

How does consumer behavior impact CPG manufacturing?

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## DIGITAL INDUSTRIES SOFTWARE

# The Executive's Guide to Transforming CPG Operations

5 Strategies for Adapting to Changing Consumer Behavior and Staying Ahead of the Curve

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# How does consumer behavior impact CPG manufacturing?

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Consumer packaged goods (CPG) companies must adjust to consumer behavior more than any other industry. Reacting to ongoing trends in society, manufacturers must adapt their processes to meet customer requests while still being able to compete in the global market. With inflation rising, CPG manufacturers must save costs in their plants to maintain their margins. Society expects sustainable operations so recycling and upcycling are placed in the spotlight. Consumers demand personalized products, effectively challenging manufacturers to produce smaller batches in an efficient way while coordinating planning, scheduling and logistics. A global standard for quality must be maintained to meet customer demands.

This eBook explains how to meet these challenges by combining manufacturing operations management (MOM) systems and other digital manufacturing tools. CPG manufacturers are profiting from digital manufacturing tools by improving efficiency throughout the manufacturing process.

**Consumer behavior is a key driver for CPG companies**



**CPG manufacturers must incorporate sustainable operations**



**Consumers demand personalized products**





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Consumer behavior is important for any industry, especially for CPG manufacturers. Understanding consumer behavior is essential for these companies to be successful in the marketplace.

Observing consumer behavior is the study of knowing how customers select, purchase, use and dispose of products and services. Understanding consumer behavior helps CPG manufacturers set the right priorities for product innovation. By understanding consumer preferences, needs and motivations, CPG manufacturers can develop and market products that appeal to their target audiences.

In addition to understanding customer preferences, CPG manufacturers must also understand the competitive landscape. Learning about competitors' strategies and tactics help CPG manufacturers stay ahead of the competition and develop products that stand out from the crowd. Knowing what their competitors are doing allows CPG manufacturers to adjust their own strategies to remain competitive.

By listening to its consumers and conducting market research, such as surveys and focus groups, a company can optimize its pricing. This research, combined with data analytics to gain further insights, can help the company identify consumer preferences and behaviors, which then influences pricing strategy. This helps them maximize their sales while remaining competitive in the marketplace.

Finally, understanding consumer behavior is essential for CPG manufacturers to build customer loyalty. Loyalty programs and customer service initiatives will help retain customers over the long term.



# What challenges await CPG manufacturers regarding consumer behavior?

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**Consumers are becoming more aware of the environmental and social impacts of their purchasing decisions and are looking for brands that reflect that corporate sustainability identity.**

Due to changing consumer behavior, CPG manufacturers are facing several challenges. In today's world, consumers have access to more information and choices than ever before and are becoming increasingly powerful in the marketplace. CPG manufacturers must adapt to this changing landscape to remain competitive and successful.

Consumers demand more personalized products, which requires more flexibility from manufacturers in their operations to allow for easy changeovers. Just think about personalized Coca-Cola bottles with the names of the customers on the label. By integrating such flexibility from early product development onwards, major cost savings can be realized while meeting the demand for more personalized products.

Another challenge that CPG manufacturers are facing is the increasing demand for sustainable and ethical products. Consumers are becoming more aware of the environmental and social impacts of their purchasing decisions and are looking for brands that reflect that corporate sustainability identity. CPG manufacturers must take steps to ensure their products and processes meet these standards and their packaging is recyclable or compostable.

Finally, CPG manufacturers must also adapt to changing consumer tastes and preferences. Consumers are increasingly looking for unique, innovative products that offer health benefits and convenience. CPG manufacturers must stay ahead of the curve and develop products that meet these demands to stay competitive.

Therefore, consumer behavior, which is often seen as a driving force, has a major impact on CPG manufacturers when it comes to strategic planning and alignment. Consequently, it is important to determine what kind of value the manufactured product can give the consumer.



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# Inflation affects consumer decisions

Inflation is a macroeconomic phenomenon that affects the purchasing power of consumers and has a significant impact on the customers of CPG products. It can have a profound influence on the purchasing decisions of CPG customers and their satisfaction with the products they buy. Rising inflation leads to a decrease in customer satisfaction as they may be unwilling to pay higher prices for CPG products. Additionally, CPG producers may have to reduce their margins to keep their prices competitive.

Promotions can offer customers discounts on CPG products, allowing them to purchase more items with the same amount of money. Less expensive brands will rise in popularity as customers manage their budgets and have a way to purchase their products without breaking the bank. That's why it is crucial for established CPG companies to use promotions as leverage to counter less expensive brands.

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# Boost your overall efficiency by deploying an MES

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To counter inflation and meet customer expectations, prices must remain as constant as possible. This in turn means that it becomes more important to make manufacturing operations lean and to save costs.

Efficiency is key when it comes to CPG manufacturing. When a manufacturing process is efficient, it allows for better control of resources, increased productivity and improved customer satisfaction.

By streamlining the process, CPG companies can reduce waste and rework, which leads to fewer resources being consumed and building the cornerstone for sustainability and overall efficiency. This leads to significant cost savings, allowing companies to invest more in other areas of the business, such as research and development (R&D). Increasing productivity shortens time-to-market, enabling manufacturing plants to secure time slots for post-production changes or to take on additional orders.

Overall equipment effectiveness (OEE) is an important key performance indicator (KPI) used to measure the performance and efficiency of a production process. It is used to evaluate the effectiveness of the production line and identify areas for improvement. OEE gives an accurate indication of machine performance and direct product quality.

By focusing on improving the OEE, CPG manufacturers can identify and eliminate waste in their production process. By

measuring the performance of the machines, manufacturers can determine the root cause for machine stops and look for ways to avoid them. The OEE also helps to identify areas that harm product and packaging quality. By identifying and addressing these issues, CPG manufacturers can further reduce costs and improve efficiency. The implementation of a manufacturing execution system (MES) plays an important role in improving OEE. Using an MES provides real-time visibility into work order management. By connecting seamlessly with scheduling systems upstream and the automation layer downstream, the MES enables the user to oversee the entire production process. The MES is used to manage full traceability and genealogy through the entire value chain. This enables companies to optimize their operations, reduce waste and improve quality.

Using data and information from the manufacturing process, the MES gives real-time insights into the OEE for different production lines and machines. This way, the MES helps companies track and monitor production processes and identify areas of waste, inefficiency and quality problems.

Lean management is another way of creating an efficient production system that can eliminate or minimize wasteful steps or processes. You can use MES to accelerate the process of establishing lean management in the plant as optimizing work orders is one key element in eliminating all types of waste: overprocessing, movement and

inventory. Integrating the MES opens doors to opportunities, which leads to more efficiency in the manufacturing process.

To take the efficiency of manufacturing processes to the next level, the power of low code can be leveraged to personalize the user experience of the MES. Manufacturers can take ownership of personalizing the user experience, resulting in more efficient operations. Using low code, the MES becomes a tailored solution, answering specific user needs. Many industries face specific challenges and have different MES needs. This can be done by using a variety of out-of-the-box (OOTB) user experience (UX) templates. These templates can be implemented and utilized as is, or they can be treated as a baseline and further personalized. They should be role-based, industry-specific and process-centric.

Leveraging the multi-plant capabilities of the MES, manufacturing processes can be standardized across countries. This is due to the creation of solution hubs that connect to global sites and consume the solution, which further increases efficiency.

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# Embracing sustainability

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Due to the continued growth of world population as well as its impact on the climate, sustainability is extremely important in the CPG industry. It is being driven by decarbonization, the circular economy and realizing the impact on our environment. With a growing population comes a higher demand for goods and resources, leading to environmental degradation and resource scarcity.

With the rise of environmental awareness and concern, consumers are more likely to consider a product's eco score when making a purchasing decision. As they become more educated and aware of the environmental and social impacts of their purchasing decisions, consumers are also increasingly looking to purchase products that are produced and packaged sustainably and responsibly using locally sourced raw materials.

As an example, some jar manufacturers use 100 percent beeswax that can be transformed into a candle. Promoting sustainability initiatives, such as eco-friendly packaging and highlighting their commitment to sustainability on their packaging and labels, is becoming increasingly important. By doing so, an increasingly sustainability-conscious consumer can be satisfied.



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# Embracing sustainability

## Incorporate sustainability into your product from the beginning

As the demand for sustainable products and manufacturing operations is on the rise, companies must find ways to introduce them into their product lines. By taking proactive steps to design, produce and promote products that are sustainable, companies can not only meet customer demand but also reduce their environmental footprint.

One of the most effective methods of introducing sustainability into products is to use sustainable materials. Companies can do this by choosing materials such as upcycled materials, which are eco-friendly and have a smaller environmental impact.

Another essential part of product development is the packaging. It is a major source of waste in many CPG products. Companies can easily introduce sustainability into their products by reducing packaging.

Newly introduced energy-efficient production techniques can also affect environmental impact by minimizing waste and emissions. This can help to reduce their environmental footprint, while also making the production process more efficient.

While aiming to establish a corporate sustainable identity from a product and process perspective, the key challenge to all those R&D activities remains time-to-market. By being efficient in product and process development, CPG companies can rapidly meet the consumer's demand.

The use of digital solutions in R&D has revolutionized the way products are created and developed. They help support better collaboration between teams, automate processes and enhance access to real-time data to make better decisions. By leveraging the power of digital technologies, CPG companies can gain a competitive advantage in product design and production as well as improve the customer experiences and satisfaction.





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Digital solutions can be used in R&D to facilitate the product development process. Digital tools such as product lifecycle management (PLM) software can be used to simulate the impact on product performance in a digital environment and drastically decrease the number of prototypes. This allows companies to iterate quickly and reduce the time and cost associated with product development. Making trial tests with recycled materials is now not only time efficient, but also less expensive.

Furthermore, by integrating existing systems and data, organizations can improve the speed and accuracy of product development. This can include developing better models for testing, creating better user experiences and optimizing the development process. Additionally, digital solutions can be used to create virtual environments for testing and simulations, allowing organizations to better understand how their products will perform in the real world before launching them to the public. This prophylactic approach allows for less waste. The advantage is throughout the product lifecycle it is possible to make changes to save costs in manufacturing before even creating a prototype. With the data taken from the simulations, the newly acquired know-how can be used to further the process.

**With the rise of environmental awareness and concern, consumers are more likely to consider a product's eco score when making a purchasing decision.**



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Product customization in CPG manufacturing is important because it allows companies to meet customers' specific needs and preferences. This can help to improve customer satisfaction and loyalty, which can lead to increased sales and profits. Customized products give manufacturers the opportunity to create a unique value that is not available in stores, allowing them to express their individuality and stand out from the crowd. It can also help to differentiate a company's products from the competition and make them more attractive to consumers. However, customization leads to producing smaller batches of products that are tailored to specific consumer segments – bringing complexity into the manufacturing process.

Personalization leads to a stock keeping unit (SKU) explosion for manufacturers, resulting in a decrease in efficiency in manufacturing. As the number of SKUs grows, there is an increased need for production line flexibility to accommodate the changing mix of products. This can lead to increased costs due to the need for additional equipment, staff and training.

Another challenge can appear in supply chain and inventory management. As the number of SKUs increases, the demand for each product can become more difficult to predict and manage. This can lead to issues with overstocking or understocking, which can result in increased costs due to excess inventory or lost sales due to stockouts.

## **Optimizing planning and scheduling to manage a broad product portfolio**

A high product variety has a significant impact on planning and scheduling. CPG companies that have many SKUs can have difficulty managing them in production, which leads to a decrease in efficiency and accuracy.

CPG manufacturers must frequently produce multiple products on the same line, often with different production requirements. High product variety has a significant impact on both changeover and cleaning in a manufacturing site. This is because each product likely has different production requirements, such as tools, materials, settings and instructions for the production line. Therefore, these changes must be made each time a new product is run on the line. This process takes a significant amount of time, which increases production costs and reduces efficiency.

Cleaning is another process that is impacted by a high product variety. Cleaning is necessary to prevent product contamination and ensure quality control. In the food and beverage (F&B) industry, manufacturers frequently switch from product to product on the same lines. Therefore, the cleaning process must be tailored to each product but organized in the most efficient way to reduce cost and complexity. For example, when manufacturing chocolate, as part of a broad product portfolio with many ingredients, it cannot be stressed enough how important the cleaning process is to safety. Since some variants might contain nuts, it's crucial to clean and





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swap the equipment before switching over. If too many traces of nuts are present on the line after cleaning, a severe food safety incident might occur due to the contamination of the nut-free batch for people suffering from nut allergies. This makes production planning and scheduling important as it mitigates these issues.

When switching to smaller batch sizes, CPG manufacturers must reduce the complexity of their manufacturing process. By integrating software for a better overview, it is easier to switch between product types and keep the overview of the operations in the plant. This way, a higher variety of products can be managed efficiently and cost effectively.

Digital solutions help manufacturers with scheduling and planning by providing them with a streamlined and more efficient way to organize and manage their production processes. By using digital solutions, manufacturers can easily create and optimize production schedules, track production progress and manage their production lines. These digital solutions can also monitor inventory levels and identify areas of improvement for production. Additionally, digital solutions will help manufacturers to reduce costs by streamlining their production processes and reducing labor-intensive and time-consuming changeovers with extensive cleaning. They also provide manufacturers with the ability to quickly and easily adjust production schedules to meet changes in customer demand. This helps manufacturers to remain agile and competitive in their manufacturing process, effectively mastering the exploding SKU.



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# Managing quality on a global scale

Globalization has had a tremendous impact on the manufacturing industry as it not only changed the way products are created and delivered but also altered the landscape of the entire industry.

This impact has increased competition and opened access to new technologies and labor pools. Although this approach has enabled new markets, from a global perspective logistical difficulties and new suppliers with different materials have resulted in manufactured products with fluctuating quality standards.

When it comes to the quality of products produced by a company, it is often assumed the same formula and processes used in one area should result in a product of the same quality no matter where it is produced. However, that is often not the case.

The reasons for this can vary, but some of the most common are differences in regulations and the availability of certain raw materials. For example, a company may not have the same quality standards for their production facilities in different countries due to different local regulations. This can lead to inconsistent quality between certain geographical regions.

CPG companies must comply with local laws and regulations as well as any applicable international standards. Additionally, they must ensure their suppliers and subcontractors are adhering to the same standards. Ensuring compliance can require significant time, money and staff.

Sharing know-how can be hindered by travel restrictions as well as language and cultural barriers. Companies with employees in different countries often require multiple translations of information, which is costly and time-consuming.





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# Managing quality on a global scale

## **Using traceability to secure quality and product safety**

A global manufacturer can guarantee the same quality standards all over the world by implementing and maintaining a consistent quality management system. This system is designed to meet international standards and be accessible to all employees, regardless of their location. Additionally, the system should be regularly audited and updated to ensure that it meets the changing needs of the business.

The quality management system is designed to ensure that all processes and procedures are standardized. This includes everything from raw material selection to production processes and quality control measures. All employees should be trained on the same standards and have access to the same tools and resources. By collecting data, the standardizing process can be accelerated. Therefore, comparing data that is acquired during the manufacturing process allows for finding the root cause of the deviation: was the raw material contaminated, did the machines show an error code or did the machine operator mix something up? As you read through those questions you realize that meeting the golden batch standard for the product is a challenging imperative.

As the CPG industry is vulnerable to recalls and reclamations, it cannot be stressed enough how important it is to use controlling measures before manufactured products leave the plant. Comparing contextualized feedback on quality parameters from the laboratory with the golden batch standard allows the manufacturer to target excellent quality and avoid recalls.

Another important part is product traceability. Since customers are increasingly invested in learning about the products they purchase, the genealogy of the product, in other words knowing where the different materials come from and what batch they belong to, has great significance for CPG manufacturers. With the help of digital solutions, linking the final product to the origin of the materials becomes transparent and graphically visible.



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# Leaving the competition behind

The CPG market has become highly competitive, as companies are continually looking for ways to differentiate their products to gain and maintain market share. Consumers have more choice than ever before, making it increasingly difficult for companies to stand out and capture the attention of shoppers. The global CPG market has seen an influx of new competitors, particularly from emerging markets. This increase was largely driven by the quick rise of new players from regions such as China, India and Southeast Asia. Therefore, companies are investing in new technologies, product lines and innovative marketing strategies to remain competitive. Consequently, CPG companies need to focus on increasing the efficiency of their internal value stream. Additionally, companies should look to partner with other businesses to reduce costs and improve delivery times.

To maintain high production standards, reduce costs and increase customer satisfaction, CPG manufacturers should introduce continual improvement cycles on the shop floor. Continually improving manufacturing helps management identify and eliminate any potential bottlenecks or problems that may arise during the production process. This will lead to increased efficiency, improved quality and consistency and reduced costs. In this context, it is crucial to leverage contextualized data to realize a decisive advantage over competitors.

## **From contextualized data to continual improvement**

In addition to the challenges we have covered thus far, CPG companies need to focus on increasing the efficiency of their processes and supply chain. This can be done by leveraging technology to automate processes, optimize inventory management and streamline the delivery of goods.

Data and analytics are used to create more accurate demand forecasts, track and analyze production costs and identify inefficiencies in the process. Additionally, data analytics can be used to optimize production schedules, identify and reduce bottlenecks and improve inventory management. By utilizing data and analytics, manufacturers gain a better understanding of their operations and make more informed decisions to improve the process. Using data to enhance the manufacturing processes in the plant results in a great leverage effect when it comes to continual improvement.

Manufacturing intelligence enables customers to connect, organize and aggregate manufacturing data from multiple company sources into cohesive, intelligent and contextualized information to help gain immediate and actionable insights. The information includes process data combined with business information, operational data and KPIs.

When speaking about contextualized data and continual improvement, one must step back and evaluate the process occasionally. With the help of artificial intelligence (AI) and machine learning (ML), the user can rate the setup of the production lines in the plant and their productivity. Using data to simulate the process in a comprehensive digital twin brings more efficiency to the manufacturing site as ergonomics are improved and collaborative robots are integrated into the line. Based on OEE, we see better results for quality and availability as well as increased productivity in the plant.





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Manufacturing intelligence offers users a big-picture perspective of the information, providing CPG industry-specific, out-of-the-box, web-based dashboards, accessible from anywhere. This enables the user to explore the data, allowing them to spot trends and other data relationships that otherwise may not be apparent when looking at spreadsheets or reports. Moreover, the product allows the user to design entirely new customized dashboards, answering the customers' needs.

This assists with achieving quality improvements in first-pass yield, reducing scrap and identifying the root cause of quality issues. From a productivity standpoint, the OEE can be optimized by improving throughput, asset utilization, time and labor.

Due to the accessibility of contextualized data, data-driven decisions are executed more effectively. As the CPG industry is dependent on know-how, the use of data in decisive action greatly affects the outcome. The company can receive no better advice for making decisions than data that has been generated by their own manufacturing process.

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Siemens Digital Industries Software now offers its harmonized MOM solutions in one portfolio, Opcenter™ software, to enable the digital transformation of manufacturing. The portfolio encompasses integrated MOM capabilities, including advanced planning and scheduling, manufacturing execution, quality management, manufacturing intelligence and performance, and formulation, specification and laboratory management. Using Opcenter enables you to consolidate legacy solutions with best-in-class technologies throughout a coherent MOM portfolio that helps customers meet demands for production efficiency, quality, visibility and reduced time to production.

Opcenter is part of the Siemens Xcelerator business platform of software, hardware and services.

Using Opcenter adds value by incorporating benchmark technologies and industry-specific capabilities in a portfolio that is easy to deploy, configure, extend and integrate with other systems across the value chain, including PLM, enterprise resource planning (ERP) and shop floor automation solutions for closed-loop manufacturing. With Opcenter, the company delivers a holistic solution that enables manufacturers to implement strategies for the complete digitalization of manufacturing operations. The portfolio has wide recognition and a solid installed base, and continues to serve major players in industries such as aerospace and defense, automotive, industrial machinery, heavy equipment, chemicals, consumer packed goods, food and beverage, life sciences, electronics, semiconductor and medical devices.

## Using digital solutions to meet customer requirements

Regardless of factors such as inflation, the drive for sustainability or customer-specific wishes, purchasing behavior remains an externally influenced driving factor in the CPG industry. To react to changing customer behavior, integrating digital solutions is the key factor to making decisions and adapting to customer needs in the best possible way. By using MOM systems, efficiency can be increased, new products can be developed more quickly and the exploding number of product variants can be controlled. This enables CPG companies to not only stand out from the crowd but simultaneously meet the needs of customers, such as sustainable products, individuality, innovation and quality. Using this supports the holistic optimization and adjustment of production to meet customer demands and maximize efficiency.





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