

SAP Forecasting and Replenishment for Retail – A short Overview



Applies to:

SAP Forecasting and Replenishment for Retail (for use with the SAP merchandizing system) Release 5.2.
For more information, visit the [Supply Chain Management homepage](#).

Summary

SAP Forecasting & Replenishment (SAP F&R) is a solution for retailing companies who want to optimize inventory level/cost and service levels simultaneously. It provides retailers with a sophisticated sales forecast to precisely forecast demand at the SKU / location level.

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Author Bio

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Laura Friedrichs works as a Solution Manager for SAP Forecasting and Replenishment in SAP's Industry Solution Management for Retail. She joined SAP in 2001 starting as a consultant for implementation projects working with multiple customers in different countries. She later joined Solution Management to support product definition and delivery of SAP Forecasting and Replenishment

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General Objectives and Applicability

SAP Forecasting and Replenishment (F&R) is a solution which has specifically been created for efficient replenishment of retailers' stores and distribution centers. Its main goal is to simultaneously reduce inventories while optimizing actual service levels.

SAP F&R focuses on products which are replenished on a regular base from external and/or internal vendors. The solution is built to manage even more complex products which are affected by trends, seasons, seasonality, price changes and/or promotions.

As a basic requirement products need to have a measurable and repeated sales history as well as up-to-date stock information.

Process Overview

The **business process** begins with the evaluation of future demand of customers, and then of stores and DC, which needs to be fulfilled. This demand determination considers the effect of upcoming events on the demand of the different products, such as promotions or seasonality. The demand is then opposed to the anticipated in-stock positions in order to determine whether these are sufficient to meet the demand. If not enough inventory will be available, an order needs to be placed to cover the gap between supply and demand. While building an order different constraints have to be considered, such as vendor minimums, pack size requirements or truck load restrictions like weight or volume.

Orders might need specific approval before being transmitted to the respective vendor.

In parallel, many vendors expect retailers to provide them with forecasts of the order volumes expected for the future to allow for a better planning of their own supply chain and production capacities.

From a **system perspective** the process flow works as follows:

The process begins with the transfer of data into SAP F&R which are needed to run the forecasting and replenishment processes. Once the data are updated and available, forecasting and replenishment calculations run automatically:

First, the forecast is calculated. On this basis requirements calculation starts and issues net requirements which are then optimized. The results from this step are optimized order proposals, and, possibly, also alerts (called "exceptions").

Order proposals are processed in the order proposal release management where they are either released or forwarded to exception handling or the manual release processes.

- Exceptions trigger the user, such as replenishment analysts, to look closer at the areas indicated.
- Released order proposals are transferred to the purchasing system, for example SAP Retail, where they are automatically converted in valid orders and transmitted to the respective supplier.

In addition, SAP F&R provides data for vendor collaboration: Sales, sales forecast and even order forecast can be shared with the respective vendor for a better planning of the supply chain.

SAP Business Warehouse has been furnished with content for SAP F&R analytics. Different information from SAP F&R can be transferred in to SAP BW to allow for a monitoring of the overall processes and KPI as well as of the quality of the solution implementation.

Detailed Process Description

Provision of Master Data and Transactional Data

The data relevant to the calculations need to be imported into SAP F&R from the leading master and transactional data systems. These data can stem from multiple systems. They have to be provided to SAP F&R in time for the calculations to start.

Relevant data are (amongst others):

- Master data, such as products, locations, supply relationships, scheduling information, product hierarchies
- Sales / goods issue data
- On-hand stock positions
- On-order stock positions
- Demand influencing factors, such as promotions, holidays, price changes.

Maintaining Parameters

Parameters are like additional attributes to the master data controlling the detailed aspects of the processes. The planned delivery time for example is a simple parameter.

Manual changes of SAP F&R parameters are made based on results of analytical reports, exception reporting or business experience and user judgment.

SAP F&R allows for different modes of parameter maintenance: Parameters can either be sent from an external system by interface, or preset in the interface (usage of default values/default profiles), or manually maintained within SAP F&R. It is possible to specify within the solution which parameters must not be overwritten by inbound interfaces.

For an easier maintenance the usage of profiles is enabled in the solution wherever it makes sense. Profiles are sets of parameters within one specific process area, for example a “forecasting profile” bundles parameters concerning the forecast calculation. These profiles need to be maintained only once and can then be assigned to all suitable master data elements, e.g. location products.

For time-efficient manual assignment of profiles mass maintenance tools are provided within SAP F&R.

Within SAP F&R many parameters can also be maintained in a time-phased manner. This allows setting of future values/assignments as well as automated consideration of new parameter values by the system once a specific point in time is reached.

A centralized customizing for all parameter settings and definitions, which do not change frequently, is offered.

Forecast Calculation

A broad range of statistical methods and algorithms are available. They are applied fully automatically and individually per each product/location combination based on different characteristics - and this per each forecast calculation run. For example based on the sales velocity of a product, which may change over time, the appropriate forecast model and parameter settings will be selected automatically.

The forecasting calculation is done fully automated and no manual profiling is necessary. Sales or consumption history is evaluated and extrapolated into the future while automatically considering

- Trends
- Seasons and seasonal pattern
- Past and future demand influencing factors (DIF) such as price changes, promotions, holidays, emergency situations such as hurricanes.
- Related products (e.g. cannibalization or HALO effects).

Safety amounts are calculated within this step according to a very flexible safety stock policy.

Requirements Quantity Calculation

Net requirements are calculated based on (amongst others):

- Future demand calculated in the forecast module
- On-hand stock projections
- Order and delivery cycles
- Fixed or dynamic target stock
- Fixed or dynamic presentation stock requirements.

Pre-allocation capabilities allow building up stock earlier than it would be usually done: In specific situations, typically promotions or Christmas, the demand of some products is extremely high compared to their regular demand. The impact on logistic resources and capacities may be so heavy that the work load must be distributed over multiple weeks.

An advanced option for supplying locations like DC consists in basing the requirements quantity calculation on an aggregated store order forecast instead of using a DC-own forecast. This technique is called multi-echelon replenishment. It basically generates an order forecast on store level for every single product location combination and rolls it up to the level of the supplying DC. This allows for a most precise consideration of future demand occurring against the DC as it automatically includes information about upcoming store sales uplifts (e.g. due to promotions), pack size, scheduling and – partially - optimization.

Requirements Quantity Optimization

Within this step net requirements are combined to order proposals and optimized according to defined rules.

An order proposal is defined as the combination of products and quantities for a receiving location and a specific (internal or external) supplier and for a defined delivery date.

Although the results of the requirements quantity calculation includes already some optimization functionality (e.g. safety stocks or dynamic presentation stocks), additional optimization requirements need being considered.

Further optimization steps can include simple pack size rounding or matching order proposals against vendor minimums; but they can also include more complex optimization scenarios such as truck load building or Economic Order Quantity, where ordering cost are balanced with the cost of capital tied-up in inventories.

Exception Management / Manual Release

Exception handling covers the main point of interaction of a replenishment analyst with the SAP F&R system. The replenishment analyst reviews and adjusts the results of SAP F&R mainly triggered by exceptions rather than reviewing all results SAP F&R generates.

The system can be configured to issue exceptions based on the following main processes:

Connectivity, automated forecast and replenishment calculations, order proposal release management. Exceptions can be of a more technical nature like when indicating missing stock updates or inconsistent master data. Exceptions can also be related to business reasons such as exceptions on order proposal (items) which may deal with reasons why an order proposal needs review, e.g. purchase order value or order proposals of new vendors. The solution can be configured in a way that order proposals which fulfill certain conditions or bear a certain exception need to be released manually.

Order Proposal Release Management

SAP F&R's order proposal release management is a process in which order proposals are either automatically released for transfer into the purchasing solution or automatically marked for manual release.

The solution offers a wide array of options to create release strategies which define under which circumstances an order proposal must not be released. Release strategies can contain different rules and restrictions, such as maximum or minimum rules based on specific values or quantities. They can be applied on different levels, e.g. on level of a product and/or a location.

Also, exceptions can be configured in a way that they prevent an order proposal from being automatically released.

Manual Replenishment

SAP F&R contains different tools or workbenches to support the manual replenishment processes:

The replenishment workbench allows the replenishment analyst to review, create, alter, delete, copy, group or split order proposals in many ways.

The product workbench contains useful functionality for the replenishment analyst to review products – and alter/create order proposal items - based on different criteria, e.g. products with their delivery date overdue, or products with unexpected sales troughs.

The exception workbench provides the replenishment analyst and other users with information on exceptional situations which need to be solved. Every user can subscribe to specific types of exceptions and data subsets he is responsible for.

Cause determination provides an aggregated view of all information concerning a specific location product for an in-depth analysis. Information provided are (amongst others) master data, time series (such as forecast, sales), exceptions.

Collaborative Planning, Forecasting & Replenishment (CPFR)

SAP F&R supports parts of the CPFR process. CPFR as defined by the Voluntary Interindustry Commerce Standards Association “is a business practice that combines the intelligence of multiple trading partners in the planning and fulfillment of customer demand.” (see <http://www.vics.org/committees/cpfr/>).

SAP F&R supports this process by creation of both a demand and an order forecast, and allowing the retailer to share this data with defined vendors by providing a function module which can easily be called via RFC.

SAP F&R Analytics

SAP F&R provides standard content in SAP Business Warehouse (BW) to monitor the quality of the processes and of the solution implementation. SAP F&R exports information into SAP BW on a regular base where it is kept over long periods of time and available for different views – from highly aggregated views drill down into the most detailed views is offered.

The following standard queries are delivered:

- History of manually changed order proposals
- Order proposal level of automation report
- Forecast quality
- Range of coverage development
- Overstocks
- Understocks
- Stockouts and undelivered products
- Stockouts and lost sales
- Number of stock exceptions
- Weekly service level development
- Gross margin return on investment report
- Replenishment exceptions
- Dead stock report
- Variances of dynamic versus static minimum stock

With the use of SAP BW many other additional analysis and reports can be generated using the information collected from SAP F&R.

Related Content

SAP F&R Wiki: <http://wiki.sdn.sap.com/wiki/display/Retail/SAP+Forecasting+and+Replenishment>

SAP Retail Wiki: <http://wiki.sdn.sap.com/wiki/display/Retail/IS-Retail>

SAP Retail Homepage: <http://www.sap.com/industries/retail/index.epx>

For more information, visit the [Supply Chain Management homepage](#)

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