S4H01

Introduction to SAP S/4HANA

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PARTICIPANT HANDBOOK
INSTRUCTOR-LED TRAINING

Course Version: 04
Course Duration: 2 Day(s)
Material Number: 50135535

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Typographic Conventions

American English is the standard used in this handbook.

The following typographic conventions are also used.

This information is displayed in the instructor's presentation	
Demonstration	
Procedure	
Warning or Caution	
Hint	
Related or Additional Information	
Facilitated Discussion	
User interface control	*Example text*
Window title	*Example text*

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Course Overview

TARGET AUDIENCE

This course is intended for the following audiences:

- Executive
- Systems Architect
- Project Manager
- Application Consultant
- Technology Consultant
- Support Consultant
- Super / Key / Power User

UNIT 1 Introduction to SAP S/4HANA

Lesson 1

Why do we need a new business suite? 2

Lesson 2

Introduction to SAP S/4HANA 6

UNIT OBJECTIVES

- Describe the need for a new business suite
- Describe SAP S/4HANA and its key features

Unit 1
Lesson 1

Why do we need a new business suite?

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe the need for a new business suite

New Business Suite Requirement

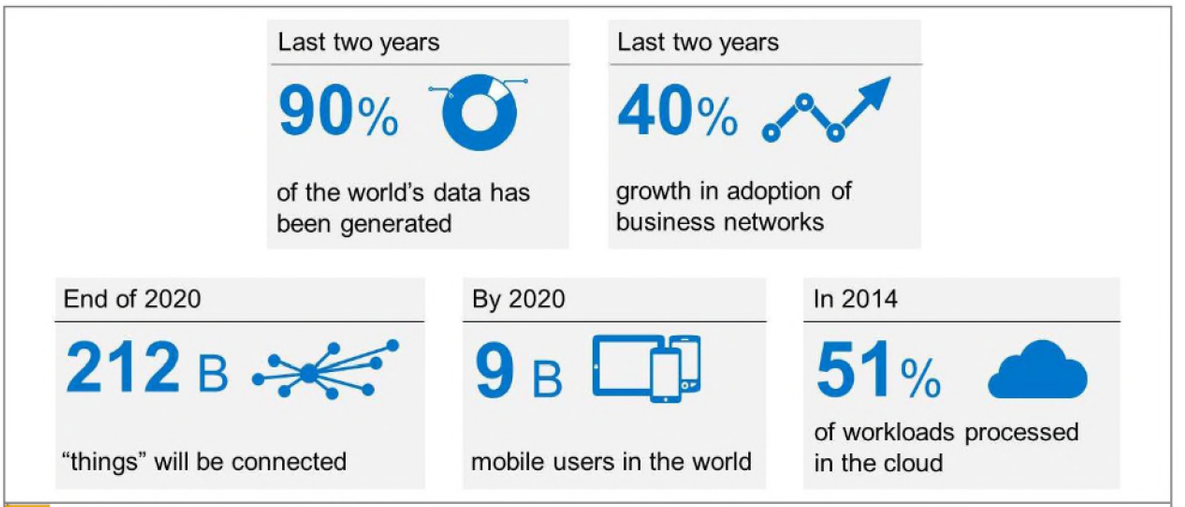

Figure 1: The World is Now Digital

As the numbers on the figure show, the world around us is not getting simpler, but more complex, due to the following:

- Exponential growth of digital information - social, mobile, big data
- Globalization and spread of business networks
- Internet of Things, or Internet of Everything

The response so far has been to add more complex business processes, organizations, and software solutions.

At the end of 2009, 5% of the world's population owned smartphones. Four years later that figure jumped to 22%. Currently, 1.7 billion people are on social networks. Over the next three years that audience will surpass 2.55 billion. By 2020, 5 billion people will enter the middle class and come online, while 50 billion devices will be connected to the "Internet of Things," creating a digital network of virtually everything. And cloud computing - a $41 billion business in 2011 - will grow to a $241 billion business in that same time frame.

The increase in the use of mobile devices, social media, and cloud technologies, and the amount of data they generate have transformed the way we live and work. In fact, 61% of

companies report that the majority of their people use smart devices for everything from email to project management to content creation.

While all of these advancements have improved our lives and provided us with greater opportunities for innovation than ever before, they have also accelerated the rise of an entirely new problem to contend with: unprecedented and crippling complexity that suffocates innovation.

The world may be getting smarter, but it has not gotten any easier.

Massive consumerization of IT means online purchasing, banking, and completing online applications has become commonplace. Think about it: How much digital data did you create today? Perhaps it is of interest to some organizations, but they can only integrate it with their core business processes if they run SAP S/4HANA.

Data is valuable and is often referred to as the new oil.

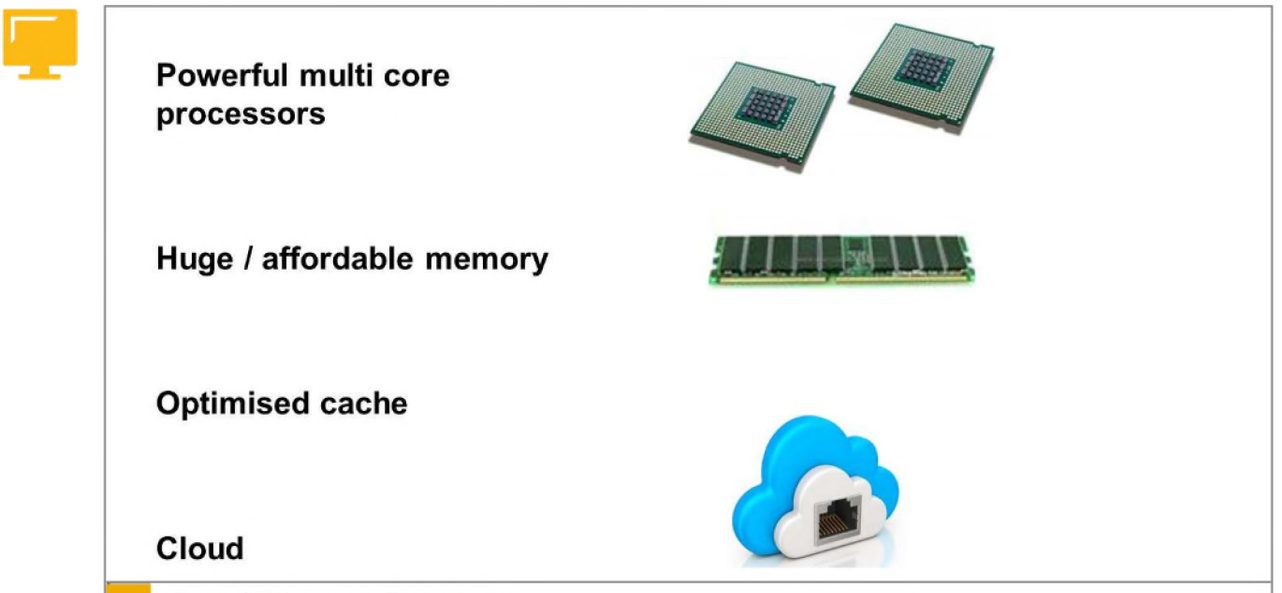

Figure 2: Advances in Technology

In the last few years, there have been significant advances in technology that application developers can take advantage of to build smarter and more powerful applications. Examples include the following:

- Multi-core processors enabling parallelism of tasks: This means more throughput of data and faster processing to give us real-time responses.
- Big memory: This enables us to fit an entire organization's database in memory, which means we lose the mechanical spinning disk and the latency it brings.
- Advances in the design of the on-board cache: This means that data can pass between memory and CPU cores rapidly. In the past, even with large memory, this was a bottleneck as the hungry CPUs demanded more data and the journey from memory to CPU was not optimal.
- Increasing your server landscape: This means you can slot more servers into your landscape to add more processing power or memory to scale to any size.

SAP rewrote its business application software to fully exploit the new hardware. SAP worked closely with leading hardware partners who shared the product blueprints of their new CPU architectures, so that SAP knew how to write the very best modern software to extract as much power as possible.

Cloud computing technology has matured in the last few years and is now a compelling deployment option for our customers who do not want to take on the complexity and cost of the installation and maintenance of IT landscapes. The use of virtual machines lowers the costs associated with running enterprise-wide applications. Public cloud services based on subscription models increase access to everyone to the latest solutions, reducing the costs and simplifying everything.

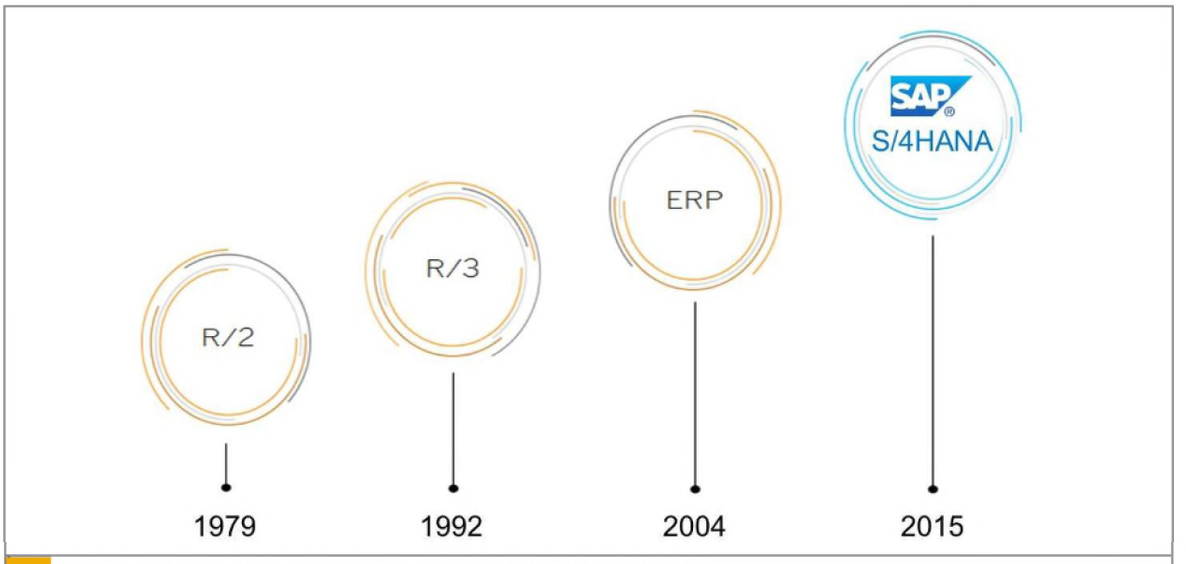

Figure 3: Time to Rebuild the Business Suite for the Digital World

Since the beginning of enterprise computing, SAP have been rebuilding the business applications whenever major technology shifts have occurred.

Some key moments in SAP's application development history are the following:

- 1979 - SAP invents ERP. SAP builds standard business software based on mainframe technology. The name, SAP R/2 supports and integrates major business functions in real time and handles multi-country and multi-currency implementations. (R means real time, and although there was an R/1, this is not regarded as the first major release.)
- 1992 - With the rise of the personal computer, the introduction of client/server architecture means another rewrite of the applications to exploit the power of a layered, three-tier architecture approach, in which processing is split across three layers - client, application, and database. It is the end of the mono-chromatic, text-based, messy green screens and the start of a new graphical interface to improve the end user experience. This is the birth of SAP R/3.
- 2004 - Now the Web is firmly established as the common business network and customers demand better integration between their business applications and the Web. SAP develops a new integration application platform called SAP NetWeaver to enable this. Now all SAP applications run on a common platform, and customers and partners can build and integrate existing applications easily using widely adopted Web standards, such as service-oriented architecture (SOA).

  Additionally, a little later, a new switch framework is introduced to allow customers to selectively enable only the new functions developed by SAP in order to avoid disrupting their core processes. The SAP R/3 name is now replaced by SAP ERP. ERP is part of a larger family known as SAP Business Suite, which also contains many other line of business (LOB) applications from SAP, such as SAP CRM.

- 2015 - A new wave of advances in hardware architecture brings massive computing power at decreasing costs. Huge memory and multi-core processors arrive to offer massive computing power. The underlying design of existing SAP applications does not fully exploit the power of the new hardware. A rewrite of the complete Business Suite is required. The new business suite is called SAP S/4HANA.

LESSON SUMMARY
You should now be able to:

- Describe the need for a new business suite

Unit 1
Lesson 2

Introduction to SAP S/4HANA

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe SAP S/4HANA and its key features

SAP S/4HANA and its Key Features

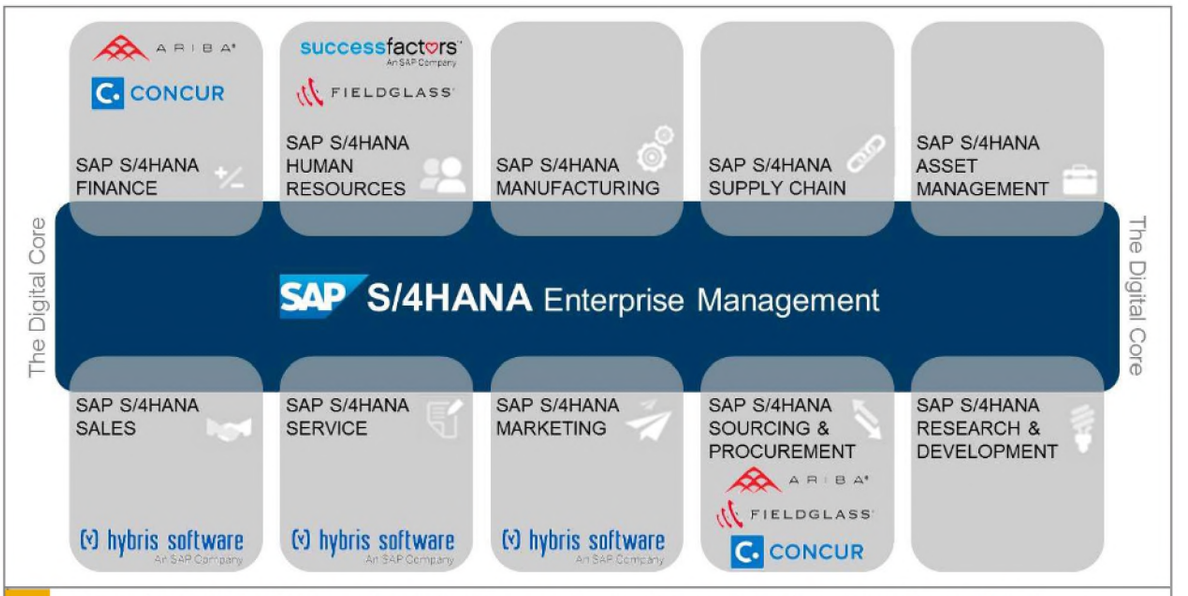

Figure 4: SAP S/4HANA Next-Generation Core and Lines of Business Solutions for the Digital World

SAP S/4HANA is not a single product, but covers many applications. Customers can start with the basic components and add to them later. S/4HANA Enterprise Management is a great place to start. This is known as the "simplified core". It is helpful to think of S/4HANA Enterprise Management as the replacement for SAP ERP. It offers support for all core business processes, such as quotation to cash, procure to pay, and so on. For many customers, this is where their S/4HANA adoption begins.

SAP S/4HANA Lines of Business (LoB) solutions integrate with the core. There are options that can be added at any time, and provide best-in-class lines of business solutions and connections to SAP business networks. Customers choose the LOB solutions that suit their businesses, to extend the functionality of the core.

In the past, we had multiple add-on applications surrounding the core (for example, SAP CRM and SAP SRM surrounded the core ECC), but with overlapping models and much redundancy. Overlaps and redundancy have been completely removed from SAP S/4HANA.

A key point is that SAP S/4HANA is built natively and optimally to run only on the SAP HANA platform.

Key Aspects of SAP S/4HANA

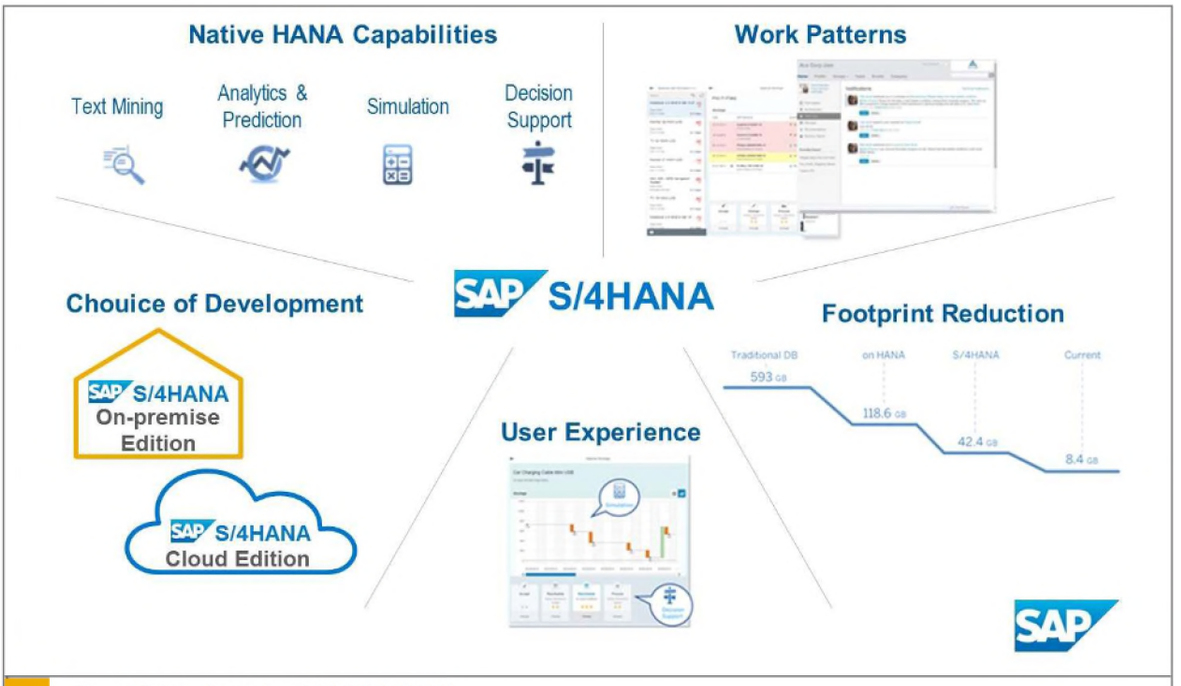

Figure 5: Key Aspects of SAP S/4HANA

The figure, Key Aspects of SAP S/4HANA, highlights the most important aspects of SAP S/4HANA.

SAP S/4HANA is built on SAP HANA, so it inherits all the capabilities of this powerful in-memory data management and application platform. This includes advanced text mining, predictive analysis, simulations, and powerful real-time decision support, with access to any type of data in real time.

A brand new user experience is delivered to improve the productivity and satisfaction of business users and brings the interface up to a consumer-grade experience, optimized for any device.

SAP S/4HANA can be deployed on premise, in the cloud, or a combination of both, to provide flexible consumption options to customers.

The data model has been massively simplified. This means we have lost unnecessary tables, and the data in those tables, in order to shrink the footprint dramatically and simplify the application design and extensibility.

SAP HANA - The Great Simplifier

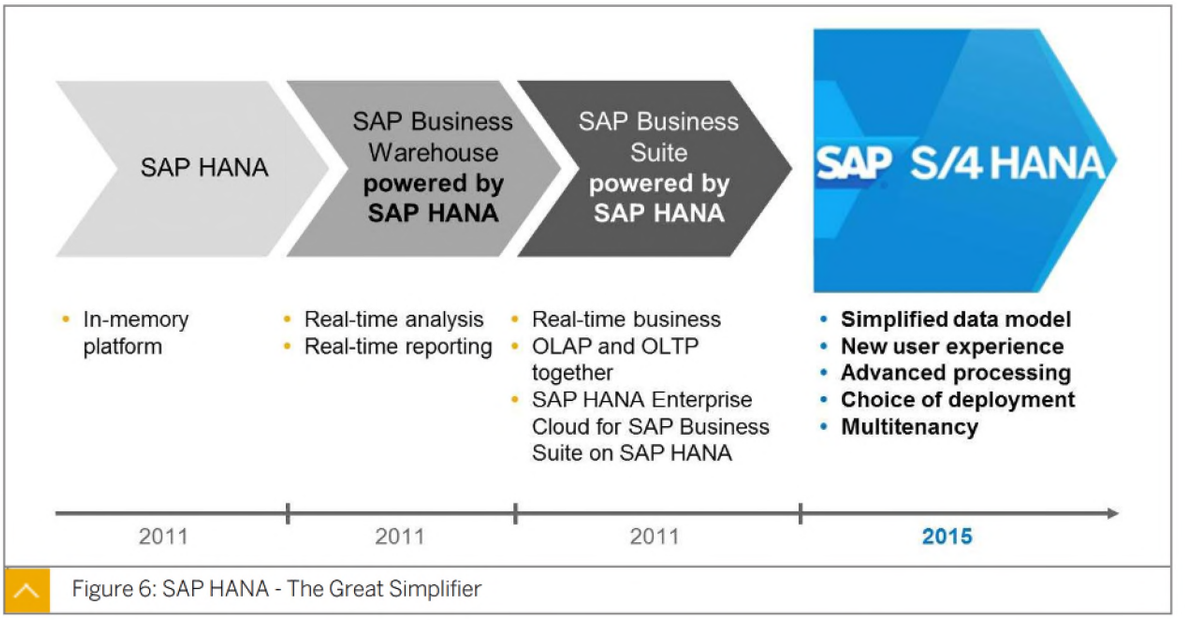

Figure 6: SAP HANA - The Great Simplifier

The key enabler of SAP S/4HANA from the software side is called SAP HANA, and it is the platform on which S/4HANA is natively built.

In 2005, SAP started researching the possibility of developing a new wave of applications built on an in-memory database. When SAP realized that no traditional database vendor had what they needed on the database side, SAP began developing its own in-memory database. SAP worked with leading chip manufacturers to identify to optimal design of a database that could exploit the full power of the new generation of powerful processors.

The first release of SAP HANA was in early 2011. It was initially positioned as a standalone data mart solution, where customers could replicate data from any sources in real time to the in-memory database, and build Business Intelligence (BI) reports and applications on top. This meant BI was an early beneficiary of the power of SAP HANA.

Next, SAP began developing SAP HANA-based accelerators, which were deployed as side-car engines to run alongside traditional SAP ERP functions that were critical to businesses, yet were performing slowly. In simple terms, SAP HANA became a secondary helper database and stepped in to help out with the heavy processing.

Around the same time, SAP developed new, innovative applications that were completely powered by SAP HANA and needed massive processing power, such as Smart Meter Analytics and Oncolyzer.

Around 2012, SAP successfully converted its first major application, SAP BW, to run completely on SAP HANA. This was quickly followed up with the conversion of SAP Business Suite. These existing applications are referred to as powered by SAP HANA, or simply on HANA: for example, Suite on HANA (SoH) and BW on HANA. Ensure not to confuse SoH with SAP S/4HANA, as these are not the same. Conversion means the code has been adjusted to work with SAP HANA and also to take advantage of some basic optimizations.

In 2015, SAP started from scratch and rewrote the complete SAP Business Suite natively to run only on SAP HANA. Unlike Suite on HANA, SAP S/4HANA is a brand new code-line, which works only on SAP HANA. Unlike Suite on HANA, the applications do not have to work on any other vendors' database. This means SAP was not restricted by the limitations of these databases, which meant code always had to be built so it worked with many databases. This

often meant developing over-complicated data models. SAP was finally able to code freely with no compromises, in order to exploit 100% of the power of SAP HANA.

Evolution of SAP S/4HANA

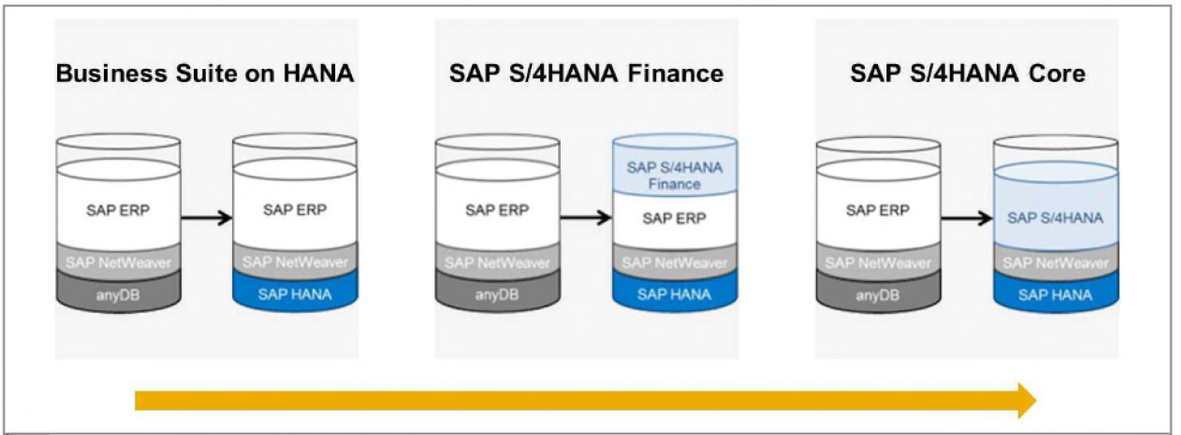

Figure 7: Evolution of SAP S/4HANA

SAP began by rewriting the Business Suite from scratch, and started with finance.

The data model was redeveloped and the application code completely rewritten on the new, simplified data model. The rewritten application is called SAP S/4HANA Finance.

Using the tools, customers can convert their SAP ERP Finance application to S/4HANA Finance and continue to use the existing ERP applications, such as sales, procurement, and inventory management.

S/4HANA Finance and existing ERP applications are fully integrated, so all financial postings made from the existing ERP applications are immediately visible in S/4HANA Finance.

Next, SAP rewrote the remaining ERP applications with new data models and application code, so we now have a full SAP S/4HANA core.

SAP HANA - The Platform for S/4HANA

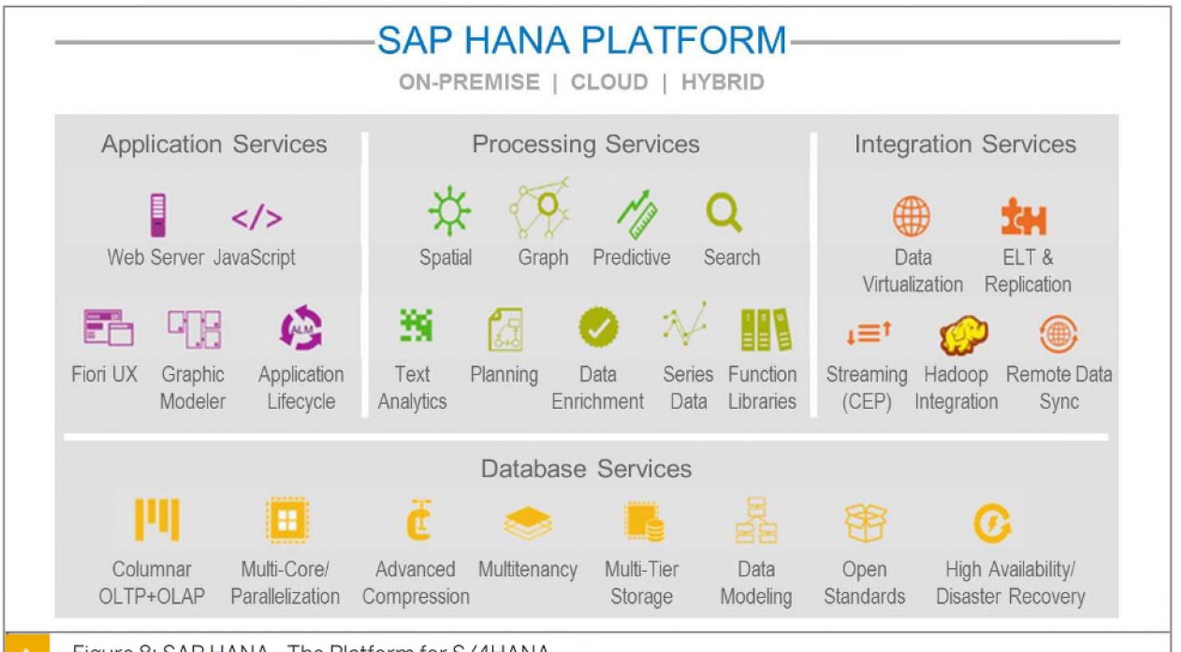

Figure 8: SAP HANA - The Platform for S/4HANA

S/4HANA inherits the built-in capabilities of SAP HANA. This is evident throughout the new S/4HANA applications.

The following list describes some of the key capabilities of SAP HANA:

- Application Services

  As well as a database, SAP HANA can provide many application services. This means that many applications can be built in a two-tier model, rather than a three-tier model. For example, imagine an application that allows a project manager to quickly check that all team members have completed their timesheets. This can easily be developed as a Web application, in which only a Web browser and SAP HANA is required. No application server is needed. This is because SAP HANA can handle the business logic, as well as the database services. SAP HANA provides a full development environment, with productivity tools supplied in the box. Everything the developer needs at design time, and at run time, is there.

- Processing Services

  SAP HANA can handle many new types of data. This includes text, spatial, graph, and more. However, it is not enough to simply store these new data types. We need to be able to build applications that can process and integrate this data with traditional data types, such as business transactions. SAP HANA provides native in-memory engines that process any types of data in real time.

- Integration Services

  SAP HANA has multiple data consumption options built in. It allows you to analyze continual streaming data, read data remotely in any data source, read Big Data stores such as Hadoop, and synchronize in both directions with remote databases and devices that collect data (IoT). SAP HANA has built-in extraction, transformation, and loading (ETL) capabilities, so that separate software is no longer needed to clean, enrich, and profile data from any source.

- Database Services

  SAP HANA is a full in-memory column and row store database that can support both Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP) requirements and is built to run on high-end hardware. It stores data optimally using automatic compression, and is able to manage data on different storage tiers to support data aging strategies. It has built-in, high-availability functions that keep the database running and ensure mission-critical applications are never down.

Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP)

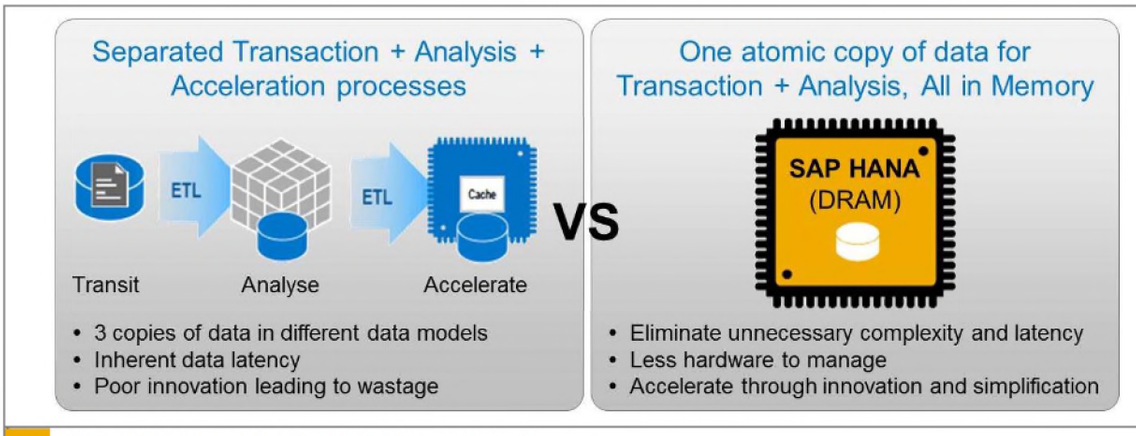

Figure 9: Bringing OLTP and OLAP Back Together

For more than 20 years, organizations have been using specialist software, usually with additional hardware, to extract, transform, and load (ETL) data from transaction systems to dedicated reporting systems. Based on the technology available, this has been the optimal way to provide a holistic view of business data with good response times (especially when you add accelerator software/hardware).

OLTP has been separated from OLAP. This is due to the database design of OLTP and OLAP. Database models have been either built for OLTP optimization or OLAP optimization, but not both.

However, this has also bought with it complexity, redundancy, and latency. It has been common for today's business figures to be available only tomorrow for analysis, once the data has been extracted and loaded to a reporting system.

The database that supports S/4HANA (SAP HANA) can handle both OLTP and OLAP processing from a single data model, so there is no need to move transaction data to a separate system. This means transaction and analytical applications run off the same tables, and data is available in real time at every level of detail.

Traditional Approach to Data Model and Application Code

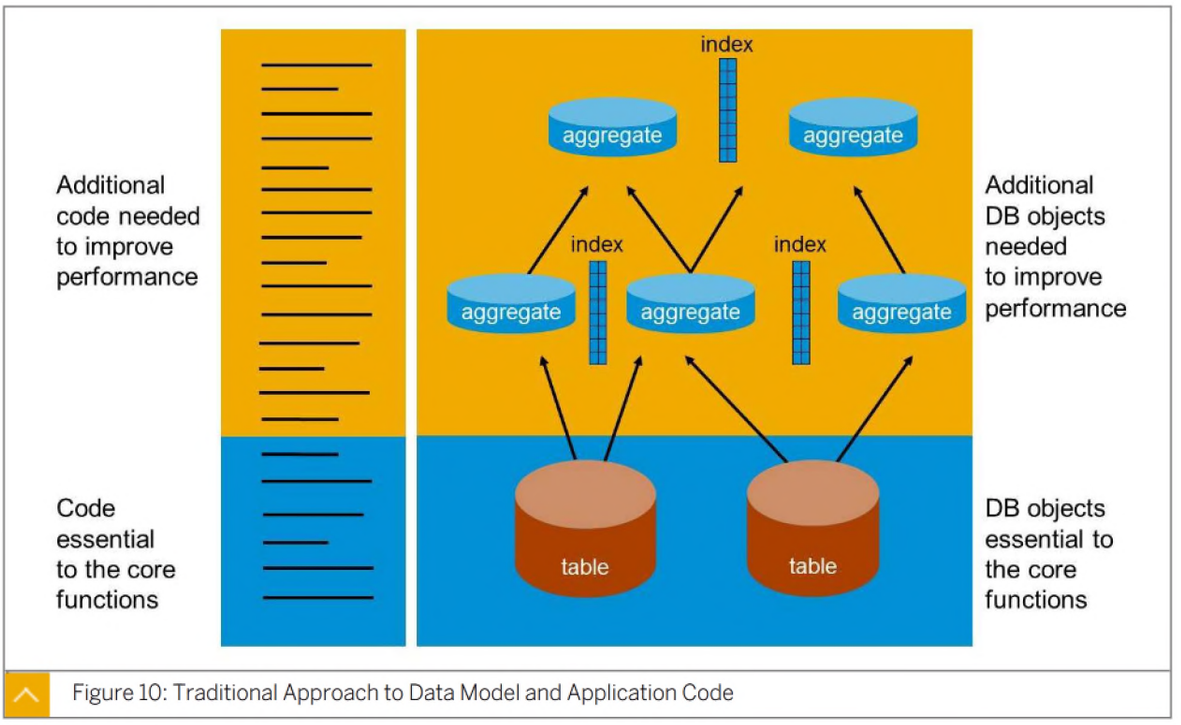

Figure 10: Traditional Approach to Data Model and Application Code

Traditional applications were built on a hierarchical data model. Detailed data was summarized into higher-level layers of aggregates to help system performance. On top of aggregates, more aggregates were built, as well as special versions of the database tables to support special applications. As well as storing the extra copies of data, application code had to be built to maintain extra tables and keep them up to date. These extra tables also needed to be backed up, so even the IT operations were impacted.

In addition to aggregates, another inefficiency needed to be removed. Database indexes improve access speed because they are based on common access paths to data. However, they need to be constantly dropped and rebuilt each time the tables are updated, and more code is needed to manage this process.

The traditional data model is complex, and a complex data model causes the application code to be complex. It has been found that up to 70% of application code is built specifically for performance of an application and adds no value to the core business function.

With a complex data model and complex code, integration with other applications and enhancements is difficult, and not agile enough for today's fast-moving environment.

Remove Complexity with SAP S/4HANA

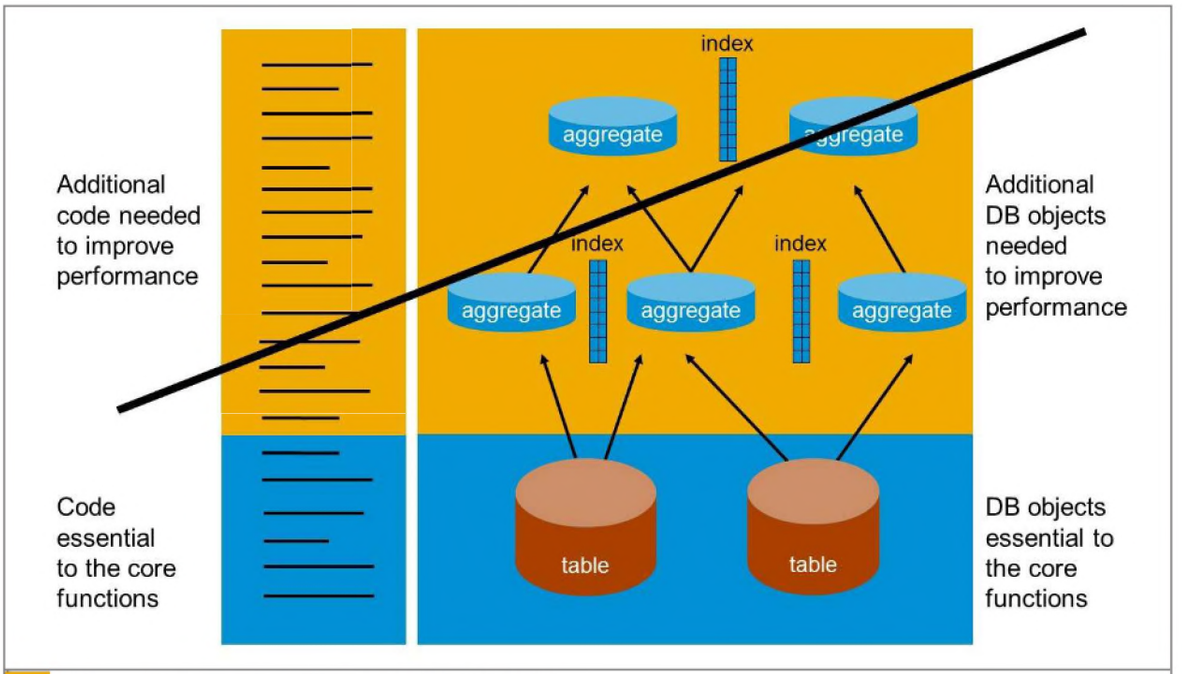

Figure 11: Remove Complexity with SAP S/4HANA

Using the raw power of SAP HANA, we can aggregate on the fly in sub-seconds from any line item table. There is no need for prebuilt aggregates. SAP HANA can generate any view of the data at runtime, all from the same source tables.

SAP HANA organizes data using column stores, which means indexes are usually not needed. They can still be created, but usually offer little improvement. Therefore, as well as losing the aggregates and indexes from the database, we can also lose huge amounts of application code that deal with aggregates and indexes.

We are left with a simplified core data model and simplified application code. It is now much easier to enhance the applications and integrate additional functions.

Reduce Data Footprint

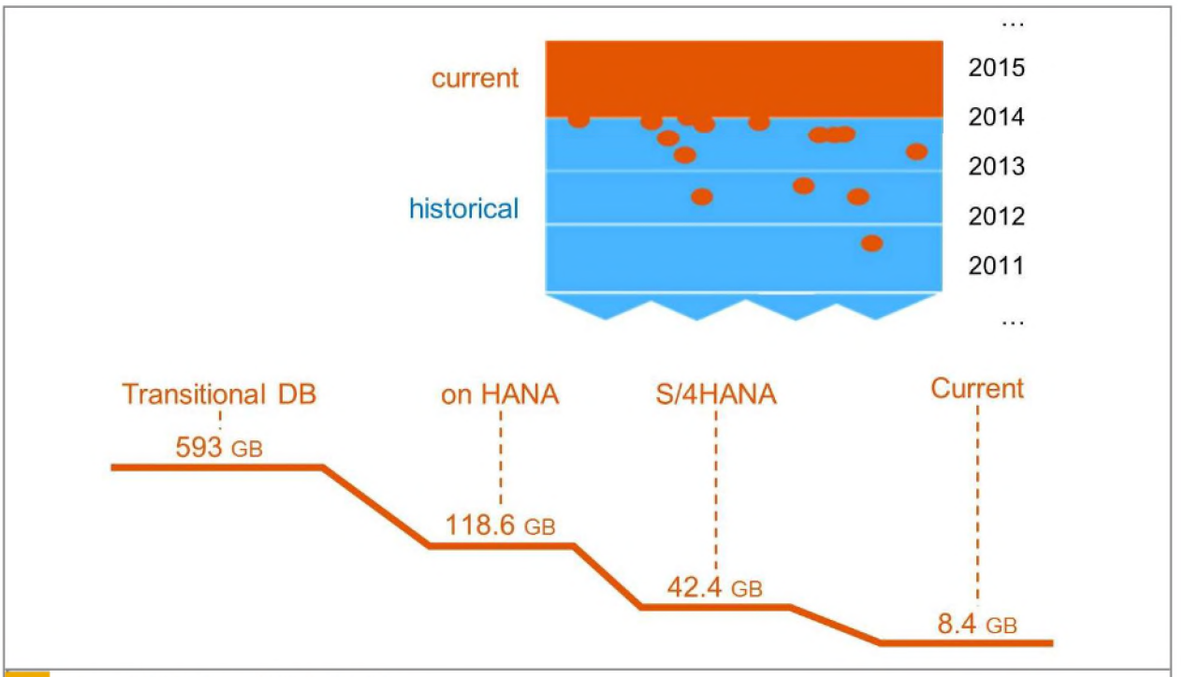

Figure 12: Reduce Data Footprint

Tables in SAP HANA are automatically compressed to enable you to store huge amounts of data within very little space.

Further data footprint reductions are achieved because we removed huge numbers of tables that are not needed, as well as unnecessary indexes.

We can go further and reduce the in-memory data footprint by implementing data aging strategies. SAP HANA can split data across an in-memory tier (we call this HOT storage) and a disk-based tier (we call this WARM storage). All processing and database services are held in common. This means a developer does not need to know where the data is physically located, as this is handled internally by SAP HANA. The benefit of this is that data that is used less frequently can be moved automatically from HOT to WARM storage, so you are not filling memory with data that is less useful. However, this data is still available whenever it is needed.

Compression from HANA, simplification of app redesign, and data aging using tiering adds up to less replication, less network load, and earlier restart over failover.

Simplified Applications

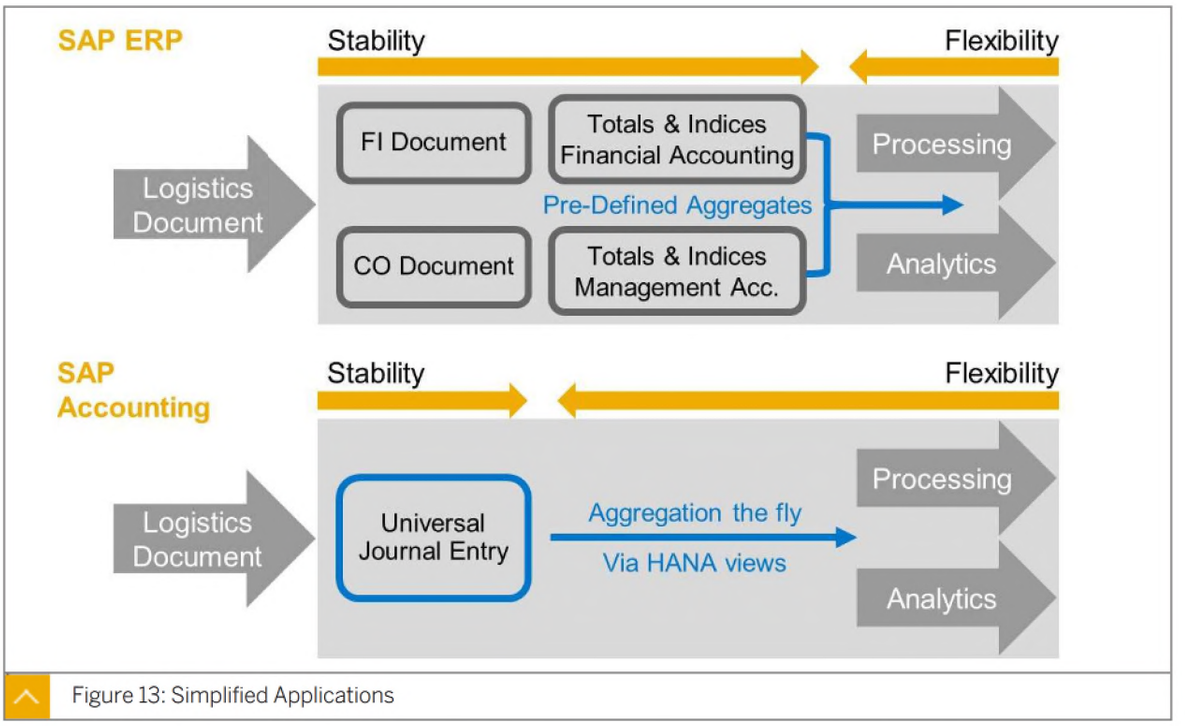

Figure 13: Simplified Applications

We have already covered the simplification of applications from the technical side. Now we look at how simplification also applies to the business side, with an example from finance.

In traditional SAP ERP finance, financial postings have been supported by two key documents, the Finance (FI) document and the Controlling (CO) document. These documents provide the required views of the finance data from a legal perspective (FI) and also an internal management accounting perspective (CO). There is a lot of overlap between these documents. Application code has had to deal with these two types of postings whenever a business event has occurred that triggered a financial outcome, for example, a material receipt.

With S/4HANA Finance, we now have only one document. This is called the Universal Journal Entry. A single financial posting is made to one table, which holds all information that is needed by both legal and management accounting. The application code is simplified and any views of the data that are required are created on the fly by SAP HANA. We do not lose any business meaning, but we lose the underlying complexity of the application.

Previous Complexity

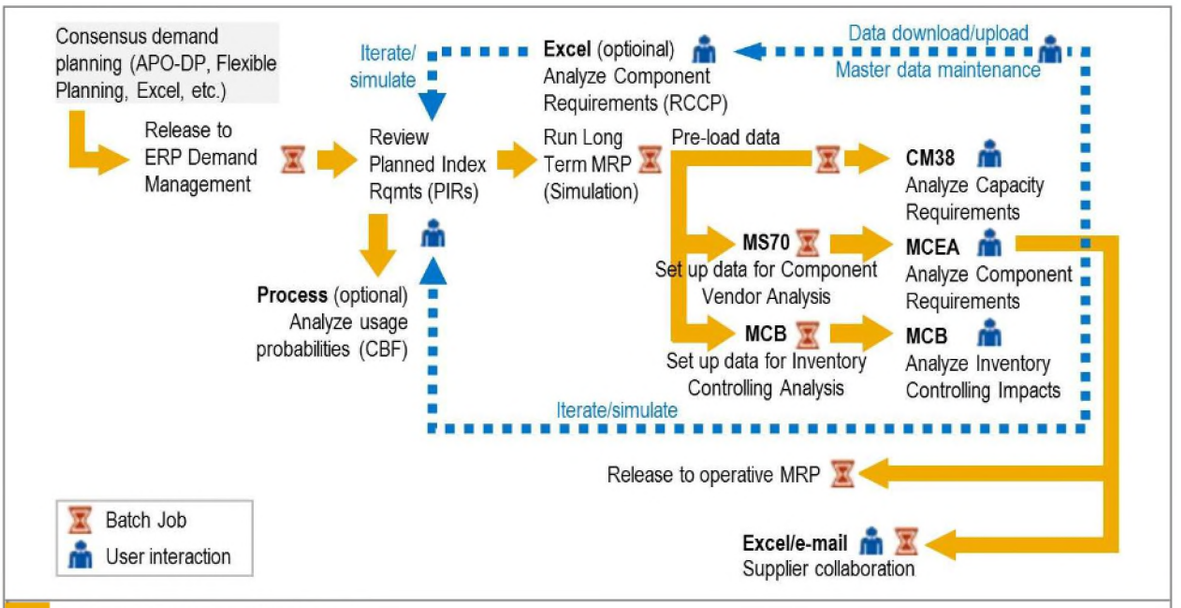

Figure 14: Previous Complexity

Another example of application simplification relates to material requirements planning (MRP).

Usually, this key business process is very complex with many steps and, as a result, can run for a long time before results are produced.

MRP is an iterative process. It involves identifying the components needed to satisfy demand, then checking resource capacity to procure those components, then readjusting the plan. This can take a lot of time, and by the time the processes have completed, the data can already be out of date. For example, you collected the demand data an hour ago and ran MRP to calculate the raw materials, but the demand picture changed while you waited for these results, so information is already out of date.

Therefore, real-time MRP is impossible, and you are always operating and making decisions on out-of-date results. In a fast-moving business where agility is essential, this is not acceptable.

Current Simplicity

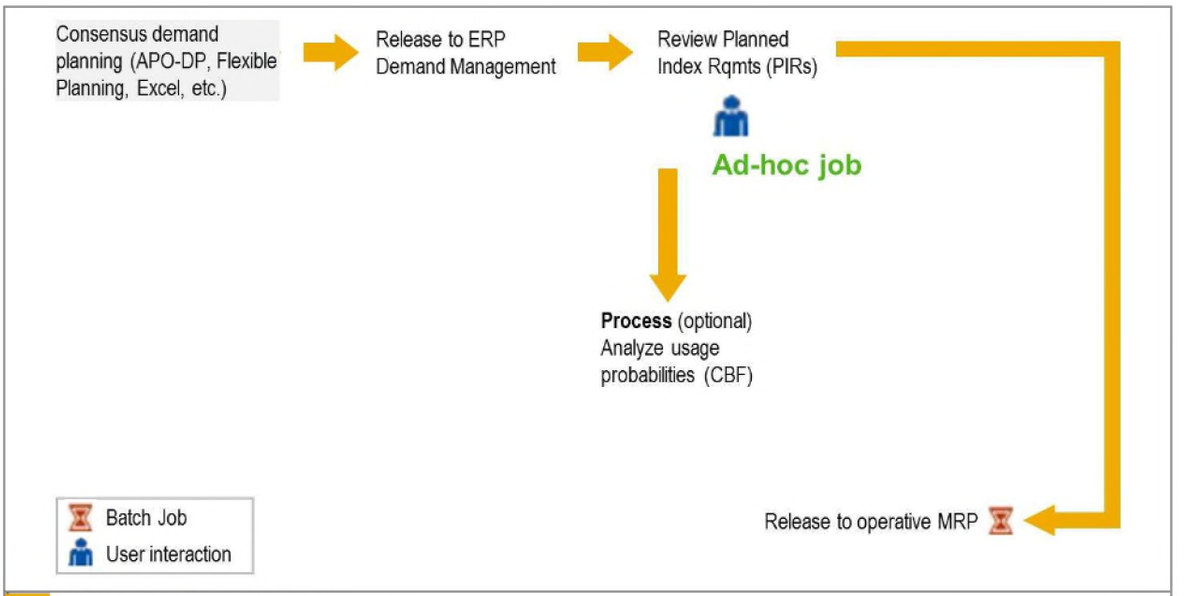

Figure 15: Current Simplicity

With SAP S/4HANA, MRP is a real-time process.

This is achieved because of the raw power available with SAP HANA, and the dramatically simplified data model and application code that runs faster.

MRP is no longer a painful batch process, which means you can run it whenever an individual change occurs in the inventory position right down the BOM component level. This means MRP becomes live.

With S/4HANA, you can now plan right down to a lot size of one. If a customer order is taken, you can immediately determine the effect on all the dependent subcomponents' requirements, but only for that single order. This means the inventory department can immediately begin working on the procurement of the missing items and do not have to wait until the next MRP run to tell them subcomponents are missing.

Next-Generation User Experience with SAP Fiori

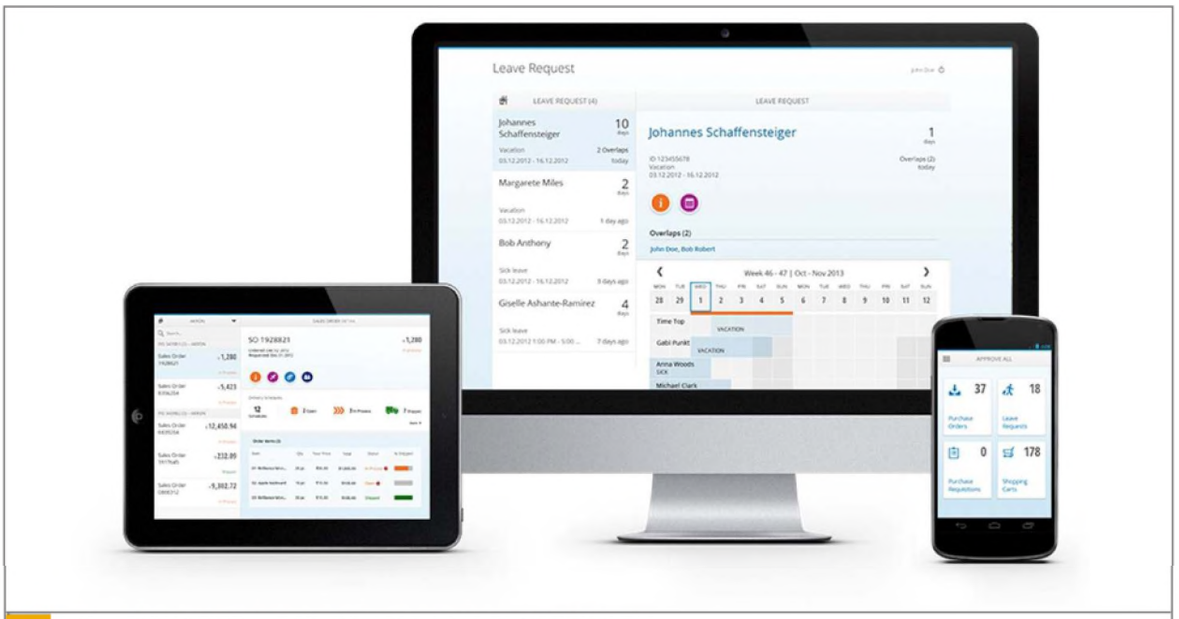

Figure 16: Next-Generation User Experience with SAP Fiori

With SAP S/4HANA comes a brand new user experience. This is called SAP Fiori.

SAP Fiori is not a software product, but the name of a new design approach that was created especially for SAP S/4HANA.

Key aspects of the design of SAP Fiori applications are as follows:

- They must run comfortably on any device, and present a modern consumer-grade quality.
- They focus on specific job functions (as opposed to an overcomplicated screen filled with functions for different users).
- They offer only the essential information that users need to get their jobs done with no clutter.
- A task is completed with very few clicks and screen changes.
- Applications are intuitive to use, with little or no required training.
- They can include embedded analytics to support in-process decision making.
- The look-and-feel can be consistent across all applications.

For the on-premise edition of SAP S/4HANA, SAP GUI is still supported, and can be used alongside SAP Fiori applications to provide an easy transition for existing SAP customers who are familiar with the classic interface. Additionally, there are a number of transactions that are not yet converted to SAP Fiori, and SAP GUI is still needed for those. It is important to remember that very often there is not a 1:1 relationship between a classic SAP GUI transaction and an SAP Fiori application. In many cases, a single SAP Fiori application can replace many individual SAP GUI transactions.

Embedded Analytics and Decision Support

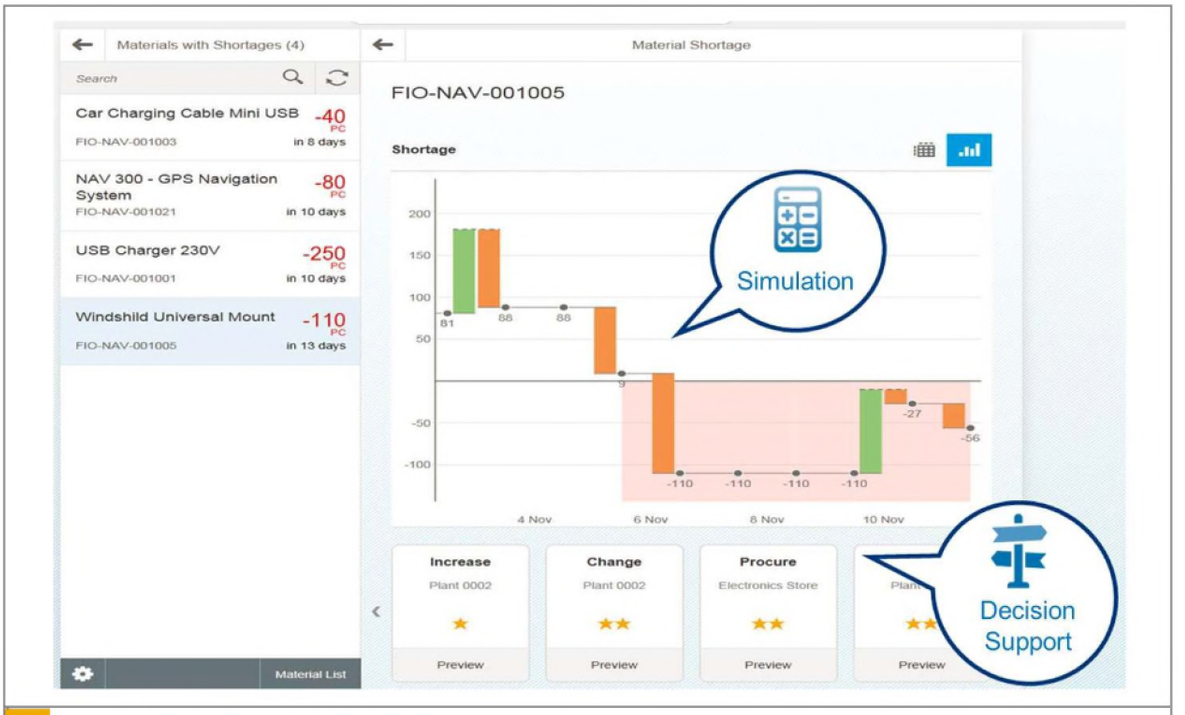

Figure 17: Embedded Analytics and Decision Support

On the left of the figure, Embedded Analytics and Decision Support, we see only the critical missing parts that need to be procured. These parts are presented only because they need some action. As the planner clicks each part, the main screen presents the shortfall situation in an easy-to-interpret graph for analysis. It is possible to drill down on any part of the graph to break down the aggregated demand or supply columns to find out why the parts are being consumed too quickly, and why the supply is falling short.

The planner can choose an action and then simulate the effect before committing.

This is an example of how OLTP and OLAP are now combined.

Ready-to-Go Integration with Existing Cloud Solutions

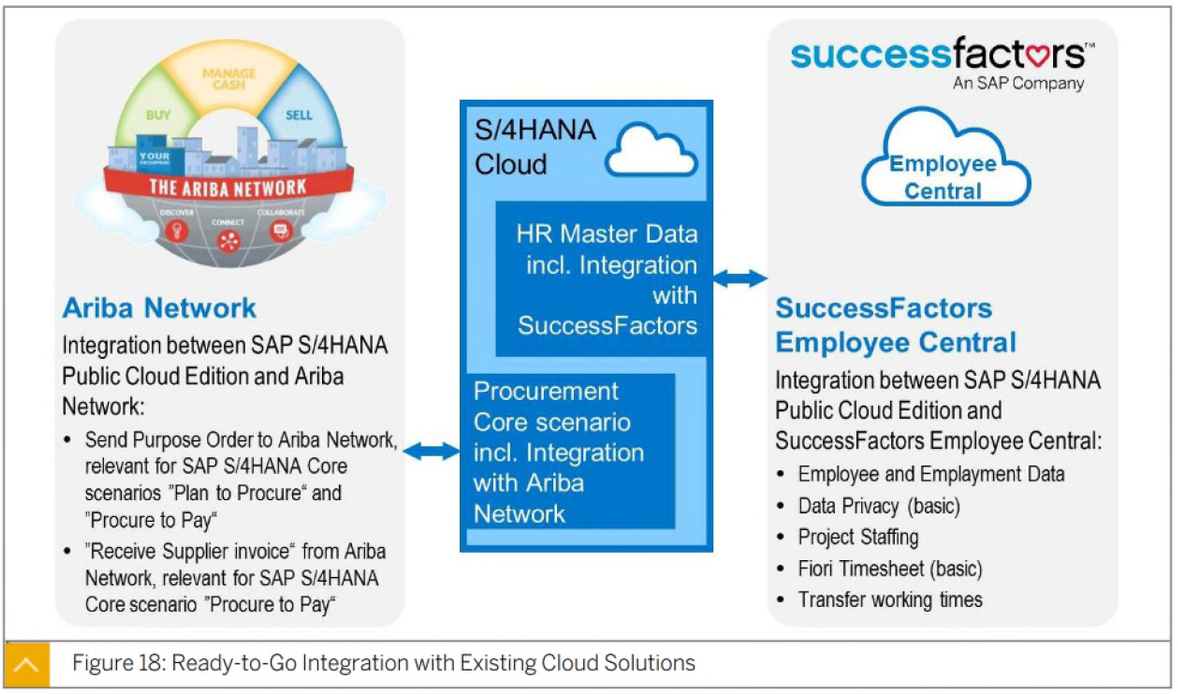

Figure 18: Ready-to-Go Integration with Existing Cloud Solutions

SAP S/4HANA can be natively integrated with the existing SAP Cloud solutions, such as Ariba, Concur, Hybris, SuccessFactors, SAP Cloud Analytics, and SAP Cloud for Customer (C4C).

Consider the following example to help illustrate what this might look like:

A customer deploys S/4HANA in order to implement a core procurement process, such as purchase to pay. Employees are now happy that they can place requests for equipment that they need.

However, employees would really like to be able to read reviews from other purchasers of the same items, just as they do when they are at home using consumer applications, such as Amazon. The employees would also like to be able to ask vendors detailed questions about the items.

By integrating S/4HANA with Ariba Network, this is possible. SAP provides best practices and tools to rapidly integrate S/4HANA with all SAP cloud solutions, including SAP Business Networks.

SAP S/4HANA Deployment Options

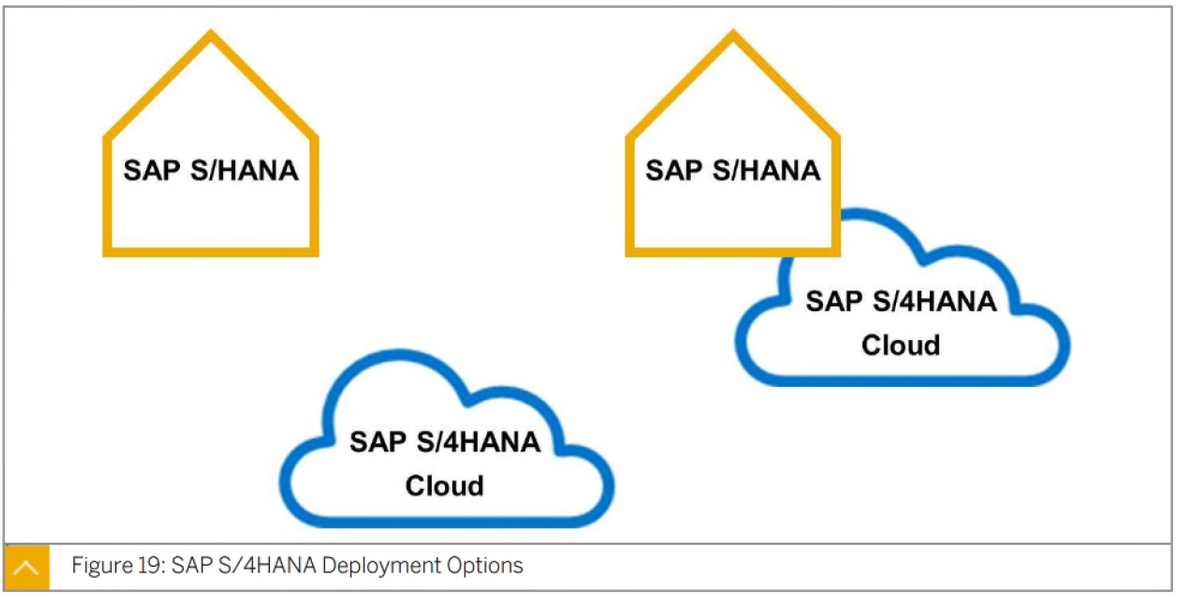

Figure 19: SAP S/4HANA Deployment Options

SAP S/4HANA is available as a traditional on-premise deployment, a cloud deployment, or a combination of both. The cloud solutions can be either a public cloud option or a private cloud option.

On-premise deployments offer greater scope of business functions than the public cloud edition and also far greater flexibility for customization. On-premise customers can also decide exactly when they would like to update their system. However, new functions and innovations are delivered only once per year. Public cloud offers innovations quarterly. On-premise also means the entire application and infrastructure is owned and managed by the customer.

A public cloud deployment of SAP S/4HANA means that customers share the applications and platform with other customers. Each customer's data is strictly isolated, and each customer has their own technical container. Customers do not affect each other regarding performance of the system.

The public cloud edition of SAP S/4HANA contains essential standard core process functionality that, for most customers, is more than enough. But it is not as comprehensive in scope as the on-premise edition. Although each customer uses the standard software, light customizations are possible, for example, to add fields to screens, define new reports, and so on. All new SAP S/4HANA innovations are released for cloud before the on-premise edition and are delivered in quarterly cycles. With the public cloud option, customers must adopt the new innovations immediately, as they do not control the release of new functions. This edition is the type of product that is known as Software as a Service (SaaS).

A private cloud deployment means the customer does not share the applications and platform with other customers, but has their own private SAP S/4HANA application and platform. This is technically an on-premise edition of SAP S/4HANA, but it is completely managed by SAP or hosting partners. The same rules apply as for the on-premise edition. Deeper customizations are possible and the customer can decide exactly when updates are applied. Innovations are available annually.

All cloud deployments offer an annual, subscription-based pricing model, so customers pay for what they need and can add to it later. On-premise continues with the traditional licensing model.

It is also possible to easily combine on-premise with cloud. This can be useful when customers would like to consume standard processes via the cloud but keep the applications that need deeper customization on-premise. We call this a hybrid deployment.

Note:
Recently, the SAP S/4HANA naming changed. The on-premise is the default edition.

Old Name	New Name
SAP S/4HANA, on-premise edition	SAP S/4HANA
SAP S/4HANA, cloud edition	SAP S/4HANA Cloud

For a private deployment of the cloud, we simply add 'private option' to the end of the product name.

At the end of the name, we add the version. The convention is YYMM (YY = last two digits of year, MM = month number). For example, 1511 is November 2015.

SAP S/4HANA Cloud Versions

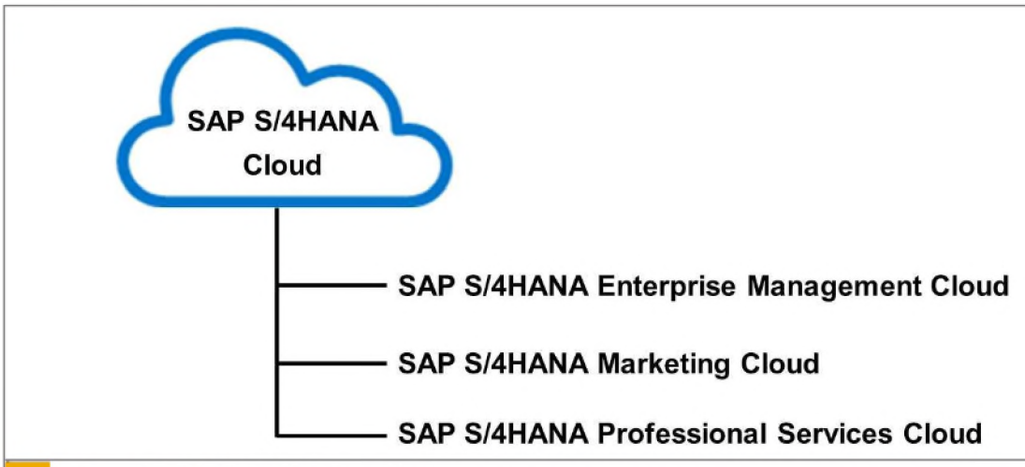

Figure 20: SAP S/4HANA Cloud Versions

The public cloud edition comes in the following three versions:

- SAP S/4HANA Enterprise Management Cloud - Similar to on-premise Enterprise Management, but with a less comprehensive scope of functionality.
- SAP S/4HANA Marketing Cloud - Focuses on the sales and marketing line of business, with deep functionality.
- SAP S/4HANA Professional Services Cloud - Focuses on the professional services industry (such as consulting services).

SAP S/4HANA Release Strategy

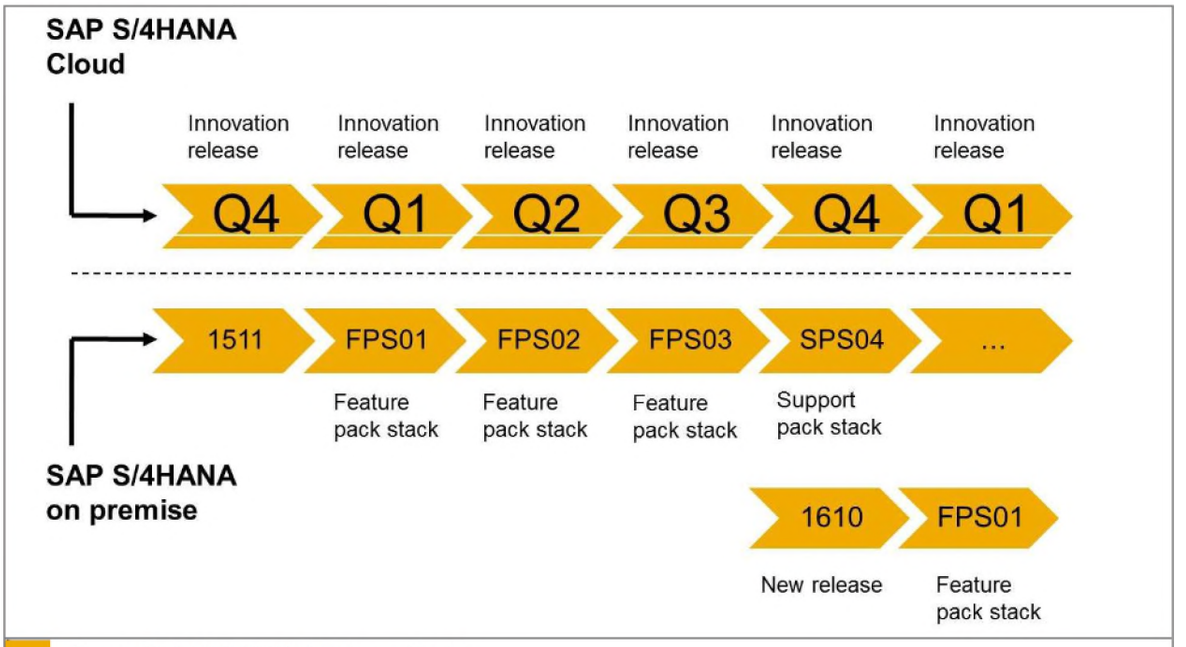

Figure 21: SAP S/4HANA Release Strategy

SAP S/4HANA cloud and on-premise editions have a different release strategy:

- SAP S/4HANA on-premise - SAP ships one major release each year followed by 3 Feature Pack Stacks (FPS) on a quarterly basis. FPS deliver additional innovations as well as fixing issues. Beyond the FPS, SAP continues to ship Support Pack Stacks (SPS) on a quarterly basis to provide further improvements for purely for stability.
- SAP S/4HANA Cloud - This moves at a faster pace and SAP ships a major release each quarter. There are no FPS or SPS releases.

LESSON SUMMARY

You should now be able to:

- Describe SAP S/4HANA and its key features

Learning Assessment

1. What are some of the trends driving the need for a re-engineered business suite built for the digital?

   Choose the correct answers.

   - [ ] A Massive increase in device connectivity
   - [ ] B Business users are taking on more technical IT tasks
   - [ ] C Increase in ownership of mobile devices
   - [ ] D Adoption of cloud computing

2. Why was the application code completely re-written for SAP S/4HANA?

   Choose the correct answers.

   - [ ] A The optimized ABAP code that we developed for Suite on HANA would not work with SAP S/4HANA.
   - [ ] B To take advantage of the simpler data model
   - [ ] C SAP S/4HANA is now built with Java
   - [ ] D To ensure that the code is optimized for SAP HANA

3. What is the missing acronym? **With SAP S/4HANA, OLTP and _____ applications are managed within the same system**

   Choose the correct answer.

   - [ ] A HTTP
   - [ ] B JSON
   - [ ] C ETL
   - [ ] D OLAP

4. What is the name of the SAP S/4HANA core?

   Choose the correct answer.

   - [ ] A Enterprise Resource Management
   - [ ] B Enterprise Management
   - [ ] C Enterprise Central Component
   - [ ] D Enterprise Line of Business (LoB)

5. What is SAP Fiori?

   Choose the correct answer.

   - [ ] A Mobile technology
   - [ ] B User experience
   - [ ] C Data model
   - [ ] D Reporting tool

6. What are the names of SAP S/4HANA cloud editions? (3 correct answers)

   Choose the correct answers.

   - [ ] A Enterprise Management Cloud
   - [ ] B Professional Services Cloud
   - [ ] C Marketing Cloud
   - [ ] D Finance Cloud

7. SAP S/4HANA is built to natively integrate with Business Networks such as:

   Choose the correct answers.

   - [ ] A SAP Ariba
   - [ ] B LinkedIn
   - [ ] C Concur
   - [ ] D SAP Fieldglass
   - [ ] E SAP Hybris

8. What features of SAP HANA enable massive data footprint reduction for SAP S/4HANA?

   Choose the correct answers.

   - ☐ A Support for data aging strategies
   - ☐ B Column store tables
   - ☐ C On the fly aggregation from line item tables
   - ☐ D Use of hierarchical cache

9. What characterizes the architecture of a simple application?

   Choose the correct answers.

   - ☐ A Use of dedicated aggregation tables
   - ☐ B Works with any database
   - ☐ C Push data intensive tasks to SAP HANA
   - ☐ D Reduction in number of tables
   - ☐ E No data redundancy

10. Which edition allows more extensive customer modifications?

    Choose the correct answer.

    - ☐ A On-premise
    - ☐ B Cloud

11. Bonus question: What does the word **`Fiori`** mean? (Clue: it is an Italian word)

    Choose the correct answer.

    - ☐ A Fire
    - ☐ B Flower
    - ☐ C Fury
    - ☐ D Fast

Learning Assessment - Answers

1. What are some of the trends driving the need for a re-engineered business suite built for the digital?

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   - [X] A Massive increase in device connectivity
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UNIT 2 User Experience

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UNIT OBJECTIVES

- Describe the next generation user experience for SAP S/4HANA
- Describe an SAPUI5 application
- Describe SAP Screen Personas

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Unit 2
Lesson 1

A New User Experience

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the next generation user experience for SAP S/4HANA

New User Experience

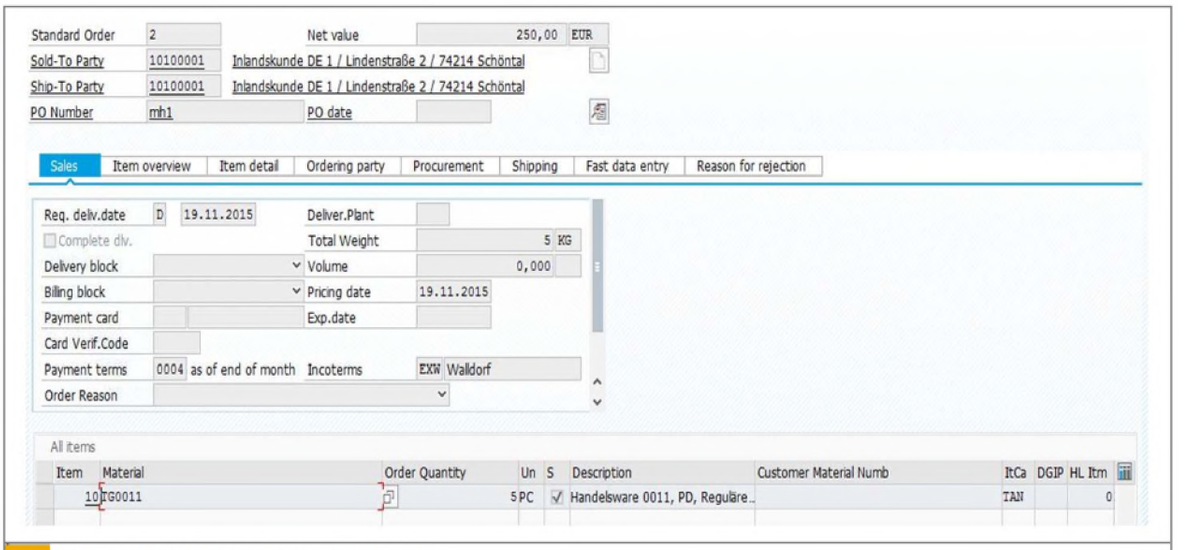


Figure 22: Traditional User Interface

It does not matter how good an application is if the user experience is poor.

In the past, user interfaces all suffered from the same problem. They were too complicated. The main reason for this is that interfaces were often designed around the business function, and not around the person. The result was a cluttered screen that tried to provide many features to many different job roles.

For example, take a sales order screen: How many job roles does this screen support? You might assume one - the sales order entry clerk. However, the reality is that the same screen is used by a large number of people who need to either check information or make adjustments to an existing order. Some examples are as follows:

- A quality assurance worker in the delivery department needs to release a blocked item in the order.
- A finance person needs to adjust tax assignments.
- A salesperson needs to adjust discounts.
- A marketing person needs to apply promotion codes.

- A project manager needs to check that costs have been assigned to the correct project phases.

Each of these people could find themselves using the same screen but only a very small part of the screen. The screen ensures that they all work hard to navigate to the specific area they need, ignoring the options they do not need. Many clicks are required for very little high-value interaction.

SAP Fiori - Next-Generation User Experience

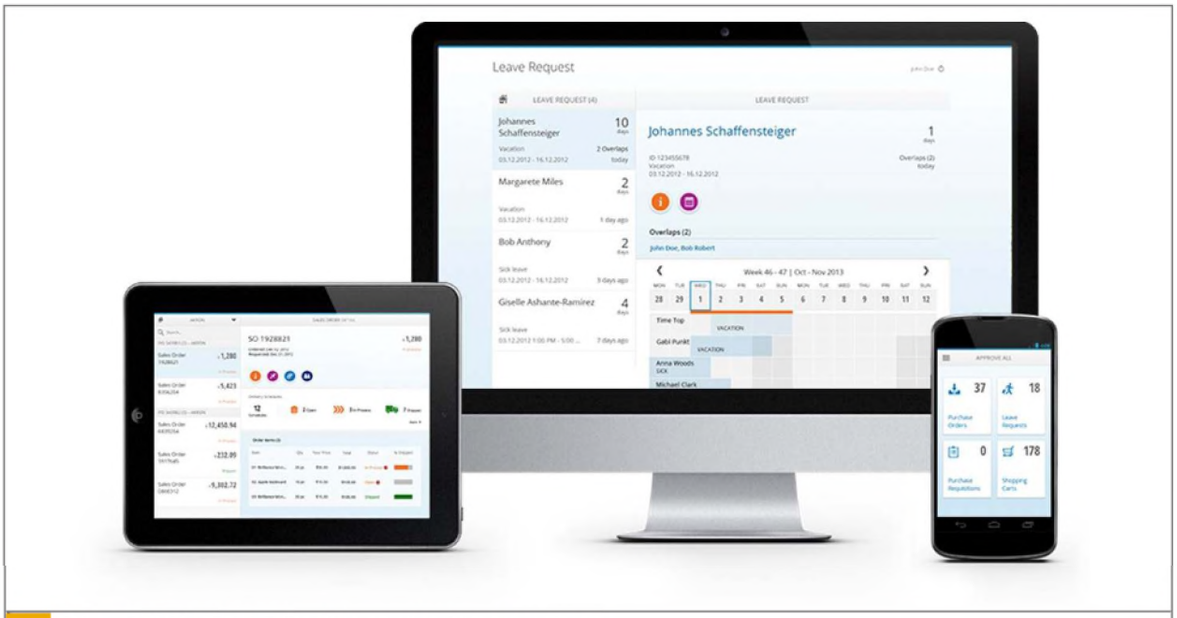


Figure 23: SAP Fiori - Next-Generation User Experience

A key theme of S/4HANA is simplification, and this certainly applies to the user experience. We use the term "user experience" (UX), rather than "user interface" because we need to consider the overall experience of the user, rather than only the look of the screen. For example, if you went to a restaurant that was strong on food presentation, but where the service was poor, you would say that the overall experience was not good, and you would not be keen to repeat it.

It is important to provide not only a great-looking user interface, but also features that help the user become more productive, resulting in a good overall experience. This is what SAP Fiori delivers.

SAP Fiori is a completely new user experience, rather than an upgrade to any existing interface, such as SAP GUI, SAP Portal, or SAP Business Client.

SAP Fiori works on any device that allows users to have the same experience, regardless of the device they choose to use. They can set up a basic sales order in the office using their desktop, then visit the customer to complete the configuration and agree pricing using a tablet. SAP Fiori provides the same look and feel and productivity features on all devices.

SAP Fiori applications are designed using a methodology called Design Thinking, which is a user-centric and solution-based approach to software and user interface design.

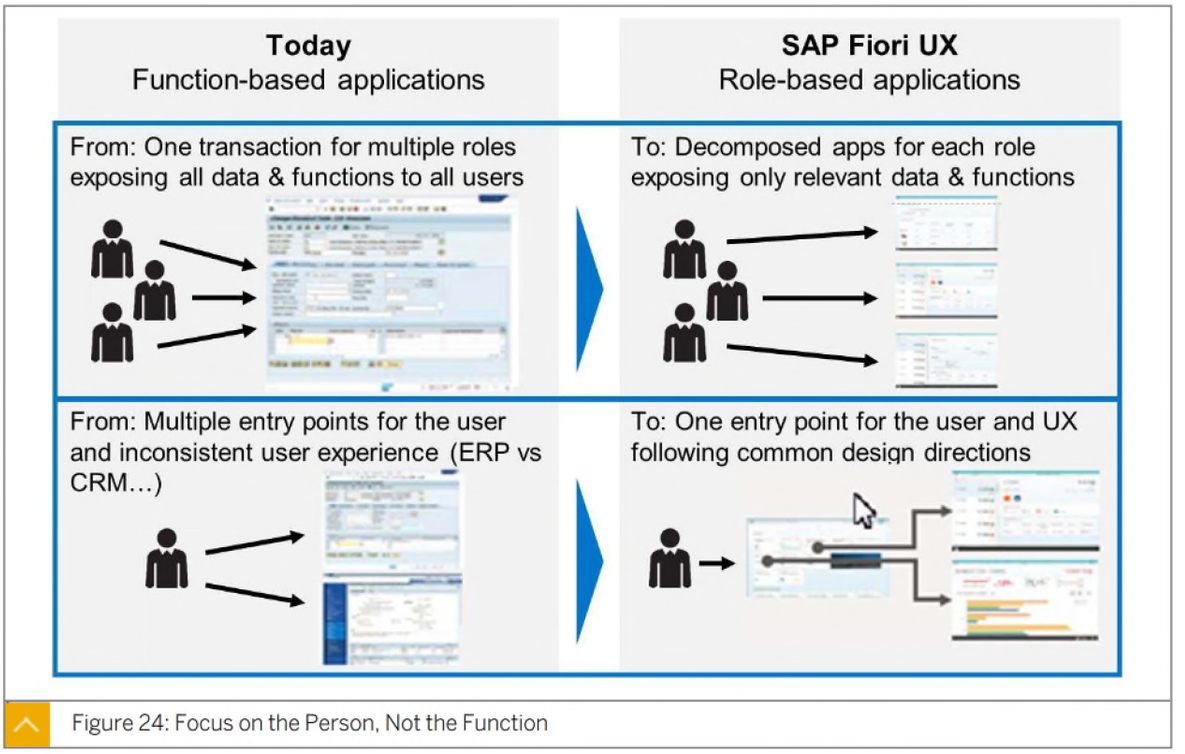


Figure 24: Focus on the Person, Not the Function

A big switch in the design approach with SAP Fiori versus traditional interface design is that the focus is now on the job role, rather than the function.

SAP Fiori applications are always role based. There are many applications to choose from, and they are organized in easy-to-use catalogs supplied with SAP S/4HANA. You need to assign the roles to the users.

Each SAP Fiori application is built around the user, rather than the function. As a result, the screens are very simple and uncluttered. A key goal of any SAP Fiori application is to ensure a user can complete a task with as few clicks as possible.

Very little training is required, as the screens are incredibly simple and intuitive, with only the essential information and options available that make sense for the user. In the past, users could find themselves working with many different interfaces with a completely different look and feel in order to complete a task.

Imagine checking a customer inquiry from SAP CRM using the SAP Portal interface, and then moving to SAP GUI to check the stock availability in ERP. Completely different interfaces are used with their own style and features. They have different buttons, menus, and tools. With SAP Fiori, users work with just one design.

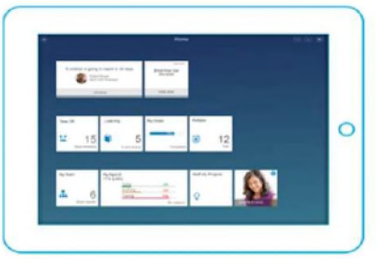
SAP GUI is still available with the on-premise edition, and can be used alongside SAP Fiori, but we recommend using SAP Fiori in order to take full advantage of the features of S/4HANA.

Not all transactions from ERP are converted to SAP Fiori applications, so SAP GUI must still be used in some cases. The cloud edition uses only SAP Fiori applications, and there are no classic SAP GUI screens.

Simplified User Experience with SAP Fiori

SAP Fiori

Offering an beautiful, role based, integrated user experience with modern usability based on mobile first principle.



Example: Clear incoming payments

User Activity	SAP GUI	SAP Fiori	% Reduction
Duration	2:25 min	1:07 min	53%
Clicks	49	22	55%
Screen changes	26	1	96%
Fields filled	9	3	60%

Figure 25: Simplified User Experience with SAP Fiori

It has been mentioned that a key goal of any SAP Fiori application is to ensure a user can complete a task with as few clicks as possible.

In this figure, Simplified User Experience with SAP Fiori, we see the dramatic reduction in clicks, but also the reduction in screen changes and fields that need to be filled with SAP Fiori when working with incoming payments.

This is especially important when the applications run on mobile devices and users expect the most streamlined task possible.

SAP Fiori: An Approach, Not Just Software

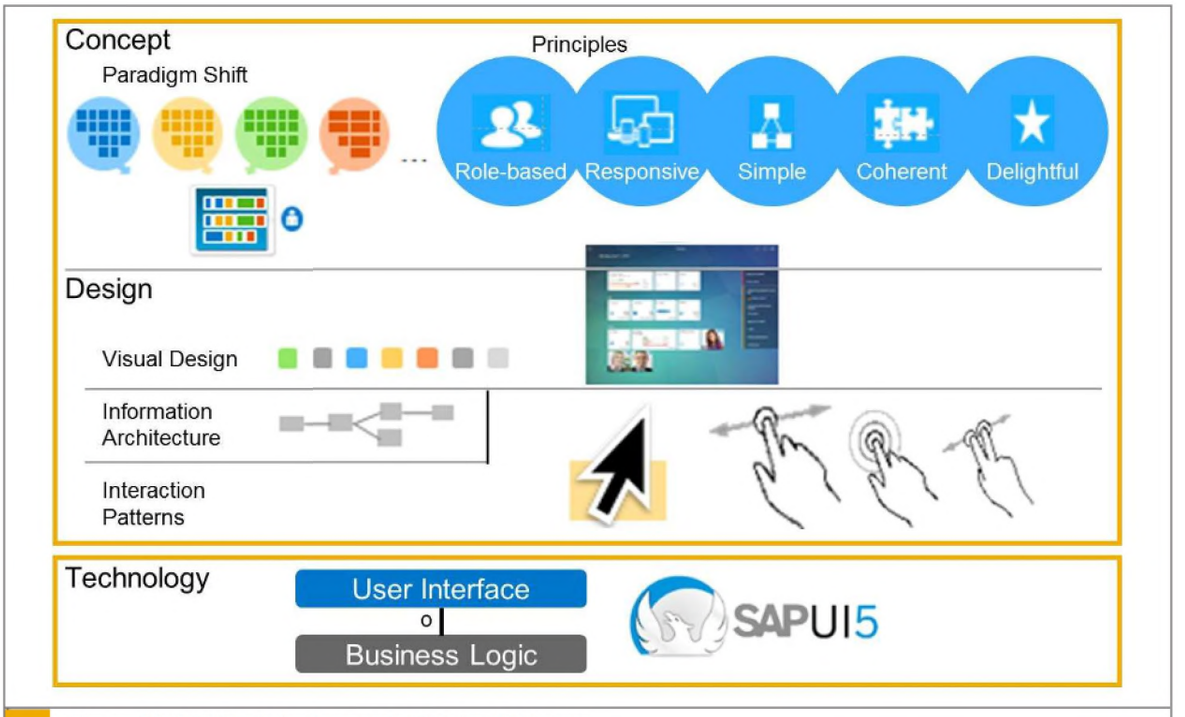


Figure 26: SAP Fiori: An Approach, Not Just Software

SAP Fiori is not a software product, but the name of a design approach that has been applied to the use of our next-generation interface development software, which is called SAPUI5.

SAPUI5 is a family of technologies used by SAP for modern interface development, and includes OData, NetWeaver Gateway, HTML5, and CSS.

In practical terms, a developer uses the SAPUI5 technology but strictly follows the SAP Fiori design approach. This means the developer is guided towards a simple and consistent design.

An easy way to understand SAP Fiori is to break it down into three dimensions:

Three Dimensions of SAP Fiori

- Fiori concept

  The SAP Fiori concept is a simplification of the user experience. It reflects a shift toward delivering a consistent user experience that is centered not only on the tasks and activities that matter, but also on the personal needs of the end user.

- Fiori design

  Anyone designing an SAP Fiori application needs to carefully adhere to the principles within the concept. Think of it as a checklist. Does the application provide minimal clicks? Can the app be used on any device?

  SAP Fiori design reflects the visual design, information architecture, colors, and interaction patterns. Design guidelines are very well documented by SAP and are available online at: **`http://experience.sap.com/wp-content/fiori-guidelines`**. SAP Fiori demands the consistent use of a subset of all the possible design items found in the SAPUI5 libraries, such as buttons, dropdown lists, and so on. Many examples of SAP Fiori designs are available online at: **`http://experience.sap.com/fiori/`**

- Fiori technology

  SAP Fiori technology comprises all the architecture, technology, infrastructure, and programming model components required to build, provision, and run SAP Fiori applications.

SAP Fiori Launchpad

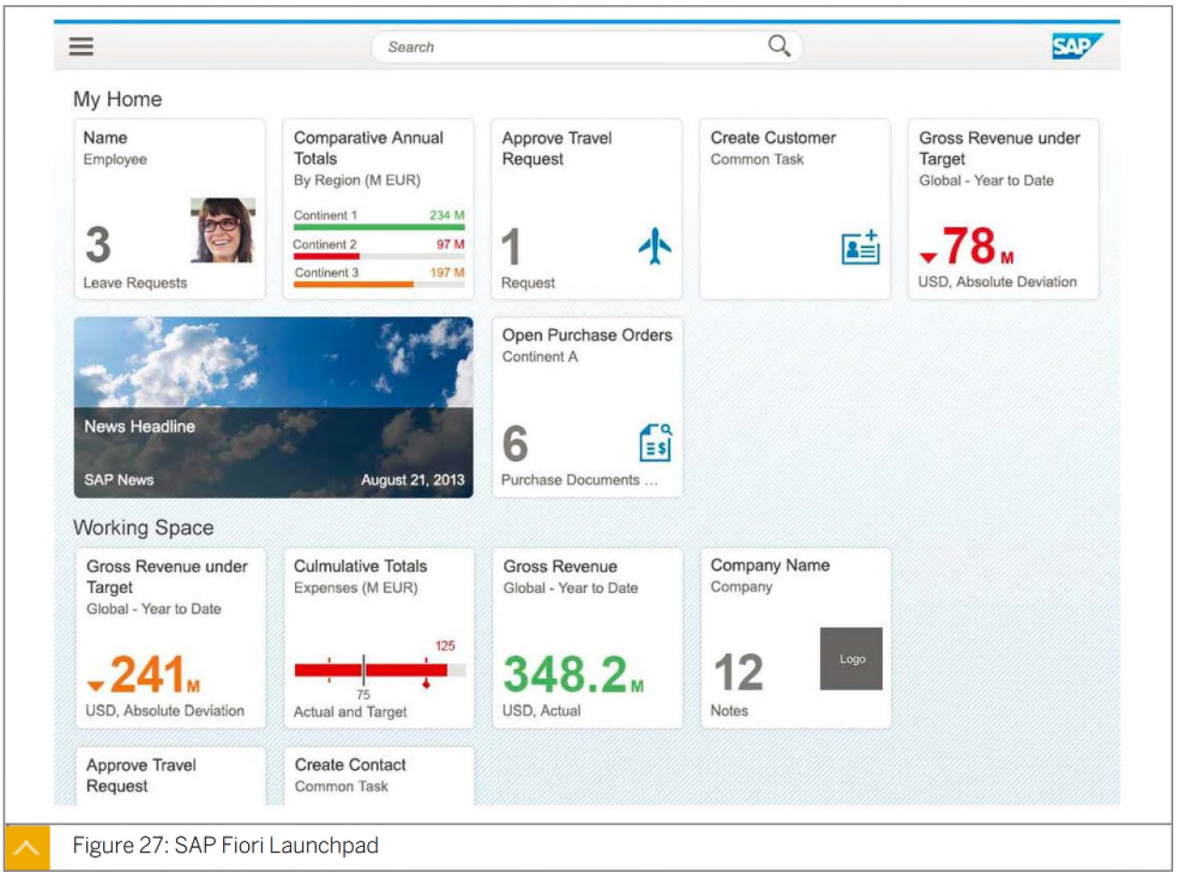


Figure 27: SAP Fiori Launchpad

What do users see when they logon to SAP S/4HANA?

The SAP Fiori Launchpad presents a role-based starting point for users. It presents job-relevant content organized by tiles. Tiles are organized by tile catalogs and tile catalogs are assigned to user roles (PFCG). This means when you assign a user to a role, the user immediately has access to the tiles in Launchpad. Users can decide if they want to hide certain tiles and even rename them.

The tiles are more than just buttons to launch an application. They can expose key information right on the tile surface. For example, a tile to launch the application to unblock orders shows on the surface how many orders are blocked. Before you even click the tile, you know how many orders you need to work through.

Therefore, the Launchpad is a collection of tiles that provide a ready-made cockpit of key information to a user with the ability to click any tile to either launch an application or to drill down for deeper analysis.

SAP Fiori Launchpad also provides a great enterprise search. A user can search for an application or even a business object, such as an employee or sales order. A customer calls with a delivery reference number, you simply type this into the Launchpad search field, and in moments you have every document that refers to the delivery number right in front of you.

Users can select applications from tile catalogs and customize their Launchpad to organize their own tiles into groups to improve their productivity.

Tiles can be used to launch reports, Web links, documents, and more.

Customers can change the look and feel of the Launchpad to follow their own corporate branding.

SAP Fiori Application

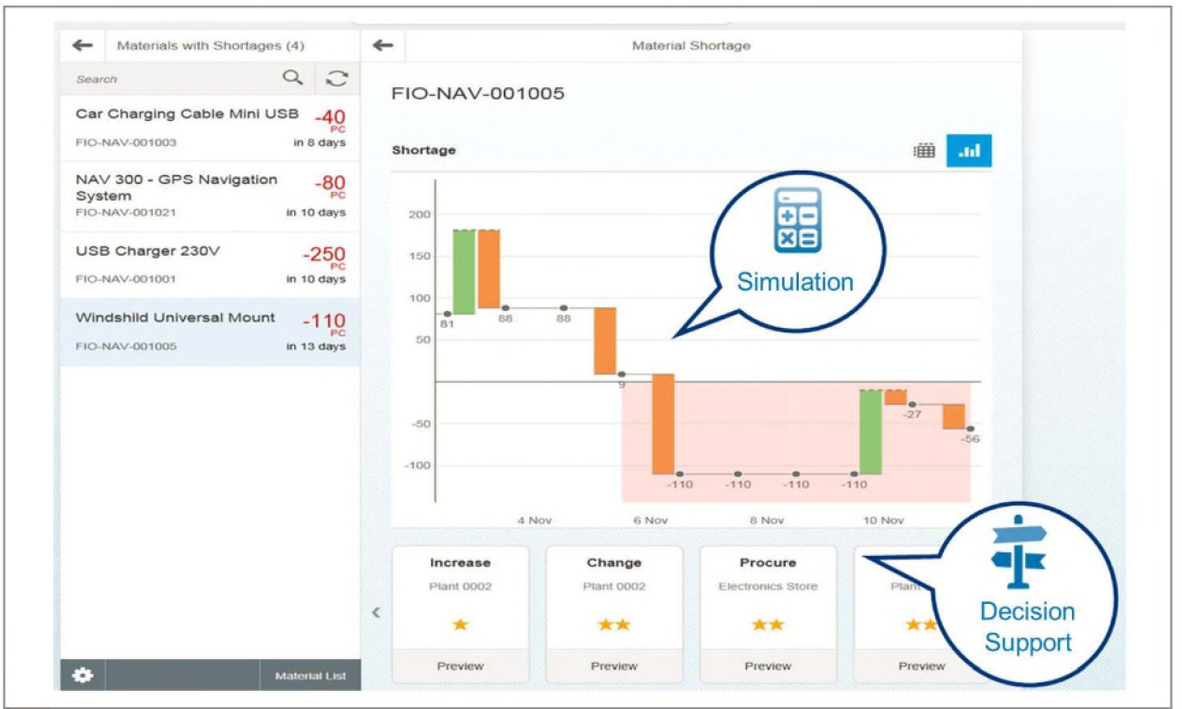


Figure 28: SAP Fiori Application

Some key features of an SAP Fiori application are as follows:

Key Features of an SAP Fiori Application

- Exception driven - only shows orders that need attention, rather than the ones that are fine.
- Fewest clicks to complete a task - no excessive navigation.
- Embedded analytics - a transaction should include all relevant analytics to support in-line decision making. Analytics should be clickable to drill into more detail.
- Next actions - context-relevant next action buttons offer the user only the possible choices when they select an item, with no grayed-out items.
- Fuzzy search - user begins to enter the first few letters of an employee name and SAP Fiori immediately shows the possible choices for completion.
- Provide continual feedback on user's progress - users can see a reducing list of outstanding items as they work through them.
- Works on any device - desktop, tablet, and smartphone.

SAP Fiori Application Types

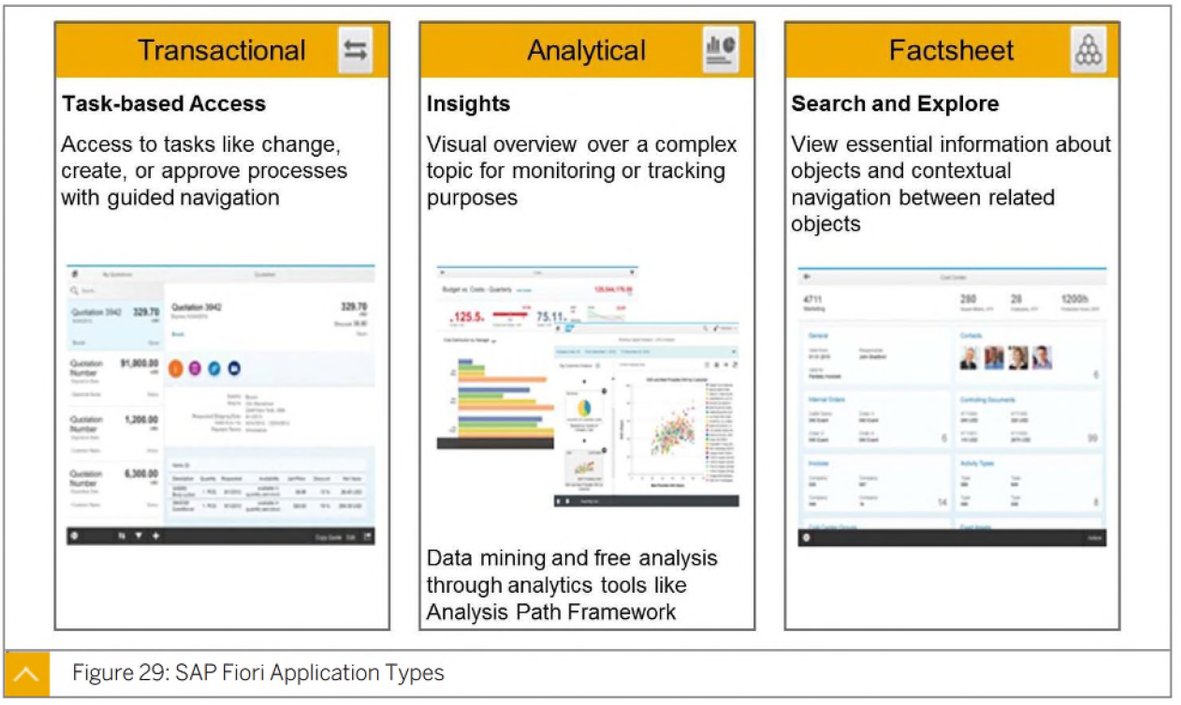


Figure 29: SAP Fiori Application Types

SAP Fiori applications can be classified into different types. Examples include the following:

- Transactional: These follow an optimal design for fast transaction processing, such as purchase receipt entry.
- Analytical: Provides tools required for analysis, graphs, charts, exploration, data mining, and drilldown.
- Factsheet: Provides a 360 degree view of all key information related to a business subject. For example, enter an employee name and all information about that employee appears, such as working hours, vacation, pay, performance, manager, and awards.

This is a good example of the SAP Fiori approach, which is to use a limited number of consistent interfaces to keep things simple.

When a developer creates a new SAP Fiori application, they begin by selecting a template that is based on transactional, analytical, or factsheet, so they have a consistent look and feel.

SAP Fiori Architecture

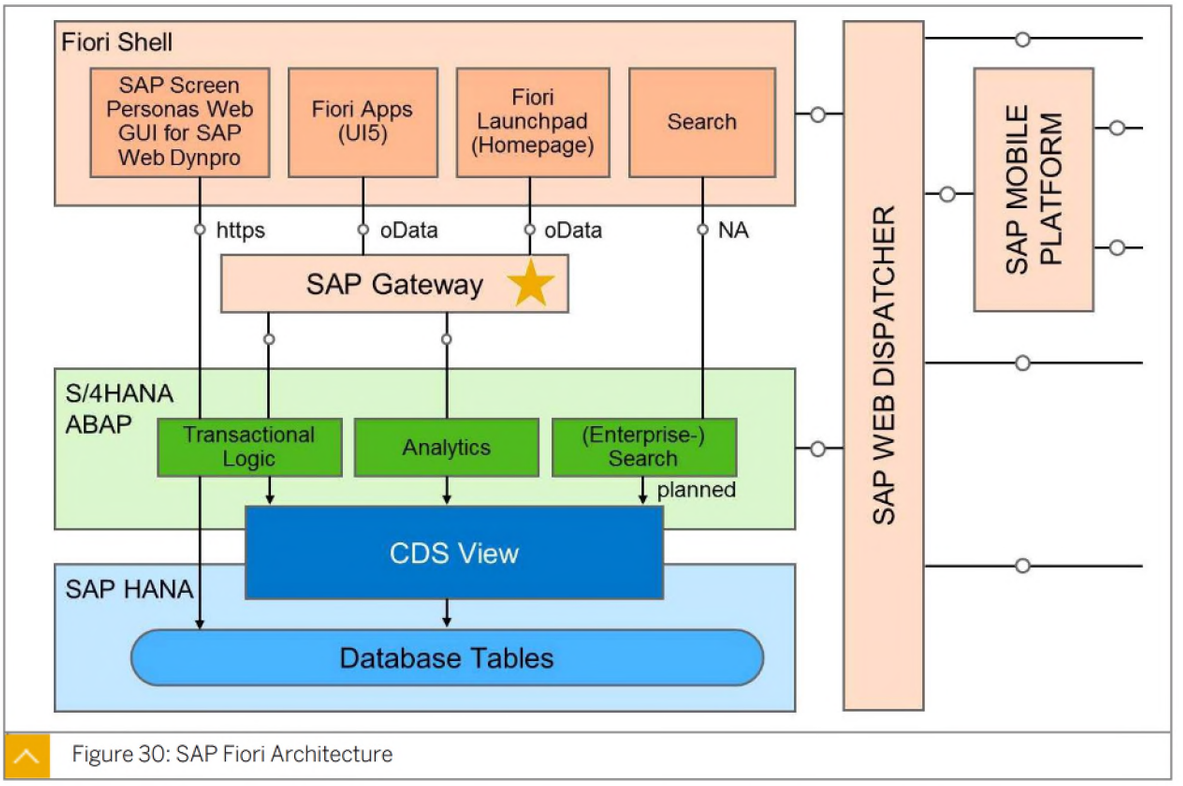


Figure 30: SAP Fiori Architecture

One of the key technical principles of SAP Fiori architecture is to decouple the interface logic from the back-end application logic. This means that, technically, SAP Fiori can be used by any back-end application, as it uses industry-standard methods of connecting the applications to the interface. In this case, the back end is an ABAP-based application (S/4HANA).

Front-end components identify the calling device (phone, tablet, and so on), so you know which native template to use to present the application optimally to the device. The front end also identifies the type of foundation for the application, for example, whether the call comes from Launchpad, a Fiori app, or Personas. (We will deal more with Personas later.)

For applications that access the back end via OData services, the SAP Gateway server is used. Otherwise, HTTPS is used directly with the back end.

The Gateway component can be installed on the AS ABAP back-end server, but for production purposes, we do not recommend this. The Gateway should be deployed on its own ABAP server. Otherwise, performance conflicts could arise. The database for the front-end server can be SAP HANA, SAP ASE, or SAP MaxDB. The back-end server DB is always SAP HANA.

The data can be exposed to the ABAP S/4HANA application directly from SAP HANA tables, but it is more likely to be exposed through CDS views. CDS views provide a business-ready view of the data ready for consumption and is a new approach to reusable data entities. The CDS views sit on top of the database tables.

Note:
For more detailed information on SAP Fiori technology, follow the training courses with the code SAPX__ (SAPUI5) and GW100 (SAP Gateway).

Unit 2
Exercise 1

Discover SAP Fiori Applications

Use the SAP Fiori Apps Library to find SAP Fiori applications for your role and learn about them.

1. Open the SAP Fiori Apps Library.
2. Locate and display the *Sales Order Fulfillment Issues* application using the search features.
3. Select the version of the application for SAP S/4HANA, on-premise edition.
4. Examine the four sample screen images provided with this application.
5. Open the SAP documentation to discover more about this application.
6. Identify the name of the two Business Catalogs (Launchpad) to which this application belongs.
7. What role must I be assigned to in order to use this application?

Unit 2
Solution 1

Discover SAP Fiori Applications

Use the SAP Fiori Apps Library to find SAP Fiori applications for your role and learn about them.

1. Open the SAP Fiori Apps Library.
   a) Open a browser (Google Chrome or Internet Explorer).
   b) Enter the URL **`https://fioriappslibrary.hana.ondemand.com/sap/fix/externalViewer/`**. Alternatively, you can use Google to search for 'fioriapps'.
2. Locate and display the *Sales Order Fulfillment Issues* application using the search features.
   a) On the left pane, choose *By Lines of Business*.
   b) On the left pane, choose *Sales*.
   c) In the *Search by App name* field, enter the word **`fulfill`** (it is not case sensitive) and choose the *Search* button to the right.

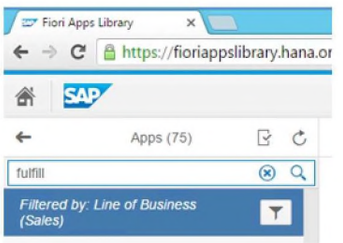


Figure 31: Folie 1

   d) In the result area, choose the *Sales Order Fulfillment Issues* application.
   The main area of the screen displays information about this application.
3. Select the version of the application for SAP S/4HANA, on-premise edition.
   a) Use the drop-down selector to switch the setting from *SAP Business Suite - Latest back-end version* to *SAP S/4HANA*.
4. Examine the four sample screen images provided with this application.
   a) Scroll down until you see the sample screen image and then use the left and right arrows to move between the four screen samples.

If you click an image it will zoom in. Use the browser back button ← to close the zoomed image.

5. Open the SAP documentation to discover more about this application.
   a) Click the *Read more in App Documentation* link.

      A new browser page opens.

   b) After studying the documentation, close the browser page.
6. Identify the name of the two Business Catalogs (Launchpad) to which this application belongs.
   a) Select the *Implementation Information* tab

   b) Expand the *Configuration* section and make sure that you have selected the *delivery date*: *SAP S/4HANA 1511*.

      Under the *Technical Configuration* section, you see the two business catalogs *SAP_SD_BC_SO_PROC* and *SAP_SD_BC_SO_PROC_PS*.
7. What role must I be assigned to in order to use this application?

   Roles are displayed alongside the *PFCG role for Business Catalog*. In this case, the application belongs to two roles, *SAP_BR_INTERNAL_SALES_REP* and *SAP_BR_INTERNAL_SALES_REP_PRSV*. The user requires one of these to use the application.

Unit 2
Exercise 2

Operate the SAP Fiori Launchpad and SAP Fiori Applications

Search for applications, add applications to your home tile group, create a new custom tile group and launch and navigate through an application.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Start the SAP Fiori Launchpad from the Windows apps menu, using your user **`S4H01-##`**, and password **`initial`**.
2. Find all application tiles that contain the word *cancel* in their title using the search feature, and return to the home page to display all applications.
3. Find all objects in the system that include the word *Germany*, and return to the home page to display all applications.
4. Create a custom tile group *My Applications* and assign the following applications to your new group:
   - Maintain Business Partner
   - Create Sales Order
   - Change Sales Order
   - Create Outbound Deliveries
   - Pick Outbound Delivery
   - Create Billing Documents (Work List)
   - Sales Order Fulfillment (All Issues)
   - Query Browser

   Ensure that the applications appear in the sequence listed, from left to right in your new tile group. Change the name of the tile *Change Sales Order* to *Modify my orders*.
5. Launch the application *Sales Order Fulfillment (All Issues)* application and display only orders that have issues relating to the delivery.
6. Open the order at the top of the delivery list and find out why the order is not fulfilled using the *Process Flow* view.

7. What option is the SAP Fiori application offering you to fulfill this order?

_____

_____

_____

8. Return to the Home Page.

Unit 2
Solution 2

Operate the SAP Fiori Launchpad and SAP Fiori Applications

Search for applications, add applications to your home tile group, create a new custom tile group and launch and navigate through an application.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Start the SAP Fiori Launchpad from the Windows apps menu, using your user **`S4H01-##`**, and password **`initial`**.

   a) Click the Windows button  and then click  to see the apps menu.

   Choose 

   to start the Fiori Launchpad

   b) Enter your user **`S4H01-##`** and password **`initial`**.

   c) Choose *Log on*.

2. Find all application tiles that contain the word *cancel* in their title using the search feature, and return to the home page to display all applications.

   a) Choose (*Search*) at the top of the screen.

   The *Search* field opens.

   b) In the *Search* field, enter the word **`cancel`** and press Enter.

   Three application tiles appear in the results.

   c) Choose the *Home* button in the top left part of the screen.

   You see all applications again.

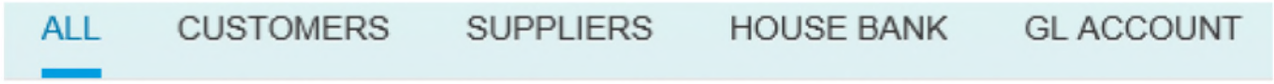
3. Find all objects in the system that include the word *Germany*, and return to the home page to display all applications.

   a) Ensure that the *Search* dropdown is set to *All*.

   b) In the *Search* field, enter the word **`Germany`** and press Enter.

   You see a list of all objects where Germany is mentioned.

c) Click across the header buttons



to move between the different types of objects, such as *Supplier* and *Customer*.

d) Choose the *Home* button  in the top left part of the screen.

You see all applications again.

4. Create a custom tile group *My Applications* and assign the following applications to your new group:

- Maintain Business Partner
- Create Sales Order
- Change Sales Order
- Create Outbound Deliveries
- Pick Outbound Delivery
- Create Billing Documents (Work List)
- Sales Order Fulfillment (All Issues)
- Query Browser

Ensure that the applications appear in the sequence listed, from left to right in your new tile group. Change the name of the tile *Change Sales Order* to *Modify my orders*.

a) Start the personalize mode by choosing the  (*Personalize Home Page*) icon at the bottom right corner of your screen.

b) To create a new group at the top of the screen, choose + *Add Group*.

c) To add an application, choose the + sign within the new group.

d) Use the catalog selector drop down list on the left to choose *Sales – Sales Order Processing*.

e) Choose the + icon  below the *Create Sales Order* application to add it to your group.

f) Choose the + icon  below the *Change Sales Order* application to add it to your group.

g) Choose the + icon  below the *Sales Order Fulfillment (All Issues)* application to add it to your group.

h) Use the application catalog selector drop down list to choose *Sales - Billing Document Management*.

i) Choose the + icon  below the *Create Billing Documents (Work List)* application to add it to your group.

j) Use the application catalog selector drop down list to choose *Logistic Execution – Outbound Deliveries*.

k) Choose the + icon  below the *Create Outbound Deliveries* application to add it to your group.

l) Choose the + icon  below the *Pick Outbound Deliveries* application to add it to your group.

m) Use the application catalog selector drop down list to choose *Query Browser*.

n) Choose the + icon  below the *Query Browser* application to add it to your group.

o) Use the application catalog selector drop down list to choose *Maintain Business Partner*.

p) Choose the + icon  below the *Maintain Business Partner* application to add it to your group.

q) On the left, choose ← (*Back*) to return to the personalize screen.

r) Reorganize the tiles by dragging them so that they appear from left to right in the following sequence:

- Maintain Business Partner
- Create Sales Order
- Change Sales Order
- Sales Order Fulfillment (All Issues)
- Create Outbound Delivery
- Pick Outbound Deliveries
- Create Billing Documents (Work List)

- Query Browser

s) Overwrite the *Enter* group name with the new group name **`My Applications`**.

t) On the *Change Sales Order* tile, choose the small blue triangle at the bottom and select the *Settings* option.

u) Overwrite the tile name with *Modify my orders*, and enter the subtitle, **`Use to adjust pricing`**, and enter the info text **`CFO to agree all Q4 discounts`**.

v) Choose *OK*.

w) To exit the personalize mode, choose (*Exit Change Mode*) at the bottom right corner of your screen.

5. Launch the application *Sales Order Fulfillment (All Issues)* application and display only orders that have issues relating to the delivery.
   a) From your new personal tile group, choose the *Sales Order Fulfillment (All Issues)* tile. You see a list of all orders that are not fulfilled.
   b) Choose the *Delivery* icon  at the top of the screen to show only orders which have a problem in delivery stage.
6. Open the order at the top of the delivery list and find out why the order is not fulfilled using the *Process Flow* view.
   a) To open the details view, choose the first order.
   b) In the bottom left corner, choose the *Process Flow* button.
   c) Notice the red circle around *Delivery* and the text *Shipping Issue, Not yet picked*.
   d) To return to the main *Issue*, click this text and select *Open in Issue*.
7. What option is the SAP Fiori application offering you to fulfill this order?

   Post Goods Issue is offered to get this order shipped.

   a) Look in the bottom right corner.
      You see that *Post Goods Issue* is offered to get this order shipped.
8. Return to the Home Page.
   a) In the top left corner, choose the *Home Page* button.

LESSON SUMMARY

You should now be able to:

- Describe the next generation user experience for SAP S/4HANA

Unit 2
Lesson 2

SAP UI5

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe an SAPUI5 application

SAPUI5 Applications

SAPUI5 Application

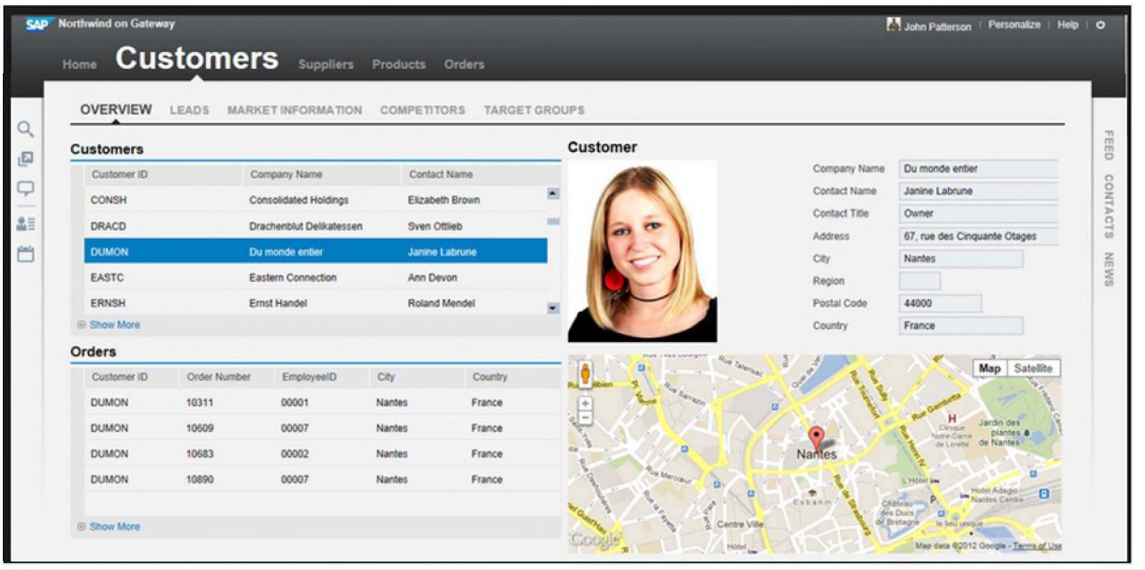


Figure 32: Describe an SAPUI5 Application

As well as SAP Fiori applications, S/4HANA contains many new SAPUI5 applications. What are these and how do they differ from SAP Fiori applications?

SAPUI5 is the family name of the tools and technologies used to develop S/4HANA user experiences. SAP Fiori uses SAPUI5 as the technology, but with strict design and development guidelines to ensure a consistent user experience. Only a subset of all design items in the SAPUI5 library is allowed for SAP Fiori.

However, not all S/4HANA applications are built using SAP Fiori. Some applications have a different design approach that does not need to follow the SAP Fiori design principles and may need more library design items than are allowed for SAP Fiori. For example, there are cockpits in S/4HANA, as shown in the figure.

A cockpit can provide a central area for a worker to react to a variety of customer questions (similar to a call center), or an HR cockpit can have a helpdesk to provide support to

employees who have payroll questions. As you can see, there are various tabs, hiding many features that may at some time be needed.

The aim of a SAPUI5 application is to create a great user experience, but this type of application is more suited to a key decision-maker than a task worker, because more flexibility is needed in an ad-hoc environment.

SAPUI5 applications can be called from the SAP Fiori Launchpad. You can create custom cockpits for employees to use in their day-to-day tasks.

SAPUI5 Application Example - SAP Medical Research Insights

SAPUI5 Application - SAP Medical Research Insights

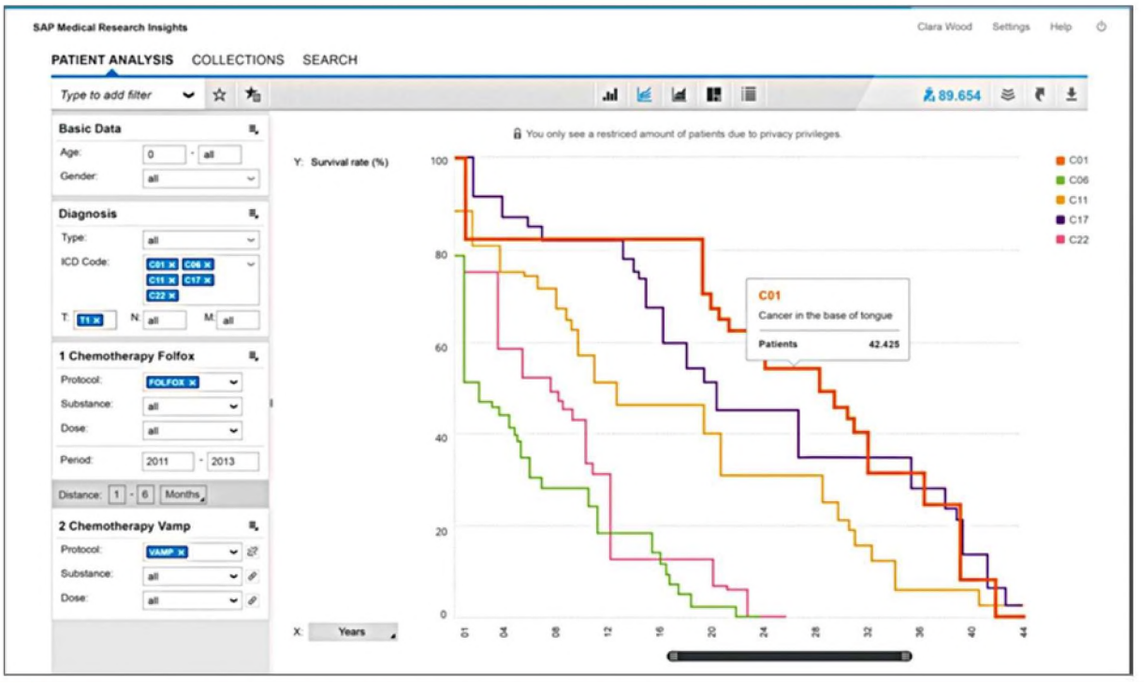


Figure 33: SAPUI5 Application - SAP Medical Research Insights

Healthcare is one aspect of our lives that will be impacted the most by information technology in the coming years. Trends such as personalized medicine, based on in-depth analysis of the human genome, proteome, and other biological data, will change the way diseases are diagnosed and treated.

This is where the software developed by SAP partner Molecular Health comes into play, as it creates an individual tumor data analysis for each patient. This application was built using SAP HANA and SAPUI5. It is another example of SAPUI5 in action.

SAPUI5 Application - Targeted Search

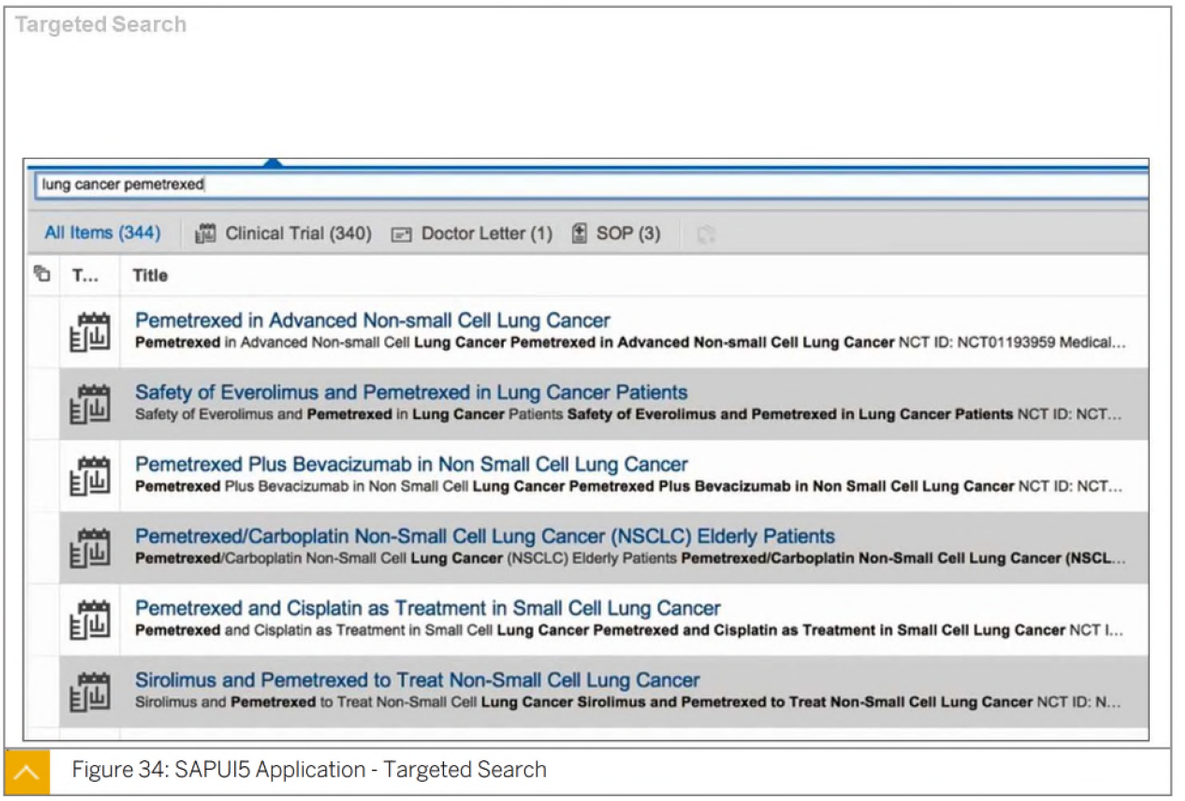


Figure 34: SAPUI5 Application - Targeted Search

This SAPUI5 application is based on a sophisticated text mining scenario. The figure shows a search for documents that contain a series of matching words.

SAP HANA provides the in-memory search engines, and SAPUI5 provides the user experience.

SAP has built a library of example SAPUI5 applications that developers can study and copy to accelerate the build of their own applications. These include shopping baskets, text search, and cockpits.

LESSON SUMMARY

You should now be able to:

- Describe an SAPUI5 application

Unit 2
Lesson 3

SAP Screen Personas

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe SAP Screen Personas

SAP Screen Personas

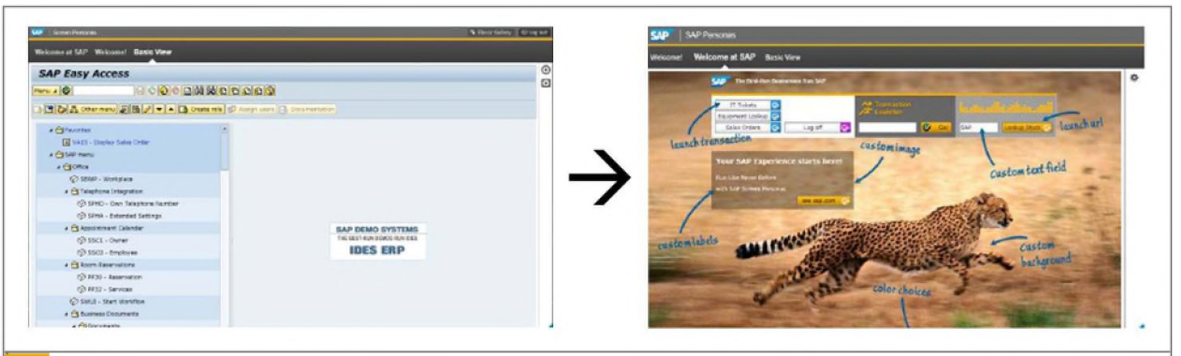


Figure 35: SAP Screen Personas

Customers can use SAP Screen Personas to simplify their existing SAP GUI screens or Web Dynpro ABAP applications to meet their unique needs and increase productivity.

SAP Screen Personas can be used to customize both SAP and customer-created screens, and is available only with the on-premise edition of S/4HANA, and not the cloud edition, where there are no classic screens provided.

SAP provides design guides and Fiori-inspired sample content for SAP Screen Personas. This means you can adjust existing screens to align more to the feel of SAP Fiori, so users truly have a consistent experience, as they move between natively built SAP Fiori applications and Fiori-influenced classic interfaces.

Examples of improvements include the ability to do the following:

SAP Screen Personas Improvements

- Remove unwanted fields and tabs
- Rename fields and other screen text
- Add graphics and colors to brighten up the screen
- Add dropdown lists to screens and prepopulate with suitable values
- Add a video link to launch a tutorial
- Add a button to kick off a sequence of actions or launch a related transaction

Example - Streamline Change Sales Order

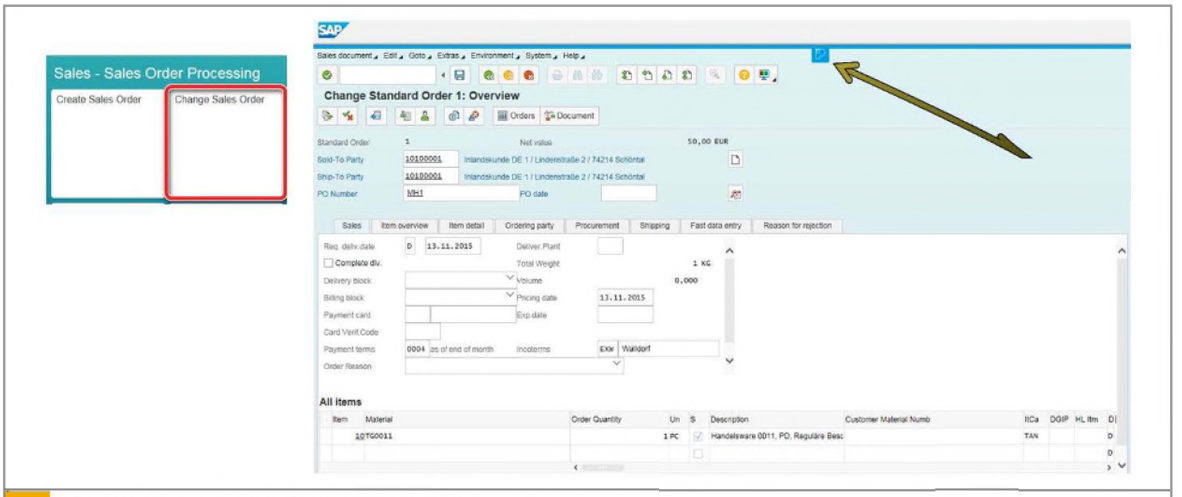


Figure 36: Streamline Change Sales Order

In SAP S/4HANA, there are many Fiori applications that are based on ABAP Web Dynpro. This means that the layout of the screen remains largely unchanged since the classic SAPGUI of ERP. Sales order create, change, and display is an example. However, it is not difficult to dramatically improve the application interface using SAP Screen Personas.

To get started, you simply launch a Web Dynpro application from the Fiori Launchpad and choose the *SAP Screen Personas* button at the top of the screen. Then you arrange the fields as you require. You can create as many personas as you need to align to different business scenarios.

Example-Streamline HR Master Data - Before

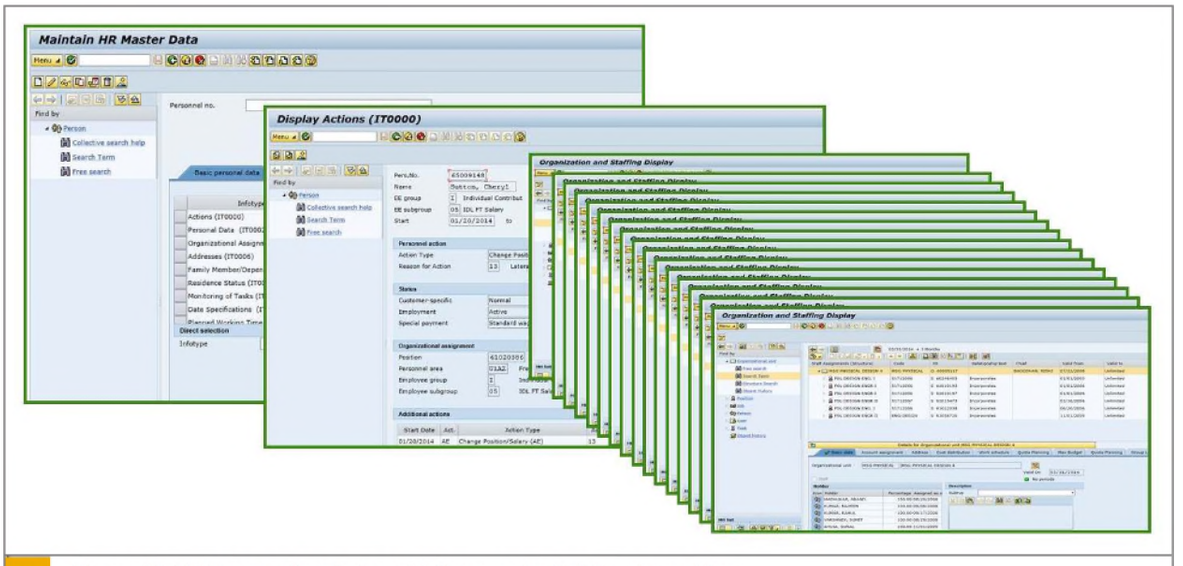


Figure 37: HR Transaction Before: 19 Screens for Full Employee View

A company wishes to simplify the notoriously complex HR transaction, PA30 (Maintain HR Master Data).

The employee record information is all contained in this single transaction, but it takes many clicks to get the complete set of HR master data, including employment history, salary information, and organizational data.

Example-Streamline HR Master Data - After

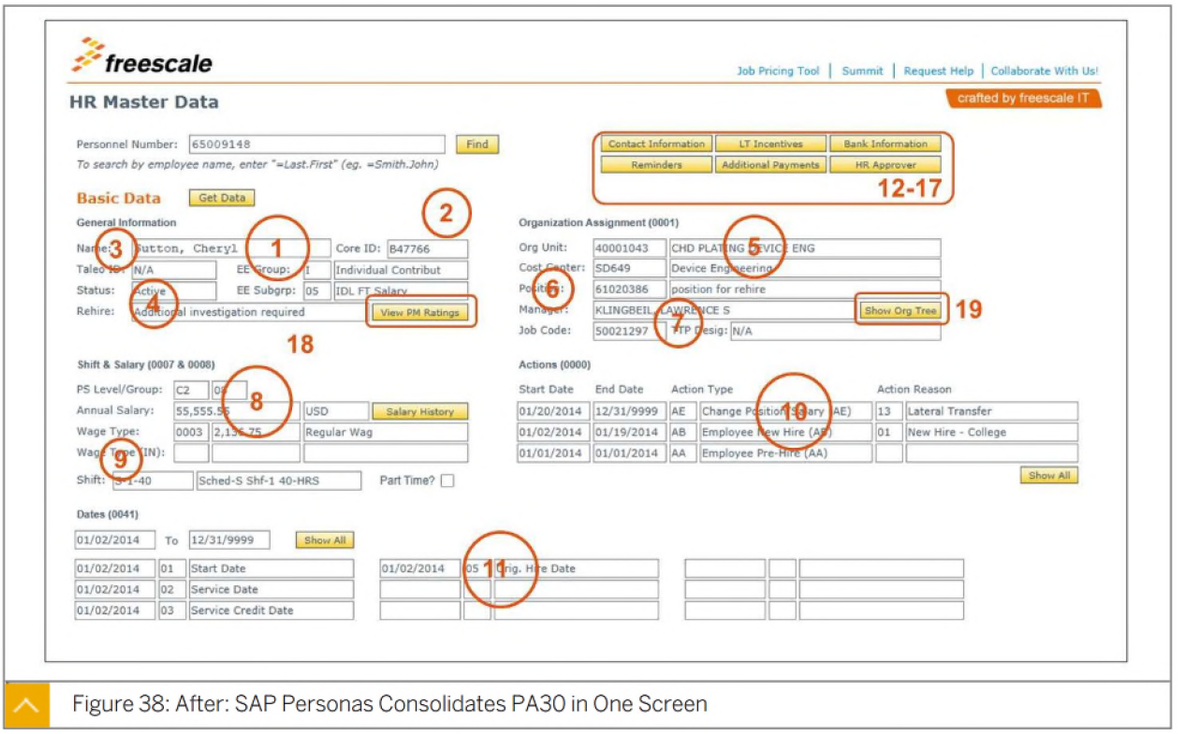


Figure 38: After: SAP Personas Consolidates PA30 in One Screen

It is possible to greatly simplify the screens using SAP Screen Personas. Behind the scenes, you can use Personas scripting to go to different areas of the transactions and consolidate the employee HR record onto a single screen.

While it used to take 3-4 minutes to see all of an employee's information, it now takes a single click. The information populates the screen in about six seconds.

LESSON SUMMARY

You should now be able to:

- Describe SAP Screen Personas

Learning Assessment

1. SAP S/4HANA user experience can be based on which of the following?

   Choose the correct answers.

   - ☐ A SAPUI5
   - ☐ B SAP Portal
   - ☐ C SAP Fiori
   - ☐ D SAP Screen Personas

2. What make up the underlying principles of SAP Fiori?

   Choose the correct answers.

   - ☐ A Design
   - ☐ B Technology
   - ☐ C Concept
   - ☐ D Speed

3. What does SAP Fiori Launchpad offer?

   Choose the correct answers.

   - ☐ A Instant messaging other users
   - ☐ B Presentation of KPIs on tile surface
   - ☐ C Search for applications
   - ☐ D Search for business documents
   - ☐ E Users can organize tiles into custom groups

4. What are common features of an SAP Fiori application?

   Choose the correct answers.

   - ☐ A Fewest clicks to complete the task
   - ☐ B Works offline when network connection is not available
   - ☐ C Works on any device
   - ☐ D Embedded analytics where useful

5. Which are correct statements?

   Choose the correct answers.

   - ☐ A SAP Fiori is based on SAPUI5 technology.
   - ☐ B SAPUI5 is based on SAP Fiori technology.
   - ☐ C SAPUI5 applications follow a less guided design approach than SAP Fiori.
   - ☐ D All SAP S/4HANA applications are based on SAP Fiori.

Learning Assessment - Answers

1. SAP S/4HANA user experience can be based on which of the following?

   Choose the correct answers.

   - [X] A SAPUI5
   - [ ] B SAP Portal
   - [X] C SAP Fiori
   - [X] D SAP Screen Personas

2. What make up the underlying principles of SAP Fiori?

   Choose the correct answers.

   - [X] A Design
   - [X] B Technology
   - [X] C Concept
   - [ ] D Speed

3. What does SAP Fiori Launchpad offer?

   Choose the correct answers.

   - [ ] A Instant messaging other users
   - [X] B Presentation of KPIs on tile surface
   - [X] C Search for applications
   - [X] D Search for business documents
   - [X] E Users can organize tiles into custom groups

4. What are common features of an SAP Fiori application?

   Choose the correct answers.

   - [X] A Fewest clicks to complete the task
   - [ ] B Works offline when network connection is not available
   - [X] C Works on any device
   - [X] D Embedded analytics where useful

5. Which are correct statements?

   Choose the correct answers.

   - [X] A SAP Fiori is based on SAPUI5 technology.
   - [ ] B SAPUI5 is based on SAP Fiori technology.
   - [X] C SAPUI5 applications follow a less guided design approach than SAP Fiori.
   - [X] D All SAP S/4HANA applications are based on SAP Fiori.

UNIT 3 SAP HANA

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UNIT OBJECTIVES

- Describe the key technologies of SAP HANA
- Describe how SAP HANA ensures 100% uptime
- Describe SAP HANA management capabilities
- Describe SAP HANA processing capabilities

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Unit 3
Lesson 1

SAP HANA - Technology Basics

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the key technologies of SAP HANA

SAP HANA Key Technologies

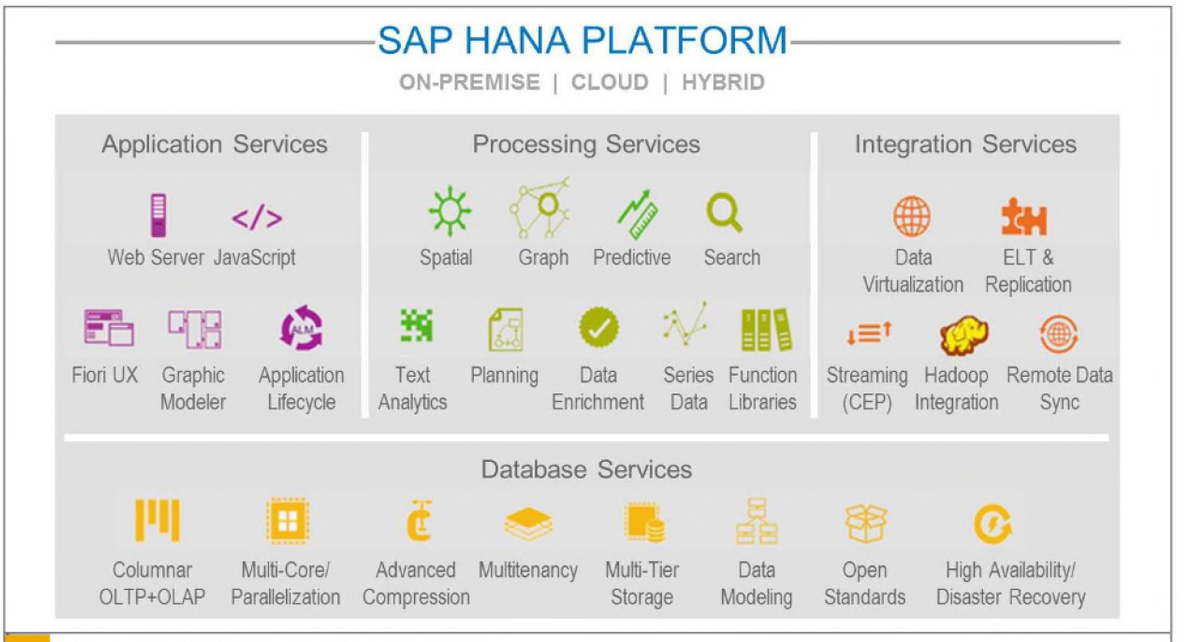


Figure 39: What is Going on in SAP HANA?

The figure, What is Going on in SAP HANA?, illustrates the many services provided by SAP HANA.

SAP HANA is the foundation for SAP S/4HANA and provides many of its critical services, so it is worth taking the time to learn a little about it.

S/4HANA is a business suite that has its own application server. The application server on which S/4HANA is based is SAP NetWeaver AS ABAP. This is the same application server as Business Suite, but is upgraded to suit S/4HANA.

The application server sits on top of the database, in this case, and SAP HANA provides all the database services that S/4HANA requires. However, SAP HANA is far more than a database. It is an application and data management platform with a very large portfolio of capabilities that power the new applications that require real-time, instant responses on a variety of different data types.

Hardware Architecture Trends

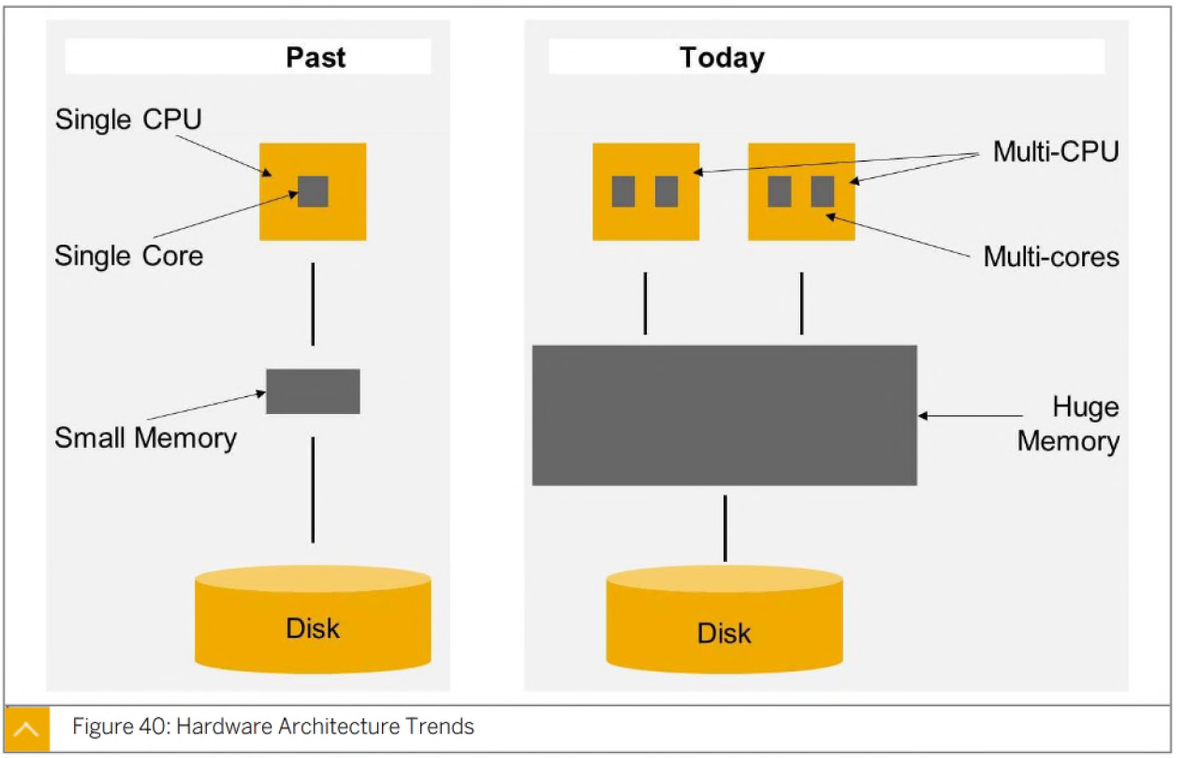


Figure 40: Hardware Architecture Trends

SAP HANA takes full advantage of the recent trends in hardware evolution.

Historically, the high cost of memory meant that only small amounts were available. This caused a serious bottleneck in the flow of data from disk to CPU (see the figure, Hardware Architecture Trends), with the CPU waiting idle for data to arrive through the tiny gateway.

Due to prices falling in the market, we now have access to huge amounts of memory. SAP HANA runs on hardware with many terabytes of memory. In fact, with so much memory available, the entire database of even a large organization can be stored completely inside memory, so there is instant access to all data and wait times are eliminated. Memory is no longer the bottleneck it once was.

In addition to huge memory, the processors continue to improve at a phenomenal rate. We have high-speed, multi-core processors that can take on complex tasks and process them in parallel. This means response times for even the most complex analytical tasks, such as predictive analysis, can be carried out in real time.

SAP could have kept the same business applications produced 20 years ago, along with the traditional databases that supported them, and installed all of these on the new hardware. There would be some gains, but traditional databases and applications were designed around old, restricted hardware architecture. This means they would not be able to fully exploit the power of the new hardware.

Put simply, the business software needed to catch up with advances in hardware technology, so a complete rewrite of the business suite was required.

SAP HANA Database

Figure 41: Column Store and Row Store Tables

Let's turn our attention to the heart of SAP HANA - the database. The SAP HANA database is fully in-memory, so it is very fast.

The SAP HANA database is fully ACID-compliant. This means Atomicity, Consistency, Isolation, Durability. This is the mark of a database that is built to be 100% reliable for mission-critical applications, where fast, simultaneous read and write operations are applied to the same data sets. The ACID standard guarantees there will never be partially updated records. You can fully trust the data at all times.

Most traditional business databases are row based. Some specialist analytical databases are column based. SAP HANA is built to support both types. Fast-moving transaction applications usually work better with row store tables, whereas analytical applications that perform a lot of aggregation work better with column store tables.

Both storage types are needed in a system that handles both transactional and analytical applications in one platform, as is the case with SAP S/4HANA.

Column store tables are incredibly efficient, especially for analytical applications where access to data sets is not predictable and we often do not know which columns are required. Column store tables work well with aggregation functions, such as sum, average, min, and max. Column store tables are automatically compressed, and can also be optionally partitioned. Column store tables are optimal for parallel processing. Why do we need row tables at all?

The downside to column store is the cost of reconstructing complete records from the columns if all data is required by the application. This is the case when the application is transactional and all fields are needed for an update, insert, and delete. Additionally, for write-intensive applications, column store tables are not optimal compared to row store tables.

Row storage is still needed to support fast-moving transaction processing when aggregation is not the main priority. Row store tables are not compressed and cannot be partitioned.

SAP S/4HANA combines transactional and analytical applications, so it utilizes both column and row store tables.

Better Memory Utilization with Column Store

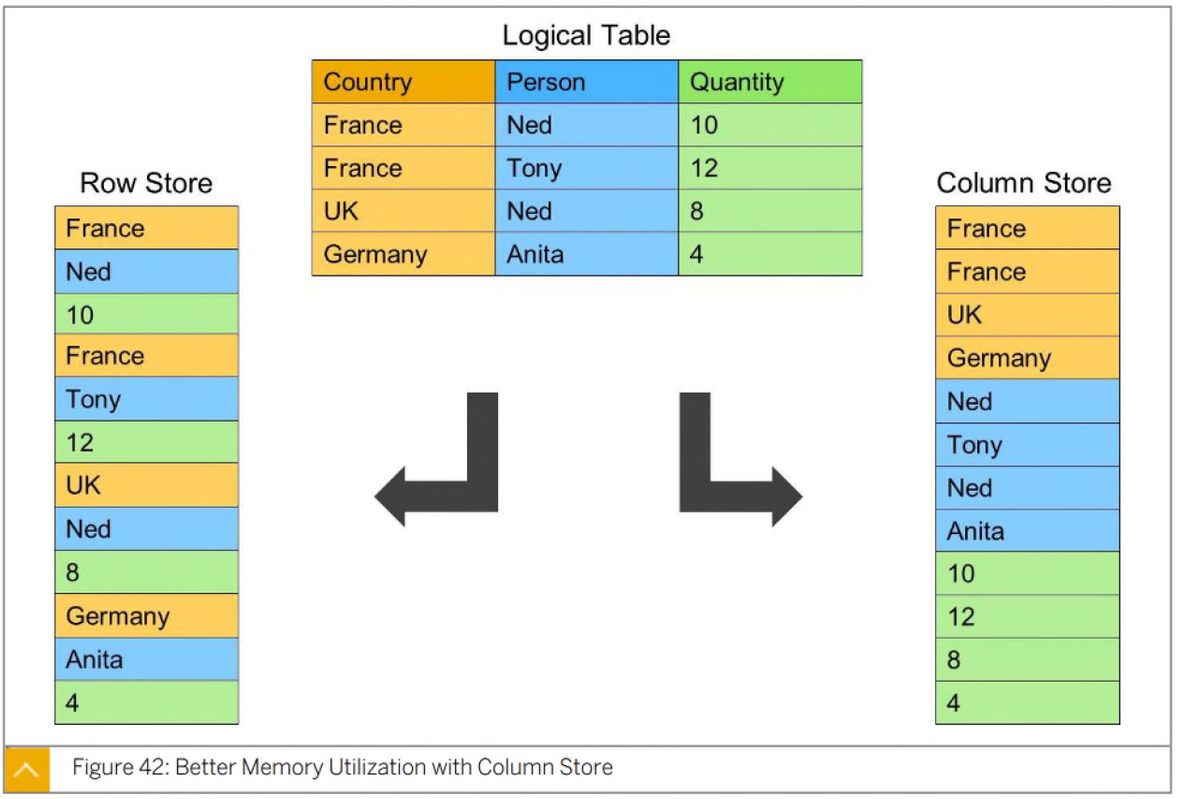


Figure 42: Better Memory Utilization with Column Store

We mentioned earlier that disk is still required for logging and backup in case of power failure. However, the disk is also required to store data that has been displaced from memory. Why does data get displaced from memory?

We know that memory is now huge and relatively affordable. It is technically possible to store an entire enterprise database in memory, especially if you implement multi-terabyte memory. However, for most organizations, most of the data that they own is not frequently used, so they really do not need to implement such huge memory sizes. Only recent data is frequently used.

Rather than try to hold all the data that the enterprise owns in memory, the memory is sized, so it is large enough to store only the most recent data. This may well be only 5-10% of the entire company's data, which is called hot data. The rest of the data, which makes up 90-95%, is called warm data.

With SAP HANA, hot data is stored in memory, and warm data is stored on disk.

Whenever older data is needed by an application, it is loaded from disk to memory and the application reads the data from memory. This data may not be needed again for a long time, so it is displaced from memory at the moment when the memory is full and other, more recent data, replaces it. The older data then goes back to disk until it is needed again.

For row store tables, loading and displacement happens at the row level. This means all columns in the row, whether they are needed or not, are loaded to memory. For analytical applications that require only few columns, this is inefficient, as it involves moving all columns to memory, even those not used.

For column store tables, loading and displacement happens at the column and partition level. This means that only the required columns, and even better, only the required partitions in the columns, are loaded to memory. This is very efficient for analytical applications, which often only ask for small portions of data.

Reducing the Data Footprint

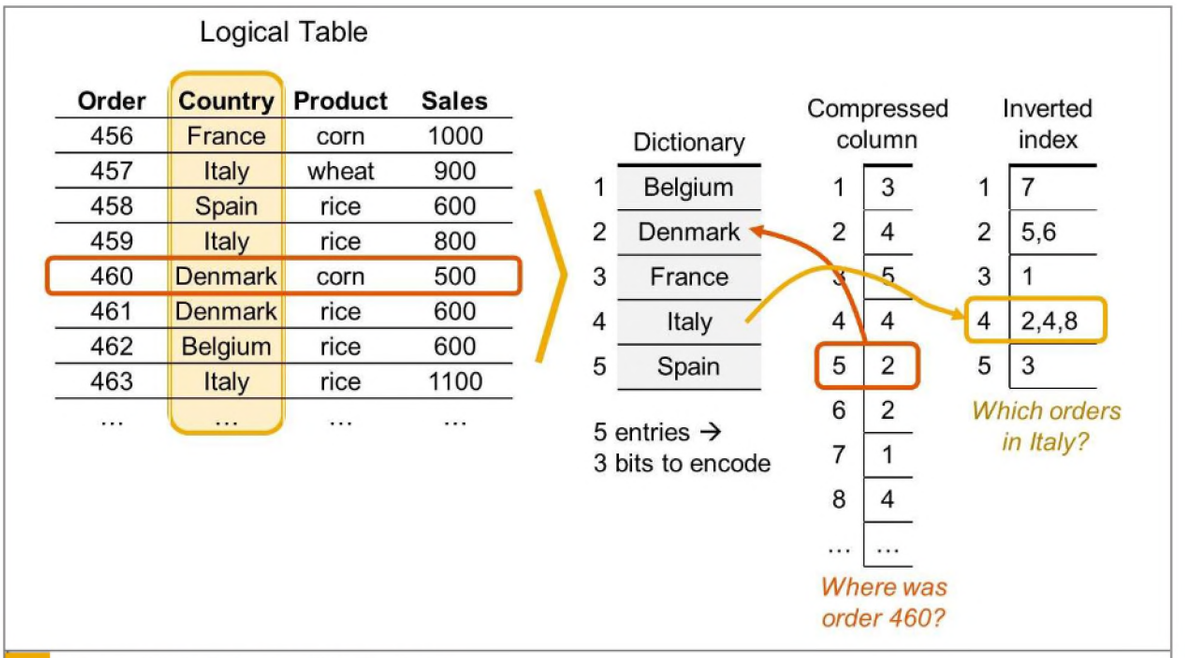


Figure 43: Reducing the Data Footprint

The data in the SAP HANA column store tables is automatically compressed in order to reduce the data footprint.

The following are a number of benefits associated with a reduced data footprint:

Benefits of a Reduced Data Footprint

- You can get more data into the CPU cache, and therefore reduce main memory access, in order to maintain high performance.
- You can fit entire enterprise databases into memory and avoid disk access.
- Operations such as backup and restore are speeded up as data size decreases.
- The amount by which data reduction can take place is driven by the shape of the business data. Compression is most impressive when there is a lot of data repetition in the tables. An example is a huge sales order table, in which the customer type is stored on each customer order, but there are only three customer types. The customer type is repeated many times across the table.
- Compression strips out the repetition and uses integers to represent the business values. Then it uses special dictionary tables to hold the distinct list of business values and the corresponding integers. This all happens in the background, and is not visible to the business user. It is also not something with which the developer needs to be concerned.

Parallel Processing

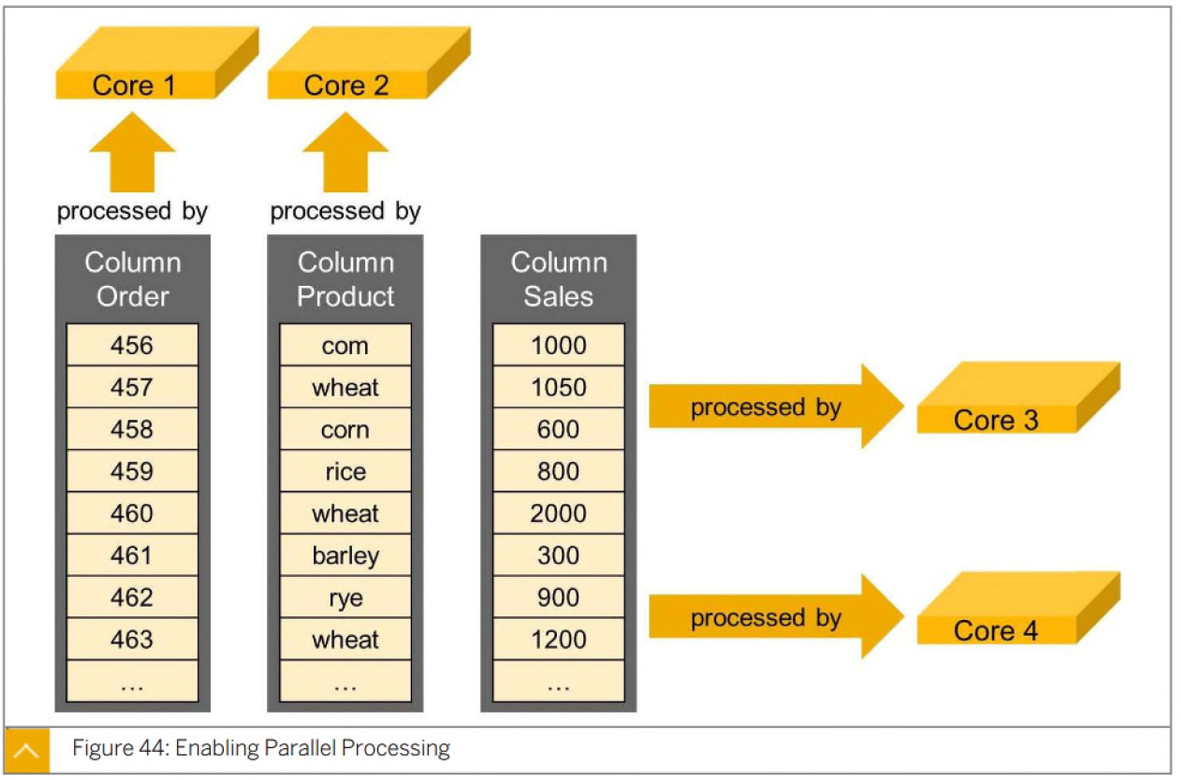


Figure 44: Enabling Parallel Processing

A key theme of SAP HANA is parallel processing. With the new hardware architecture, especially utilizing the new multi-core processors, you can ensure instant responses by spreading out the processing tasks across the cores.

SAP HANA automatically spreads the workload across all processors and ensures all parts of the hardware are contributing to the throughput.

SAP HANA is scalable, which means you can add more processors, as required, to increase the parallelization, and therefore the speed, of processing.

In addition, you can manually partition column tables to influence the parallelization based on common business values that are accessed frequently.

Parallel processing is a key enabler for real-time processing, on which many new S/4HANA applications are based.

Push Down Processing to SAP HANA

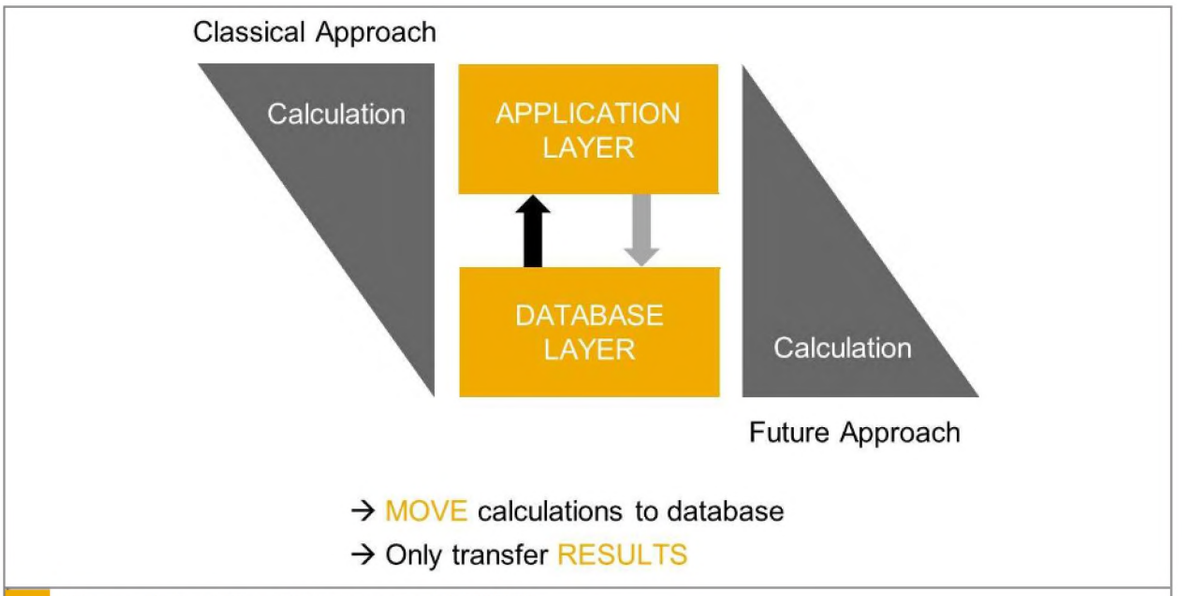


Figure 45: Push Down Processing to SAP HANA

In the past, the key job of the database layer was to listen out for requests for data from the application server and then send that data to the application server for processing. Once the data had been processed, the results were sent back down to the database layer for storage.

SAP HANA is capable of taking over many of the processing tasks from the application server. All data-related tasks, such as aggregation, filter, sort, calculate, and predict can be handled by SAP HANA.

Now the application layer simply needs to tell SAP HANA what is to be done on the data, and SAP HANA processes the data and send only the results. This is done in memory, so speeds can be impressive. We call this code-to-data, as opposed to the traditional way, which was data-to-code.

The application layer is still needed with SAP S/4HANA to handle the complex business logic that must be programmed in a business programming language. In the case of S/4HANA, this is ABAP. However, many simpler applications can be built directly on SAP HANA, with no need for an additional application server.

Multi-Tenancy

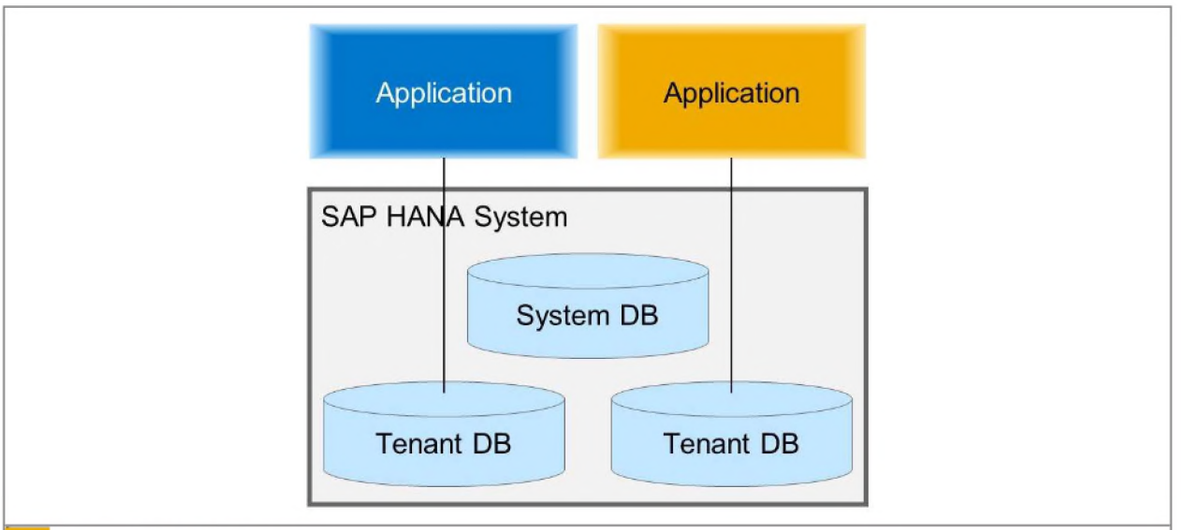


Figure 46: Multi-Tenancy

SAP HANA can run multiple isolated applications within the same hardware and software infrastructure. There is a strong separation of business data and users, and they must be kept apart. Each tenant has its own database and business users have no idea that they are sharing a system with others. The system layer is used to manage the system-wide settings and cross-tenant operations, such as backups.

The benefit of a multi-tenancy platform is the ability to host multiple applications on a single infrastructure and share common resources. This is the basis for cost-efficient cloud computing.

LESSON SUMMARY

You should now be able to:

- Describe the key technologies of SAP HANA

Unit 3
Lesson 2

SAP HANA - Always Running

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe how SAP HANA ensures 100% uptime

SAP HANA Ensures 100% Uptime

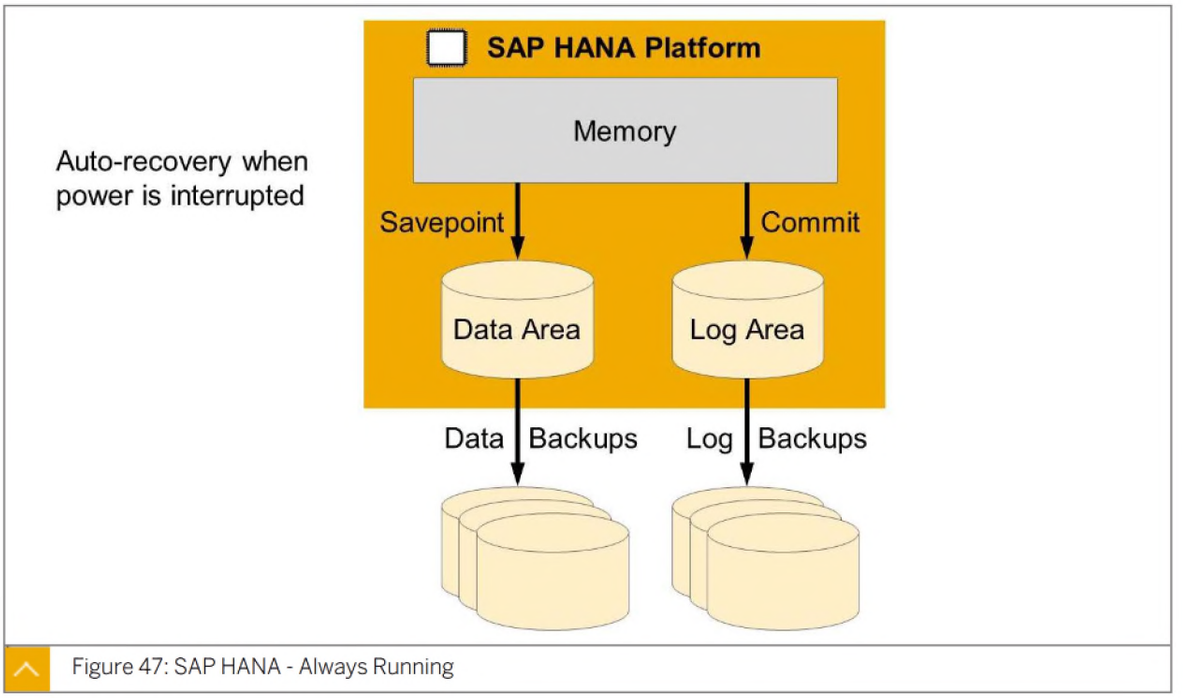


Figure 47: SAP HANA - Always Running

SAP HANA utilizes memory for storage and once the power is gone, we lose the data in memory.

How does SAP HANA ensure we do not lose data when the power goes, and how does it get back up and running quickly? SAP HANA's solution for zero-downtime is based on a two-phase approach.

Every few minutes, SAP HANA automatically takes a snapshot of the entire memory and stores this on a disk layer. This is called a savepoint.

What happens if the power goes off between savepoints? Do we lose this data? We do not lose data because between savepoints, every committed transaction is also saved to a log area. This log area is often based on flash memory (SSD) to ensure lightning speed, so every update to the database is captured.

When power is restored, SAP HANA automatically readies the last savepoint, and also re-applies the transactions from the log since that savepoint occurred, to ensure the system is exactly where it was when the power was lost.

This all happens invisibly in the background.

Auto-Recovery and Failover in SAP HANA

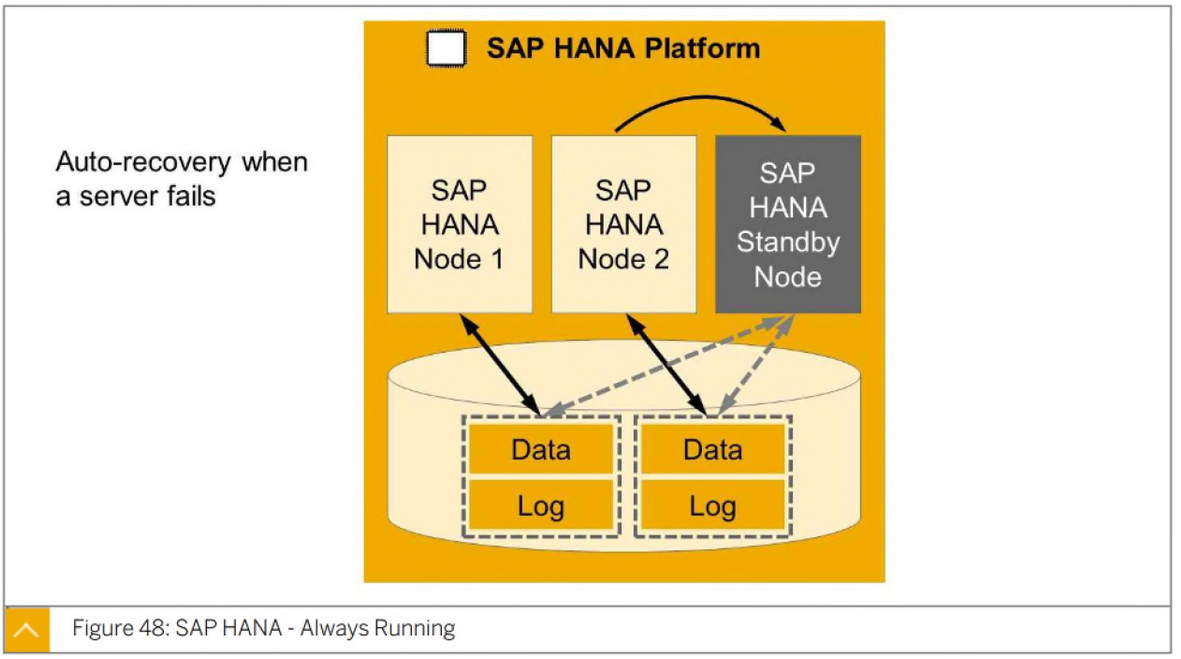


Figure 48: SAP HANA - Always Running

If a server fails, SAP HANA can automatically swap it out to a standby server.

Standby servers can be on warm standby, which means they are ready to go immediately and do not need to be started. The data is loaded to memory from a backup server. SAP HANA uses the savepoints and log, as mentioned previously, to bring the warm standby server up to date with the data.

Standby servers can also be on hot standby, which means the standby server is always in sync with the live server, usually by continually replaying the database log. If it is necessary to swap over, this can happen with almost no interruption to processing.

For mission-critical applications and where SLAs are implemented, you can ensure customers' systems are always running by implementing this approach. This auto-recovery approach is referred to as failover.

LESSON SUMMARY

You should now be able to:

- Describe how SAP HANA ensures 100% uptime

Unit 3
Lesson 3

SAP HANA - Data Management

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe SAP HANA management capabilities

SAP HANA Data Management Capabilities

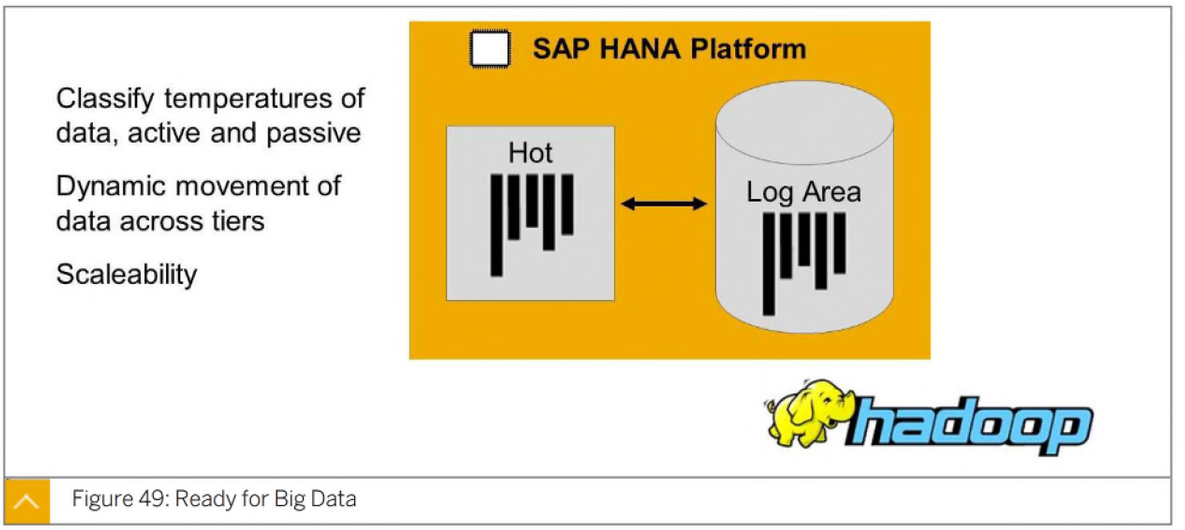


Figure 49: Ready for Big Data

We know the digital world is creating huge amounts of data. Do we just keep loading this data to SAP HANA?

Technically, this is possible, but it would not be efficient. Most business applications refer to only a small subset of data, and this is usually the most recent data. You should not fill SAP HANA's in-memory database with data that is old and hardly used.

SAP HANA allows us to classify our data as active and passive. We also use temperatures as a reference to how hot (useful) the data is. Active, or hot, data is data that is recent or perhaps the focus of a current analysis (even if it is old). Passive data is warm, or even cold, data that is older and less used.

Only active (hot) data should occupy SAP HANA memory and the passive (warm or cold) data should be on cheaper storage options such as Big Data commodity server solutions (Hadoop) and data archive systems.

A key point is that, regardless of where the data physically resides, all of it is still available seamlessly to SAP HANA applications. Application developers do not need to know where data is, as this is managed by HANA.

SAP HANA moves data across the storage tires automatically based on usage patterns and other programmable business conditions. This ensures a customer's SAP S/4HANA will always run optimally, with no older data clogging up the database.

Real-Time Data Streaming

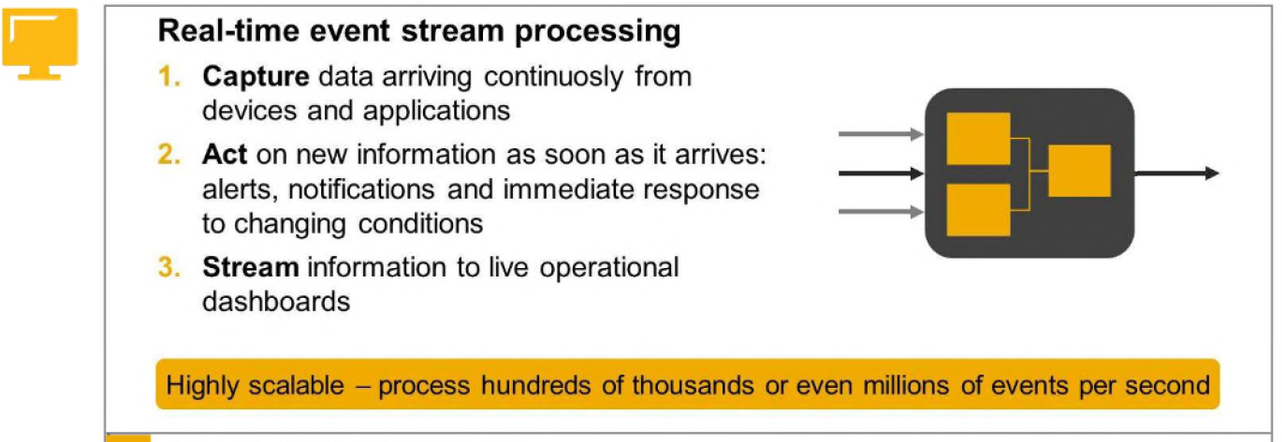


Figure 50: Real-Time Data Streaming

SAP HANA can consume data in many different ways. Real-time data can be consumed to power real-time S/4HANA applications. The Internet of Things (IoT) means we will connect large numbers of devices that transmit information continually.

It is important to remember that real-time data streaming is not the same as real-time data loading. Often, once the data is consumed and processed, it is of no further interest and SAP HANA can ignore it.

The following are examples of devices and activities that could stream real-time data to S/4HANA applications:

- Sensors - machines
- Clickstreams from Web activity
- Social media - respond to consumer sentiments (for example, Twitter)
- Market stock prices
- Energy consumption
- In-game sports analysis

Synchronize IoT Data Collection with SAP HANA

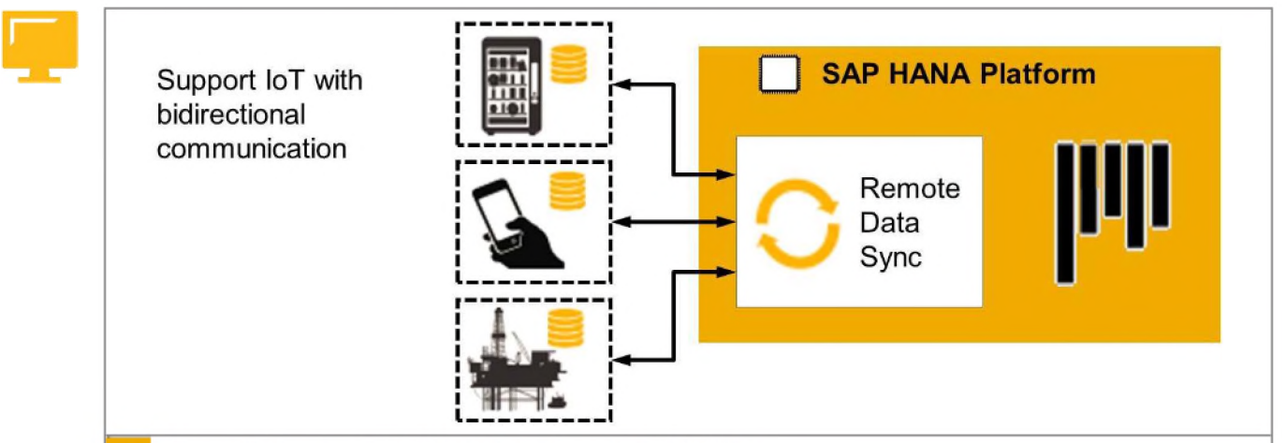


Figure 51: Synchronize IoT Data Collection with SAP HANA

SAP HANA can communicate with devices (IoT) using remote data sync. Often, such devices do not need to be continually online with SAP HANA. We call this "occasionally connected".

Devices can collect data locally, with their built-in light databases, and SAP HANA can periodically collect this data. For example, every hour a vending machine passes its stock data to SAP HANA. When an item is running low, SAP HANA can pass back a message to the vending machine that a refill is on its way. Remote data sync is bidirectional.

S/4HANA applications can communicate with IoT devices. There are many innovative enterprise applications that can benefit from communication with devices in the IoT.

The same technology is used to connect SAP HANA to remote environments that may operate in hostile conditions, or where the signal is not reliable, such as an engineer working in a lift shaft where the signal is poor, or an oil rig where a satellite passes only once per day to provide communication back to HQ.

Data Provisioning

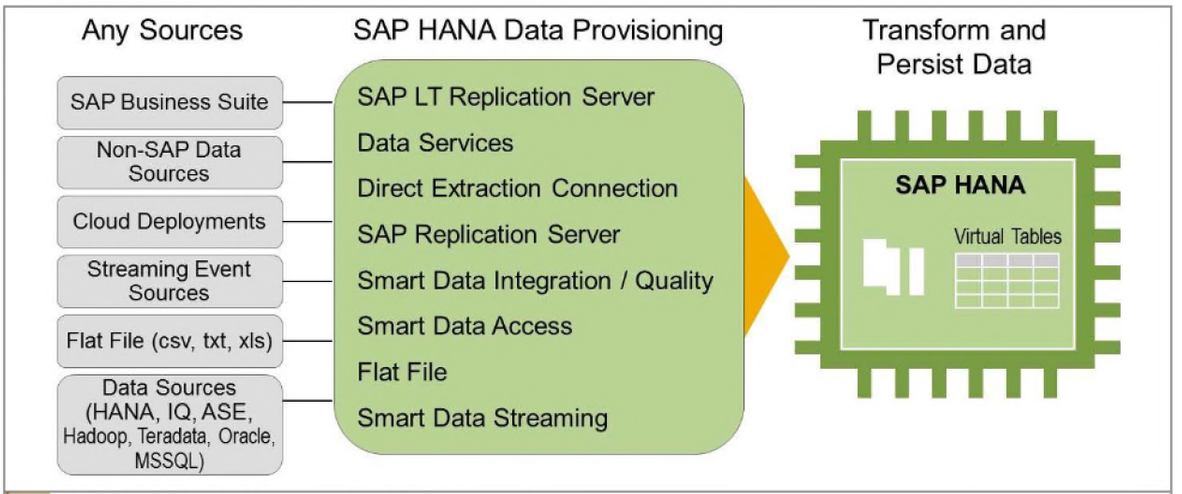


Figure 52: Data Access from Anywhere, Anytime

As well as real-time streaming and remote data sync, SAP HANA has many other options for data provisioning.

Smart Data Access (SDA) allows SAP HANA to access remote database tables and files from any source, as if the data was loaded to SAP HANA. A great use case for this is the integration of Hadoop or data archives, where occasional access to data is required.

Smart Data Integration (SDI) and Smart Data Quality (SDQ) provides real-time data replication from any source, with the option of enhancing the data quality during the loading process.

SAP HANA is fully integrated with existing and well-known data-loading tools, such as SAP LT Replication Server and SAP Data Services for real-time and batch data loading.

LESSON SUMMARY

You should now be able to:

- Describe SAP HANA management capabilities

Unit 3
Lesson 4

SAP HANA - Processing capabilities

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe SAP HANA processing capabilities

SAP HANA Capabilities

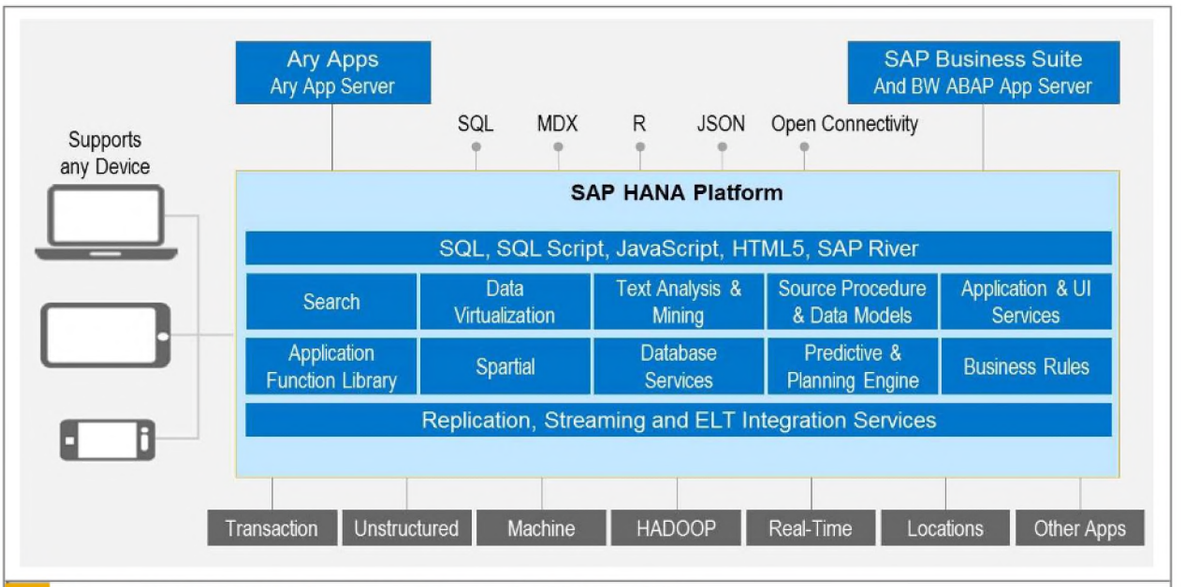


Figure 53: SAP HANA: More than a Database for SAP S/4HANA

If all we asked of SAP HANA was to support the database requests for S/4HANA, then we would be using only a fraction of SAP HANA's capabilities.

SAP HANA is not just a database, it is also a powerful data processing engine with many built-in capabilities that can enable organizations to develop innovative applications integrating S/4HANA. We call this "extending the core", with the core as SAP S/4HANA.

Companies implement a digital platform, such as SAP S/4HANA, not only to run their core business processes, but to take full advantage of the new digital world where innovative, disruptive applications can be game changing.

This is why companies will look to exploit the full potential of the SAP HANA platform to move beyond the core.

Text Processing with SAP HANA

Figure 54: Text Processing with SAP HANA

Did you know that between 70% and 80% of data in an organization is unstructured, and most of this unstructured data is text based?

The majority of the most powerful and insightful business information is locked up in text. Unlocking it should be taken seriously. SAP HANA has native text-processing capabilities. These include the following:

SAP HANA Native Text-Processing Capabilities

- Text search: Fuzzy search (Google-like searching) helps users with fault-tolerant searches during data input. It helps to improve data quality by suggesting spellings and codes. It helps to avoid duplication by suggesting similar matches before a user creates another customer account.
- Text analysis: Identifies key entities in text. For example, how many times was company x mentioned this week in tweets that also mentioned words relating to acquisition? Aggregated sentiment analysis of a new product helps you to learn what consumers think, so you can react and make improvements.
- Text mining: Which documents cover similar topics? What is the key subject being discussed in a series of documents or emails?

SAP HANA text processing handles multiple languages. It can identify the language automatically from the text and apply appropriate linguistic rules.

SAP HANA text-processing capabilities are already very well exploited in S/4HANA applications, and customers can develop their own applications using the same capabilities.

Spatial Analysis with SAP HANA

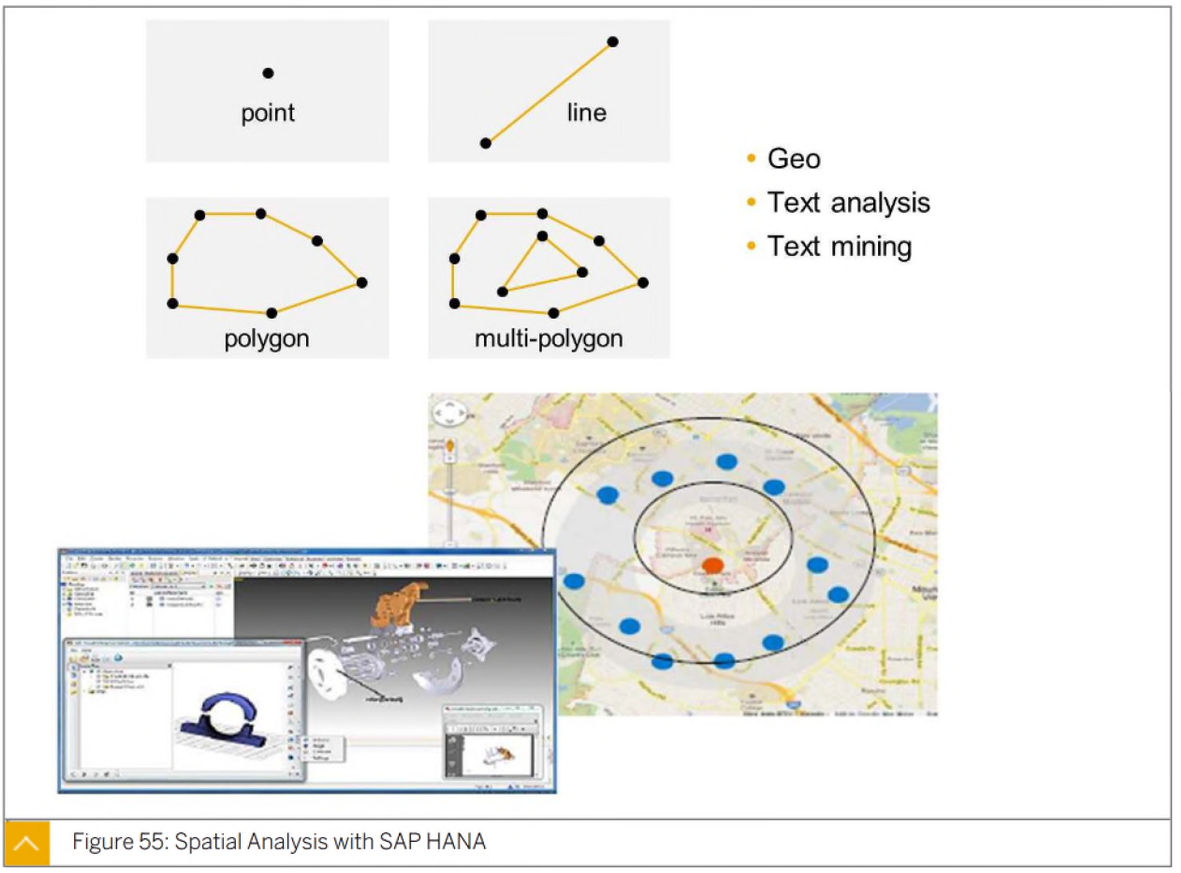


Figure 55: Spatial Analysis with SAP HANA

SAP HANA can store and process spatial data. For example, we can identify the exact location of each customer and when the customer is browsing our online catalog we can suggest the nearest pickup location.

SAP HANA is fully integrated with industry leading partners who specialize in spatial processing. These include Google, ESRI, Pitney Bowes and Tom Tom.

There are many use cases for spatial data, these include:

Spatial Data Examples

- Live Traffic information - communicate to emergency services driver
- Sport - In-game football analysis - add geo sensor to ball and players and track movements, distances, contacts etc.
- Energy companies - map their pipes, cables, identify closest engineer, or identify nearby assets that could also be cleaned or maintained to save on separate call out.

Predictive Analysis with SAP HANA

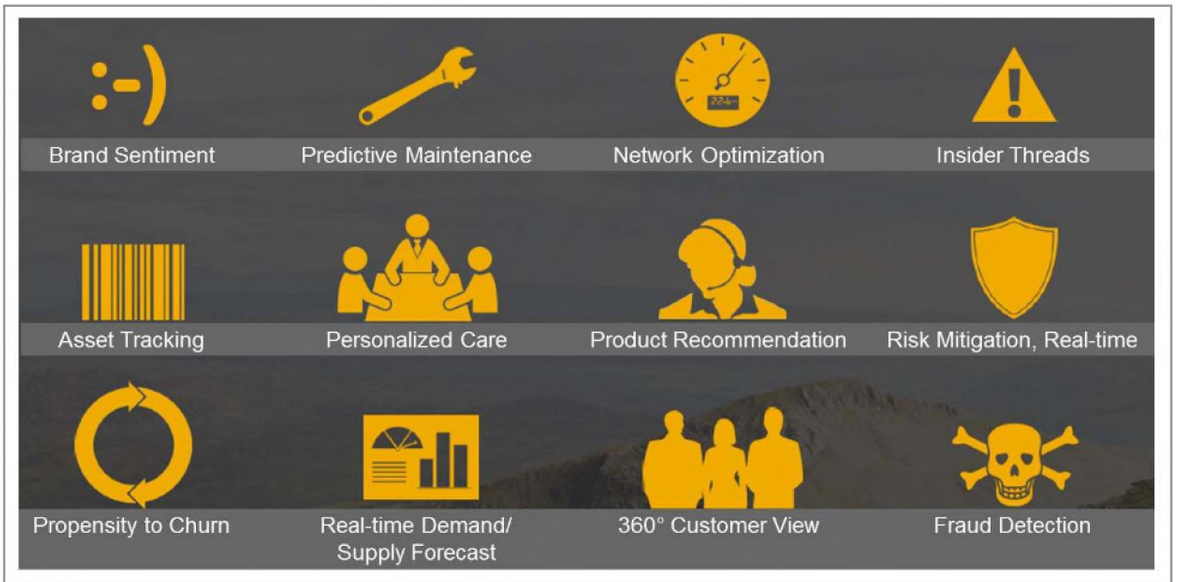


Figure 56: Predictive Analysis with SAP HANA

A key theme running through SAP S/4HANA is embedded analytics. In many cases, this means adding in predictive capabilities to a transaction flow. Customers can continue to build their own applications that embed predictive capabilities. For example, an administrator is providing security clearance to sensitive data for a new employee. However, during the clearance process, SAP HANA identifies and alerts the administrator to a suspicious pattern of system access by the employee that does not fit the profile of this type of worker.

SAP HANA has an extensive built-in library of powerful predictive algorithms and business functions to suit different analysis scenarios, as shown in the figure, Predictive Analysis with SAP HANA.

In addition to the built-in algorithms, SAP HANA is integrated with the 'R 'public libraries, where thousands of additional algorithms can be found.

With SAP HANA's ability to manage huge data volumes, and at speed, real-time predictive analysis is possible and can add huge value to business transactional processing to offer decision support in-line. You can find many examples of embedded predictive analysis in S/4HANA applications.

Unit 3
Exercise 3

Explore the SAP HANA Database

Log on to the SAP HANA platform and explore key SAP S/4HANA database tables.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Launch the SAP HANA Studio and open the *Administration Console*.
2. Add a system connection using the following details:

Field name	Value
Host Name	wdflbmt7122.wdf.sap.corp
Instance Number	00
User	STUDENT##
Password	Training1

3. Locate the *VBAK* table in the *SAPHE4* schema.
4. How many records does this table contain?

5. Is *VBAK* a row or column table?

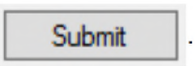
6. How many records were created by user (column *ERNAM*) *SALESREP*?

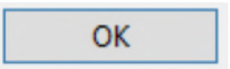
Unit 3
Solution 3

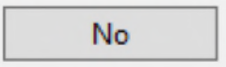
Explore the SAP HANA Database

Log on to the SAP HANA platform and explore key SAP S/4HANA database tables.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

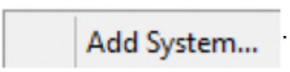
1. Launch the SAP HANA Studio and open the *Administration Console*.
   a) From the Windows *Start* button, locate and launch the SAP HANA Studio.
   b) When you see *StratUpTool-HANA Studio* prompt, choose *Submit* 

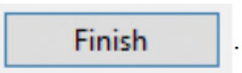
   .
   c) On the *Workspace Launcher* prompt, choose *OK* 

   .
   d) If you see the *Secure Storage — Password Hint Needed* prompt, choose *No*
   

   .
   e) On the *Welcome* screen, choose *Open Administration Console*.
2. Add a system connection using the following details:

Field name	Value
Host Name	wdflbmt7122.wdf.sap.corp
Instance Number	00
User	STUDENT##
Password	Training1

   a) Right-click anywhere inside the *Systems* tab, and choose *Add System*
   

   .
   b) Enter the values as indicated in the table.
   c) Choose *Finish* 

   .
   You see the new system entry with four nodes (Catalog, Content, and so on), on the *Systems* tab.
3. Locate the *VBAK* table in the *SAPHE4* schema.
   a) Expand the *Catalog* node.

b) Expand the *SAPHE4* schema.

c) Right-click the *Tables* node, and choose *Filter*.

d) Enter **VBAK**, and choose *OK*.

4. How many records does this table contain?

The number will vary if records were recently added.

a) Right-click the *VBAK* table, and choose *Open Definition*.

b) Select the *Runtime Information* tab.
You see *Number of Entries*.

5. Is *VBAK* a row or column table?

The table type is *Column*.

a) At the top right corner of the screen you will see that the table type is Column.

6. How many records were created by user (column *ERNAM*) *SALESREP*?

The number of records where the user (column *ERNAM*) matches the filter value will vary.

a) Right-click the *VBAK* table and choose *Open Data Preview*.

b) In the filter field, enter **SALESREP** and press Enter.
You see 24 records where the user (column *ERNAM*) matches the filter value.

LESSON SUMMARY

You should now be able to:

- Describe SAP HANA processing capabilities

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Learning Assessment

1. Which recent hardware architecture trends does SAP HANA exploit?

   Choose the correct answers.

   - [ ] A Multi-core processors
   - [ ] B Cheaper and larger memory size
   - [ ] C Faster disk speeds
   - [ ] D Multi CPUs working in parallel

2. What type of table storage does SAP HANA support?

   Choose the correct answers.

   - [ ] A Column
   - [ ] B Row
   - [ ] C Vector
   - [ ] D Flat

3. What type of tasks does SAP HANA typically take over from the application server?

   Choose the correct answers.

   - [ ] A Filter
   - [ ] B Aggregate
   - [ ] C Validate screen input
   - [ ] D Sort

4. Even though SAP HANA utilizes a full in-memory database, disk storage is still required.

   Determine whether this statement is true or false.

   - [ ] True
   - [ ] False

5. What data types can SAP HANA natively store and process?

   Choose the correct answers.

   - ☐ A Voice
   - ☐ B Transactional
   - ☐ C Textual
   - ☐ D Spatial

Learning Assessment - Answers

1. Which recent hardware architecture trends does SAP HANA exploit?

   Choose the correct answers.

   - [X] A Multi-core processors
   - [X] B Cheaper and larger memory size
   - [ ] C Faster disk speeds
   - [X] D Multi CPUs working in parallel

2. What type of table storage does SAP HANA support?

   Choose the correct answers.

   - [X] A Column
   - [X] B Row
   - [ ] C Vector
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   - [X] A Filter
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   - [ ] A Voice
   - [X] B Transactional
   - [X] C Textual
   - [X] D Spatial

UNIT 4 Applications

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UNIT OBJECTIVES

- Describe the scope of SAP S/4HANA applications
- Describe the benefits of S/4HANA
- Describe enterprise management with S/4HANA

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Unit 4
Lesson 1

Scope of SAP S/4HANA Applications

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the scope of SAP S/4HANA applications

SAP S/4HANA Applications

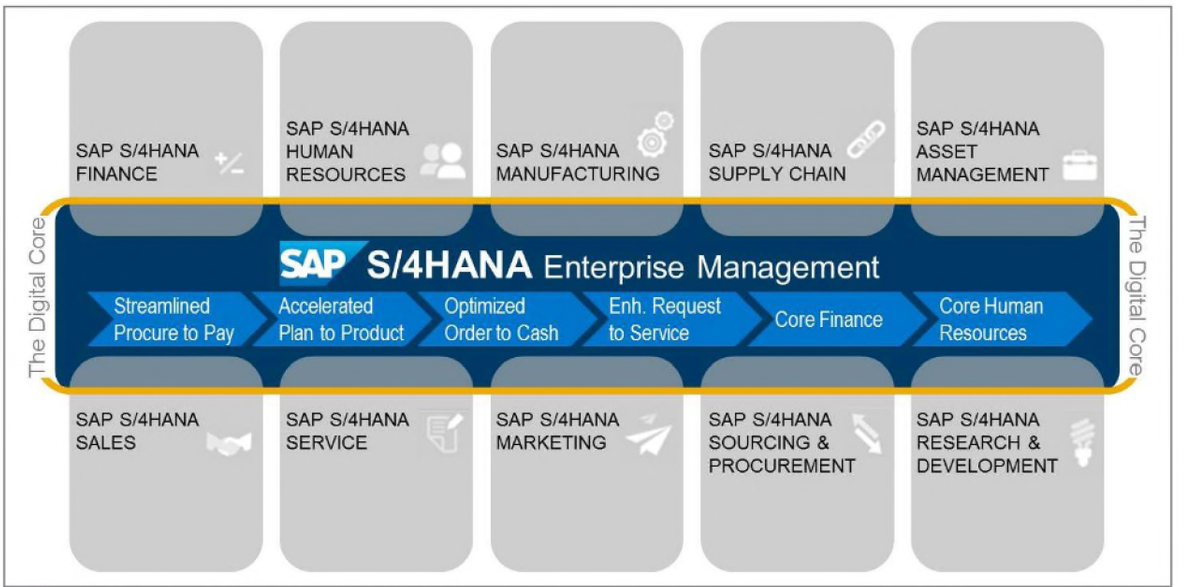


Figure 57: SAP S/4HANA - The Complete Solution

There are two key layers in the SAP S/4HANA application framework.

SAP S/4HANA Enterprise Management represents the core solution, covering all mission-critical processes of an enterprise. It represents the foundational core solution, natively built on the SAP HANA platform and designed with SAP Fiori UX.

For customers who are coming from an existing SAP applications background, Enterprise Management can be loosely compared to SAP ERP. However, S/4HANA is a completely new set of applications. Although there are many similarities to SAP ERP, many of the processes are redesigned, so there is often not a simple one-to-one comparison with traditional transactions.

SAP S/4HANA Line of Business (LoB) solutions provide much broader and deeper functionality to support organizations in strategic areas, where they want to fully exploit innovative digital applications. LoB solutions can be on premise or in the cloud. The key point is that you extend the core by adding LoB solutions. The overall solution is extended seamlessly. When LoB solutions are added, the business users have the same Fiori-based user experience as before, with the same HANA-based high performance.

SAP S/4HANA Enterprise Management - Scope

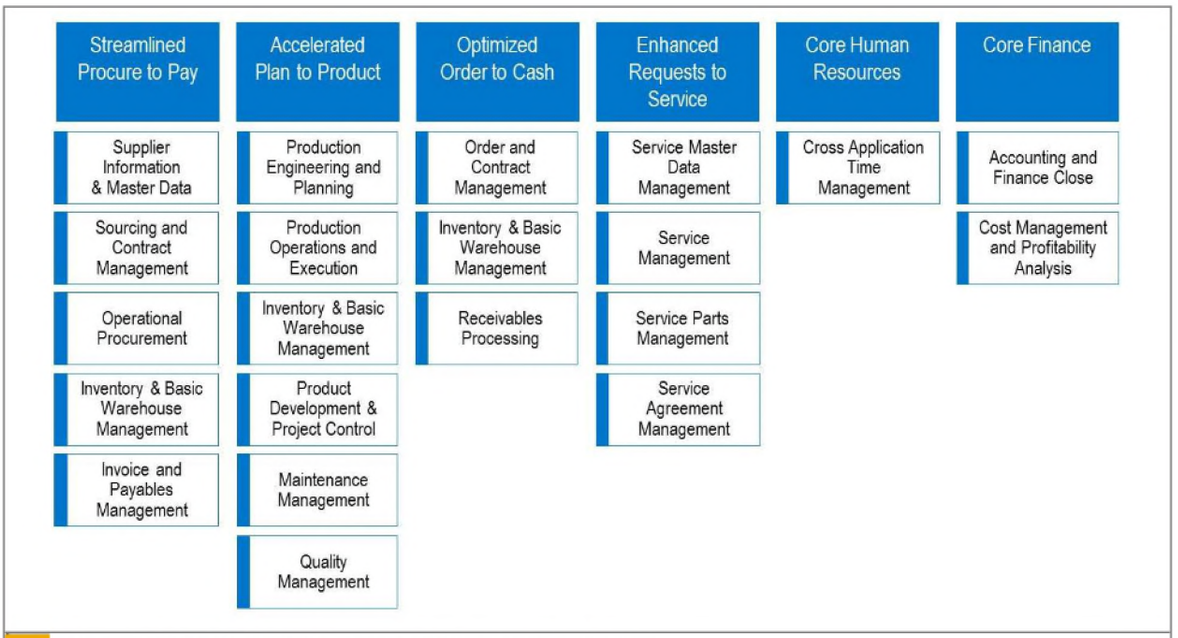


Figure 58: SAP S/4HANA Enterprise Management - Scope

SAP S/4HANA Enterprise Management is very broad, and includes support for key end-to-end business processes, including the following:

SAP S/4HANA Enterprise Management Key End-to-End Business Processes

- Procure to pay
- Plan to product
- Order to cash
- Request to service

Remember, core HR and core finance are also included in Enterprise Management, rather than only logistics and operations applications.

For all these areas, there are additional LoB solutions that can be added to significantly extend the functionality and provide innovation on top of the core.

SAP S/4HANA Enterprise Management is the digital core and represents the starting point on which to implement and build modern, innovative digital applications.

LESSON SUMMARY

You should now be able to:

- Describe the scope of SAP S/4HANA applications

Unit 4
Lesson 2

S/4HANA Finance

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the benefits of S/4HANA

S/4HANA Benefits

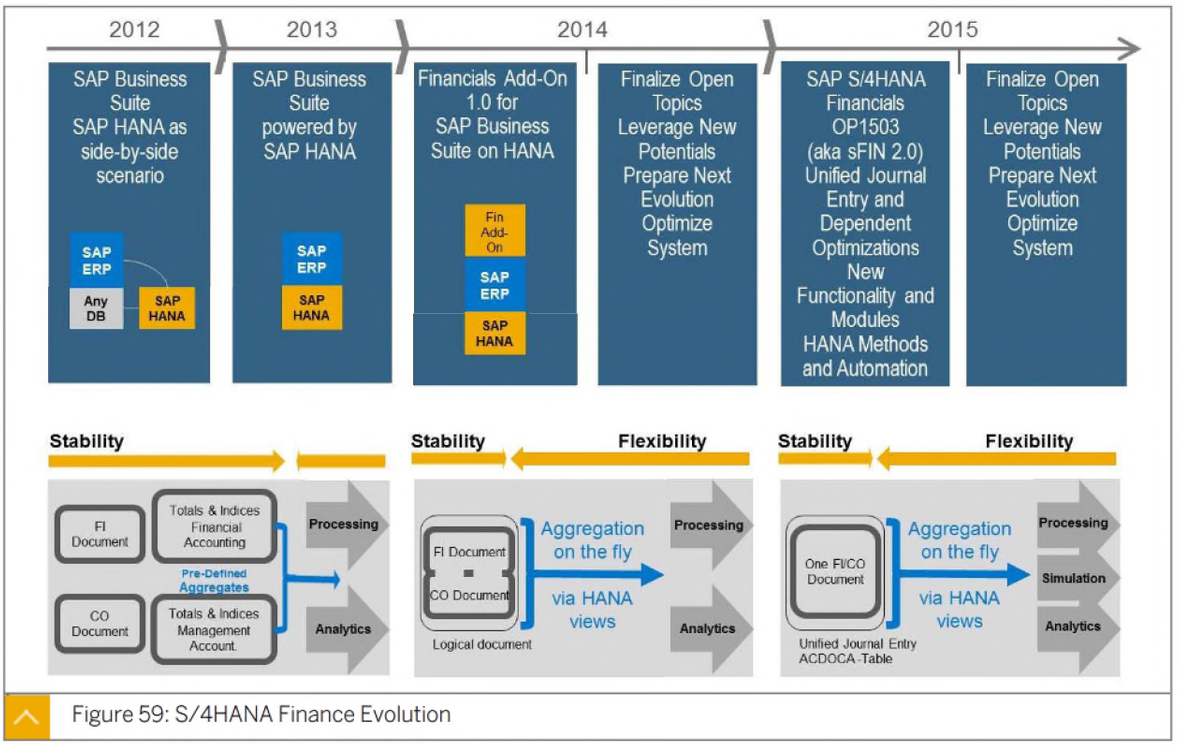


Figure 59: S/4HANA Finance Evolution

In the past, the SAP financial applications were separated into the following different components:

SAP Financial Applications Components

- Accounting (known as FI)
- Controlling (known as CO)
- Assets accounting (known as AA)

Each component has its own data model architecture, and this brings with it some inefficiencies. The following list outlines the development of S/4HANA as it provided the opportunity for a complete redesign of data models to remove inefficiencies:

- In 2012, it was possible to implement SAP HANA as an accelerator to sit side-by-side with the traditional stack to apply significant speed to some selected applications. These included financial applications, such as CO-PA.
- In 2013, it was possible to migrate a traditional non-SAP, disk-based database to SAP HANA, so that everything was running in-memory. No more accelerators were required, so all applications benefited from the fast, in-memory processing.
- In 2014, SAP began simplification by providing an add-in for finance that was part of Suite on HANA (not S/4HANA). This streamlined the finance application.
- In 2015, SAP completed the simplification by fully redesigning the data model and code for S/4HANA Finance, which was the first major application of SAP S/4HANA.

Simplification List

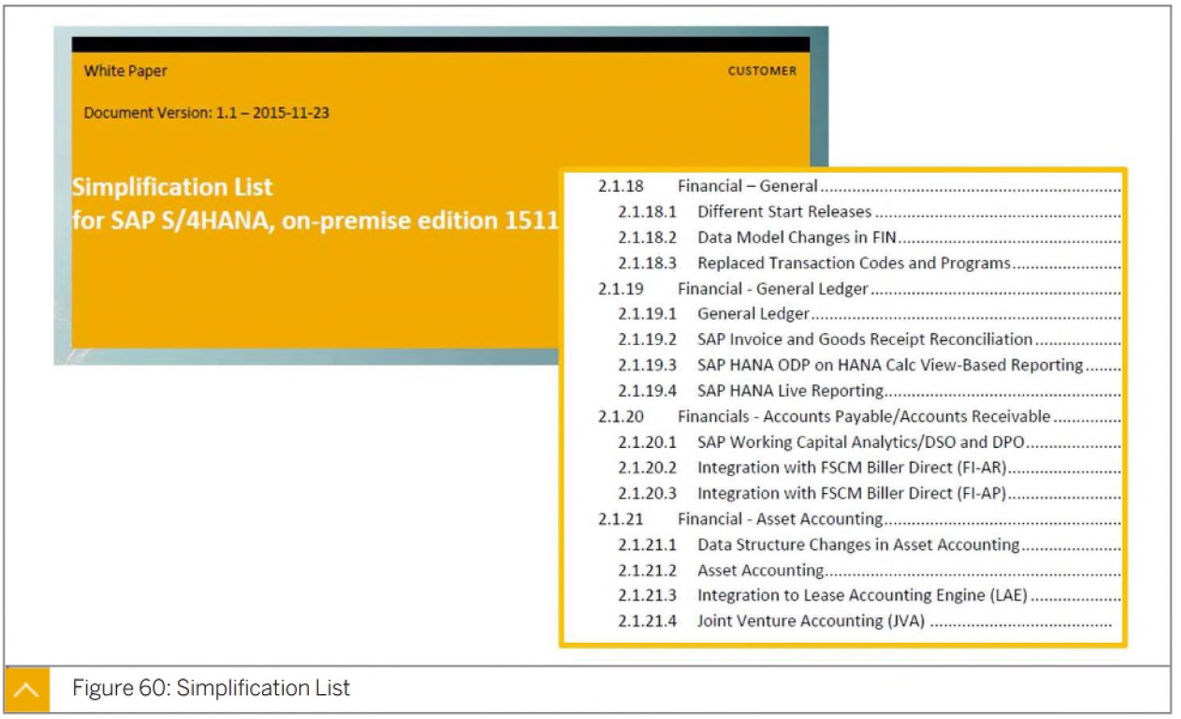


Figure 60: Simplification List

There are many simplified processes in S/4HANA Finance.

Customers who are coming from existing SAP Finance applications can learn about how traditional processes are rebuilt for S/4HANA by referring to the key document Simplification List for S/4HANA. In this document, which is freely available online, you can find out if an existing process is still available unchanged. If a process has changed, you can find out how it has changed or even been replaced.

Note the S/4HANA edition and release number that aligns to the document. The figure, Simplification List, shows the on-premise edition 1511.

Challenges of the Architecture Before S/4HANA Finance

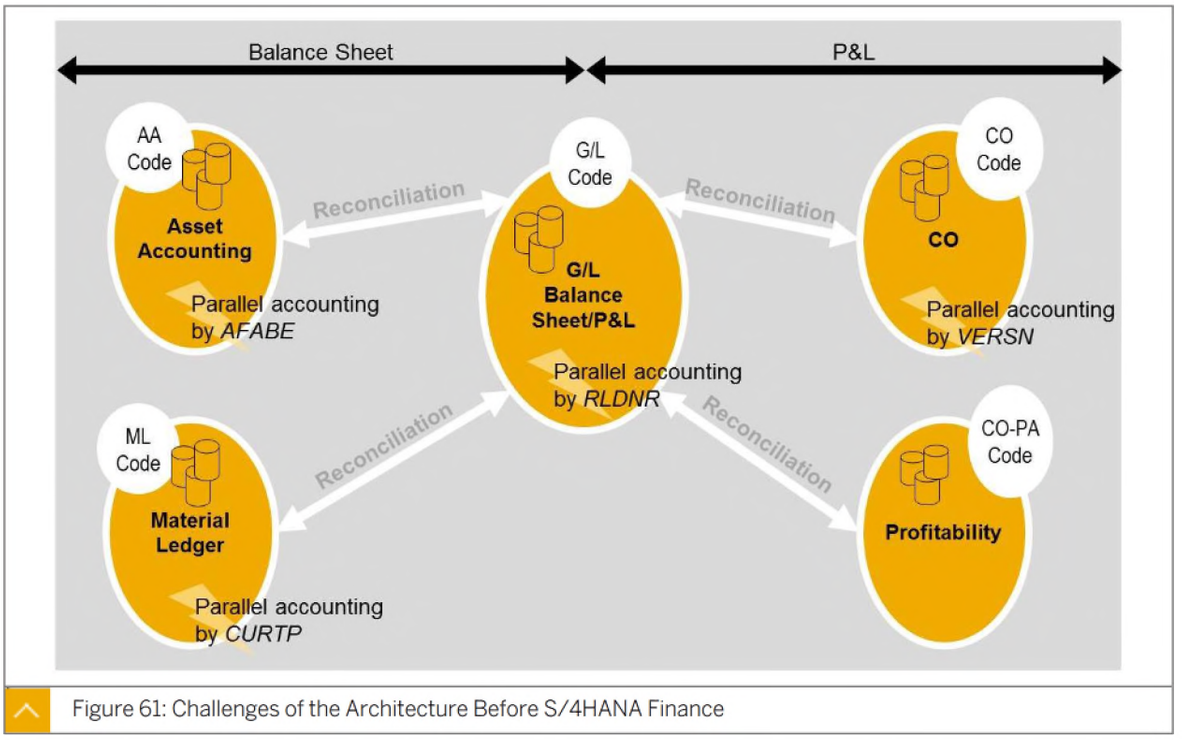


Figure 61: Challenges of the Architecture Before S/4HANA Finance

With the old architecture, there were some fundamental gaps that meant building a complete financial picture was technically challenging, as shown in the following examples:

- The material ledger does not store the G/L account or profit center.
- There is no profit center or G/L account in asset accounting totals.
- In controlling, there is a restriction of 999 document lines, which means breaking up large documents.
- There is a many-to-many document relationship between FI/CO, which creates complexity.
- G/L and profitability are updated at different business events and on different controlling entities, so they are not always in step.
- There is no common extensibility approach, so customizations are complex across all components, with different methods used.
- Data needs to be transferred to the appropriate table, and calculations run before reporting can begin (for example, settlement).
- Multiple extractors are needed to move data to BW in order to cover the complete financial picture.

Universal Journal

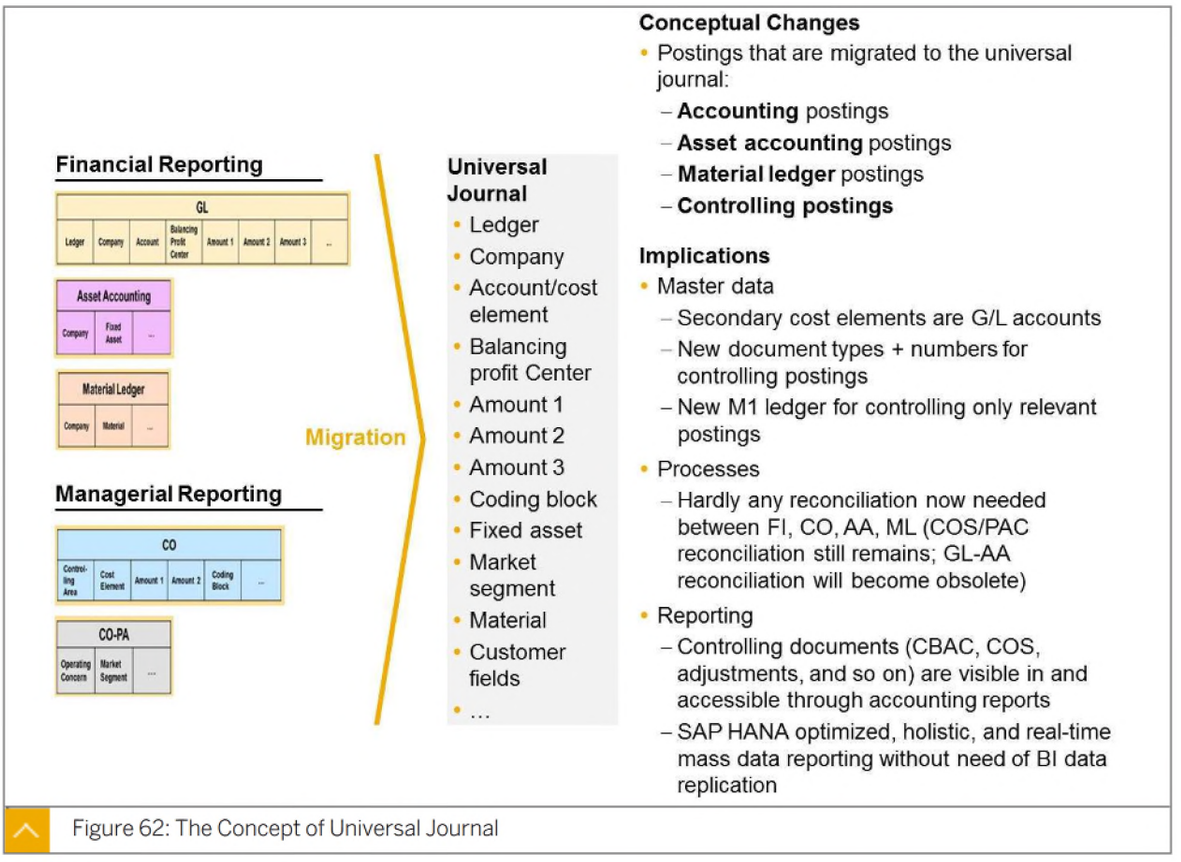


Figure 62: The Concept of Universal Journal

SAP has taken the best aspects of all previous designs in the financial applications, such as market segment derivations and coding block for extensions, and reused them to create S/4HANA Finance.

SAP has removed all the inefficiencies and added many brand new aspects, including the following:

- A major architectural simplification with just one line item table needed to store all financial details. This is known as the Universal Journal.
- No reconciliation is needed any longer between FI, CO, AA, and ML. The data is stored only once, but serves all of these areas as before.
- There is harmonization between the G/L account and cost elements. Secondary cost elements are now also G/L accounts, just like primary cost elements.
- Profitability attributes are written to every P&L item in real time. SAP has reused the CO-PA technology.
- HANA-optimized, fast, multi-dimensional reporting on the Universal Journal is possible without replicating data to BW.
- However, if BW is in place, only one single BW extractor is needed, instead of the many extractors needed in the past.
- A simplified extensibility concept: Only one table has to be enhanced.

Extensibility

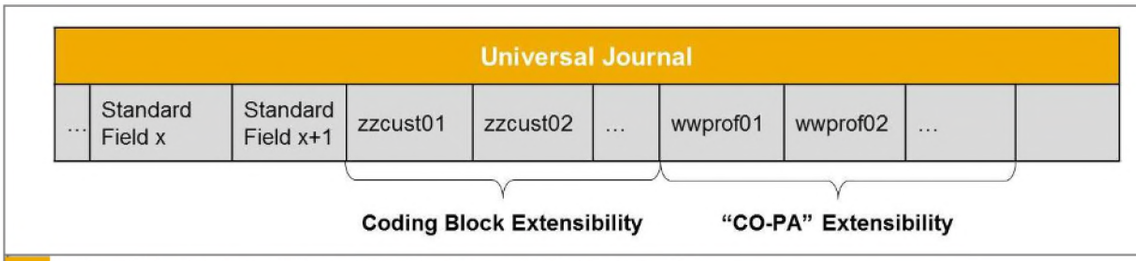


Figure 63: Simple and Powerful Extensibility with Customer Fields

In the past, extensibility was complex, as the different components had their own extensibility approaches.

With S/4HANA Finance, the Universal Journal can be easily extended with customer fields.

P&L line extensions can be created using the approach previously known in classic ERP to define and derive the value of new fields that were used in CO-PA. Additionally, the standard coding block extensibility approach can be used and the respective customer fields are added automatically to the Universal Journal. This approach was used in the classic ERP new G/L.

Anytime Data Access

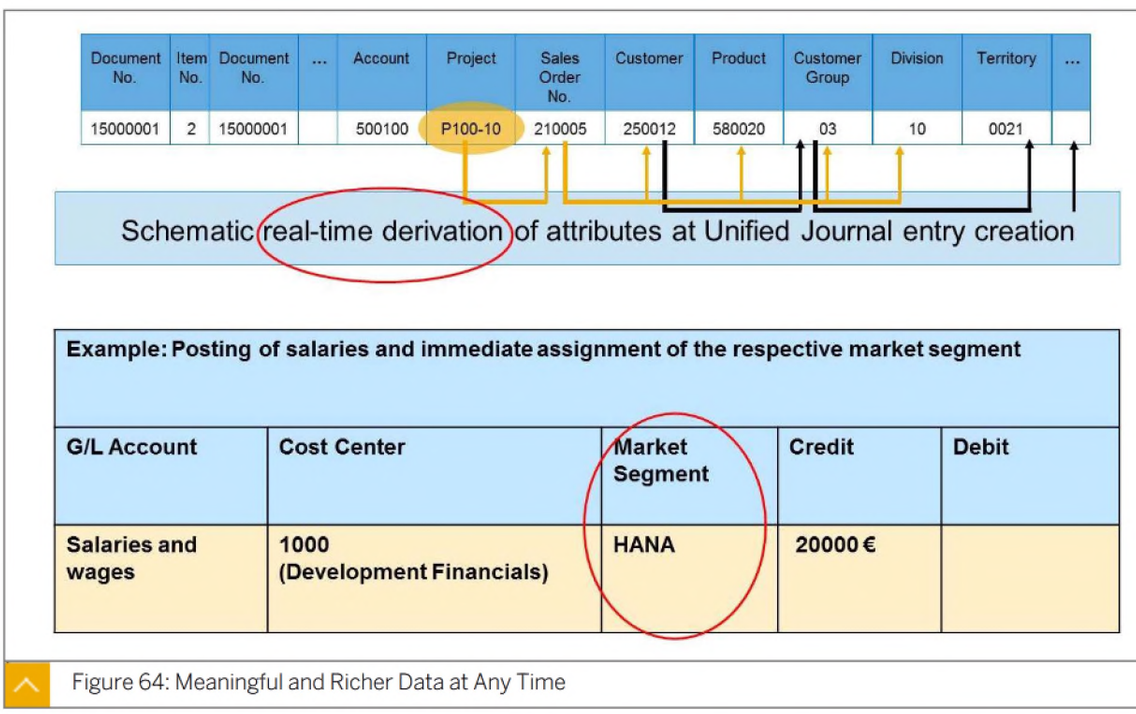


Figure 64: Meaningful and Richer Data at Any Time

Previously, when postings were made, only the basic financial information was collected and stored. Later, additional enriching information that was needed for analysis was added, usually as a result of running batch processes to derive attributes. This approach was taken to ensure the initial posting was not held up with additional processing of extra attributes that were not immediately essential.

Now additional characteristics are immediately derived at the point in time of each primary document. The new approach is to take all information that is available and known at this time.

For example, you post to a CO object and fill market segment attributes all in one step, so you can begin profitability analysis immediately.

Multi-Dimensional P&L

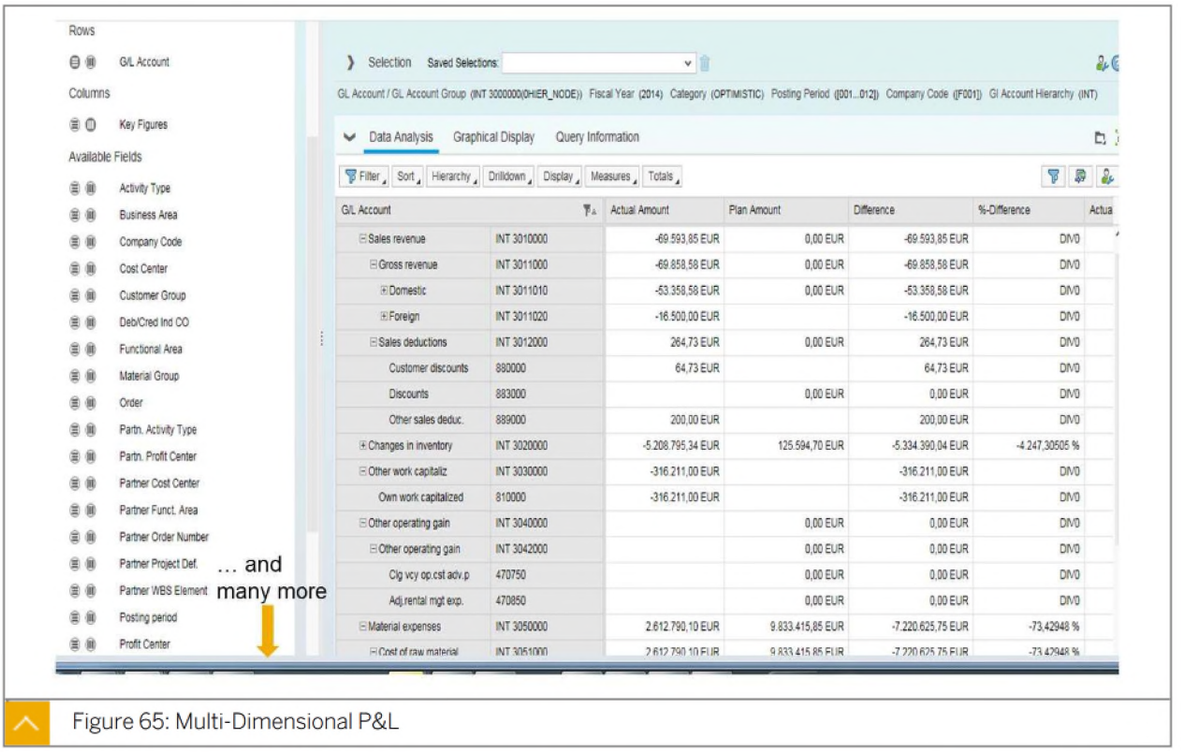


Figure 65: Multi-Dimensional P&L

Another major advantage comes into effect when it is time for financial reporting. You can now drill down on any dimension in order to explore the breakdown of any balance. Remember, what you see in any report is an on-the-fly aggregation that always comes from the individual line items.

For example, a sales director asks "Why is the profit so low on this new product we just launched? The total costs look high compared to the revenue collected." The sales director drills down on the total cost of sales, breaks down the cost elements, and notices that a lot of money has been spent on marketing the new product. Further drilldown identifies the biggest marketing expenses, which are celebrity agent fees. A further drilldown to break down the fees reveals an expensive British celebrity was used at a US launch, and that this person put in outrageous expense claims.

Without leaving the report, the sales director has managed to get to the root of the issue of low profitability. Additionally, because everything is processed in memory, performance is not a problem on any data size. It is possible to keep drilling to the bottom, click by click.

SAP S/4HANA Central Finance

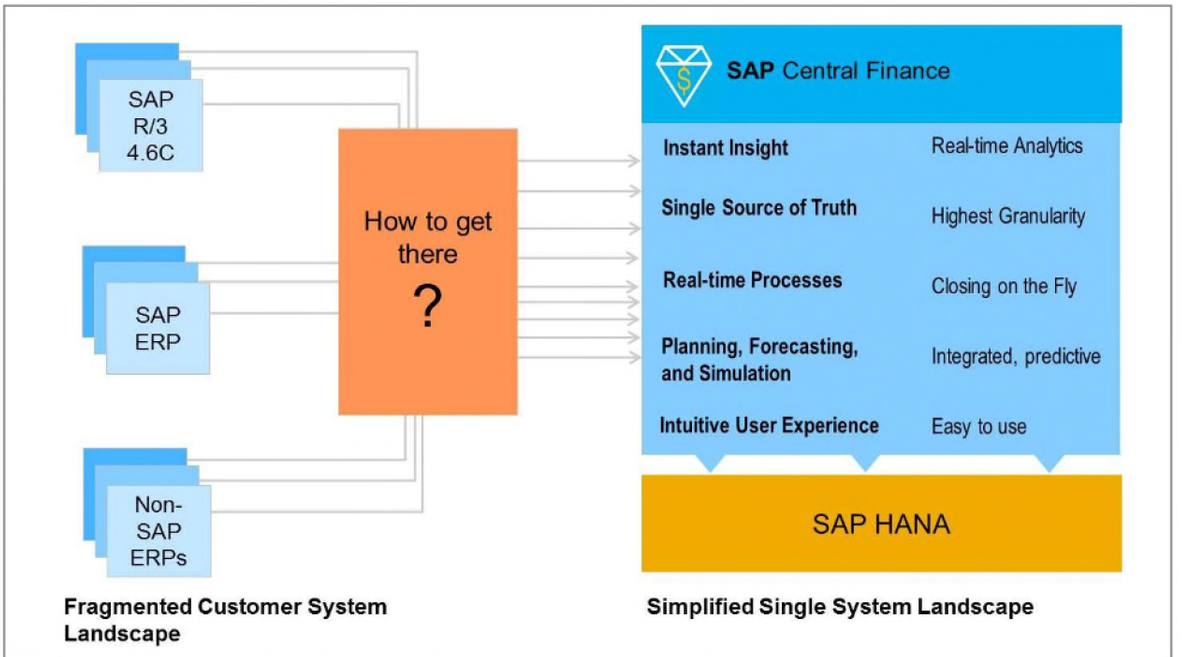


Figure 66: SAP S/4HANA Central Finance

Many organizations want to get started with S/4HANA Finance as soon as possible, so they can start to realize the benefits of real-time, instant insight and consolidated financial management. However, they know their existing, and often multiple, ERP operations are complex and may have had a lot of customization over the years.

This means it may take time to move all critical operations such as sales, procurement, and manufacturing to S/4HANA, and a major project and associated budget would be needed for this big-bang approach. How can we get started with SAP S/4HANA Finance on its own? There is a solution.

S/4HANA Finance can be implemented as a central component in a landscape of SAP and non-SAP ERP systems, in order to provide all financial functions across the entire enterprise.

Essentially, this involves connecting all legacy source systems to S/4HANA Finance, so that all financial postings are diverted to, and consolidated with, S/4HANA Finance. This deployment scenario is known as SAP S/4HANA Central Finance.

Functionality of S/4HANA Central Finance

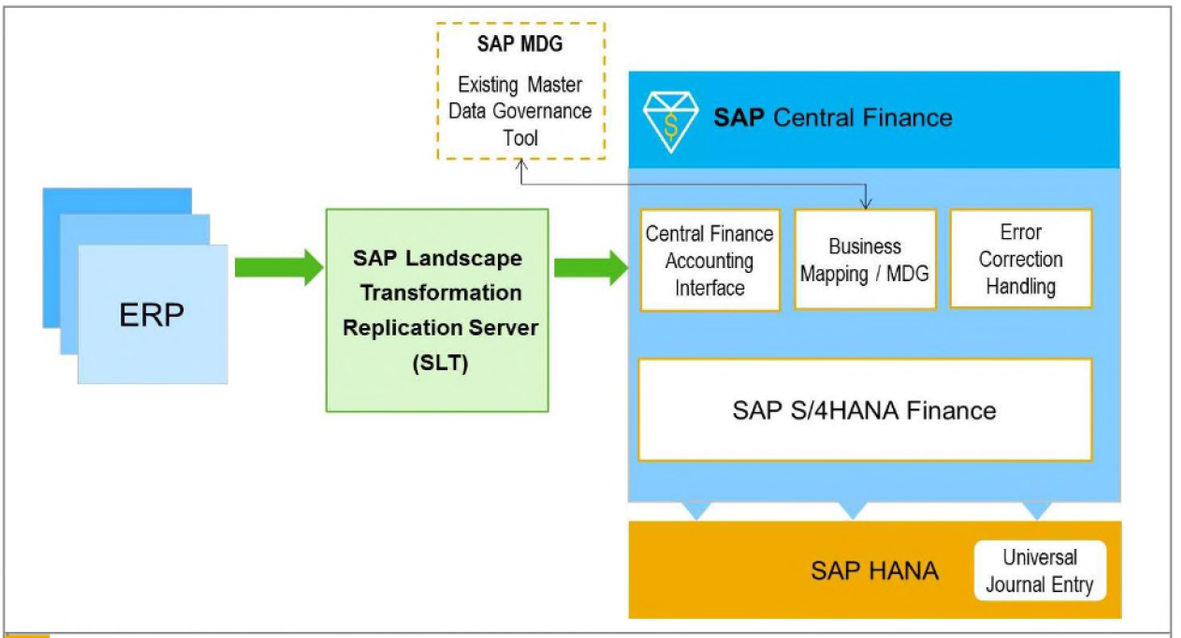


Figure 67: Functionality of S/4HANA Central Finance

On the left of the figure, you can see the source systems. These are the ERP systems that will continue to run. This applies to any release of SAP back to ERP 6.0. Older SAP ERP releases need to have special treatment, and this includes all non-SAP systems. Often, these systems have been significantly customized, making it too expensive to migrate or upgrade them to S/4HANA.

The key components in the Central Finance deployment scenario include the following:

Key Components in the Central Finance Deployment Scenario

- SAP LT Replication Server (SAP SLT)

  Data is replicated using the SAP Landscape Transformation Replication Server (SAP SLT). The SLT can be located on premise or in the HANA Enterprise Cloud. SLT replicates data from both SAP systems and non-SAP systems in real time. For non-SAP systems, it pulls the data directly from the database without having to adapt the programs.

- Central Finance Accounting Interface

  A key component of S/4HANA Central Finance is the accounting reposting interface. This is a component of the target S/4HANA Finance system, and can be regarded as the target for SLT replication.

- Business Mapping / SAP Master Data Governance (MDG)

  In order to harmonize all financial master data from the different source systems, this component provides mapping logic. For complex mapping, we can also use SAP MDG. There are basic mapping tables to support key master data, for example, chart of accounts, customers, and suppliers. There is also a Business Add-In (BAdI), which can be used for customer-specific mapping logic.

- Error Correction Handling

We manage posting errors with this component to provide a worklist-based approach to correcting replication or mapping errors.

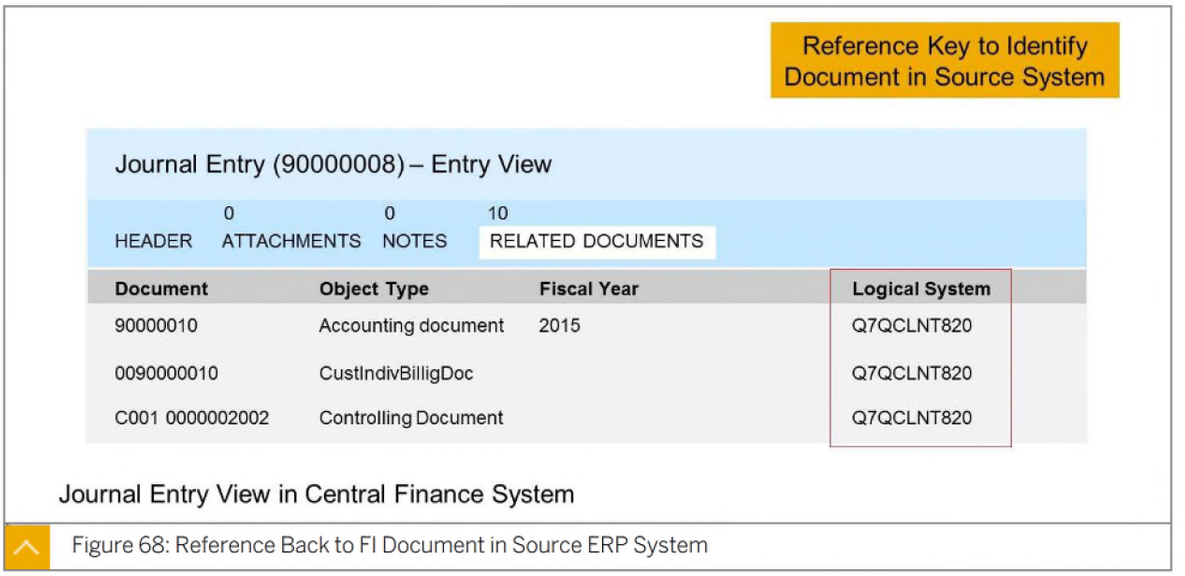


Figure 68: Reference Back to FI Document in Source ERP System

The document header of the newly posted FI document in the S/4HANA Central Finance target system includes new fields that have been added to reference the posting back to the original source document in the source system.

In the Related Documents view of the newly posted FI document in S/4HANA Central Finance, you can see the information that refers back to the original document. It is even possible to navigate back to the original source documents in the source ERP systems.

LESSON SUMMARY

You should now be able to:

- Describe the benefits of S/4HANA

Unit 4
Lesson 3

S/4HANA Enterprise Management

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe enterprise management with S/4HANA

Enterprise Management with S/4HANA

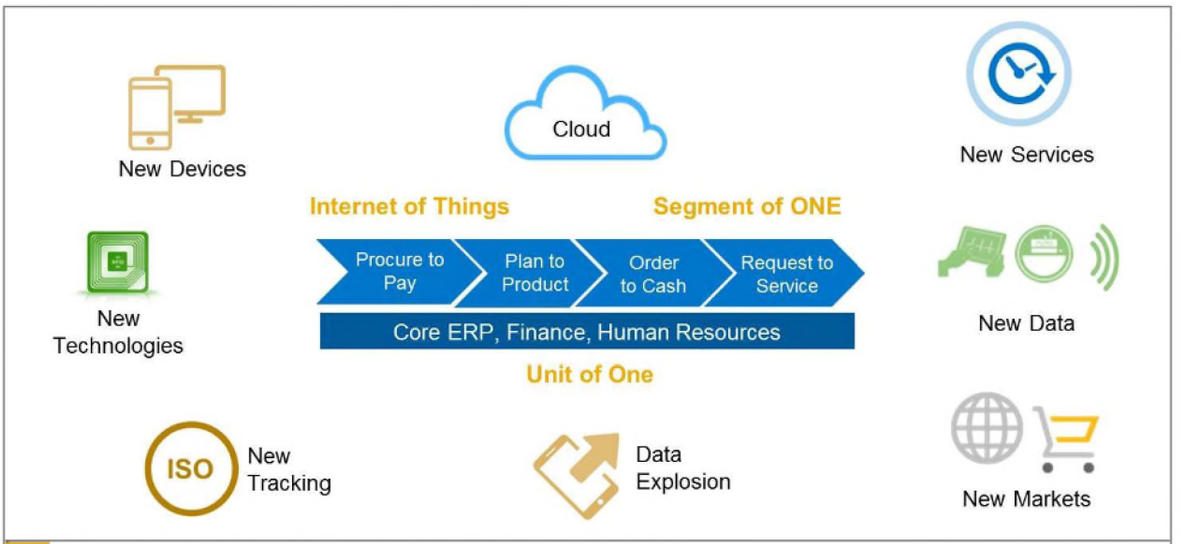


Figure 69: Unchanged Core ERP Processes and New Trends

Core ERP operational processes have remained largely unchanged. It is still necessary to support the operations of a business in the core areas of sales, procurement, manufacturing, and service. However, we now live in the digital world and there are new market trends due to the digital transformation.

Although the processes have not changed hugely, the way they are executed has changed. For example, the multi-channel methods the consumers now use to order goods and services have changed. The speed at which they expect their orders to be fulfilled has changed. The speed and visibility of customer feedback, good and bad, has changed.

As more and more sensors show up in a variety of devices, there are new opportunities to monitor, trace, and track everything in your operations.

Further changes include Big Data and more opportunities to develop deeper insight to help us continually improve the efficiency of our operations.

Organizations are keen to optimize their core processes and this is usually the highest priority, but they are also very keen to explore new business models that modern business systems such as SAP S/4HANA support.

To stay relevant in these times of massive disruption, enterprises are forced to review how their current core systems are supporting the new business realities. Consequently, enterprise management has to adapt to this changing digital world.

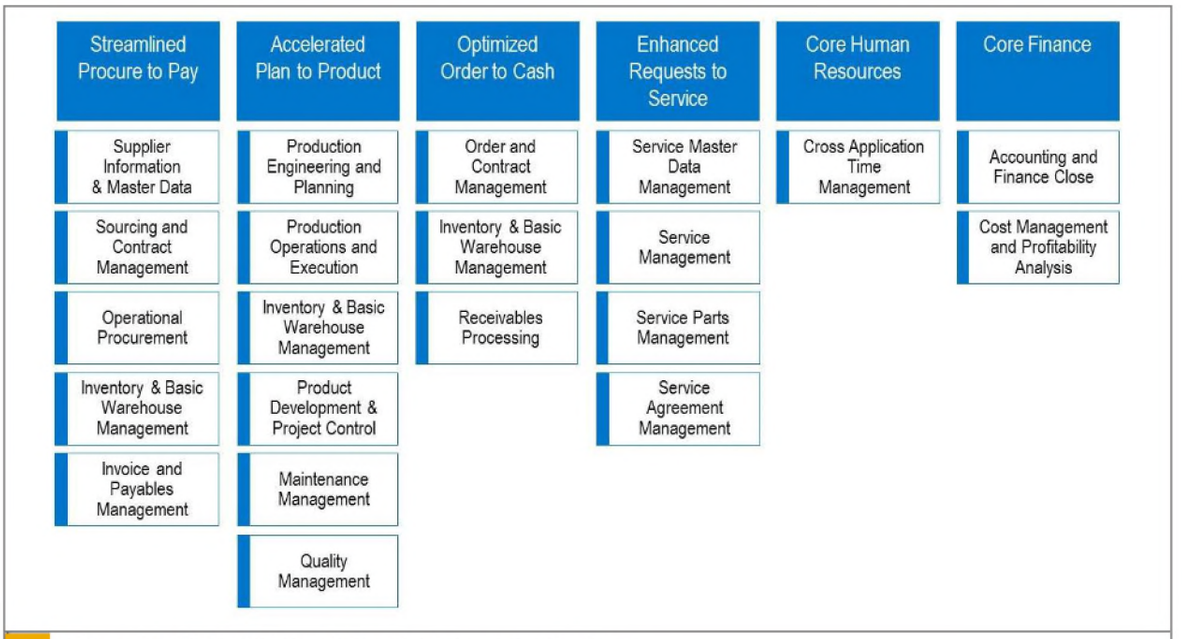


Figure 70: SAP S/4HANA Enterprise Management - Scope

Here we focus on how SAP S/4HANA Enterprise Management supports core operational processes.

SAP has worked closely with customers to identify where digitized operations could provide the most value. The result is a massive wave of simplification and innovation in the core that covers critical business processes in finance, sales, service, sourcing and procurement, manufacturing, supply chain, asset management, research and development, and human resources.

SAP S/4HANA Enterprise Management represents the core solution, covering all mission-critical processes of an enterprise. It represents the foundational core solution, natively built on the SAP HANA platform and designed with SAP Fiori UX.

SAP S/4HANA Enterprise Management is broad and includes the following:

- Procure to pay
- Plan to product
- Order to cash
- Request to service
- Core human resources
- Core finance

We can further break these up into the following key areas:

SAP S/4HANA Enterprise Management Key Areas

- Logistics

Often referred to as simple logistics, this was never an official product name and was used internally by SAP during the development phase. The correct name is Materials Management and Operations and it covers sales, procurement, and manufacturing, as well as all inventory management and logistics execution that runs through these core processes. We will focus on this area in the next lesson.

- Request to Service

  This covers service-based scenarios, as opposed to product-based scenarios, but also often integrated scenarios, such as shipping a product, then later performing a service repair.

- Core Human Resources

  This covers basic personnel scenarios.

- Core Finance

  This covers basic legal and management accounting.

Key Innovations Mapped to Core Processes

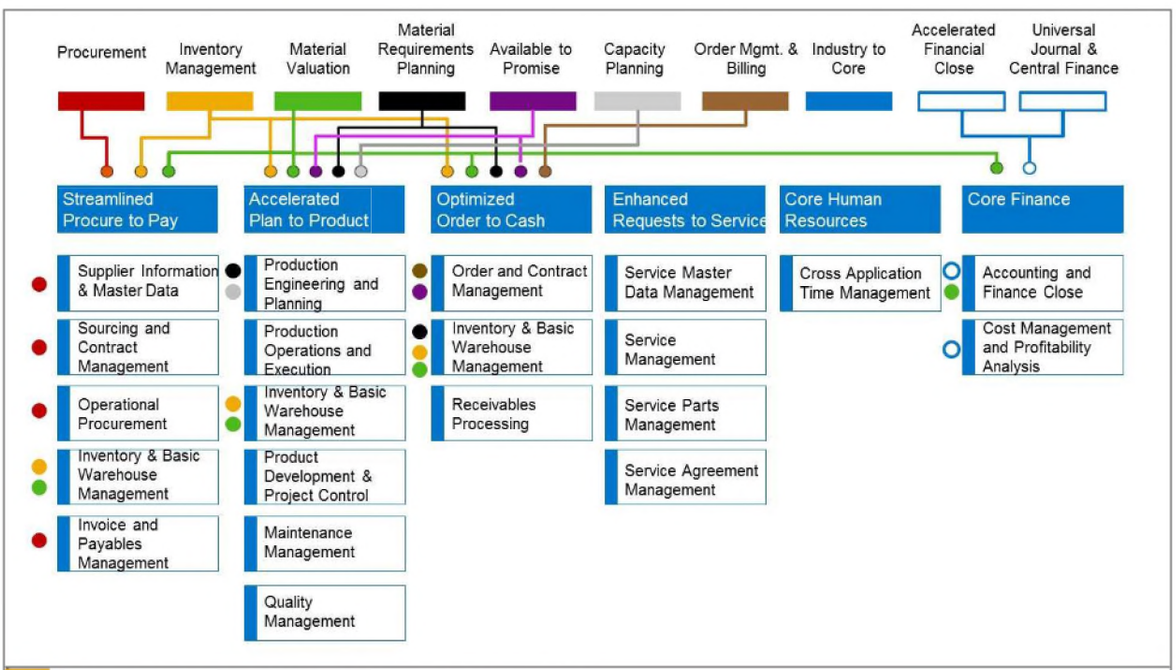


Figure 71: Key Innovations Mapped to Core Processes

The figure, Key Innovations Mapped to Core Processes, shows how the various innovations appear throughout the core processes for Materials Management and Operations. This provides a better view of what is covered in Materials Management and Operations.

SAP S/4HANA is a process-oriented solution. This means that the business functions, such as available-to-promise, overlap with multiple processes. For example, notice how this function appears in both Plan to Product and Order-to-Cash. Both processes require stock availability checking functions and have only one common function that deals with all types of material availability check, regardless of who is requesting the check.

Procurement

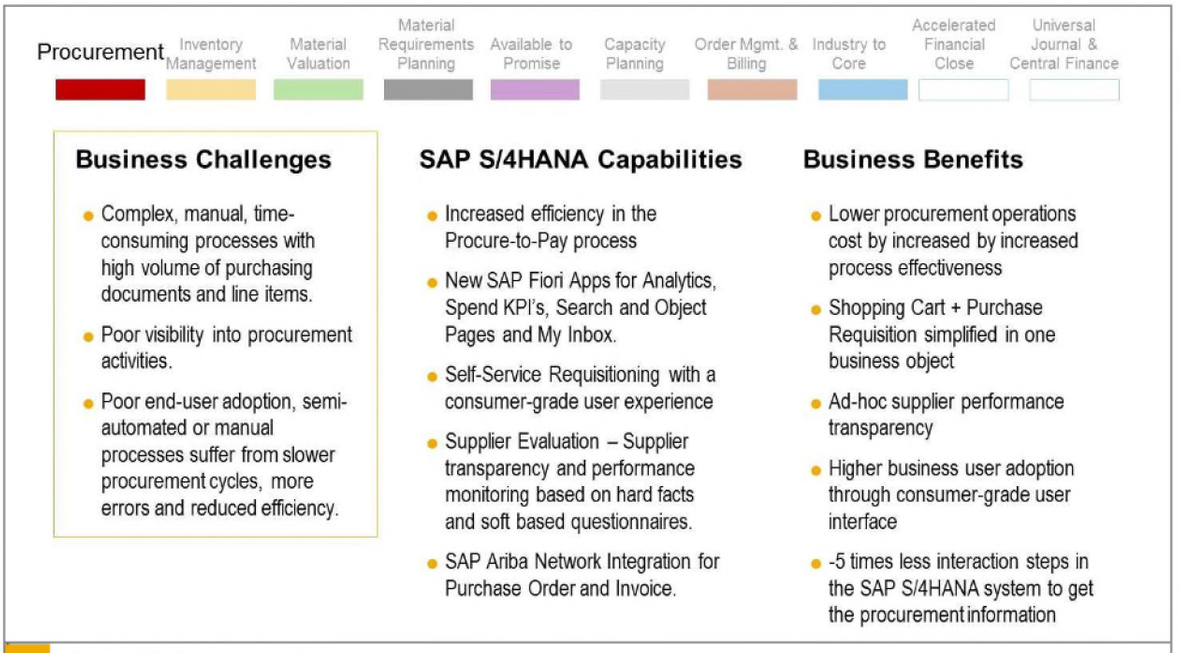


Figure 72: Procurement

Procurement covers the end-to-end process that starts with requisition management, goes through to order management, then to goods receipt, invoice receipt, and supplier payment.

A variety of purchase requirements are handled quickly and efficiently. S/4HANA simplifies the source of the supply assignment, so less time is spent figuring out which suppliers to use for orders.

Employees are given self-service requisition capabilities to create, manage, and track their orders efficiently to allow the purchasing department to deal with more high-value strategic buying decisions, rather than the day-to-day, low-value items needed by the business.

Buying has been simplified with one-stop purchase order processing, combining requisition and shopping carts into a single business object.

There are up-to-date insights with real-time purchasing and inventory reporting, so we always have accurate information to support decision making.

We have native integration to support the transmission of purchase orders and other related documents through the Ariba® Network.

Inventory Management

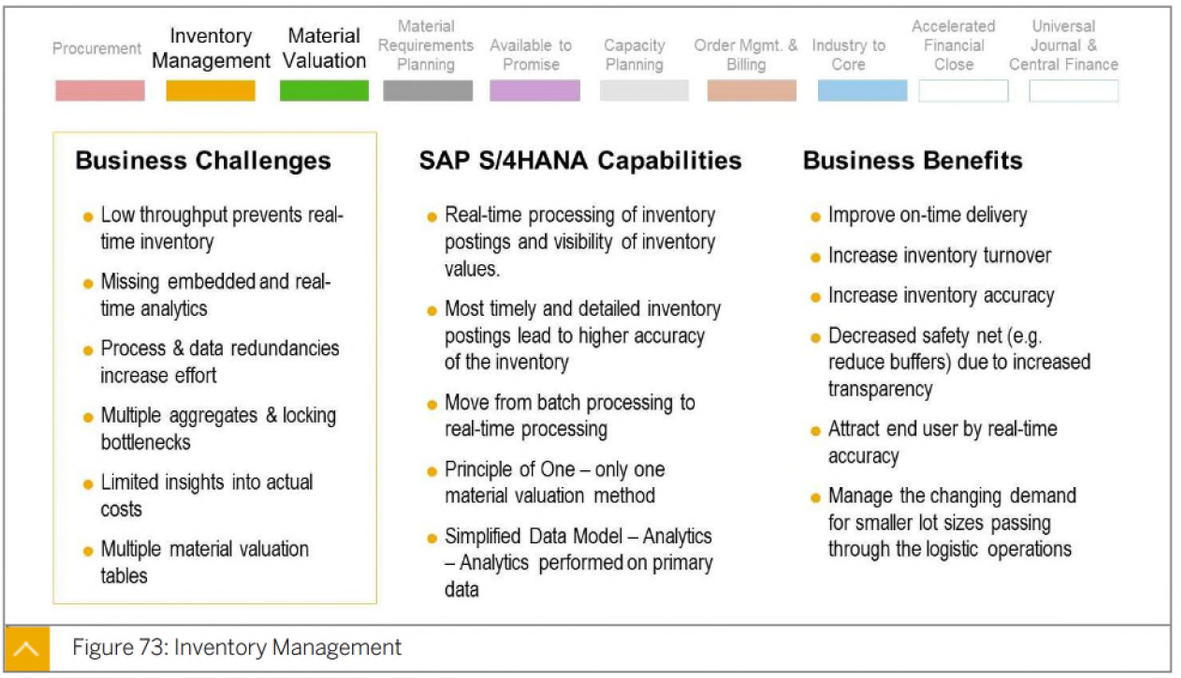


Figure 73: Inventory Management

Inventory Management supports the identification, classification, valuation, and storage of stock items across complex supply chain networks.

Traditionally, a lot of stock movement posting was carried out in batch processes, particularly where stock movements needed to be calculated from production yields, such as backflushing. This meant the stock position was not always up to date. With SAP S/4HANA, we work in a real-time inventory management environment, where up-to-date information is always available.

At any moment, you can see across a time horizon all future stock movements and balances that include all demand and supply, and at all levels of product structures, right down to the smallest component.

You can finally see accurate costs associated with all levels of the BOM in real time. This means you can calculate real-time profitability of products, based on accurate direct and indirect costs.

By working with real-time inventory, there is no longer a need for the stock buffers that were used in the past to make up for inaccuracies and allow for discrepancies. This results in an increased stock turnover.

With the power and speed of HANA, you no longer have to process inventory in large, aggregated batches. Now you can process much smaller lot sizes on demand.

Material Requirements Planning (MRP)

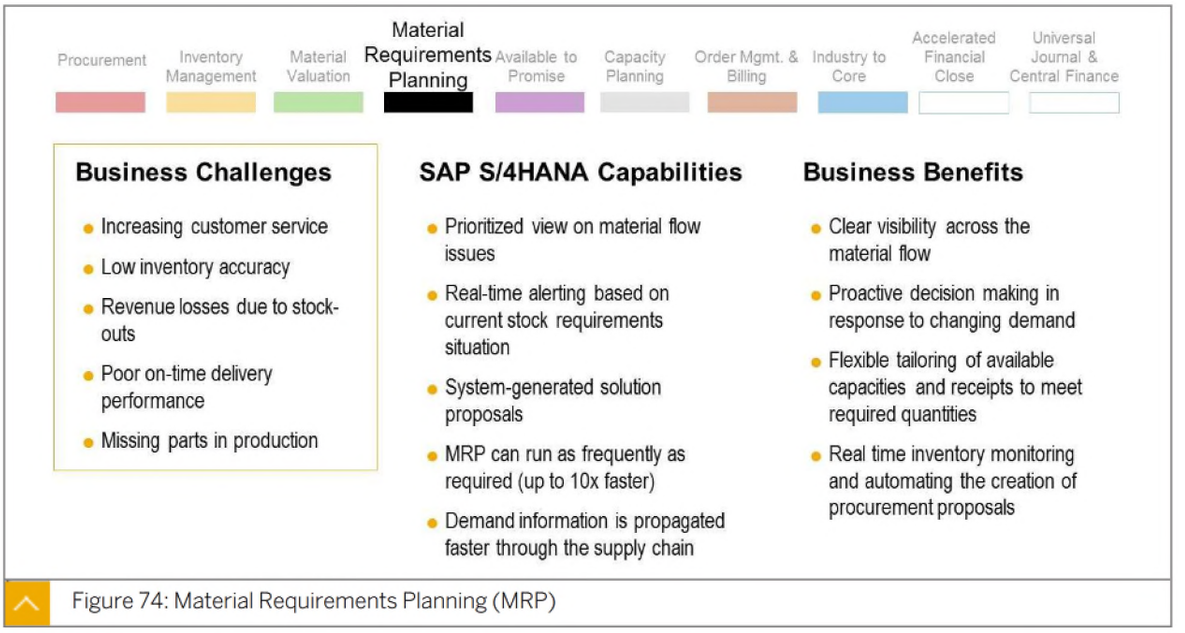


Figure 74: Material Requirements Planning (MRP)

MRP supports multi-level BOM component planning over a short to medium-term horizon.

This is a very intense and complex process that traditionally took a lot of resources and a long time to run.

With the power of SAP HANA, MRP now runs significantly faster. This means more MRP runs can be carried out in order to plan more frequently and with smaller batch sizes, providing the business with an accurate picture of product and component availability.

You can set up real-time alerting to highlight when stock situations need attention, with prioritization of the most critical issues, so they can be dealt with quickly.

The application makes proactive suggestions whenever there are issues with material flow to point the way to solutions.

Available-to-Promise

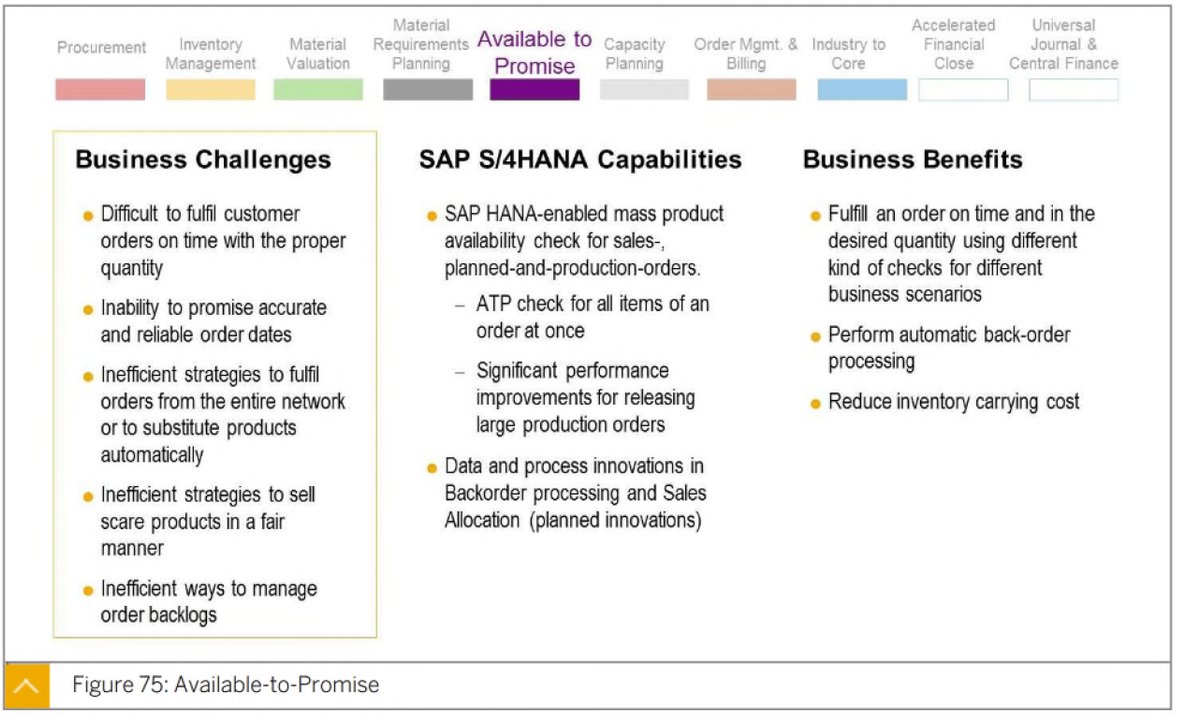


Figure 75: Available-to-Promise

Available-to-promise offers the following:

- Real-time availability check that considers all planned and actual future orders
- Simultaneous checks of all items in an order
- Smart product substitution processing
- With the power of SAP HANA, massive speed-up of processing availability checks
- Smart backorder processing and product allocation help to deal with conflicts when there is a low stock situation or a new product launch requires all key customers to have a fair share.

Capacity Planning

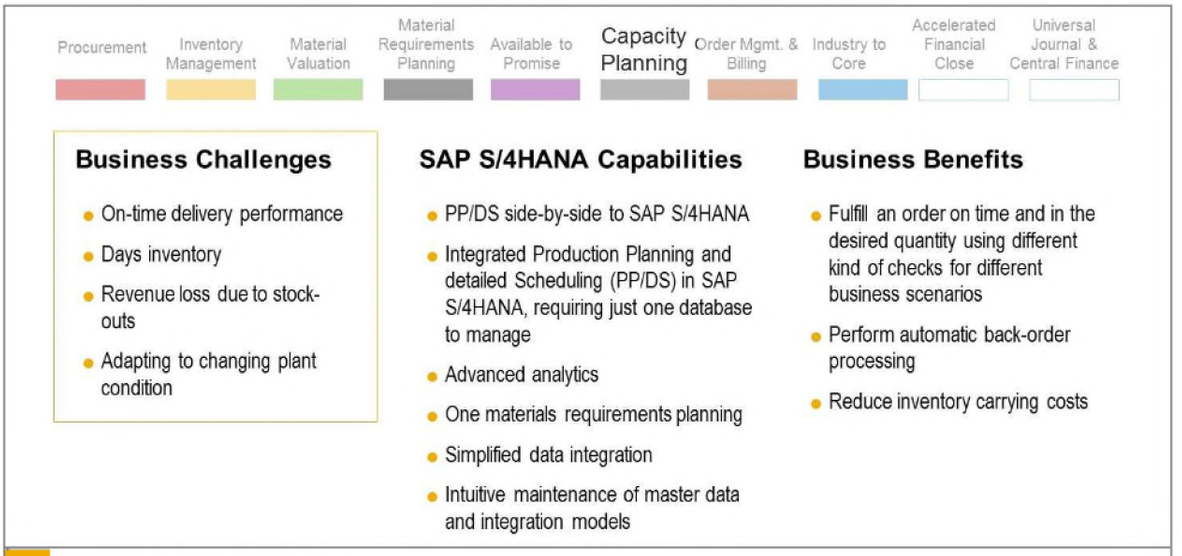


Figure 76: Capacity Planning

Capacity planning supports the planning of production orders and sequencing and scheduling of actual production and assembly operations.

At the same time, resources are planned to ensure production plans can be met and any shortages are highlighted so they can be resolved quickly.

Order Management

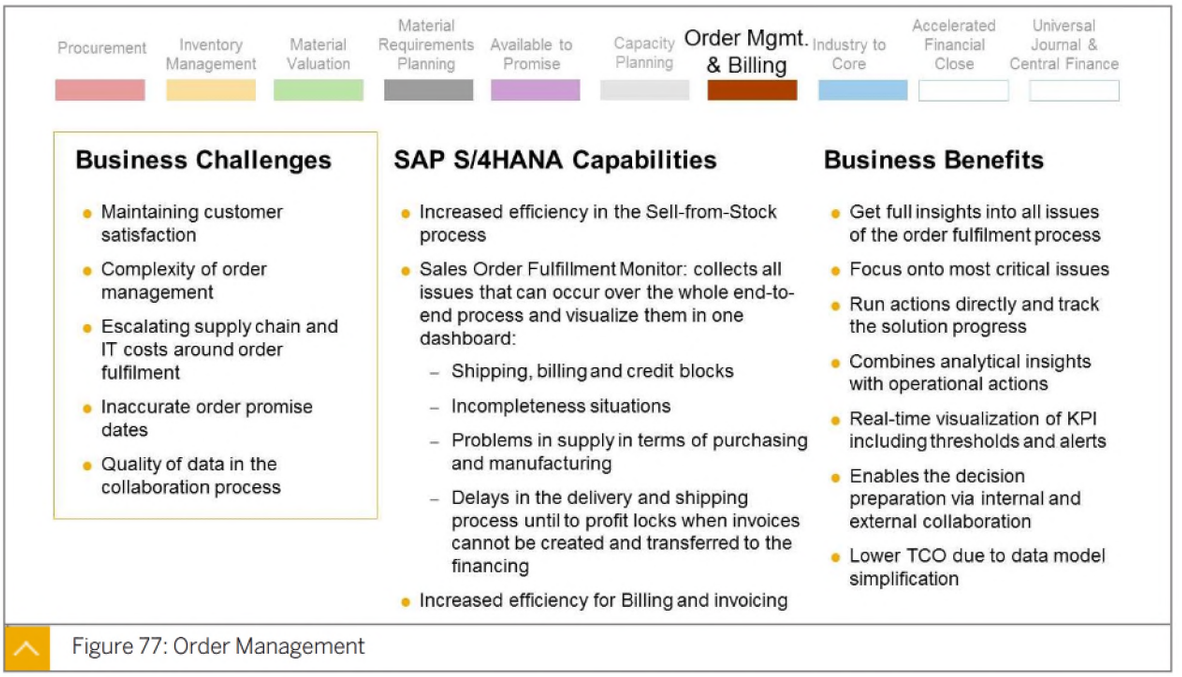


Figure 77: Order Management

Order management covers quotation, to order, to delivery, to billing, to payment - the complete, end-to-end order management lifecycle.

Order management includes new applications to provide end-to-end order fulfillment visibility to ensure any blockages are highlighted and dealt with immediately.

It works on the basis of exception-driven order processing, which means the end-to-end process is highly automated and only issues that need intervention are highlighted. We call this frictionless sales order processing and it ensures orders are fulfilled as quickly as possible.

Moving Industry Functionality to the Core

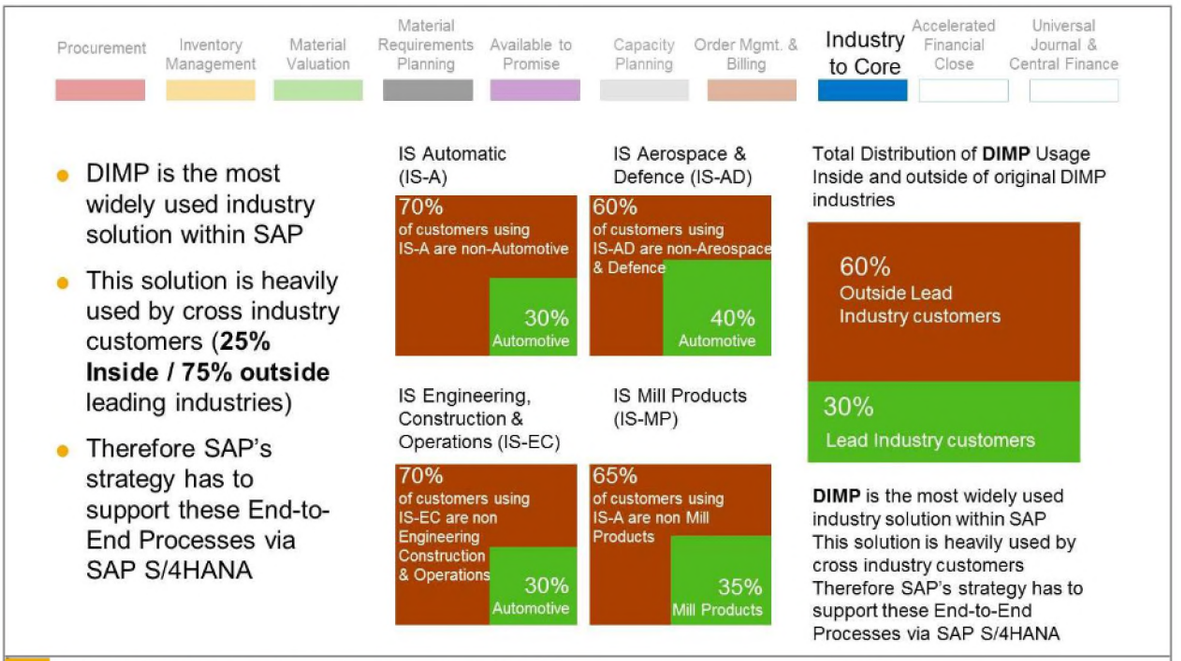


Figure 78: Moving Industry Functionality to the Core

For more than 20 years, SAP has been providing industry-specific functionality to either replace or enhance the standard functions of the business suite.

For example, a customer in the automotive industry may be keen to implement the SAP for Automotive solution to take advantage of the additional functionality that supports complex component supersession management (such as when a car component is no longer available and is replaced by one or more newer, improved components).

You might think that this specialized function would only be of interest to organizations in the automotive industry, but any organization might find they also have need for this type of function to manage any type of product replacement scenario. In fact, it is surprising that the majority of organizations who use some of the most popular SAP industry solutions are not from those industries at all.

SAP decided to combine the functions from various generic industry solutions with SAP S/4HANA Enterprise Management, so that any organization can include these functions in their own solutions.

The industry solutions SAP chose are part of what is known as Discrete Industries and Mill Products (DIMP). DIMP is the umbrella term used to describe a group of generic industry solutions. and it can be broken down into more specific industries, including aerospace and defense, automotive, high tech, engineering construction and operations, and industrial machinery and components industries.

Simplification List

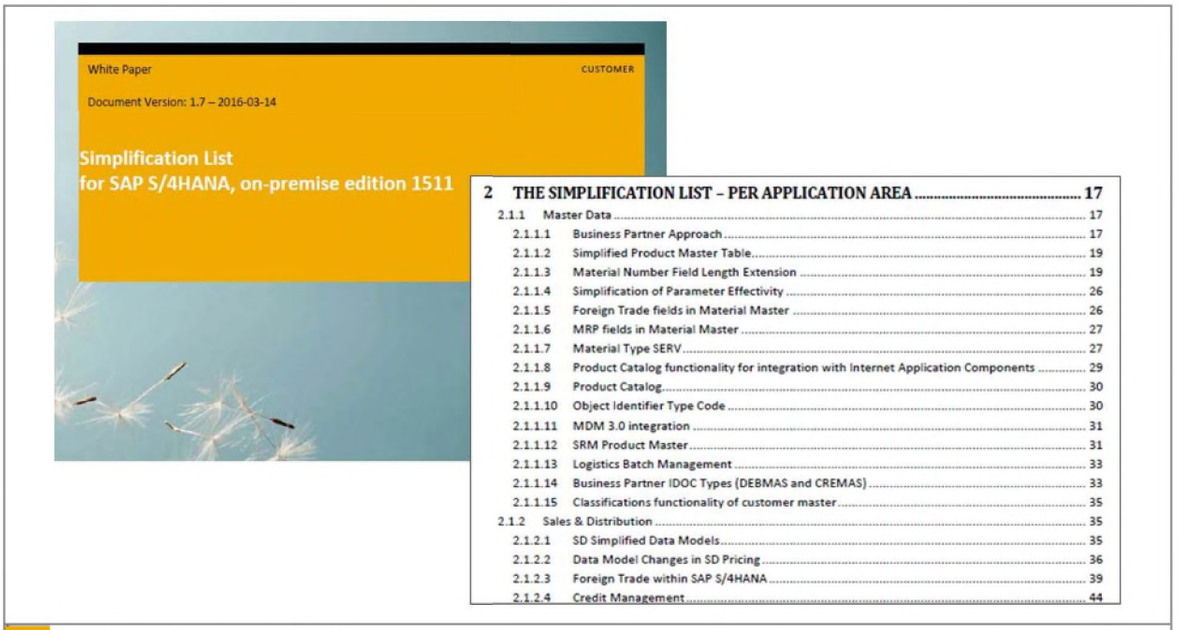


Figure 79: Simplification List

The Simplification List describes in detail and on a functional level what happens in S/4HANA to individual transactions and solution capabilities found in SAP Business Suite products.

In some cases, we have merged certain functionalities with other elements, or reflected them within a new solution or architecture, compared to the SAP Business Suite products.

This is a key document that is used in the implementation phase and is relevant only to customers who are converting from SAP Business Suite to SAP S/4HANA. It helps to determine the impact of converting.

For example, the Simplification List highlights where transaction codes are no longer available and points to the replacement application.

The Simplification List is especially helpful when the source systems have had customizations, because you can consider how these might be affected by the new design and make adjustments.

Unit 4
Exercise 4

Create a Business Partner

Create a new Business Partner master record for a new customer.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Start the *Maintain Business Partner* app from the SAP Fiori Launchpad.
2. Create the new business partner and maintain the *General Data* using the following information:

Field name	Value
Business Partner Categorization	Organization
Business Partner	T-OVW##
Grouping	External alpha-numeric numbering
Title	Company
Name	MTB World ##
Street/House number	P4
Postal Code/City	68161 Mannheim
Country	DE (Germany)
Region	BW (Baden-Wurttemberg)
Language	German

3. Maintain the *Company Code Data* for the new business partner using the following information:

Field name	Value
BP role	FI Customer
Company Code	1010
Reconciliation Account	12100000

4. Maintain the *Sales Area Data* and use the following information:

Field name	Value
BP role	Customer

Field name	Value
Sales Organization	1010
Distribution Channel	10
Division	00
Sales District	DE0002 (Southern Germany)
Currency	EUR
Price Group	C1 (Regular Buyer)
Customer Pricing Procedure	01 (Procedure 01)
Delivering Plant	1010
Shipping Conditions	01 (Standard)
Inco. Location1	Plant 1
Terms of Payment	0001 (Pay immediately w/o deduction)
Account Assignment Group	01 (Domestic revenues)
Tax classification	1 (Liable for Taxes)
Incoterms	EXW
Inco. Location1	Plant 1
Terms of Payment	0001 (Pay immediately w/o deduction)
Account Assignment Group	01 (Domestic revenues)
Tax classification	1 (Liable for Taxes)

5. Check that the mandatory partner functions have been filled automatically. Note the values in the table below:

Partner Function	Number
Sold-To Party	
Bill-To Party	
Payer	
Ship-To Party	

Unit 4
Solution 4

Create a Business Partner

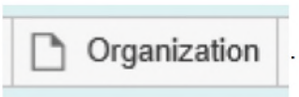
Create a new Business Partner master record for a new customer.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Start the *Maintain Business Partner* app from the SAP Fiori Launchpad.
   a) To start the app, choose the corresponding tile in your *Order Fulfillment* group on the SAP Fiori Launchpad.

2. Create the new business partner and maintain the *General Data* using the following information:

Field name	Value
Business Partner Categorization	Organization
Business Partner	T-OVW##
Grouping	External alpha-numeric numbering
Title	Company
Name	MTB World ##
Street/House number	P4
Postal Code/City	68161 Mannheim
Country	DE (Germany)
Region	BW (Baden-Wurttemberg)
Language	German

   a) Choose the *Organization* button 

.

   b) In the *Business Partner* and *Grouping* fields, enter the values provided in the table.

   c) On the *Address* tab, enter the values provided in the table.

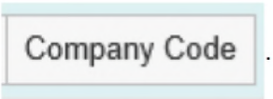
   d) Save your entries, but do not leave the screen 
.

3. Maintain the *Company Code Data* for the new business partner using the following information:

Field name	Value
BP role	FI Customer
Company Code	1010
Reconciliation Account	12100000

a) Choose the button  to switch to change mode.

b) In the *Change in BP role* field, choose the *FI Customer* value.

c) At the top of the screen, choose the *Company Code* button 

.

d) Enter the value provided in the table for *Company Code*. Don't forget to press ENTER.

e) On the *Customer: Account Management* tab, enter the value provided in the table for the *Reconciliation Account*.

f) Save your entries, but do not leave the screen. 

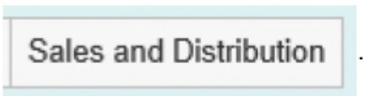
4. Maintain the *Sales Area Data* and use the following information:

Field name	Value
BP role	Customer
Sales Organization	1010
Distribution Channel	10
Division	00
Sales District	DE0002 (Southern Germany)
Currency	EUR
Price Group	C1 (Regular Buyer)
Customer Pricing Procedure	01 (Procedure 01)
Delivering Plant	1010
Shipping Conditions	01 (Standard)
Inco. Location1	Plant 1
Terms of Payment	0001 (Pay immediately w/o deduction)
Account Assignment Group	01 (Domestic revenues)
Tax classification	1 (Liable for Taxes)

Field name	Value
Incoterms	EXW
Inco. Location1	Plant 1
Terms of Payment	0001 (Pay immediately w/o deduction)
Account Assignment Group	01 (Domestic revenues)
Tax classification	1 (Liable for Taxes)

a) In the *Change in BP* role field, choose the *Customer* value.

b) At the top of the screen, choose the *Sales and Distribution* button



.

c) Enter the values provided in the table for *Sales Organization*, *Distribution Channel*, and *Division*.

d) Confirm your entries by pressing ENTER.

e) On the *Orders* tab, enter the values provided in the table for the *Sales District*, *Currency*, *Price Group*, and *Customer Pricing Procedure* fields.

f) On the *Shipping* tab, enter the values provided in the table for the *Delivering Plant* and the *Shipping Conditions*.

g) On the *Billing* tab, enter the values provided in the table for the *Incoterms*, *Inco. Location1*, *Terms of Payment* and *Account Assignment Group*.

h) Confirm your entries by pressing ENTER.

i) Enter the value for *Tax Classification*.

j) Save your entries.

5. Check that the mandatory partner functions have been filled automatically. Note the values in the table below:

Partner Function	Number
Sold-To Party	
Bill-To Party	
Payer	
Ship-To Party	

a) On the *Partner Functions*, tab within the *Customer Data* of your new business partner (*T-OVW##*), check the values for the partner functions and note them in the table.

Unit 4
Exercise 5

Perform Order Fulfillment

Sell and deliver the produced material to your new customer. Create the corresponding invoice.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Create a sales order using the following information:

Field name	Value
Order Type	OR
Sales Organization	1010
Distribution Channel	10
Division	00
Sold-To Party	T-OVW##
PO Number	4455##
Material	TG11
Quantity	2

2. Save the sales order and write down the order number.

3. Create the outbound delivery with reference to the sales order with shipping point **`1010`** and your *Ship-To Party* **`T-OVW##`**.

   Write down the document number of the delivery.

4. Pick the material for the outbound delivery and post the goods issue.
5. Create the billing document with reference to the outbound delivery. Use your *Sold-To Party* as selection criterion.

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Write down the document number of the billing document.

Unit 4
Solution 5

Perform Order Fulfillment

Sell and deliver the produced material to your new customer. Create the corresponding invoice.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Create a sales order using the following information:

Field name	Value
Order Type	OR
Sales Organization	1010
Distribution Channel	10
Division	00
Sold-To Party	T-OVW##
PO Number	4455##
Material	TG11
Quantity	2

   a) Start the *Create Sales Order* app in your *Order Fulfillment* group on the SAP Fiori Launchpad.

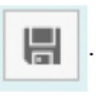
   b) On the *Create Sales Order: Initial* Screen, enter the **`Order Type`** and the values provided in the table for the relevant organizational data.

   c) Press ENTER.

   d) On the *Create Standard Order: Overview* screen, enter the values provided in the table for *Sold-To Party*, *PO Number*, *Material*, and ordered *Quantity*.

2. Save the sales order and write down the order number.

---

a) To save the sales order, choose the *Save* button  . The order number is then displayed on the bottom of the screen.

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3. Create the outbound delivery with reference to the sales order with shipping point **1010** and your *Ship-To Party* **T-OVW##**.

   Write down the document number of the delivery.

   _____

   a) Start the *Create Outbound Deliveries* app in your *Order Fulfillment* group on the SAP Fiori Launchpad.

   b) Enter the *Shipping Point* **1010** and the *Ship-To Party* **T-OVW##** in the respective fields.

   c) To see a list of sales documents corresponding to your selection, choose Go .

   d) Select your sales order and, at the bottom of the screen, choose Create Deliveries (1) .

   e) To navigate to the log, choose Display Log .

   f) Choose the *Deliveries* category 

.

   You see the document number of the created outbound delivery in the log.

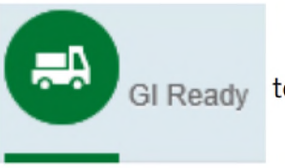
4. Pick the material for the outbound delivery and post the goods issue.

   a) Start the *Pick Outbound Delivery* app in your *Order Fulfillment* group on the SAP Fiori Launchpad.

   b) Enter the number of your outbound delivery in the corresponding field and press ENTER.

   c) On the *Pick Outbound Delivery* screen, ensure that you are in the *Picking* process step and, for *Picking Quantity*, enter **2 PC**.

   d) Choose *Save*  .

   e) In the same app, choose the *GI Ready* button 

to switch to the *GI Ready* view.

   f) To fulfill this step, choose Post GI .

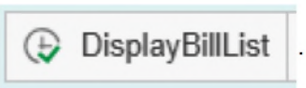
5. Create the billing document with reference to the outbound delivery. Use your *Sold-To Party* as selection criterion.

   Write down the document number of the billing document.

   _____

   a) Start the *Create Billing Document (Work List)* app in your *Order Fulfillment* group on the SAP Fiori Launchpad.

   b) Enter your *Sold-To Party* **`T-OVW##`** in the respective field.

   c) Choose 

   .

   d) Select the row with your outbound delivery and choose *Individual Billing Document*.

   e) On the *Invoice (F2) Create: Overview of Billing Items* screen, choose *Save*  to create the billing document.
   The number of the created document is displayed at the bottom of the screen.

Unit 4
Exercise 6

Analyze the Posted Invoice in FI

You previously posted an invoice for your sales order. In this exercise, you check and analyze the FI posting in order to understand the integration and the data recorded on the FI document. You also want to view the customers' outstanding balance.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Go to the *Manage Journal Entries* app and find the posted customer invoice.
2. Select the billing document transfer and open it with the *Manage Journal Entry* app.
3. Check the related documents tab and confirm the sales order number.
4. Check the Revenue Item, and view the account assignment analysis.
5. Select the customer line, check the *Payment Method*, and enter *Payment Methods* `T`.

   Write down the amount for the customer item (this changes, so no fixed amount is given).

   _____

   _____

   _____
6. Open the *Overdue Receivables* app.
7. Filter for your customer *T-OVW##*.
8. Save *Overdue - Customer T-OVW##* as a tile.
9. Go to the Launchpad home page, and find and launch your tile.

Unit 4
Solution 6

Analyze the Posted Invoice in FI

You previously posted an invoice for your sales order. In this exercise, you check and analyze the FI posting in order to understand the integration and the data recorded on the FI document. You also want to view the customers' outstanding balance.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Go to the *Manage Journal Entries* app and find the posted customer invoice.
   a) In the *Accounting Transaction* tile group, choose the *Manage Journal Entries* tile.
   b) Choose *Filters*.
   c) In the *Administrative Data* section, choose *More Filters*.
   d) Select the *User Name* checkbox, and choose OK.
   e) Enter your user name, **S4H01-##**, select the checkbox next to the field, and choose Save.
   f) In the *Name* text box, enter **S4H01-##** and choose OK.
   g) Choose Go.
2. Select the billing document transfer and open it with the *Manage Journal Entry* app.
   a) Choose the document number with document type *Billing doc.transfer (RV)*.
   b) Choose *Manage Journal Entry*.
3. Check the related documents tab and confirm the sales order number.
   a) Choose *RELATED DOCUMENTS*.
   b) Check the *Sales Order* number.
      The number should be the one that you created earlier.
4. Check the Revenue Item, and view the account assignment analysis.
   a) In the *Line Items* section, select the revenue line.
      It should be line 000002.
   b) Check the *Account Assignments* and the *Profitability Segment*.

> Note:
> All information, such as *Material Group* and *Customer Group* is updated directly in Accounting and is available for reporting.

5. Select the customer line, check the *Payment Method*, and enter *Payment Methods* **T**.

   Write down the amount for the customer item (this changes, so no fixed amount is given).

   _____

   a) Choose  (*Back*).

   b) Choose Edit.

   c) Select the receivable item.
   It should be line 000001.

   d) Check the *Payment Terms*.
   The *Payment Terms* should be 000001.

   e) In the payment methods, enter **T** (SEPA transfer).

   f) Write down the amount for the customer item in the space provided.

   g) Choose *Back to Journal Entry*.

   h) Choose Save.

   i) Exit to the *SAP Fiori Launchpad* Homepage.

6. Open the *Overdue Receivables* app.
   a) In the *Accounting Transaction*, choose *Overdue Receivables - today*.

7. Filter for your customer *T-OVW##*.
   a) On the filter bar, choose *Customer (All)*.

   b) In the search, enter **T-OVW##**.

   c) Select your customer and choose OK.

8. Save *Overdue - Customer T-OVW##* as a tile.
   a) Choose  (*Action*).

   b) Choose *Save as Tile*.

   c) In the *Subtitle*, enter **T-OVW##** and choose OK.

9. Go to the Launchpad home page, and find and launch your tile.

a) On the *SAP Fiori Launchpad* Homepage, refresh the browser (press Ctrl+R).

b) Drag the tile to the *Accounting Transactions* group.

c) To launch your customized app, choose the *Overdue Receivables T-OVW##* tile.

Unit 4
Exercise 7

Post an Incoming Payment

You have received payment from your customer and want to clear his account. Post an incoming payment for your customer.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Use the *Post Incoming Payments* app to enter the payment and clear your customer account. Enter the data as in the following tables:

Table 1: General Information

Field	Value
Company Code	1010
Posting Date	Today's date
Document Date	Today's date
Value Date	Today's date
Journal Entry Type	DZ (Customer Payment)

Table 2: Bank Data

Field	Value
G/L Account:	11001020 (Bank1 Bank Transfer)
House Bank / Account ID	Bank1 / GIRO
Amount / Currency	Amount from Invoice / EUR
Document Date	Today's date

Table 3: Open Item Selection

Field	Value
Account Type / Account ID	Customer / T-OVW##

2. Select the item to clear from the list of proposed items.
3. Post the payment document.

4. Launch the *Overdue Receivables – T-OVW##* that you created previously and check the new outstanding amount.

Unit 4
Solution 7

Post an Incoming Payment

You have received payment from your customer and want to clear his account. Post an incoming payment for your customer.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Use the *Post Incoming Payments* app to enter the payment and clear your customer account. Enter the data as in the following tables:

Table 1: General Information

Field	Value
Company Code	1010
Posting Date	Today's date
Document Date	Today's date
Value Date	Today's date
Journal Entry Type	DZ (Customer Payment)

Table 2: Bank Data

Field	Value
G/L Account:	11001020 (Bank1 Bank Transfer)
House Bank / Account ID	Bank1 / GIRO
Amount / Currency	Amount from Invoice / EUR
Document Date	Today's date

Table 3: Open Item Selection

Field	Value
Account Type / Account ID	Customer / T-OVW##

a) In the *Accounting Transaction* tile group, choose the *Post Incoming Payments* tile.

b) Enter the data as in the table, and choose *Propose Items*.

2. Select the item to clear from the list of proposed items.
   a) Find the line with the amount to be paid and choose *Clear*.
3. Post the payment document.
   a) Choose 

.
   b) Choose 

.
   c) Go back to the Home page.
4. Launch the *Overdue Receivables – T-OVW##* that you created previously and check the new outstanding amount.
   a) To launch your customized app, on the *SAP Fiori Launchpad* Homepage, choose the *Overdue Receivables T-OVW##* tile.
   b) Confirm that there is no longer any outstanding amount.

LESSON SUMMARY

You should now be able to:

- Describe enterprise management with S/4HANA

Unit 4

Learning Assessment

1. What are the benefits of the SAP S/4HANA Finance Universal Journal?

   Choose the correct answers.

   - [ ] A Period end closing is obsolete
   - [ ] B Drill down to the most granular information
   - [ ] C Reporting from the source with no data movement needed
   - [ ] D Easy extensibility

2. Which of the following are important architectural components in SAP S/4HANA Central Finance?

   Choose the correct answers.

   - [ ] A SAP Landscape Transformation Replication Server (SLT)
   - [ ] B Central Finance Accounting Interface
   - [ ] C SAP BW extractors
   - [ ] D Business Mapping

3. Which of the following are included in SAP S/4HANA Enterprise Management?

   Choose the correct answers.

   - [ ] A Order to Cash
   - [ ] B SAP Ariba
   - [ ] C SAP SuccessFactors
   - [ ] D Core Human Resources
   - [ ] E Plan to Product

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4. What does DIMP relate to?

   Choose the correct answer.

   - ☐ A Single sign-on
   - ☐ B SAP Industry solutions
   - ☐ C Simplified data model architecture
   - ☐ D Data mapping policy for central finance

5. To understand the mapping between SAP Business Suite applications and SAP S/4HANA applications, what do you refer to?

   Choose the correct answer.

   - ☐ A Simplification List
   - ☐ B SAP Solution Manager
   - ☐ C SAP S/4HANA Product Roadmap

Learning Assessment - Answers

1. What are the benefits of the SAP S/4HANA Finance Universal Journal?

   Choose the correct answers.

   - [ ] A Period end closing is obsolete
   - [X] B Drill down to the most granular information
   - [X] C Reporting from the source with no data movement needed
   - [X] D Easy extensibility

2. Which of the following are important architectural components in SAP S/4HANA Central Finance?

   Choose the correct answers.

   - [X] A SAP Landscape Transformation Replication Server (SLT)
   - [X] B Central Finance Accounting Interface
   - [ ] C SAP BW extractors
   - [X] D Business Mapping

3. Which of the following are included in SAP S/4HANA Enterprise Management?

   Choose the correct answers.

   - [X] A Order to Cash
   - [ ] B SAP Ariba
   - [ ] C SAP SuccessFactors
   - [X] D Core Human Resources
   - [X] E Plan to Product

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4. What does DIMP relate to?

   Choose the correct answer.

   - [ ] A Single sign-on
   - [X] B SAP Industry solutions
   - [ ] C Simplified data model architecture
   - [ ] D Data mapping policy for central finance

5. To understand the mapping between SAP Business Suite applications and SAP S/4HANA applications, what do you refer to?

   Choose the correct answer.

   - [X] A Simplification List
   - [ ] B SAP Solution Manager
   - [ ] C SAP S/4HANA Product Roadmap

UNIT 5 Adoption

Lesson 1

Adoption 136

Lesson 2

Methodology 140

Lesson 3

Best Practices 143

Lesson 4

Guided Configuration 146

Lesson 5

Adapting Custom ABAP Code 149

UNIT OBJECTIVES

- Describe the overall aim of SAP Activate
- Describe SAP Activate methodology
- Describe SAP Activate Best Practices
- Describe SAP Activate Guided Configuration
- Explain the importance of a custom code review

Unit 5
Lesson 1

Adoption

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe the overall aim of SAP Activate

SAP Activate

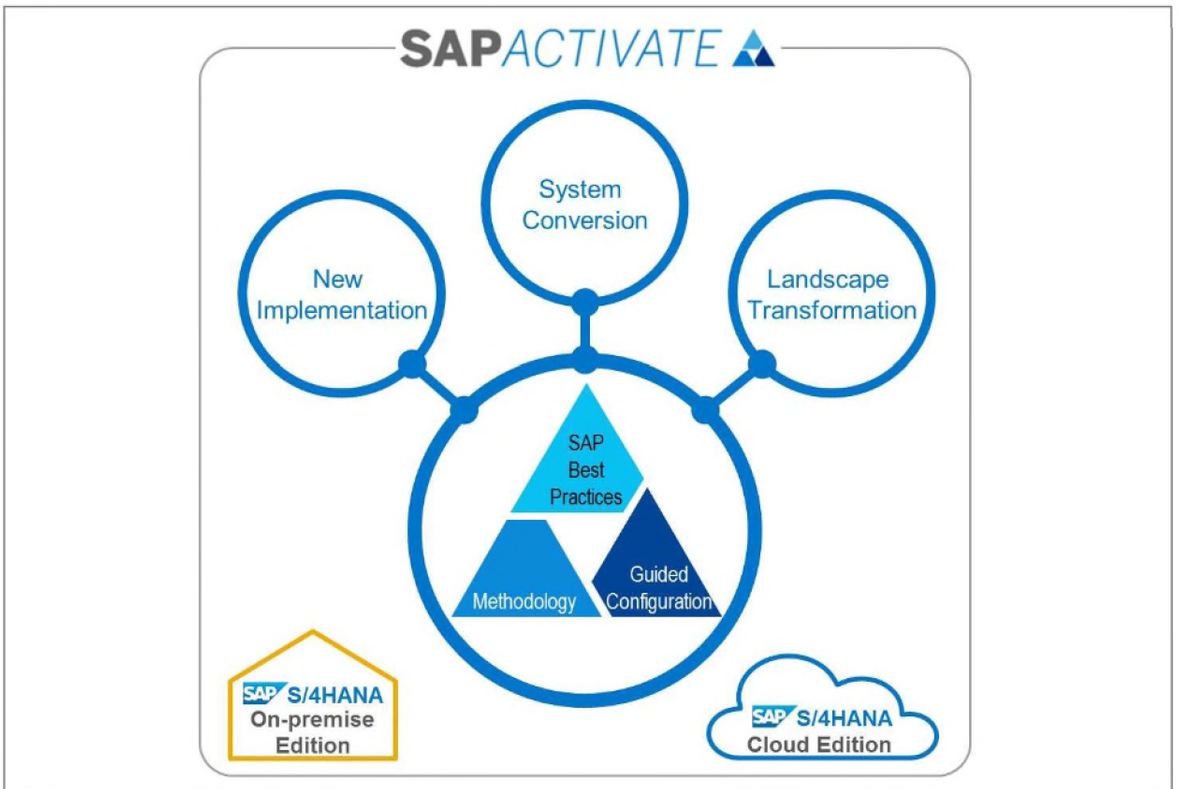

Figure 80: Introducing SAP Activate

SAP Activate is a combination of SAP Best Practices and tools to help customers simplify and accelerate the adoption of SAP S/4HANA.

The following are the main components of SAP Activate:

- SAP Best Practices - These are ready-to-run business processes optimized and following industry best practices.
- Methodology - This is a comprehensive road map to ensure a well-managed and accelerated implementation project and continuous optimization of the solution.
- Guided Configuration - These are tools to help activate Best Practices content and make customized adjustments.

•

SAP Activate is available for on-premise and cloud editions of SAP S/4HANA and uses a common methodology for both editions. SAP Activate supports the following deployment scenarios of SAP S/4HANA:

- New implementation
- System conversion
- Landscape Transformation

New Implementation Scenario

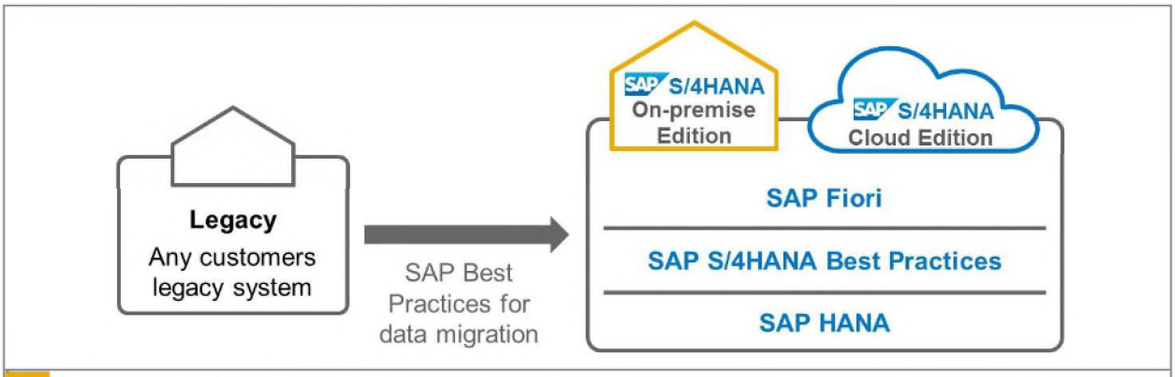

Figure 81: 1 - New Implementation

In the first scenario, new implementation, we are focusing on customers coming from any legacy system. This includes SAP Business Suite customers who want to start again with a new installation of on-premise S/4HANA or move to the cloud, rather than convert their existing system.

This scenario includes the following key steps for an S/4HANA on-premise implementation:

- Installation of SAP NetWeaver Application Server ABAP 7.5 based on SAP HANA
- Installation of SAP S/4HANA
- Installation of SAP Fiori for SAP S/4HANA
- Activation of the required business processes
- Migration of business data from legacy systems

For S/4HANA Cloud, there is no installation required of the SAP S/4HANA software. Customers simply need to do the following:

Implementation Steps for S/4HANA Cloud

- Activate the required business processes
- Migrate business data from legacy systems

Remember, the implementation project does not start from scratch. The initial configuration of SAP S/4HANA is based on a preconfigured system, providing ready-to run business processes with sample data, and this marks the starting point.

Existing SAP System Conversion Scenario

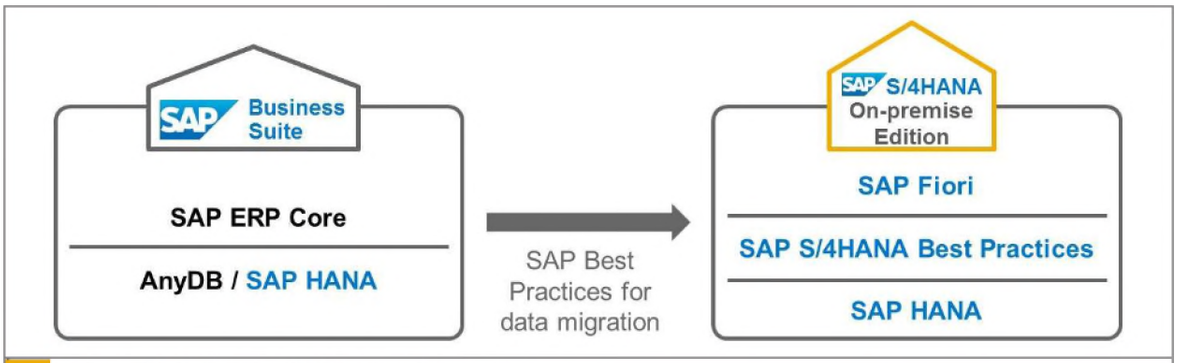

Figure 82: 2 - Existing SAP System Conversion

The second scenario, referred to as system conversion, is focused on existing SAP Business Suite customers who want to convert their current system into an SAP S/4HANA on-premise system. This includes the following key steps:

Conversion Scenario Steps

- Update your system to SAP NetWeaver Application Server ABAP 7.5.
- Migrate the database to SAP HANA, but only in cases in which the SAP Business Suite system is not yet on SAP HANA.
- Install SAP S/4HANA and SAP Fiori for SAP S/4HANA.
- Migrate data from the old data structures to the new, simplified data structures.

Obviously, the biggest advantage for customers choosing this option is the conversion without re-implementation. This means a non-disruptive approach for existing business processes, while still being able to transition over time to the simplified and innovative processes. The good news is that existing customizations are also converted.

It is important that we describe this scenario as conversion, rather than upgrade. We are converting from one SAP product to another SAP product. Upgrades are when we move to the newer version of a product we already run.

Landscape Transformation Scenario

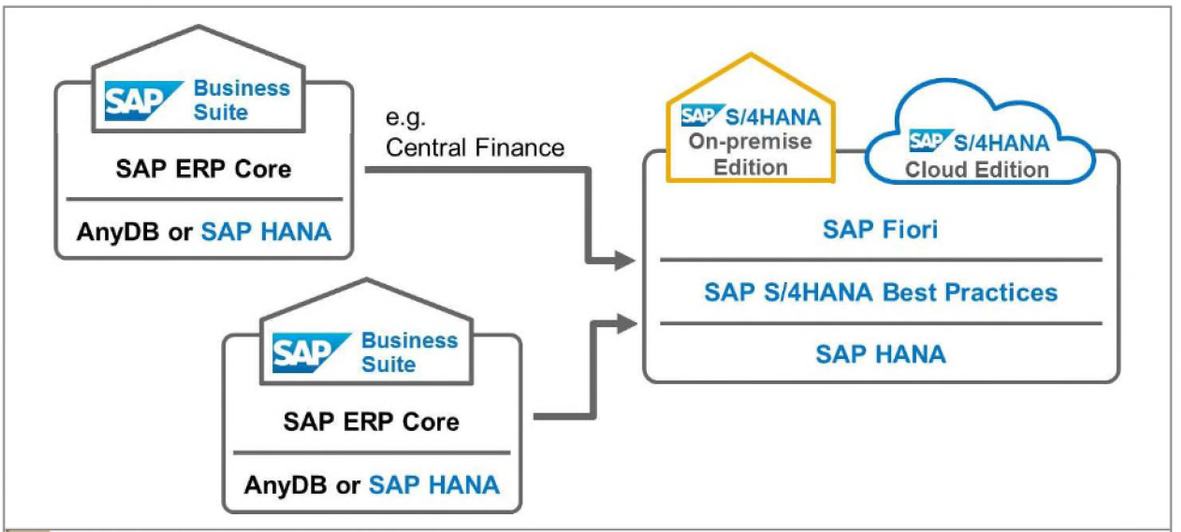

Figure 83: 3 - Landscape Transformation

The third scenario supports SAP Business Suite customers who want to reorganize their current system landscape, and SAP S/4HANA plays a key role in the target landscape.

This applies, for example, where multiple legacy systems are consolidated into one target S/4HANA system, or one legacy system is split up into multiple target S/4HANA systems, perhaps to separate individual companies.

In the example of a transformation to SAP S/4HANA on-premise edition, the following main technical steps are required:

Transformation to SAP S/4HANA Steps

- Possibly a new installation of S/4HANA or a conversion from ERP to S/4HANA.
- Additional migration steps that are based on SAP Landscape Transformation Replication Server (SLT) in order to move or replicate the data.
- Set up of a central finance instance. This approach is used so that individual legacy source systems (SAP or non-SAP) can begin to post their finance data in real time to a central S/4HANA system (cloud or on premise). This allows customers to get started early with S/4HANA Finance, but keep their legacy applications running on existing systems until they are ready to fully convert.

LESSON SUMMARY

You should now be able to:

- Describe the overall aim of SAP Activate

Unit 5
Lesson 2

Methodology

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe SAP Activate methodology

SAP Activate Methodology

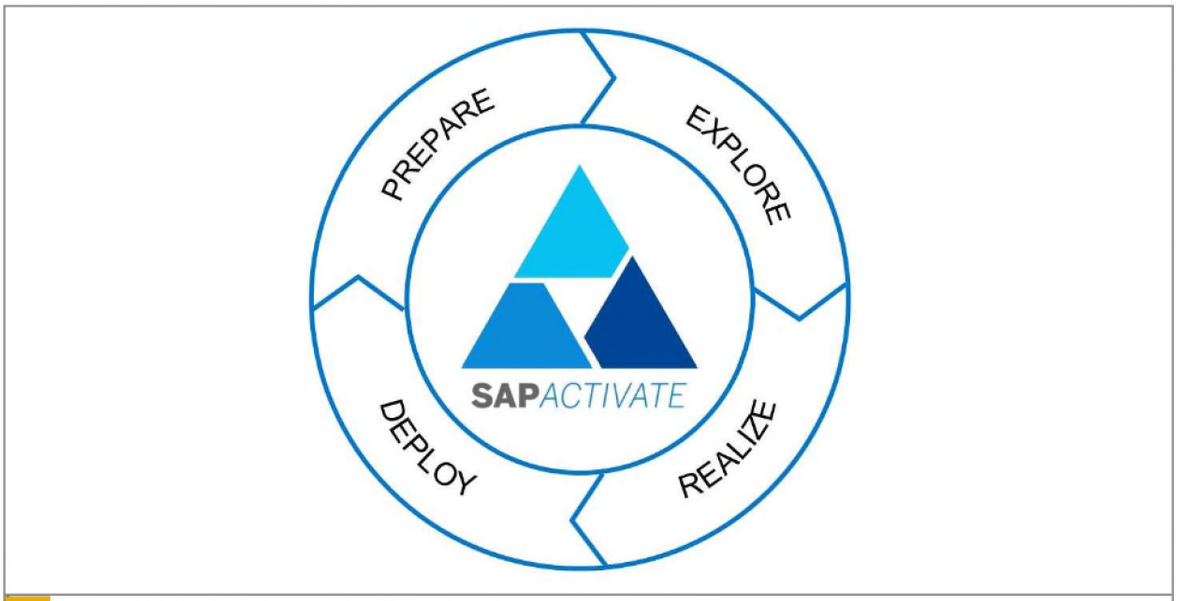

Figure 84: SAP Activate Methodology

SAP Activate methodology provides one simple, modular, and agile road map that supports all S/4HANA implementations, whether on premise or in the cloud.

SAP Activate provides full support for the initial setup of SAP S/4HANA but also provides support after go-live for continuous business innovation.

SAP Activate methodology enables co-innovation with customers and is accessible for partners who can add their own content, perhaps to support specific industry or country requirements.

It is the successor of the ASAP and SAP Launch methodologies and is optimized for an SAP S/4HANA implementation.

SAP Activate Methodology Roadmap

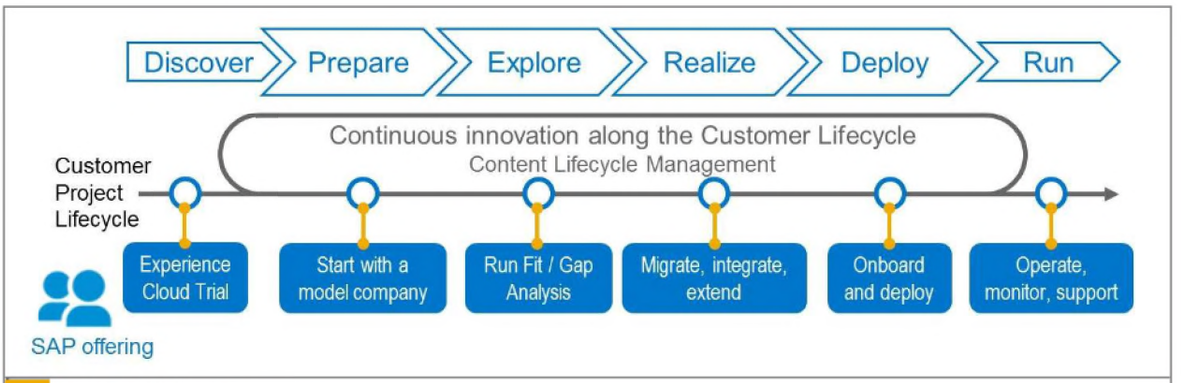

Figure 85: Roadmap

SAP Activate methodology provides a comprehensive road map for a simplified deployment of S/4HANA.

As shown in the figure, Roadmap, the road map starts by guiding customers through an exploration phase for S/4HANA using a trial version. Customers can try out the SAP Fiori user experience across many preconfigured business scenarios.

Next, customers are guided in the setup of their own private model company, so they can fully explore the functions and processes. The setup of the model company is very fast, as we already populate it with example master data and transactions, and it is already configured for best practices.

In the next phase, using the model company, we guide customers through a fit/gap analysis to identify what needs to be done to adapt the system to the exact requirements of the customer.

In the next phase, customers are guided through Best Practices integration with business networks, such as Ariba, and cloud-based applications, such as SuccessFactors. This phase also guides customers through data migration, customization, and extensions, all following SAP Best Practices.

The onboarding phase ensures customers cover all the key areas of preparation for go-live, including user readiness facilitated by SAP Learning Hub, which is the SAP cloud-based training solution.

Finally, we ensure customers are fully ready for the continuous operation and optimization of their solution, using SAP Best Practices for monitoring and support.

Hierarchy of Methodology Information on SAP Jam

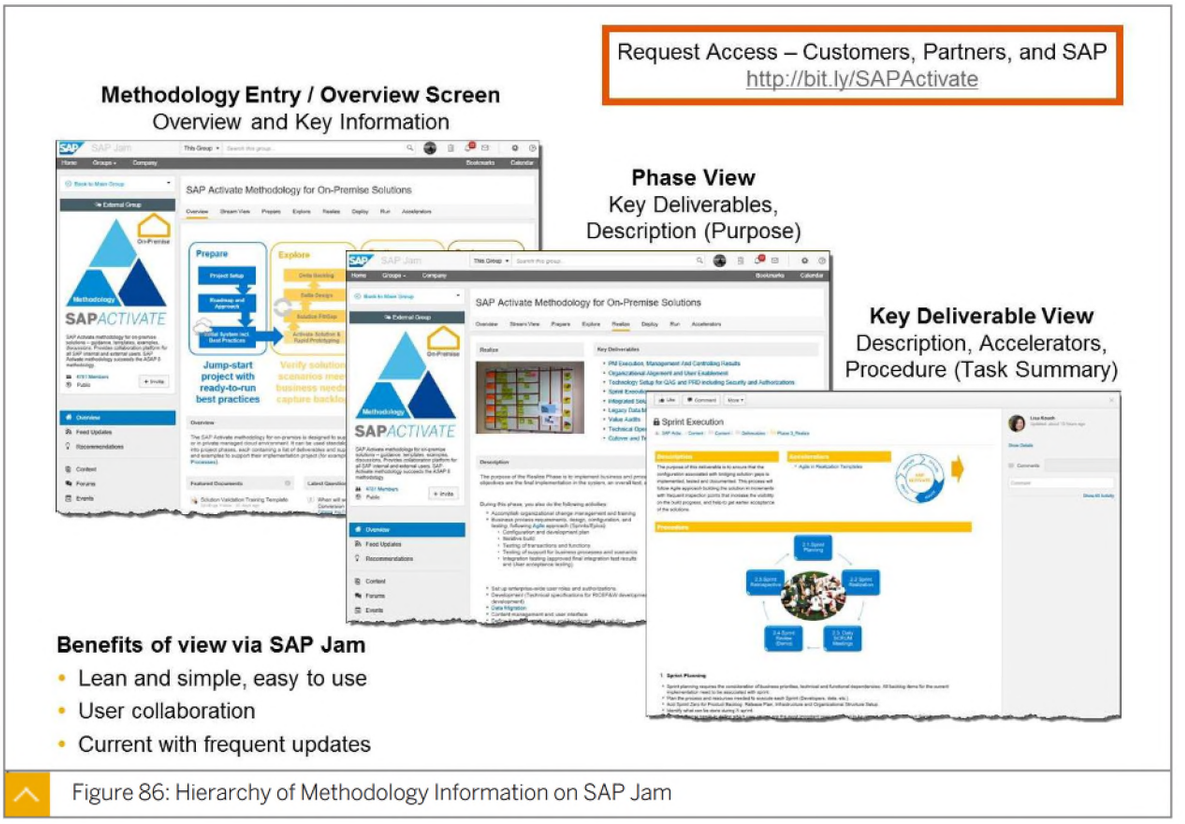

Figure 86: Hierarchy of Methodology Information on SAP Jam

SAP Activate methodology is available through the Methodology Jam community that is open to customers, partners, and internal SAP users.

The SAP Activate methodology is structured as follows in the JAM community:

- The landing page contains overview information, latest updates, and key links.
- From the landing page, users can navigate to a specific methodology phase and explore the key project management deliverables in that phase.
- If users wish to dive deeper, they can access the deliverable details, which provide descriptions of the deliverable and appropriate accelerators.

In addition to this structure, the Jam space contains collaboration areas. Users can comment and provide feedback on each item. They can also start discussions, engage with SAP experts, and share examples with the community. An advantage of hosting Activate on JAM is that it is a live environment, where the latest information is always available.

To request access SAP Activate methodology, use the link: **`http://bit.ly/SAPActivate`**

LESSON SUMMARY

You should now be able to:

- Describe SAP Activate methodology

Unit 5
Lesson 3

Best Practices

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe SAP Activate Best Practices

SAP Activate Best Practices

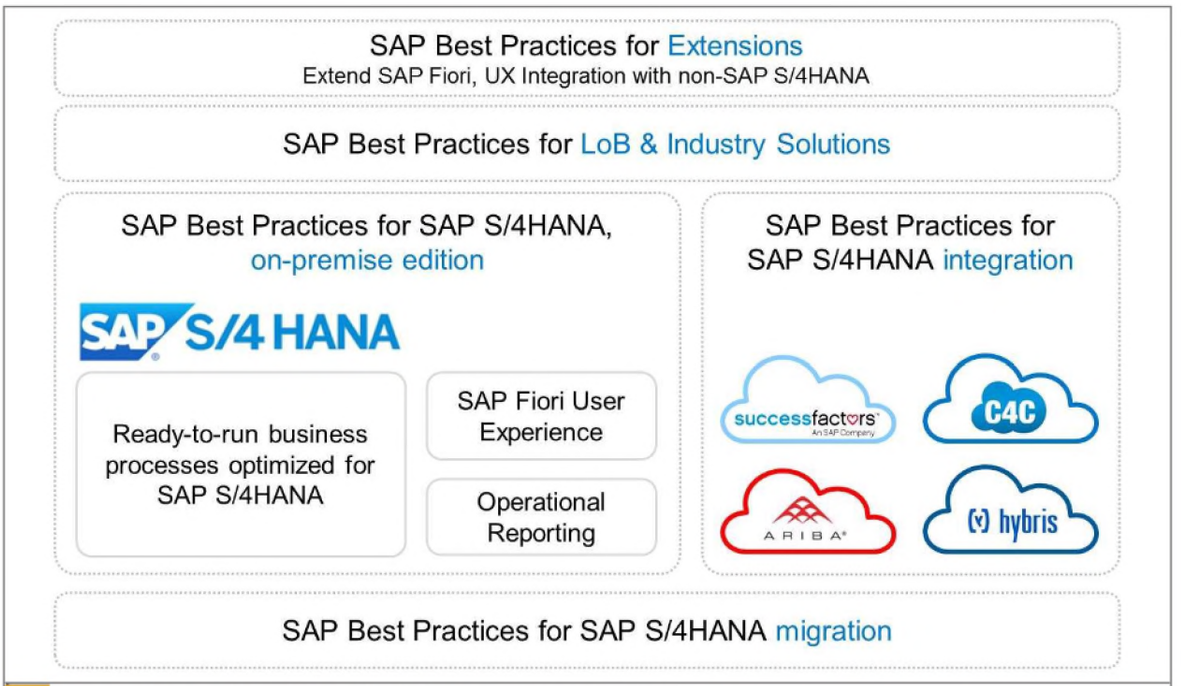

Figure 87: Best Practices for SAP S4HANA, on-premise edition

SAP Best Practices for SAP S/4HANA provides ready-to-run, digitized, analytical, and operational business processes that cover the fundamental business processes of an enterprise, often referred to as the baseline. Whether you want to streamline your procure to pay processes, optimize your order to cash flow, or take advantage of simple finance, we provide a preconfiguration for many of your business priorities.

Let's take a look at an example of a new financial implementation. You want to leverage parallel accounting to address multinational reporting requirements. There is no need to create a standard chart of accounts, because it is already there. Best practices for closing books, remaining IFRS compliant, tracking debits and credits, and calculating taxes are all preconfigured in your solution. These business processes are easily integrated with other cloud solutions, such as SuccessFactors Employee Central and the Ariba Network.

SAP Best Practices also guides customers through the migration process to SAP S/4HANA, whether they migrate existing SAP ERP solutions from a non-SAP database or legacy systems. SAP Best Practices covers integration and migration fundamentals. Whether you

are performing a new implementation, a conversion, or a landscape transformation, you never start from a blank slate. Instead, SAP Activate gives you sample data, clear guidelines, and step-by-step directions on how to move from your current landscape to your goal.

SAP Best Practices for S/4HANA Cloud

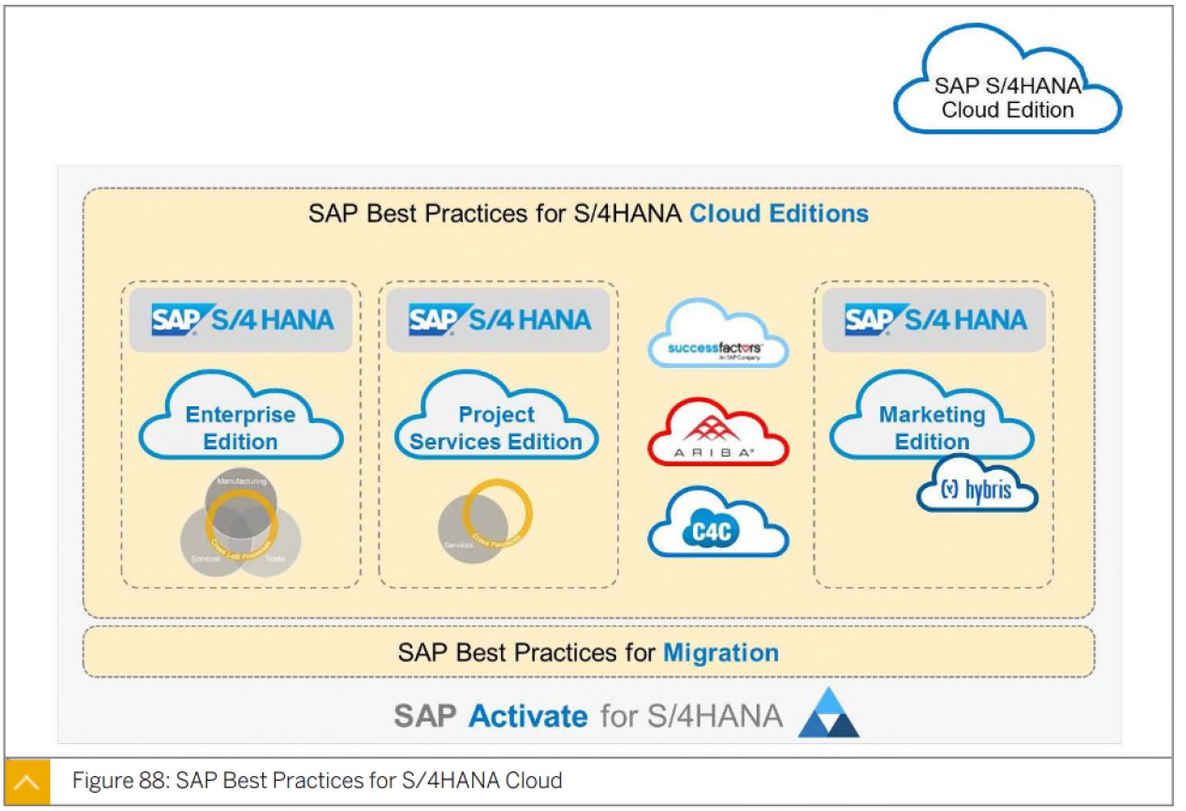

Figure 88: SAP Best Practices for S/4HANA Cloud

Best Practices for SAP S/4HANA cloud delivers ready-to-run processes, migration tools, and content for migration to move business data from the legacy system to the SAP S/4HANA cloud.

Best Practices are available for all cloud versions, including Enterprise Management, Professional Services, and Marketing Edition, and also for LoB cloud solutions, such as Cloud for Customer, Ariba, and SuccessFactors.

With the cloud edition, customers can view all ready-to-run business processes in detail and decide how they fit with their own processes. Light customization is possible but the core processes cannot be changed.

SAP Best Practices for S/4HANA: On-Premise Edition

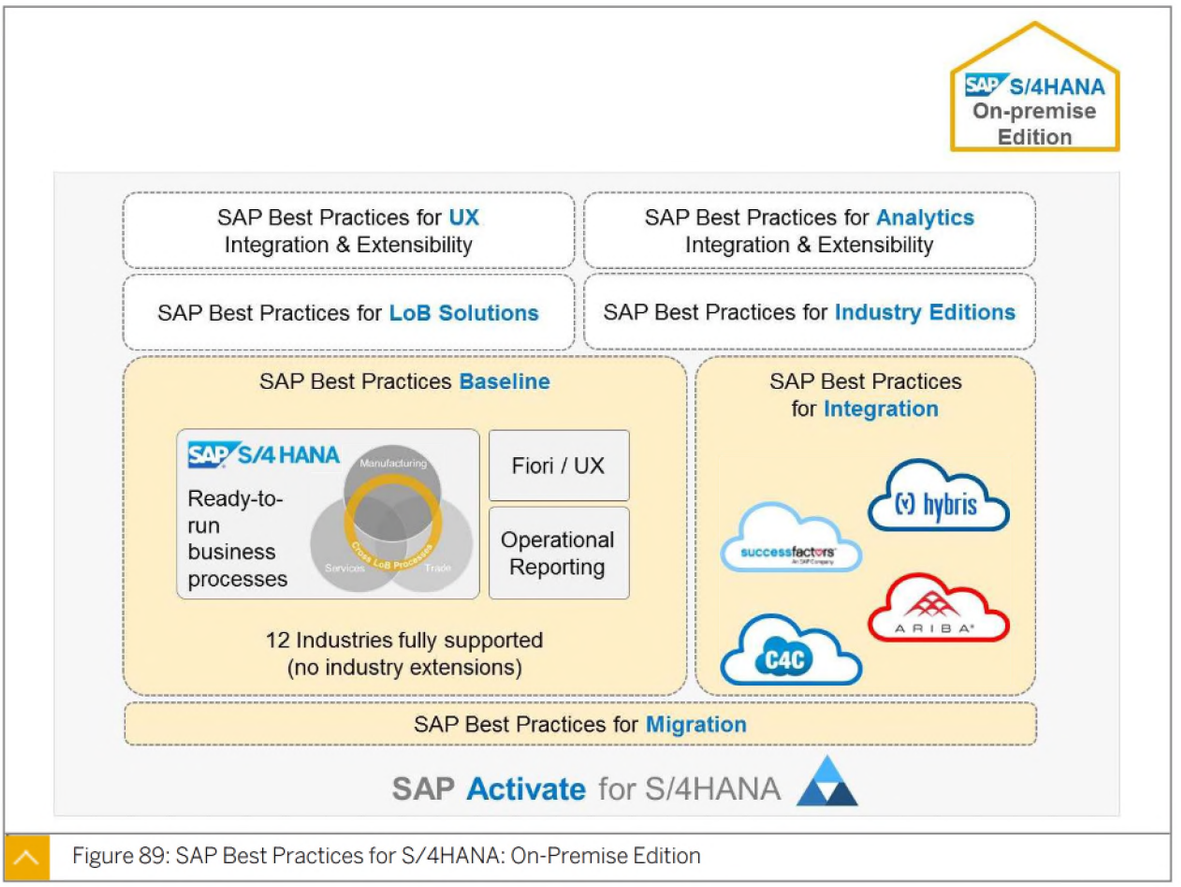

Figure 89: SAP Best Practices for S/4HANA: On-Premise Edition

In addition to ready-to-run business processes and migration tools and content, the on-premise edition of SAP Activate also delivers Best Practice content for the following:

- Setup and extension of SAP Fiori
- Analytics
- Industry content
- On-premise LoB solutions
- Integration with LoB cloud solutions

In the past, systems were configured from scratch. The new approach is to review according to configured processes and decide where the gaps exist. This approach works by identifying exceptions, rather than building everything from the beginning.

Unlike the cloud edition, the on-premise edition allows for more customization possibilities. This includes configuration changes to the core processes.

LESSON SUMMARY

You should now be able to:

- Describe SAP Activate Best Practices

Unit 5
Lesson 4

Guided Configuration

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe SAP Activate Guided Configuration

SAP Activate Guided Configuration

KEY MESSAGE
- Guided Configuration provides an assisted way to implement SAP Best Practices
- For S/4HANA cloud edition, Guided Configuration facilitates the lifecycle management of the preconfigured business process content

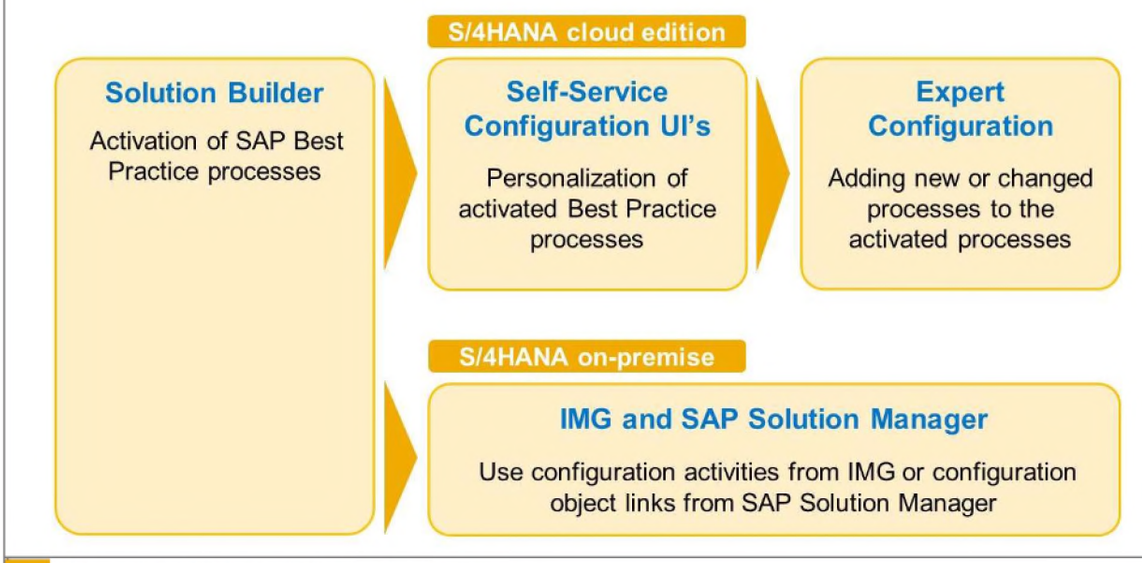

Figure 90: SAP Activate Guided Configuration

SAP Activate Guided Configuration is a new approach, which assists with the implementation of SAP Best Practices.

For S/4HANA cloud edition, it also facilitates the lifecycle management of the preconfigured business processes from SAP and any additional customizing added by the customer. SAP provides various tools to support these efforts as follows:

- Solution Builder

  This tool is used to develop and structure configuration content according to the domain model of SAP. All processes are modeled as scope items, and scope items are implemented through building blocks. Content is not an option, but an integral part of the product. Solution Builder is used to activate this SAP Best Practices content in the customer system.

- Self-Service Configuration UIs (Relevant only for S/4HANA Cloud)
- Next to the activation of ready-to-run business processes delivered by SAP, Best Practices customers typically want to personalize processes. Personalization typically does not change a business process but adjusts settings to the customer needs. SAP provides easy to use Fiori applications for self-service configurations to support personalization.
- Expert Configuration (Relevant only for S/4HANA Cloud Editions)

  Our experience has taught us that almost no customer project can be implemented without adjustments. Customers typically want to add new processes or adjust preconfigured business processes delivered by SAP Activate. SAP makes Expert Configuration available to support these needs. With Expert Configuration, you can create your own scope items and (delta) building blocks for any complementary content development at your side.
- IMG and SAP Solution Manager (Relevant only for S/4HANA On-Premise Edition)

  You can use configuration activities from the product Implementation Guide (IMG) or configuration object links added to the configuration documentation in SAP Solution Manager.

SAP S/4HANA - Guided Configuration

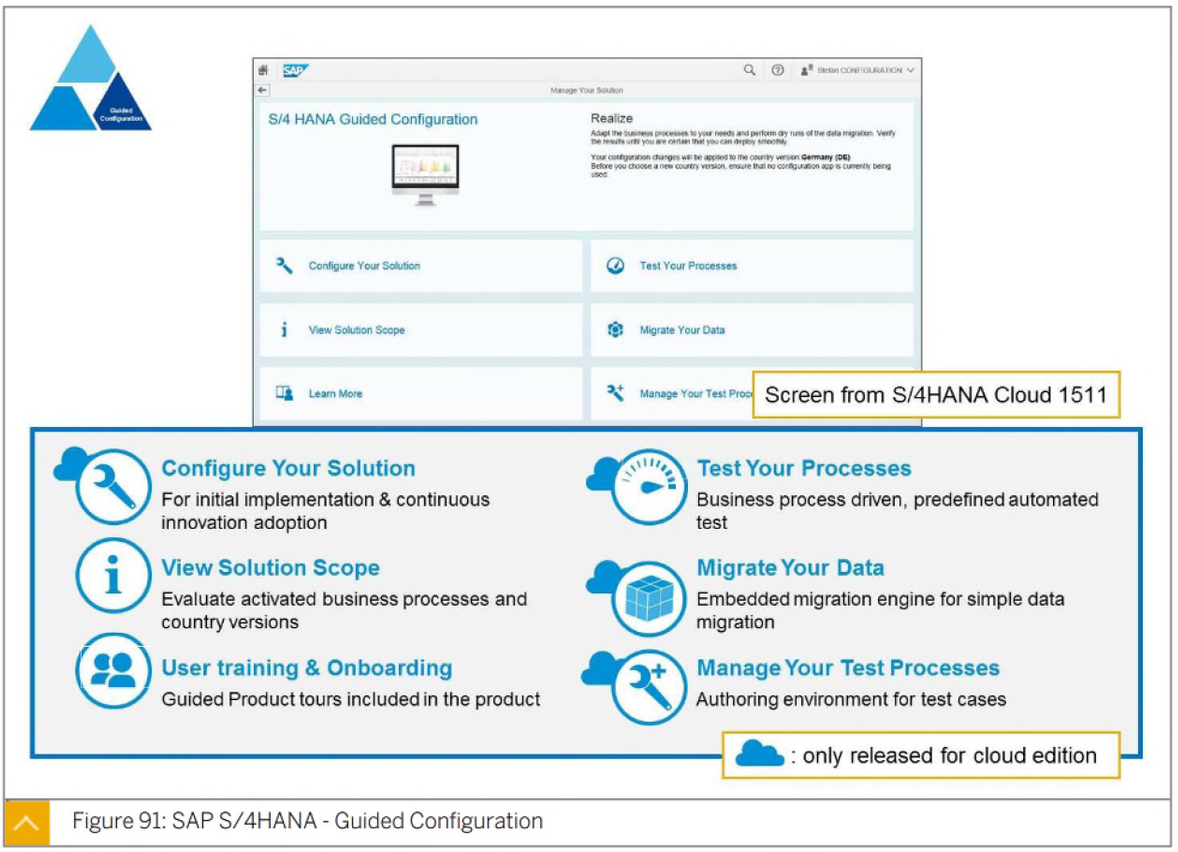

Figure 91: SAP S/4HANA - Guided Configuration

SAP Activate Guided Configuration is available through the "Manage Your Solution" Fiori application. It is business-process oriented. The following features are available:

- Initial configuration of the solution
- A process-driven approach for automated testing of your configured business processes

- A possibility of evaluating already activated business processes and versions for each country
- An embedded migration engine for simple data migration
- User training and onboarding

LESSON SUMMARY
You should now be able to:

- Describe SAP Activate Guided Configuration

Unit 5
Lesson 5

Adapting Custom ABAP Code

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Explain the importance of a custom code review

Custom Code Review

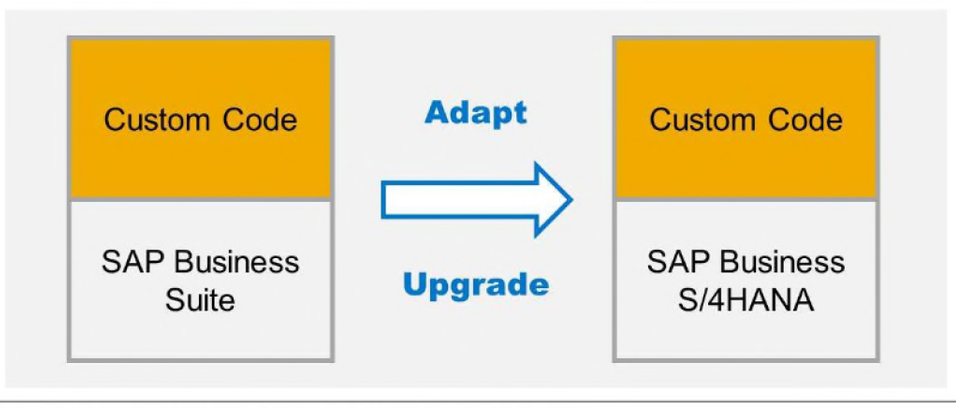

Figure 92: Review Custom ABAP Code During Migration Phase

SAP has always made it possible for customers and partners to adapt the processes and add new functionality to all applications. Whether it is to add new fields to the screens, new columns to tables, or new functions and interfaces, we can expect that all implementations of legacy SAP systems have some kind of customization.

When a customer migrates an existing SAP system to S/4HANA, the standard ABAP code is migrated, and if necessary, adjusted automatically by the migration tools in order to run optimally on SAP HANA.

S/4HANA runs on SAP HANA's in-memory database, and although the database compares conceptually to a traditional disk-based database, there are some features that are not the same. When custom code was written, the developer applied coding techniques that were optimal for traditional databases. These techniques are often not optimal for SAP HANA and need to be reviewed and perhaps adjusted.

Although the migration tools move custom code to the new S/4HANA target system, there is no automatic adjustment of the code.

The good news is that, in most cases, the code will run as expected. However, an important task in a migration to an S/4HANA project should be the detailed review of custom ABAP code in order to ensure the following:

- That the custom code still functions as expected - there are a few coding techniques and database objects that simply do not work in S/4HANA and must be replaced.

- That the custom code runs optimally with SAP HANA. Although the code may run, there are easy adjustments to the code that can make a huge impact on performance.

Review References to ABAP Dictionary Objects

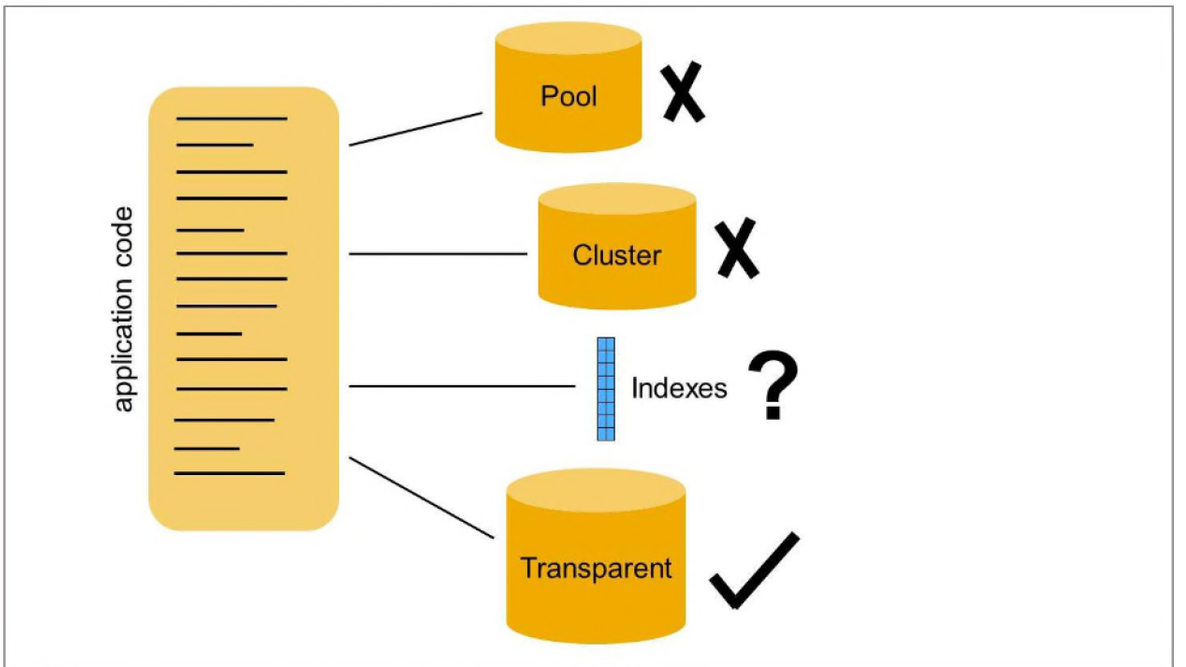

Figure 93: Review References to ABAP Dictionary Objects

In the past, special types of ABAP tables were used in order to overcome limitations of the underlying databases that powered SAP applications.

The tables shown in the figure, Review References to ABAP Dictionary Objects, are called pool and cluster tables and are found in standard and custom ABAP code. One of the key reasons for using special tables was to overcome design limitations of tables in certain databases. The special tables sit in the ABAP layer on top of the physical database and act as a logical layer to the ABAP code.

SAP S/4HANA does not need these special tables, and uses only one type of table, called a transparent table, with no loss in performance or function. A transparent table has a one-to-one relationship with a physical table.

During migration, the special tables are converted to transparent tables. SAP standard code is automatically adjusted to switch from calling the special tables to calling the transparent tables. Secondary indexes are dropped during migration. Indexes are usually not required by SAP HANA. If your code refers to them, you must make adjustments.

Customers and partners need to make their own checks and adjust their code where necessary.

However, if your custom code refers to a standard table that has now been removed, SAP provides views for all removed tables. This means your code still works and just uses the view.

Other Essential ABAP Code Checks

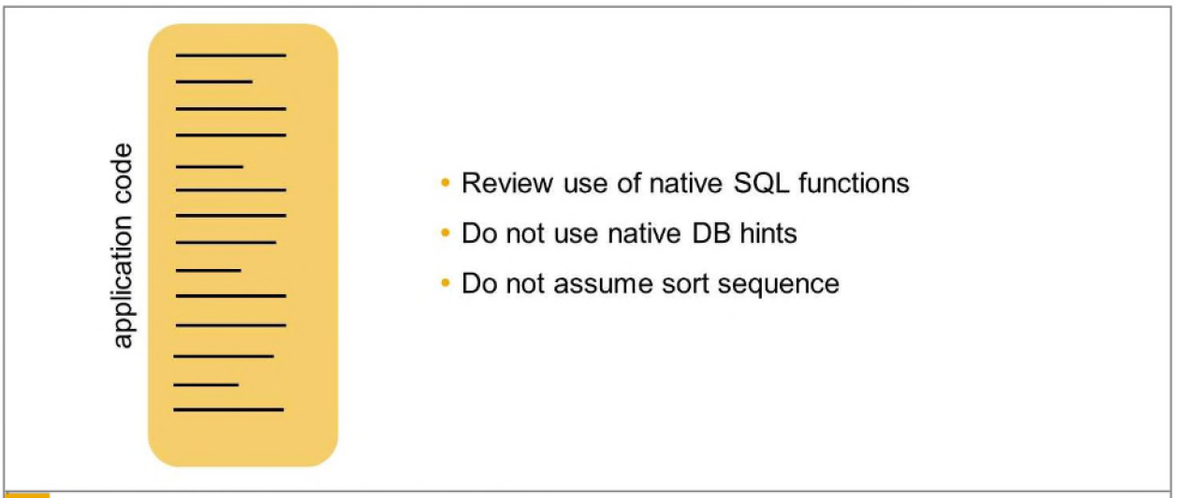

Figure 94: Other Essential ABAP Code Checks

Issues to watch for with the ABAP code that mean the application may not function as expected are as follows:

- Review of native SQL: For example, functions that only work with MS SQL Server, and database hints to override the SQL execution plan (for example, use this aggregate if it exists).
- Avoid SELECT *: This is another way of asking for all columns in a record. SAP HANA's column-based database works better when you ask for only columns you need.
- Do not assume a sort sequence of the results: Sort sequences were usually implied by the primary key, and SAP HANA does not pre-sort the data. You must explicitly code this sort request, if needed.

Recommended ABAP Code Review

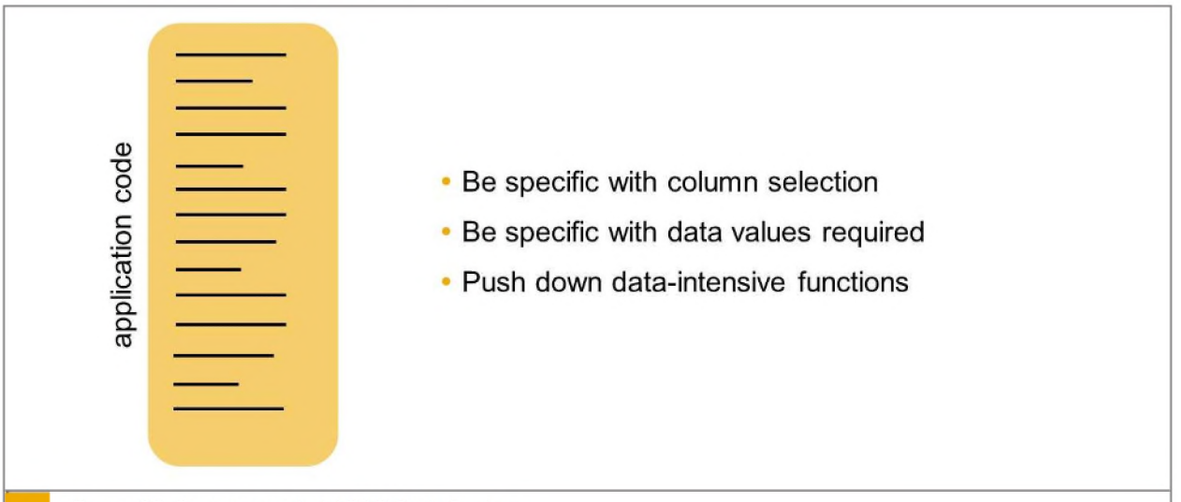

Figure 95: Recommended ABAP Code Review

Look out for the following items in your existing ABAP code in order to improve the performance:

- Avoid SELECT *

SAP HANA's column-based database works better when you ask for only columns you need, and avoid filling memory with unwanted columns.

- Try to Send a WHERE Clause to the SAP HANA Database

  Often, developers request all data (they do not use WHERE), and then they filter the data in the application code.

- Push Down all Data-Intensive Functions to the SAP HANA Database

  Examples include aggregation, filters, and sorts. You do this by calling native SAP HANA database functions.

Tools for Code Review

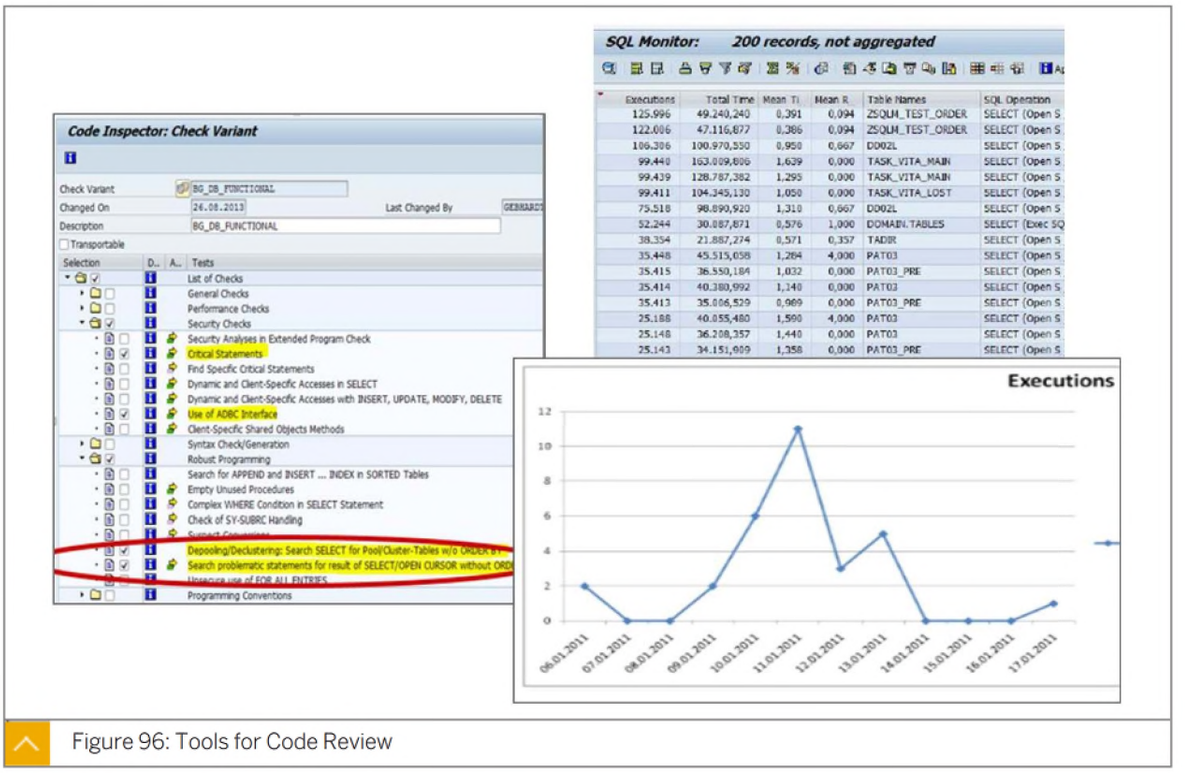

Figure 96: Tools for Code Review

SAP provides tools to speed up and automate the code review phase and ensure nothing is missed.

ABAP Code Inspector allows developers to choose the type of checks they want to make. For example, the following:

Code Checks

- Show me where I refer to pool and cluster tables
- Show me where I use SELECT *
- SQL Monitor identifies bottlenecks, so developers can focus on improving the most problematic code. For example, it takes a long time to read a table: maybe table partitioning could help?
- Usage and Procedure Logging (UPL) identifies dead code, or code that is rarely used. Do not waste time improving this if nobody uses it.

LESSON SUMMARY

You should now be able to:

- Explain the importance of a custom code review

Unit 5

Learning Assessment

1. What are the 3 pillars of SAP Activate?

   Choose the correct answers.

   - ☐ A Methodology
   - ☐ B Performance tuning
   - ☐ C Guided configuration
   - ☐ D Best Practices

2. What are the 3 implementation scenarios covered by SAP Activate?

   Choose the correct answers.

   - ☐ A System Conversion
   - ☐ B New Implementation
   - ☐ C Landscape Transformation
   - ☐ D Database migration

3. What type of checks must you make to your custom ABAP code prior to conversion?

   Choose the correct answers.

   - ☐ A Use of Object Oriented ABAP
   - ☐ B Use of pool and cluster tables
   - ☐ C Use of native SQL
   - ☐ D Use of database hints
   - ☐ E Use of Select ALL

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4. Put the following SAP Activate Methodology phases into the correct sequence.

   Choose the correct answer.

   - [ ] A Explore – Deploy – Realize - Prepare
   - [ ] B Explore – Realize – Deploy - Prepare
   - [ ] C Prepare – Explore – Realize – Deploy
   - [ ] D Prepare – Realize – Explore - Deploy
   - [ ] E Explore – Prepare – Deploy - Realize

Learning Assessment - Answers

1. What are the 3 pillars of SAP Activate?

   Choose the correct answers.

   - [X] A Methodology
   - [ ] B Performance tuning
   - [X] C Guided configuration
   - [X] D Best Practices

2. What are the 3 implementation scenarios covered by SAP Activate?

   Choose the correct answers.

   - [X] A System Conversion
   - [X] B New Implementation
   - [X] C Landscape Transformation
   - [ ] D Database migration

3. What type of checks must you make to your custom ABAP code prior to conversion?

   Choose the correct answers.

   - [ ] A Use of Object Oriented ABAP
   - [X] B Use of pool and cluster tables
   - [X] C Use of native SQL
   - [X] D Use of database hints
   - [X] E Use of Select ALL

4. Put the following SAP Activate Methodology phases into the correct sequence.

   Choose the correct answer.

- [ ] A Explore – Deploy – Realize - Prepare
- [ ] B Explore – Realize – Deploy - Prepare
- [x] C Prepare – Explore – Realize – Deploy
- [ ] D Prepare – Realize – Explore - Deploy
- [ ] E Explore – Prepare – Deploy - Realize

UNIT 6 Embedded Analytics

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UNIT OBJECTIVES

- Describe the concept of embedded analytics with S/4HANA
- Describe a Virtual Data Model (VDM) and its implementation with SAP S/4HANA
- Describe the tools for end users
- Describe the tools for key users
- Describe the tools for IT users
- Describe where SAP BW fits with SAP S/4HANA

Unit 6
Lesson 1

Introduction

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the concept of embedded analytics with S/4HANA

Embedded Analytics with S/4HANA

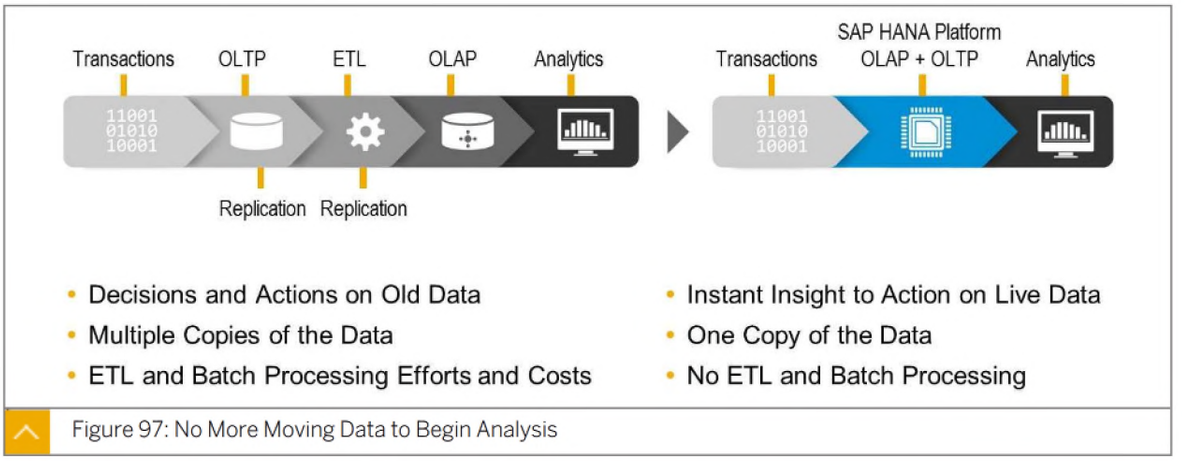

Figure 97: No More Moving Data to Begin Analysis

Traditional systems periodically move transaction data from the transactional systems (OLTP) to dedicated, analytical (OLAP) systems, through a series of steps known as Extraction, Transformation, and Loading (ETL). This is done because transactional systems are not built for sophisticated analysis, as their focus is on transaction processing. The data is physically moved to a system where the focus is on advanced analysis. The movement creates delays is making data available for analysis, and there are many points of failure along the journey, so it comes with risk.

Additionally, the landscape is complex and expensive, and special skills are needed to implement and run the various components in the ETL flow. One of the side-effects of the ETL approach is that a huge amount of duplication is generated, due to the constant copying of data from one system to the next.

With SAP S/4HANA, OLTP and OLAP are combined on a single, in-memory platform. This means that there is no more moving data, generating multiple copies, and causing delays in the viewing of the business performance information. We also have a much simpler IT landscape with only the SAP HANA platform needed.

A key enabler of this simplicity is that the SAP S/4HANA data model is simple. We do not need to prepare and aggregate transactional data into separate analysis tables. All analysis is done directly on the core transactional tables. There is no more moving data, either from one system to another, or even within one system, from detailed table to summary table. There is no redundancy at all. Additionally, SAPS/4HANA includes built-in analysis tools that are user-friendly and promote self-service BI.

Better Analytics

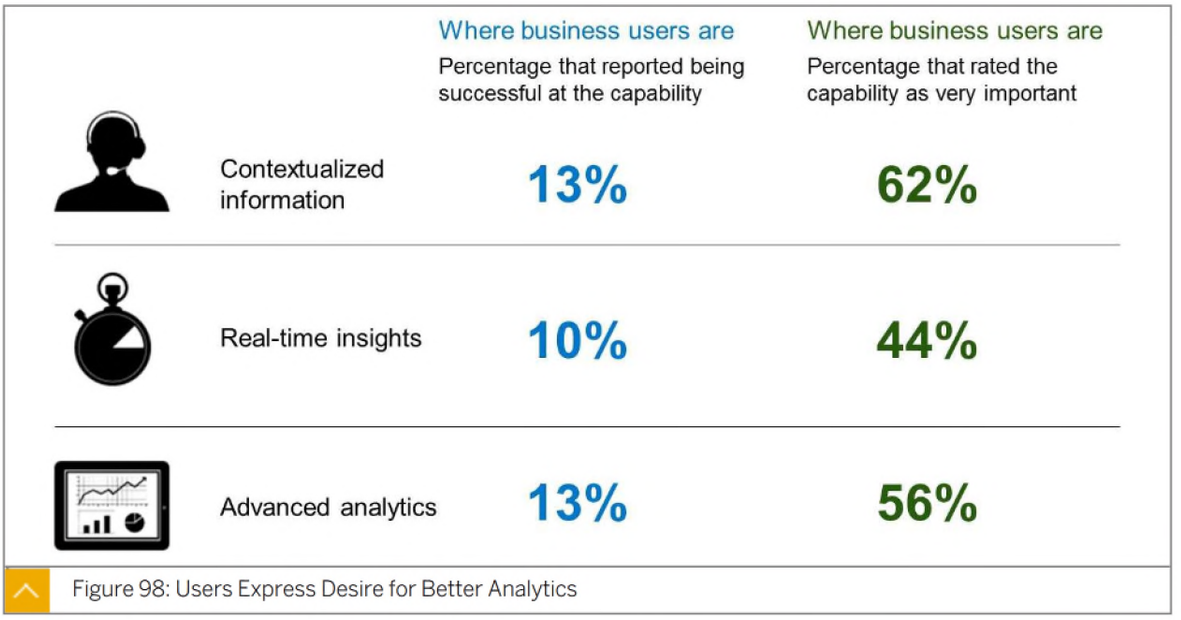

Figure 98: Users Express Desire for Better Analytics

Removing the complexity and latency is not the only issue. We need to also improve the type of analytics available to users. The numbers speak for themselves.

On the whole, using traditional business systems, users have reported that they experienced a very low personal success rate in all areas of modern analytics. Yet these same people know that these are important measures that could help them to be more successful in their roles.

Embedded Analytics

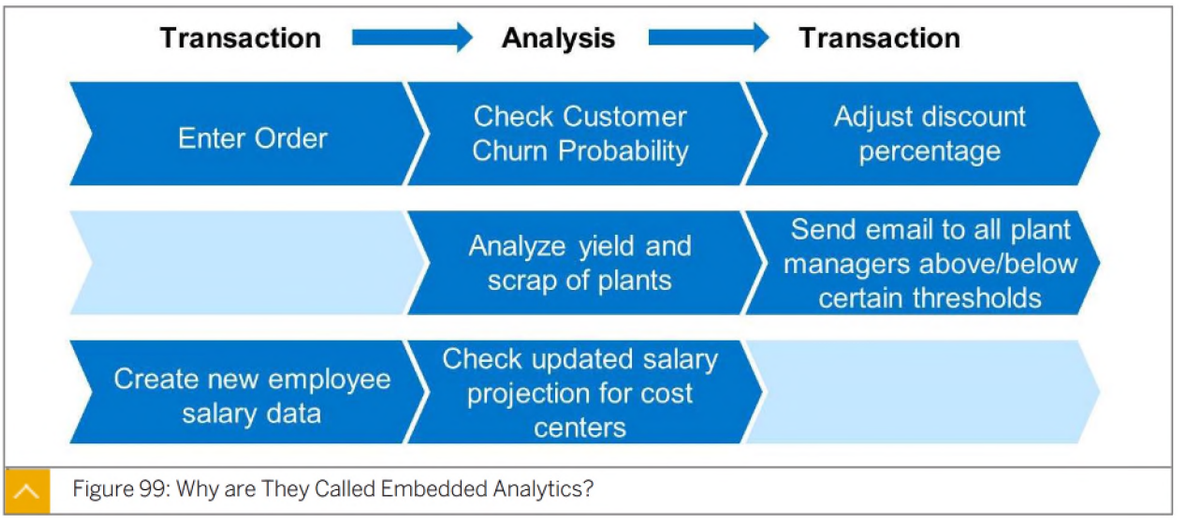

Figure 99: Why are They Called Embedded Analytics?

In the past, analytics and transaction processing were considered separate tasks, usually with their own dedicated systems.

Imagine this scenario: A business user creates a sales order for a new customer. During the transaction, the business user needs to decide how much discount to offer the new customer, based on how likely the customer is to return. The business user saves the incomplete transaction. Later that day, an analysis is carried out and a report is produced in order to classify the customer's life-time value with a suggested range of discounts that could be offered. Then next day, the sales order is reopened and the appropriate discount is applied. The business user calls the customer to confirm the order. The customer really likes the

discount but it is too late. The customer has already placed the order with a supplier who reacted more quickly. The order is lost.

Within a transaction, a business user should be surrounded by contextual insight. This means key information should appear inside the transaction, where it is needed.

Often, it is not a transaction that triggers the need for analysis. Sometimes, a transaction is needed as the result of an analysis. For example, after an analysis of wastage during manufacturing, each plant manager who has exceeded the thresholds for waste generation needs to be contacted with the results of the impact they have on the business profit. Rather than the details being collected from the analysis, they are pasted into an Excel document, and the document is attached to individual emails to the plant managers. The communication should simply be sent at the moment of analysis, rather than as a separate task in a separate system. All relevant information should be automatically collected for the communication.

The key point is that analytics and transactions are no longer separate tasks in a modern business system, but are combined.

A central theme of SAP S/4HANA is embedded analytics - analytics at the point of opportunity or risk within a transaction. SAP S/4HANA works on real-time data, so all analytics are always up to date. With today's fast-moving data, internal and external, decision-making on out-of-date data, even when it is just a few minutes old, can be costly.

Embedded Analytics - Example

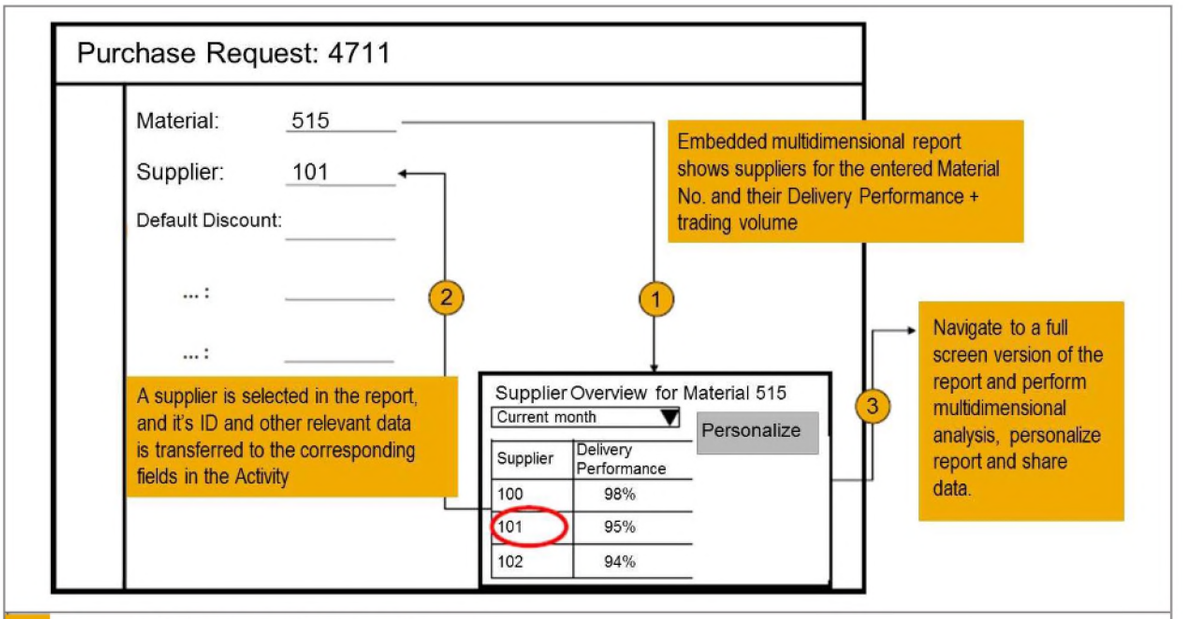

Figure 100: Embedded Analytics - Example

The figure provides an example of SAP S/4HANA embedded analytics in action.

As you can see, the user is creating a new purchase request and needs to assign a supplier. There are quite a few suppliers who can shop this product, so an embedded analysis right inside the application provides some key decision-making information to the user to help them make the decision without leaving the application.

The users choose the supplier with the best delivery performance.

Advanced BI Tools

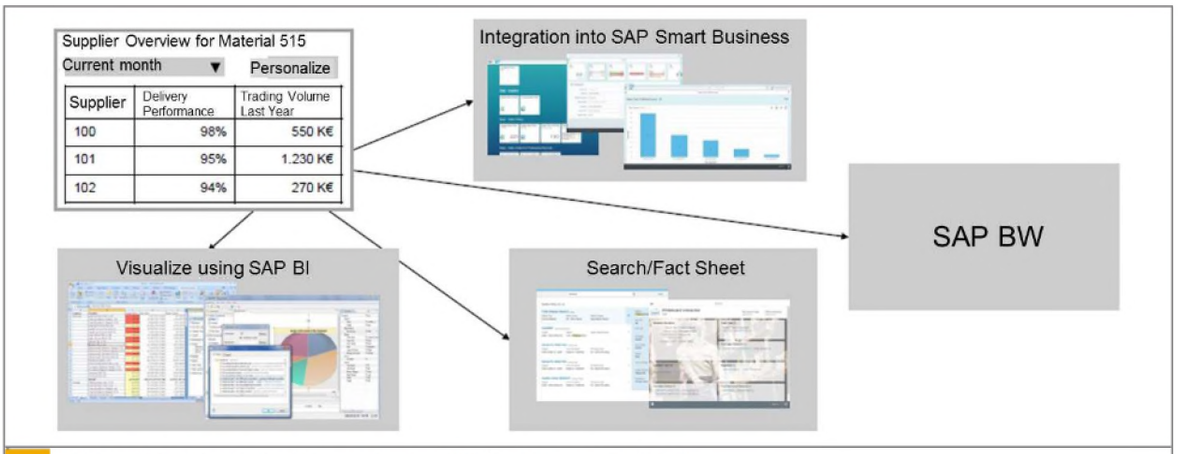

Figure 101: Continuing Deeper Analysis Using Advanced BI Tools

Perhaps a user needs to find out why a supplier does not achieve 100% delivery performance, for example, because there has been a serious issue that might be repeated.

The user begins a drilldown to break down that 95% figure to look for a pattern. Perhaps the concern is far in the past and issues have now been fixed, or the whole of the last order was a disaster.

This seamless, extended exploration of data is possible because, with SAP S/4HANA, you can launch advanced BI tools while still in context.

You can explore all dimensions of the performance of a supplier and, if necessary, drill all the way down to individual historical transactions. You can also use tools to look for hidden patterns of behavior to identify warning signs. Additionally, you can compare the current supplier data with years of historical information on the supplier to identify trends. All of this analysis is always based on real-time data.

This is all possible with SAP S/4HANA Analytics, and we can address the low levels of satisfaction illustrated earlier.

However, as well as making analytics available inside the business processes, we provide more sophisticated tools that allow for advanced analysis.

Embedded Versus Strategic Analysis

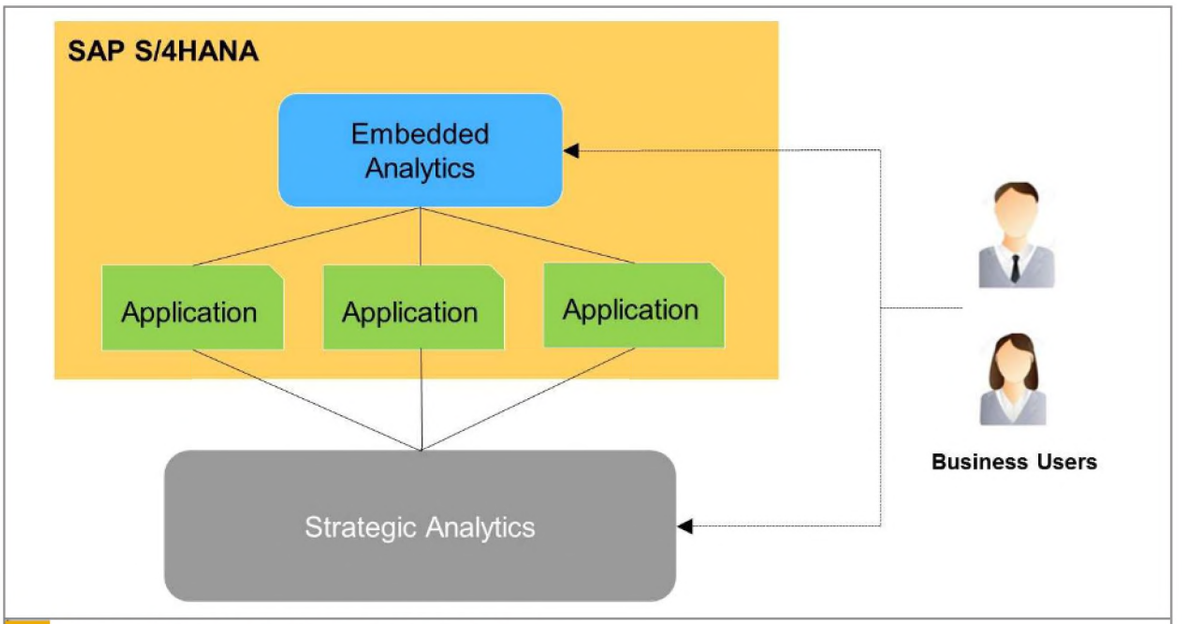

Figure 102: Embedded Versus Strategic Analysis

There are many analytic tools relevant to SAP S/4HANA. These tools are part of embedded analytics or strategic analytics, as follows:

- Embedded analytics: A collection of tools that are included with core SAP S/4HANA. No additional license is required, and the focus is operational analytics.
- Strategic analytics: A collection of tools that are not included with core SAP S/4HANA. Additional licenses are usually required, and the focus is on deeper, more advanced BI scenarios.
- All analytics, embedded or strategic, always run on a single copy of live, common SAP S/4HANA data.

SAP S/4HANA Embedded Analytics

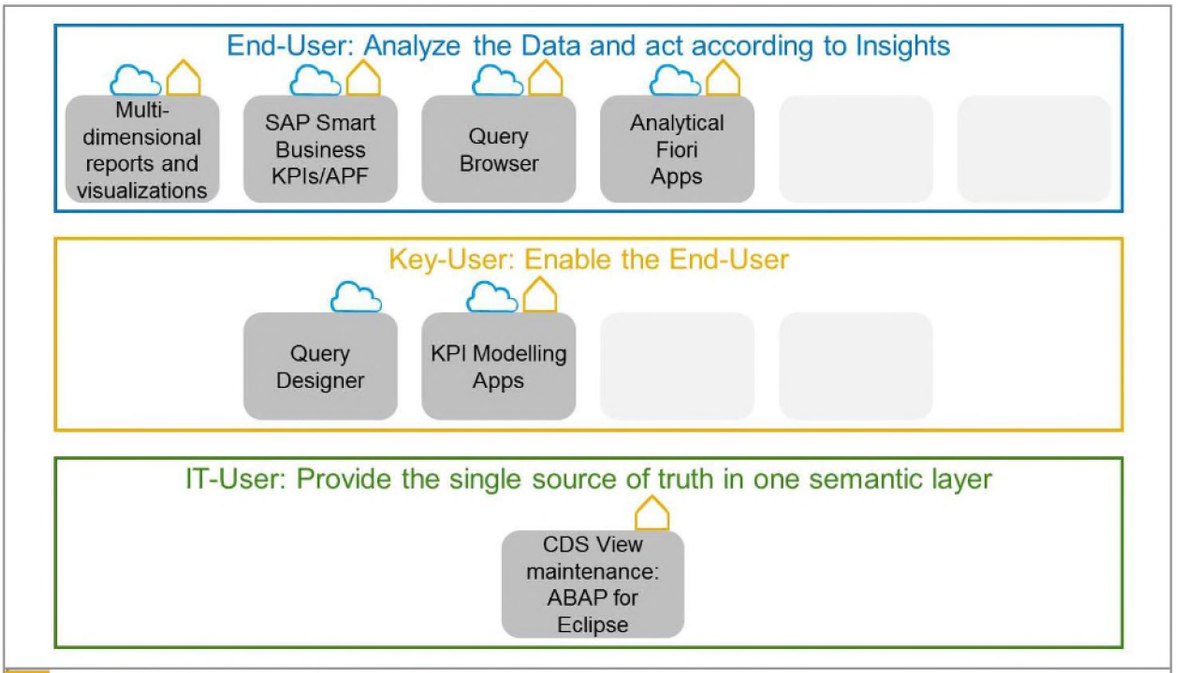

Figure 103: What is Included in SAP S/4HANA Embedded Analytics?

SAP S/4HANA Embedded Analytics are part of the core SAP S/4HANA license.

The tools can be broken down by the types of users at which they are aimed, as follows:

- End User
  - Multidimensional Reporting: ABAP Web Dynpro-based standard delivered reports with flexible slice-and-dice navigation features presented through SAP Fiori.
  - SAP Smart Business Cockpits: SAP Fiori-based cockpits built using the KPI modeling apps toolkit.
  - Query Browser: SAP Fiori portal presenting standard and custom-created analytic queries to allow flexible slice and dice; based on a Design Studio template.
  - Analytical Fiori Apps: Any Fiori application that presents concentrated analytics.
- Key User
  - Query Designer: Use to develop customer queries (for now only available for SAP S/4HANA Cloud).
  - KPI Modeling Apps: Toolkit to build KPIs, associate them with drilldowns, and assign them to tiles.
- IT user
  - Core Data Service maintenance: CDS is the foundation for all analytics, provided by SAP and extendable by customers. IT users perform the maintenance.

SAP S/4HANA Strategic Analytics

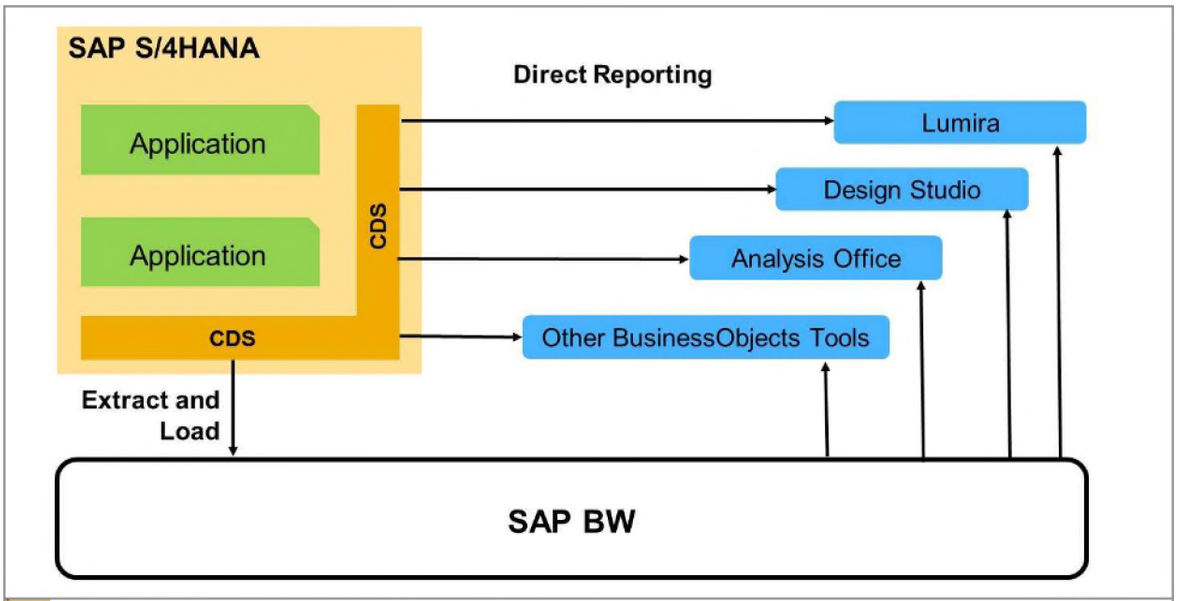

Figure 104: What is SAP S/4HANA Strategic Analytics?

SAP S/4HANA Strategic Analytics are not part of the core SAP S/4HANA license.

These tools leverage the same foundation used by embedded analytics, which are CDS views.

They are used by dedicated BI users, who need to go beyond the capabilities of embedded analytics.

Strategic analytics focus less on the operational analytics and more on a long-term, aggregated view of business performance.

Strategic analytics include the following areas:

- SAP BW

  Enterprise data warehouse used to consolidate multiple data sources, including SAP and non-SAP, with advanced data staging, and ETL flows with strong data flow management. Also capable of handling huge stores of data, with data lifecycle strategies.

- Lumira

  Powerful data-mashup and visualization tool, used to create story boards that can provide insight where data is complex.

- Design Studio

  A developers' tool used to create advanced analytical applications and dashboards that can be presented on any device.

- Analysis for Office

  Excel-based advanced, multidimensional OLAP tool used for unrestricted, deep exploration of data.

- Other SAP BusinessObjects Tools

  These tools include SAP Predictive Analytics, SAP BusinessObjects Web Intelligence, and SAP Crystal Reports.

- CDS views can be a data source to be consumed directly by the reporting tools. They can also be used as a data source (extractor) to load BW DataStore objects. These can then be the data source for all reporting tools shown in the figure.

LESSON SUMMARY

You should now be able to:

- Describe the concept of embedded analytics with S/4HANA

Unit 6
Lesson 2

The Virtual Data Model (VDM)

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe a Virtual Data Model (VDM) and its implementation with SAP S/4HANA

Virtual Data Model (VDM) and its Implementation with SAP S/4HANA

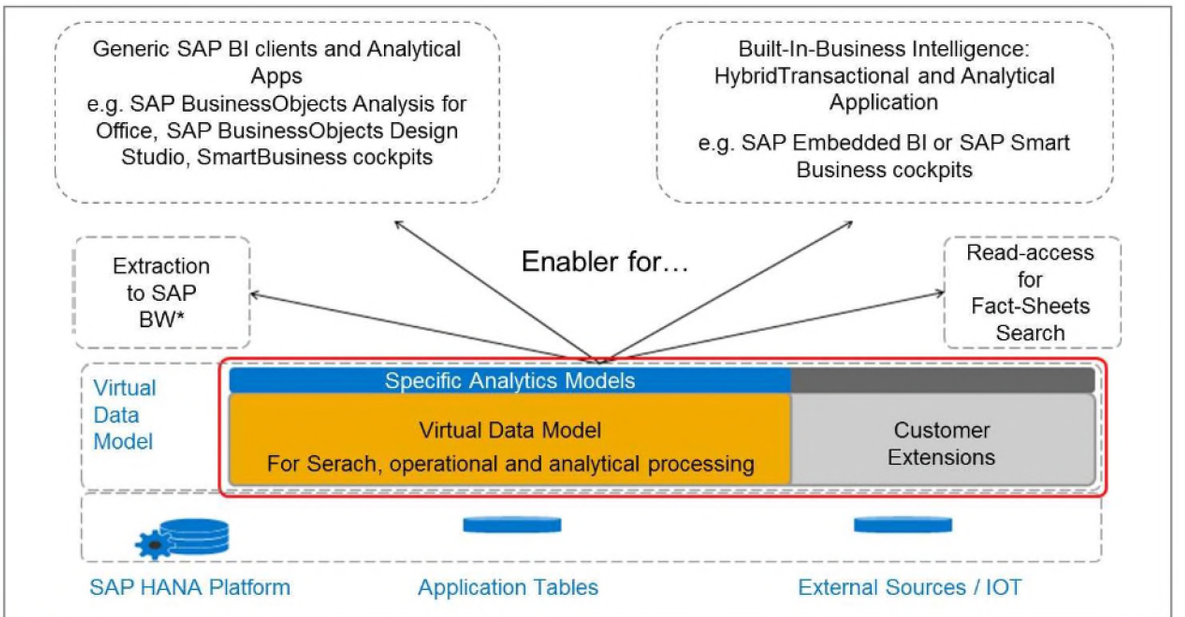

Figure 105: VDM - A Foundation for S/4HANA Embedded Analytics

The core data model is massively simplified for SAP S/4HANA. Huge numbers of tables that were used for materialized aggregations and unnecessary indexes have been removed. Hierarchical models have been flattened right down to the line item. We store only what is absolutely needed, and nothing else.

However, this efficient model is way too complex for direct consumption by analytic applications that need more business context to explain the meaning of the data. A layer that sits above the application tables is necessary. This is a logical layer that exposes business-ready views of the table data and adds extra meaning to the data, such as how it can be consumed (transactional or analytic), how the measures should be aggregated, and which measures are currently relevant.

This layer is called the Virtual Data Model (VDM).

With the introduction of SAP HANA, SAP has developed a comprehensive VDM called SAP HANA Live. SAP HANA Live exposes all key ERP data from the underlying database tables into views that can easily be consumed by any BI tool. SAP HANA Live is still available and important for customers who run Suite On HANA (SoH).

However, for SAP S/4HANA, SAP HANA Live is not relevant. We have made huge changes to simplify the SAP S/4HANA data model, and SAP HANA Live is based on the original, non-simplified data model.

For SAP S/4HANA, we have a brand new implementation of the virtual data model using ABAP-managed core data services (CDS).

Virtual Data Model (VDM)

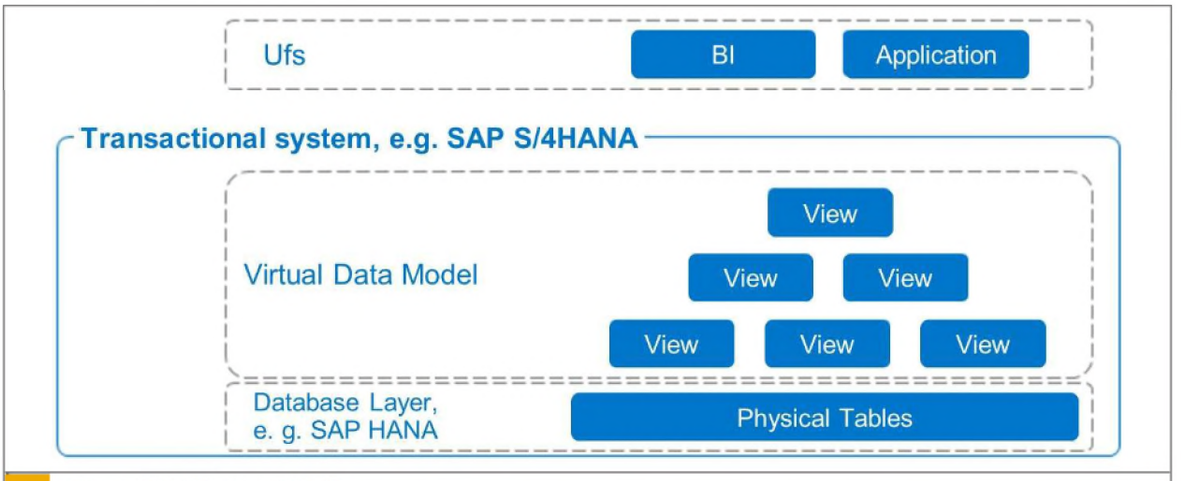

Figure 106: What is a VDM?

Database tables are generally not built for direct consumption by analytical applications. They do not have to be beautiful and, in fact, many tables are very complex and ugly. However, they were never meant to be on show. The reason tables are ugly is that the main goal of a table model is to provide a physical store of data, and this does not take the consumption of analytical applications into account. Optimal storage is their main goal, and this cannot always coexist with beauty.

A VDM is a hierarchy of views, in which each layer adds more business context, until the top layer is consumed by the application.

The lowest VDM layer sits on top of the database tables and consumes the most important data directly from the tables.

The next VDM layer consumes from the first virtual layer to refine the data, apply filters, add calculations, convert currencies, change the description of the columns, and so on.

There is no technical, fixed limit to the number of layers in a VDM. However, for consistency and governance, the number of layers and their purpose are usually well defined.

A VDM can be developed using scripting tools or graphical modeling tools. In the case of CDS, we develop the VDM using a scripting language, which is based on SQL, but with additional syntax and keywords to add more semantics.

The virtual data model contains views that are fully reusable in any application, and can be extended by customers.

CDS-Based VDM for SAP S/4HANA Embedded Analytics

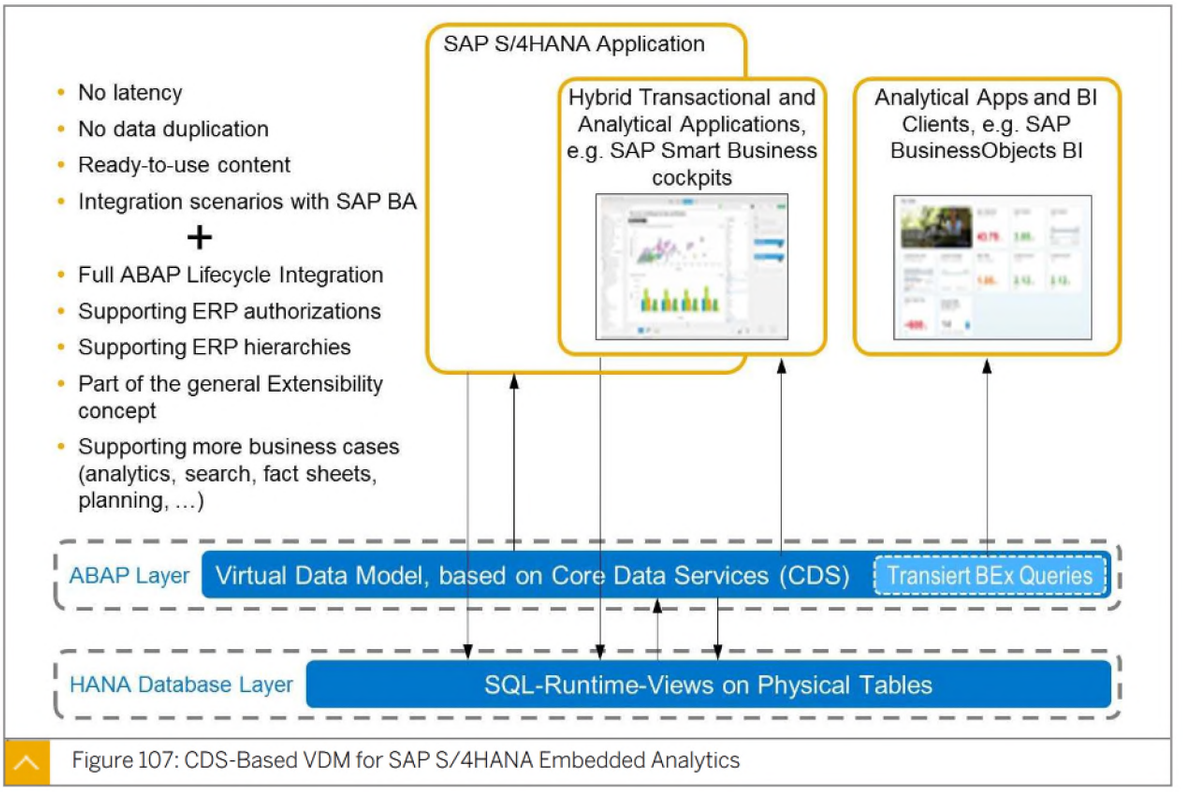

Figure 107: CDS-Based VDM for SAP S/4HANA Embedded Analytics

The SAP S/4HANA VDM is built with ABAP-managed CDS views. ABAP-managed CDS views are developed, maintained, and extended in the ABAP layer of the S/4HANA system. They are ABAP artifacts, and are physically stored in the ABAP repository, where the ABAP programs reside. They do not reside in SAP HANA.

It is advisable to refer to them carefully as ABAP-managed CDS views because there is another type of CDS view that is managed and stored in the SAP HANA platform. These are called SAP HANA native CDS views. These CDS views are not relevant to S/4HANA embedded analytics.

Many SAP S/4HANA embedded analytics tools directly consume the CDS views, but CDS views also generate transient BW InfoProviders. Think of these as dynamic BW InfoCubes that are created at runtime and disappear when the session ends.

This is good news, because it means you can build BW BEx queries using CDS views as the data source. It also means you can build reports with any SAP BI (BusinessObjects) tools, making use of the CDS views, with or without a BEx query.

A key concept behind CDS views is that they are the foundation for all consumption for SAP S/4HANA analytics and remove the need to develop the consumption layer in the database.

ABAP-Managed CDS Views

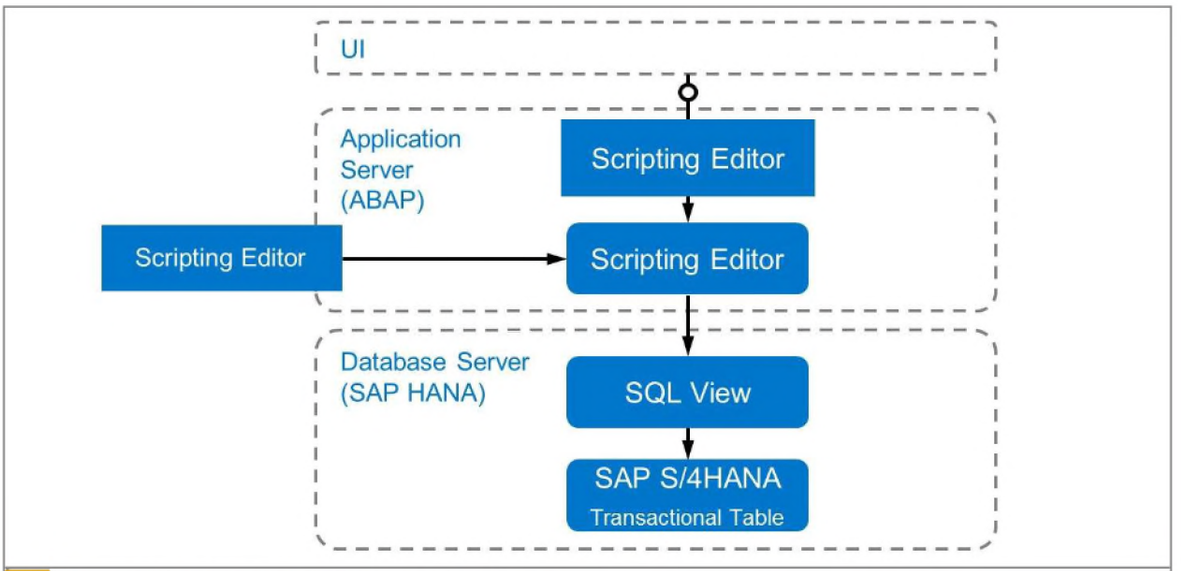

Figure 108: What are ABAP-Managed CDS Views?

A CDS view is built using SQL, but with added annotations. When the CDS view is activated, an SQL view is generated in the SAP HANA database.

Annotations are added to the native SQL to enrich the data when it arrives at the ABAP layer. The annotations describe how the view can be used (for example, for OLAP use only), restrictions (for example, for the country France only), and business context (for example, this account is a supplier, not a customer).

When the CDS view is processed, the result is exposed to a hidden, embedded analytics engine. This is the same engine used by BW. This engine has been developed over many years and is very powerful. It can handle very advanced, multidimensional queries that include complex hierarchies.

This is why a key component of SAP S/4HANA embedded analytics is the embedded BW. The BW analytic engine is necessary for query processing and to generate the transient providers.

CDS views do not contain ABAP code, just standard SQL Plus annotations to enrich the data. The runtime for CDS views is ABAP, so an SAP NetWeaver stack is required to execute CDS views. S/4HANA is built on an SAP NetWeaver stack, so it is perfectly suited to this scenario.

CDS views are built using the ABAP editor for Eclipse. Currently, the CDS views are created using script (this makes copy/paste very easy, and developers really like it), but later graphical tools may be developed with wizards to guide the creation.

SAP S/4HANA VDM Architecture

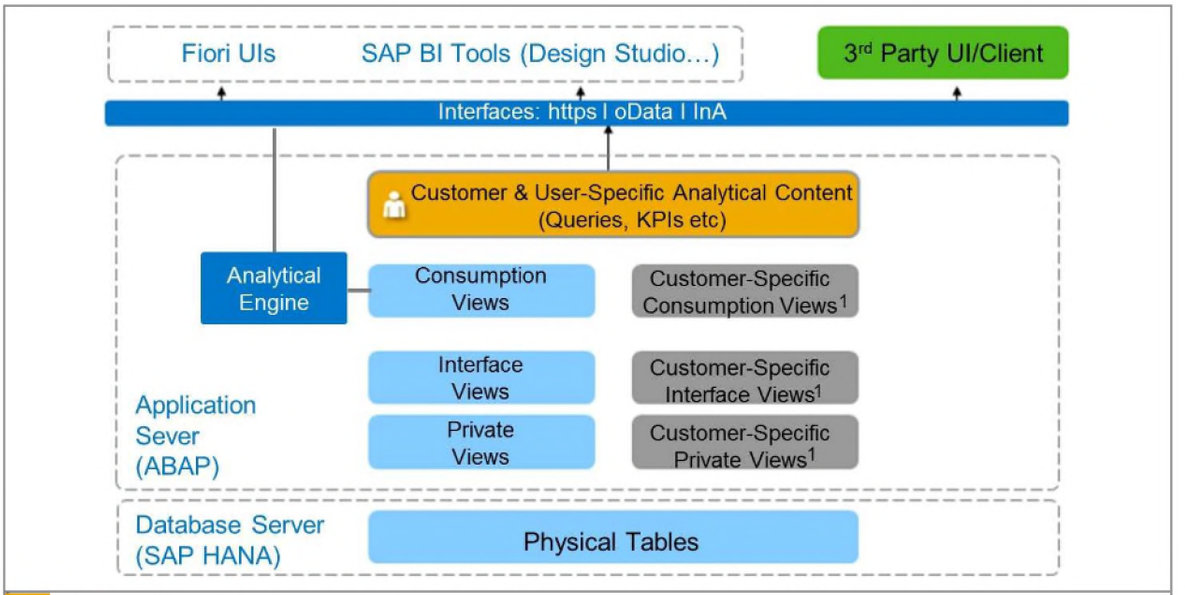

Figure 109: SAP S/4HANA VDM Architecture

CDS views are built in layers. The idea is to provide a set of base layer views (called private views) to offer a high degree of reusability of common views. Then you combine these private views to make them more useful at the next layer (interface views).

Finally, you add more semantics (such as filters) to provide a view that is optimal for consumption by the application code or analytic engine (consumption view).

At all layers, extensions can be added. Customers can also add their own views at any layer and combine them with SAP-delivered views.

This layering model is strictly enforced by SAP to provide governance and promote controlled extensibility.

LESSON SUMMARY

You should now be able to:

- Describe a Virtual Data Model (VDM) and its implementation with SAP S/4HANA

Unit 6
Lesson 3

Tools for End Users

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the tools for end users

Tools for End Users

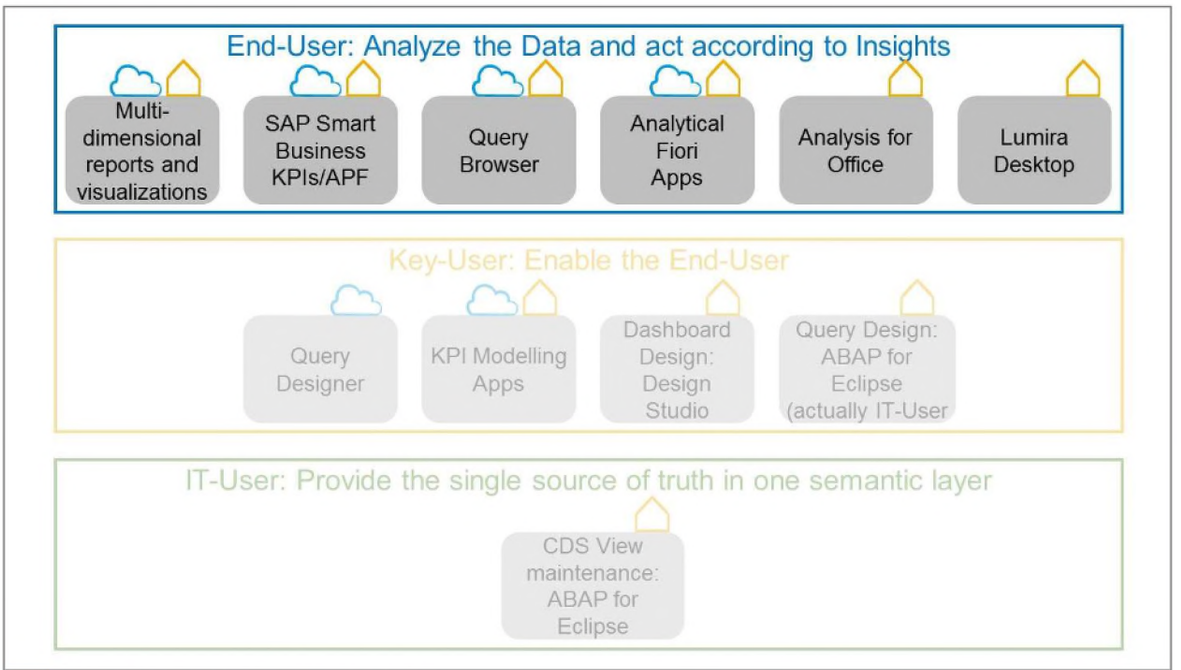

Figure 110: What do End Users Get?

An end user is someone who is at the consumption end of S/4HANA embedded analytics, rather than working in the development area. End users are typically business users who are IT literate and comfortable with reporting tools.

This figure, What do End Users Get?, shows the tools that are part of embedded analytics and strategic analytics.

Multidimensional Reporting Client (MDRC)

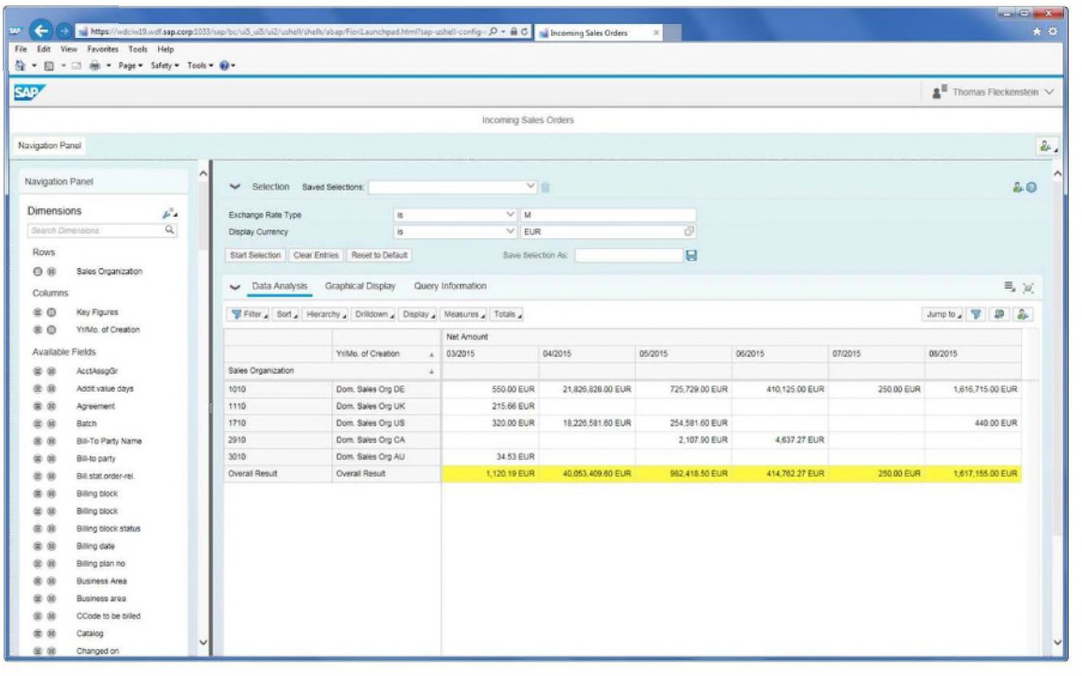

Figure 111: Multidimensional Reporting Client

A multidimensional reporting client (MDRC) is an easy-to-use end user reporting tool that is embedded in SAP S/4HANA, and comes with the installation of core S/4HANA. No separate installation of this tool is needed.

The MDRC is available for cloud and on-premise deployments. The MDRC is based on ABAP Web Dynpro and uses the grid layout. When the report is launched, a default layout is presented to begin the analysis. The user can then add or remove elements of the report.

Key capabilities include drilldown, sort, filters, and free construction of the report using any attributes and measures. Many of the capabilities will be familiar to existing SAP ERP customers who use ABAP reports.

The client is limited to very basic OLAP reporting capabilities. When you launch a standard report, this appears in the MDRC.

Smart Business Cockpits / KPI Tiles

Figure 112: Smart Business Cockpits / KPI Tiles

Smart Business cockpits deliver out-of-the-box Key Performance Indicators (KPIs) organized into tile groups. You can also create your own tile groups.

As shown in the figure, the tiles highlight key information at a glance. Numbers can be color coded to represent different levels of alert. The surface of the tile can show simple numbers or chart snippets. The information on the tile is updated in real time. You can reorganize tiles to form new groups in a cockpit. In addition, you can configure each tile with additional drilldown capabilities. Tiles can be single size or dual size.

When you click a KPI tile in the group, you launch an evaluation that provides more information to break down the individual KPI, in order to provide drilldown capabilities and appropriate actions. We call this Insight to Action.

For example, you may see a KPI tile that shows a missed profit target for your project in red. When you click the tile, you see a breakdown of costs in a bar chart. You can drill down on the highest cost to reveal some high spending on travel expenses. You then drill down to the individual expense postings. You realize some of the expenses are wrongly posted to your project, so you click the button to reassign costs to a different cost centre, all on the same screen. The KPI tile immediately reflects the adjustment, and now the profit figure is back in green.

Customers can create their own KPI tiles and configure drilldowns.

Query Browser

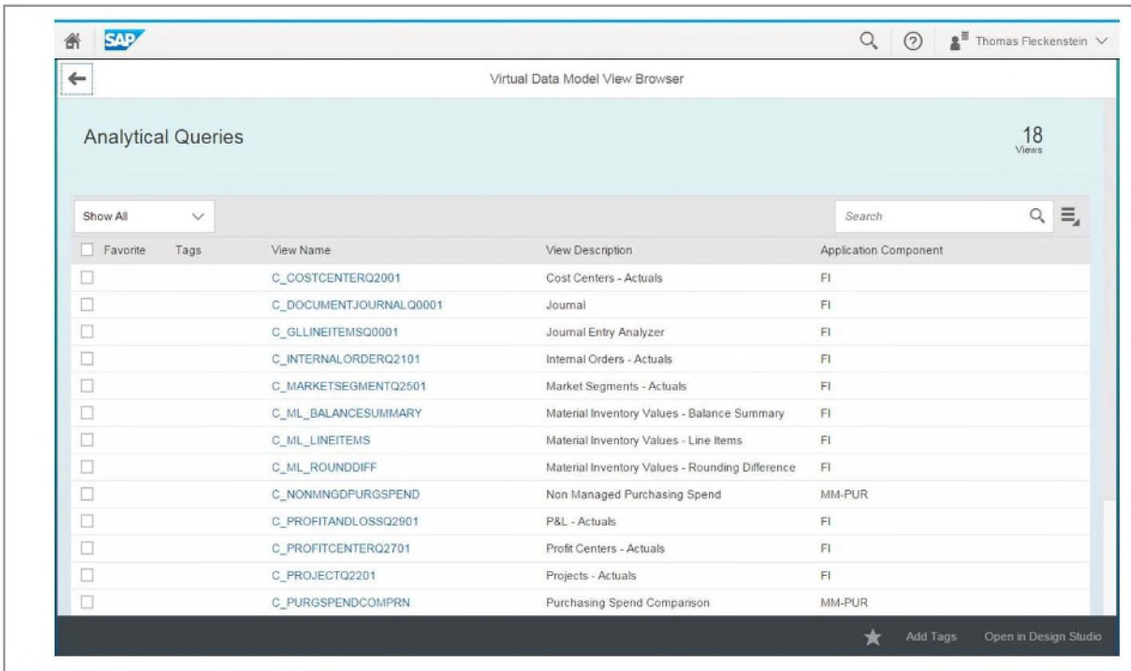

Figure 113: Query Browser

The Query Browser provides a list of all available analytical queries supplied by SAP. These queries can be launched from the Query Browser. Customers can also create their own analytical queries and these will also appear in the Query Browser.

You can search for analytical queries by name or by application component. You can also explore the data definition before launching the query.

It is possible to tag analytical queries, so they can easily be identified by key words or synonyms and are easily found. Analytical queries can be marked as favorites, so each user can quickly locate their most popular reports.

The reports are based on a Design Studio template and offer basic OLAP capabilities.

Analytical SAP Fiori Applications

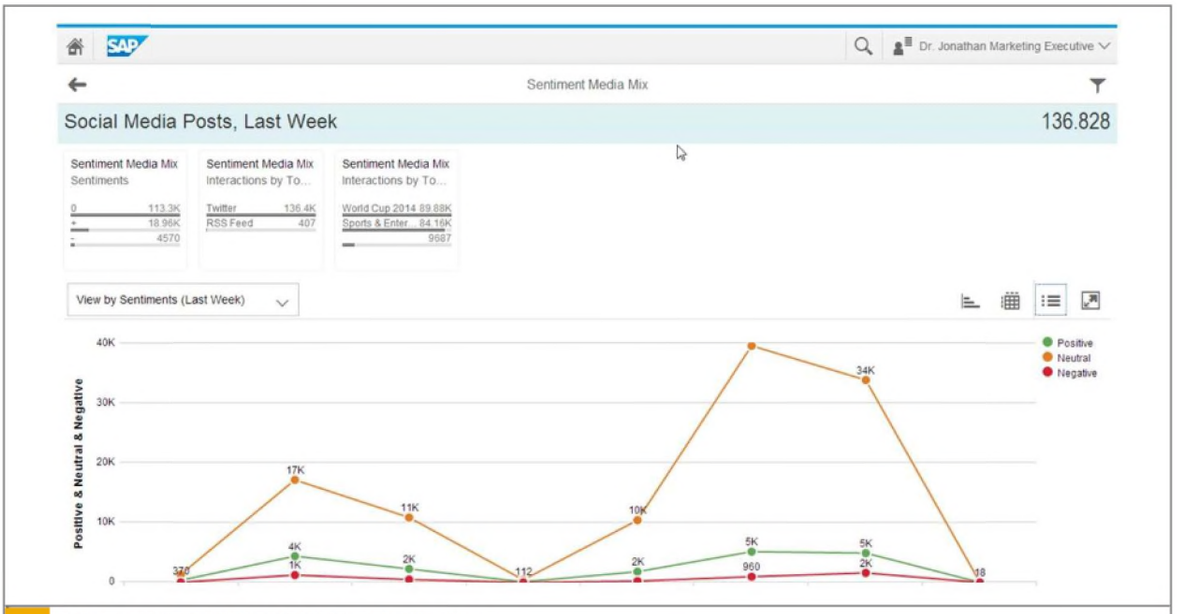

Figure 114: Analytical SAP Fiori Applications

These are dedicated SAP Fiori applications that use a particular Fiori template, which is optimal for analysis.

The figure, Analytical SAP Fiori Applications, shows an example of a delivered analytical Fiori application. It uses the same VDM as all analytical applications in S/4HANA to provide an instant response with real-time data.

End users are assigned to relevant analytical SAP Fiori applications to support them in their roles.

SAP BusinessObjects Analysis, edition for Microsoft Office

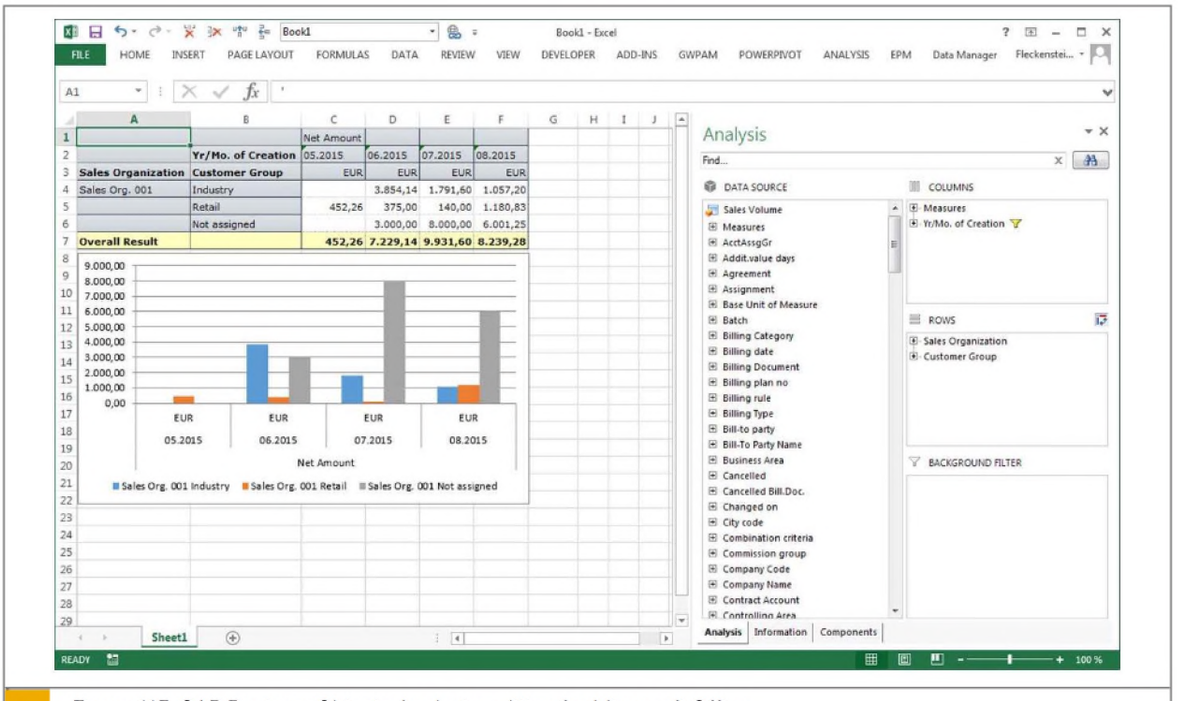

Figure 115: SAP BusinessObjects Analysis, edition for Microsoft Office

If more advanced OLAP features are required than are available in the built-in MDRC, the recommended tool is SAP BusinessObjects Analysis, edition for Microsoft Office.

This powerful reporting tool can be used to create simple, Excel-based reports all the way up to the most advanced, highly formatted reports, with full integration with Excel functions and features.

Integration with BusinessObjects Analysis, edition for Microsoft Office is available for the on-premise edition of S/4HANA. It is not available in the cloud.

This is a key tool used by financial controllers and planners, but its ease of use and familiar interface make it a popular choice, regardless of role. It is already used by many customers. It is the flagship reporting tool for SAP BW, and end users can reuse the skills they have already developed.

BusinessObjects Analysis, edition for Microsoft Office uses a separate license, and is not included with SAP S/4HANA.

SAP BusinessObjects Lumira

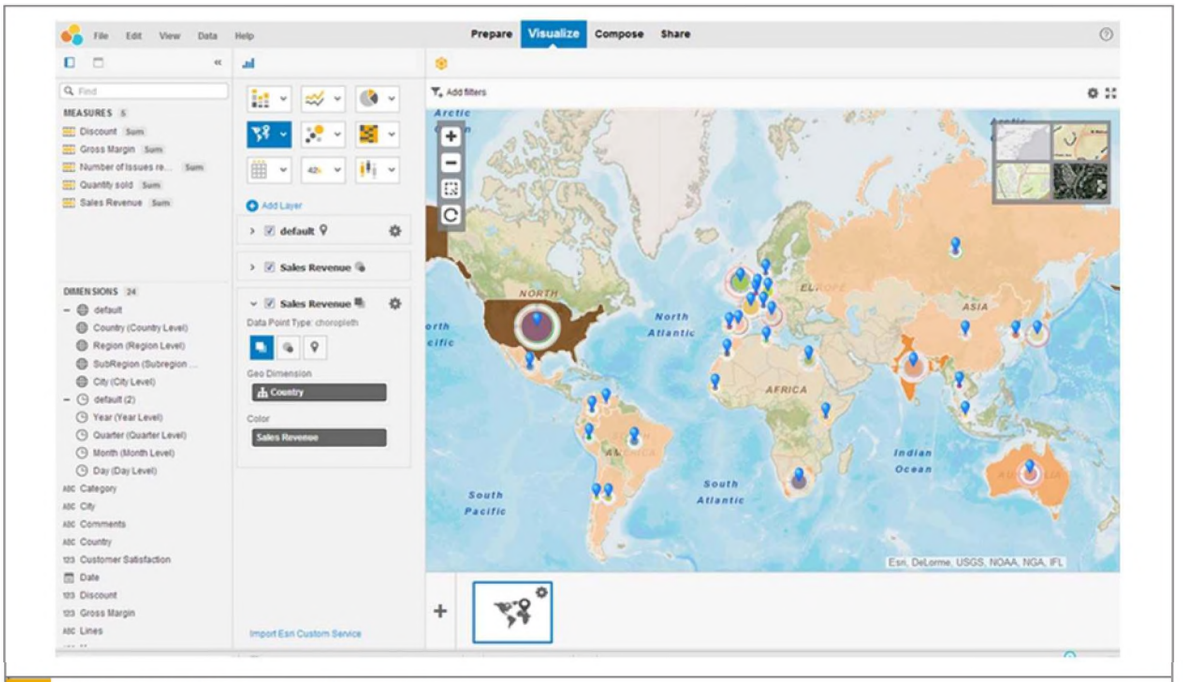

Figure 116: SAP BusinessObjects Lumira

For self-service BI within S/4HANA embedded analytics, we recommend SAP BusinessObjects Lumira.

Lumira is a powerful, but easy-to-use, desktop tool that allows end users to acquire data from S/4HANA, but also from any other data sources in a customer's landscape. Data from multiple sources can be combined into a single data set. The harmonization logic of multiple sources can be controlled by the end user.

Lumira can automatically make suggestions to enrich the data. For example, if your data contains city names, Lumira automatically adds in the country, continent, and any other necessary information. It provides tools to allow the end user to prepare source data. Examples include splitting fields, trimming unwanted leading characters, assigning customers to groups, adding calculations, replacing values, and so on.

One of the most important features of Lumira is its built-in visualizations. For very large data sets, these visualizations (which are also extendable) provide beautiful insights into data patterns. Lumira reports against the same VDM.

Lumira has a separate license, and is not shipped with SAP S/4HANA. It is not available with the cloud edition of S/4HANA, only the on-premise edition.

LESSON SUMMARY

You should now be able to:

- Describe the tools for end users

Unit 6
Lesson 4

Tools for Key Users

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe the tools for key users

Tools for Key Users

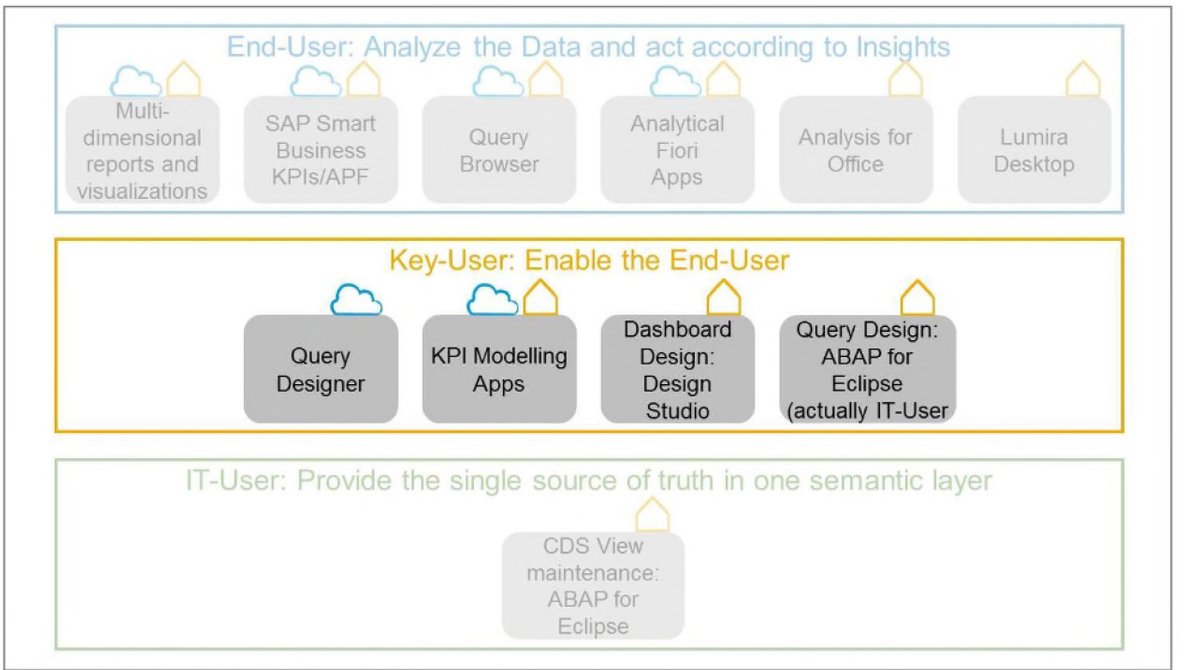

Figure 117: What do Key Users Get?

A key user is someone who is responsible for building analytics, and may also be a consumer.

Key users are typically IT users, who are building BI content for the business.

Query Designer

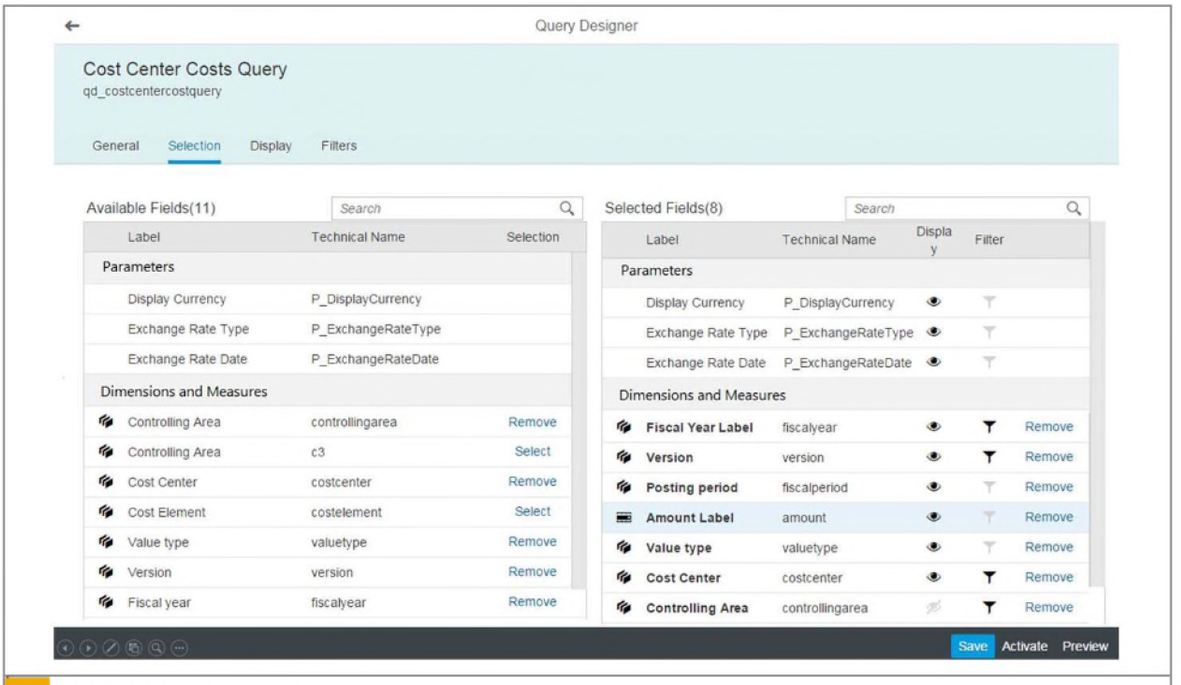

Figure 118: Query Designer

For building reports from scratch, we provide a built-in Query Designer. This tool is available in the cloud for now, but it is likely to be delivered with the on-premise edition later.

Currently, on-premise customers can build their own analytical queries using CDS query language, but this approach is complex and not aimed at key users.

Although Query Designer is an easy-to-use tool, it is aimed at key users, rather than end users. This is because the query needs to be built from scratch, unlike the analytical queries that are launched from the Query Browser, which have predefined layouts. An end user expects to see an already-constructed report, whereas this tool is used to create new reports.

KPI Modeling

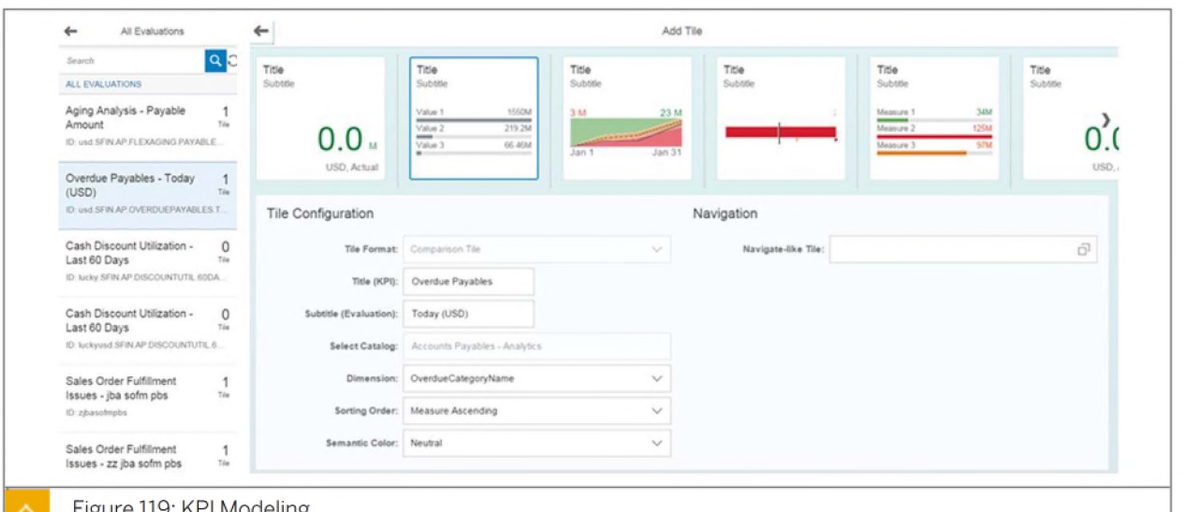

Figure 119: KPI Modeling

This is the toolkit used by the key user to develop the KPI tiles, and follow-on evaluations and drilldowns. All of these components are used to build smart business cockpits.

There are two levels of KPI tiles. The first level involves the tiles on the Launchpad (think of these as showing the very high-level information at a glance). The second level involves the tiles within the cockpit, which appear in a row once you click Launchpad tile. It is possible to create multiple tiles, each presenting a KPI that relates to the overall topic.

In the KPI configuration tool, you can choose from a library of KPI tile templates. For example, on the KPI tile, you can decide to present a critical business number, which can change color depending on the threshold value. You can also present a mini-chart to highlight a worrying trend that needs attention. Tiles can also contain dual visualizations, for example, a number representing the total lost sales, then a small bar chart alongside to show the top products that are losing sales, both on one tile.

With this toolkit, you also define the drilldown that follows the click of a KPI tile. You can define multiple drilldowns for each tile.

You classify the KPI tile so that it appears in the relevant catalog of the related KPI tiles, allowing users to locate the tiles they need using roles names and function names.

Design Studio

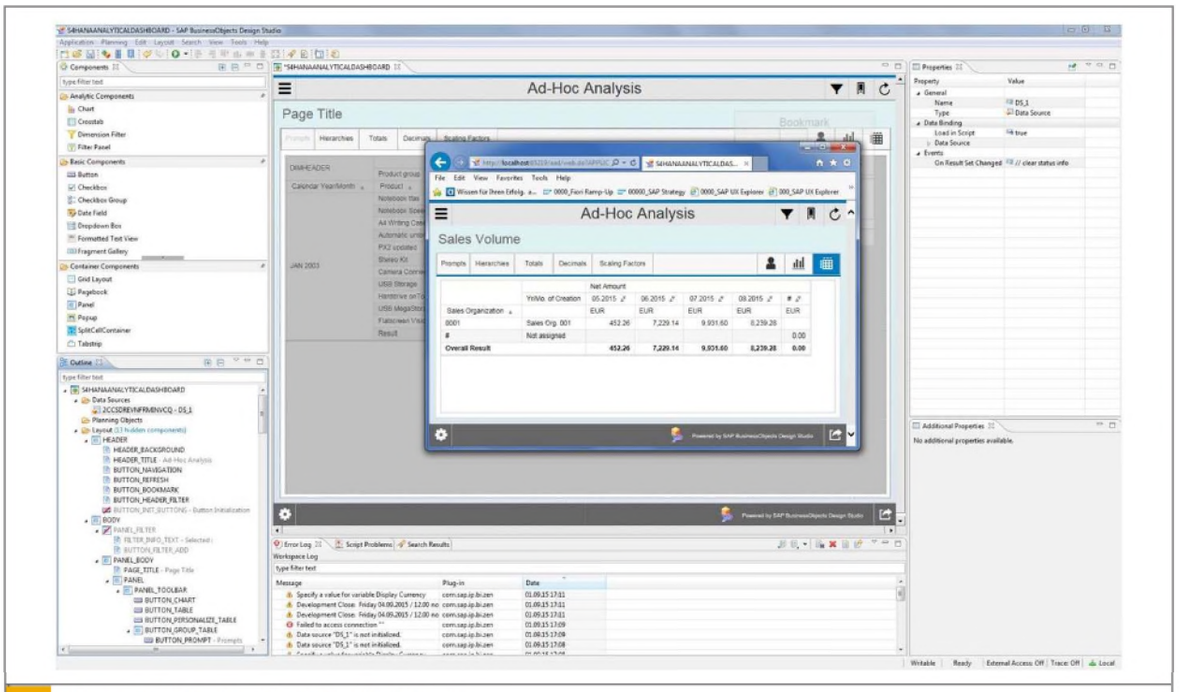

Figure 120: Design Studio for Dashboard

The recommended tool to develop dashboards within S/4HANA embedded analytics is Design Studio. Design Studio is a powerful tool that can be used to develop composite analytic applications, cockpits, and dashboards and can combine data from multiple sources, including relational, multidimensional, and flat files. The built-in graphical components, such as charts, maps, and buttons allow for the rapid design of highly interactive dashboards.

Design Studio is not an end user tool, as it requires some specialist training. However, a key user can use the supplied templates for a quick start. Design Studio can automatically generate dashboards for immediate desktop and mobile device deployment. Dashboards created with Design Studio can be easily embedded into smart business cockpits to provide insight into a KPI that needs to be investigated.

The figure, Design Studio for Dashboard, shows Design Studio opened in the background, with the generated dashboard displayed in the foreground. Design Studio comes with a separate license, and is not included in the S/4HANA core embedded analytics. However, the

applications created with the Design Studio can be embedded into smart business cockpits, within embedded analytics. Design Studio is a content creator tool.

Analysis Path Framework

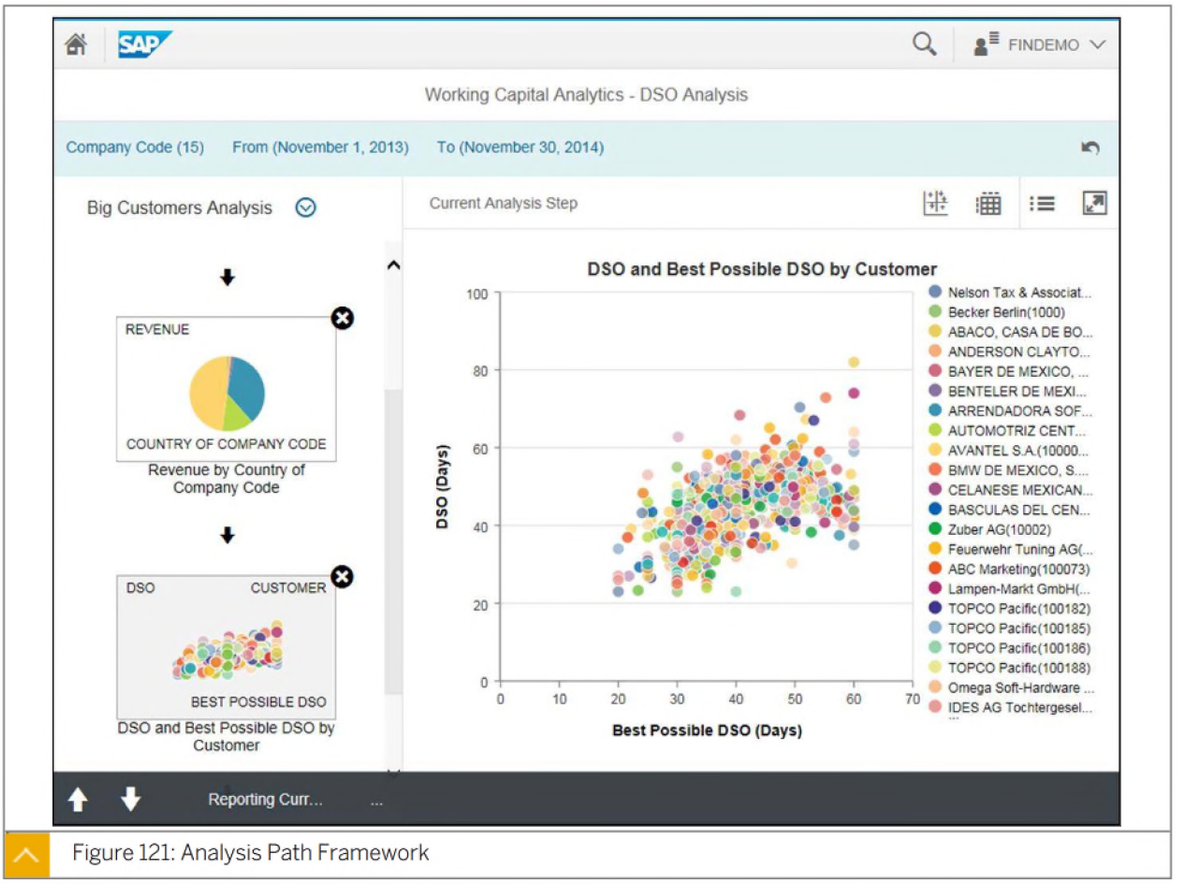

Figure 121: Analysis Path Framework

Analysis Path Framework (APF) can be integrated within smart business cockpits. APF provides insight to help you focus on where to dig deeper to find the root cause of an issue. The analysis path is a connected sequence of analysis steps (seen on the left of the figure, Analysis Path Framework) and you can move back and forward through the path to refine this iteratively when you discover more insights.

As you modify any analysis in the path, for example, if you filter a country in the middle analysis, all other analyses in the path will change immediately. This in turn may help identify the next action.

In simple terms, this tool helps you develop a story, and it is very helpful in supporting your explanation of how your analysis evolved and how you reached your conclusion. It is possible to replay the same path over multiple sets of similar data.

LESSON SUMMARY

You should now be able to:

- Describe the tools for key users

Unit 6
Lesson 5

Tools for IT Users

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe the tools for IT users

Tools for IT Users

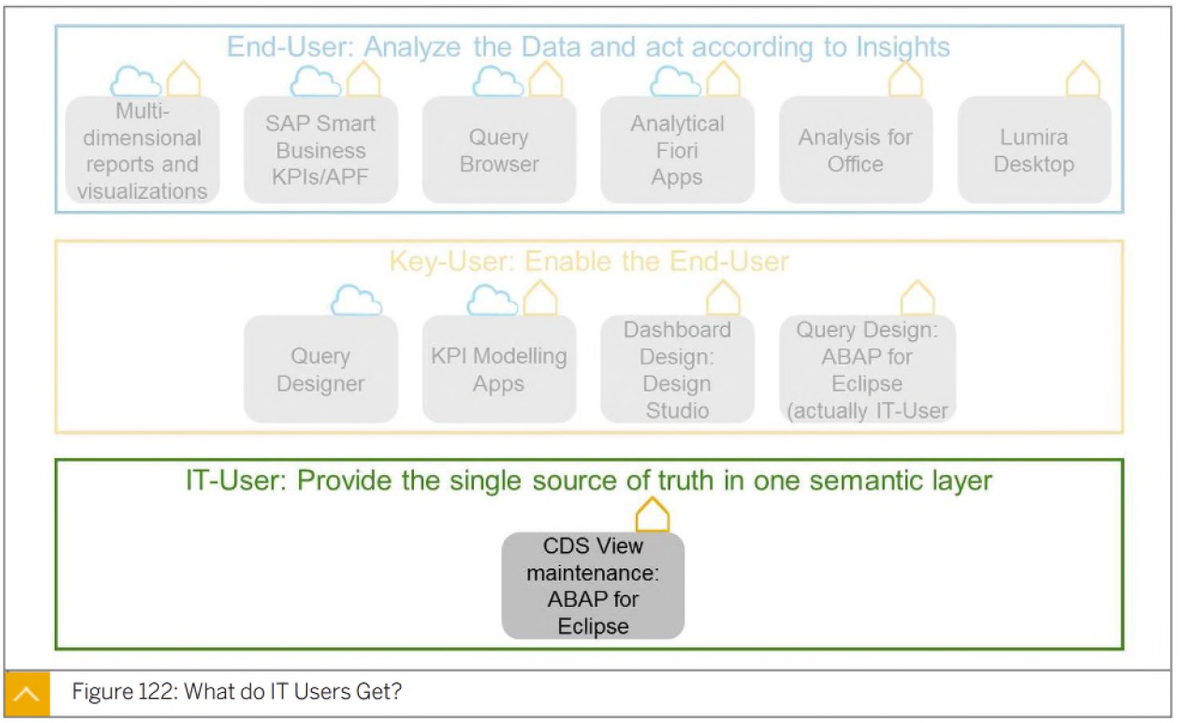

Figure 122: What do IT Users Get?

An IT user is someone who is part of the technical team who sets up and maintains the infrastructure of SAP S/4HANA.

This includes all of the components of SAP S/4HANA embedded analytics, including the VDM.

ABAP for Eclipse: CDS Development and Maintenance

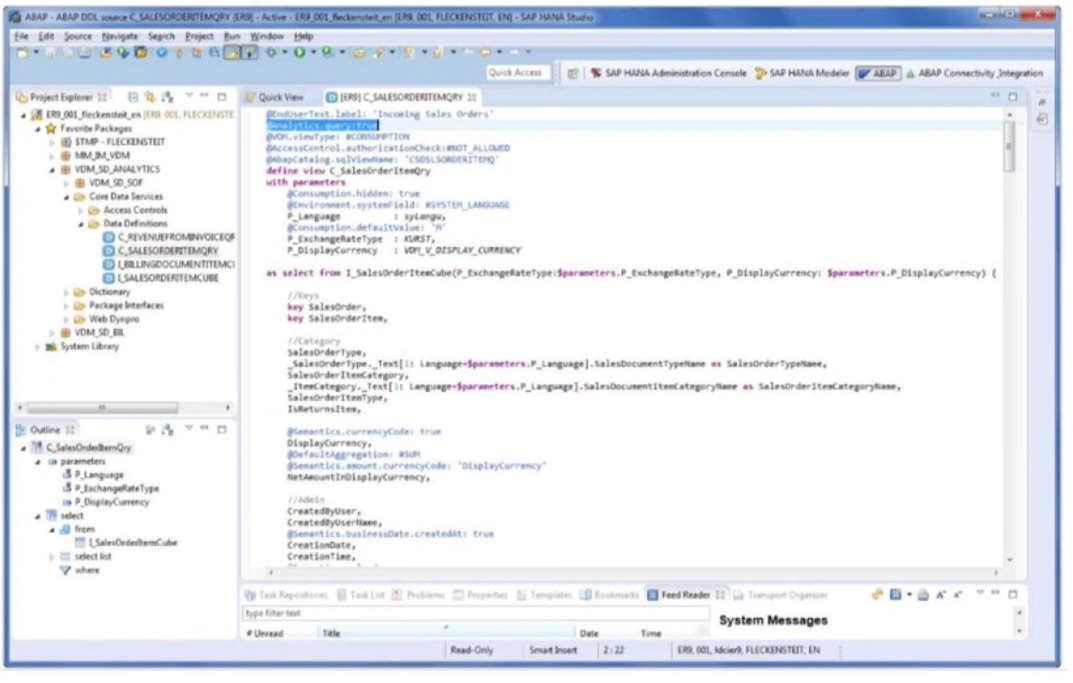

Figure 123: ABAP for Eclipse: CDS Development and Maintenance

The Virtual Data Model (VDM) used by SAP S/4HANA analytics is based on ABAP-managed CDS views.

The design interface for CDS views is called ABAP for Eclipse. Despite the name, no ABAP code is entered in a CDS view. A CDS view contains SQL code, and extra annotations to describe the technical and business semantics. You use this interface to review standard delivered CDS views, copy CDS views, and extend them with additional SQL logic and annotations.

For now, the only way to view and maintain CDS views is using the ABAP for Eclipse. Developers very much like this method of access to CDS views, and it is a familiar interface for coders, with many productivity aids. This interface is also used by application developers, who may be building ABAP code on one tab, some JavaScript on another, and a database table on another. This single, consistent interactive development environment (IDE) face is optimized for productivity. As well as a desktop client, it is also available as a Web client, which is key for cloud developers.

SAP is working on the creation of a graphical interface for the viewing and maintenance of CDS views, so it is a little more user-friendly for the non-technical people. It is currently possible to display the definition of a CDS view graphically, though you cannot edit it this way. From this screen, you can also review the data in the CDS view to ensure it returns the expected results.

LESSON SUMMARY

You should now be able to:

- Describe the tools for IT users

Unit 6
Lesson 6

Where does SAP BW Fit?

LESSON OBJECTIVES
After completing this lesson, you will be able to:

- Describe where SAP BW fits with SAP S/4HANA

SAP BW and SAP S/4HANA

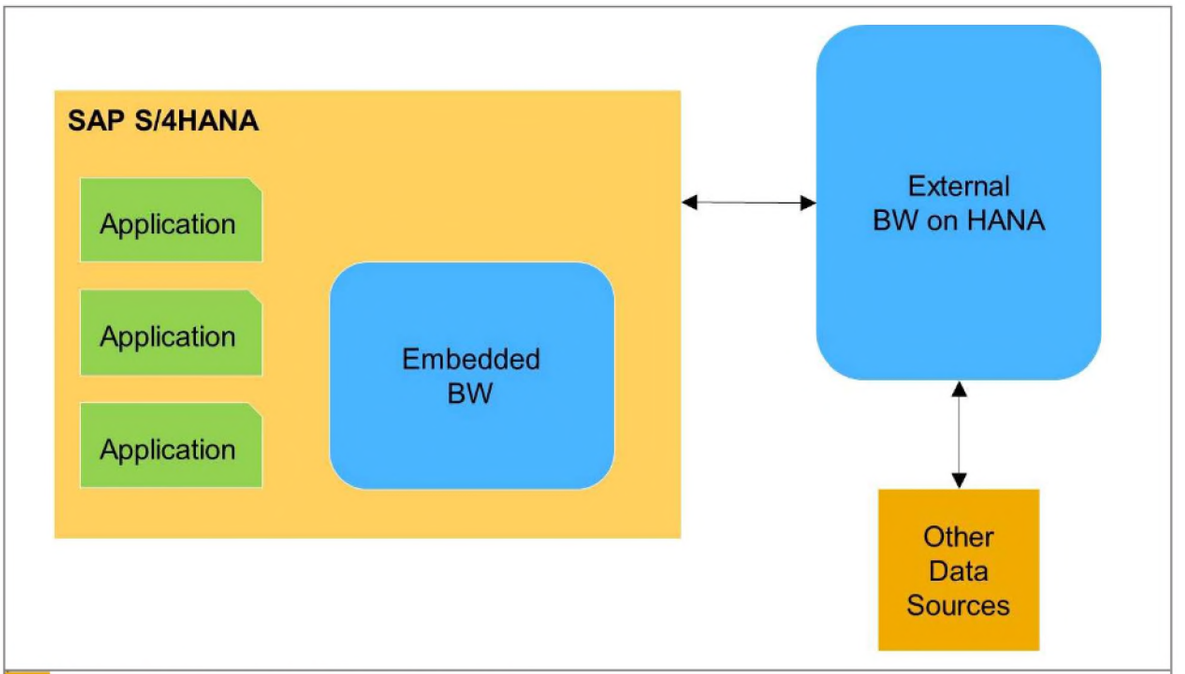

Figure 124: Embedded BW Versus External BW

SAP S/4HANA embedded analytics already includes an embedded BW in the core. This is used to provide analytical services to embedded analytics, but is mostly invisible to users. It might help to think of the embedded BW as a powerful, invisible, embedded analytical engine that provides the complex OLAP capabilities needed by many embedded analytics tools.

One of the services of the embedded BW is to generate a transient provider for all CDS views at runtime. This means it is possible to build BEx queries directly on these transient providers. It is also possible to build BI reports directly on these transient providers, without first creating a BEx query.

However, for full Enterprise Data Warehouse cases, an external BW is still required. It is not advisable to use the embedded BW for this purpose for many reasons, including data volumes, performance impact, product lifecycle management, and ownership/governance.

An external BW in not considered part of embedded analytics, but of strategic analytics, and therefore is covered by a separate license.

Do we Still Need SAP BW with S4HANA?

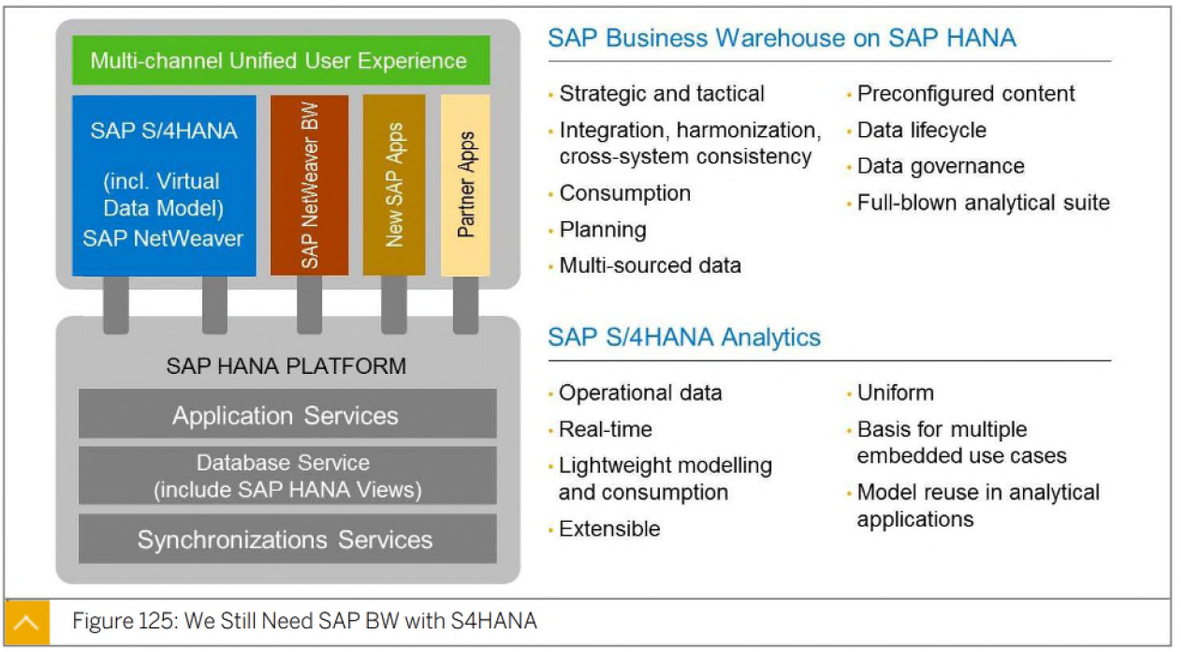

Figure 125: We Still Need SAP BW with S4HANA

Why do we need an external BW, and how does it complement SAP S/4HANA embedded analytics?

We know that real-time analytics on operational data are well supported by SAP S/4HANA, and the goal of taking operation reporting back to the operational systems is achieved. However, we also know that operational data needs to be moved to a suitable location once its value in day-to-day online business operations has decreased.

At this point, we need a solution for data archiving, preferably an intelligent and automated archive that can integrate back with real-time operational data, and also from multi-sources, in a landscape made up of multiple SAP and non-SAP systems. A sophisticated enterprise data warehouse is needed, with strong data governance. SAP BW is the solution for this.

SAP S/4HANA provides extractors that expose the application data for batch and real-time loading to SAP BW.

ABAP CDS views have been developed for BW extraction, and can coexist with the classic extractors. There is no big-bang cutover with the new CDS-based extractors. Customers can adopt the new CDS view-based extractors in their own time.

There are many strong, application-based use cases for SAP BW. For example, business planning requires data to be stored at various levels of aggregation, and not at the typical atomic level of line item data, as preferred by S/4HANA. Additionally, whenever the need for long-term, strategic reporting is required on aggregated levels, SAP BW is the solution.

It is important to remember that SAP BW is moving away from the classic approach of acquiring all data and storing it, which is called persistence. Today, with SAP BW powered by SAP HANA, there are many ways to design a logical data warehouse using many of the newly introduced modeling components. This means the data is not always moved, but SAP BW can 'see' the remote data as if it were loaded.

Integration with SAP BW and S/4HANA

Material		Sales Qty last Period	Current Open Quantity
[-] 200	Material (configurable objects)	355 PC	368 PC
[-] 200/CL_MONITOR_PC	200/CL_MONITOR_PC	355 PC	368 PC
GK1	Flatscreen LE 50 P	50 PC	100 PC
M-01	Sunny Sunny 01	30 PC	40 PC
M-02	Sunny Xa1	50 PC	46 PC
M-03	Sunny Tetral3	19 PC	26 PC
M-04	Sunny Extreme	31 PC	39 PC
M-05	Flatscreen LE 50 P	1 PC	1 PC
M-06	Flatscreen MS 1460 P	22 PC	26 PC
M-07	Flatscreen LE 64P	9 PC	11 PC
M-08	Flatscreen MS 1575P	7 PC	5 PC
M-12	MAG DX 15F/Fe	3 PC	3 PC
M-13	MAG DX 17F	70 PC	60 PC
M-14	MAG PA/DX 175	9 PC	11 PC
T-01	Test Material	0 PC	0 PC
[+] Not Assigned Material (s)		99 PC	136 PC

Figure 126: Integration with SAP BW and S/4HANA

In the figure, Integration with SAP BW and S/4HANA, you can see a report that is built using a modeled material hierarchy that comes from the master data of SAP BW. This hierarchy can be custom created in SAP BW, and can be independent of any standard corporate hierarchies.

For the transactional data, you see that last period sales quantity comes from the SAP BW InfoProviders. This data could have originated in any source system.

You can also see, for each material, the real-time open sales quantities that come from SAP S/4HANA CDS views. Therefore, it is easy to create hybrid reports that combine the historical data with real-time data.

Hybrid Scenarios

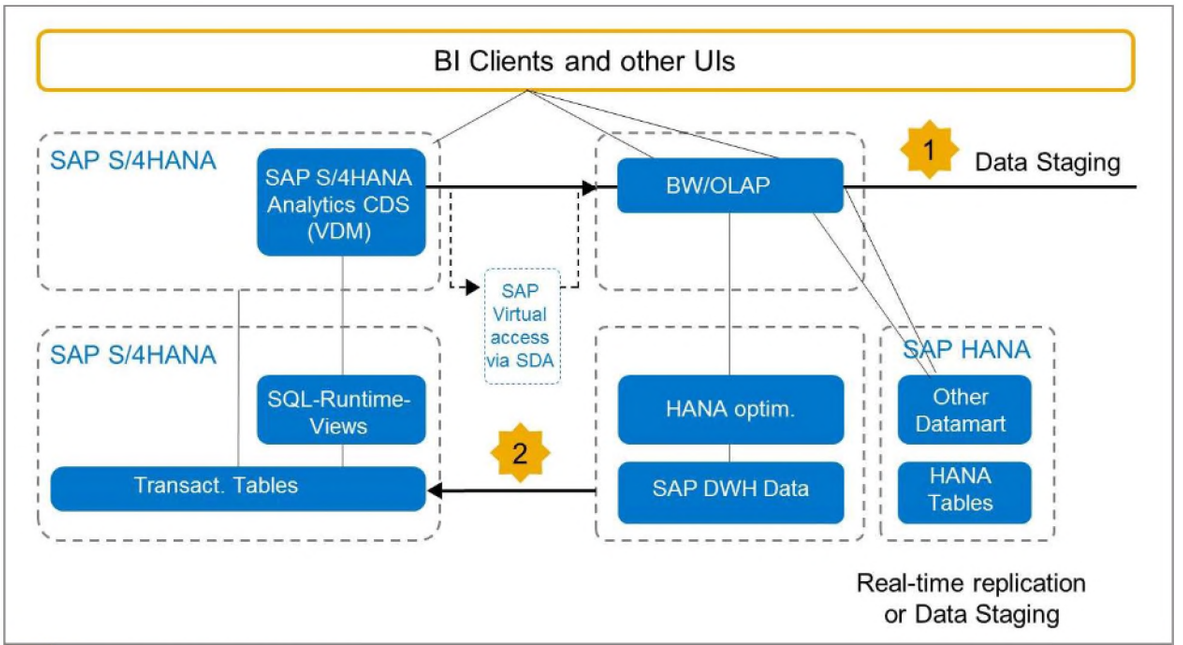

Figure 127: Hybrid Scenarios

SAP BW and S/4HANA can be used side by side. In the figure, Hybrid Scenarios, we see an example landscape, with SAP S/4HANA on the left, virtual connectivity between SAP S/

4HANA and SAP BW using SAP HANA Smart Data Access (SDA), separate SAP BW powered by SAP HANA in the centre of the diagram, and on the right, another SAP HANA side car, on which you might deploy an SAP BI solution for two-tier reporting. On the top, you can deploy BI clients.

There is strong integration between SAP S/4HANA and SAP BW, and they work together to form a complete analytics solution to combine real-time operational and archived data at any level of aggregation.

Another option is to use the fact table from BW and the master data inside your HANA modeling. The possibilities you choose can depend on your experience and your user landscape.

Unit 6
Exercise 8

Apply the Query Browser

Open the *Query Browser* SAP Fiori application and launch a query to explore sales information.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Open the *Query Browser* from the SAP Fiori Launchpad and locate the analytical query *C_SALESORDERITEMQURY*.
2. Launch the analytical query *C_SALESORDERITEMQURY* in the *Design Studio* with the prompt value *USD* for display currency.
3. Switch on auto-refresh so that any navigation is immediately carried out.
4. The query already shows *Net Amount* by *Sales Organization* and *Yr/Month*, but you should expand the result to show who created the orders (use the *Created by* dimension). Use the search feature to find the dimension quickly.
5. Filter the entire query results to show only Sales Organization *1010* and remove the *Sales Organization* dimension to display a simpler result.
6. Set the results to show only the products that *HUETT* has sold. Try to achieve this in one action.
7. Close the filters pane.
8. As well as the tabular display, show a simple column chart.
9. Save the analytical query as a new SAP Fiori tile with the title **`Products sold by HUETT`** and the subtitle **`Use in weekly sales review`**.
10. Launch the saved query from the Launchpad using USD as the display currency.

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Unit 6
Solution 8

Apply the Query Browser

Open the *Query Browser* SAP Fiori application and launch a query to explore sales information.

Note that, in this exercise, when the values include ##, replace ## with the number provided by your instructor.

1. Open the *Query Browser* from the SAP Fiori Launchpad and locate the analytical query *C_SALESORDERITEMQURY*.
   a) In the Launchpad, choose the *Query Browser* tile to launch the application.
   b) In the search field, enter the word **`sales`** and press Enter.
      The analytical query appears at the top of the list.
2. Launch the analytical query *C_SALESORDERITEMQURY* in the *Design Studio* with the prompt value *USD* for display currency.
   a) To select the view, choose the *C_SALESORDERITEMQURY* checkbox.
   b) On the bottom right of the screen, choose the *Open in Design Studio* button.
   c) In the *Prompts* dialog box, highlight the *Display Currency* in the left pane.
   d) In the search field below the *Selection* tab, enter **`US`** and press Enter.
   e) Select the *USD* (US Dollar) checkbox.
   f) Choose *OK*.
3. Switch on auto-refresh so that any navigation is immediately carried out.
   a) Choose (*Settings*), which is to the right of *Dimensions*.
      The manual *Refresh* button disappears.
4. The query already shows *Net Amount* by *Sales Organization* and *Yr/Month*, but you should expand the result to show who created the orders (use the *Created by* dimension). Use the search feature to find the dimension quickly.
   a) In the dimension search field, enter the partial word **`crea`**.
      You see the dimensions that match these characters.
   b) In the *Unallocated* section beside the *Created by* dimension, choose the icon to the left to add an extra column to the results to show who created the orders.
5. Filter the entire query results to show only Sales Organization *1010* and remove the *Sales Organization* dimension to display a simpler result.
   a) Delete the partial word **`crea`** in the dimension search field you entered in Step 4 a.
   b) At the top right to open the filter pane, choose (*Filter*).

c) Right-click the *Sales Organization* dimension and, from the context menu, choose *Set as Filter*.

d) In the *Sales Organization* input field in the top pane, choose the input help icon.

e) Select the *Sales Organization* checkbox with the value 1010.

f) Choose *Apply*.

g) In the rows section on the left, beside the *Sales Organization* dimension, choose the icon to the left to remove it from the results.

6. Set the results to show only the products that *HUETT* has sold. Try to achieve this in one action.
   a) In the results area, right-click *HUETT* and, from the context menu, choose *Filter Member and Swap*.
   b) Use the drop-down list to choose *Material* and choose *OK*.
7. Close the filters pane.
   a) In the top right, choose the funnel icon.
8. As well as the tabular display, show a simple column chart.
   a) Choose the  icon on the far right.

      The chart appears.
9. Save the analytical query as a new SAP Fiori tile with the title **`Products sold by HUETT`** and the subtitle **`Use in weekly sales review`**.
   a) Choose the *Actions* icon.
   b) Choose *Save as Tile*.
   c) Enter the title **`Products sold by HUETT`** and the subtitle **`Use in weekly sales review`**.
   d) Choose *OK*.
   e) Choose *Home*.
10. Launch the saved query from the Launchpad using USD as the display currency.
    a) In your *Home* tile group, choose the new *Products sold by HUETT* tile and launch the query.
    b) In the *Prompts* dialog box, for *Display Currency*, choose *USD*.

LESSON SUMMARY

You should now be able to:

- Describe where SAP BW fits with SAP S/4HANA

Learning Assessment

1. What does a virtual data model provide?

   Choose the correct answer.

   - [ ] A Copy of the database optimized for analytical use
   - [ ] B Reporting tools for users
   - [ ] C Consumption ready views of data
   - [ ] D Ready to use business reports

2. Which of the following is used to build the SAP S/4HANA virtual data model?

   Choose the correct answer.

   - [ ] A SAP HANA Live
   - [ ] B Universes
   - [ ] C ABAP logical databases
   - [ ] D ABAP CDS views

3. With SAP S/4HANA Embedded Analytics, which tools are aimed at end users?

   Choose the correct answers.

   - [ ] A Query Browser
   - [ ] B Design Studio
   - [ ] C Analytical SAP Fiori applications
   - [ ] D Query Designer
   - [ ] E Smart Business Cockpits

4. Which of the following are typical tools used by key users to develop various analyses in SAP S/4HANA Embedded Analytics?

   Choose the correct answers.

   - [ ] A SAP HANA Live Browser
   - [ ] B KPI builder
   - [ ] C Design Studio
   - [ ] D Query Designer

5. Why do we still need SAP BW when we have SAP S/4HANA Embedded Analytics?

   Choose the correct answers.

   - [ ] A To provide a full data lifecycle management framework
   - [ ] B To consolidate multiple data sources
   - [ ] C To support SAP BW powered business applications
   - [ ] D To provide SAP S/4HANA Embedded Analytics with real-time data

Learning Assessment - Answers

1. What does a virtual data model provide?

   Choose the correct answer.

   - [ ] A Copy of the database optimized for analytical use
   - [ ] B Reporting tools for users
   - [x] C Consumption ready views of data
   - [ ] D Ready to use business reports

2. Which of the following is used to build the SAP S/4HANA virtual data model?

   Choose the correct answer.

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   - [x] D ABAP CDS views

3. With SAP S/4HANA Embedded Analytics, which tools are aimed at end users?

   Choose the correct answers.

   - [x] A Query Browser
   - [ ] B Design Studio
   - [x] C Analytical SAP Fiori applications
   - [ ] D Query Designer
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   - [X] B KPI builder
   - [X] C Design Studio
   - [X] D Query Designer

5. Why do we still need SAP BW when we have SAP S/4HANA Embedded Analytics?

   Choose the correct answers.

   - [X] A To provide a full data lifecycle management framework
   - [X] B To consolidate multiple data sources
   - [X] C To support SAP BW powered business applications
   - [ ] D To provide SAP S/4HANA Embedded Analytics with real-time data

UNIT 7 Continuing Your Learning Journey

Lesson 1

Continuing your SAP S/4HANA Learning Journey 200

UNIT OBJECTIVES

- Describe the journey to develop deeper SAP S/4HANA skills

Unit 7
Lesson 1

Continuing your SAP S/4HANA Learning Journey

LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the journey to develop deeper SAP S/4HANA skills

SAP S/4HANA Skills

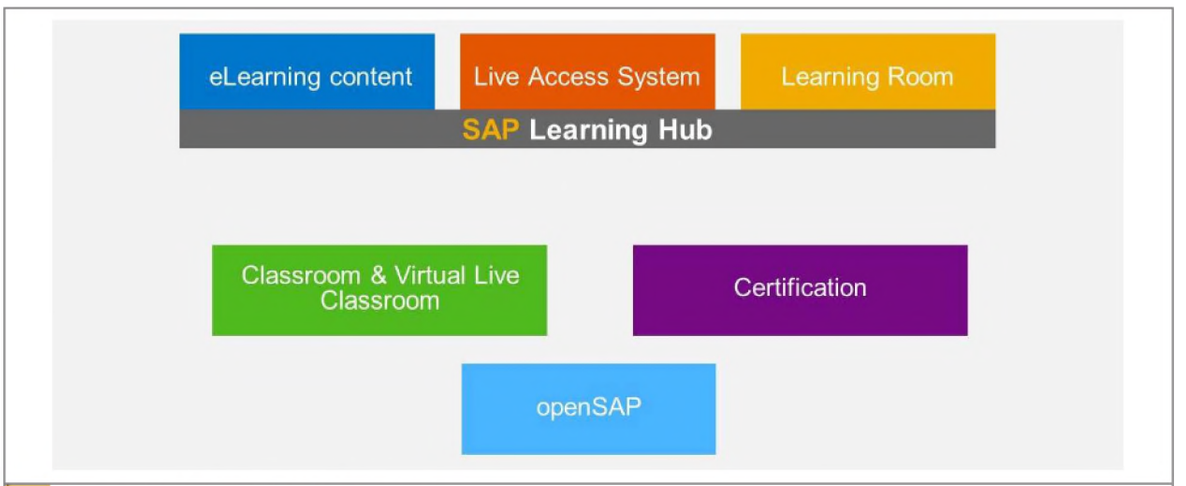

Figure 128: SAP S/4HANA Education

It might be helpful if we first explain the different options for education consumption and knowledge assessment.

The Learning Hub is SAP Education in the cloud for learning on-demand and anywhere. The three key components of the Learning Hub are as follows:

- eLearning Content - The entire SAP public course catalog in eLearning form, as well as other learning assets, in one place.
- Live Access Systems - A personal copy of the same, fully configured training systems we use in the classroom for you to practice on.
- Learning Room - 24/7 online support community of learners, moderated by the same SAP instructors you see in the classrooms. You can post questions, watch videos, read blogs, and more.
- Classroom - Traditional instructor-led courses at the SAP training centers or on the customer site.

- Virtual Live Classroom (VLC) - Exactly the same as classroom, including full interaction with the instructor, except students can be located anywhere there is an Internet connection.
- Certification - After study, prove your knowledge and achieve an industry recognized, professional qualification by taking one of our many SAP exams.
- OpenSAP - Online, mostly high-level courses, ranging from one hour in duration to multi-week courses, covering new SAP topics with lectures, demos, knowledge assessments, and assignments. Students provide their own system, but a system is always necessary. A great complement to formal training options.

SAP S/4HANA Education

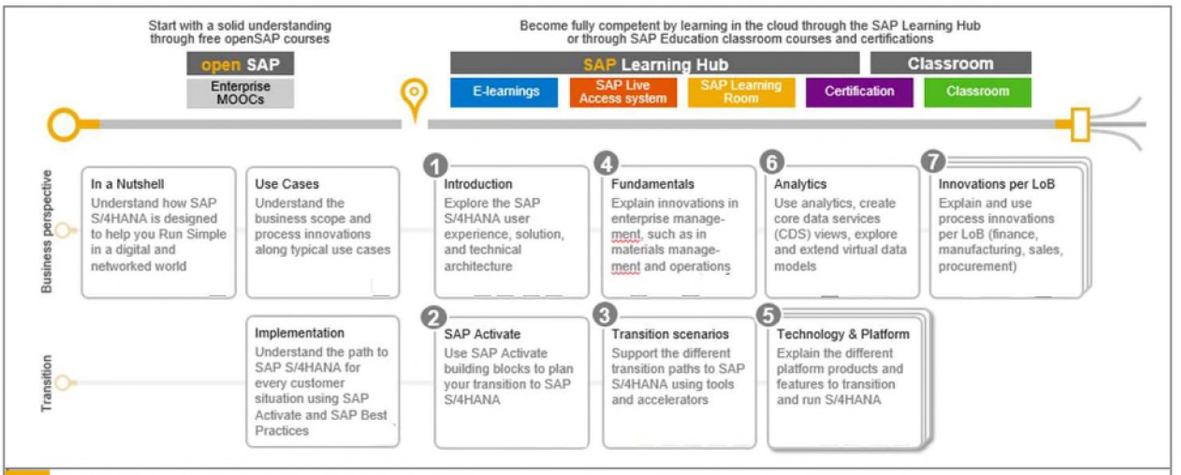

Figure 129: SAP S/4HANA Education

Let's take a look at what is available for development of skills in SAP S/4HANA.

The figure, SAP S/4HANA Education, shows the entire curriculum from a Business Perspective (top layer) and also Transition (bottom layer).

The following list outlines the components of each layer:

- Business Perspective - education content with a business focus
  - Introduction
  - Fundamentals
  - Analytics
  - Innovations per LoB
- Transition - education content with an implementation and technical focus
  - SAP Activate
  - Transition Scenarios
  - Technology and Platform

We can then further divide things up by phase. The left side covers the discovery phase using the free OpenSAP courses. The right side covers the implementation phase where we move away from discovers and develop skills that we can take to a project. There are offerings in each of these areas such as training courses, Learning Rooms, Live Systems, Certifications.

Please refer to the SAP Education web site to find out more what is available in each area:
http://www.training.sap.com

LESSON SUMMARY
You should now be able to:

- Describe the journey to develop deeper SAP S/4HANA skills