

The new world of SAP® Reporting and Analytics

Using embedded and enterprise analytics
to power the intelligent enterprise

Michael DiGiandomenico, President and CEO



“ While embedded analytics focuses on real-time operational reporting, enterprise analytics is suitable for holistic business management and covers a broader range of applications. ”



Embedded Analytics let you analyze and visualize the data directly in the source system. It eliminates the need for complicated and time-consuming data preparation steps. The combination of the simplified data model across applications, instant access to CDS views for real-time data retrieval, and the new Fiori front-end, enables all business users to choose from a wealth of standard SAP analytical reports.



Enterprise Analytics is a more comprehensive concept that encompasses complex analyses for strategic reporting, which are better served by data analytics platforms, such as SAP Data Warehouse Cloud and more traditional tools like SAP BW4/HANA, that can integrate and harmonize disparate data that is then accessible by advanced visualization and rendering tools such as SAP Analytics Cloud.



SAP Data Warehouse Cloud goes beyond traditional data warehousing to provide a multi-cloud, multisource business semantic service for enterprise analytics and planning. The SAP Data Warehouse Cloud solution provides data modeling, connectivity, virtualization, and access across the enterprise. Using managed spaces, business users can explore data, integrate new information, and share insights.

Overcoming the old ways of working

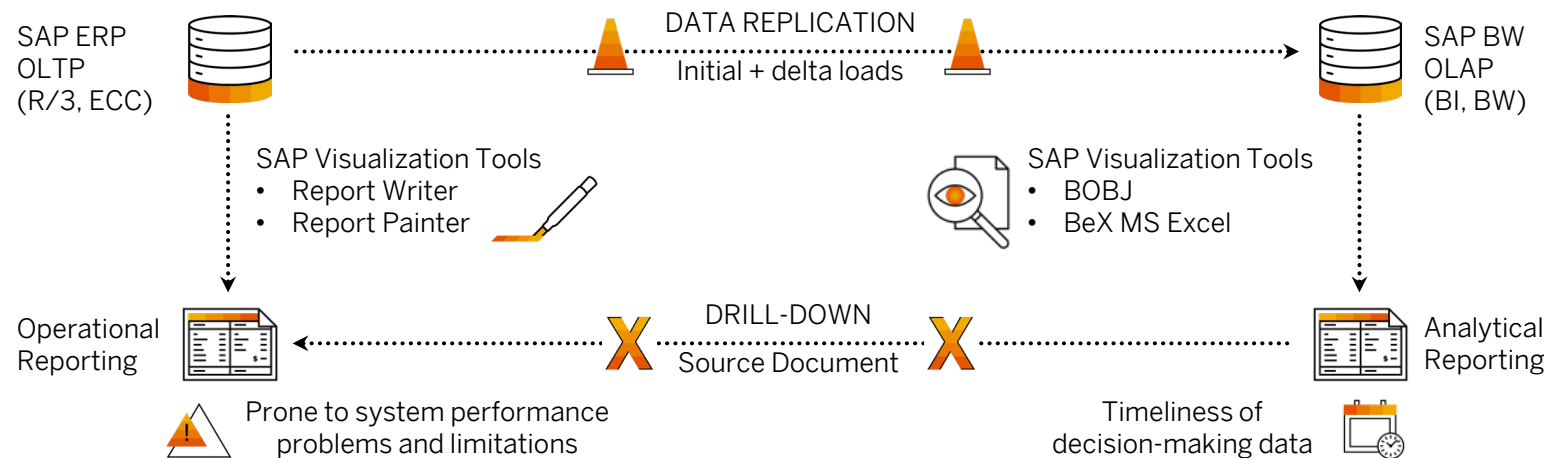
SAP has been a vast repository of data that captured a variety of data records from master to transactional data. Over the last 30 years, SAP responded to this core requirement with several different reporting tools.

HISTORICAL DATA REPORTING

The overarching principle during this time was to deliver pertinent information with the least performance impact. This thought led to a variety of technical approaches, mainly driven by having aggregate tables in the system that totaled transaction figures while line-item level data was created through transactions. This principle was further developed by off-loading reporting information to another server, conceptually separating transaction processing from reporting needs. The distinction between the online transaction processing (OLTP) and online analytical processing (OLAP) led to the birth of SAP's Business Intelligence suite of software products in the early 1990s.

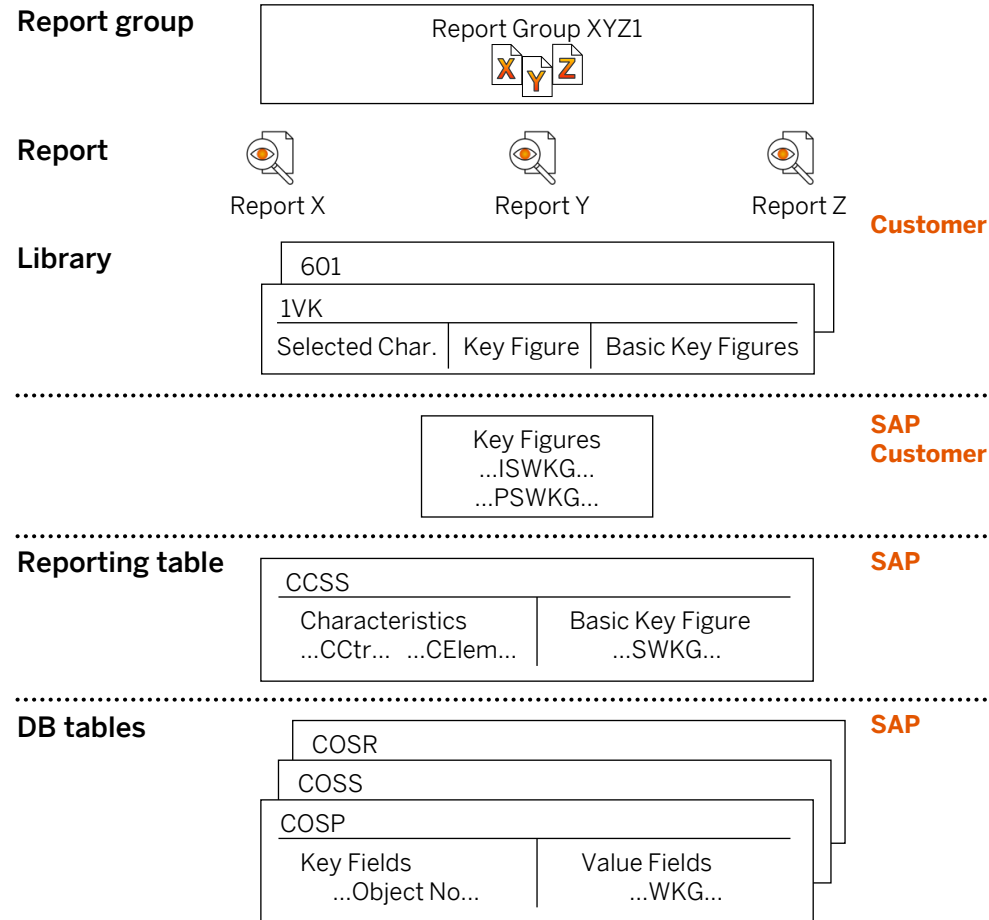
While operational reporting on a comparatively small slice of data remained in the OLTP system (ECC and R/3), the analyses of large data volumes was outsourced to another server (BW and BI). This process was supported through standard SAP extractors that on a scheduled basis would replicate the transaction data into the reporting environment via an initial or delta data load process.

TRADITIONAL SCENARIO



Reporting limitations of the classic data model

TRADITIONAL SCENARIO



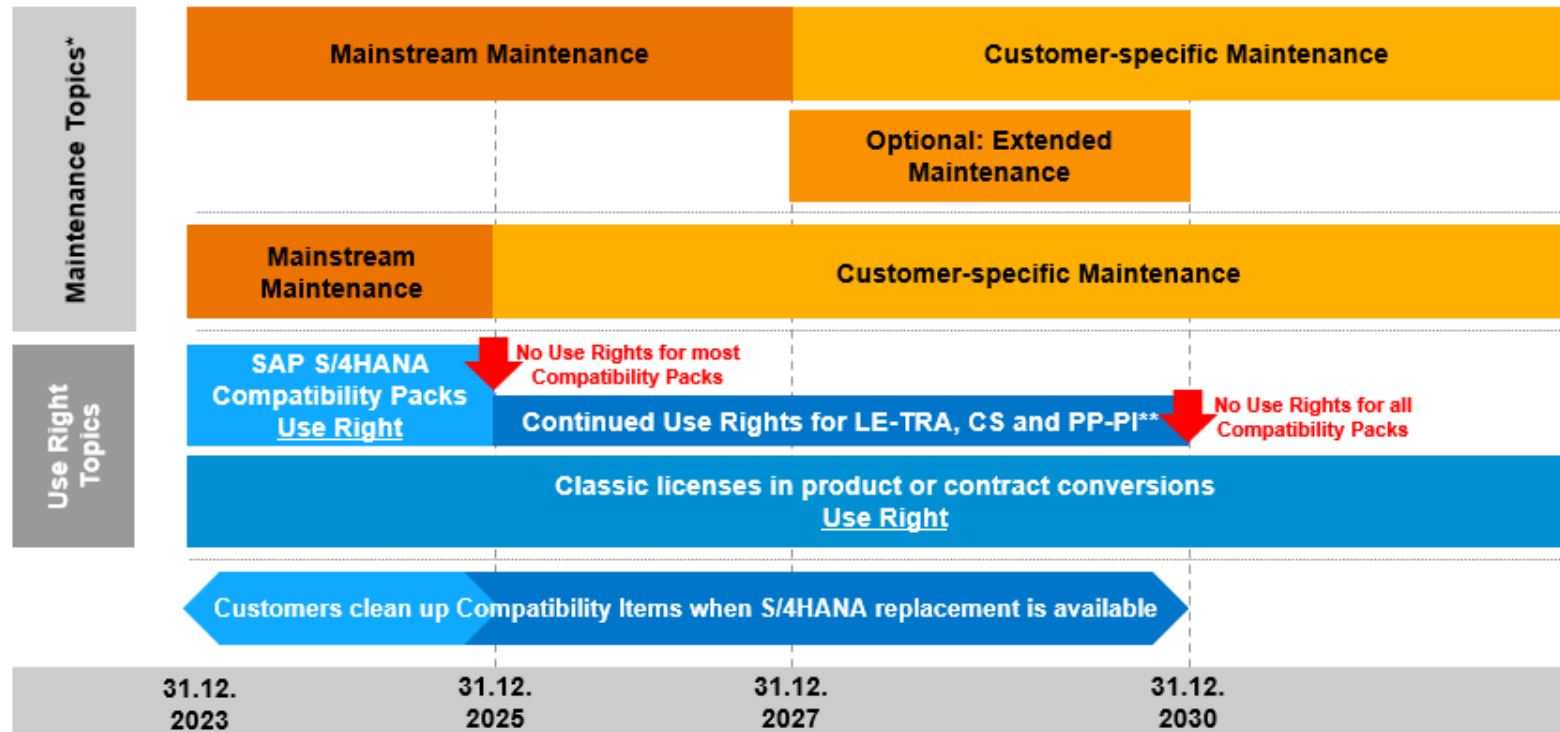
“ When it came to standard SAP delivered reports, most customers developed custom reports to meet business requirements either using standard reporting tools or introducing best-of-breed reporting tools. SAP customers’ investments in analytics applications and custom reporting must now fit with the new S/4HANA intelligent suite.”

Compatibility Scope decommissioning



What happens to support of Compatibility Scope items?

Support stops for Compatibility Scope items after December 31, 2025 with the expiration of the usage rights. Exception: The support of the selected items of CS, PP-PI and LE-TRA which will end on December 31, 2030.



What is the approach for the migration to the recommended alternate solution in S/4HANA?

Customers must consider the following activities when they are planning to migrate from Compatibility Scope to the alternative solution in SAP S/4HANA.

- adaptation of custom code
- changes of customizing
- training of users in the new functionality
- data migration

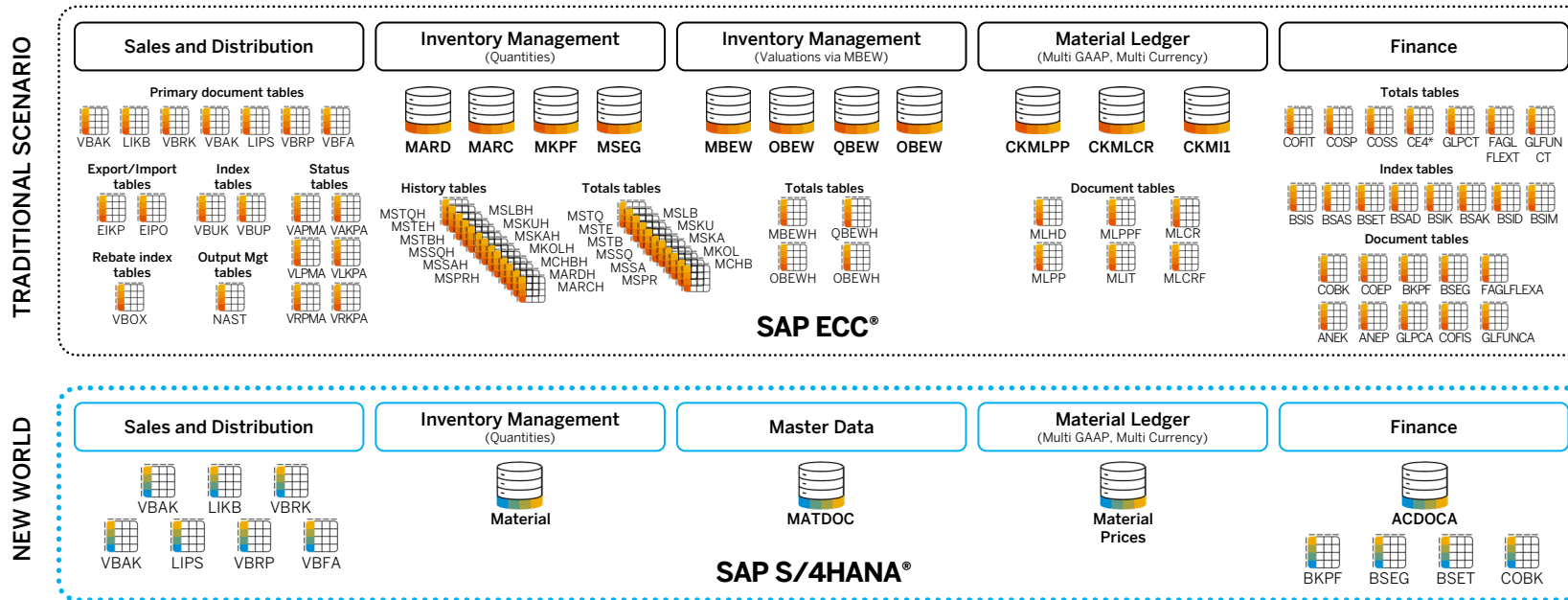
More information about how the transition is supported by the respective application can be found in the business impact notes or will be added to the business impact notes in the future. This support could consist of guides describing the transition to the alternative solution, functional, technical, and data model mapping between the Compatibility Pack and alternative solution, and dedicated reports and tools for automating individual steps of the transition.

<https://blogs.sap.com/2022/08/09/c-ompatibility-scope-what-happens-after-2025-2030/>

Simplifying the data model—single source of the truth

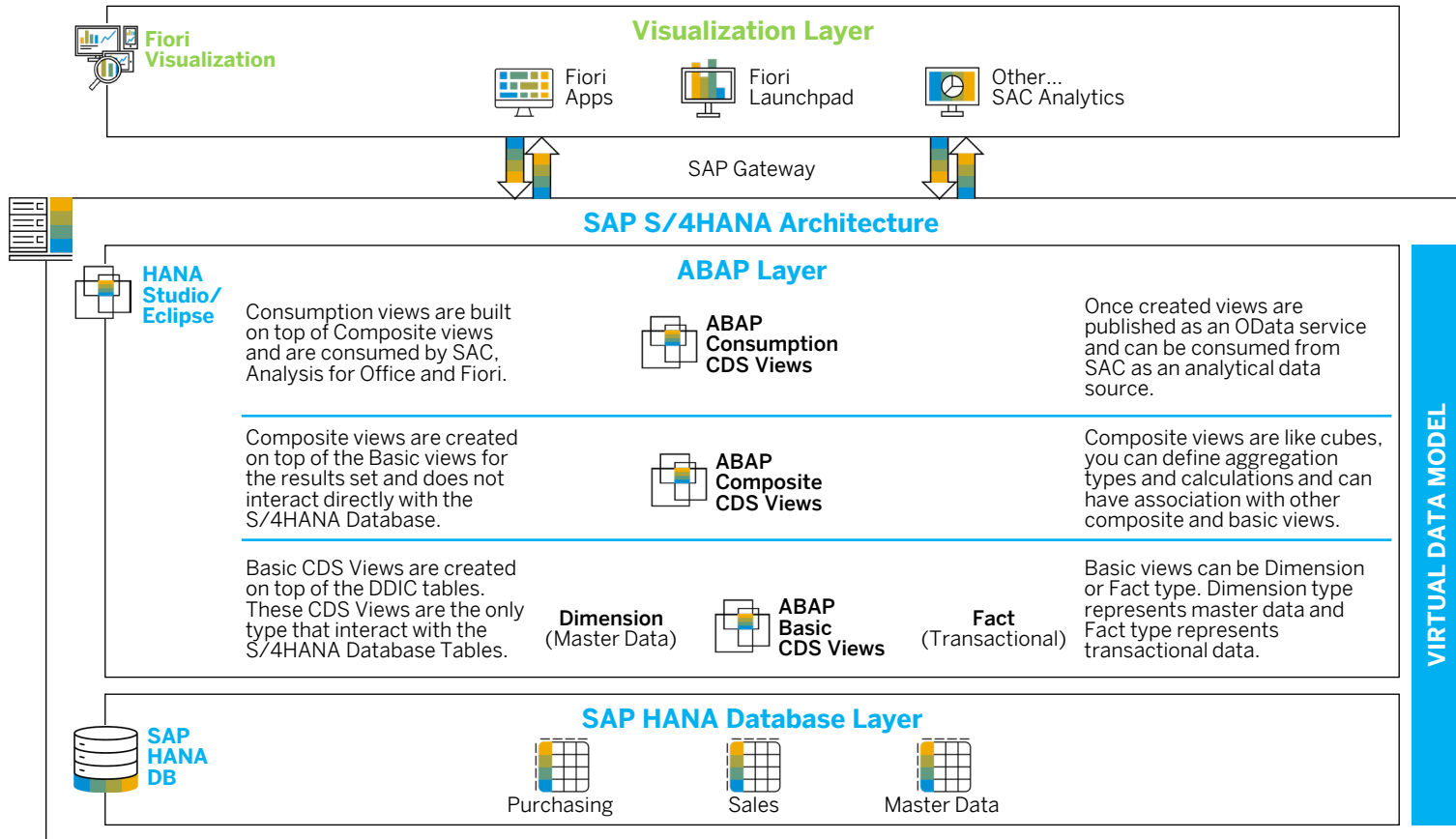
It was only with the introduction of the SAP HANA database technology that the last logical step could be taken—unite FI and CO into one physical table, known as ACDOCA.

“ SAP HANA with its superior compression techniques and columnar layout is now able to aggregate huge numbers of line items within seconds, making it possible to dispense with separate physical line item and totals tables in each application. Real-time integration is therefore guaranteed by design. Thanks to this technology, the Universal Journal with its centerpiece, table ACDOCA, could be developed. ”



Leveraging the power of in-memory, virtual data model

With the evolution of SAP HANA, the SAP core technology has undergone a paradigm shift in the way business applications are developed.



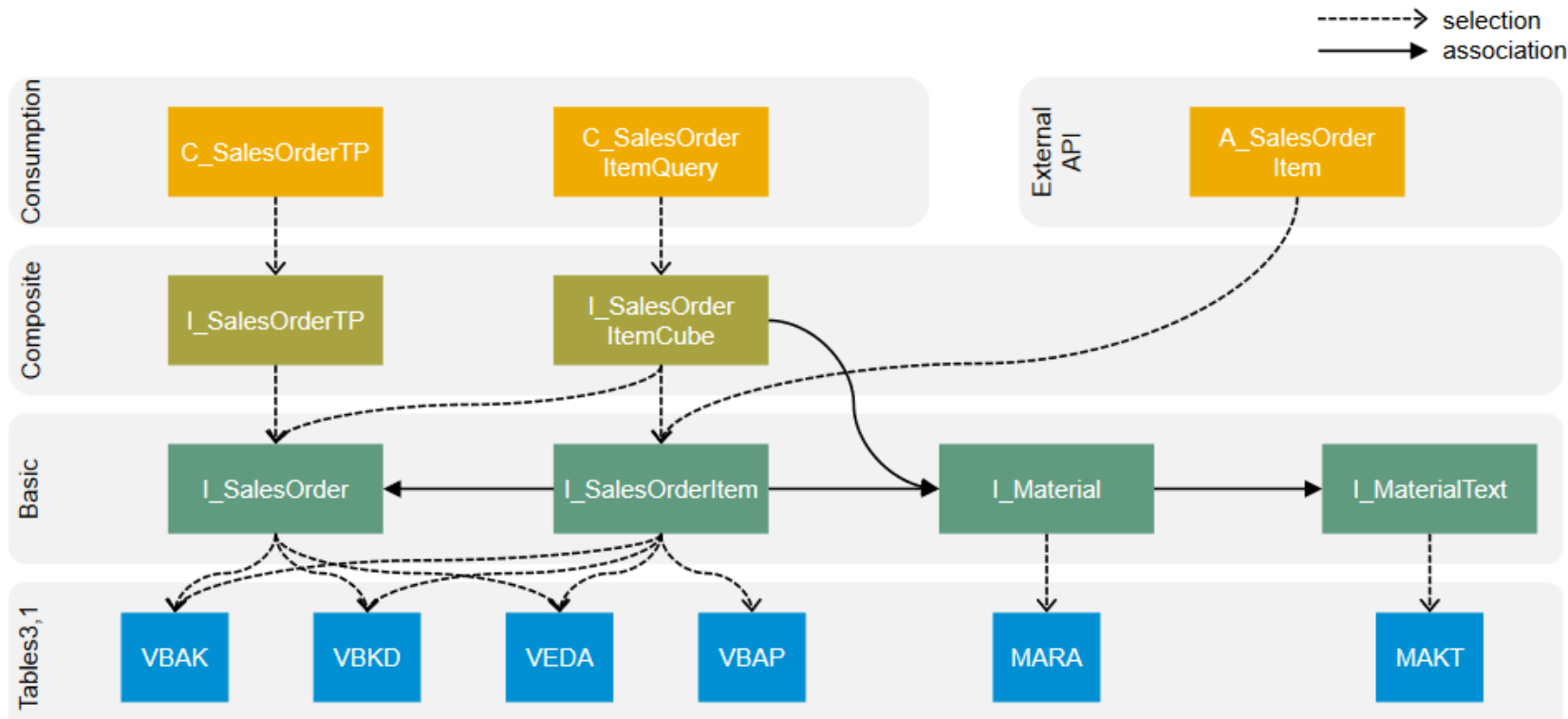
“ The simplification of the data storage logic introduced an optimized way of retrieving the data from the Universal Journal table ACDOCA, which now holds the ‘single source of truth’ for all accounting concerns. The absence of aggregate accounting tables eliminates the need to reconcile the transactions on a recurring basis, while delivering the same answer to queries in light speed.”

Discovering the new virtual data model

The virtual data model (VDM) contained in SAP S/4HANA

The Virtual Data Model (VDM) and ABAP Core Data Services (CDS)

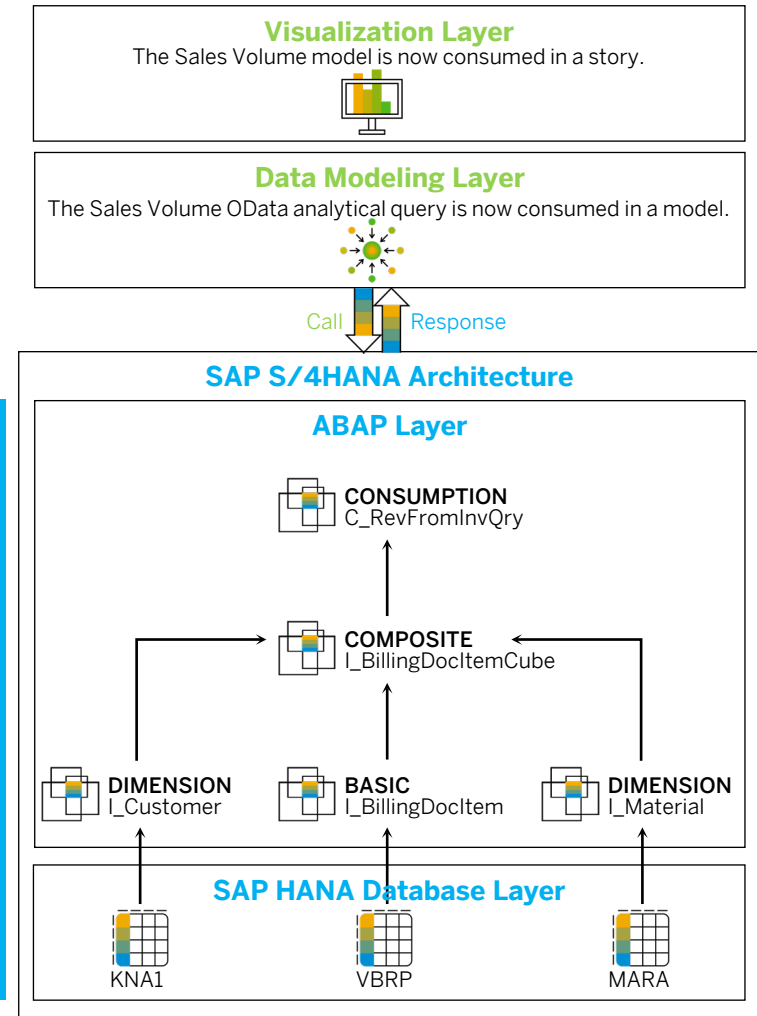
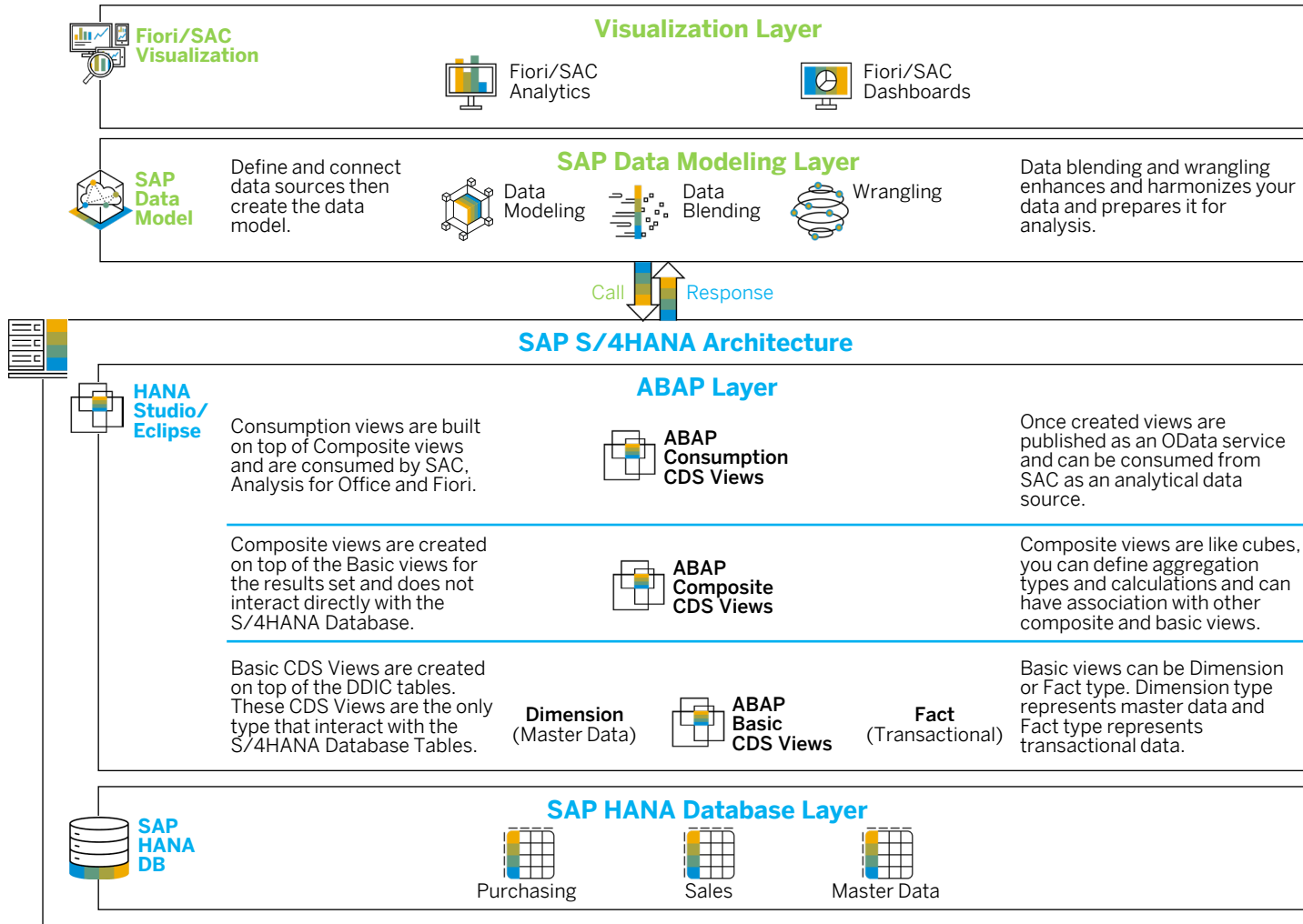
Sales Order and related views



The virtual data model (VDM) is a structured representation of Core Data Services (CDS) views in SAP S/4HANA. The VDM forms the basis for data access in SAP S/4HANA in, for example, analytical consumption or APIs. The CDS views that make up the VDM follow consistent modeling and naming rules. They expose business data – stored in abstract database tables – in a way that is based on business semantics and therefore easier to consume.

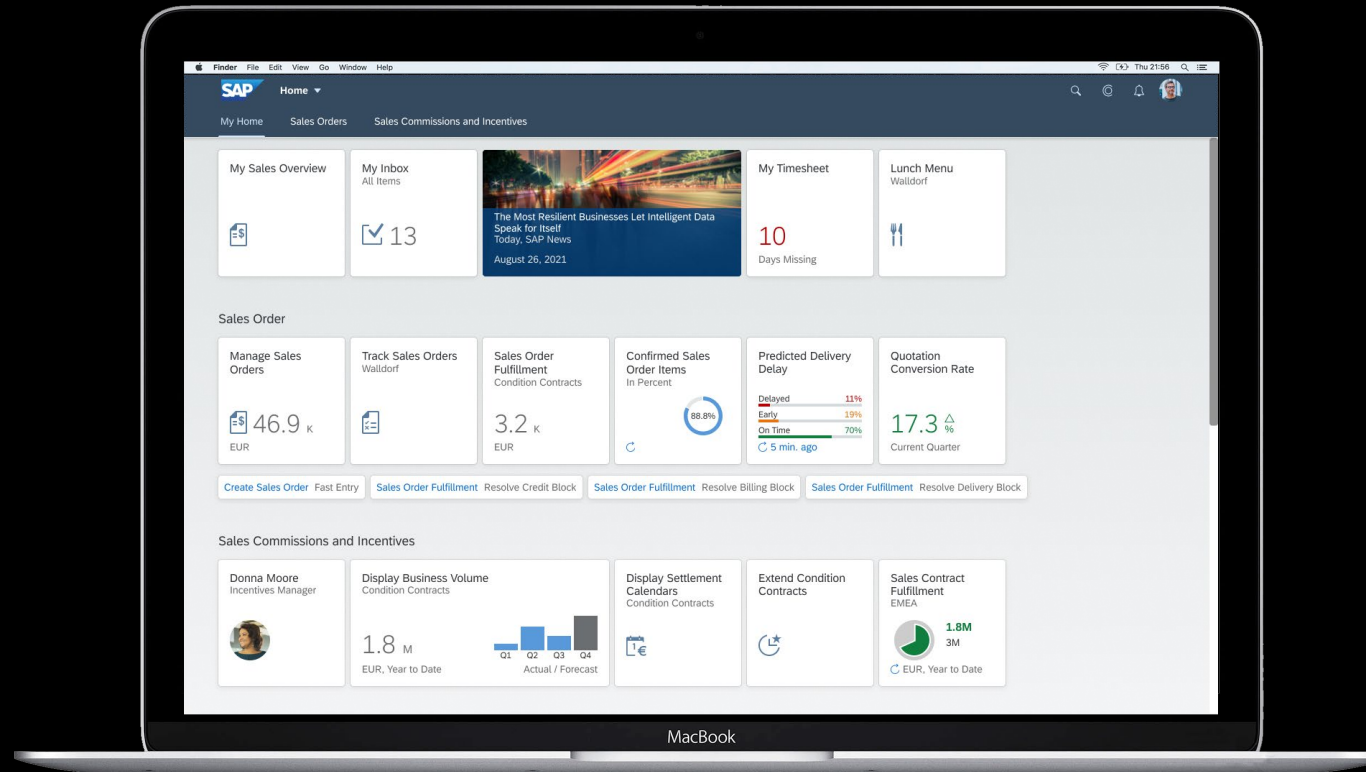
To access exactly the data required for the apps created, existing released CDS views are reused from those available in the VDM. For example, you can define views that aggregate and analyze data in a layered fashion, starting with existing views delivered by SAP and then adding your own views to match your specific use case.

Exploring the modeling and visualization options



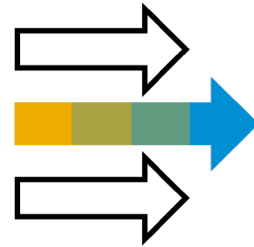
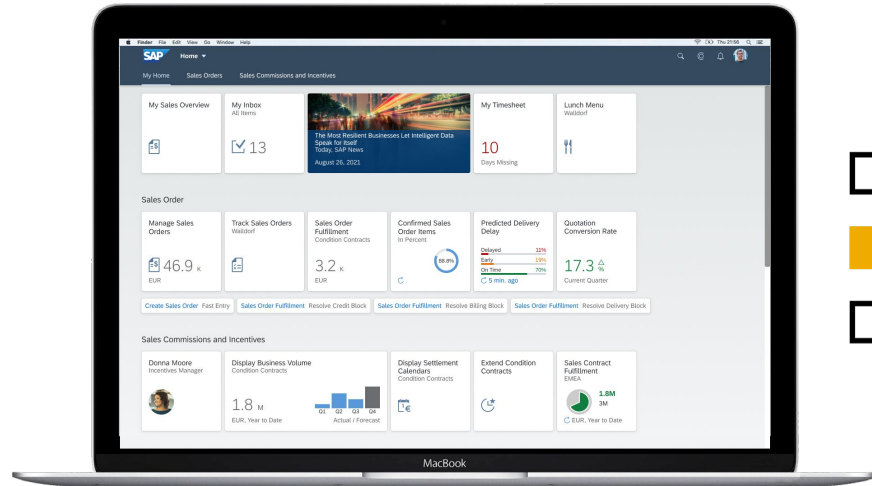
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Embedded Analytics



Fiori, your gateway to Embedded Analytics

The SAP Fiori launchpad home page is the first page that users see after they have signed in. It is the main entry point to SAP Fiori apps on mobile and desktop devices.



Manage Sales Orders
46.9 k
EUR

Confirmed Sales Order Items
88.8%

Predicted Delivery Delay
Delayed 11%
Early 19%
On Time 70%
5 minutes ago

Donna Moore
Incentives Manager

Sales Contract Fulfillment EMEA
1.8M 3M
EUR, Year to Date

Display Business Volume Condition Contracts
1.8 M
EUR, Year to Date
Q1 Q2 Q3 Q4
Actual / Forecast

The launchpad home page displays tiles and links that allow the user to launch apps and may also show additional information. The page can be personalized, and apps can be added, removed, or bundled in groups.

Types of Embedded Analytics



Embedded Analytics apps are used to provide role-based, real-time information about business operations. Using Analytical apps, you can perform complex aggregations and calculations of your business operations data and react to changes in market conditions.

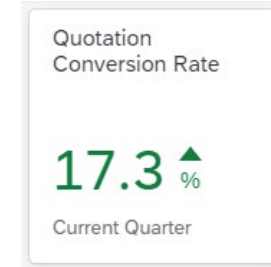
Comparison Chart (Micro Chart)—Use comparison charts to show detailed comparisons with semantic coloring for entries in a “Top N” list.



Trend Chart/Area Chart (Micro Chart)—You can use trend charts (aka, area charts) to show cumulated totals over time, based on amounts or percentages.



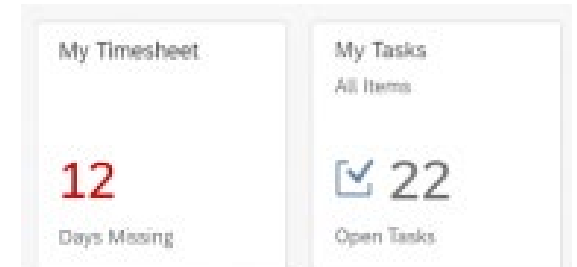
KPI & Monitoring Tiles – Key performance indicators are used to measure and monitor a company’s performance, and display status updates or an object count.



Bullet Chart (Micro Chart)—A bullet chart compares a single, primary value to one or more target values. The primary value is shown in the context of ranges (thresholds).



Column Chart (Micro Chart)—You can use column charts (bar charts) to compare categories using vertical bars. One axis shows specific categories, while the other represents a discrete value.

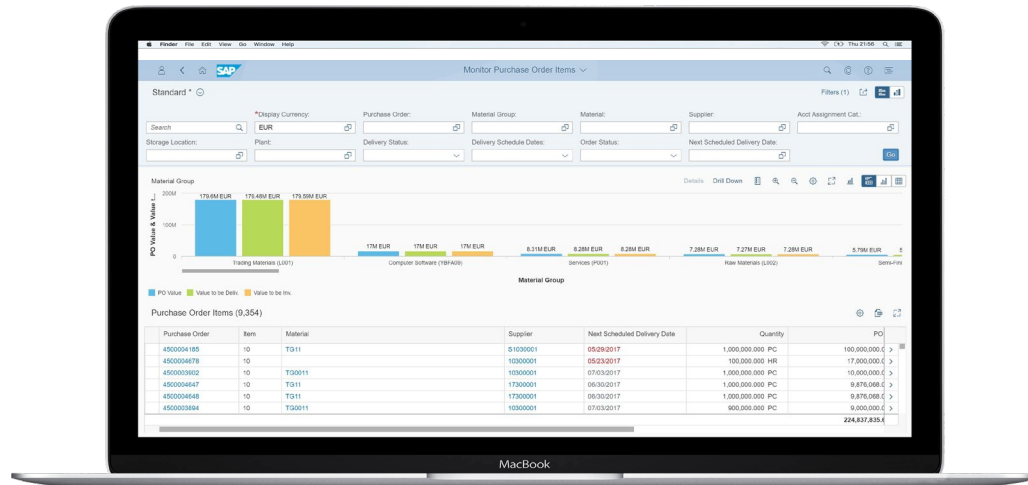


Using the new world of Embedded Analytics

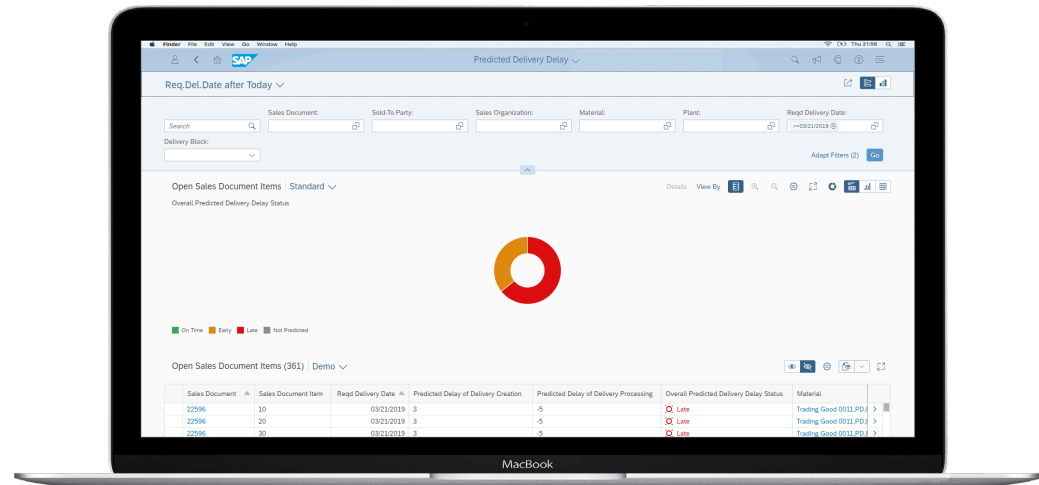


For the first time, SAP S/4HANA and its in-memory database, now enables real-time access to all operational reporting requirements with a single data concept—Embedded Analytics.

Embedded List Page Analytic: Monitor P.O. Order Items

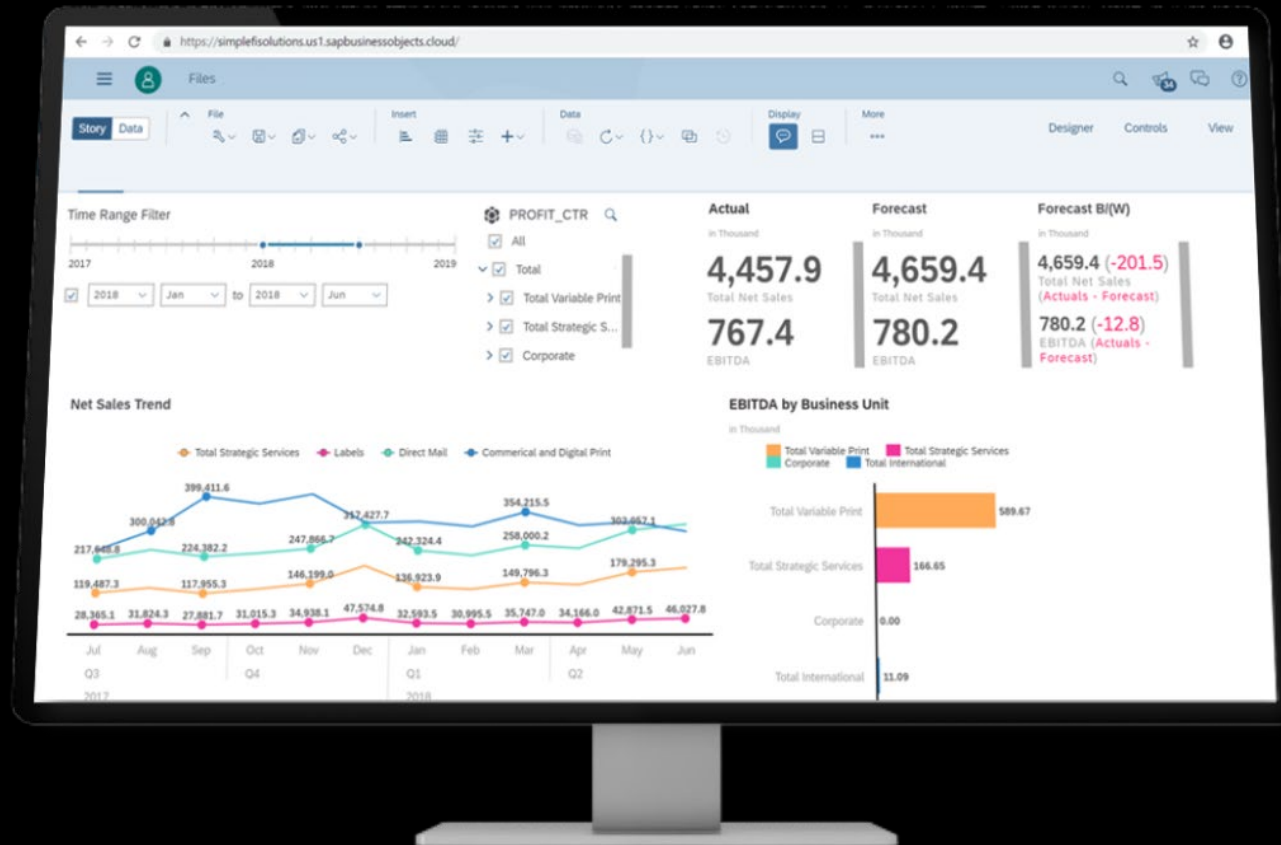


Embedded Predictive ML Analytic: Predictive Delivery Delay

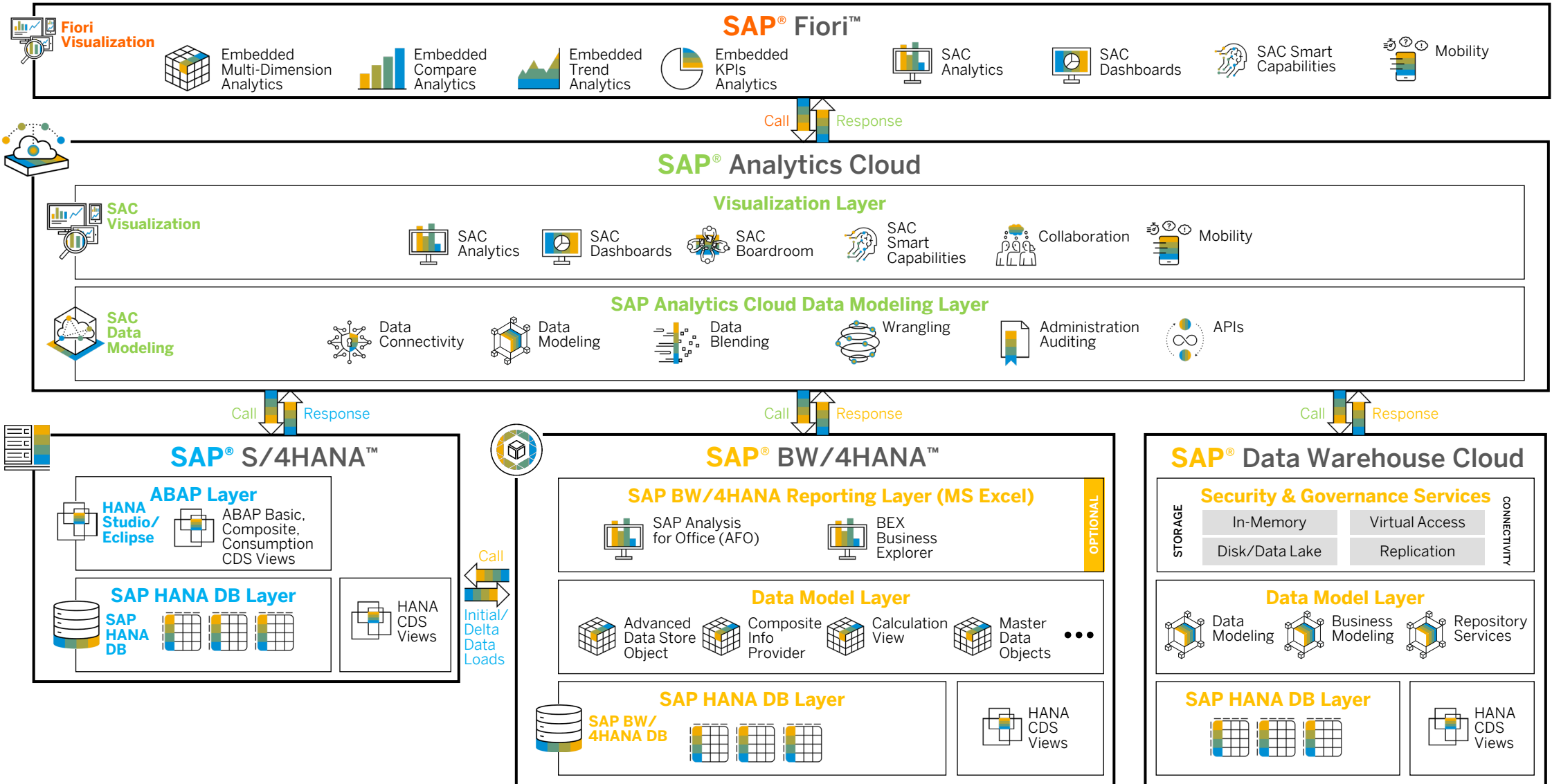


SAP S/4HANA brings OLTP and OLAP back together. This is because SAP S/4HANA runs on the SAP HANA platform and can handle the workloads of both transactions and analysis all in the same system with great performance. This means that we can use the transaction data in decision-making with advanced built-in analytics in real time.

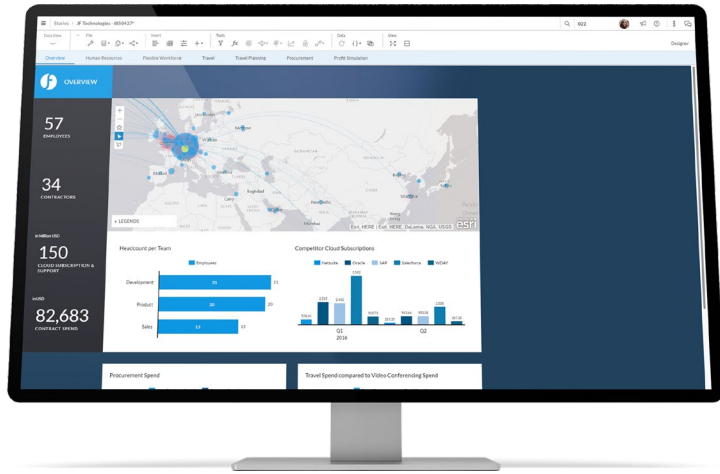
Enterprise Analytics



Enterprise Analytics Architecture



SAP Analytics Cloud – Curate big data and publish reports using **Business Intelligence**



SAP® Analytics Cloud for **business intelligence is transformational**. It allows real-time updates to your plans, collaboration across the organization, advanced analytics, and one-click visualization.

Uncover actionable insights to deliver value across the business. Answer complicated business questions in a few clicks with the real-time analytics capabilities. Integrated with augmented analytics and smart visualization features, organizations can evaluate and predict business outcomes with an all-in-one solution.

Bring it all together by linking data sources in one unified view. Connect, prepare, and leverage data – big and small – from cloud or on-premise applications and sources. Analyze it at any level of detail, with any number of users, and align activities across departments.

Turn insight into action using business intelligence tools to get you to your answer faster. Answer business questions in just a few clicks with the latest innovations in business intelligence in combination with Smart features powered by machine learning technology. Uncover unique insights and take action right at the point of decision.

Communicate like a pro using stunning visualizations to tell your story. Create state-of-the-art visualization with role-based personalization. Engage and convince your key audiences with stunning dashboards while bringing across your message – to the point and backed by data.

SAP Analytics Cloud – Transform the planning function across LoBs using Enterprise Planning



Create strategic alignment across all departments, crowdsource plans across the business, and make confident decisions with SAP® Analytics Cloud Enterprise Planning.

Deliver timely plans, budgets, forecasts, and reports with greater speed and accuracy with a full set of enterprise planning features at your fingertips. Make data-driven decisions that trump human bias and encompass end-to-end decisions across the business in real-time with built-in business intelligence and analytics. Model situations immediately by simulating multiple outcomes to see the impact of your business drivers in a sandbox environment. Use private versions to collaborate with teams on what-if analysis.

Crowdsource plans across departments by sharing and discussing plans across the business with built-in collaboration features. Leverage dynamic workflows for increased accountability and discuss on-the-go with the mobile experience. Create seamless planning workflows using the powerful calendar feature to create scheduled tasks, workflows, and allocations to streamline your planning processes. The built-in multi-step planning processes allow you to trigger actions across departments, cost centers and versions.

Use SAP S/4HANA content packages to jumpstart your financial planning and analysis (FP&A) and supply chain transformations. Use live connectivity between financial plans and actuals and automate allocations and multi-step planning processes. Use SAP Integrated Business Planning and SAP S/4HANA content packages to harvest insights from design to operate and extend supply chain planning processes with financial, strategic and operational alignment. Complete the closed loop process by simulating outcomes based on supply chain and financial drivers.

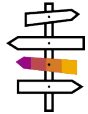
Augmented Analytics are smart capabilities that drive new predictive and cognitive business outcomes



Futuristic predictive and cognitive solutions provide intelligent enterprises next generation capabilities that will unleash new growth opportunities through innovation.

Understand the main business drivers behind your core KPIs, such as revenue, churn, and productivity – powered by Machine Learning. Interact with insights and explore hidden structures and relationships. Find the answer to business questions through intuitive charts and natural language to ask IT experts or data scientists for assistance. Simulate possible outcomes based on your business scenarios.

Predict the outcome of a particular KPI or record value based on historical data. Experiment to see how particular dimension or KPI values will affect business process outcomes. Simulate possible outcomes based on your business scenarios and execute the optimized model based on next generation capabilities. SAP Analytics Cloud delivers smart capabilities across seven key components;



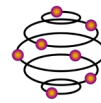
Search To Insight



Smart Discovery



Smart Insights



Smart Predict



R Visualizations

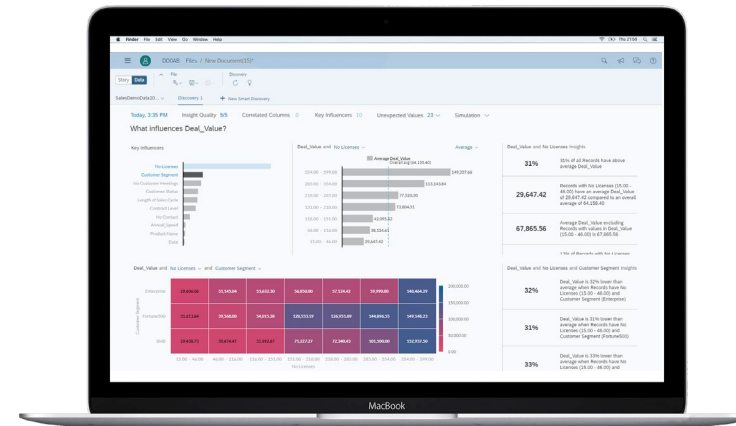
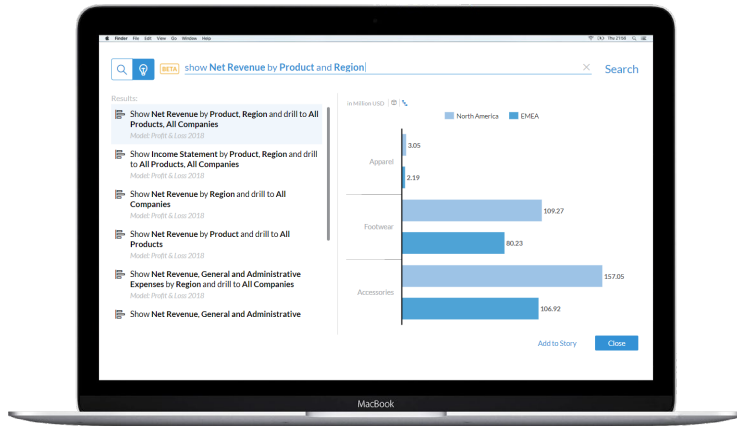


Smart Grouping



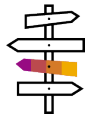
Smart Transformation

Search to Insight is an AI-powered natural language interface Smart Discovery explores and uncovers valuable insights



Search to insight provides a new way to interact with your data to quickly find usable information. This functionality helps you to quickly find usable information through questions in a natural language. It automatically generates charts that provide answers, allowing you to share info or move to the next question. You can ask questions about your data in natural language and get instant answers.

Smart Discovery is a powerful feature of SAC that uses machine learning to analyze and explore data, explain the trends and patterns that influence key figures, and uncovers valuable insights that turn into action. This feature helps save time and effort by running automated machine learning algorithms in the back-end to find correlations between your dataset elements against the target metric. It identifies the key influencers of a selected measure or dimension and is generated automatically to describe the trends and patterns in your data that drive a key figure.



Search To Insight



Smart Discovery

Smart Insights

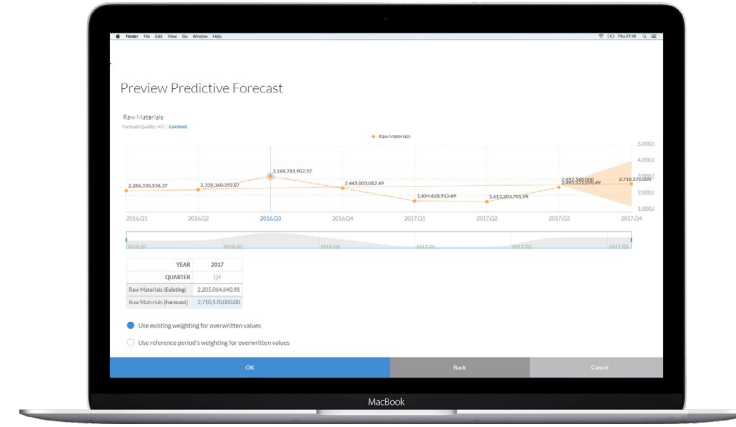
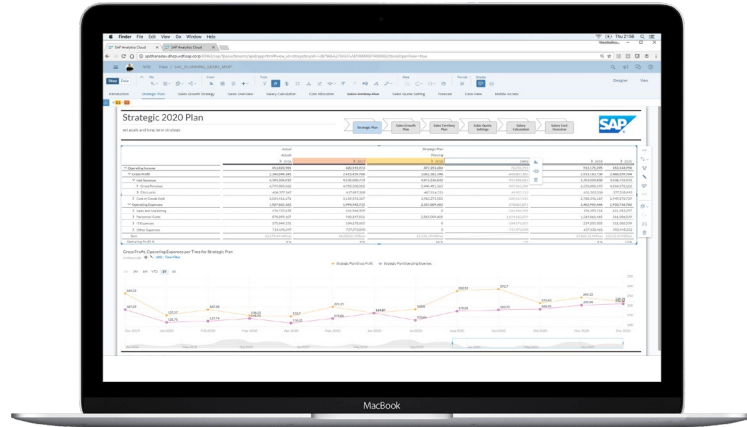
Smart Predict

R Visualizations

Smart Grouping

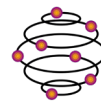
Smart Transformation

Smart Insights examines what is behind data anomalies Smart Predict projects potential future business outcomes



Smart Insights identifies a data point or variance in a dataset and examines what is behind a data anomaly. It can add context and relevance to your data visualization which helps in understanding a business occurrence. Smart Insights uncovers top contributors of a selected value or variance point. Smart Insights uncovers the top contributors of a selected value or variance point. Top Contributors are the dimension members that provide the highest contribution to the data point being analyzed.

SAP Analytic Cloud's Smart Predict feature offers three predictive scenarios. Classification scenarios predict the value of a (target) variable that can only have two values like yes and no or 0 and 1. Regression scenarios predict the numerical value of a target variable depending on variables describing it. Time Series scenarios predict the value of a variable over time taking into account further descriptive variables.



Search To Insight

Smart Discovery

Smart Insights

Smart Predict

R Visualizations

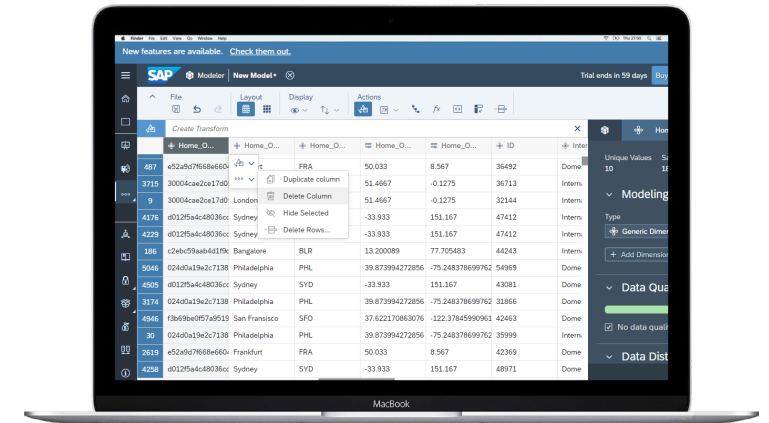
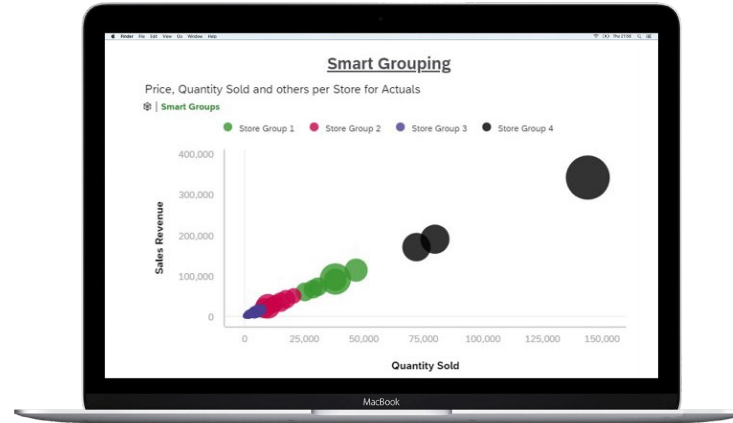
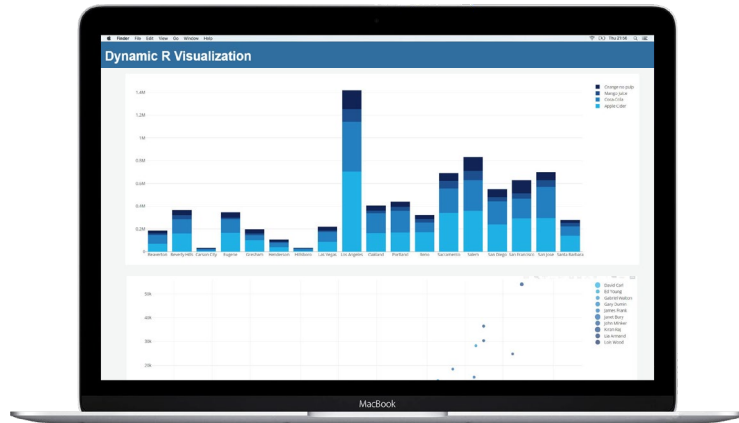
Smart Grouping

Smart Transformation

R Visualizations uncover insights fast, confident decisions

Smart Grouping analyzes and groups data points

Smart Transformation automates data prep, cleansing and staging



R is an open-source programming language that includes packages for advanced visualizations, statistics, machine learning and much more. R Visualization feature allows users to integrate their own R environment into SAC. Analyzing text data can reveal powerful insights in qualitative data, especially when trying to answer the “why” question.

Smart Grouping clusters different values in data aligned to KPIs you are analyzing. This feature uses ML to accurately group values based on relationships in data and predict future outcomes. This feature can be applied to scatter and bubble charts that segregate data points into groups for easier classification. Smart Groupings can be labelled and analyzed to validate human bias against ML, predictive data science models.

Smart Transformations suggests transformations that apply to a particular data set. It lets you geo-enrich your data either by specifying location by region or coordinates, so your data can be displayed in geo maps. Data transformation, or data wrangling is the first stage of modeling. Models can be created from files, connected data, or in the cloud through import data connections.



Search To Insight

Smart Discovery

Smart Insights

Smart Predict

R Visualizations

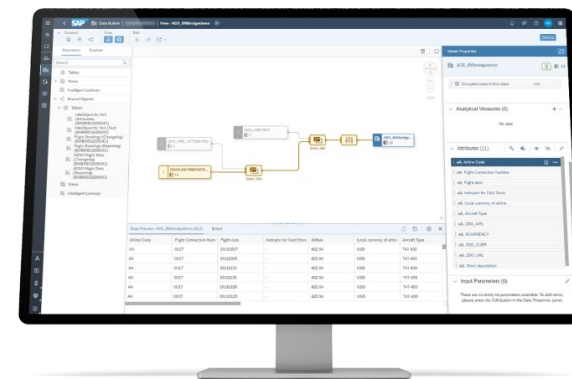
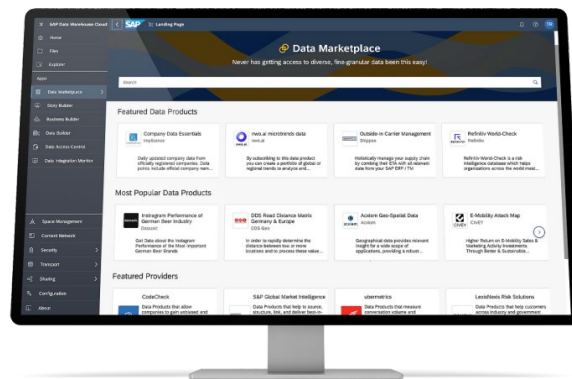
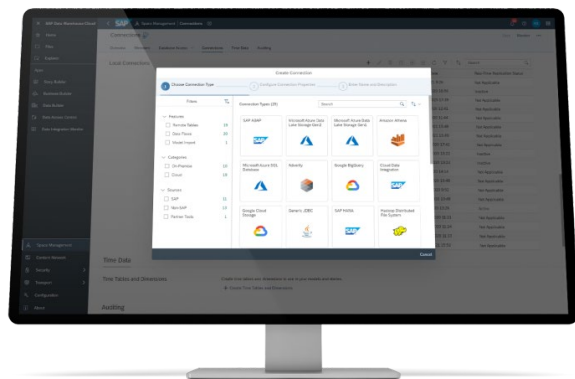
Smart Grouping

Smart Transformation

SAP Data Warehouse Cloud introduction



SAP DWC is an end-to-end data management business tool and persona-driven Data Warehouse as a Service solution. SAP DWC also integrates to SAP ECC and S/4HANA, SAP Analytics Cloud (SAC), partner solutions and open-source technologies.



SAP DWC comes with a breadth of connection capabilities to SAP and non-SAP data sources in the cloud or on-premise. Easily connect data from SAP S/4HANA, SAP Commerce, Sales, Marketing and Service Cloud, and more, to enable a holistic view of all your touchpoints.

With Business Content, you can jumpstart customer analytics projects, automatically connect to your source systems, and populate rich dashboards. Business Content packages are a collection of end-to-end business scenarios that contain connectors, models, and dashboards that help you leverage your data quickly and reduce time to value.

The Data Marketplace allows you to connect with external data. The Data Marketplace allows you to improve your analytics with third-party data. External data is available with your enterprise data to build more robust data models.

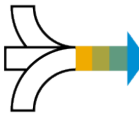
SAP DWC BW Bridge leverages existing BW data models and transformations that allow you to keep your customizations and protect your past investments, without having to rebuild data models.

SAP Data Warehouse Cloud benefits



Complete End-to-end Solution

Unified data and analytics service providing a complete end-to-end solution with one semantic view designed for business and IT.



Connect to SAP Data with Business Context

Out-of-the box understanding of SAP data with semantic business context from SAP applications.



Connect and Collect Data from all Sources

Data virtualization, replication and orchestration from SAP and third-party solutions across clouds and with on-prem.



Semantic Business Modelling

User empowerment with self-service modeling, governance and IT control. User ability to connect own data, share it securely, and run analytics without affecting other users.



Spaces Management & Data Sharing

Independent virtual work environments to foster collaboration and enable data sharing between IT, business units, and projects to connect global and local data.



Reuse & Extend SAP BW Investments

Leverage SAP BW data structures, transformations, customizations, and skills to quickly extend your SAP BW investments to the public cloud.



Choice and Openness

Multi-cloud support and open interfaces with choice of modeling environments, analysis tools & languages (SQL, Python, Jupyter) from business analysts to data scientists to developers.



Business Content

Pre-built data models, semantic views of SAP ERP data (CDS views & Service APIs), and transformation leveraging SAP's business expertise and ecosystem partners' knowledge.



Integrated Data Marketplace

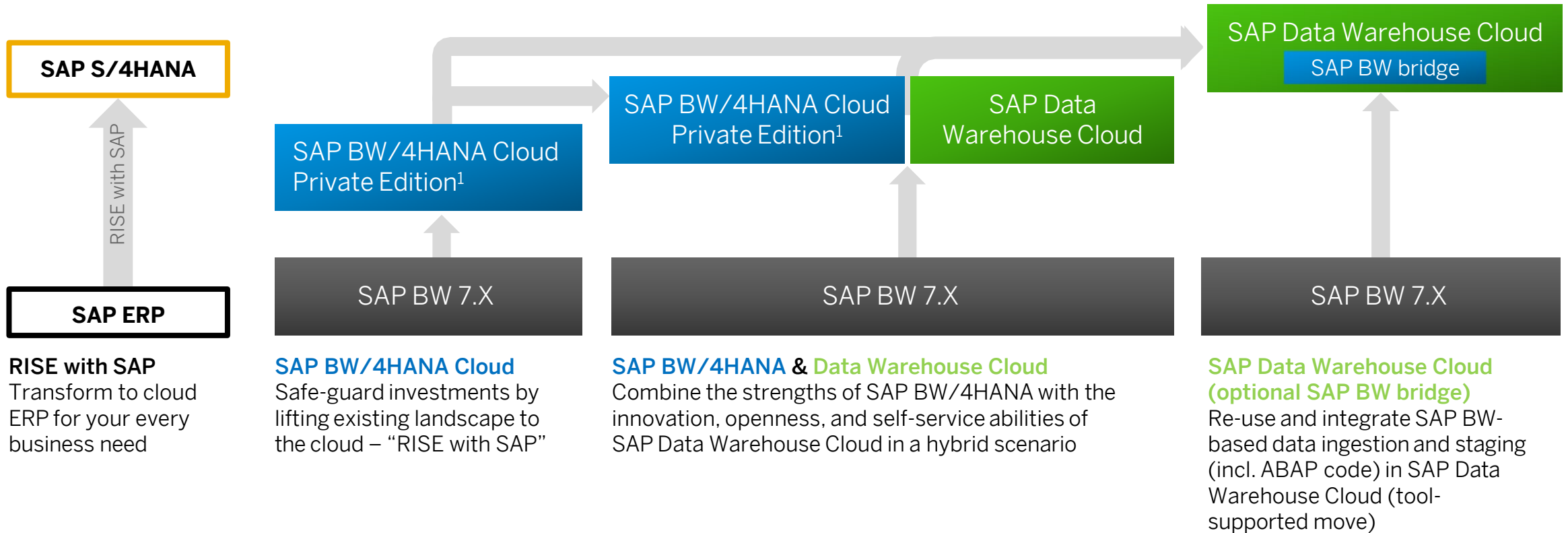
Data Marketplace manages scalable and decentralized cross tenant data exchange for data providers & consumers. Use Intelligent Lookup to match imperfect data sets for enterprise-ready usage.



Future Platform for Planning*

Streamlining planning and analysis with reduced modelling efforts, while operating on a single source of truth for analytics and planning across the organization.

Innovation Journeys for SAP BW Customers



Use right of SAP BW changes with move from on-prem to “RISE with SAP”
SAP cloud ERP subscription license models do not include the use right for an SAP BW stand-alone deployment.^{1,2}

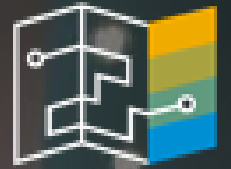
¹ SAP BW/4HANA is fully supported until 2040 and can also be deployed on-premises; SAP BW NetWeaver 7.5 available in private cloud

² SAP cloud ERP includes the embedded BW

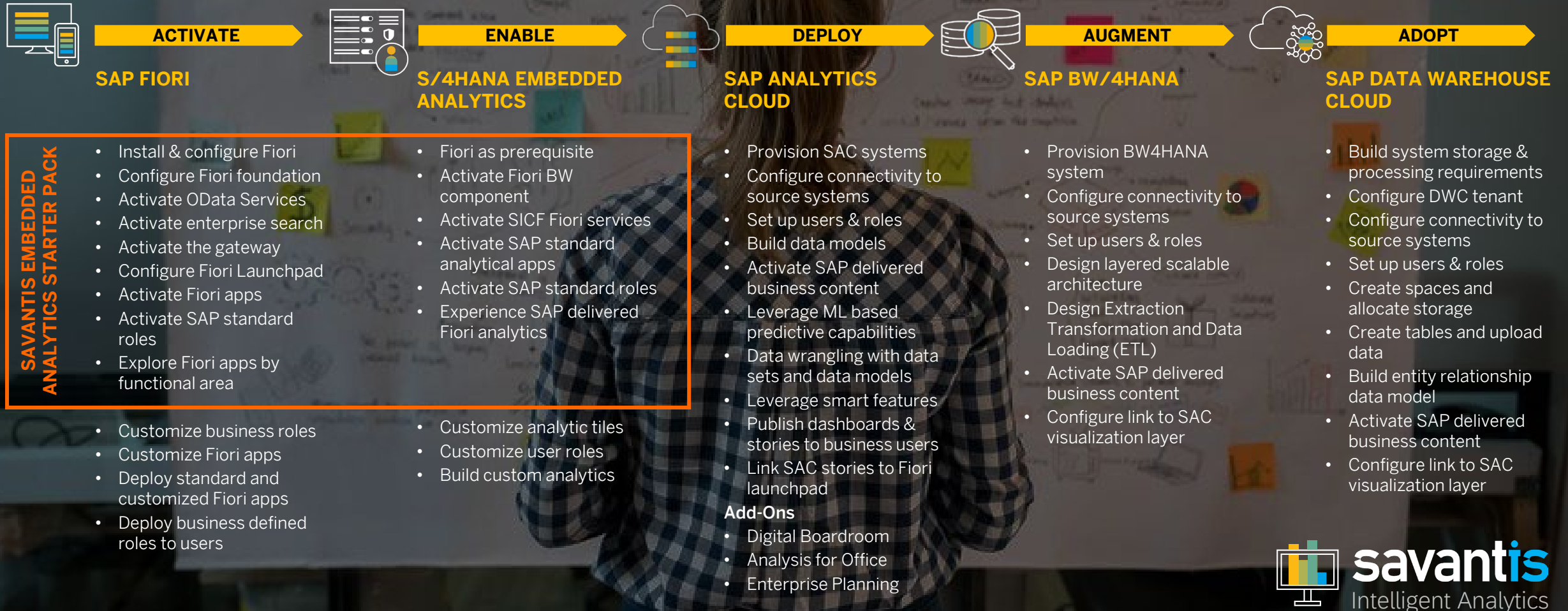
Selecting the best-fit reporting solution

Analytics Criteria		Embedded Analytics	Enterprise Analytics		
		SAP Fiori-based Embedded Analytics	SAP Analytics Cloud	SAP Datawarehouse Cloud	SAP BW/4HANA
Data Sources	Real-time Reporting on Live Data	√	√	√	√
	3 rd Party data sources		√	√	√
Advanced Analytics	Prebuilt business analytical content	√	√	√	√
	Analysis for Office excel based add in		√		√
	Digital boardroom add-on		√		
	Planning add-on		√		√
	Build custom analytical applications	√	√	√	√
	Data consolidation and cross application reporting		√	√	√
Reporting Functions	Support of R-Visualization		√		
	Collaboration support		√	√	√
	Navigation between analytical apps & transactional apps	√			
	Self service data visualization (no data model required)		√		
Big Data	Gather, store, and analyze		√	√	√
Augmented Analytics	Support of Machine Learning Analytics	√ Limited	√	√	√
	Support of Smart Insight		√		
	Support of Smart Discovery		√		
	Support of Search to Insight		√		

SAP Embedded & Enterprise Analytics Quick Start



Savantis' SAP Embedded and Enterprise Analytics Quick Start program helps customers begin their adoption of new generation SAP reporting and analytics. Savantis first helps to redefine the reporting and analytics strategy to maximize the use of S/4HANA and the new in-memory platform to deliver real-time operational reporting using out-of-the-box S/4HANA functions. We then help develop a tailored crawl, walk, run approach to delivering business user communities 'analytical stories' that improve business decisions at the lowest TCO.



Key Contacts



Michael DiGiandomenico

CEO and President
M. 610.220.1498
E. michael.digiandomenico@savantis.com



Michael Eash

Global VP – SAP S/4HANA OTC + CX
M. 484.340.0594
E. michael.eash@savantis.com



William Sherry

Global VP – SAP Cloud + Managed Services
M. 484.716.1103
E. william.sherry@savantis.com



Mark Dooling

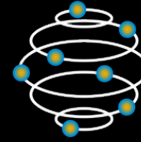
Global Director – SAP S/4HANA Supply Chain
M. 201.306.4461
E. mark.dooling@savantis.com



John Zinni

National Business Development Director
M. 484.557.1787
E. john.zinni@savantis.com

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References & Acknowledgements

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