Highlights from an American Virtual Roundtable on

Improving Productivity with Predictive Process Analytics

▶ Disclaimer

The participation of the industry panelists in this roundtable is for educational purposes only and does not represent an endorsement of GE Digital, its products, or any other platforms and resources used in their digital journey.

▶ Executive Summary

On September 15, 2021 GE Digital and the FSO Institute conducted a virtual roundtable discussion with nearly 25 Americas consumer packaged goods companies (CPG) on "Improving Productivity with Predictive Process Analytics." The focus of the roundtable was on both the challenges consumer packaged goods manufacturers face and the solutions they've put in place to meet an ever-increasing consumer demand and proliferation of SKUs. Highlights and key takeaways from the roundtable can be summarized as follows:

- **Building a comprehensive, compelling business case** is essential to beginning the journey to predictive process analytics.

- **Getting better visibility into production operations, measuring losses, and realizing the true performance of assets** (actual and possible) are primary targets for utilizing predictive process analytics.

- **The newest technologies (artificial intelligence, machine learning, edge devices, etc.)** are already available for implementation to help accelerate the predictive process analytics journey.

- **Determining what the goals are of a predictive process analytics initiative and why** are the first critical questions to ask.

- **Start with the plant floor operators first** and build a team around them, the IT (Information Technology) department, and other critical stakeholders to ensure the initiative's success.

- **Adopt a "walk-to-run" strategy** by utilizing resources and systems already in place and remember that the process is a journey that takes time – there are no silver bullets.

- **A predictive process analytics initiative that doesn't resonate with plant-level associates is doomed to failure** as it is those associates who must buy in, own, and advocate for the system.

- **Don't move too fast and expect immediate results.** Instead, look for incremental improvements, the results of which may fund future projects.

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About This Roundtable

The proliferation of SKUs driven by consumer demand coupled with the "thinning" or downsizing of consumer packaged goods companies has put tremendous pressure on CPGs to do more with less than ever before.

This was certainly the case prior to the global coronavirus pandemic, but as seen during the past year the pressure has intensified significantly due to lockdowns, working from home, new e-commerce demands, supply chain disruptions, and widespread product shortages. Predictions point to a heightened continuation of this trend in the future.[1]

Accordingly, CPGs are looking for opportunities to improve productivity including: new technology applications, LEAN principles, outsourcing, new equipment design and changeover improvements, just to name a few. The roundtable focused on process analytics – how CPGs are gathering/using data and for what purpose – as a means of improving productivity.

Participants heard from a panel of experts in food and beverage manufacturing about the greatest challenges they face and the most effective solutions they have put in place when it comes to process analytics in addressing the SKU demand challenge.

Topics discussed included: the use of process analytics for improving production volume, improving product quality, reducing downtime, determining true production costs, and return on assets, among many others. There was also a special focus on stating the business case, linking business goals, and process analytics.

This unique 90-minute format featured input from the panelists to help jump-start participants' thinking. So that participants could get the most from the roundtable, they were invited to share their own challenges, solutions, and results.

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[1] *The CPG Post-Pandemic Outlook: Five Trends Emerging From COVID-19 That Will Redefine the Industry.* Consumer Brands Association, 2021.

▶ Consumers in Charge: A Pull Model of Manufacturing

Over the past several years, the FSO Institute in cooperation with Packaging Machinery Manufacturers Institute (PMMI)'s OpX Leadership Network has conducted multiple focus groups with hundreds of CPG manufacturers in order to keep abreast of and document the most significant issues affecting them on a day-to-day basis. The culmination of these many focus group discussions is shown in the supply chain dynamics of the Pull Model of Manufacturing shown in the Appendix. A quick review of this model was provided in order to help put the Americas Roundtable topic on SKU demand in a broader perspective.

It shows how consumer demand impacts upstream stakeholders including retail and distribution, CPG product manufacturing and Original Equipment Manufacturer (OEM) equipment manufacturing. It is the CPG product manufacturing piece of the puzzle shown in the Pull Model of Manufacturing that is the focus of the Americas roundtable topic, especially predictive process analytics.

Additional issues discussed include:

- Innovation
- Equipment Costs
- Skilled Workforce
- Leaning (Thinning) of American Manufacturing
- Regulations and Standards
- Collaboration and Process Improvement
- Globalization

Important to note; this model reveals CPG thinking in a pre-COVID environment. A recently released study by the Consumer Brands Association reports that CPG sales will remain well above pre-pandemic levels going forward, though they will retreat slightly from levels observed during COVID lockdowns.[1]

> *There is no 'normal' to which the industry will return—urgent transformation is the only way forward.*
>
> *– Geoff Freeman*
> *CBA President and CEO*

▶ What Participants Wanted to Know About Predictive Process Analytics

To help jumpstart participants' thinking on the challenges they face regarding SKU demand and to ensure that the panelists addressed them, participants shared their concerns in a pre-roundtable exercise that was then previewed by all parties. Here are some of the things attendees wanted to know about predictive process analytics:

• How to use analytics to manage multiple SKUs and decrease variability and changeovers in production operations

• How to use data effectively and determine usage goals

• How to make a compelling case for digital transformation – what are the benefits, how can attendees convince leadership

• How to use data to better design processes and modify approaches for process control during day-to-day uses

• How to determine the variability in production operations and use data streams to lessen variability

• How to take human error out and improve efficiency as much as possible

• How to get reliable information from different data streams

• How to leverage predictive opportunities and capitalize on data collected

To help answer these and other questions about how predictive process analytics can help address the challenges of ever-expanding SKUs, the following panelists shared their insights:

Panelists

Jim Prunesti, Sr. Vice President Engineering – *Conagra Brands*

James Couch, Director of Equipment Engineering – *Smithfield Foods*

Cobus Van Heerden, Product Manager Analytics – *GE Digital*

Stating the Business Case for Predictive Process Analytics

The most significant reasons for adopting predictive process analytics are:

- **The need for a visionary system that will capture trends and performance and present information to allow for adjustments before an issue arises.** As an example, the automotive industry has built predictive safety and maintenance features into cars. This has improved their business and presents a vision for use within a CPG operation.

- **Providing an opportunity to get better visibility on losses – small losses cumulate to much larger ones as greater visibility into them shows.** Getting better visibility is like looking through a telescope versus binoculars or wide-angle lens. The business case should clearly show these losses and how they adversely affect the business.

- **Determining the true performance of assets measures the real cost of downtime (asset reliability) and performance improvement or overall equipment effectiveness (OEE).** Incremental improvements can add up to big savings when measured properly and can reinforce the business case to be made.

- **Interpreting the complexity and variability in production operations.** Understanding how the manufacture of multiple SKUs is affecting productivity and profitability is made simpler by predictive process analytics. Predictive process analytics data outputs show where business improvements can be made, strengthening the business case for investment.

- **Taking advantage of the newest technologies and the next evolution of equipment intelligence.** Machine learning, AI (artificial intelligence), AR (augmented reality), edge devices, and automated controls all rely on analytics that can readily be used to improve production operations. Their dependence on analytics reinforces the business case.

- **Informing the timeline for improving production operations.** Any plan for improving productivity should be accompanied by a timeline for its implementation. Predictive process analytics are a part of that cadence and add value to the business case.

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Getting Started: How to Begin the Journey to Predictive Process Analytics

1. **Assess goals and reasons for implementing a predictive process analytics initiative.** Get teams aligned on these two factors and then work backwards for implementation.

2. **Determine who the system is for – empowering the plant floor workers!** While senior executives need to see the value of predictive process analytics, once approved, it is important that the system drives actionable information that can be used on the plant floor. Empowering people on the floor to take action is critical from the outset on the journey to predictive process analytics. Operators should not see analytics as a threat, instead they should feel empowered to optimize and automate their tasks using their experience and expertise. Predictive process analytics are tools that help them be more successful at what they are already doing – resulting in added adding value to the company. Floor workers will be able to make better informed decisions faster.

3. **Form a team of stakeholders, especially IT (Information Technology) associates.** The IT and OT (Operational Technology) relationship is particularly critical in the successful implementation of predictive process analytics. They should work closely together as their common space grows larger. Relationships with suppliers are also critical.

4. **Create new operational standards.** This can be particularly challenging when blending new equipment with legacy equipment, but a future focus must prevail as new technologies come on board. Managing obsolescence can also pose a huge problem as legacy systems are no longer supported by suppliers.

5. **Decide where to start.** When thinking about embarking on a digital transformation journey consider this question: "Where do I start and where does it make sense to start?". There may be disparate systems that need processes built for information extraction. Plant-level operators are a great place to start as they know the operations better than anyone else and can help identify where the greatest needs (improvements) are.

6. **Build the system from the bottom up.** Change management will occur at all levels but begin with the floor operators first. Resist the urge to drive change

from the top down. Include floor-level operators in the early formation of the predictive process analytics design team(s).
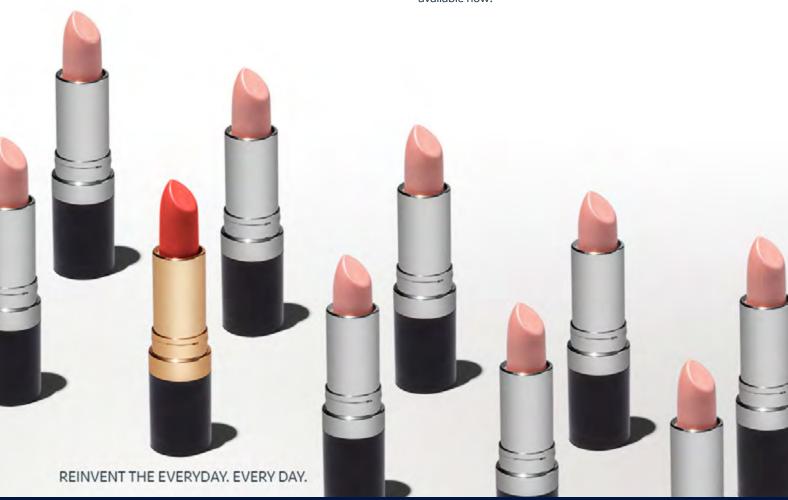
7. **Leverage what already exists.** Typically, 10% or more savings on OEE can be achieved without investment in equipment, simply by enabling better decision with existing data.

8. **Focus on waste.** Realize savings and increase production efficiency through waste reduction, reduced quality defects, and rework costs. Sometimes this may justify spending more on materials to improve productivity while maintaining cost savings.

9. **Look ahead, not in the rear-view mirror.** Rather than investing millions of dollars into evaluating yesterday's performance, use historic information to determine immediate and future action.

10. **Adopt a "walk-to-run" strategy.** Use currently available analytical tools to help now with incremental improvement projects that may fund future investments.

11. **Remember, there is no silver bullet to solve all problems.** The journey to predictive process analytics is one that involves testing and iteration for success.

Watch Outs: Things to Look Out for When Considering Predictive Process Analytics

- **The initiative does not resonate with floor-level operators.** One way to avoid this mistake is to include a wide, representative group of people when forming the analytics team. Include all functional areas in the plant, leadership representatives, suppliers, outside advisors, etc. from the beginning. There should be a special emphasis on selecting the correct applications based on operational and business needs and not on territory and/or internal politics.

- **Moving too fast and expecting immediate results.** It is crucial to develop a road map with a timeline for a digital transformation journey. Random, impulse moves not linked to the plan create confusion and distraction from a carefully laid out process. Expect the process to involve testing and iteration.

- **Incremental improvements are best.** Don't make the mistake of expecting a perfect "big bang" approach to predictive process analytics. Don't wait for perfection, incremental improvements are best practice.

- **Trying to do things alone.** Leverage relationships with IT and with trusted outside vendors to ensure success. Everyone must be on the same trajectory. Involving all stakeholders ensures understanding and rapid implementation of new and improved processes.

- **Focusing on the wrong information.** Information at the lowest level must be available to make data-driven decisions. Focus on this type of information first and then focus on how to roll up the information for senior executives who simply want to know if this new initiative is working or not. Remember, operators need real-time instantaneous information to improve productivity, so be sure that the system can provide it.

- **Failing to consider the newest technologies for predictive process analytics.** AI is created with "machine learning", a "deep learning" process that uses information to make data-driven decisions. These technologies are available now!

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The Simplest Path Forward to Predictive Process Analytics

Predictive technologies are here and being increasingly adopted. In one use-case for a food and beverage company GE Digital saw a 10% increase in operational efficiency after implementing analytics solutions.[2] To enjoy similar results, remember:

• There is no perfect solution for each area of a plant and organization, only continuous improvement.

• The executive, operations, and IT teams need to come together, agree that digital is important, and that transformation may be a multi-year journey.

• It is important to empower staff at the lowest possible levels for rapid incremental improvements.

• Use existing information first.

• Frame AI and machine learning as tools to enhance the team's work. Reassure them that it's not here to replace them, it's here to empower them. These solutions are meant to take away mundane tasks so they can become subject matter superheroes.

[2] Blog: Close the Productivity Gap with Overall Equipment Effectiveness, GE Digital, 2020.

APPENDIX

Pull Model of Manufacturing

1 CHANGING CONSUMER DEMANDS
- Personal Choice
- SKU Explosion
- E-Commerce
- Digital & Social Media

2 RETAIL & DISTRIBUTION DEMANDS
- New Product & Packaging Configurations
- Changing Retail Formats & Channels
- New Distribution & Delivery Methods
- Economics & Durability

4 OEM EQUIPMENT MANUFACTURING DEMANDS
- Innovation
- Collaboration
- Process Improvement
- Entire Supply Chain Focus

3 CPG PRODUCT MANUFACTURING DEMANDS
- Innovation
- Equipment Costs
- Skilled Workforce
- Rapid, Cost-Effective Change Overs
- Multi-Functional Equipment
- Leaning of American Manufacturing
- Regulations & Standards
- Collaboration & Process Improvement
- Globalization

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