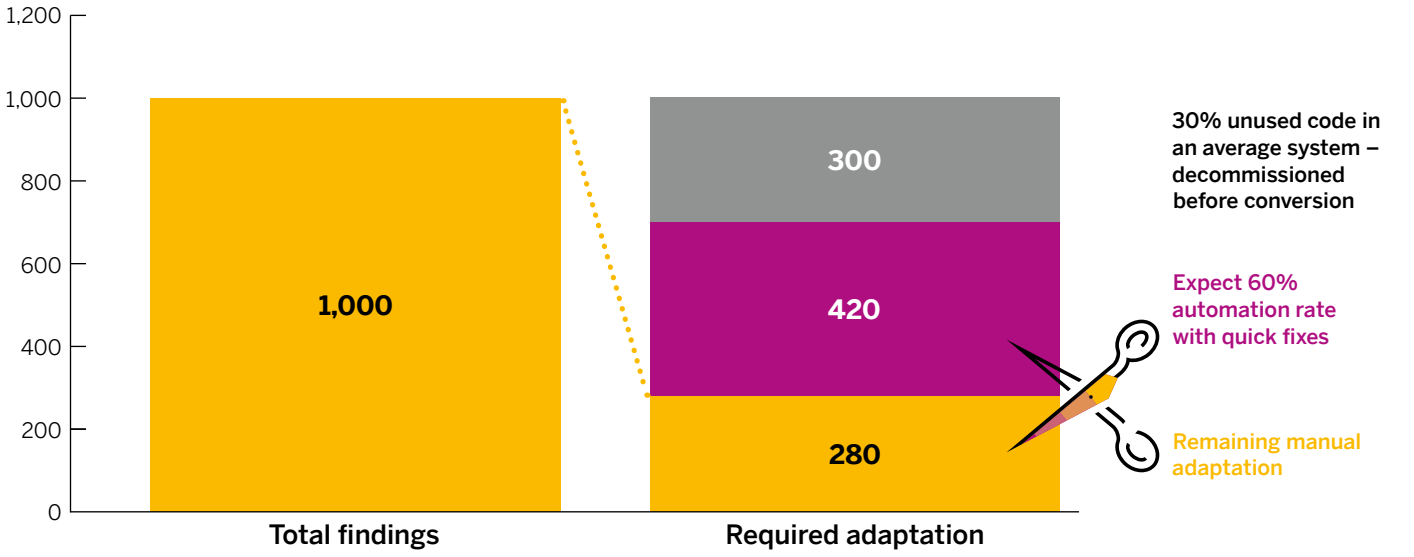
- Removal of unused code
- Automated and manual code adaptation
- Review of modifications, clones, and implicit enhancements

The performance optimization of custom code is usually part of the overall performance test; therefore, you may or may not consider it an extra work package.

Removing Unused Code

In an average SAP ERP system, 30% to 60% of custom code is never executed in the production system. Use ABAP Call Monitor statistics and the SAP Fiori app "Custom Code Migration" to remove unused code upon conversion. This step is now technically integrated into the conversion process and makes the execution very easy. Keep collecting the data with usage procedural logging (UPL) if you already have it active. Alternatively, activate the ABAP Call Monitor and enable aggregation of statistics in the production system as soon as possible to have a reliable data set by the time of system conversion.

Figure 9: Exemplary Calculations for 1,000 Findings in Custom Code



6. One of the biggest SAP ERP systems we know has more than 20 million lines of custom code. This is comparable to the size of Linux operating system.

Automated and Manual Code Adaptation

Correcting the ABAP statements in custom code to reestablish compatibility with the new data model or the APIs of SAP S/4HANA is known as custom code adaptation. ABAP test cockpit and the ABAP development tools in Eclipse are the only tools you need to identify the required corrections and adapt the code. You can expect ABAP quick fixes to automatically resolve the majority of findings. When correcting the rest manually, focus on ABAP test cockpit findings with priority one (errors) and two (warnings).

Contrary to popular belief, you need to correct findings in the unused code just as in the used code objects. Failing to do so not only poses a risk of system dumps, but also that of data inconsistencies that may go unnoticed. Thus, retaining unused code upon conversion will increase the effort for adaptation.

Your ABAP development team has to complete the code adaptation after the development system has been converted and before it is handed over to the functional team.

You can usually defer the execution of ABAP test cockpit checks until the first conversion cycle. Customers with large custom code footprints, such as 20,000 objects or more, may choose to execute ABAP test cockpit earlier to get an accurate impact assessment and make a more reliable effort estimation.

Review of Modifications, Clones, and Implicit Enhancements

Many SAP ERP systems contain a high number of obsolete modifications, that is, with the code actually identical to the standard. There is no reason to take these over to SAP S/4HANA as they can be reverted without any impact. During several reviews performed in customers' systems over 50% of all modifications in a given system were classified as obsolete. Another large group of modifications will become dispensable upon system conversion and thus can be reverted too.

Analyze all modifications and classify them into the categories listed in the following table. Don't be deterred by numbers; the actual modifications are much fewer. Include the clones (that is, the custom programs created as copies of SAP code) and implicit enhancements into your review and treat both as modifications.

Classifying Modifications

Modification Category	Action
Obsolete – object identical to the SAP version	Revert
Unused – according to code usage statistics	Revert
Dispensable – become irrelevant on SAP S/4HANA® (for example, indices) or standard objects that belong to deprecated application components	Revert
Replaceable – when you can fulfill a business requirement with standard SAP functionality, in-app extensibility (such as UI adaptation), or partner solution	Revert and redesign upon conversion
Required – modification that supports critical business process	Document business requirements and contact SAP to get advice on those modifications

NEW IMPLEMENTATION PROJECTS

This section covers our recommendations for a successful new implementation. These include the use of SAP standard content, the downside of using a lift-and-shift approach to custom code, and the use of the SAP S/4HANA migration cockpit for data migration.

Leverage SAP Standard Content

SAP standard content is an umbrella term for SAP Best Practices packages, the enterprise management layer for SAP S/4HANA, and additional LoB and industry-specific content. Through SAP standard content, we provide you with support for preconfigured and comprehensive business processes.

Please note that SAP standard content is offered for SAP S/4HANA and SAP S/4HANA Cloud, private edition. SAP S/4HANA Cloud uses a different configuration and content activation mechanism.

SAP Best Practices are cataloged in the SAP Best Practices Explorer tool and can be used by any SAP customer or partner. You can activate them using the SAP solution builder tool, which automatically deploys the required customizing and sample master data in the system. A "scope item" for SAP Best Practices corresponds to a certain business-process implementation in a specific country. You can combine multiple countries in the same client through a sequential activation of the corresponding SAP Best Practices.

In 2020, SAP introduced the enterprise management layer for SAP S/4HANA. It combines a standard set of SAP Best Practices into a global template for companies operating in multiple countries. This template consists of a fixed baseline and optional elements that you can choose, such as specific countries, settings, or functions. SAP creates it upon customer request and ships it as an SAP HANA database export from which you can build your DEV, QA, and PRD systems.

SAP Best Practices and the enterprise management layer for SAP S/4HANA both serve as a basis for additional LoB or industry-specific content developed and deployed by SAP's Customer Success organization or SAP partners. You can request such additional content from us through the SAP standard content activation service. This service is carried out by process experts from SAP who deploy the content to a newly installed SAP S/4HANA system, which is intended to serve as a reference and demo system.

Technically, this content is a set of customizing and configuration settings that enable you to execute a certain set of business scenarios for SAP S/4HANA and, possibly, other SAP solutions, such as the SAP Transportation Management application or the SAP Manufacturing Integration and Intelligence (SAP MII) application. For each scenario, there is a detailed description, process diagram, test or demo script, and configuration guide explaining how to set up the system. These are available as JSON file content on SAP Solution Manager and need to be uploaded to an instance of SAP Solution Manager.

SAP standard content is not only essential for new installations, but it is very helpful for conversions too. You can use it during the project's preparation and exploration phase to:

- Demonstrate the functionality and process in show-and-tell sessions for business users
- Have your key users study the preconfigured scenarios with the test scripts
- Build prototypes by using or extending the existing configuration
- Use as a reference when conducting fit-gap and fit-to-standard analyses
- Use as a reference system for the project's joint design authority

For more information on Enterprise Management Layer, please read this blog.

Avoid Lift-and-Shift of Custom Code

Reusing the custom code from today's SAP ERP by applying a simple lift-and-shift policy is tempting. However, before copying it to the new system, consider the following:

- With SAP S/4HANA in-app extensibility, business users can now easily perform simple reporting or minor UI adjustments without IT involvement.
- Leveraging SAP BTP for complex extensions is an investment that will pay you back in each future upgrade.
- The more code you copy, the higher your code adaptation costs.
- Complex code with quality issues will require rework and performance optimization.
- A new user experience doesn't happen by itself. However, building a new SAP Fiori UX for old custom transactions might lead to application redesign.
- Don't opt for "import-all" as that might ruin your implementation.

Data Migration

The setup of the data migration team and its ways of working are determined by many factors. These include the number and variety of data sources, the required data transformations and business rules, the amount of data construction required,[7] and the need to improve data quality, as well as the project's team size and the resulting intensity of collaboration.

For new implementations, SAP recommends using the SAP S/4HANA migration cockpit. Depending on the above factors, you may also want to employ complementary tools. (See "Part Three" for an overview of the data migration tools.)

Irrespective of the tool set, consider these practical pieces of advice:

- Define the scope for data migration as early as possible. The functional design doesn't have to be 100% complete for this. You can start evaluating what business data is required for a smooth start of business operations as soon as the first scope items have been agreed upon.
- Create a data migration concept – a document to capture the scope (what data), the rationale (why it is needed), and the associated requirements (that is, mappings, data construction, sign-offs, auditing, reconciliation, and more).
- Make sure your data migration team knows the SAP S/4HANA migration cockpit and understands its capabilities. Start with **this overview presentation** and the learning material it references.
- Depending on your data source types, the expected data volume, and the deployment option, choose one of two options offered by the migration cockpit: migrate data using staging tables or migrate data directly from another SAP system. (Read more about these options and how to choose between them in the section "SAP S/4HANA Migration Cockpit" in "Part Three.")
- Assess your system landscape requirements early to decide which system can be used to host the staging tables. For more information on staging tables, see **KBA 2733253**.
- Reassess your data migration scope against the set of migration objects provided by SAP and understand if there are any migration objects that your team needs to develop.
- Make sure the people involved in the data migration process are clear on their roles and responsibilities, as well as which tools are used in the project.
- Discuss with your team:
  - The way in which the data will be extracted from each source system
  - What data transformation and data cleansing need to be done, and how
  - Auditing, reconciliation, and sign-off requirements, and how to address them
  - Possible reuse of mappings and other assets across projects and waves
- Following this discussion, reassess the capabilities of your current extract, load, and transform (ETL) solution and SAP S/4HANA migration cockpit. If you need additional capabilities, SAP Data Services software and the SAP Advanced Data Migration application by Syniti can help.

7. For data that is required to operate SAP S/4HANA but not available in the source and, thus, has to be created manually.

PROJECT SETUP

This section identifies the critical elements for effectively governing your SAP S/4HANA project. It also describes how SAP's partner ecosystem, SAP Integrated Delivery Framework, and service offerings from SAP can facilitate project success.

Establish a Practical Governance

These three elements are crucial to an efficient and effective governance for SAP S/4HANA projects:

- Project's steering committee
- Joint design authority
- Architecture governance board

By definition, the steering committee is the project's principal authority. It should include senior leaders from business and IT, as well as senior management from your implementation partner and a representative from SAP (for instance, your designated contact in the SAP customer care program).

A joint design authority is a decision body that provides guidance on major functional design topics. Like the steering committee, the joint design authority has to include representatives from the respective business departments, IT, and implementation partner(s).

The architecture governance board is a decision-making board concerned with the key architectural topics. It should include at least the chief enterprise architect, leading IT architects, senior staff from IT operations, and representatives from your cloud or hosting provider.

Apply SAP Activate

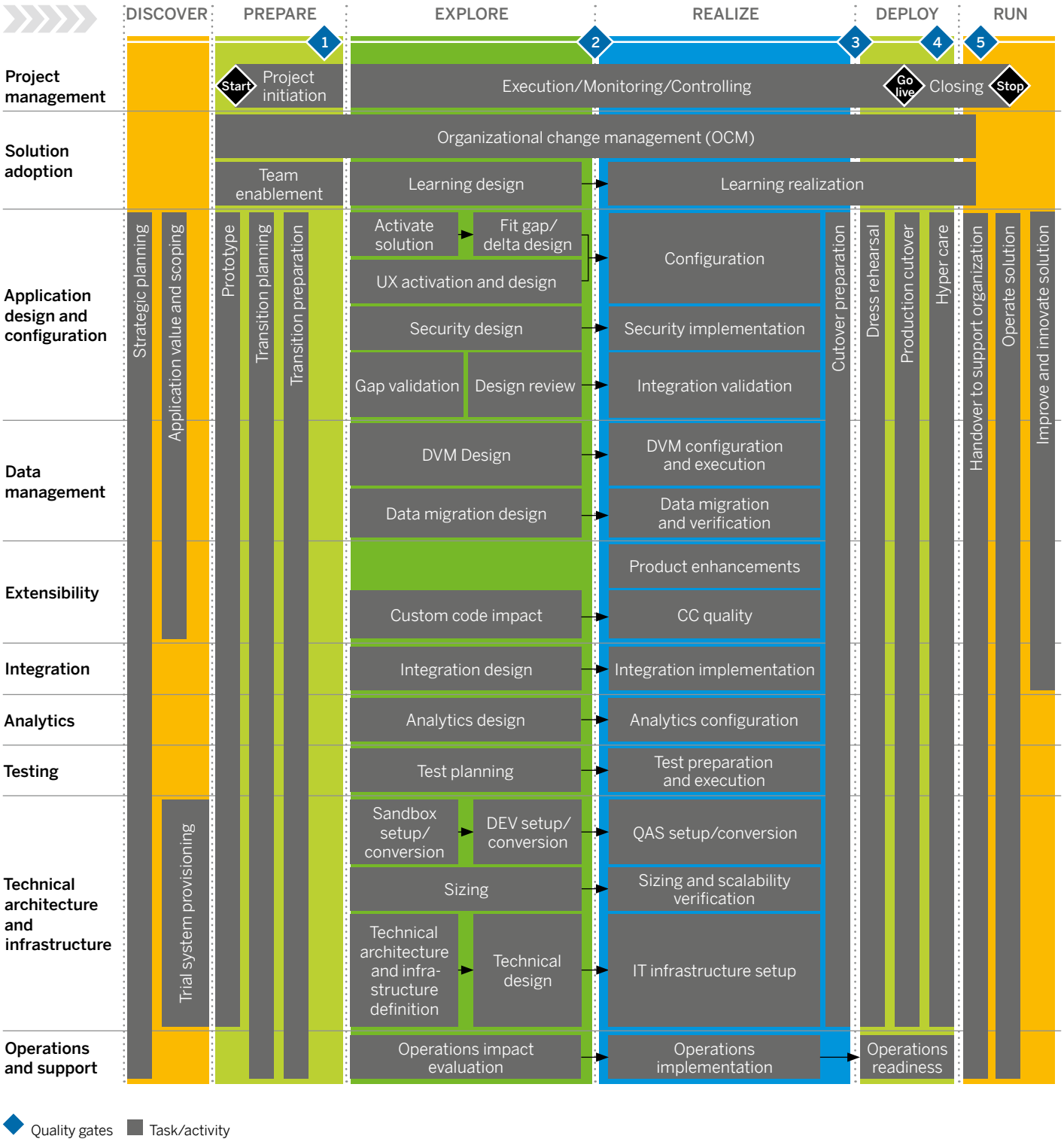
The SAP Activate methodology is a harmonized implementation approach for cloud, on-premise, and hybrid deployments. The methodology scales extremely well, becoming lightweight for smaller engagements or more robust for larger projects or programs.

The workstreams and work packages defined by SAP Activate build a solid baseline for your project plan (see Figure 10). Make sure these are reflected in your project's work break-down structure and responsibilities.

For more information, visit:

- Roadmap Viewer
- SAP Activate Web page
- SAP Activate FAQ

Figure 10: SAP S/4HANA® (On-Premise) Transition Road Map



CC = Custom Code; DEV = Development System; DVM = Data Volume Management; QAS = Quality Assurance System

Leverage the Strength of the SAP Ecosystem

SAP has a powerful partner ecosystem ready to help enterprises of any size to make the move to SAP S/4HANA.

The largest 17 SAP partners specializing in business transformation and system integration – also referred to as global strategic service partners (GSSPs) – have more than 90,000 trained SAP S/4HANA professionals globally, with more than 7,000 SAP S/4HANA consultants certified by SAP. All of them offer unique value-adding solutions, tools, and accelerators to speed up your transition from SAP ERP to SAP S/4HANA.

These 17 partners include Accenture, Atos, Capgemini, Cognizant, Deloitte, DXC Technology, EY, HCL Technologies, IBM, Infosys, LTI, NTT Data, PwC, Tata Consultancy Services (TCS), Tech Mahindra, T-Systems, and Wipro.

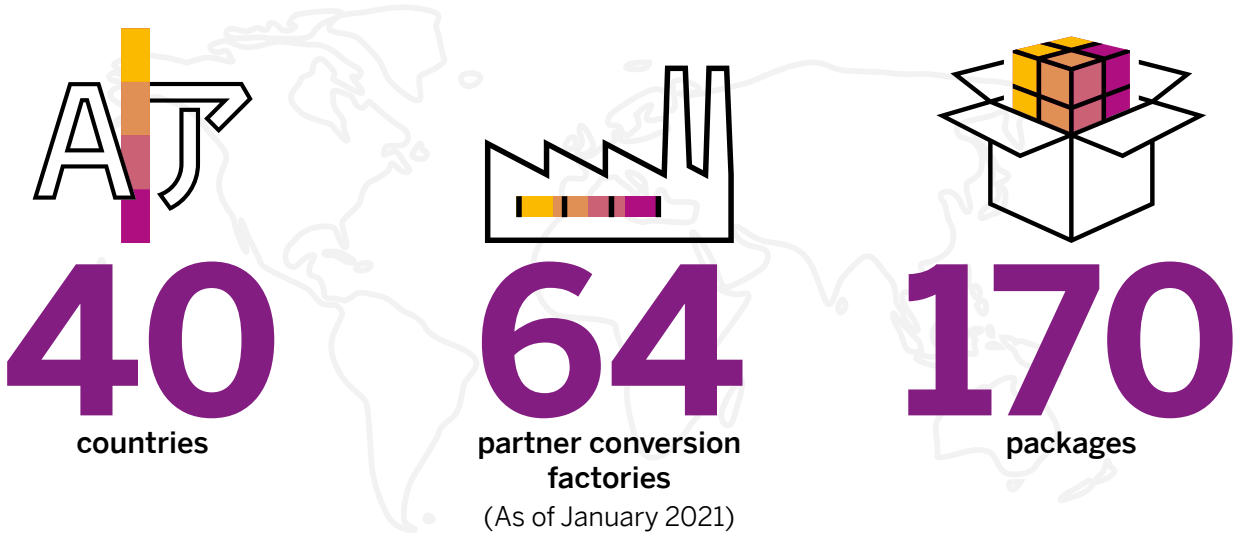
In addition, there are hundreds of regional system integration partners who offer specialized expertise and services to make the transition to SAP S/4HANA easier for our SAP ERP customers in all segments of the market. Notable regional system integration partners include Abeam Consulting, BearingPoint, Birlasoft, Bristlecone, Fujitsu, Hitachi, MHP, and NEORIS.

SAP's wider ecosystem includes more than 2,000 members of the SAP PartnerEdge® program who specialize in selling and servicing SAP S/4HANA mainly to small and midsize enterprises. These partners have also made significant investments in SAP S/4HANA practices, such as educating their consultants in the "10 Steps to SAP S/4HANA" program offered by SAP.

To satisfy the increasing demand in the market, SAP partners in all segments have established "conversion factories." The factory approach provides a fixed-scope, fixed-price offering that combines on-site and remote delivery through highly specialized consultants to facilitate the SAP S/4HANA conversion in the fastest and most cost-efficient manner.

As of January 2021, there are 64 conversion factories with 170 local offerings in 40 countries (see Figure 11). To find the conversion factories in your country, click **here**.

Figure 11: Conversion Factories for SAP S/4HANA®



Ask Your System Integrator for SAP Integrated Delivery Framework

Together with its global and regional system integration partners, SAP has established an integrated delivery framework to form the basis for successful SAP S/4HANA engagements.

With SAP Value Assurance service packages as the foundation, SAP Integrated Delivery Framework aligns the delivery roles, templates, methodologies, and services of SAP with those of global SAP partners to create a holistic delivery plan and approach. The framework clearly defines the roles and responsibilities of the customer, implementation partner, and SAP at each stage of the project in a RACI[8] matrix, thus simplifying customer engagement, removing delivery inefficiencies, and accelerating time to value.

To learn more about SAP Integrated Delivery Framework, contact your SAP representative or global system integrator account team.

Explore SAP-Qualified Partner-Packaged Solutions

Many regional SAP partners offer SAP-qualified partner-packaged solutions, which are end-to-end, fixed-price, fixed-scope offerings for either new implementations or system conversions, tailored to the needs of small and midsize enterprises. They leverage the concept of SAP Best Practices and combine it with our partners' industry expertise and regional specifics.

Each SAP-qualified partner-packaged solution includes an SAP software license, partner services, and associated documentation necessary for a successful implementation. By choosing an SAP-qualified partner-packaged solution for your SAP S/4HANA implementation, you can expect a proven solution that offers rapid implementation, low risk, and a predictable outcome.

Find out more about SAP-qualified partner-packaged solutions.

Ask for SAP Service Offerings

If you want SAP to play a more prominent role in your project, ask your account representative for SAP service offerings, including SAP Value Assurance, SAP MaxAttention™, and SAP ActiveAttention™ services.

8. Responsible, accountable, consulted, and informed

TYPICAL PROJECT DURATIONS

Both the project's effort and its duration depend on a number of factors. The most obvious hard factors are the system's functional scope, the degree of process harmonization, and customizations. In system conversions, another hard factor is the number of simplification items relevant for the given system. The most prominent soft factors are the company's culture, structure, and speed of decision-making; however, these soft factors are hard to quantify.

A practical way to estimate the project duration is to take a past project (such as the initial implementation of SAP R/3 or the upgrade to SAP ERP) as a baseline and adjust it according to the influencing factors listed in the **tables** on the next page.

In the absence of reference values from past projects, assume nine months for a new implementation of the on-premise edition of SAP S/4HANA, six months for a new implementation of SAP S/4HANA Cloud, and nine months for a single system conversion.

See the **table** on the next page for project reference durations and influencing factors.

Reference Durations for Preparation Projects

Preparation Projects	Reference Durations
Customer vendor integration	3 to 9 months
Migration to new G/L functionality	3 to 9 months
Switch from foreign trade functionality in SAP® ERP to SAP Global Trade Services	2 to 3 months
Archiving	1 month per object type archived

Influencing Factors for Conversion Projects

Influencing Factor	Adjustments
Target system size	+1 month for systems larger than 5 TB and/or using downtime-optimized conversion
Functional scope	-2 months if fewer than 3 modules[9] are used +1 month per module if more than 8 modules
Satellite systems	+1 month if more than 5 satellite systems
Custom code	+1 month per 1,000 **manual** adaptations if there are more than 3,000 **manual** adaptations in total
Functional impact	+ 1 month for every 20 simplification items if you have more than 70 relevant simplification items +1 month for asset accounting +1 month for material ledger
Data center move from on-premise to infrastructure as a service (IaaS)	+1 month

Influencing Factors for New Implementations

Influencing Factor	Adjustments
Functional scope	-2 months if fewer than 3 modules are used +1 month per module if more than 8 modules
Satellite systems (SAP and third party)	+1 month for more than 5 systems
Use of SAP standard content	-25% if using SAP standard content (conservative estimate)

9. In the new SAP business capability model, the highest entity is called "line of business." We use the term "module" here because it is still widely used in the context of SAP ERP.

Part Three

ESSENTIAL TOOLS

KEY TAKEAWAYS

This section is for technology-savvy IT leaders who want to understand the most influential technology aspects for successful project planning and execution, such as system readiness, downtime, custom code adaptation, and data loading. It delves into the following topics:

- SAP continues to invest in tools for both new implementations and system conversions to reduce complexity, increase automation, and make the tools easier to use.
- Starting with SAP S/4HANA 1809, the ABAP test cockpit offers automated custom code adaptation. With the first available set of rules, the so-called "quick fixes," you can expect an automation rate of up to 60%.
- For midsize and large systems, the common downtime window requirements are achievable using the standard tool set. For extra-large systems, SAP offers specialized services. Therefore, the downtime requirements should not influence your choice of implementation options.
- With SAP S/4HANA 1809, the SAP S/4HANA migration cockpit is far more advanced than SAP's legacy system migration workbench has ever been.
- Integration Advisor reduces integration efforts for new interfaces by 60% or more.

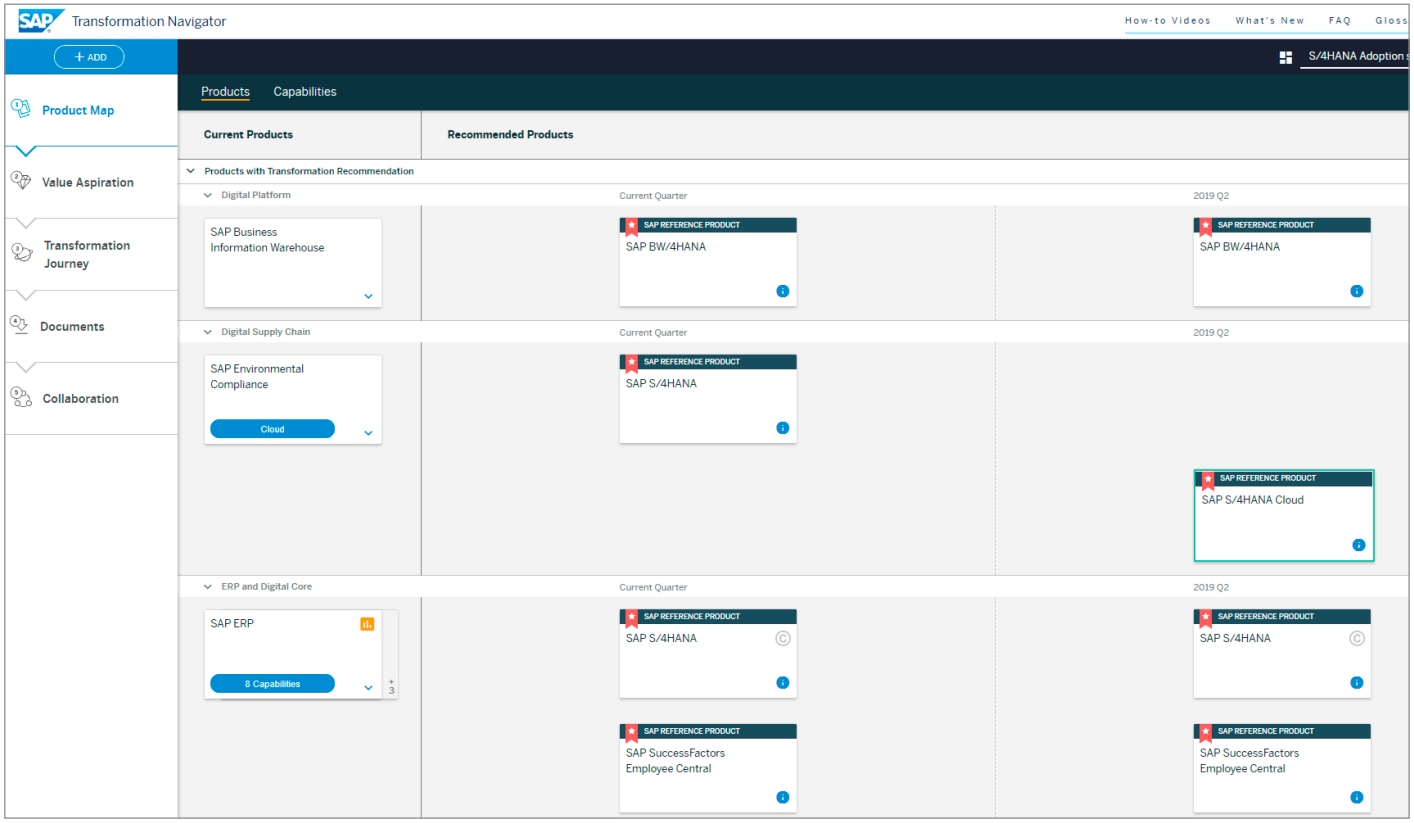
DISCLAIMER: Please be advised that this section doesn't replace the official SAP product descriptions, road maps, and documentation.

SAP TRANSFORMATION NAVIGATOR

SAP Transformation Navigator is a Web-based and free self-service road-mapping tool (see Figure 12). It uses the information about your SAP system landscape that is stored in your instance of SAP Solution Manager to create a recommendation for a new SAP S/4HANA-centric landscape with the latest SAP solutions. It also provides information about possible benefits that you can achieve with the new solution capabilities. At the end of your analysis, you can download a comprehensive report that contains recommendations for SAP products that are tailored to your system requirements.

For more information about SAP Transformation Navigator, click here.

Figure 12: Plan Your Solution Landscape with SAP® Transformation Navigator



PROCESS DISCOVERY FOR SAP S/4HANA TRANSFORMATION

Process Discovery is a free tool from SAP that helps you build your case for SAP S/4HANA. It shows where SAP S/4HANA can make a difference in your company, thus allowing for a very focused discussion between business decision-makers and IT based on hard facts and measurable business objectives.

The tool analyzes the functional system usage of your SAP ERP application. It then highlights the new or improved functionalities of SAP S/4HANA and other SAP innovations that are most relevant for the respective lines of business and can help improve the performance and efficiency of the associated business processes. At the same time, it benchmarks the organization's operational business performance with its industry peers. This comprises process performance indicators (PPIs) for relevant process improvements, such as degree of automation, process failures, and on-time execution.

Process Discovery contains two complementary elements:

- A PDF document, providing a summary targeted at business executives, called SAP Process Discovery summary (formerly SAP Business Scenario Recommendations) – see Figure 13
- A cloud-based interactive application for process analysts called the SAP Process Discovery solution (formerly known as the Spotlight by SAP solution) – see Figure 14

Follow this link to request an analysis of your system, to see a sample report, or to experience a demo version.

BUSINESS PROCESS INTELLIGENCE

In March of 2021, SAP completed the acquisition of Signavio, a leader in enterprise business process intelligence, process mining, and process management space. Signavio's products have become part of our business process intelligence portfolio.

Learn more about business process intelligence with SAP solutions **here**.

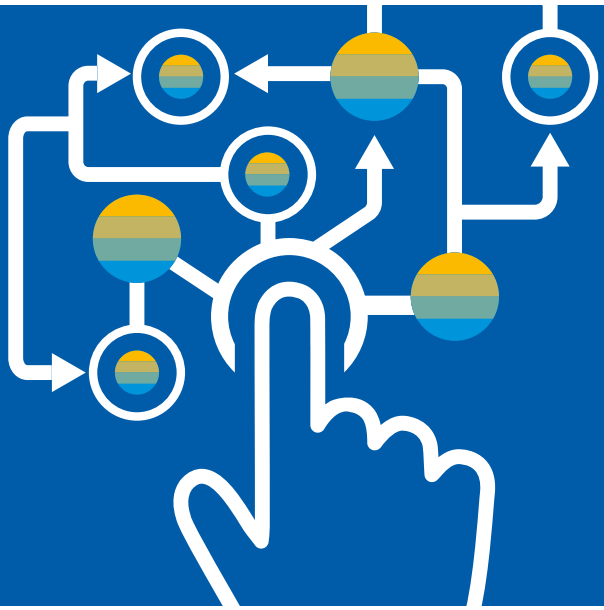


Figure 13: Process Discovery Tool Summary (formerly SAP Business Scenario Recommendations)

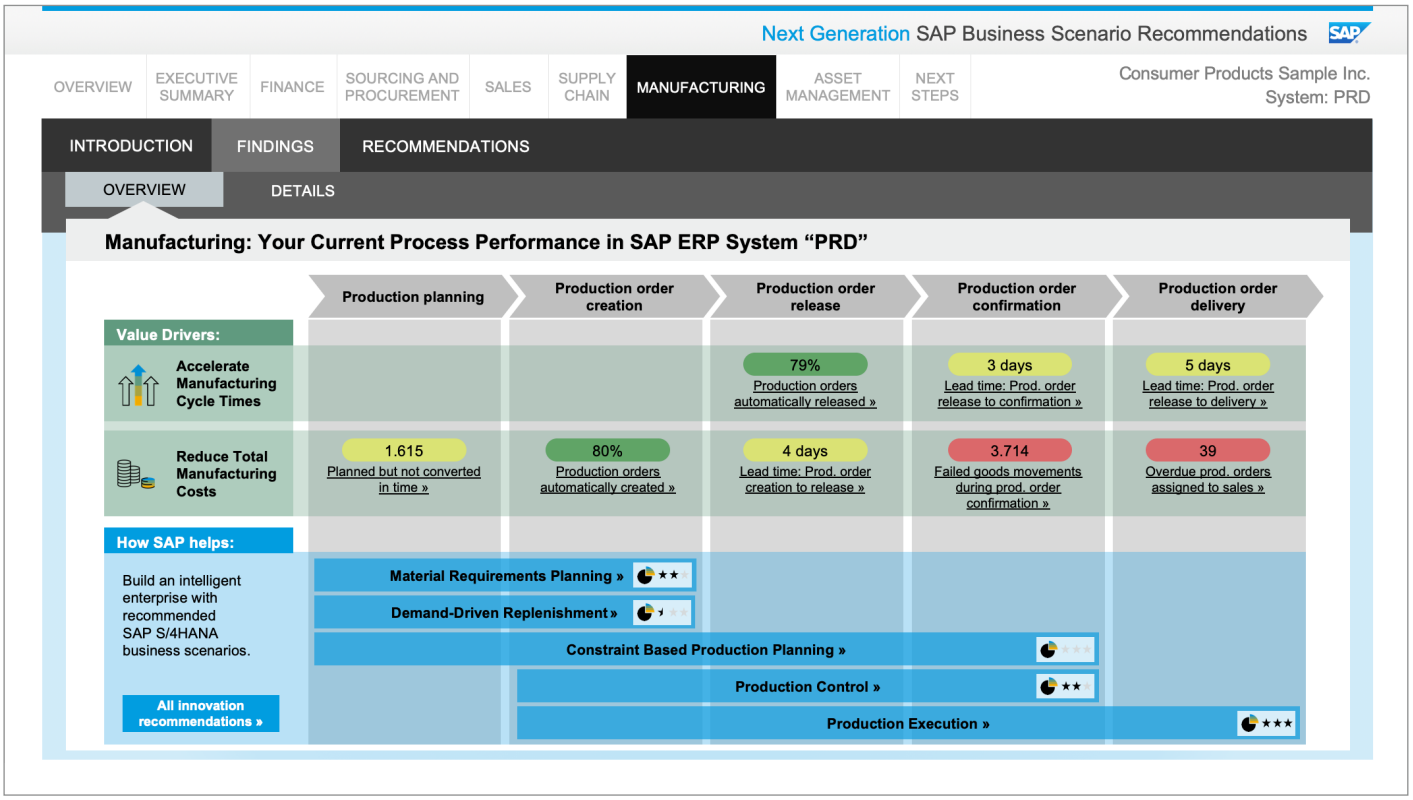
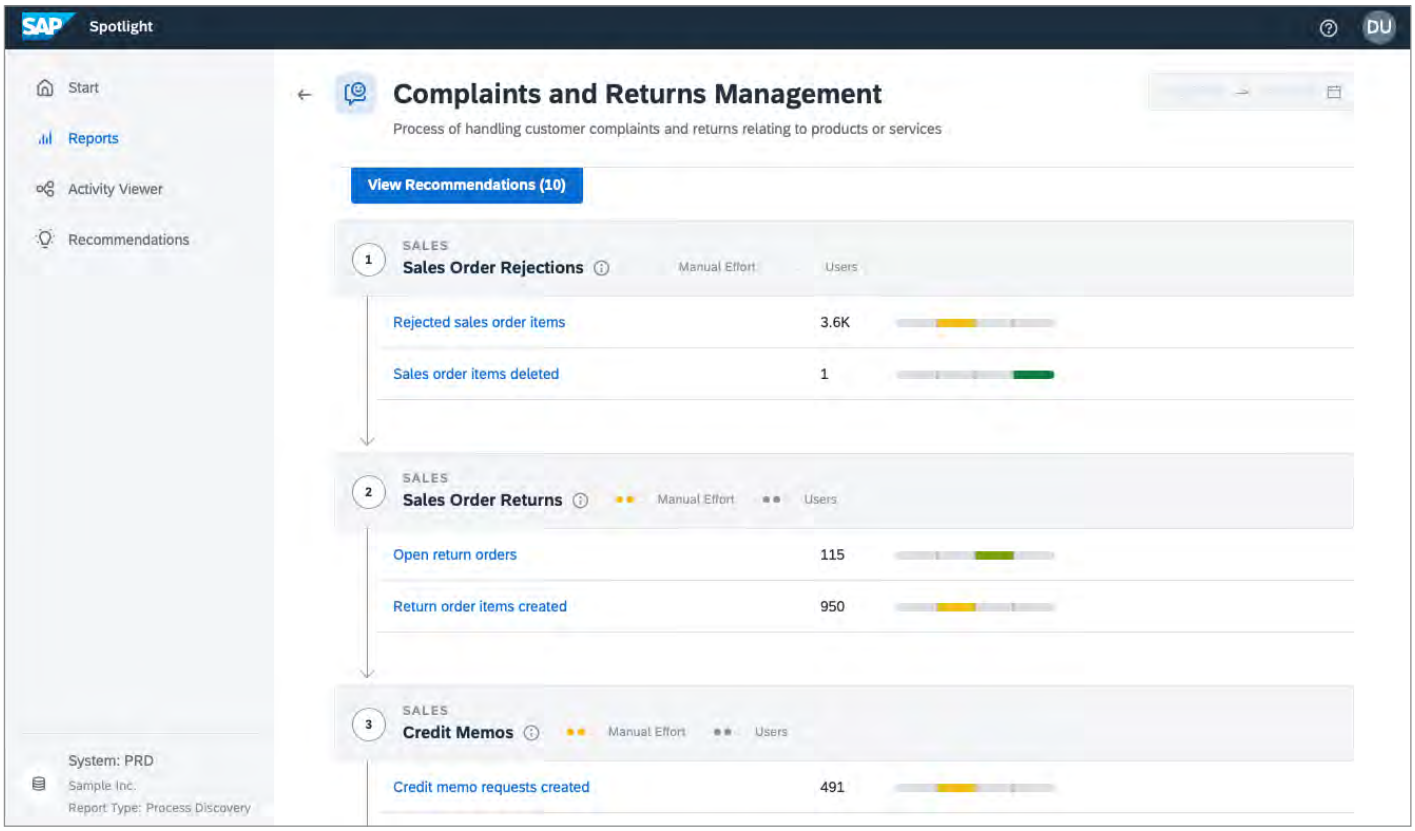


Figure 14: Process Discovery Solution (formerly known as Spotlight by SAP)



SAP READINESS CHECK FOR SAP S/4HANA

The SAP Readiness Check tool for SAP S/4HANA performs functional and technical assessments for SAP ERP systems prior to a planned conversion to SAP S/4HANA (see Figure 15).

The tool's main focus is on the functional assessment that evaluates all available SAP S/4HANA simplification items, identifies the ones that are relevant for your system, and ranks the amount of effort you might expect for implementation. This assessment provides a basis for the functional system redesign that is necessary upon conversion. It breaks down the associated work to individual activities and shows the point in time at which these should be carried out.

The SAP Fiori section of SAP Readiness Check matches your system's current transactional load to the available SAP Fiori apps and roles.

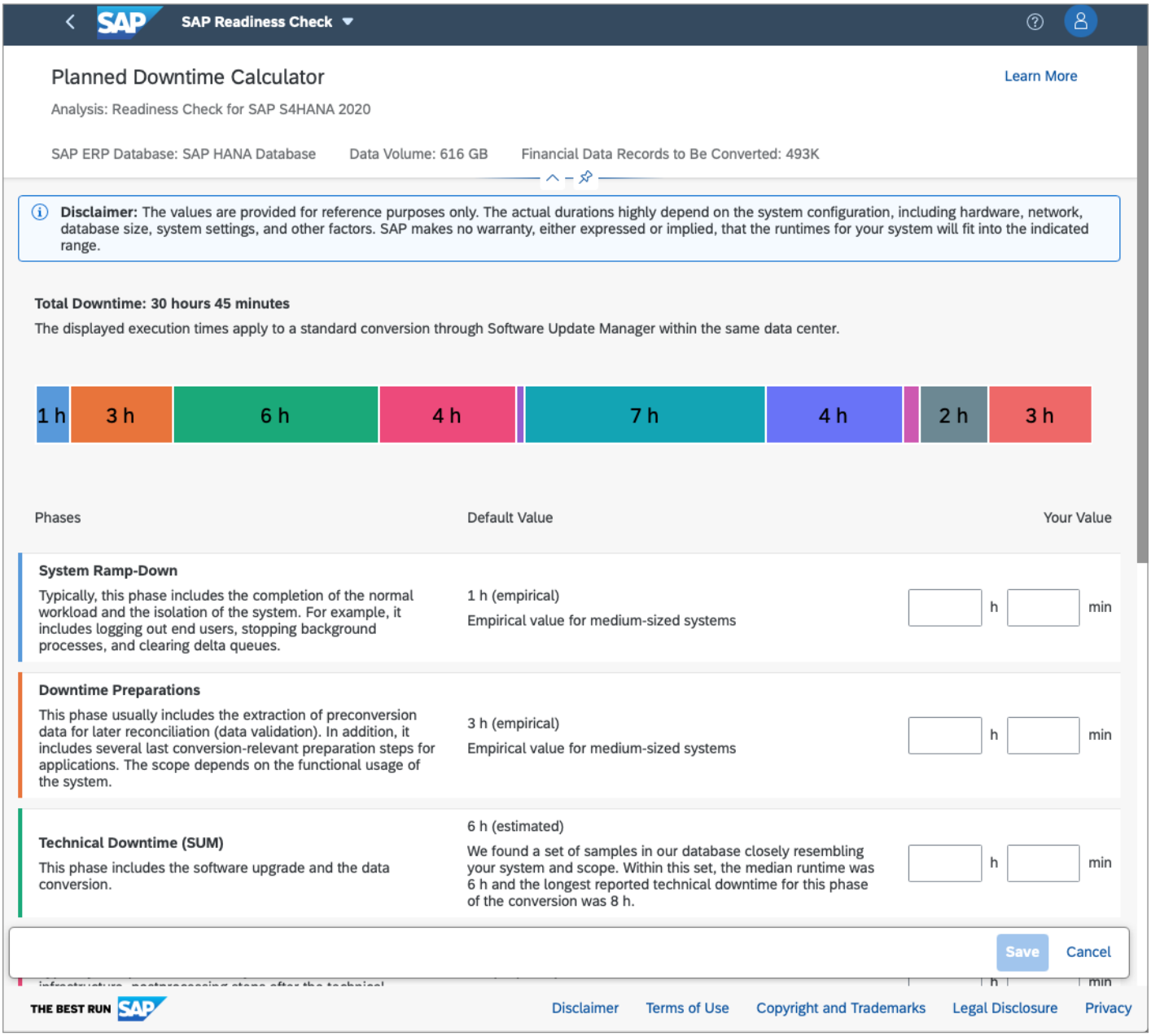
The technical assessment includes system sizing and data volume management, assertion of the software prerequisites for conversion, inspection of the extractors for the SAP Business Warehouse (SAP BW) application, blocked IDocs, and more.

The software information section covers OS and database versions of the SAP ERP system as well as compatibility of the installed industry solutions, add-ons, and activated business functions. The list of unsupported SAP industry solutions and business functions is reduced continually. There are very few left with SAP S/4HANA 2020.

Figure 15: SAP® Readiness Check for SAP S/4HANA®

The system sizing and data volume management section offers an interactive simulation that allows you to see at once how different data-volume-reduction options can reduce the data footprint. The planned downtime calculator section uses the statistics from other productive conversions to calculate the expected outage window (see Figure 16).

Figure 16: Planned Downtime Calculator



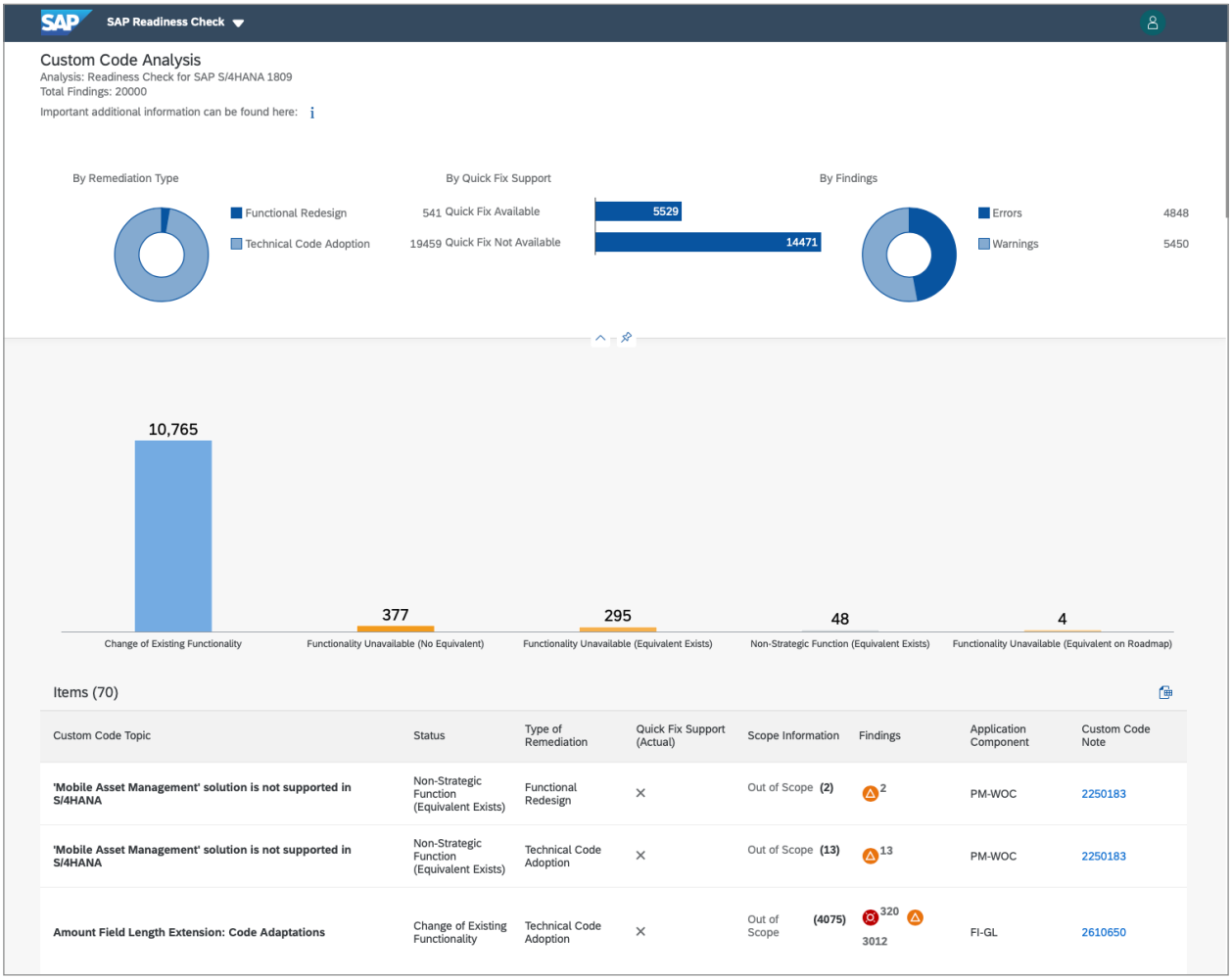
The technology used by SAP Readiness Check to estimate the impact on custom code (SYCM report) is a trade-off between the speed and precision of the code scan. The results of the report are sufficient to get a first impression of the magnitude of the necessary changes. For an exact analysis and subsequent adaptation of custom code, SAP recommends the ABAP test cockpit.

Note that you can upload the results of the ABAP test cockpit to SAP Readiness Check (see Figure 17). It helps you to better structure the findings and to estimate the degree of automation you can achieve by applying ABAP quick fixes.

Even if you decide on a new implementation, SAP recommends running SAP Readiness Check for your SAP ERP. The results will help you better understand the state of your current system from an SAP S/4HANA point of view. In particular, the check highlights the incompatible add-ons and functionality that you need to replace.

To execute SAP Readiness Check for your SAP ERP, click **here**.

Figure 17: Analyzing the Results of ABAP® Test Cockpit in SAP® Readiness Check



MAINTENANCE PLANNER

The cloud-based maintenance planner available through SAP ONE Support Launchpad enables easy and efficient planning of all changes in your SAP system landscape.

The tool simplifies the maintenance process by combining tasks such as defining product maintenance dependencies, generating configuration stack files, downloading software archives, and many more – all in one tool. The maintenance planner is indispensable for either planning a new SAP S/4HANA system or converting an existing SAP ERP system to SAP S/4HANA.

For more information, click here.

SYSTEM CONVERSION AND DOWNTIME

To help you meet system downtime requirements, SAP offers the following options for system conversion (see Figure 18):

- Standard conversion for smaller SAP ERP systems
- Downtime-optimized conversion for midsize and large systems
- Minimized downtime service by SAP for extra-large systems

As a rule of thumb, a small system has data volumes of less than 5 TB, and extra-large systems have data volumes of more than 20 TB.

Standard Conversion with Software Update Manager

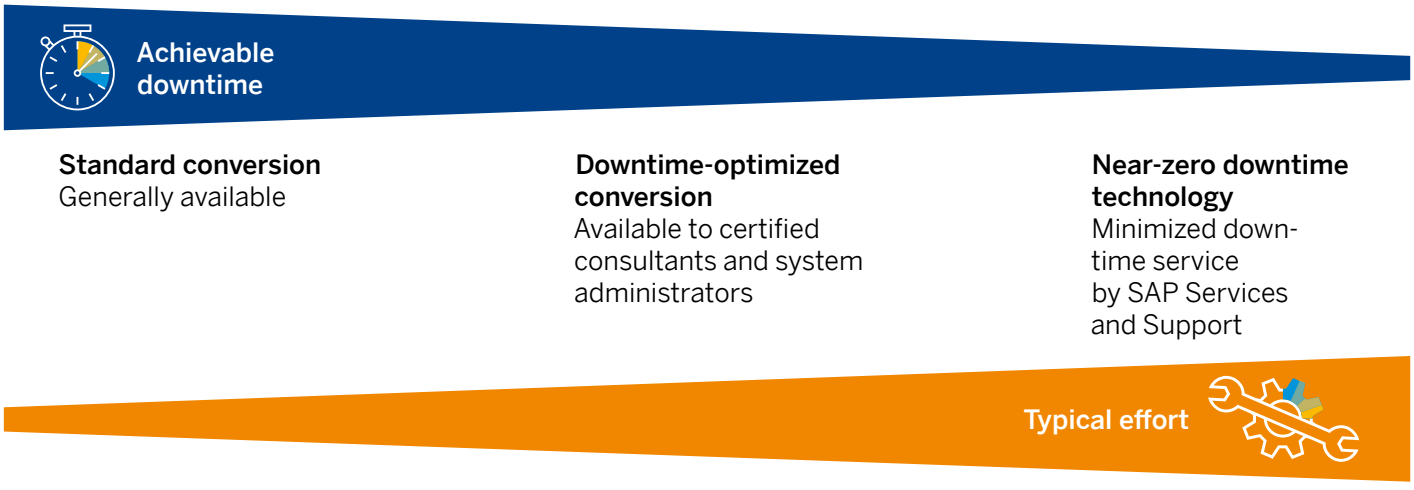
Software Update Manager is a multipurpose tool used for SAP software maintenance (for example, for installing support packages, migrating an SAP system to another database, installing add-ons, and other tasks). It is also the tool that technically converts an SAP ERP system into an SAP S/4HANA system. It combines the migration of the system to the SAP HANA database (if required), conversion of data, and software upgrade into one single step.

A single-step conversion is supported for SAP ERP 6.x (any enhancement pack) single-stack, Unicode systems; however, database and OS-level restrictions may apply.

Most of the data conversion (that is, the transfer into the new data model) is carried out by Software Update Manager with the help of special programs, namely XPRAs and XCLAs. The conversion is partially executed directly in SAP HANA and partially in the ABAP application server(s). However, both the conversion of financial data and the conversion of material ledger data are special steps that are performed after the actual conversion procedure of Software Update Manager.

Before executing your first conversion run on a sandbox system, you can use the prerequisite check extended mode of Software Update Manager. In that mode, Software Update Manager will execute the same checks it usually does. However, instead of breaking at hard issues, it will collect them in a single list (a CVS file) and stop prior to entering the downtime phase. With that, you can analyze the issues and solve them, thus optimally preparing for the first complete conversion run.

Figure 18: Conversion Options in Relation to Downtime Requirements



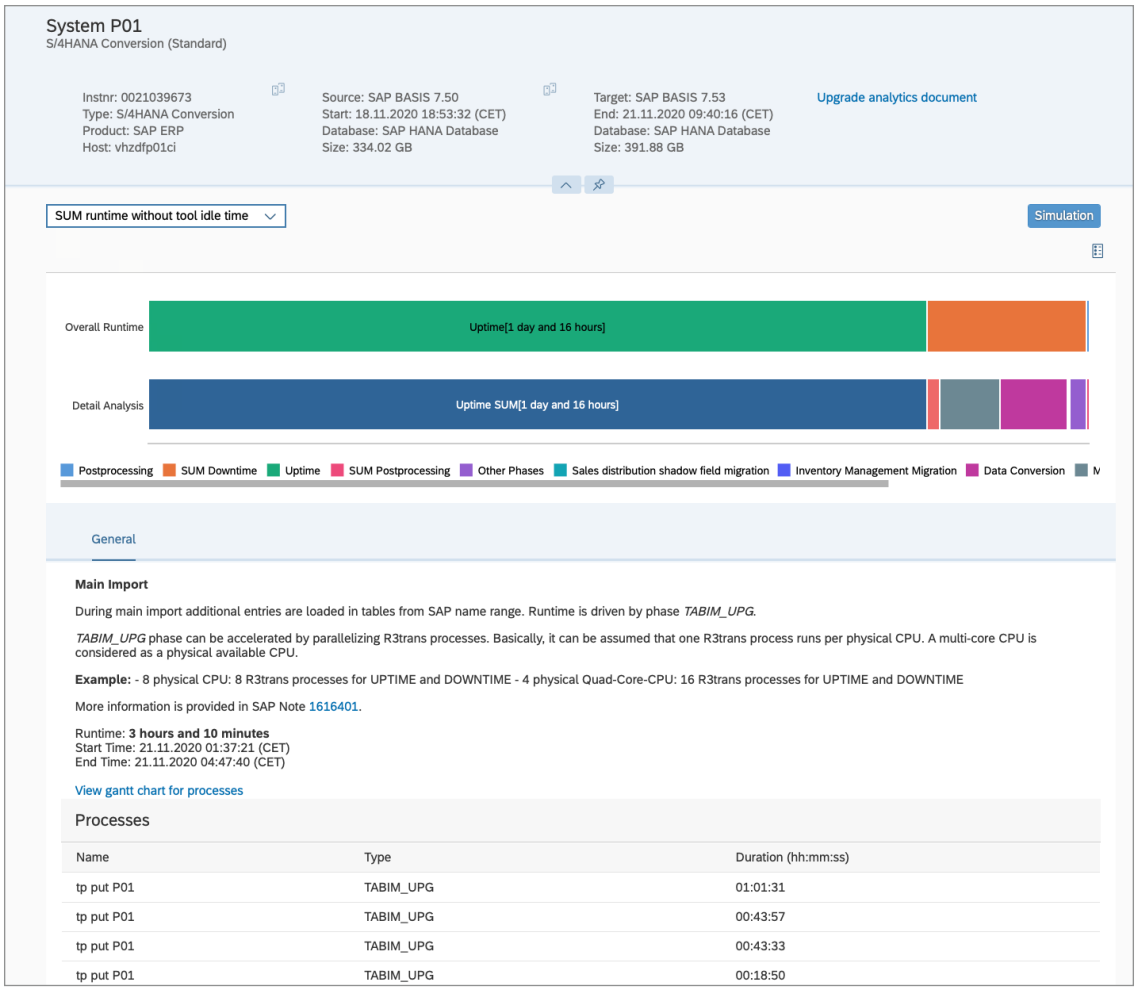
You can significantly reduce the overall conversion time for the standard conversion option by applying the right optimization strategy and exploiting the capabilities of Software Update Manager. The Technical Downtime Optimization tool offered in the SAP Support Portal helps you choose optimal system settings based on the results of your first conversion run (see Figure 19).

Read this blog post on the Technical Downtime Optimization tool and this one to understand the mechanics behind it.

When combining a system conversion with relocation to another data center or to an IaaS provider, your standard choice is the "DMO with system move" option offered by Software Update Manager. It allows you to combine the system conversion for systems that are not based on SAP HANA with a move to SAP HANA Enterprise Cloud, Microsoft Azure, Google Cloud Platform, or Amazon Web Services in one step.

For systems already on the SAP HANA database, look for technology options offered by the corresponding provider and SAP, such as SAP HANA system replication.

Figure 19: Technical Downtime Optimization Tool



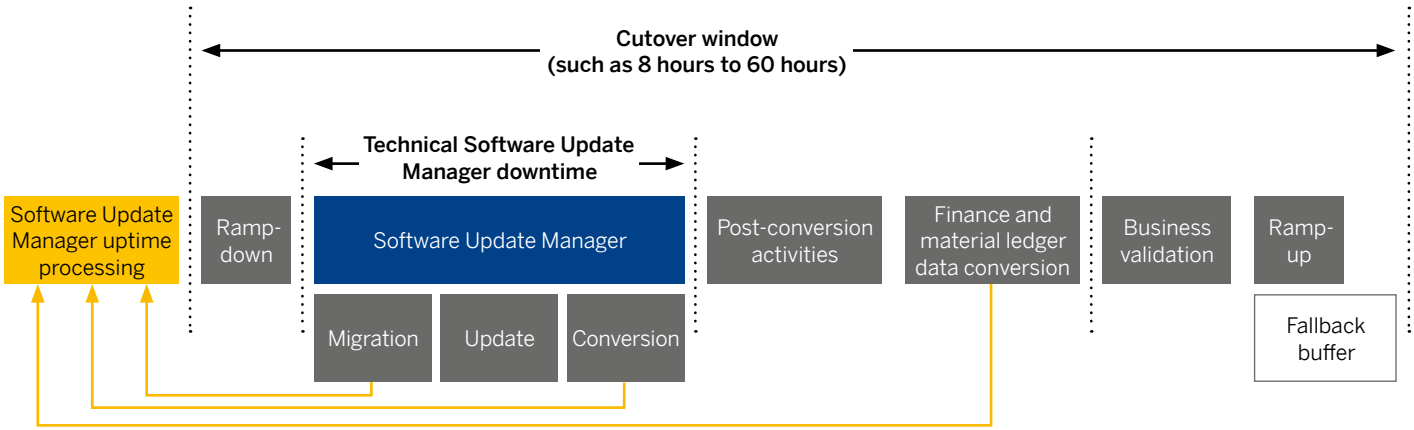
Downtime-Optimized Conversion with Software Update Manager

For larger systems, converting the data into the new data structures may take a long runtime.

In practice, project teams and business users can usually negotiate a cutover window between 8 hours (that is, one factory shift) and 60 hours (that is, from Friday 6 p.m. to Monday 6 a.m.). This time window includes not only the actual downtime but all phases of the cutover procedure (see Figure 20).

To make this cutover window achievable for midsize and large systems, SAP has developed the downtime-optimized conversion option and has included it in the standard Software Update Manager tool. In a nutshell, it converts large parts of the SAP ERP data during uptime and uses record-and-reply technology to incorporate the data changes. This way, midsize and large systems are able to comply with the common downtime requirements using the standard tool set.

Figure 20: Cutover Phases for System Conversion and Downtime-Optimized Conversion



ADM329 TRAINING

For technology consultants and system administrators who want to apply this option, SAP offers ADM329 training and certification. Book your seat **here**.

Minimized Downtime Service by SAP

The minimized downtime service offered by SAP is designed to help customers operating extra-large systems with:

- Data volumes of 20 TB or more
- A large data footprint in finance or logistics
- A high volume of application changes

The minimized downtime service also makes it possible to combine multiple maintenance events – such as Unicode conversion, a move to another data center or IaaS provider, and system conversion – into a single system downtime.

The technology applied within this service is known as near-zero downtime technology (NZDT). In essence, this conversion procedure is composed of the following steps:

- Activating change recording in the productive SAP ERP system with database triggers
- Creating a copy (clone) of the production system
- Performing a standard system conversion with Software Update Manager using the clone as the source system
- Synchronizing the newly converted system with the original production system
- Performing the cutover to the newly converted system

With this approach, a cutover window of 24 hours is usually achievable. However, given the complexity of the procedure, the exact runtimes have to be confirmed individually for any given environment.

For more information, refer to SAP Note 693168 or contact minimized downtime services at mds@sap.com.

ABAP TOOLS AND CUSTOM CODE

This section focuses on the use of ABAP tools for testing and adapting custom code during your SAP S/4HANA transition

ABAP test cockpit

The ABAP test cockpit offers SAP S/4HANA–specific checks available with SAP NetWeaver 7.51 or higher. While you can use these checks with a stand-alone installation of SAP NetWeaver 7.51 or 7.52, ABAP test cockpit in SAP S/4HANA brings important additional features. SAP recommends running ABAP test cockpit out of the sandbox once it has been converted to SAP S/4HANA.

The new SAP Fiori app "Custom Code Migration" offers analytical capabilities that can help you understand the impact on the custom code and structure your work accordingly (see Figure 21). The app also helps you remove unused custom code upon system conversion. To do this, it can load the code execution statistics directly from the SAP ERP production system and delete the custom code that has not been executed in the monitored period of time during the conversion. To benefit from this feature, SAP advises you to activate the ABAP Call Monitor (SCMON transaction) in the productive SAP ERP system today and start collecting these statistics as soon as possible.

With SAP S/4HANA, the ABAP development tools in Eclipse enable automated adaptation of custom code with only a few clicks through the ABAP quick fixes (see Figure 22). These can resolve the most frequent findings that don't necessarily require deep functional knowledge, such as ORDER BY issues, MATNR issues, and issues related to data model changes, such as database access to tables KONV, VBFA, VBUK, VBUP, BSEG, and others. You can expect an automation rate of up to 60% for most systems.

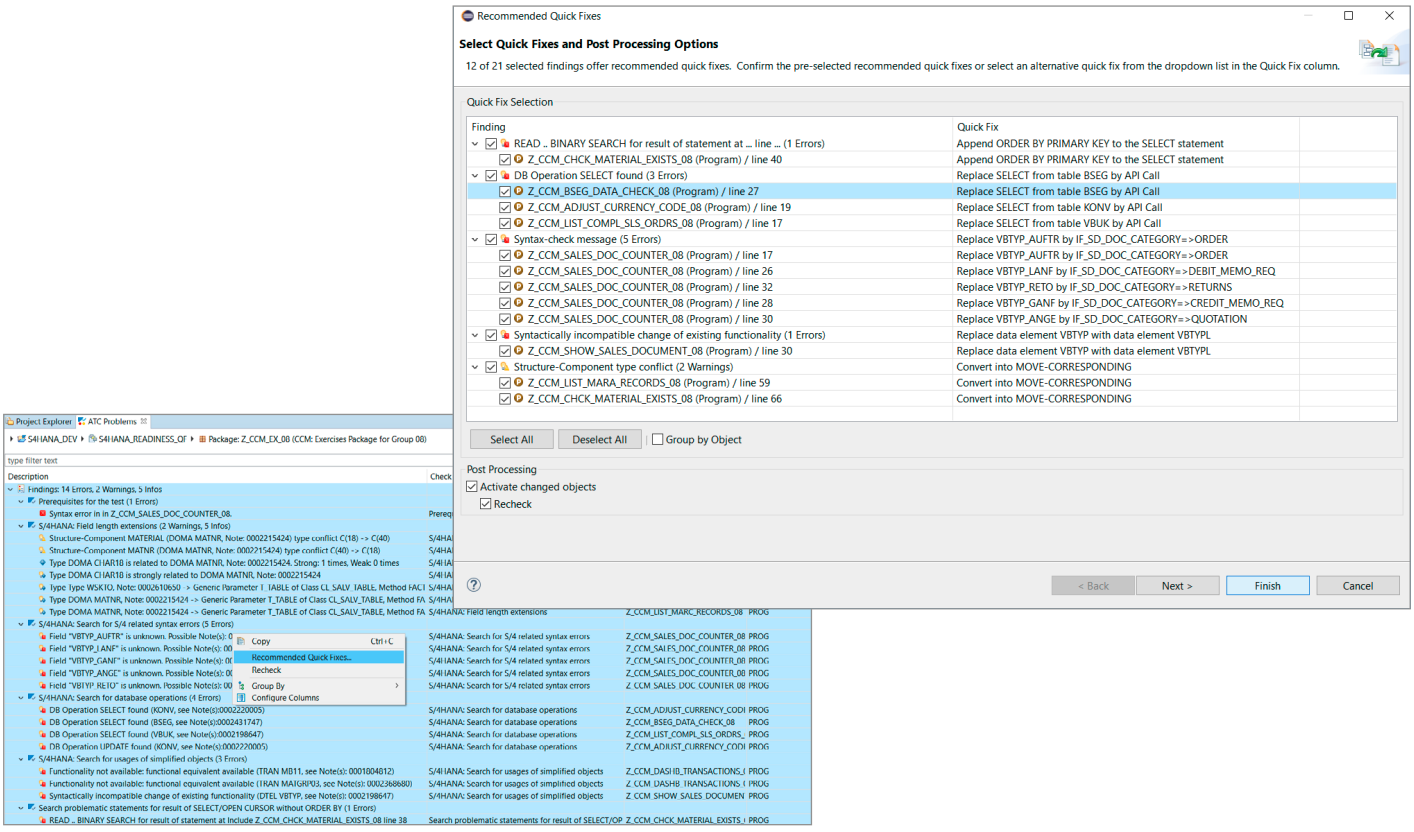
Note that the above features are part of SAP S/4HANA and do not require a separate license.

The Custom Code Migration app is also available on SAP BTP, ABAP environment. With this option, you can perform SAP S/4HANA custom code analysis for your on-premise SAP ERP systems remotely from the cloud. Besides the common advantages of SaaS offerings, this option helps ensure that you always have the latest custom code checks offered by SAP.

For more information on ABAP custom code analysis using SAP BTP, read this **blog** and discover the **custom code migration mission** in the SAP Discovery Center. For details on SAP BTP, ABAP environment visit **SAP Store**.

Figure 21: Custom Code Migration App

Figure 22: Quick Fixes in ABAP® Development Tools



SQL Monitor

The ABAP test cockpit also offers performance checks to identify poorly performing ABAP code. However, optimizing the entire body of custom code is usually impractical because of the associated effort. Instead, you can achieve considerable performance improvements with only a fraction of the effort by using SQL monitor tool, which analyzes all database queries in the production system.

SQL monitor identifies expensive SQL statements and the corresponding ABAP objects. Use ABAP test cockpit performance checks to analyze these objects and get hints on performance optimization.

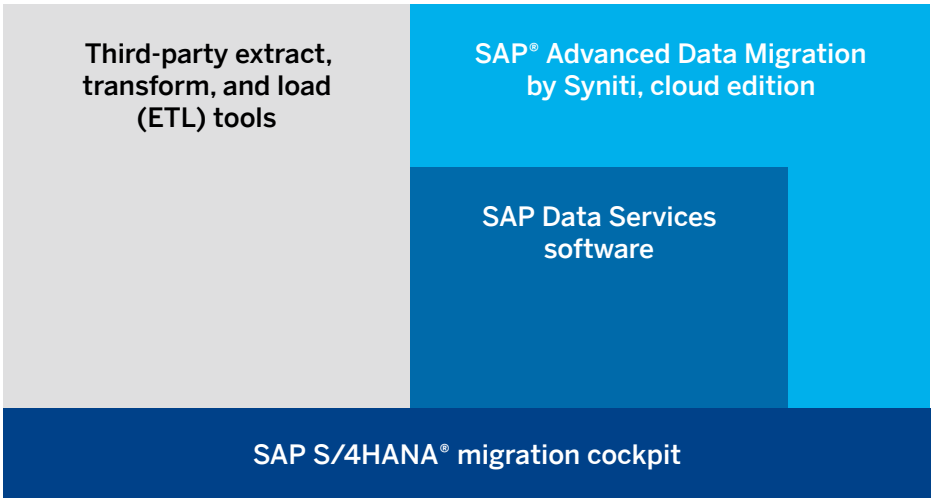
To learn more about ABAP tools, click **here**.

DATA MIGRATION TOOLS FOR NEW IMPLEMENTATIONS

SAP's recommended tool for SAP S/4HANA data migrations in new implementations is the SAP S/4HANA migration cockpit (see Figure 23). As already mentioned, you may also want to employ complementary tools depending on the following factors:

- Number and variety of data sources
- Required data transformations and business rules
- Amount of data construction required
- Data quality
- Project team size and the resulting intensity of collaboration

Figure 23: Data Migration Tools for New Implementation



*Migration objects are currently available for the SAP ERP, SAP Extended Warehouse Management (SAP EWM), and SAP Apparel and Footwear applications as well as for migrations from the SAP Customer Relationship Management (SAP CRM) application to customer management functionality in SAP S/4HANA.

SAP S/4HANA Migration Cockpit

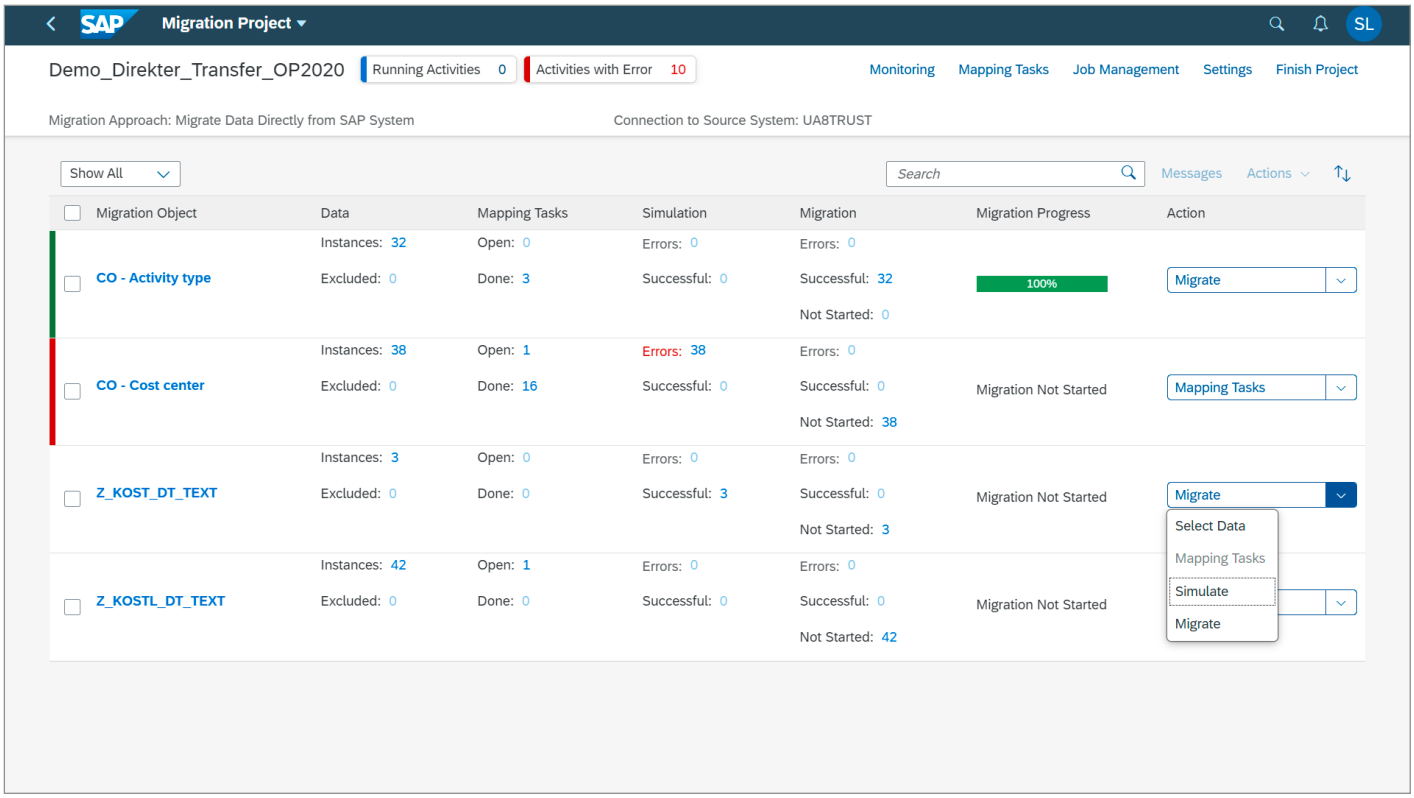
For SAP S/4HANA data migrations, SAP recommends using the SAP S/4HANA migration cockpit (see Figure 24). It comes as part of both SAP S/4HANA and SAP S/4HANA Cloud without any extra license and cost. This is also the only tool to migrate data to SAP S/4HANA Cloud.

The tool allows migrating data from both SAP and third-party systems and guides you throughout the data migration process. That includes automatic generation of migration programs, simulation mode for migration to verify data quality and help ensure error-free data loading, cross-object value mappings to help ensure data consistency, progress monitoring, and more.

With SAP S/4HANA 2020, the migration cockpit has unified data load through XML template files and staging tables. Now, you can fill the staging tables either by using the well-known XML template files or by populating them directly with the ETL tool of your choice. The third option, direct transfer, allows you to migrate data directly from your legacy SAP systems to a new instance of SAP S/4HANA, without any intermediate storage. In this case, the data is extracted from the source SAP system through a remote function call (RFC) connection.

The SAP Fiori app "Migrate Your Data" in SAP S/4HANA now comprises all migration approaches (see Figure 24).

Figure 24: Migrate Your Data Using SAP S/4HANA® Migration Cockpit



The SAP S/4HANA migration cockpit comes with a ready-made set of migration objects and rules. A migration object represents a business entity in SAP S/4HANA, such as a customer, sales order, or invoice. It encapsulates the logic to create the specific business entities through the corresponding APIs offered by SAP S/4HANA. All migration objects are ready for immediate use.

You can extend the existing migration objects and rules and create your custom objects with the SAP S/4HANA migration object modeler.

Migration Approaches Supported by SAP S/4HANA® Migration Cockpit (SAP S/4HANA 2020 Onward)

	Staging Tables	Direct Transfer
Source System	Any (SAP®-and third-party system)	Generally, any ABAP®-based source system Migration objects currently available for the SAP ERP, SAP Extended Warehouse Management (SAP EWM), and SAP Apparel and Footwear applications as well as for migrations from the SAP Customer Relationship Management (SAP CRM) application to customer management functionality in SAP S/4HANA
Data Volume	For XML file upload: • Maximum 100 MB .zip file size for SAP S/4HANA Cloud • Maximum 160 MB .zip file size for SAP S/4HANA (on premise) When populating staging tables directly, possibility for data load of large data volumes with multiple jobs in parallel	Large data volumes Possibility for data load with multiple jobs in parallel
Data Cleansing	Upfront in the source systems, in the XML files, or in the staging tables	Upfront in the source systems Ability to enhance standard selection options with the SAP S/4HANA migration object modeler
Availability	SAP S/4HANA SAP S/4HANA Cloud Migration object modeler available for SAP S/4HANA only	SAP S/4HANA 1909 and above

Working with the SAP S/4HANA migration cockpit is easy and does not require developer skills. These are needed only when you want to create your own migration objects or transformation rules.

With the above functions and features, the SAP S/4HANA migration cockpit has generally superseded SAP's legacy system migration workbench. Use of the latter with SAP S/4HANA is neither supported nor recommended by SAP.

To learn more about the migration cockpit for SAP S/4HANA, click **here**. For more about the migration cockpit for SAP S/4HANA Cloud, visit this **site**. For those, who want to learn about the migration cockpit in depth, we recommend the openSAP course, "**Migrating Your Business Data to SAP S/4HANA – New Implementation Scenario**."

SAP Data Services

Customers migrating from multiple legacy systems by different third-party vendors to their SAP S/4HANA instance will face an increased level of complexity in data migration. The goal of data migration should not just be to move and transform the data, but also to improve data quality so that you go live with clean, valid, trusted data. SAP's flagship ETL solution for profiling, extracting, transforming, and improving data quality is SAP Data Services. This solution can play an important role in a data migration project.

Employing SAP Data Services in your migration project gives you the ability to:

- Profile the source system data to discover data quality problems within those systems – from simple technical profiling (such as how many records miss a certain attribute) to complex cross-table checks (such as how many vendors have no corresponding orders)
- Extract source system data efficiently and transform it into the target SAP S/4HANA format and structure
- Apply data cleansing jobs
- Implement data validations against the target system configuration to help ensure technical alignment of the transformation logic
- Deliver the data in the correct format (staging tables or files) to the SAP S/4HANA migration cockpit to reduce the amount of work needed to be done there

As data migration projects become larger, collaboration is required in designing, transforming, and validating the data. For these projects, it is recommended to use SAP Advanced Data Migration by Syniti.

For more information on SAP Data Services, click **here**.

SAP Advanced Data Migration by Syniti, Cloud Edition

Midsize and large projects require extensive collaboration within the data team and with other stakeholders. A combination of SAP Advanced Data Migration by Syniti, cloud edition, with SAP Data Services provides the orchestration, extraction, transformation, and data quality capabilities that are essential for migrating complex data to SAP S/4HANA.

SAP Advanced Data Migration is built specifically to automate a best-practice process for data migration and to orchestrate the process of SAP and third-party data migrations to SAP S/4HANA (see Figure 25). It offers a collaboration platform enabling all stakeholders to deliver their tasks in a guided, controlled, auditable, and secure environment.

The key features of the solution are:

- A single view into what your team is working on: mappings, data cleansing, data construction, sign-off workflows, and more. The solution provides the metrics and KPIs you need to drive project progress.
- The solution automates the creation of up to 80% of the code and reports needed to execute data migration.
- The ready-to-load data is handed over to the SAP S/4HANA migration cockpit either through files or staging tables.
- Technical reconciliation capabilities support the comparison and review of source and target data, as well as the approval of the migration process by the business owners.
- Native data replication capabilities and the ability to capture data changes help ensure real-time access to data during the migration.
- You can reuse the business knowledge and assets created during the migration for both subsequent migrations and future information management initiatives (that is, post-go-live data quality initiatives or data governance initiatives).

Projects employing the solution indicate savings of 30% to 40% versus traditional approaches.

For further information on SAP Advanced Data Migration by Syniti, cloud edition, including an overview of the functionality and savings possible with the solution, check out the **overview, demo, and ROI calculator**.

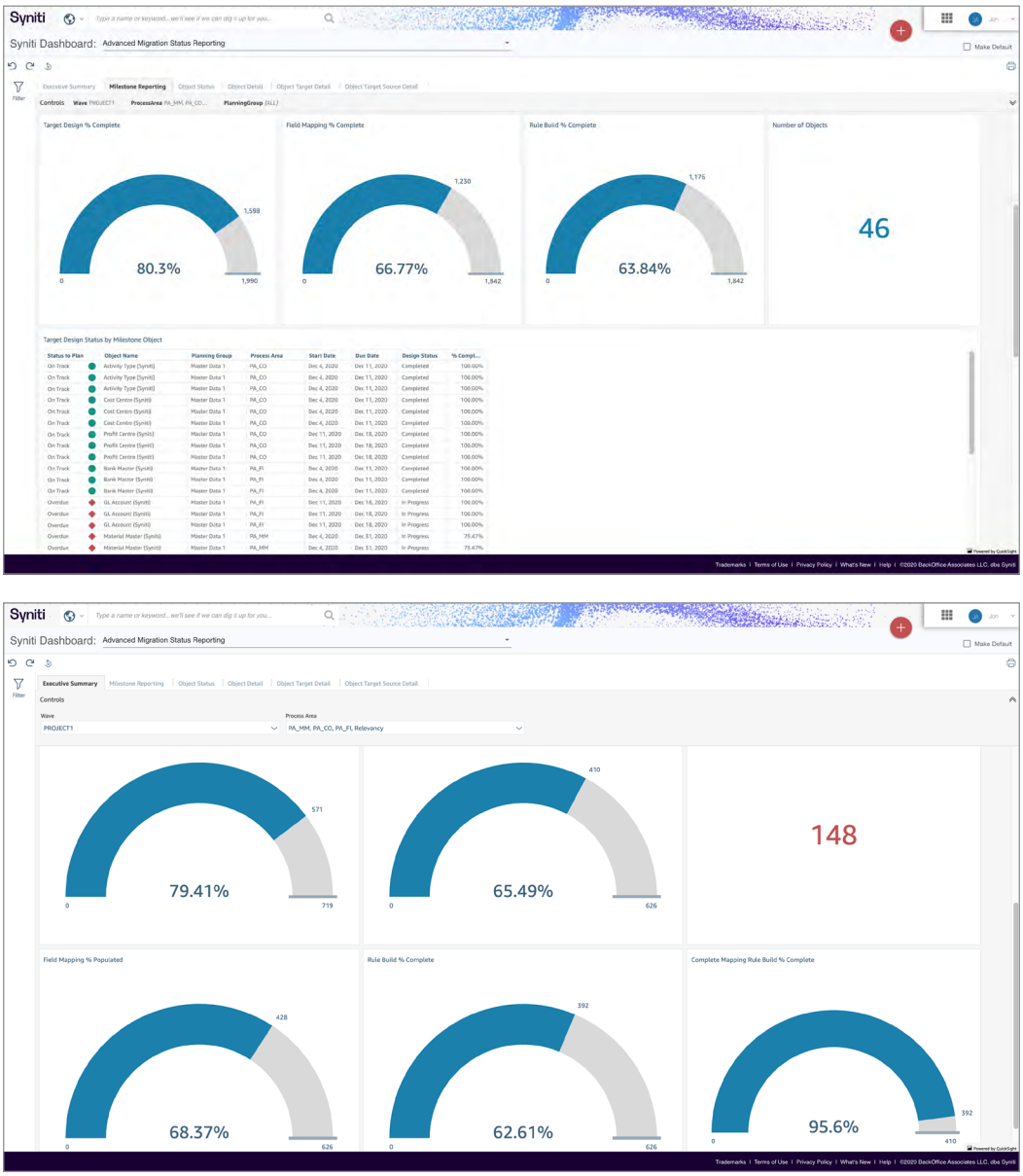
SAP Advanced Data Migration by Syniti is also available as an on-premise installation with many of the same benefits and features.

The tool can also be used in selective data transition projects for data cleansing and preparation and works in combination with other tools offered by SAP services.

Key Benefits of SAP® Advanced Data Migration by Syniti, Cloud Edition

Project Manager	Business User/ Subject-Matter Expert	Developer
• Automated reporting into the exact status of your migration program • Timelines and data quality metrics	• No more spreadsheets to populate and manage • Web portal to design, view, check, and remediate data – with a minimum effort	• Auto-generated code for data extraction, transformation, validation, and reconciliation • Focus on high-value business validation rules

Figure 25: Migration Dashboard of SAP® Advanced Data Migration by Syniti



SAP INTEGRATION SUITE AND INTEGRATION ADVISOR

SAP Integration Suite enables solution integration across cloud-based and on-premise environments. It provides features such as:

- Core runtime for transactional message exchange including message processing, transformation, and routing with tenant isolation
- Built-in connectivity support through technology and application adapters (for example, Java Database Connectivity (JDBC), IDoc, Secure File Transfer Protocol (SFTP), AS2, HTTP, SAP S/4HANA, SAP SuccessFactors, SAP Ariba, and more)
- Predefined integration content as integration packages containing integration flows
- Advanced security

The Integration Advisor capability for SAP Integration Suite is unique. It is an intelligent integration content management system for designing and managing your interface and mapping content, designed to make B2B and application-to-application (A2A) integration simpler than ever before.

Through a smart combination of machine learning and crowdsourcing, it generates proposals for interfaces and mappings tailored for a specific industry, country, and business context – ultimately saving the most labor-intensive part of integration projects (see Figure 26 and Figure 27).

The early adopters of Integration Advisor report savings of 60% and more in their integration projects.

- Join this course to learn more about Integration Advisor.
- Click here to try it out and see it in action.
- Read the "Intelligent Enterprises Are Integrated Enterprises" white paper and materials referenced therein.

Figure 26: Generated Interface Proposal for POs in a Specific Industry Context

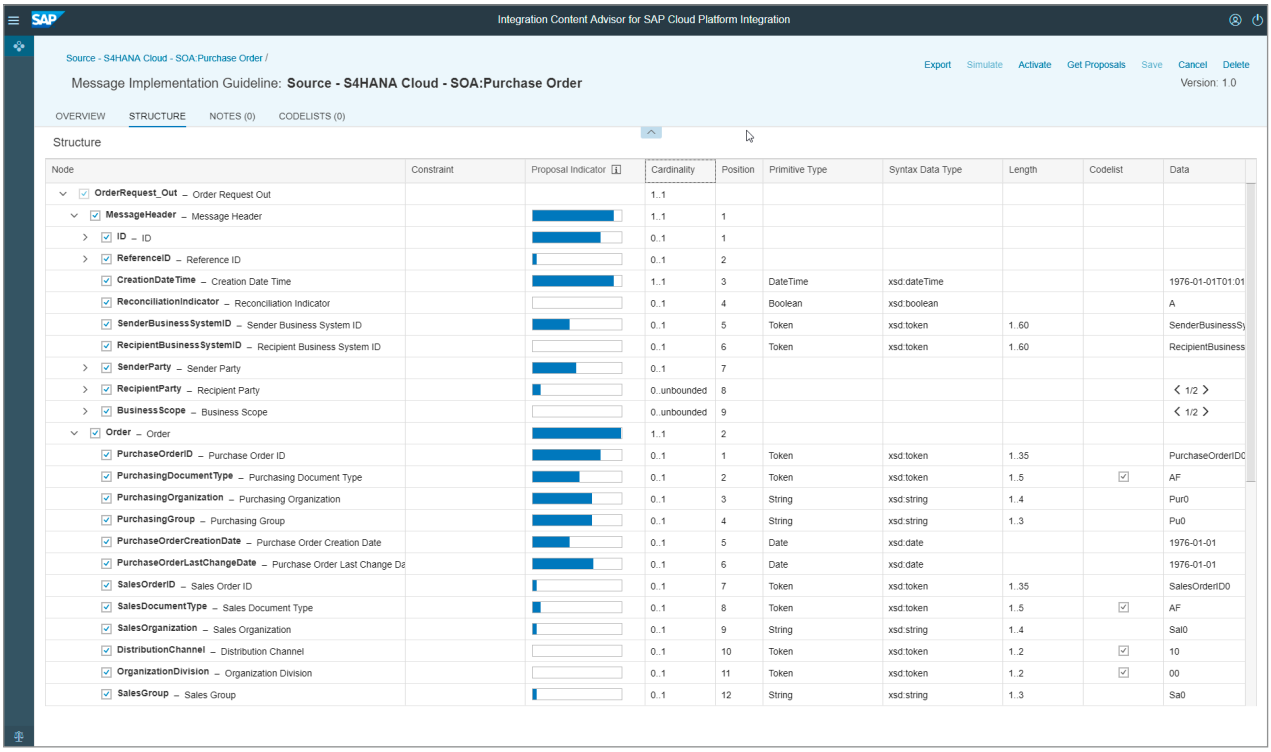
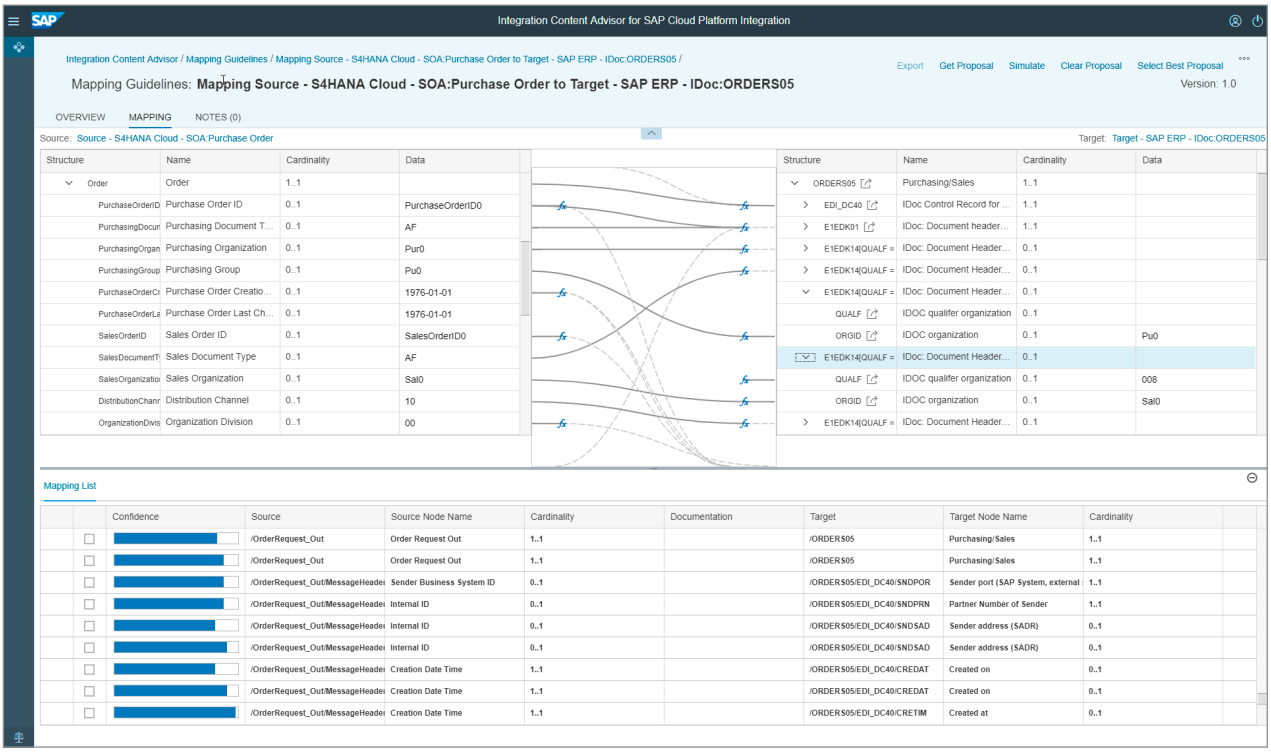


Figure 27: Generated Mapping Proposal



SAP SOLUTION MANAGER

SAP Solution Manager is a well-established solution for application lifecycle management (ALM) for on-premise SAP applications, but it is also for hybrid landscapes including SAP S/4HANA Cloud, private edition.

SAP Solution Manager offers a number of tools to support individual project tasks, such as business process documentation, test management, and software deployment. We would like to highlight two of them.

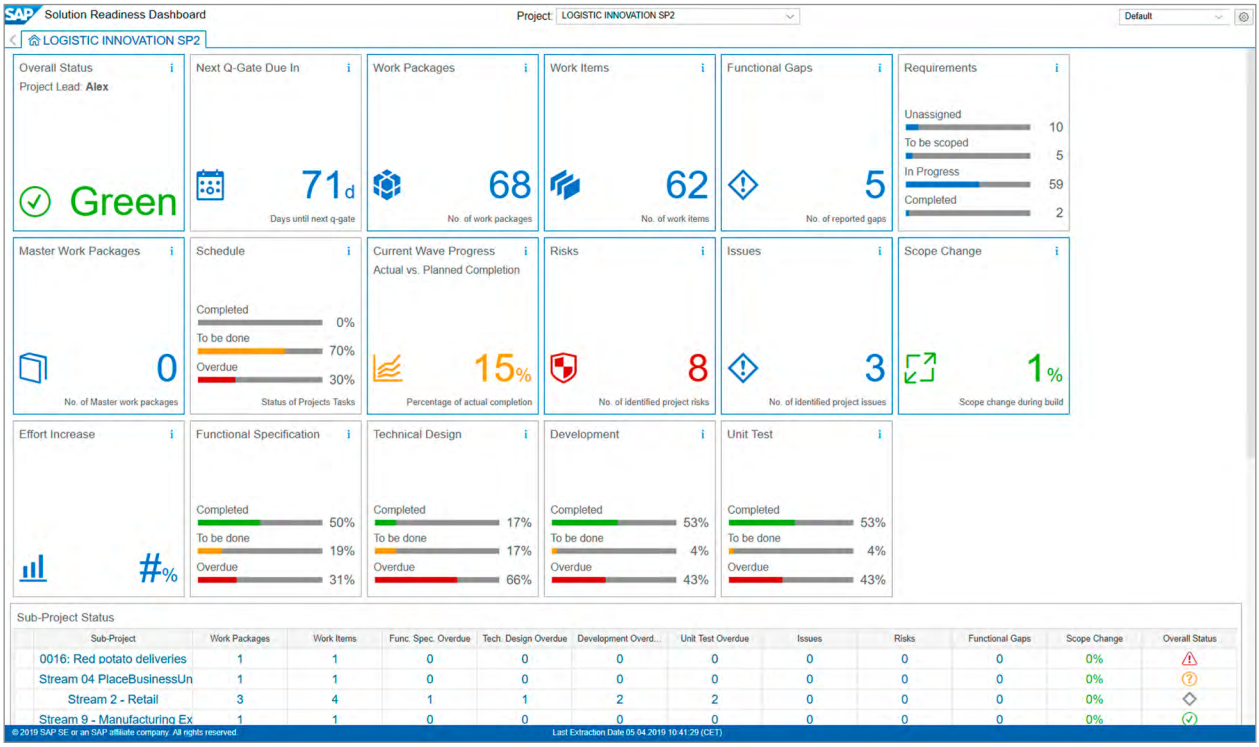
Focused Build for SAP Solution Manager

Starting with version 7.2, SAP Solution Manager offers the Focused Build solution, which includes business demand and requirements management, integrated risk management, and collaboration features that help business and IT work together more closely while also helping manage global development teams (see Figure 28). It is designed based on SAP Activate methodology to guide customers through standardized project activities to assure a successful transformation to SAP S/4HANA.

Regardless of the implementation approach you chose, Focused Build decreases the risk of deployment failures, enables a real-time status view of all project activities, and helps to keep a centralized source of truth for business processes and documentations.

The integration between SAP Readiness Check and Focused Build speeds setup. You can import the simplification items and the related activities from the SAP Readiness Check into Focused Build as a baseline for project planning and continue planning by creating requirements, work packages, or subprojects for complex activities with expected high effort.

Figure 28: Solution Readiness Dashboard in Focused Build for SAP® Solution Manager



Consider the Focused Build solution for SAP Solution Manager if any of the points below hold true:

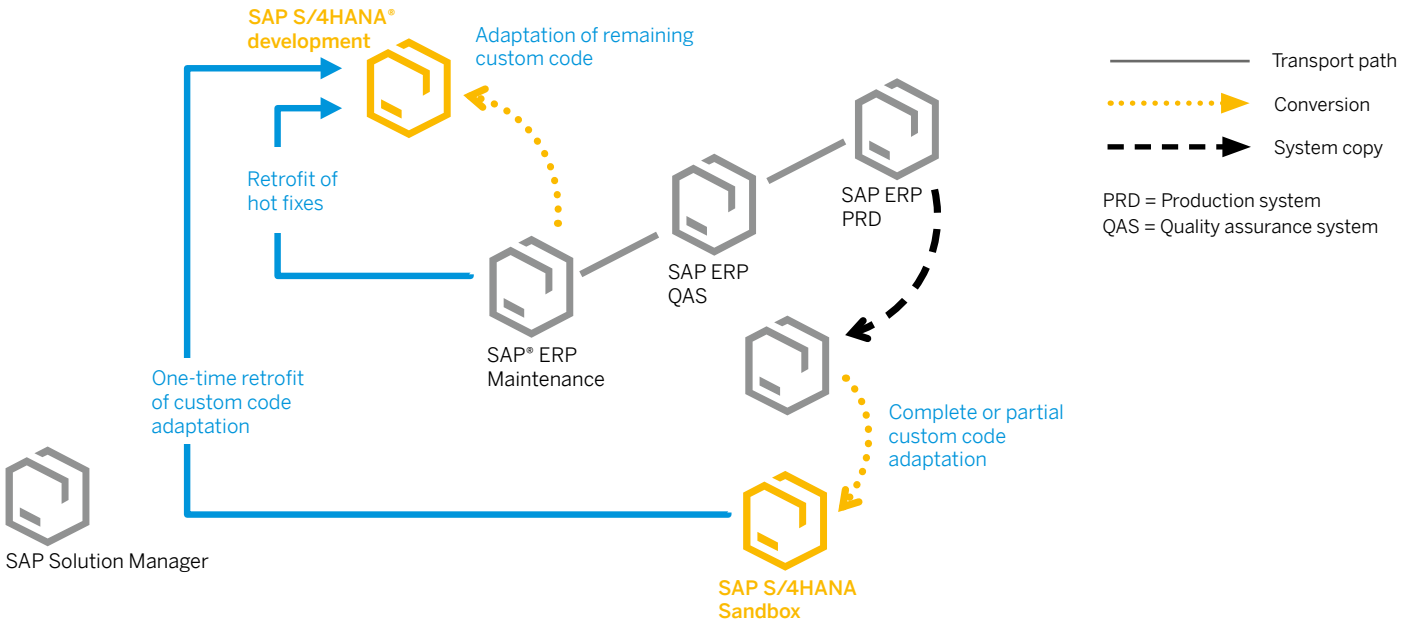
- You consider the project a business-driven project.
- You plan your new implementation based on SAP Best Practices or SAP Activate.
- You expect the conversion to bring significant functional changes to the system.
- You intend to structure your conversion project based on the results of SAP Readiness Check.
- You expect a considerable number (more than 100) of RICEFWs to be developed.
- The project team works across several locations, or you expect a high share of remote delivery.
- The project management office wants to use a project tool that supports standardized and transparent activities in the project and helps accelerate onboarding.
- You already employ, or intend to employ, SAP Solution Manager for IT operations after the go-live.
- You intend to apply agile development principles in your project.

For more information, click **here**. Join this **course** to learn more about Focused Build.

Retrofit

The retrofit functionality in SAP Solution Manager has been your reliable companion in complex landscapes for almost a decade (see Figure 29). With it, you have neither a development freeze nor double work. It is very suitable for conversion projects for systems with large amounts of custom code and intense, ongoing custom development.

Figure 29: Using Retrofit Functionality in SAP S/4HANA® Conversions



Test Automations and Test Management

In July 2020, SAP and Tricentis announced an exciting new partnership in software testing and test automation. One of the objectives of this partnership is to provide SAP Enterprise Support customers with the test automation capabilities for testing SAP products through the combination of Tricentis and SAP Solution Manager 7.2 – at no additional cost. This new offering is called Tricentis Test Automation for SAP (TTA for SAP) and includes the following test automation capabilities of Tricentis:

- Automated testing of all SAP products with wide support of UI technologies – SAPUI5, SAP Fiori, SAP GUI, and other Web UIs, such as SAP SuccessFactors or SAP Ariba solutions
- API-based automated testing of SAP products – for protocols such as RFC, HTTP, REST, or OData
- Test data services to allow for central management of the test data through the TTA for SAP server, including test data retrieval and updates during test execution

The test management functionality in SAP Solution Manager complements the above capabilities with the following:

- Test case preparation
- Test planning
- Test execution and reporting

Please note that certain functionalities of Tricentis Tosca, such as automation capabilities for non-SAP solutions, distributed execution engine, or Tosca Server APIs, are not part of TTA for SAP but can be licensed through the SAP Enterprise Continuous Testing solution by Tricentis.

For more details about Tricentis Test Automation for SAP Solution Manager and to also access the download area for the software, visit this **page**.

SAP CLOUD ALM

The hallmark of cloud solutions is a much leaner application lifecycle. While SAP Solution Manager remains the solution of choice for complex on-premise landscapes, SAP offers SAP Cloud ALM as a cloud tool for implementation, test management, and operation of cloud solutions from SAP, starting with SAP S/4HANA Cloud and SAP SuccessFactors solutions.

Within an SAP S/4HANA Cloud implementation, SAP Cloud ALM allows you to create your own process diagrams by reusing the process diagrams from best practices, adjusting the process flows, defining extension points, and embedding them into process documentation.

To jump-start your implementation project, it offers a complete task list based on SAP Activate and task management capabilities such as assignment of project tasks, approvals, tracking, and monitoring.

For testing, it offers over 5,000 automatic test cases through the test automation tool for SAP S/4HANA Cloud and the means for manual test case creation (in SAP Cloud ALM or upload from Microsoft Excel), as well as typical test management functionality such as test assignment and tracking of execution. Furthermore, SAP Cloud ALM integrates with SAP products to centralize technical monitoring (users, network, jobs, performance, and the like).

Read more about **SAP Cloud ALM**.

For more information about the test automation tool for SAP S/4HANA, refer to SAP Note **2129247** and this **blog**.

Conclusion

We hope that this guide helps you find your way to the new digital core and shape your strategy by:

- Identifying the strategic choices and understanding the trade-offs
- Knowing the right questions to ask your project teams
- Understanding the essential tools that SAP provides – and continuously improves – for both new implementations and conversions

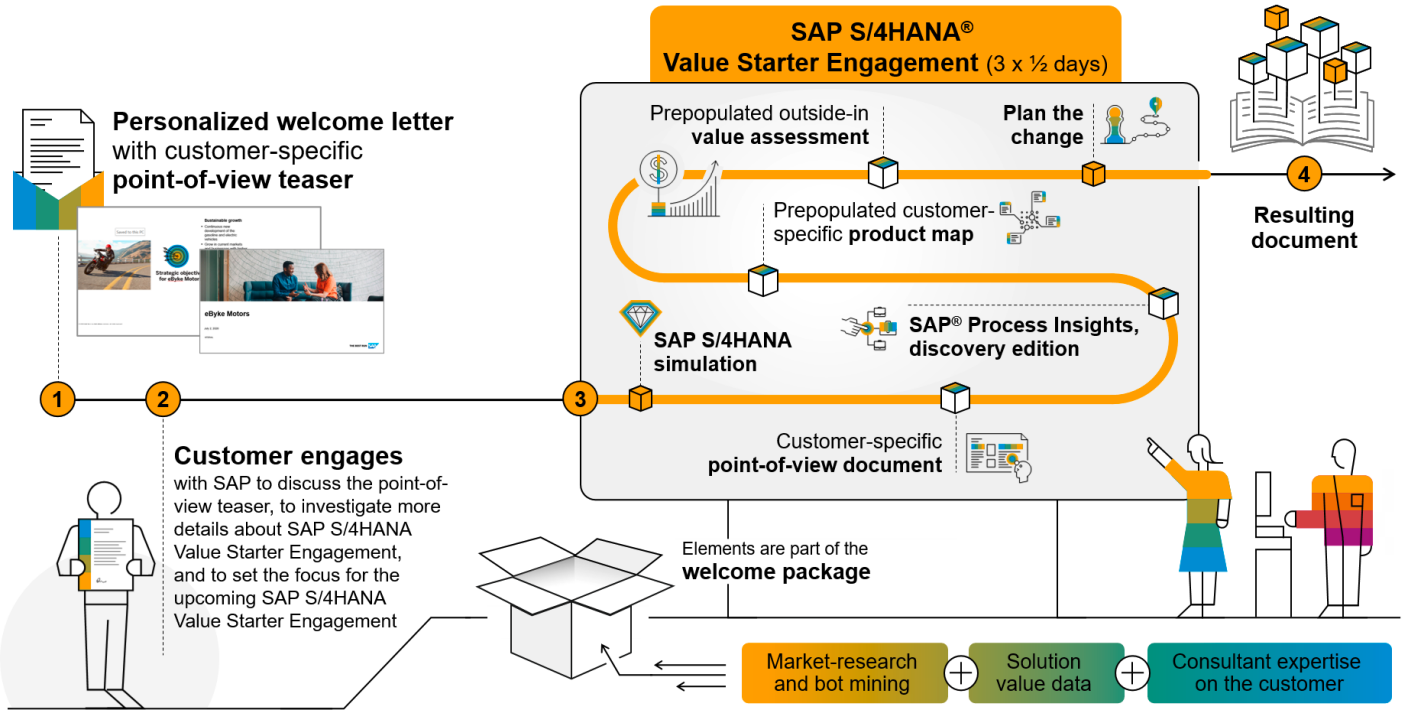
As we continue to update and enhance this guide, we welcome your ideas and suggestions. While we have highlighted the pivotal elements of your journey to the new digital core, we certainly haven't covered all of them. You can send us your feedback at s4move@sap.com.

For those who want to learn more about SAP S/4HANA and its functional capabilities, the ultimate source is the product page.

For customers who have yet to make their case, we recommend SAP S/4HANA Value Starter Engagement, which is available to all customers with a valid support agreement without any additional fee. This program consists of weekly virtual classes. At the end of the program, you will have built your first implementation plan for your SAP S/4HANA transition, including benchmarking, value assessment, and transition strategy. See Figure 30.

Last but not least, we would like to direct you to the SAP S/4HANA Movement program page, which offers plenty of resources, including customer stories, event announcements, and Webinars. In the future, we intend to publish more guides on the practical aspects of the transition to SAP S/4HANA.

Figure 30: Value Starter Engagement



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Marcus Wefers
Arend Weil
Maic Wintel

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