

2019

An Introduction to SAP CAR



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SAP CAR - What exactly is it?

You might be wondering if SAP have gone mad and ventured into the motor industry in a bid to put Tesla in their place? Fortunately for the retail industry, SAP is continuing to develop innovative retail solutions to deal with the ever-changing behaviours of customers and the need for real-time insight to support decision making throughout the entire supply chain.

One of SAP's biggest innovations to date is the introduction of the Customer Activity Repository or CAR for short. Taking advantage of SAP HANA's in-memory computing it's capable of providing real-time inventory visibility, POS data transfer, sales analytics and demand forecasting in real time.

SAP CAR is the foundation that collects transactional data that was previously spread over multiple independent applications. The repository facilitates a common foundation and a harmonized multi-channel transaction data model for all consuming applications. As a result, this provides businesses with one version of the truth and supports aligned decision making based on the same set of data.

At a glance it;

- Collects multichannel customer and POS data;
 - Multichannel sales repository (MCSR) – The MCSR is the basis for multichannel transaction and inventory visibility analysis. It helps to define order channels such as retail stores, call centres, and online stores.
 - POS Data Transfer and Audit (POSDTA) – An extended version of SAP's software component for point-of-sale data management (POSDM).
- Accurately forecasts demand to optimise processes, decisions, and the shopper experience
- Creates more effective promotions and product assortments – and use customer insights to personalise marketing
- Improves customer satisfaction with a real-time view of inventory, including on-shelf availability and omnichannel article availability
- Minimises data replication and simplify your IT landscape with a single, unified data repository

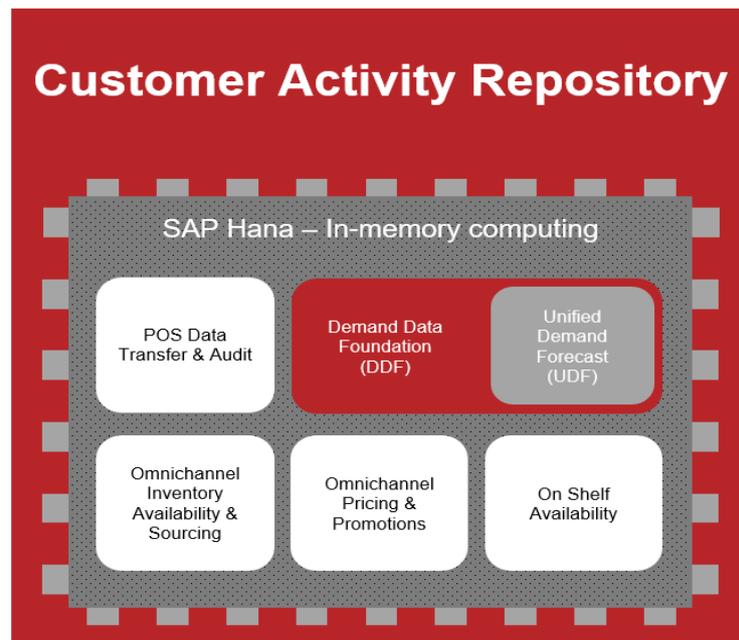
This powerful data platform prepares cross-channel data by collating, cleansing, and centralising your customer and point-of-sale (POS) data in real time for analysis and prepares it for consumption by other applications. Accelerate retail analytics and planning, improve demand forecasting, maximise promotion and assortment effectiveness, and more.

To summarise, it's a repository for storing and analysing data in real-time and prepares this for sharing with other consuming applications and external systems.

SAP CAR – The basic components

Let's continue with an overview of the basic components.

First and foremost, as a pre-requisite, you must have an instance of SAP HANA installed, SAP's new in-memory database solution. The reason for this is CAR utilises the HANA platform to provide the real-time analytics and data processing etc. The below breaks down each component within CAR;



Utilising the SAP HANA platform, we have the following components;

Demand Data Foundation (DDF)

- DDF is a reusable data layer in SAP Customer Activity Repository that supports the planning, analysis, and forecasting required by different retail business processes. DDF acts as a liaison between the consuming applications installed on top of SAP Customer Activity Repository and the modules within the repository that provide the analysis and forecasting services.
- DDF includes, for example, a data model, data import infrastructure, reuse frameworks (such as the process controller), as well as reuse tools and user interfaces for data maintenance.
- DDF supports the mass maintenance of data and stores master data. It handles the creation, import, and export of data to and from external master data systems (such as SAP ERP). It also manages the exceptions for the consuming applications.
- Additionally, DDF supports Unified Demand Forecast. UDF is the module in SAP Customer Activity Repository that provides the demand modelling and demand forecasting services.

Unified Demand Forecasting (UDF)

- Unified Demand Forecast (UDF) is a module in SAP Customer Activity Repository and provides demand modelling and demand forecasting services for SAP for Retail applications driven by demand prediction. UDF also provides insight into shopper behaviour, enabling retailers to perform predictive analytics on customer demand.
- For input, UDF uses near-real-time information about multichannel customer transactions collected in SAP Customer Activity Repository. UDF can also use historical demand data from different time series (such as consumption data, point-of-sale data, or sales orders). Taking advantage of SAP HANA capabilities, UDF provides a unified prediction of future daily demands.
- For output, UDF generates a daily demand value plus an accompanying decomposition of demand by demand influencing factors (such as baseline demand and promotional uplifts). The demand forecasts can then serve as the basis for various cross-industry planning use cases.

Point of Sale Data Transfer & Audit (POSDTA)

- You can use this functionality to manage point-of-sale (POS) transactions. During the processing, cash register sales data from individual stores is transmitted (typically using trickle feed) to SAP Customer Activity Repository. System administrators are then able to monitor and troubleshoot the inbound queues.
- After the transactional data is received, you can process, cleanse and audit the data.
- You can also use outbound tasks of SAP Customer Activity Repository to send the processed transactional data to follow-on applications. Alternatively, you can store transactional data in the repository. Any consuming applications can access the stored data in near-real-time through SAP HANA views provided in the SAP HANA content for SAP Customer Activity Repository.

Omni-Channel Article Availability (OAA)

- Part of SAP CAR and provides a homogenised view of article availability across all channels or 'silos', app, web, bricks-and-mortar etc. As part of this, it provides facilities for Rough Stock Indicators (RSI), Inventory Visibility and Availability.
- The new Omnichannel Article Availability and Sourcing (OAA) solution is based on a new common cross-channel availability module in SAP CARAB Feature Pack, that consists of different data sources for distribution centres (DC's), stores and vendors:
- Pre-calculated DC stock availability information as ATP stock with time series, determined via a periodical parallel ATP Run in ECC.
- Store inventory (out of CAR, continuously mapped with incoming POS documents).
- Vendor Stock (as of CAR 3.0).

- On various levels (e.g. product hierarchy, merchandise category, article), thresholds for a traffic light availability status can be defined in SAP CAR (using the SAP HANA rules framework) that can be used to populate a rough stock indicator.

Omni-Channel Promotion Pricing (OPP)

- Omnichannel Promotion Pricing (software component RTLDDF) is one of the modules included in SAP Customer Activity Repository.
- OPP contains a central price and promotion repository that stores all the relevant information for the calculation of effective sales prices in all sales and communication channels (points of sale, web, mobile, call centres), for all items in a shopping cart.
- For the calculation of the effective sales prices, OPP provides the promotion pricing service. This promotion pricing service can be deployed locally or centrally:

Local deployment

- With this deployment option, the promotion pricing service runs locally on the database of the corresponding sales channel application. Therefore, regular prices and OPP promotion are replicated from the central price and promotion repository to the database of the sales channel application. In this way, the sales application can work without an additional remote system being continuously available.

Central deployment

- With this deployment option, the promotion pricing service runs on the central price and promotion repository located in SAP Customer Activity Repository powered by SAP HANA extended application services (XS Advanced, XSA).

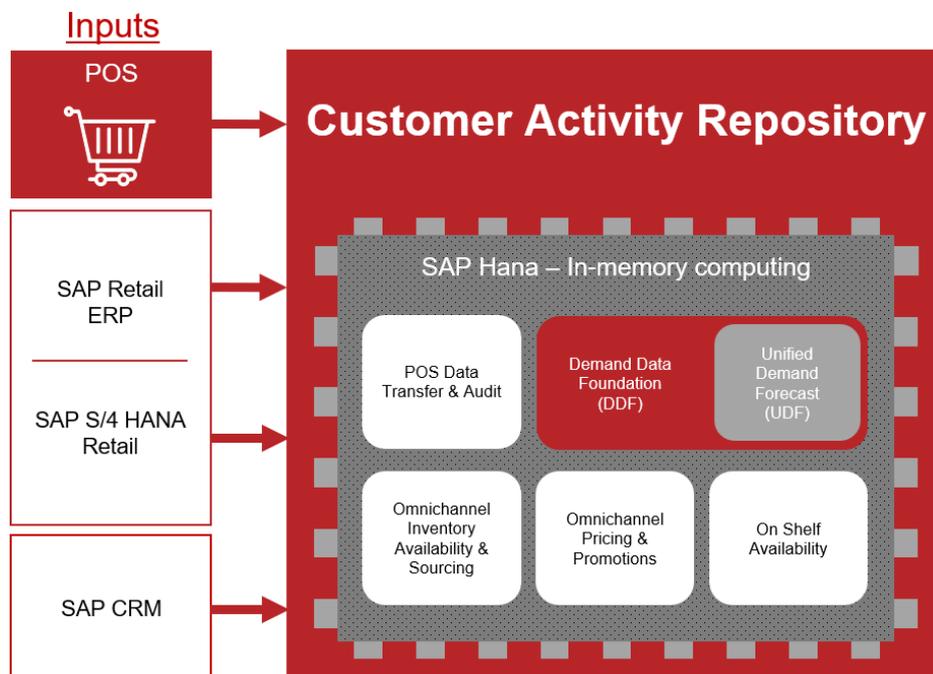
On-Shelf Availability (OSA)

You can use this to perform monitoring or analysis:

- Perform monitoring to retrieve a regularly updated list of product locations that are likely out-of-shelf at a specific point in time in one or more stores. You can use this information to trigger follow-on actions, such as replenishment from the backroom, correction of inventory information, and tidying of the shelf to allow for an unobstructed view of the product.
- Perform analysis to ascertain which product locations had on-shelf availability issues at what times in the past. This makes you aware of the on-shelf availability situation and allows you to define appropriate follow-up activities to improve these situations going forward.
- By detecting product locations that are likely out-of-shelf, using a statistical algorithm based on POS transaction data in SAP Customer Activity Repository, you can determine possible out-of-shelf situations even if you have no separate system inventory for the shelf or the figures are not correct due to spoilage, theft or misplacement.

What inputs are required to enable SAP CAR?

For SAP CAR to perform all its wizardry it must regularly be supplied with both transactional and master data. To achieve this, data is either sent or replicated from various systems at regular intervals throughout the day. The below describes the various inputs;



Point of Sale (POS)

To utilise the advanced processing power and provide up to date information on sales and stock, a regular feed of sales data is required from the store POS systems into POSDTA. Historically this information would be processed as infrequently as once a day providing an ‘end of day’ stock position. However, with sales regularly being sent into POSDTA they can be considered against the current stock within an ERP system before they have been processed. This then provides a real-time stock position.

SAP Retail ERP or SAP S/4 HANA Retail or Third-Party ERP

SAP provides standard integration to SAP CAR from other SAP ERP systems and can also be integrated with third party ERP systems. The relevance of the ERP system is to provide CAR with all the necessary master and inventory data to further support the advanced analytics. Examples of such data are listed below;

- Product and Location Data
- Product and Location Hierarchies
- Pricing
- Promotions
- Source of Supply
- Historical Data
- ...

Data is replicated to CAR iteratively throughout the day using standard SLTs which stands for SAP Landscape Transformation Replication Server (SLT) running on the NetWeaver Platform. SLT is the ideal solution for all HANA customers who need real-time (and non-real-time) data replication sourcing from SAP ERP or non-SAP systems into HANA. By using replication, the master source of the data remains within the ERP system and instead, the data is simply copied to CAR, regularly checking for inconsistencies and automatically correcting these during each replication.

SAP CRM

SAP also provides standard integration to SAP Customer Relationship Management or CRM, from this customer insight data can also be shared with SAP CAR for further advanced analytics on customer behaviours and shopping habits.

What outputs are available to utilise the processed data from CAR?

So, we have a high-level overview of what SAP CAR offers but where does it fit within a typical system landscape and how can I use the information that's being collated and analysed?

There are several standard outputs of the forecast data and these are typically called by the relevant applications using standard Remote Function Calls (RFCs) from the target system. Examples of target applications have been listed below;

Fiori Apps

As part of CAR, SAP provides a list of standard Fiori applications to help visualise and interpret the forecast data calculated by the Unified Demand Forecast (UDF) function module. An example would be the 'Analyse Forecast' application that enables the end user to have a detailed view of the forecast and analyse all the contributing factors that were considered during its creation.

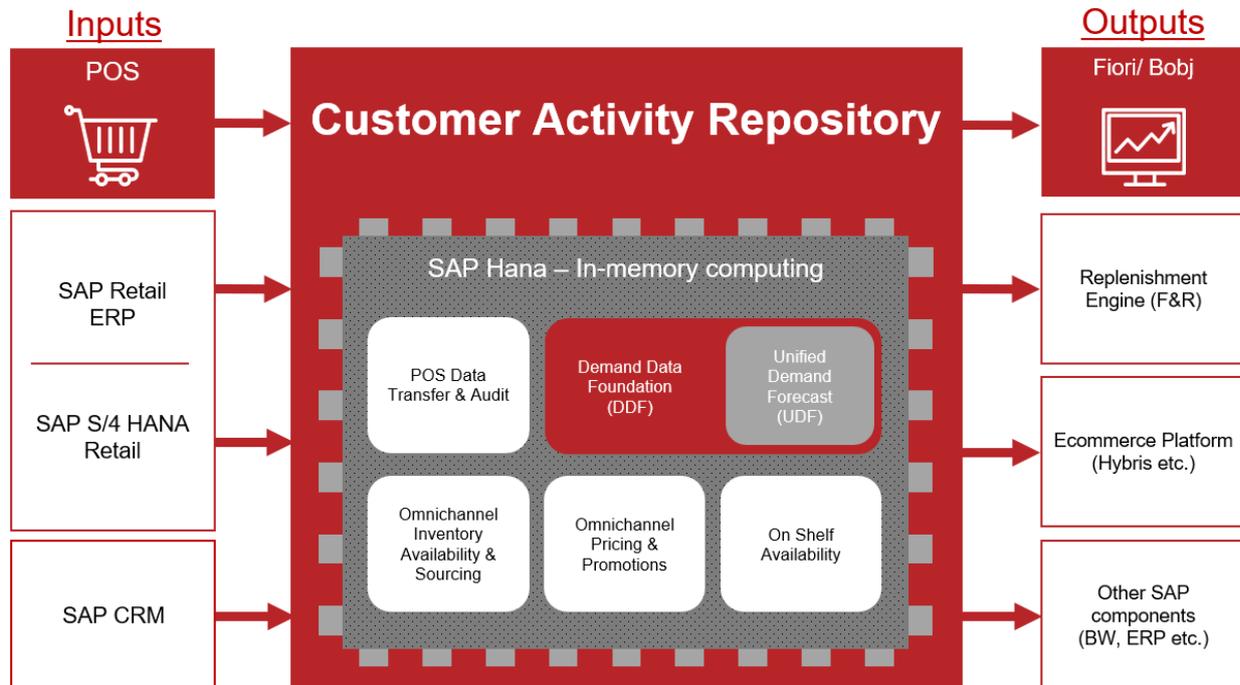
SAP Forecasting & Replenishment

One of the use cases of the UDF forecast is to replace the forecasting solution within SAP F&R through standard integration. The forecast from UDF is pulled into SAP F&R using 'Remote Function Call' or RFC functionality and it's possible to define if the UDF forecast should be called at Article and Site level. This enables F&R to continue functioning without any disruptions to existing processes and merely bases its replenishment calculations on a forecast generated from within UDF. Essentially nothing changes apart from a far more sophisticated and granular forecast, providing forecasts at a daily level as opposed to weekly within the standard F&R forecast.

SAP Hybris Marketing

SAP Hybris is the next generation cloud-based CRM (customer relationship management) suite from SAP. It is a fully digital CRM suite which integrates with SAP ERP. It has omnichannel capabilities and can communicate with customers via all touch points like phone, email, online web shop, in-store etc for a 360-degree customer view. It primarily analyses sales, services and marketing data using advanced analytics capabilities of which address the CRM shortcomings present in traditional CRM

systems. To support this, SAP Hybris Marketing can also call the unified demand forecast from CAR providing a more detailed analysis of sale patterns in relation to customers.



What are the consuming applications of SAP CAR?

To compliment CAR, you are provided with a whole suite of consuming applications that utilise the data within CAR and provide meaningful insight to other functions within the retail space, such as, promotion management or allocations. This helps provide the visibility required to target the strategies that will deliver the greatest benefits.

All the below consuming applications have been developed to utilise UDF and perform ad-hoc iterations of the 'what-if' forecast based on parameters defined within the requesting application. For example, the 'Promotion Management' consuming application provides the ability to execute what-if forecasts on intended promotional activity before promotions are created within the system. For example, before confirming the price reduction for a promotion you can run the proposed pricing mechanic through the what-if forecast to get a view of how this will potentially influence the sales.

The consuming applications are as follows;

Promotion Management (PM)

- Identify offers that will be most profitable based on shopper demand
- Reduce the time required to plan and execute a promotional event
- Create marketing and merchandising offer versions to target specific locations and specific products
- Help retailers to efficiently manage their advertising budget by better understanding the expected financial performance of each offer

Merchandise Planning (MP)

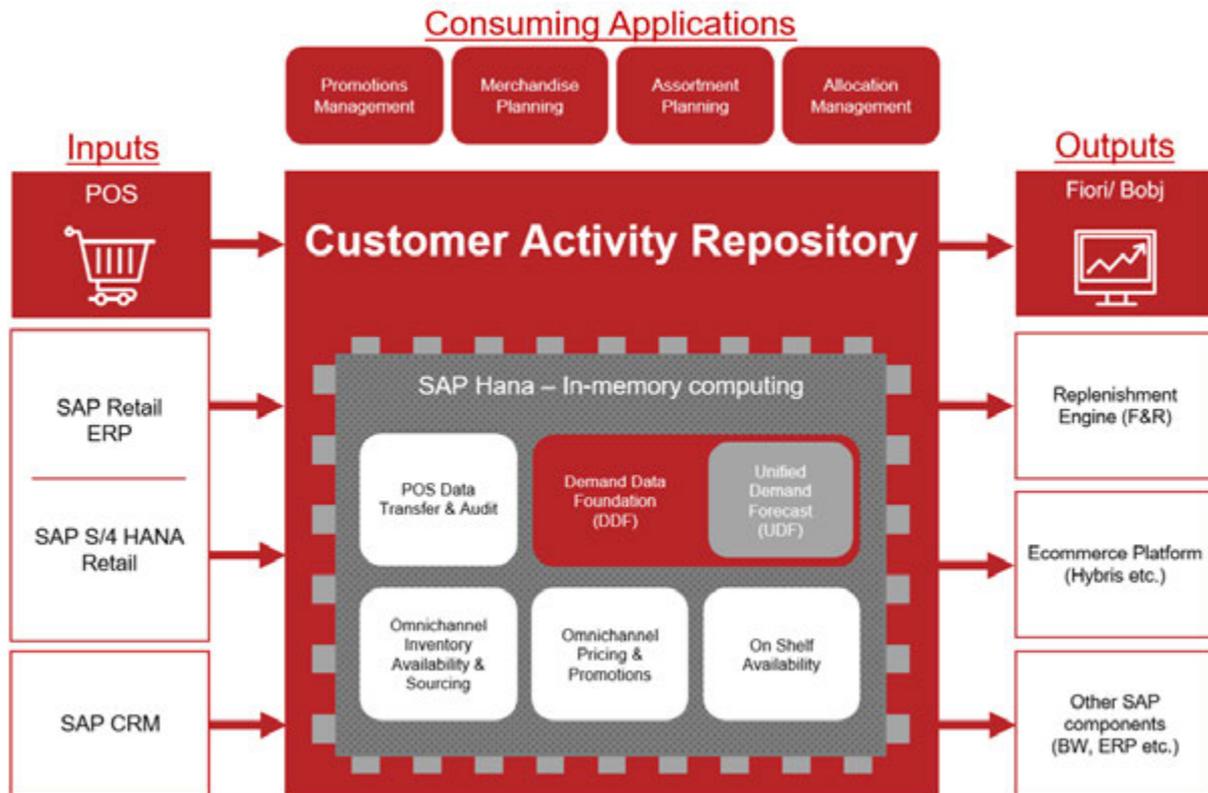
- Using the forecast data from UDF a planner can create a company-wide merchandise plan at all levels of the merchandise hierarchy, for all selling channels, to build a purchasing budget by month and week that is used for Open-To-Buy (OTB) purposes.
- You can develop sales, margin, inventory, and receipt flow for the upcoming fiscal year and seasons at various levels of the merchandise, channel and time hierarchies.

Assortment Planning (AP)

- Model product groups across selling channels to propose assortments by using predictive algorithms.
- Plan sales and purchase quantities by location clusters.
- Provide initial allocation instructions using approved purchase quantities.
- Review proposed product counts by location cluster when developing and assigning products to the assortment plan.

Allocation Management (AM)

- Define the parameters on the level of product groups and either stores or distribution centres to provide business users with system-proposed allocation plans.
- Enhanced functionality allows for automated allocation processes at a level defined by the business.
- Launch new fashion articles for the first time in your retail brick-and-mortar channel based on defined target stocks.
- Facilitate automatic fill-in during seasonal periods.
- Set up the organizational structure of one or multiple market units that are relevant for allocations.



What is the future of CAR?

With SAP having a vision of centralising many business functions and systems into one platform, eliminating the need for complex system integrations and replicating data, the importance of CAR for retail businesses will continue to grow. SAP has laid the foundations for years to come with several planned innovations that are due to be included as part of CAR over the next couple of years and CAR is heavily embedded within SAPs development roadmap going forward.

An example of another innovation, due sometime 2019/2020, is the development of a store replenishment solution built within CAR as a replacement of the store replenishment solution within SAP F&R. With support for F&R expected to end by 2025, SAP is slowly enhancing the replenishment solution and embedding this within CAR, leaving only DC replenishment within SAP F&R. In doing so, this brings F&R closer to being de-commissioned with the expectation that eventually, although not yet referenced by SAP but a logical step after fully integrating store replenishment, developing a DC replenishment solution directly within CAR also.