Adexa's Precision ATP Solution White Paper:

Managing Allocations While Processing Orders

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The Challenges You Face

The ability to respond immediately to a product availability request with an accurate delivery date, and then to follow through on the commitment, is critical in order to serve your customer base. Improved capabilities in this area will impact the bottom line, a direct result of increased revenues through higher customer satisfaction, and decreasing the cost of goods sold. It is especially critical, and difficult for today's leading enterprises to be able to manage supply commitments to customers when demand is greater than supply, and products need to go on allocation.

After orders are taken, commitments that were made to the customer need to be honored - even as the order backlog or supply availability changes.

When the customer calls to enquire about product availability, or to place an order, they have come to expect a high degree of service and follow up to ensure that they receive the product on time. To meet world class standards a company needs to be able to do the following:

World Class Expectations:

- **Immediacy** - Enterprises need to provide an immediate response regarding the availability of the requested product. Companies that can provide an answer while the customer is on the phone has a distinct advantage over companies that must wait for a day or more to provide the required data or response.
- **Accuracy**—Enterprises must be accurate on the commit date of availability and the quantity available. Customers want to know *exactly* when the product will arrive.
- **Minimal Volatility**--Keep commitments steady, with little volatility in the committed date or quantity.
- **Exceed Expectation**--Provide the possibility of improving the date or quantity of availability, and communicate when things change.
- **Provide Choices**--Be ready to offer alternatives so that if the customer's first choice is not available the next best alternative is available.

Today's leading companies not only need to meet these customer expectations, but they also need to run the business so that it can be profitable in the short term, and grow over time. In order to do this, enterprises must have the following capabilities when it comes to order fulfillment:

Order Fulfillment Capabilities

- Be able to protect the best customers when product availability is not sufficient to cover all the demand.
- Be able to manage product supply for inventory on hand, on order, and in production.
- Have the capability to calculate availability statements in less than one second for products that are make-to-order, configure-to-order, or build-to-order. Availability for products like these can not be calculated from only on-hand and expected supply arrivals since they are not built until ordered.
- Be able to determine the cost of fulfilling an order for each possible alternative.
- Be able to know whether or not a better supply and demand match exists to reduce order lateness, or shift supply to protect the most important customers.

- Be able to employ different allocation and commitment strategies for different customers depending on the business agreement in place and their importance to the enterprise.
- Be able to understand how well sales plans are being executed, and make adjustments based on this understanding.
- Be able to decide if product should be promised to a direct-ship customer, sent to a distribution center, or sent to a customer inventory hub.

Enhancing the ATP Capabilities of your ERP System

Available-to-Promise and Allocation Management are the parts of the complete order-to-delivery set of business processes that manage how supply will be used to meet demands. A successful process keeps customer satisfaction high and executes on the sales and operations plan.

The Adexa Precision ATP solution provides complementary capability to ERP systems such as SAP, Oracle and QAD in the area of managing product availability during the order fulfillment cycle. The Adexa Precision ATP module enhances the ATP capabilities of ERP systems in the following three key areas:

1. **Ability to increase the accuracy of the availability quote by considering the key attributes needed for ATP decisions**. Any company that needs to be able to track more than the aggregated product availability based on an end item number alone will benefit from the Adexa Precision ATP solution. Adexa provides a way to model available supply and demand with attribute data that is critical to obtain acceptable results in the ATP calculation. Examples are attributes that describe product speed, packaging, unique traits, or manufacturing origin. Without this information a company may not be able to distinguish what inventory is appropriate to satisfy a customer order.

2. **Ability to better implement order fulfillment rules to enable increased customer satisfaction and profitability**. Adexa's Precision ATP solution allows companies to configure key business rules that are at the heart of the order promising process. These rules enforce allocation plans, and form the core of the Adexa Precision ATP logic. The Adexa Precision ATP logic can be flexibly defined to fit most business needs, while other systems have logic that is fixed and too rigid.

3. **Ability to optionally manage the allocation plan using aggregated targets, such as customer tiers, instead of being forced into item level reservations for individual customers**. Adexa Precision ATP allows a company to allocate product at a group level and then promise at the end item or configured product level. This enables strategies for managing the allocation of supply to groups of customers, sales channels, or regions. It also allows allocation of product without regard for final configuration which is done at time of order entry. It also enables product planners to monitor how well the order backlog is being managed. It offers advanced algorithms to re-plan the backlog of orders to better use supply. Adexa supports a process of managing to commit dates while trying to improve to customer request dates.

Real-Time Precision ATP and Allocation Management

There are two major types of people who play a role in the fulfillment of customer orders, and management of supply. These are the customer service representatives taking the individual orders using the order entry screen of the ERP system (such as SAP R/3), and the Product Planners who need to manage the assignment of supply across customer orders. Both will benefit from using the Adexa Precision ATP system. The advantages for each are outlined in the sections that follow.

REAL-TIME ORDER PROMISING ADVANTAGES

The real-time ATP availability process is one step in the overall order management process performed by the customer service representative or sales person. The order management process is divided here into 3 main parts for the purpose of positioning an advanced ATP process:

1. Order entry and validation
2. Real-time supply availability promising
3. Order execution and close-out

Steps 1 and 3 are performed in the ERP order entry module in the same way that they would be done without the Adexa Precision ATP process. Step 2 should be done in the advanced real-time ATP system since it involves calculations, which can not be done within the framework of an ERP system. The integrated ATP module is most often implemented as a real-time black box; therefore the customer service representative uses the same order entry screen that they are used to and sees the calculated availability date on their regular ERP order entry screen. Custom screens can be added in the ERP system to give the sales representative more flexibility to view additional information from the Adexa ATP system, such as supply alternatives in deciding how to serve the customer.

The advantages of the Adexa Precision ATP system are critical to many make-to-stock businesses, but are especially important for any company that requires ATP calculations for make-to-order, or configure-to-order businesses. Typical ATP systems will allow the user to check availability for an end item based on an item-location identifier, comparing total supply to total demand at an aggregated basis. The major limitations in doing this is that end item inventory on the supply side may not be the same, and a company may not want to treat all demands the same in deciding if inventory can be freed up to satisfy a new order.

The Adexa solution goes beyond this rudimentary ability. The demand can be identified by order with all its special attributes, and supply can be identified as more than just generic supply. Common data elements required for basic ATP capabilities are provided, with the ability for each enterprise to add custom attributes that are needed to represent their specific business needs and ATP logic. These attributes can be considered during the ATP calculation through the use of flexible business rules. For a basic ATP system, available supply, multi-line item orders, soft or hard pegging, and the hierarchical allocation plan can be represented. The attributes on supply and demand data support attribute driven ATP requirements that are needed for planning products defined by special attributes, or configure-to-order planning environments. Examples of this would be order requests for specific quality levels, speed properties, or electrical properties.

PRECISION ATP MODELING ADVANTAGES

For companies that are implementing allocation plans, the Adexa Precision ATP solution has the unique ability to apply allocations at an aggregated level such as customer group (tier), product group, region, or other dimension instead of only allowing allocations at the individual item, location, customer level. This makes it much easier to drive allocation plans from Sales and Operations Planning (which is commonly done at an aggregated level) into the order promising process.

For environments that have the need to represent build-to-order and configure-to-order environments, there is a Bill of Material (BOM), Manufacturing work order and lead-time, and Transportation lead-time representation that allow real-time planning. Distribution networks with alternatives can be represented for companies that are implementing pooling strategies, and want sourcing location alternatives considered at the point in time of order entry. Simple capacity representations can be managed to allow make-to-order or configure-to-order environments understand the quantity of product that can be promised with a defined capacity limitation. These features all combine to enable a real-time ATP planning system that can represent a variety of environments.

The business rules that control the Adexa Precision ATP logic are powerful and can be easily configured through the use of business plug-in rules. Adexa Precision ATP can consider any user-defined data attributes added to the standard data model. A different rule can be applied for each ATP request. Typically the rule would be set for an item and customer (or customer group), but this too is configurable. The unique power of the Adexa Precision ATP engine is in its ability to quickly consider all the different information in the search for the best supply to commit for an order. The person requesting the ATP can interact with the system to change key inputs such as dates, quantities, or other parameters (such as does the customer split orders), to see the effect on the availability date. This all comes together to ensure that the system fits your business needs rather than your company being limited by the ATP system.

ALLOCATION MANAGEMENT ADVANTAGES

While the customer service representatives will typically interact with the system through the ERP system to get ATP quotes one order at a time, the Product Planners need to be able to plan across all orders for the products that they manage. They are responsible for making sure the company executes the Sales and Operations Plan and makes the best use of available supply to meet customer orders. This involves executing the allocation plan (allocation management) and periodically re-planning the orders against supply when supply statements change or high priority orders need a better availability date. The Adexa Precision ATP solution also offers key advantages for the product planner.

Instead of managing allocations at the individual item, location, customer level, allocation plans can be managed at the aggregate level in the Adexa Precision ATP system. Hierarchical management allows a company to manage allocations in a more productive way and not have to react to all lower level changes. An example of this is that tier 1 customers that are the core of a business may have a certain amount of supply allocated, instead of trying to split this to individual customers.

Another area that the Adexa Precision ATP system gives the Product Planner an advantage is in the features that allow them to re-promise supply to orders in *batch*. A "what-if" analysis may be performed to see what would happen if supply and demand can be shuffled to better match up, or if a customer order should be raised in priority to get a better promise date. While doing this the effect on all the orders needs to be seen before committing the change to the system. In order for the product planner to be able to balance the changing supply and demand, systems and processes must ensure that both the customer commit date (CCD) and the original customer request date (CRD) are known and considered by the system when supply and demand adjustments are made. The Adexa algorithms ensure that the commit date to the customer is held while attempting to improve to the request date. The algorithms of other order fulfillment systems do not understand both request and commit dates, so while re-planning the promises made are not visible to the ATP algorithm.

Adexa Precision ATP Architecture

As discussed earlier, the Adexa ATP module integrates easily with ERP systems such as SAP R/3, Oracle and QAD. The architecture overview below shows how Adexa is compatible with transactional middleware backbones such as SAP Netweaver XI, IBM Websphere, Web Methods, Vitria, etc. The Adexa system also integrates with Supply Planning systems such as the Adexa Supply Chain Planning module, or other heterogeneous supply planning systems.

Architecture Overview
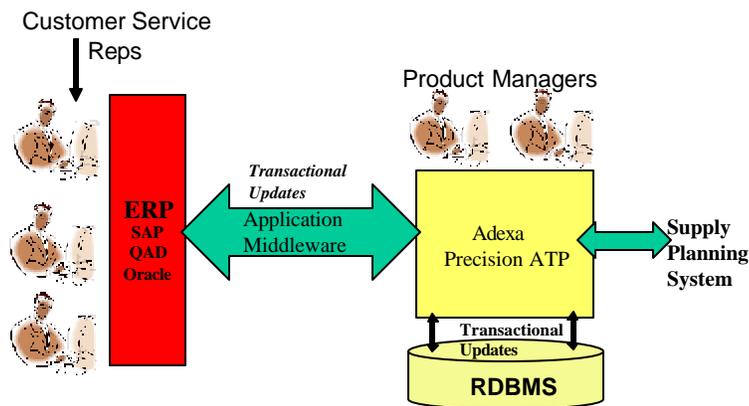
The overview above highlights how the two main types of users interact with the system. On the left are the customer service representatives who work on the ERP order entry module and utilize the Adexa Precision ATP system as a black box. On the top right are the Product managers who interact with the UI of the Adexa Precision ATP system in order to manage the allocations and perform what-if scenarios.

The integration layer for the ATP module supports integration using a services oriented protocol. ATP queries are done in real-time. Transactions from the ERP system such as SAP that update short term supply information or order information are passed to the Adexa Precision ATP system through the Application Middleware with guaranteed delivery. When a customer service representative enters an order into their screen in the order management module, it automatically sends an ATP request to the Adexa Precision ATP module. Adexa's Precision ATP module responds immediately with an ATP availability reply that fills in an availability quote for the customer service representative on the order entry screen. Statements of expected supply are updated on a periodic basis that is determined by the supply planning cycle. This can be done as frequently as multiple times a day.

Additional information on the Adexa Precision ATP module and other Adexa solutions can be found at www.adexa.com.