

# White paper

**The Consumer Packaged Goods  
Supply Chain:**

**Optimized Supply Network  
Management Solutions**



**ADEXA**

## Executive Summary

The food and consumer packaged goods (CPG) industry is undergoing intense competition and cost restructuring. Growth has reached a plateau, even in emerging markets. There is greater choice in the market, resulting in more demanding customers and retail oligopoly. Opening new avenues for growth and increasing the profitability of existing businesses have never been more critical. The emergence of new enabling technologies and solutions could not be better timed.

The industry is creating a compelling new agenda that will determine future winners and losers. This agenda is mandating a focus on four key areas: (1) collaborating with vendors and customers, (2) exploiting the value of information technology, (3) optimizing the costs of the extended enterprise and (4) ensuring 100% availability of quality products in the market. Many companies are turning to collaborative planning, forecasting and replenishment (CPFR) and ECR guidelines and resorting to integration and synchronization of the supply chain as part of this agenda.

Understanding the primary function of the CPG supply chain is perhaps the easiest thing – making sure that a product is available when it is required. But it is equally critical to ensure that the product delivery is carried out at the least possible cost. Minimizing costs and maximizing service levels are two conflicting but real objectives of today's CPG enterprise. Optimized management of the supply *network* –which can no longer be construed as simply a “chain”— is the key to managing this all-important tradeoff.

*Opening new avenues for growth and increasing the profitability of existing businesses have never been more critical for Food and Consumer Packaged Goods (CPG) companies.*

*Minimizing costs and maximizing service levels are two conflicting but real objectives for any CPG enterprise.*

## **Beyond Traditional Supply Chain Management**

Stagnating growth, intensifying global competition, greater variety in the market and a need to compete on a cost basis are forcing companies to re-examine their fundamental supply chain strategies. The traditional view of supply chain management was optimizing within functional and corporate silos at the expense of the greater supply chain. But now that has all changed. Today, the key to compete and grow is for the entire enterprise to focus concertedly on optimized supply network management (o-SNM).

A supply network is characterized by players who work together to drive down cycle times and costs, share important information, and build strategies together. Together, they form the “enterprise,” sometimes also referred to as the “extended” or “virtual” enterprise. The goal of every consumer-oriented enterprise is to ensure that the ***right product*** is available at the ***right place*** at the ***right time***, in the ***right quality*** and at the ***lowest possible cost***.

Translated into acronym form, this mandate becomes: **Quality, on-Time, least-Cost Delivery** of products. QTCD is the goal for companies in all industries, be it high-tech, CPG, automotive or apparel. After all, it is the customer who drives revenues.

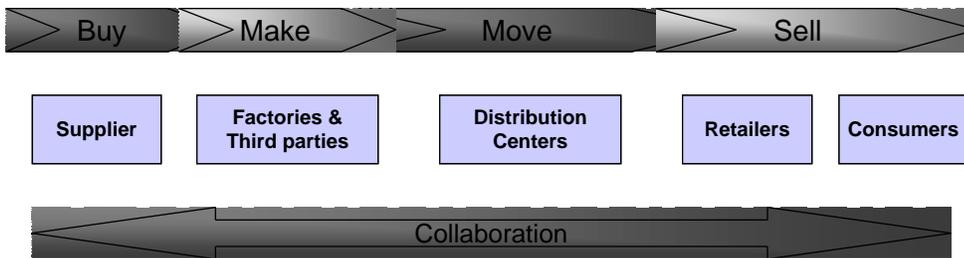
In the CPG environment in particular, sales are driven largely by stock availability and stock freshness. A consumer buying a packet of soup is not going to wait if the desired brand is not available – the nearest brand, with the best stock freshness will be picked. So managing the supply network with the objective of QTCD is the key to growth for any CPG business.

*The key to compete and grow is for the entire enterprise to focus concertedly on optimized supply network management (o-SNM).*

*In the CPG environment, sales are driven largely by availability and stock freshness.*

## CPG Challenges

We discussed the importance of **Quality on-Time least-Cost Delivery** in the context of a CPG enterprise. And in any industry, delivering products and services at the least cost is the collective responsibility of the supply network. But in the case of CPG we can drill down even deeper. The CPG environment offers unique challenges. Let us look at each of these challenges and understand their implications on optimized supply network management (o-SNM). For ease of understanding, we will classify them as Sell, Move, Make and Buy processes.



### Challenges: SELL process

#### 1. Seasonal and Unpredictable Demand

Sales in CPG companies, often, are not order-based. The companies hence operate on a **Made-To-Stock (MTS)** model: build stock at distribution centers and/or warehouses (own or retail) based on forecasts and meet demand from the stocks. The move, make and buy processes hence are driven by the forecast figure. When the accuracy of forecast itself is questionable, it calls for a high degree of flexibility in the supply chain – both in distribution and manufacturing. Besides an accurate forecast, an ability to maintain low but sufficient covers of stock is also critical, to counter this challenge.

*Delivering products at the least cost is the responsibility of the supply network. To execute this vision, CPG companies must master complex Sell, Move, Make and Buy processes.*

*CPG companies operate on a Made-To-Stock model since sales are not order-based.*

## **CPG Challenges (cont.)**

### **Challenges: SELL process (cont.)**

#### **2. Influence of large retail groups**

CPG markets in developed countries are controlled primarily by large retail chains like Sainsbury's & Tesco's in the UK and Wal-Mart and K-Mart in the US. It is hence important to be able to measure and improve this service level on an ongoing basis. From a retailer's point of view, a high service level derives from on-time delivery, quality, joint promotion planning and responsiveness. There is no better way to improve these measures of service than to implement the CPFR framework with key retailers.

### **Challenges: MOVE process**

#### **1. Complex distribution setup**

Distribution in most CPG industries is always a complex affair because of the number of options available and the nature of the products (ice creams and frozen foods because of the need to have a cold chain, edible oils and foods because of the collapsibility of plastic). But the complexity of the distribution network presents itself in the form of an opportunity – namely, being able to optimize your choice each time there is a move and hence drive down distribution costs.

#### **2. Products with low per-unit volume and value**

Products such as soups, soaps, tea bags and coffee have very low per-unit volume and value. The cost of meeting small orders is hence very high. The tradeoff is not just inventory carrying cost versus transportation cost. The impact on stock freshness and hence obsolescence also is a big factor. The solution lies in lean stock covers, a flexible distribution model and the use of 3PL to form synergies with their existing transportation loads.

*To manage the low per-unit volumes, it is important to have lean stock covers, a flexible distribution model and the use of third-party logistics (3PL).*

## **CPG Challenges (cont.)**

### **Challenges: MOVE process (cont.)**

#### **3. High transportation costs**

This is linked in some sense to the previous point. Being low-value items, the contribution of transportation costs to the total product cost is often high. By maintaining low transport costs through optimizing of the transportation model, CPG companies can make significant savings. This optimization should combine inbound, internal and outbound movements to deliver maximum value. This can be achieved by collaborating with suppliers and customers, along with 3PL providers.

#### **4. Route Scheduling**

The permissible delivery times to each customer is often fixed in the CPG industry, because the supply is not to meet an immediate demand – it is to replenish stock at the immediate customer location, which in turn will be used to fulfill demand. The number of customer locations to be serviced in a day, coupled with the customer's demands for delivery timings makes optimizing the transportation routes a unique challenge.

*Mastery of move processes is complicated by high transportation costs and the difficulty of optimizing transportation route scheduling.*

## CPG Challenges (cont.)

### Challenges: MAKE Process

#### 1. Short production cycle times and long batch sizes

In CPG plants, production cycle times are often short (excepting cases like cheese, wine, beer, glycerin soaps etc.), which should normally mean an ability to changeover frequently. But plants want to run large batches, because they don't want to compromise on utilization. Modeling changeovers therefore becomes a tricky issue.

#### 2. Mix of production models

Consider a fully backward integrated tea company. Growing tea in the gardens is a completely different process compared to packing of tea. The former is a seasonal and batch process, whereas the latter is a typical CPG packing process. The challenge is in managing both through the same supply chain model.

### Challenges: BUY Process

#### 1. High cost of direct materials

Every company is trying to do something with Internet exchanges – whether it adds value to their bottom line or not. Direct material costs account for a major portion of the product cost absorbed by CPG companies, which force them to resort to strategic buying for such materials. Internet exchanges, hence, do not offer further cost reductions, since costs are already negotiated to the lowest possible levels. Working with the supplier to optimize his supply chain and inventories, and thereby reducing material costs is the better approach. This can be achieved only through improved collaboration.

#### 2. Commodity buying

Many CPG products are commodity based. Examples include makers and sellers of soaps (oils) and skin-care (cotton). The buying process for commodities is totally different from that of other direct materials. It involves brokers, auctions and speculative (or otherwise) trading. Optimizing sourcing and inventory levels of these commodities, as part of the entire supply network, along with other inputs, is critical to total system cost optimization.

*Planning CPG production effectively requires the ability to keep utilization high while modeling changeovers and representing several different production processes within the same supply chain mode*

## CPG Challenges (cont.)

### **Challenge: COLLABORATION**

The list of parties that are involved in delivering QTCD in a CPG supply chain is by no means a small one: Suppliers, brokers, auctioneers, 3PLs, co-packers, manufacturing plants, distribution centers, retail chains and warehouses.

To deliver maximum QTCD, the supply network needs to be managed ‘optimally’ and ‘synchronously’. Synchronization of the supply network can be delivered only through visibility and effective collaboration. The challenge is in formulating and implementing collaborative workflows that bring together all the players in the supply network.

*To deliver QTCD, the supply network needs to be managed ‘optimally’ and ‘synchronously’.*

### **Early Adopters of o-SNM:**

Three leading CPG companies are implementing Adexa’s optimized supply network management (o-SNM) solutions to ensure **Quality, on-Time, least-Cost Delivery (QTCD)** of their products:



## Meeting the Challenge

Delivering QTCD through optimized supply network management requires a next-generation solution. Having worked closely with CPG industry leaders like Unilever and Johnson & Johnson, Adexa has developed a vision of supply chain excellence and a proven next-generation solution for CPG, that can be implemented today – the Adexa iCollaboration suite. The iCollaboration suite also incorporates Adexa’s expertise in the electronics, semiconductor and apparel industries, thus ensuring that all generic SCM objectives and issues are addressed.

Adexa’s iCollaboration suite is specifically designed for collaborative supply network management and optimization. Built around Adexa’s Single Data Model (SDM), iCollaboration provides a unified planning environment for strategic, tactical, and operational planning. In concert with Adexa’s business alerts and agent technology, the iCollaboration suite enables dynamic and synchronized collaboration among all stakeholders.

By compressing information lead times with customers and suppliers and synchronizing planning among demand planners, master planners and plant schedulers, the iCollaboration suite provides companies with the highest levels of flexibility and responsiveness.

*Adexa delivers a next-generation solution—iCollaboration—**that can be implemented today.***

## **The iCollaboration Suite**

The iCollaboration solution suite considers enterprise-wide constraints, costs and revenue alternatives, together with the global supply chain position to minimize enterprise costs – and thereby maximize profits.

The unique collaboration features in the Adexa solution enable enterprises to implement CPFR frameworks with ease.

The software also dramatically reduces the time it takes to plan and re-plan, as well as run “what if” analyses, which is critical in a dynamic supply chain environment such as CPG.

The distributed planning capabilities of Adexa’s iCollaboration suite dramatically reduce total system cost while improving responsiveness, reliability and customer service through: (1) enterprise-wide optimization (2) collaboration among customers, suppliers and planners; (3) visibility of current constraints; and (4) fast, rule-based solving capabilities.

*iCollaboration provides a unified planning environment for strategic, tactical, and operational planning.*

## Case Study: Adexa in a CPG Company

Consumer Company Limited (CCL) -- not its real name -- is a billion-dollar food and consumer goods company. It's also an early adopter in innovating, designing and implementing supply chain processes. In January 2000, the company realized it was time to re-engineer its supply chain practices to propel top-line growth while maximizing its bottom-line. The scope and objectives of the supply chain were redefined accordingly.

### **Objectives:**

- Measure and maximize customer service
- Maximize stock availability at distribution points
- Minimize total system cost
- Minimize inventory

### **Scope:**

- End-to-end supply network: suppliers and auctioneers to retailers
- Global synergies to be exploited

### **Business Strategy:**

- Collaborative planning within the entire supply network
- Optimization of end-to-end supply chain and not just internal supply chain
- Centralized control of planning in buy, make, move and sell processes, globally (to enable collaboration and synchronization of the processes)
- Decentralized control of transaction execution
- Centralized monitoring and reporting of execution efficiencies

### **IT Strategy:**

- Single, centralized IT solution to enable:
  - Management of ALL supply processes together
  - Integrate collaboration of external parties with internal supply chain optimization
  - Central monitoring and reporting of KPIs
  - Facilitate collaboration at a global level
- Pilot the solution in the toughest environment and roll-out globally

*CCL— a leading edge adopter of best practices enabling technology for optimized supply network management—is implementing Adexa's iCollaboration suite to maximize customer responsiveness and delivery performance at the lowest possible cost.*

## The CCL-Adexa Approach

CCL won half the battle by clearly defining its fundamental approach as well as its project objectives and deliverables. With this groundwork in place, the company is now well positioned to exploit Adexa’s planning solutions. So what’s so unique about the CCL-Adexa approach? Two things:

1. A *global supply network* focus replaces a *company-wide supply chain* focus
2. “*Minimize & Maximize*” objectives replace “*Reduce & Increase*” objectives

Optimized Supply Network Management (o-SNM) is what CCL chose to implement. Adexa’s iCollaboration suite proved the best fit for the CCL initiative.

### Addressing challenges in SELL process

- **Demand Planning: Collaboration and Statistical forecasting**

Statistical forecasting techniques provide an insight into historical and seasonal trends, and help to evaluate the impact of promotional activities. But CCL recognized that statistical forecast can act only as a guideline – and the best forecast for a CPG company is one that is arrived at through Collaboration of all concerned parties. The demand planning solution provides a base statistical forecast and a framework for collaboration and monitoring with the customers.

- **Customer Collaboration: Replenishment and Order Promise**

Apart from collaborating for demand forecast, the solution is used to implement the CPFR framework: i.e. a replenishment-based ordering process with the customers. Replenishment is based on mutually agreed stock norms for the customer. The replenishment order generated by the customer is promised in full or part, using the ATP solution. Customers can also use the ATP functionality to analyze inventory availability and place a suitable order when there are shortages. The collaboration process is also used as a platform for transfer of information to and from customers: Stock/Sales and market intelligence reports from and future plans and pricing information to the customers.

*CCL's products cover the spectrum of typical food and CPG offerings. CCL makes and sells soaps, detergents, personal products, tea, coffee, ketchups, jams, ice-creams and bread.*

*Statistical forecasting can provide an insight into historical and seasonal trends and help evaluate promotion effectiveness.*

*Customers can use the ATP functionality to analyze inventory availability and place a suitable order.*

## The CCL-Adexa Approach (cont.)

### **Addressing challenges in MAKE & MOVE processes**

- **Optimization (Strategic planning)**

Using Adexa’s Strategic Planner (SP) module, CCL arrives at a high-level optimal supply chain plan. This process is used to take decisions such as “what each plant will make, which plant will service a particular DC or a customer, what is the optimal inventory level at each point and which is the most profitable market, which is the least cost supplier.”

The process also forms an integral part of the annual / half-yearly budgeting exercise, as it projects profits for future period based on demand forecasts and projected costs. Strategic planning defines the base on which tactical and operational planning will be carried out. CCL plans to reduce total system costs and also identify profitable markets in case of capacity shortages by frequently optimizing the supply network.

Adexa’s SP solution uses a combination of optimization techniques to deliver results. It recommends efficient distribution and transportation methods to maximize customer service and minimize costs. SP also evaluates trade-offs between competing supply chain objectives (like customer service vis-à-vis transportation cost, build stock now vis-à-vis make later and outsource vis-à-vis make in-house) to ensure balanced growth.

*Strategic planning defines the base on which tactical and operational planning will be carried out.*

## **The CCL-Adexa Approach (cont.)**

- **Supply Chain Planning**

A central implementation of Adexa's SCP solution integrates and synchronizes CCL's production and distribution planning activities with Strategic Planning, Collaboration and Order Management processes. The SCP solution ensures that the operational plans generated here are the best way of meeting enterprise objectives of service level and costs, as defined in strategic planning. A round of internal collaboration on operations plans is carried out through business agents to identify and resolve issues related to stock-outs, capacity constraints, order fulfillment, etc.

At CCL, supply chain planning is a daily process. This gives the enterprise the opportunity to recognize changes in sales patterns, inventory levels and capacity constraints on a daily basis. To react to these changes effectively, distribution plans are issued everyday and production plans are issued as frequently as plants' ability to change. Daily SCP and enterprise wide visibility gives CCL the much-required flexibility, to maximize customer service level and minimize stock covers.

CCL's scheduling problem is not complicated and hence plants use the ERP system to schedule and execute the central production plans. Likewise, distribution centers use the ERP system to execute the transport plans they are given. These plans are arrived at after consolidating transport loads across products, destinations and time frames. Exceptions are handled through internal collaboration.

*Daily supply chain planning and enterprise-wide visibility give CCL the flexibility it needs to maximize customer service and minimize stock covers.*

## **The CCL-Adexa Approach (cont.)**

The business rule that CCL uses for allocation of stocks during shortage scenarios is not part of basic SCP logic. But the ability of the iCollaboration suite to add plug-in rules to the basic logic enabled CCL to setup the planning decisions to suit their specific requirements.

Transportation optimization and route scheduling are two areas that need to be addressed, once the basic processes of strategic and operational planning and collaboration are streamlined. CCL is looking to address these issues at a later date, once the core processes have been re-engineered using Adexa iCollaboration Suite.

### **Addressing challenges in BUY process**

- **Optimization (Strategic Planning)**

Total system cost cannot be minimized if material costs are not considered. CCL maintains a repository of supplier-related information like quote, supplier's supply chain costs, location, capacity and flexibility. The optimization model in SP incorporates these parameters to arrive at the least-cost sourcing option for direct materials.

Indirect materials are not in the scope of strategic planning because their contribution to total costs is not significant. Commodity buying will be addressed during the second round of re-engineering.

*The optimization model in Adexa's Strategic Planner incorporates supplier-related parameters to arrive at the least-cost sourcing option for direct materials.*

## The CCL-Adexa Approach (cont.)

- **Material Planning (Supply Chain Planning)**

The SCP solution considers availability and capacities of critical materials. Availability is defined as inventory and confirmed delivery schedules, whereas capacity can be the supplier's manufacturing capability. The desired purchase requisitions are generated along with production plans. Material requirements generated therefore are synchronous with the distribution and production requirements generated downstream. By regenerating material plans at the same frequency as production plans, CCL is able to maintain low raw material inventory. Caveat: the supplier needs to be equally flexible and also part of the material planning process. The supplier collaboration process is to serve just this purpose.

- **Supplier collaboration**

The material requirements generated in Adexa SCP are shared with the suppliers on an ongoing basis, in the form of supplier schedules. Suppliers confirm their ability to fulfill the requirements, at the same frequency. CCL gives suppliers a forward view of material plans, so that they can synchronize their backend with CCL's requirements. The collaboration process is also used to keep CCL's supplier database updated with the latest information on costs & capacities.

CCL uses an in-house solution to address the supplier collaboration process. Adexa's UDS (Unified Data Server) database acts as the common platform for transferring information to and from the in-house solution.

*Material requirements generated are synchronous with the distribution and production requirements generated downstream.*

*CCL gives suppliers a forward view of material plans so that they can synchronize their backend with CCL's requirements.*

## Why CCL Chose Adexa

Benchmarked against rival systems, Adexa's software demonstrated clear advantages to CCL's evaluation team. For example:

- Adexa's iCollaboration suite provided CCL with solutions to all processes under one roof. The processes were integrated fully through the single data model.
- The iCollaboration suite provided CCL with the ability to plug-in company-specific business rules.
- CCL has four core businesses, in various segments of the CPG industry. The object-oriented approach in iCollaboration provided CCL with the flexibility to define all types of business model.
- Operational supply chain planning is carried out in CCL on a daily basis. For this, CCL required a solution that runs fast while satisfying basic objectives – and Adexa delivered.
- Having understood that internal and external collaboration are integral parts of supply chain planning, CCL needed a solution that could integrate the B2B processes completely with internal strategic and operational planning. Adexa's iCollaboration suite, a seamlessly integrated solution of CDP, CSP, SP and SCP, was a perfect fit.

*Adexa's iCollaboration suite was a perfect fit for CCL because it blended collaborative demand planning, collaborative supply planning, strategic business planning and supply chain planning within one unified environment.*

## **Business Benefits**

CCL expects to achieve the following benefits through its supply chain initiative and deployment of Adexa's software:

- Better customer management through,
  - Measurement of service at customer level
  - Improved stock availability
  - Collaboration with customer for demand planning
  - Sharing of promotions and pricing information
  - Improved on-time delivery
- Increase in sales by 10%
  - Through improved customer service and stock availability
- Reduction in total system costs by 10%
- Increased stock availability (96%)
- Reduction in inventory level by 40%
- Reduction in cycle time by 30%
- Better supplier management through,
  - Collaboration for material planning
  - Providing forward views into the material requirements

*For CCL, Adexa's iCollaboration suite is the key to improving business performance within the highly competitive CPG industry.*

## **State-of-the-Art Technology**

Adexa's iCollaboration suite provides a native Web architecture, exceptional scalability, and rapid problem solving to enable a globally distributed, one-touch planning system.

Adexa's intuitive object modeling tools enable users to quickly represent their supply chain and facility environments with user-defined attributes and plug-in business rules. Adexa is able to model one hundred percent of all resources with very compact models through dynamic routing and common bill-of-material (BOM) concepts. Importantly, Adexa's superior heuristic solving algorithms provide the fastest solving times available. Benchmarked against rival systems, Adexa's software solves problems orders-of-magnitude faster.

Adexa's applications provide rapid, one-touch integration to ERP and other legacy applications. Our integration tool set enables bi-directional communication with any relational or object database. Moreover, Adexa provides standard interfaces to the leading enterprise applications used by the CPG industry, including those from SAP and Oracle.

*Object modeling tools enable users to quickly represent supply chain and facility environments with user-defined attributes and plug-in business rules.*

## **Vision, Strategy, Solutions**

Optimized supply chain management can decrease total system cost, inventory and cycle times while significantly increasing stock availability and inventory turns. Taken together, these results can provide companies with greater profits, improved customer service and that ever-elusive competitive advantage.

But it takes the right vision, the right strategy and the right software tools for theory to become reality. Adexa's solution suite is built on the successful implementations and business solutions partnerships Adexa has developed with industry leaders such as Unilever, Johnson & Johnson and Firmenich. Available now, the iCollaboration suite enables companies to achieve supply chain excellence and overcome the myriad challenges facing today's ultra-competitive CPG industry.

To find out how your business can do the same, call us at 888-300-7692 or log on to [adexa.com](http://adexa.com).

*It takes the right vision,  
the right strategy and the  
right software tools for  
supply chain theory to  
become reality.*