



Leverage S/4HANA Embedded Analytics for real-time data insight

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Speaker introduction

- 24 years of SAP experience in a career of 29 years in a variety of roles including SAP product development, delivery/advisory/consulting, pre-sales, & sales; currently work for the SAP S/4HANA Center of Excellence, North America
- Served nearly 50 clients globally & across multiple industry verticals including Public Sector, Utilities, Media, Manufacturing, Pharmaceuticals, Oil & Gas, & Hi-tech among others
- Areas of expertise include SAP Financials, Logistics/Supply Chain, Reporting & Analytics, Data Management & Governance, Cloud technologies, User Experience, & Project/Program Management
- Prolific thought leader: Published over 100 articles & white papers for SAP publications; written 5 SAP books; spoken at nearly 50 SAP conferences globally

Agenda

- 1 Background**
- 2 S/4HANA Embedded Analytics – what it means for the business user**
- 3 Embedded analytics in action**
- 4 Technology foundation of Embedded Analytics**
- 5 Wrap-up**

Conventional view

In the past, transactions and analytics were handled separately.
But in reality, business processes are often a sequence of...

transaction → **analysis** → **transaction**

Enter Purchasing Request

Check Supplier KPIs

Assign Supplier

Review amount of blocked orders

Remove billing blocks etc.

Post G/L Booking

Check effect on P&L statement

Questions to ask when considering an ERP application

Data Integration:

Why should it be necessary to transfer data to another place just to run an analytical query on it?

Data Latency:

Why should users accept to look at outdated data and thus not focus on the problems of today, but of yesterday?

User Experience:

Why should there be a difference in the look and feel of a table that shows transactional data versus a grid that displays the result set of an analytical query?

Process Efficiency:

Why should the business process be interrupted at points where machine learning based decision support can ensure a seamless continuation?

Flexibility:

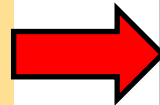
Why should users have to wait for another report to be shipped by the software vendor when creating it, tailored to the own organizations needs, is significantly faster?

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S/4HANA Embedded Analytics - Overview

“Where is my business data I need for insight-to action, fact-based process handling, and real-time operational reporting - and how is it structured?”



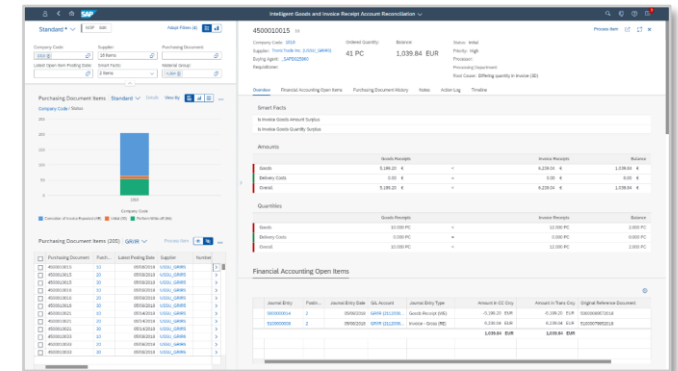
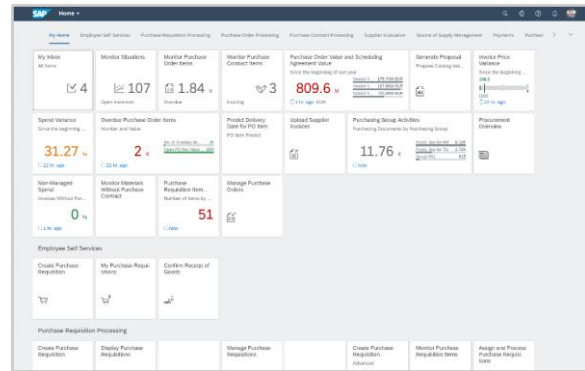
SAP S/4HANA embedded analytics =

Analytics embedded in SAP ERP (embedding analytical views inside SAP Fiori applications)*

+ SAP HANA

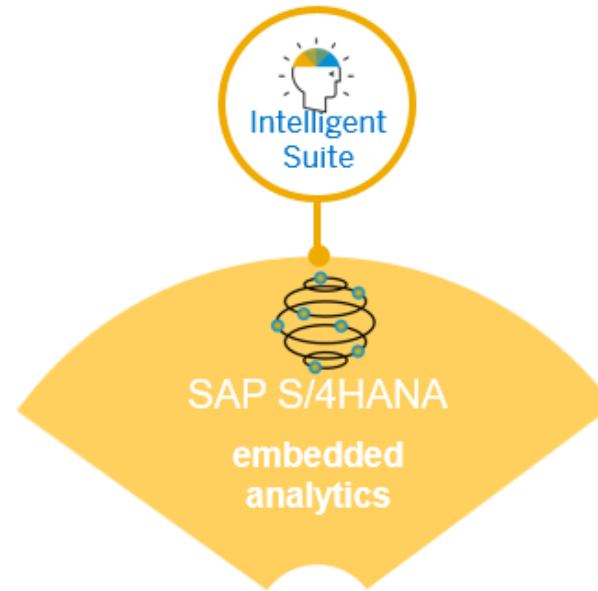
+ Content (Data Models and End User Applications)

+ Design Applications



* Using ABAP CDS view models, not embedded BW, or ABAP Reports

S/4HANA Embedded Analytics – in a nutshell



SAP S/4HANA embedded analytics =

Analytics embedded in SAP ERP + SAP HANA + Intelligent Technologies
+ Content (Data Models and Applications) + Design Time Applications



Transformational nature of Embedded Analytics

From

Answering yesterday's questions with yesterday's data

Bringing the user to the reports

Information-seeking

Business Processes, fragmented over systems of records and systems of engagement

Exception Provisioning

To

Answer today's and tomorrow's questions with embedded real-time and predictive analytics

Bringing the reports to the user (-roles)

Information-first / progressive disclosure

Insight-to-action in one system

Exception Avoidance

What are the implications of ‘embedded’?

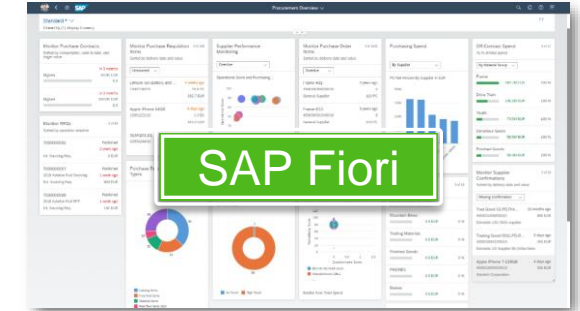
Embedded on database level:

- No separate “analytical” storage of data
- Access only to real-time live data (the analytical data *is* transactional data)
- Necessary transformations are performed by the virtual data model (VDM)



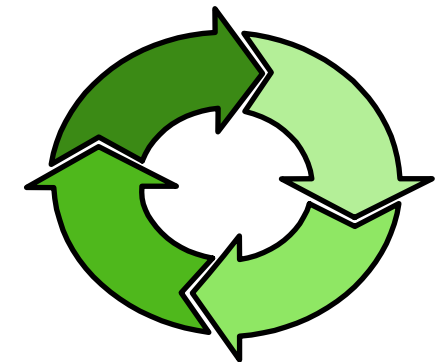
Embedded on UI level:

- Using the same UI technology (and sometimes even the same UI screen) to render transactional data and analytical information



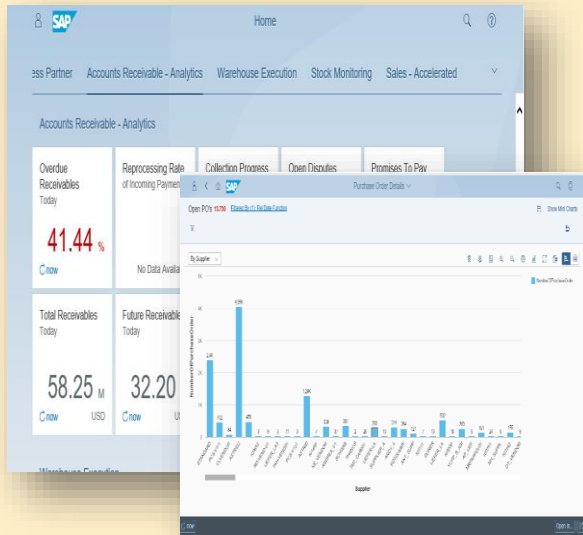
Embedded into business processes:

- Role-based access to analytical artifacts,
- Using intent-based navigation and thus
- Implementing an insight-to-action working style



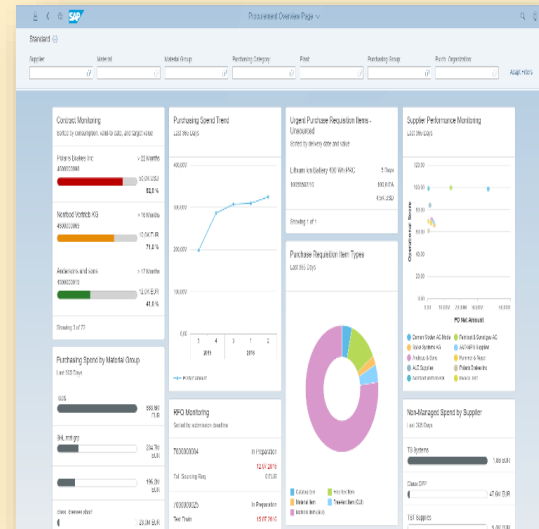
Embedded Analytics Overview for Business User

Smart Business KPIs



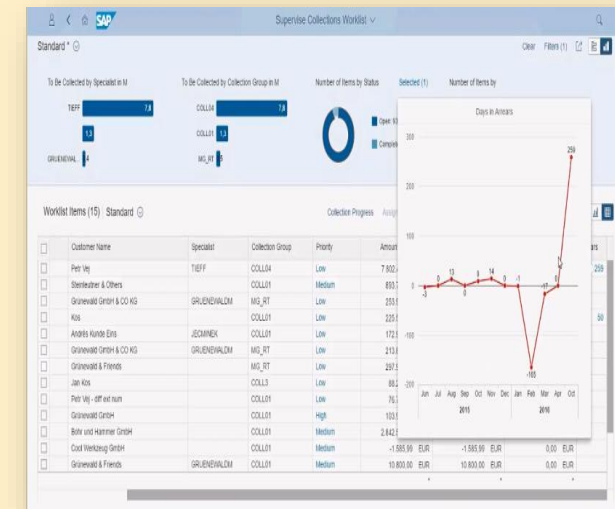
Smart Business KPIs deliver KPI monitoring on the Fiori Launchpad and drill-down capabilities into further analytical or transactional Fiori apps, save personal variants.

Overview Pages



Get a consolidated view on a certain domain, e.g. Purchasing. Information presented in analytical tables and charts, take action in the same place or navigate to more details, save personal variants.

Analytical List Pages



Generic approach to visualize and analyze data. Switch display from table to chart or a combined table-chart-display. Take action directly in the same app or navigate to other appworklists for more details and actions, save personal variants.

Business User – Analysis with Multi-dimensional reports

Multi-dimensional reports

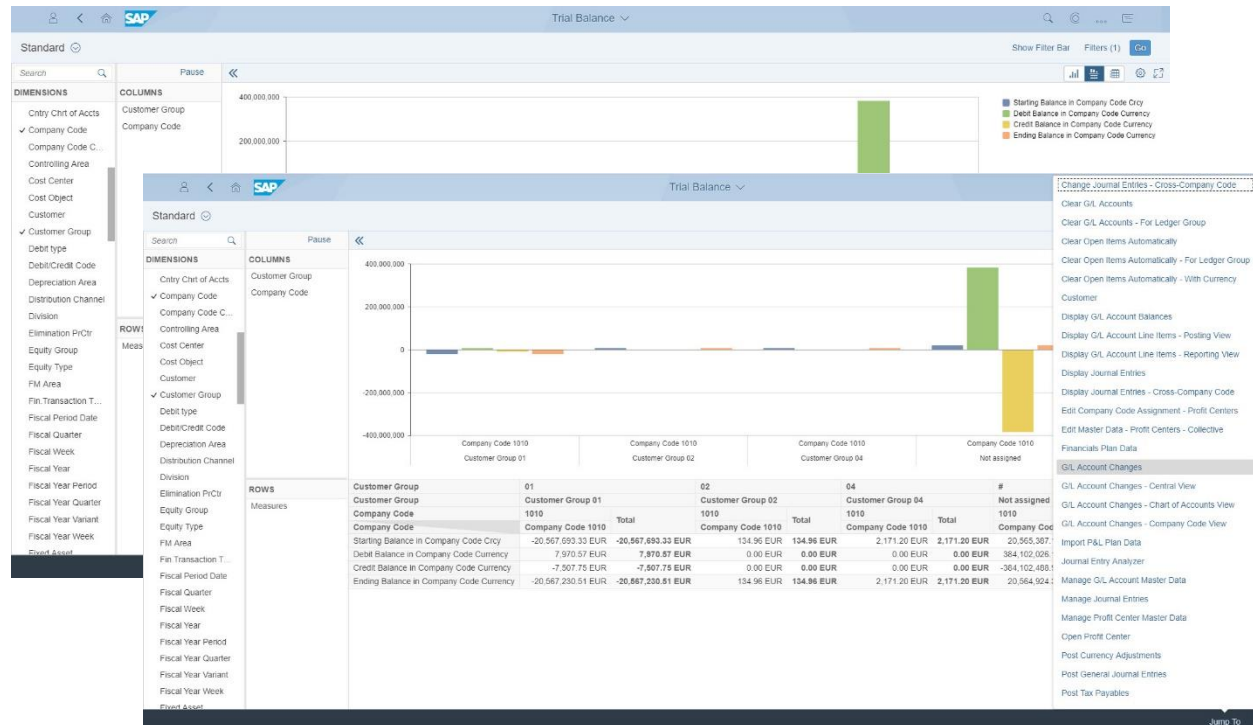
SAP Smart Business KPIs / APF

Analytical List Page

Overview Pages

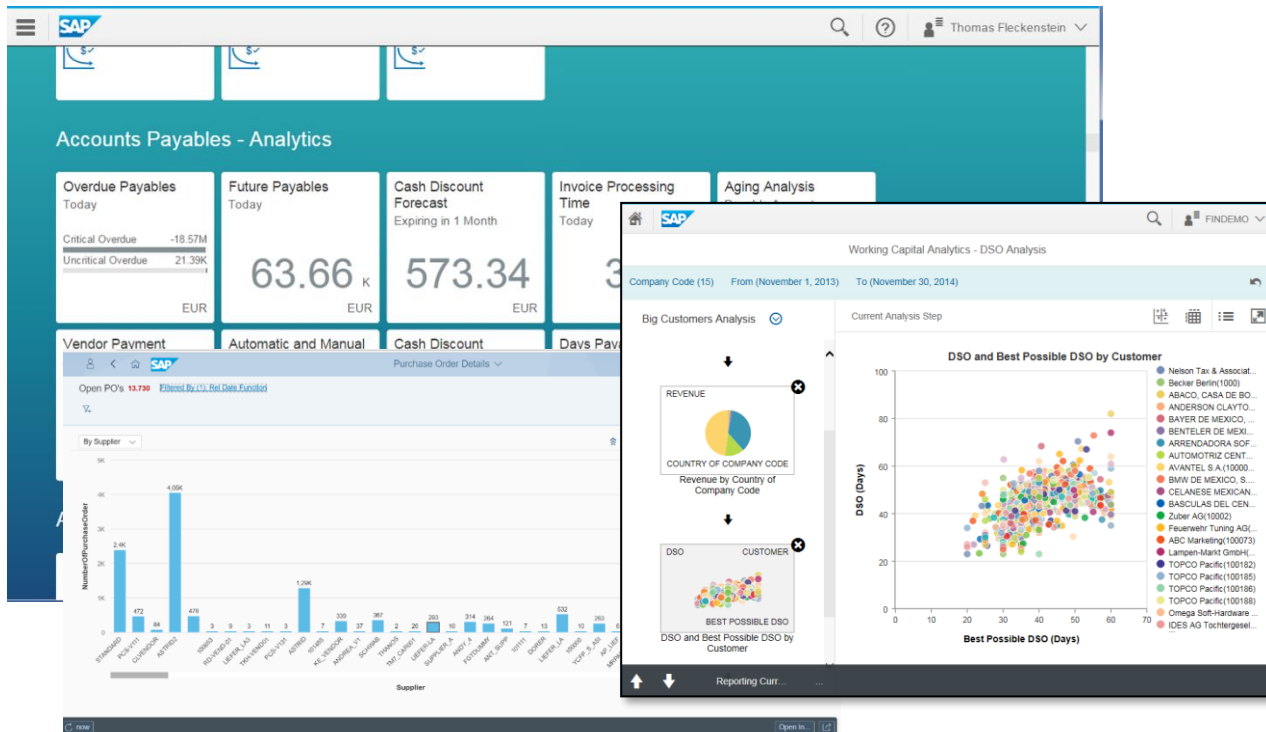
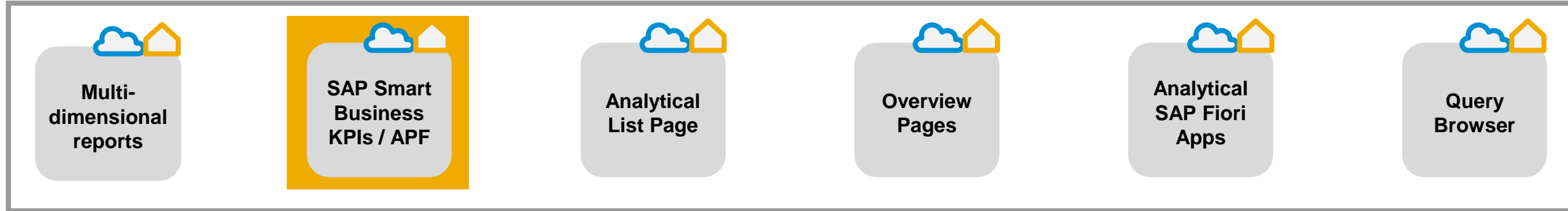
Analytical SAP Fiori Apps

Query Browser



- Slice and dice, sort, filter
- Drill down, drill across
- Swap rows and columns
- Display chart and table
- Personalized views
- Navigate to other Fiori Apps

Smart Business KPIs



- KPI-tiles on the Fiori Launchpad providing quantitative information
- KPI-Details with various drill-downs by selected dimensions.
- Personalization and “Save as tile” of the KPI-Details
- Instead of KPI-Details (default), navigation from the KPI-tile to an **Analysis Framework Path** or to any other Fiori App can be configured
- Modification-free adaptation of pre-defined KPIs

Analytical List Pages

Multi-dimensional reports

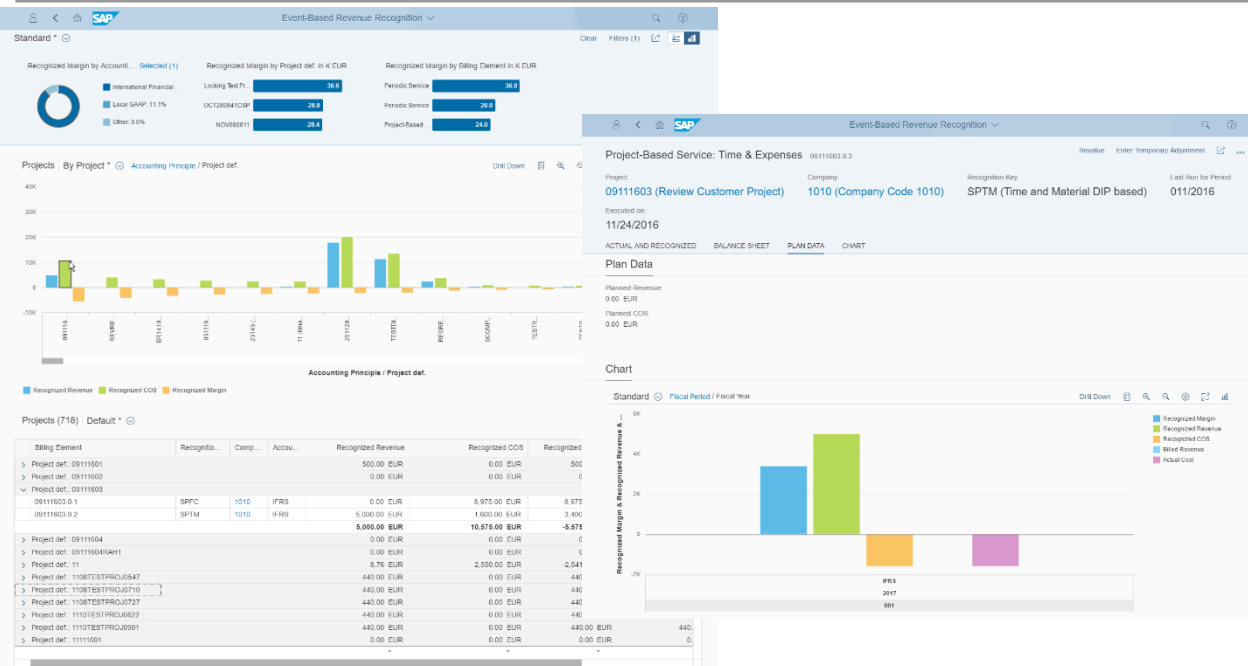
SAP Smart Business KPIs / APF

Analytical List Page

Overview Pages

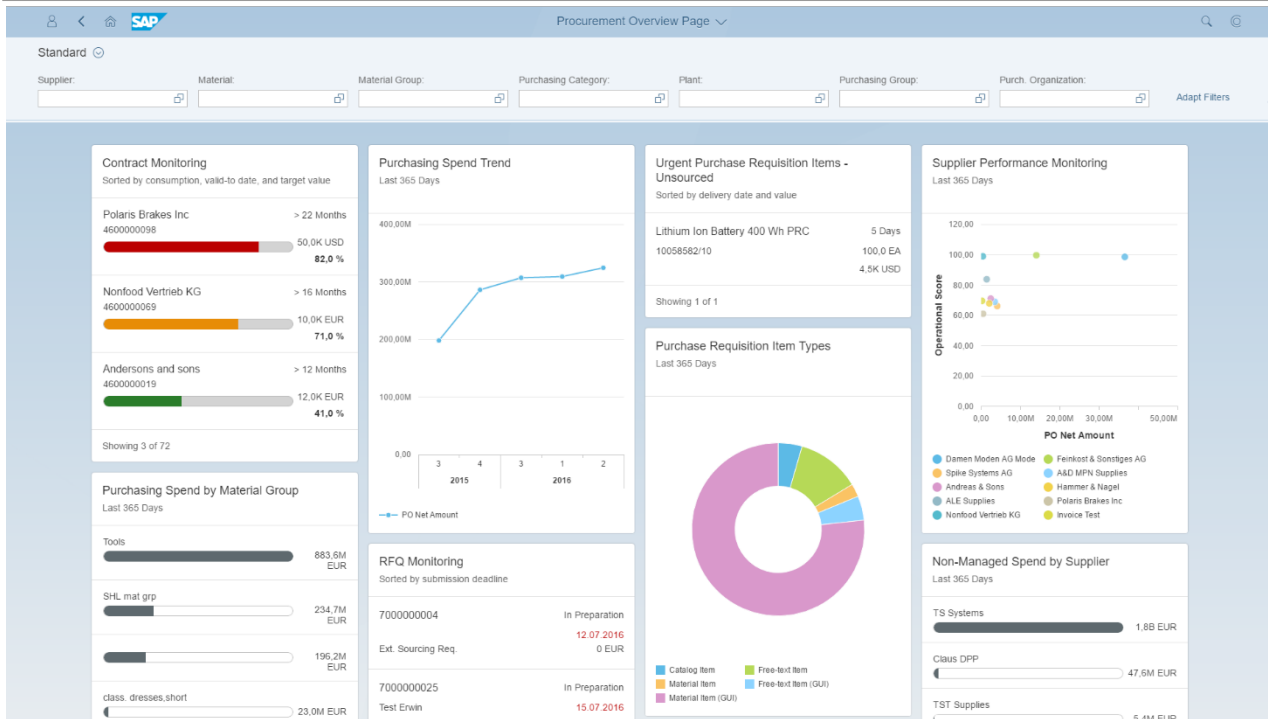
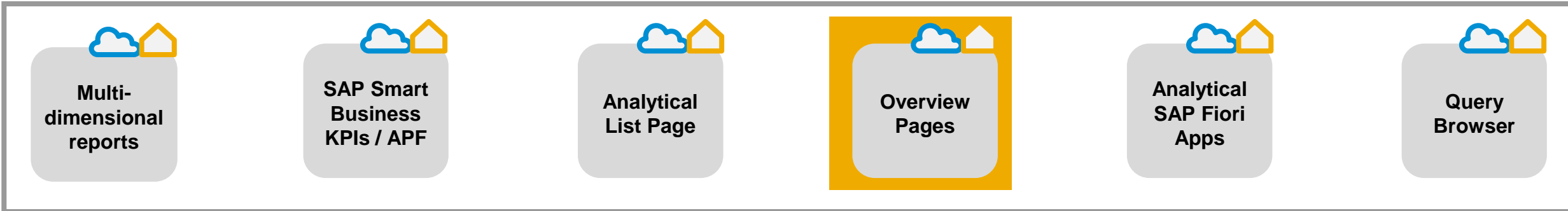
Analytical SAP Fiori Apps

Query Browser



- Visual filters to focus on the most important areas
- User switch between complex, visual, facet filter
- Chart area for quick overview and drill down, charts personalizable
- Details area for operational details
- Navigation to other Fiori apps that are semantically linked to the data
- Personalized views
- Ideal for insight-to-action scenarios

Overview Pages



- Most important information at a glance (instead of opening many different transactions)
- Combination of analytical and transactional information (*different type of "Cards"*)
- More detailed information can be found with one click
- Entire page can be fully personalized
- Navigation to other Fiori apps that are semantically linked to the data

Analytical Fiori apps



Multi-dimensional reports



SAP Smart Business KPIs / APF



Analytical List Page



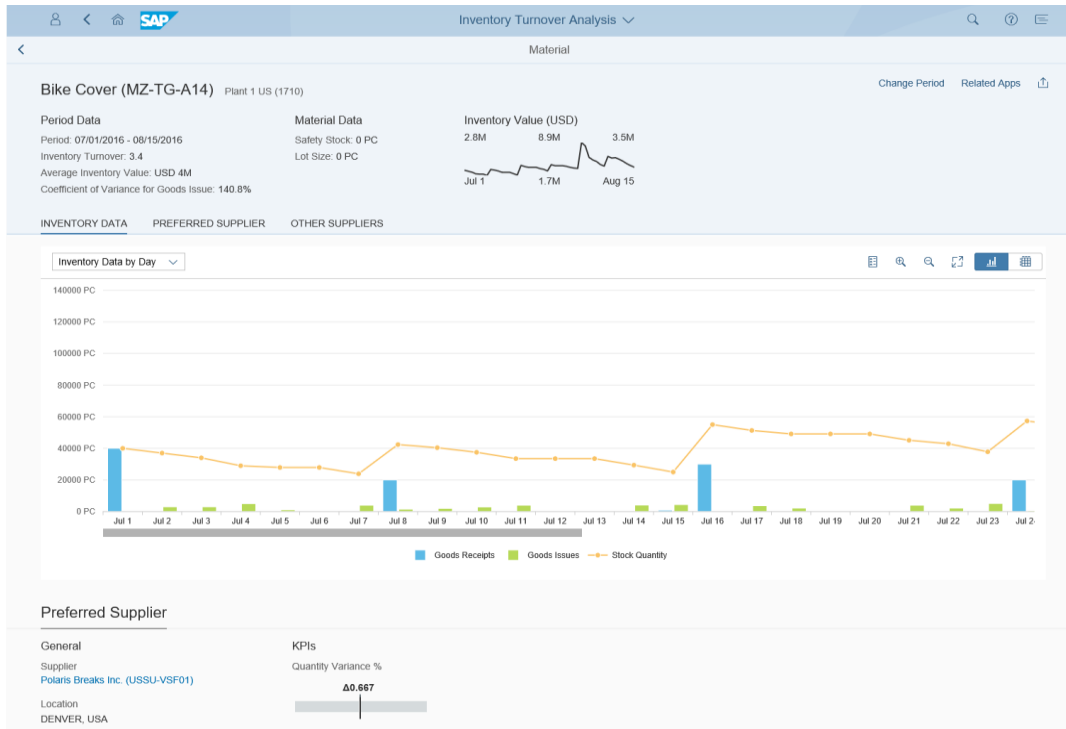
Overview Pages



Analytical SAP Fiori Apps



Query Browser



- Implemented for **highly specific use cases**
- Using Fiori floorplans and UI5 controls
- Details of the functionality depending on the use case

Query Browser

Multi-dimensional reports

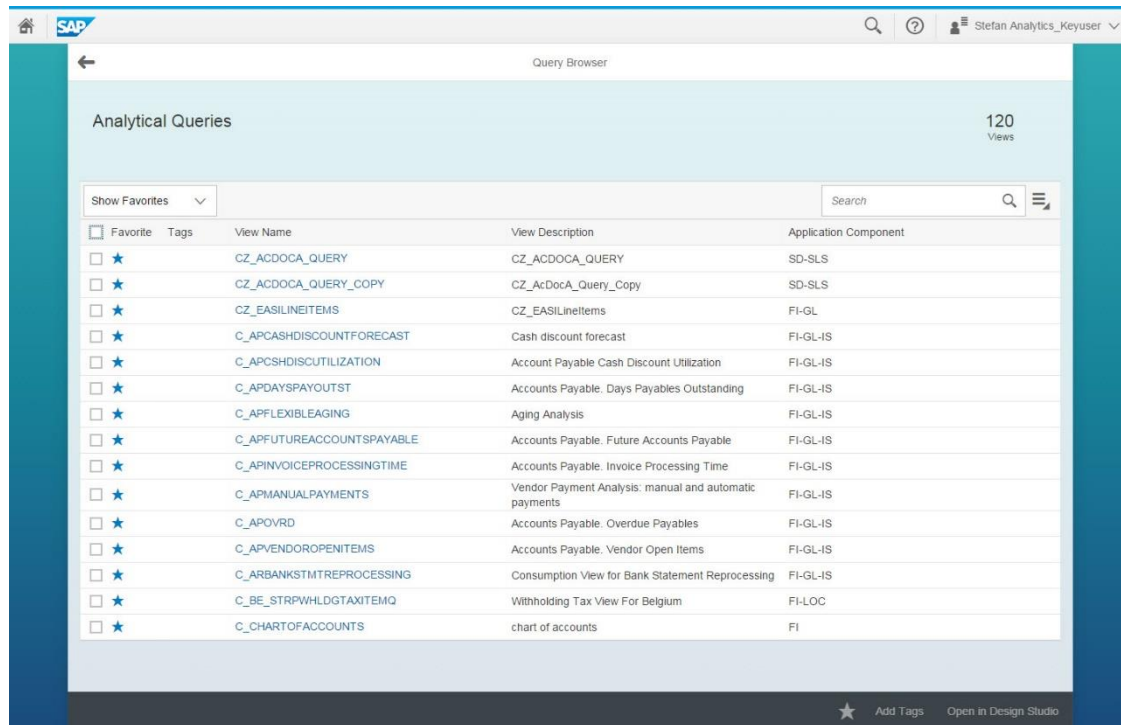
SAP Smart Business KPIs / APF

Analytical List Page

Overview Pages

Analytical SAP Fiori Apps

Query Browser



The screenshot shows the SAP Query Browser interface. At the top, there is a search bar and a user profile icon for 'Stefan Analytics_Keyuser'. Below the search bar, the title 'Analytical Queries' is displayed with '120 Views' on the right. A 'Show Favorites' dropdown menu is visible. The main content is a table with columns for 'Favorite', 'Tags', 'View Name', 'View Description', and 'Application Component'. The table lists various queries, many of which are marked as favorites with a star icon.

Favorite	Tags	View Name	View Description	Application Component
<input type="checkbox"/>	★	CZ_ACDOCA_QUERY	CZ_ACDOCA_QUERY	SD-SLS
<input type="checkbox"/>	★	CZ_ACDOCA_QUERY_COPY	CZ_AcDocA_Query_Copy	SD-SLS
<input type="checkbox"/>	★	CZ_EASILINEITEMS	CZ_EASILineItems	FI-GL
<input type="checkbox"/>	★	C_APCASHDISCOUNTFORECAST	Cash discount forecast	FI-GL-IS
<input type="checkbox"/>	★	C_APCSHDISCUTILIZATION	Account Payable Cash Discount Utilization	FI-GL-IS
<input type="checkbox"/>	★	C_APDAYSPAYOUTST	Accounts Payable. Days Payables Outstanding	FI-GL-IS
<input type="checkbox"/>	★	C_APFLEXIBLEAGING	Aging Analysis	FI-GL-IS
<input type="checkbox"/>	★	C_APFUTUREACCOUNTSPAYABLE	Accounts Payable. Future Accounts Payable	FI-GL-IS
<input type="checkbox"/>	★	C_APIINVOICEPROCESSINGTIME	Accounts Payable. Invoice Processing Time	FI-GL-IS
<input type="checkbox"/>	★	C_APIMANUALPAYMENTS	Vendor Payment Analysis: manual and automatic payments	FI-GL-IS
<input type="checkbox"/>	★	C_APOVRD	Accounts Payable. Overdue Payables	FI-GL-IS
<input type="checkbox"/>	★	C_APIVENDOROPENITEMS	Accounts Payable. Vendor Open Items	FI-GL-IS
<input type="checkbox"/>	★	C_ARBANKSTMTREPROCESSING	Consumption View for Bank Statement Reprocessing	FI-GL-IS
<input type="checkbox"/>	★	C_BE_STRPWHLDGTAXITEMQ	Withholding Tax View For Belgium	FI-LOC
<input type="checkbox"/>	★	C_CHARTOFACCOUNTS	chart of accounts	FI

- Lists the analytical queries assigned to the roles of the current user
- Tag queries, flag as favorite
- In-App Search
- Queries are launched in the multidimensional reporting client

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Demo - 1

SAP Home ▾

My Home User Management Analytics for Accounts Payable Query Design Identity and Access Management My Enterprise Search Periodic Activities for Acc > ▾

Sales Order Items
Confirmed as Reque...

52/2021	100%
51/2021	99.7%
50/2021	99.7%

🔄 15 min. ago

Spend Variance
Since the beginning ...

29.5 %

🔄 15 min. ago

Cost Centers
Plan/Actual

Incoming Sales Orders
Flexible Analysis

Goods Movement Analysis

Sales Volume Flexible Analysis

Sales Order Fulfillment
Analyze and Resolve...

Delivery Issue i...	10,89K
Shipping Issue in ...	1,9K
Unconfirmed Qu...	1,73K

🔄 20 min. ago

Monitor Settlement Documents

Treasury Executive Dashboard

Purchasing Spend Dashboard

Dispute Management...
Open Today

994

🔄 20 min. ago USD

Aging Report for Accounts Payable

Customer Returns Overview

My Sales Overview

Sales Management Overview
Track Execution

Inventory KPI Analysis

Sales Volume Detailed Analysis

2024	1,30M USD
2023	1,43M USD
2022	939,89K USD

Group Financial Statements

Manage KPIs and Reports

Maintain Business Users

Maintain Business Users

Custom CDS Views

Order to Cash Dashboard

Aging Report for Accounts Payable
Company 1010

Demo - 2

BestRun Home ▾

My Home Sales Orders Sales Quotations Sales Analytics End to End Logistics Product Master Stock Monitoring Product Allocation Sales Planning > ▾

My Sales Overview

Sales Management Overview
Track Execution

Sales Order Fulfillment
Analyze Issue - exclu...

Domestic US Cust...	468
Rock On Bikes	138
Ameo Corp	66

Sales Order Fulfillment
Sales Order Fulfillme...

Domestic US Cust...	468
Domestic US Cust...	5

Delivery Performance
Delivered as Reques...

05/2022	93.7%
04/2022	96.8%
03/2022	91.2%

[now](#)

Manage Billing Documents

My Sales Overview

Test Billing Document Request API

Manage Customer Materials

Set Material Prices Sales

Create Billing Documents

\$ 1,92^k

Billing Due List Items

Track Sales Orders

Manage Teams and Responsibilities

Manage Credit Memo Requests

261

Manage Sales Inquiries

8

Manage Customer Returns

679

Create Purchase Requisition

Release for Delivery

7

Unprepared Materials

Manage Sales Contracts

11

Track Sales Orders

Manage Credit Cases

Manage Customer Returns

679

Schedule Sales Document Output

Inventory Turnover Analysis

Demo - 3

SAP Manage Purchase Requisitions

Standard* Save as Title

Plant: Purchasing Group: Purchasing Organization: Product Group: Processing Status: Not edited

Item Delivery Date: Start Date: End Date: Release Date: Requisition Date: Delivery Date:

Adapt Filters (1) Go

Purchase Requisitions (1,667) Create Contract Create RFQ Create Purchase Order

Item	Material	Product Group	Quantity	Purchase Order Quantity	Total Value	Assigned Supplier	Delivery Date	Plant	Processing Status
<input type="checkbox"/> 10006223/50	A200 Bike Chain & Sprocket set (MZ-TG-A200)	Bike Consumables ZBIKE_CON	10 EA	0 EA	400.00 USD	Startech Corporation (USSU9020) (Out of 2 Sources)	Jan 26, 2021	Plant 1 US 1710	Not edited
<input type="checkbox"/> 10000815/10	Apple iPhone 6 - 64GB (MZ-PROC-IT-IP-0032)	Information Technolo 43000000	1 PC	0 PC	390.00 USD	Digistar (USSU9010) (Out of 1 Sources)	Mar 24, 2018	Plant 1 US 1710	Not edited
<input type="checkbox"/> 10005698/10	Apple iPhone 11 (64GB)	Expenses P002	1 EA	0 EA	498.00 USD	Digistar (USSU9010) (Out of 0 Sources)	Oct 19, 2020	Plant 1 US 1710	Not edited
<input type="checkbox"/> 10005940/10	Apple iPhone 11 (64GB)	Information Technolo 43000000	1 EA	0 EA	498.00 USD	Digistar (USSU9010) (Out of 0 Sources)	Dec 21, 2020	Plant 1 US 1710	Not edited
<input type="checkbox"/> 10005944/10	Apple iPhone 11 (64GB)	Information Technolo 43000000	1 EA	0 EA	498.00 USD	Digistar (USSU9010) (Out of 0 Sources)	Dec 21, 2020	Plant 1 US 1710	Not edited
<input type="checkbox"/> 10006223/10	A200 Bike Chain & Sprocket set (MZ-TG-A200)	Bike Consumables ZBIKE_CON	10 EA	0 EA	400.00 USD	Digistar (USSU9010) (Out of 2 Sources)	Jan 26, 2021	Plant 1 US 1710	Not edited

Demo - 4

Supervise Collections Worklist

Standard

Clear Filters

To Be Collected by Specialist in M EUR

GRUENEWALD 3,5

STEINLEITNER 1,1

To Be Collected by Collection Group in M EUR

TOOL_EUR 3,6

MG_RT 1

TOOL_US 0,0

Number of Items by Status

Open: 82,8%

Completed: 17,2%

Number of Items by Collection Specialist Assi...

Assigned: 79,3%

Not Assigned: 20,7%

Worklist Items (29) Standard

Collection Progress Assign to Specialist Remove Assignment

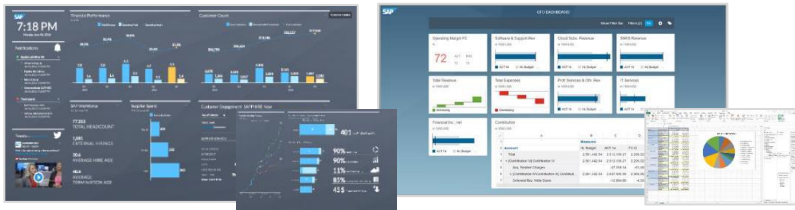
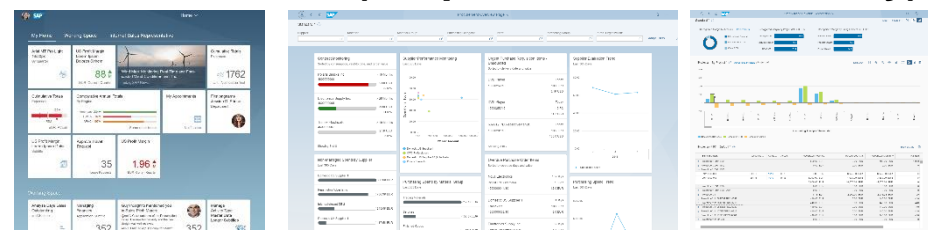
Status	Customer	Customer Name	Specialist	Collection Group	Priority	Amount Outstanding	Amount Overdue	Amount To Be Collected	Arrears
Open	C0001	Bohr und Hammer GmbH Tools		TOOL_EUR	Low	4.139.869,74 EUR	4.139.869,74 EUR	3.021.757,35 EUR	92
Open	C0002	Cool Werkzeug GmbH		TOOL_EUR	Medium	890.044,67 EUR	890.044,67 EUR	160.000,00 EUR	0
Open	C0018	SecureHome PLC		TOOL_EUR	Medium	114.128,91 EUR	114.128,91 EUR	121.359,35 EUR	9
Open	MG002	Grünewald AG	GRUENEWALDM	MG_RT	Low	100.000,00 EUR	100.000,00 EUR	100.000,00 EUR	
Open	C0003	Buff and Sand PLC		TOOL_EUR	Low	73.400,17 EUR	73.400,17 EUR	73.003,00 EUR	0
Open	C0015	Mark and Sons PLC		TOOL_EUR	Low	46.516,56 EUR	46.516,56 EUR	46.516,56 EUR	11
Completed	C0007	Vaciador S.L.	STEINLEITNER	TOOL_EUR	Low	46.242,53 EUR	46.242,53 EUR	40.953,00 EUR	-1
Open	C0017	Hip Tools PLC		TOOL_EUR	Low	40.796,00 EUR	40.796,00 EUR	40.796,00 EUR	-7
Open	MG004	Grünewald & Friends	GRUENEWALDM	MG_RT	Low	28.999,00 EUR	28.999,00 EUR	28.999,00 EUR	
Open	C0011	Sir Emi Tools	DEMO_AR	TOOL_EUR	Low	23.450,83 EUR	23.450,83 EUR	23.318,12 EUR	666
Completed	C0006	Cutters And More PLC	STEINLEITNER	TOOL_EUR	Medium	166.920,37 EUR	166.920,37 EUR	20.857,47 EUR	-9
Open	C0012	Sanderson's Sanders	DEMO_AR	TOOL_EUR	Low	15.779,40 EUR	15.779,40 EUR	15.779,40 EUR	7
Open	MG003	Grünewald GmbH	GRUENEWALDM	MG_RT	Low	15.000,00 EUR	15.000,00 EUR	15.000,00 EUR	
Open	7	ZZZ ZHANG	XIACU	TOOL_EUR	Low	9.500,00 EUR	9.500,00 EUR	9.500,00 EUR	
Open	C0008	教官 有限	XIACU	TOOL_EUR	Low	20.003,95 EUR	20.003,95 EUR	8.729,56 EUR	-2
Open	C0001	Bohr und Hammer GmbH Tools	DEMO_AR	TOOL_US	Medium	7.267,67 EUR	7.267,67 EUR	7.267,67 EUR	
Open	C0014	Masako and Sons	GRUENEWALDM	TOOL_EUR	Low	6.126,12 EUR	6.126,12 EUR	6.126,12 EUR	11
Completed	C0016	Andersons and Sons	DEMO_AR	TOOL_EUR	Low	3.587,40 EUR	3.587,40 EUR	3.587,40 EUR	26
Open	C0009	Drills For All	TIEFF	COLL01	Low	11.975,59 EUR	11.975,59 EUR	1.726,71 EUR	
Completed	C0021	Восточная Торговая Компания	STEINLEITNER	TOOL_EUR	Low	1.356,60 EUR	1.356,60 EUR	1.356,60 EUR	9
Open	C0025	Tools Inc. South America	DEMO_AR	TOOL_EUR	Low	1.166,20 EUR	1.166,20 EUR	1.166,20 EUR	29
Completed	C0020	Laura's Tool Shop PLC	STEINLEITNER	TOOL_EUR	Low	2.632,00 EUR	2.632,00 EUR	1.000,00 EUR	-9
Open	C0013	Hong Kong's Finest Grinders	DEMO_AR	TOOL_EUR	Low	6.619,80 EUR	6.619,80 EUR	842,52 EUR	25
Open	C0019	Carmen's Cutting Tools PLC	DEMO_AR	TOOL_EUR	Low	521,96 EUR	521,96 EUR	521,96 EUR	2
Open	C0004	Grind and Twist PLC	DEMO_AR	TOOL_EUR	Low	46.182,43 EUR	46.182,43 EUR	0,00 EUR	39
						5.946.802,64 EUR	5.946.802,64 EUR	3.750.163,99 EUR	

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High Level Architecture

SAP S/4HANA (scope of standard delivery)



Visualization

SAP Fiori UI
analytical apps, reports, KPIs,... delivered as part of SAP S/4HANA, extensible by the customer

SAP Analytics products
can access SAP S/4HANA data directly via the available transient analytical queries
For SAP S/4HANA Cloud:
SAP Analytics Cloud

For SAP S/4HANA on prem:
SAP Lumira, Analysis Office, Design Studio,...

Access

Odata services **Transient analytical queries**

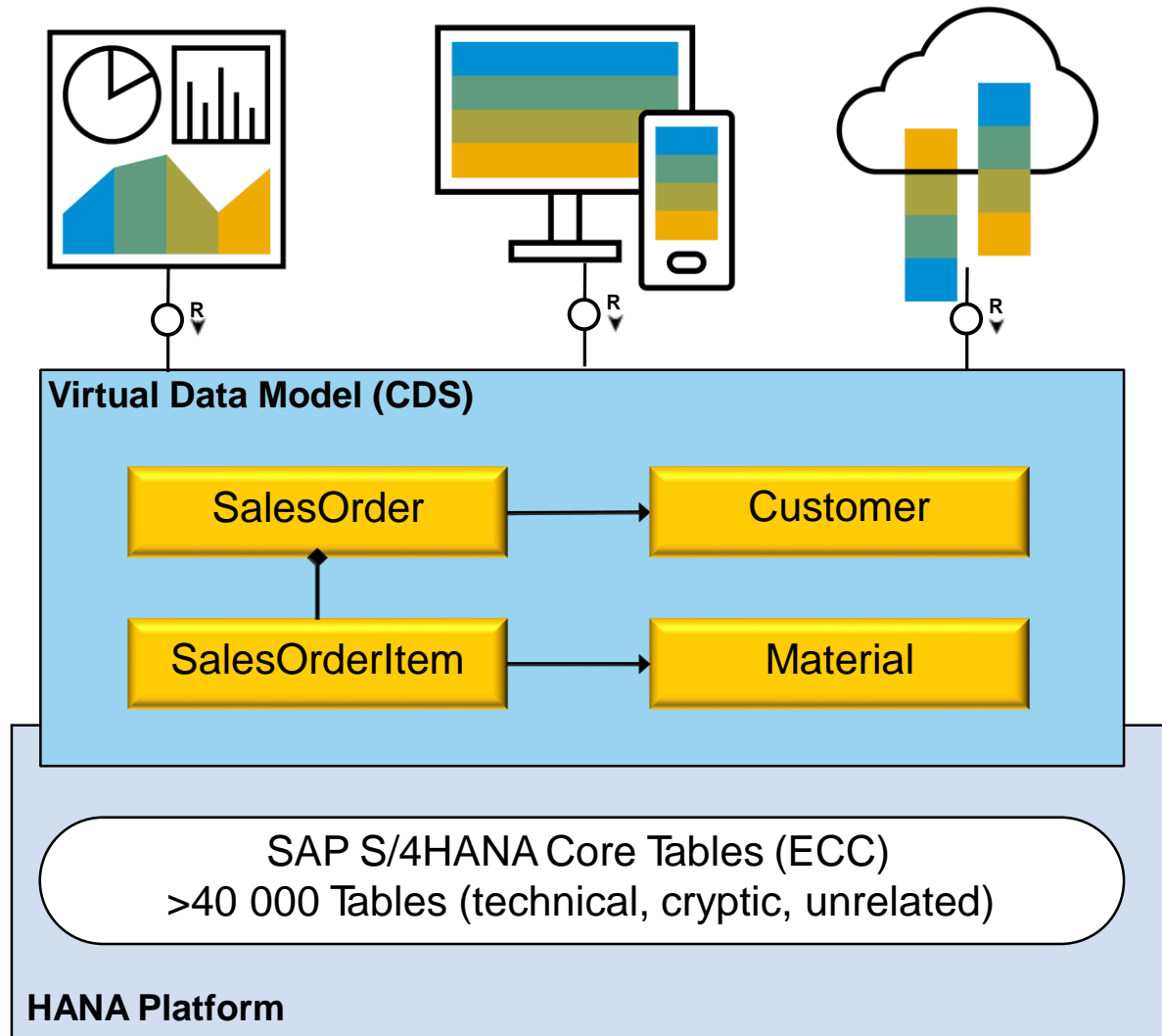
Modelling

View-Models
(for analytical and transactional purposes)

Persistency

Database tables on SAP HANA

The Virtual Data Model (VDM) as the foundation for Embedded Analytics



Customers and Partners can develop on released VDM views

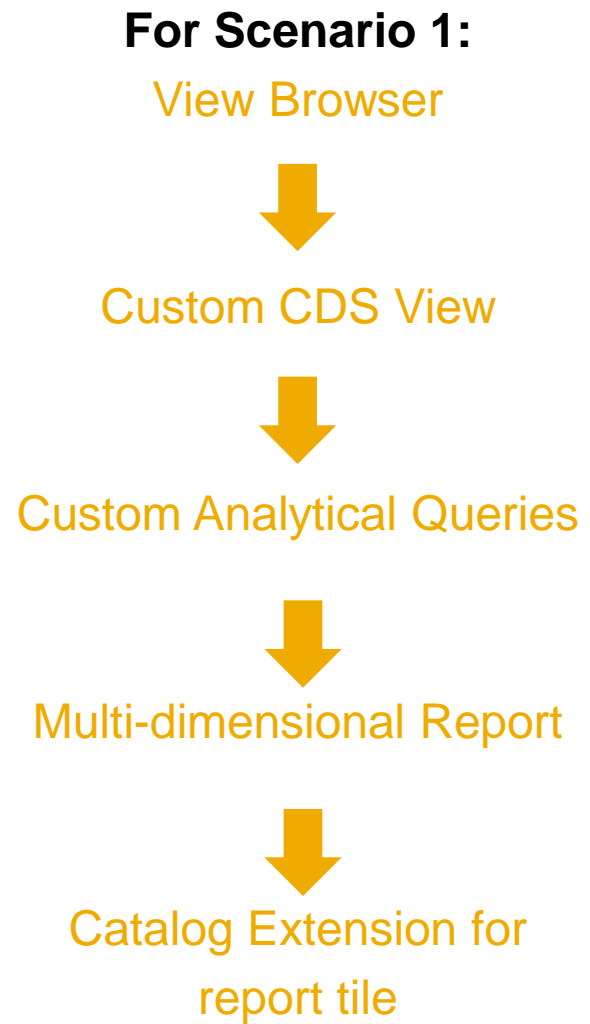
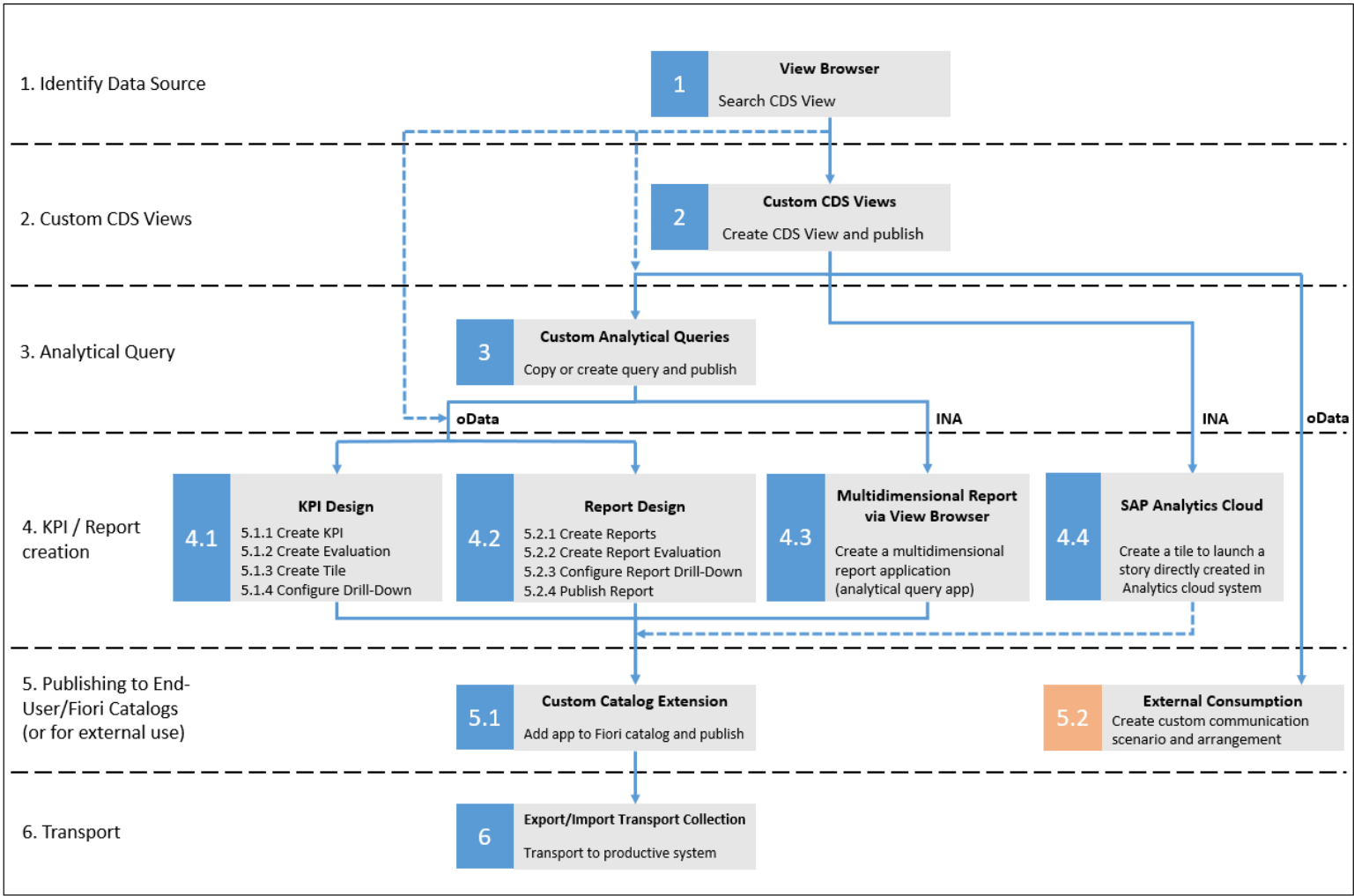
VDM is the data model and source for all types of applications

- ✦ Transactional
- ✦ Analytical
- ✦ External interfaces

VDM is a set of views on SAP S/4HANA application data

- ✦ Business-oriented
- ✦ Understandable & semantically rich
- ✦ Reusable & stable
- ✦ Executed on SAP HANA
- ✦ **Implemented as ABAP CDS views (core data services)**

Extension & adaptation via CDS views



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Key Takeaways

- In the traditional world of reporting & analytics, these were two separate activities & often times occurring in separate systems
- S/4HANA Embedded Analytics brings the two worlds together by providing users a convenient means to run their operational analytics in real-time in their source S/4HANA system
- Embedded Analytics is designed to be run as Fiori apps & therefore is easy & convenient for the business user to run both planned and ad-hoc analytics
- Embedded Analytics has a strong technological foundation and the Virtual Data Model provides users with indirect access to S/4HANA tables
- Although SAP provides considerable content out-of-the-box, you can easily extend underlying 'CDS views' to meet your custom reporting/analytics needs

Thank you.

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