IDC
ANALYZE THE FUTURE

# DIGITAL TRANSFORMATION IN PROCESS MANUFACTURING

## How Intelligent ERP can Help Close the Information Gap and Achieve Traceability across the Supply Chain

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IDC #EUR146174620

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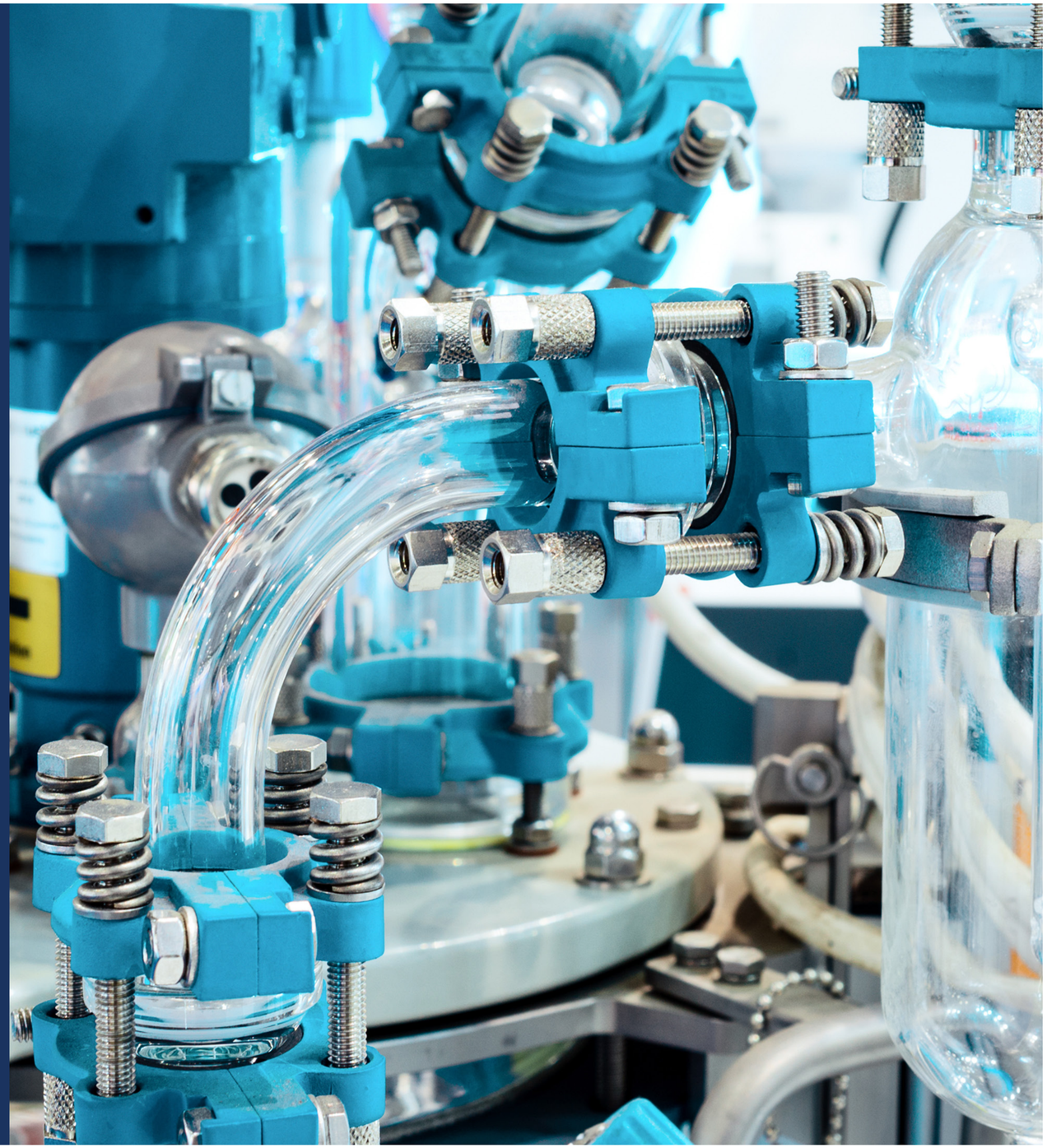


# Why read this InfoBrief?

1

To learn how IT infrastructure legacy is holding back process manufacturers from managing quality, inefficiency and the threat of costly recalls and associated repercussions.

2

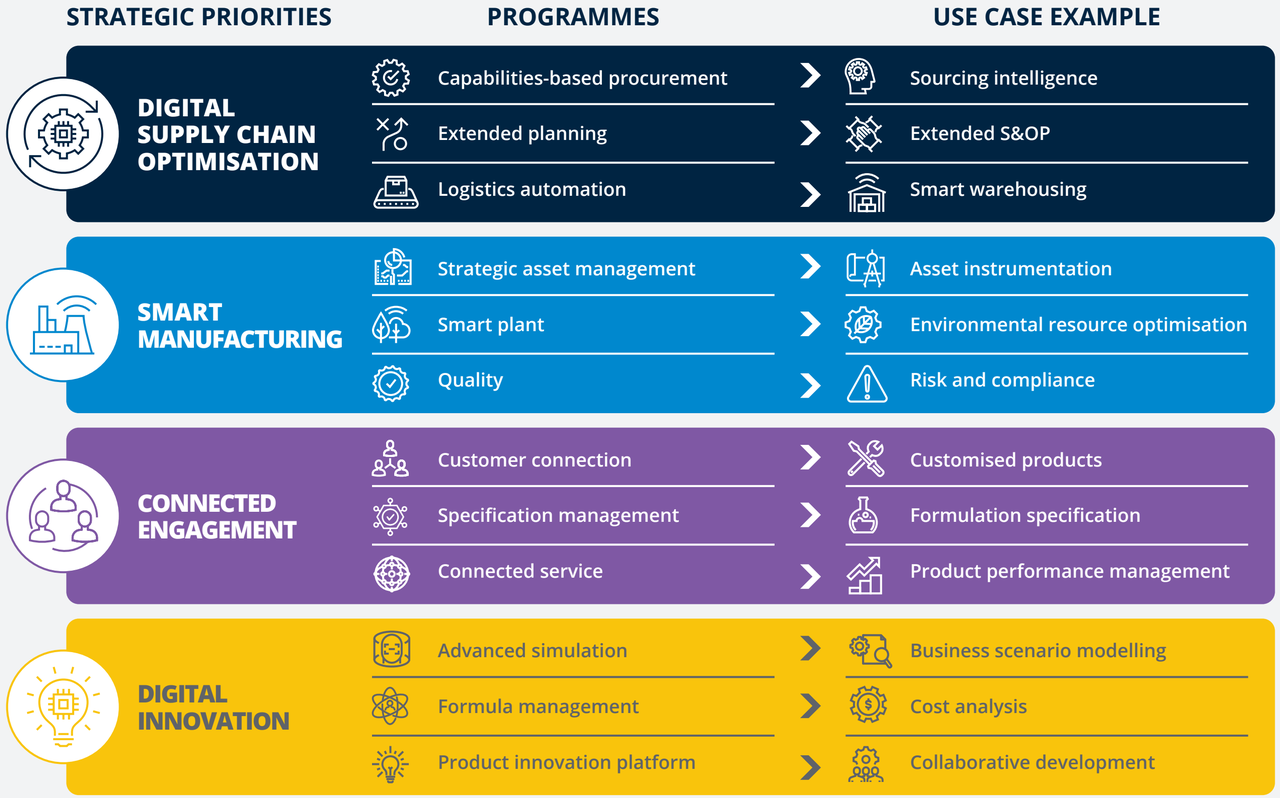
To discover how a new generation of ERP can become central to operational processes in the process manufacturing industry, helping companies to trace the whole supply chain as well as all the information relating to the product as and when needed.

3

To review two case studies and learn more about IDC's recommendations for process manufacturers that want to succeed with the digital economy.

# Traceability is vital to managing quality, inefficiency and the threat of recalls

## How process manufacturers can meet customer demands through the application of digital technology




## Transformation as the new modus operandi

The digital mission for companies in this space is **formula and recipe management**, and driving overall **value chain improvements**. The emphasis is on delivering an ecosystem-driven approach to innovation where value stream stakeholders work together to deliver new products, improved processes and innovative business models.

**Accelerating product life cycles** and achieving **process efficiency** are placing pressure on process manufacturers to do more with less — and faster. This transformation is about delivering a collective approach to meeting the demands of the customer through the application of modern digital technology, including IoT, artificial intelligence and machine learning.

## Why traceability matters more than ever

As process manufacturers move closer to the final customer, which comes with a greater focus on **mass customisation**, their **accountability for quality** increases as well. This requires the capability to access the complete product history, including handling and production steps, in case any **quality**, **safety** or **sustainability** questions are raised throughout the manufacturing supply chain, at **any given point in time**. Being able to respond to such potential issues both internally and externally is what drives **reputational value**.



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# Process manufacturers are addressing operational challenges by building operational performance, reducing cost, and exploring new market opportunities

To juggle a multitude of operationally complex challenges — from quality assurance all the way to the traceability of a batch — **US companies** balance operational performance with cost mitigation, while identifying new markets to expand into.

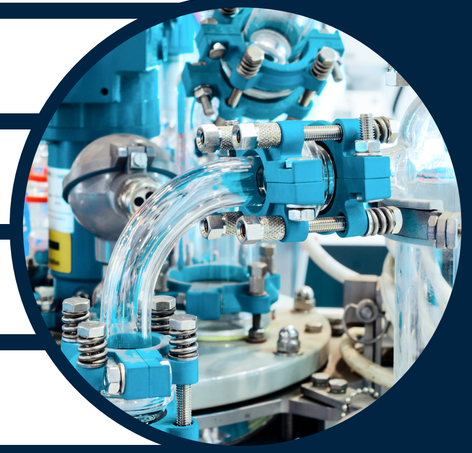
Process manufacturers in **Europe*** are entirely aligned with these business priorities.

By comparison, manufacturers in **Asia/Pacific**** have similar priorities but specifically point out **increasing competition** and **demand variability** as focal points.

These business priorities will continue to drive IT investments and digital transformation initiatives.

## Process manufacturers' key operational challenges:

- Evolving regulatory environment
- Investment-intense assets
- Asset maximisation
- Quality of material, process and outputs
- Smart batch/ traceability of batch
- Risk management



## How the market is responding to these challenges:

*Q. Which of the following initiatives will be significant in driving IT investments at your organisation?*

**PERFORMANCE:** Driving operational performance (EBTDA, revenue, etc.) — **45%**

**COST:** Reducing operational and or product costs — **38%**

**GROWTH:** Expanding into new markets, segments or geographies — **37%**

* IDC European Tech and Industry Pulse Survey 2019–2020, European process manufacturing n = 126
** IDC Manufacturing Insights Asia/Pacific Annual Survey, 2019, APAC process manufacturing = 377

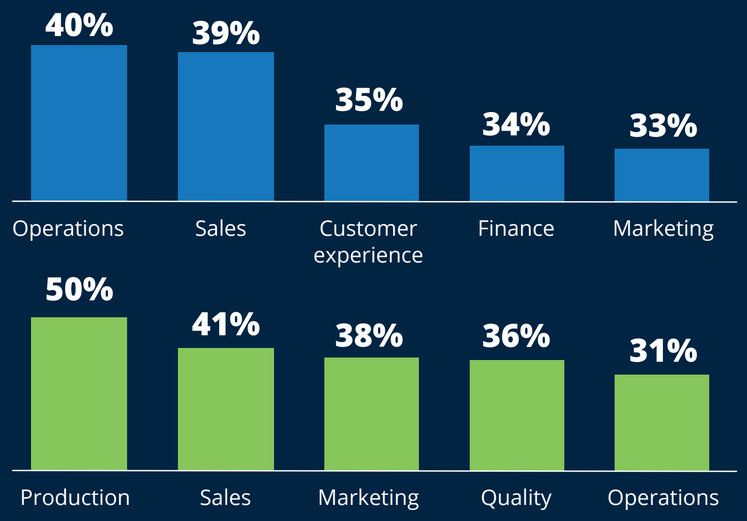
**Source: IDC EMEA, US Vertical Survey, June 2019; total n = 3,607; US process manufacturing n = 290**
**Note: Top 3 ranked responses shown**

# Regardless of the type of process manufacturing, digital initiatives show immediate return on investment for productivity and cost

Not all process manufacturers start their digital transformation journeys the same way. Whereas brand-oriented companies tackle operations (including supply chain and distribution) first, asset-oriented manufacturers prioritise the manufacturing process. Despite these differing approaches, both see an immediate impact on productivity and cost efficiencies. The productivity improvement potential for brand-oriented companies stands out not only in process manufacturing but across manufacturing as a whole.

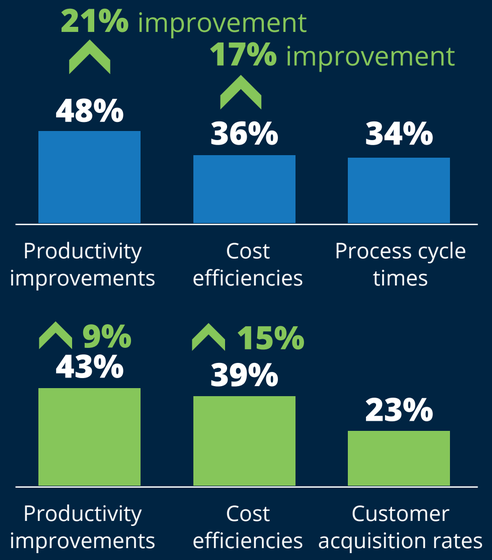
## DX transforms the following functions ...

***Q. Which business support functions are being digitally transformed?***




## ... and yields these benefits ...

***Q. Where have you achieved the biggest benefits from your current DX programmes/projects?***




**Note:** Top 5 answers shown; information technology was removed.

**Source:** Digital Transformation (DX) Executive Sentiment Survey 2019, IDC, August 2019; process manufacturing n = 197, brand-oriented companies n = 101, asset-oriented companies n = 96

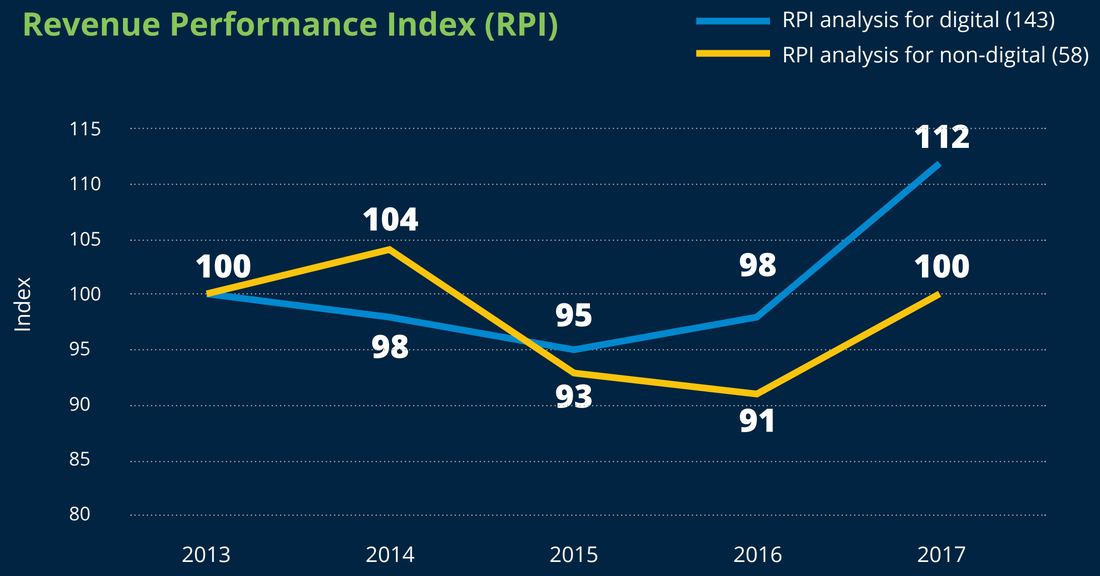
The **number 1 priority** for process manufacturers' DX vision is **operational excellence** (production/ creation of offerings), cited by **55%**.

The most common digital success metric is the **ability to transform and automate business processes**, tracked by **43%** of global process manufacturers.

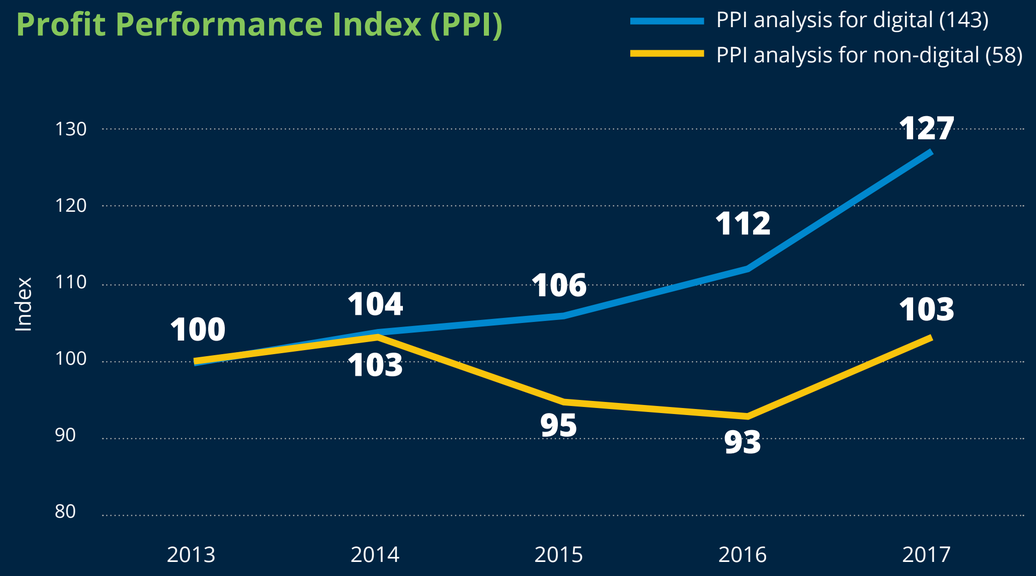
# Looking at the bigger picture, digital transformation is both a revenue and profit booster, causing a divide in the industry

Digital investments pay off. Process manufacturers that have made such investments see a positive impact on their revenues and even greater impact on their profits. In fact, the best-performing companies — armed with a digital-native culture, tools and processes — are speeding away from the rest by raising operational productivity by reducing process waste and complexity. This creates a polarisation effect, with laggards at risk of being unable to sustain their businesses and demonstrate relevancy in today's digital economy. What is holding these companies back?

## Revenue Performance Index (RPI)




## Profit Performance Index (PPI)




### The impact of digital on process manufacturers differs depending on process:

Asset-oriented companies, mostly chemicals producers, rely heavily on internal process efficiencies, so the impact of digital is significantly higher on the bottom (profit) line than the top line (revenue).

Brand-oriented companies, mostly food and beverage in this sample, are volume based and operate on lower margins. As such, digital impact will lead to improved demand/supply balancing, better customer visibility, PoS metrics driven alignment etc., hence more impact will be on the top line (revenue).

***Methodology:***

*The IDC Manufacturing Insights Global Performance Index (GPI) tracks growth metrics from 800+ publicly traded global firms in the manufacturing and retail industries based on the performance of a sample of companies from those subindustries. Estimates by Reuters.*

**Source:** IDC Manufacturing Insights' Global Performance Index analysis 2013–2017

# To compete in the digital economy, the right technology is needed, but process manufacturers are held back by their legacy environments

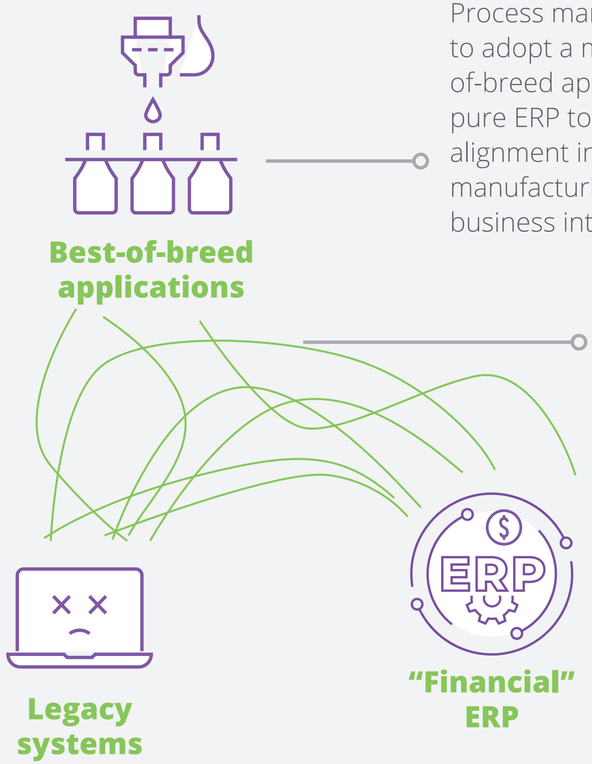
In the past, process manufacturers have invested in **outdated legacy systems**, heavily customised applications and "financial" ERPs — creating a technical debt that is a nightmare to untangle. This archaic ERP heritage, along with the ongoing use of spreadsheets, is what prevents companies from moving forward in their digital transformation journeys — and is one of the key challenges they need to solve.

**In a 2018/2019 IDC study of process manufacturers in the UK:**

Only **12%** admitted their ERP is used the way it was intended.

**The top 3 ERP weaknesses mentioned were:**

- The system is **transactional** and does not offer real-time information.
- It doesn't offer **collaborative or social networking-style features** to increase productivity.
- It doesn't support **fast decision-making capabilities**.




Process manufacturers have had to adopt a multitude of best-of-breed applications beyond pure ERP to augment business alignment in areas such as manufacturing, supply chain, business intelligence and B2B.

Extremely complex interfaces reduce IT efficiency and hinder further business alignment.

"Financial" ERP provides the necessary infrastructure that forms the transactional system of records. ERP is primarily focused on financial transactions, and most process manufacturers already have it: it's an essential "commodity" to run the business.

**According to recent IDC research, at least 40% of companies worldwide are stuck in an ERP technical debt with heavily customised systems.**

# The repercussions of not being able to track and trace product data in the process industry are more costly today than ever before

There are many materials, actions, dates, compliance issues and suppliers to track in process manufacturing. The industry is consuming more information than ever before, but it is not necessarily using it to its advantage. Being able to get access to data in real time and apply it intelligently in the context of business processes will drastically improve value delivered to customers — delivering **safe products** which are **traceable across the supply chain**. This is only possible with the right ERP solution. **ERP helps to close the information gap.**

## Key C-suite and end-user challenges:

**Lack of data accessibility** leads to operational resources spending extra time looking backward instead of at current data, and forces them to perform **manual processes** to fill the gaps.

This causes three business issues ...

- **Inefficiencies**, errors, inflexibility and lack of agility
- Inability to trace **key metrics** across the value chain (e.g., productivity, inventory, booked vs billed, continuous production vs batch)
- **Loss of money** related to missing payment discounts and other cost savings, and inefficient processes

**Nestlé Maggi Recall in India**

In 2015, within a three-month period, Nestlé had to recall nearly 38,000 tons of its famous Maggi seasoning product. This was caused by a 10 times higher than accepted concentration of lead in the product. Maggi lost 80% of its market share and the company had to go to court before it could reintroduce the product.

... and leads to wider industry issues ...

## Industry issues:

- **Inability to respond fast enough** to changing customer needs and requirements in production and the wider supply chain
- **Waste** — risking cross-contamination and costs associated with decay
- **Risk exposure** — related to the quality, traceability, and safety of material and ingredients, and sustainability of suppliers
- **Lack of agility** — in being able to adapt to changing regulations and compliance requirements
- **Lack of resources** — especially production scientists (in charge of formula creation and technology definition/footprint)

... and ultimately this response from the market:

## The cost of the wrong ERP

### Direct costs:

- Recall(s)
- Legal costs
- Media costs associated with contacting customers
- Regulatory compliance costs
- Cost to cover product replacement or customer credit

### Indirect costs:

- Brand damage
- Customer attrition
- Marketing costs to recover market share
- Increased regulatory and testing costs

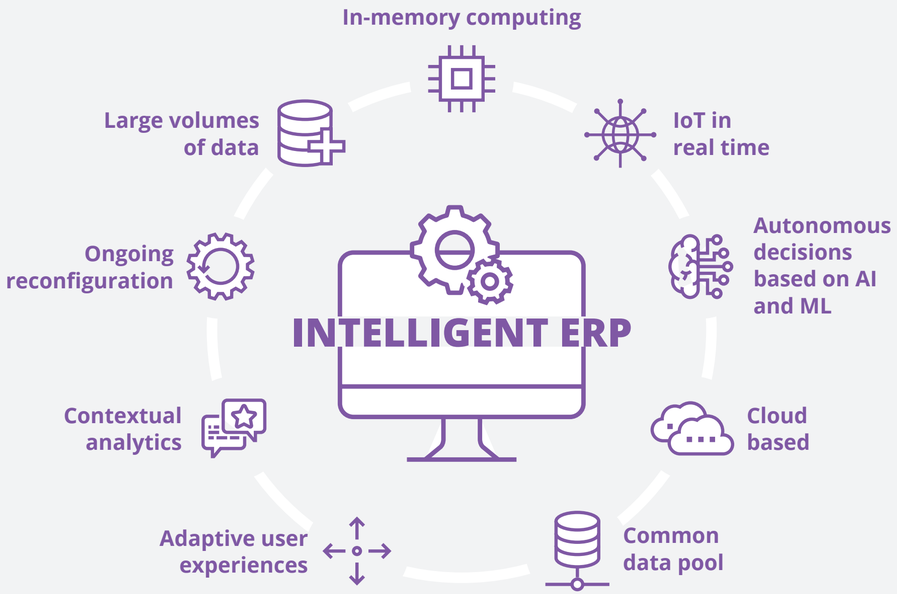
**Source:** IDC MarketScape Worldwide SaaS and Cloud-Enabled Operational ERP Applications 2019 Vendor Assessment

# Intelligent ERP becomes an enabler and strategic decision-making tool in the digital transformation journey

## The ERP market is shifting

Process manufacturers must stop investing in antiquated legacy ERP solutions and start looking into more robust, innovative, responsive and intelligent ERP systems to address their challenges. This new generation of intelligent ERP — iERP — is the future of the business enterprise. The intelligence comes from more information/data, in-context learnings and the application of the knowledge obtained to deliver better business outcomes.

## Key characteristics of iERP:




The features of iERP help process manufacturers achieve new levels of productivity across the organisation

## iERP strategy to maximise business value:

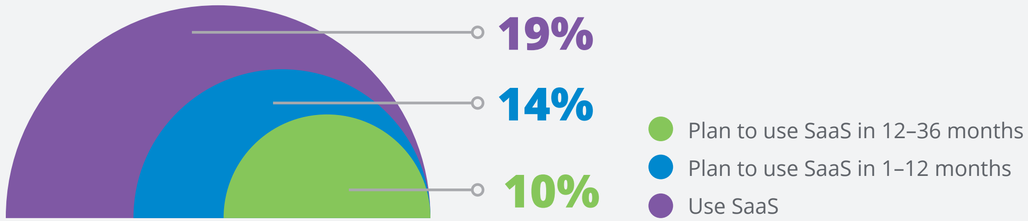

Process manufacturing enterprises can optimise across all resources with iERP systems and applications. The business improves productivity; reduces additional layers of resources in employees, technology and processes; and altogether improves its time to market.

**Source:** IDC, 2020

# Cloud will become the cornerstone of connected data environments

## The industry is still conservative towards cloud adoption

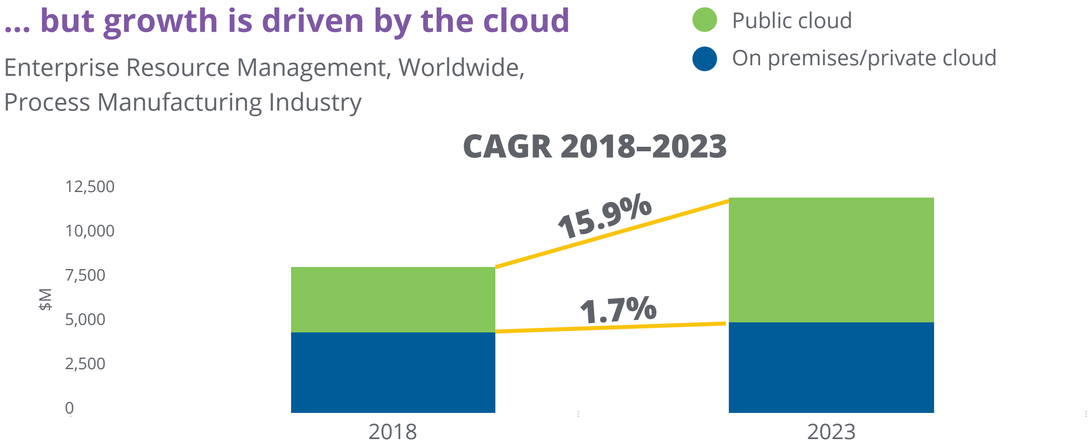
*Q. Does your company use a SaaS application for ERP?*




**Source:** IDC SaaS Cloud Survey, January 2020, process manufacturing n = 175

## … but growth is driven by the cloud

Enterprise Resource Management, Worldwide, Process Manufacturing Industry

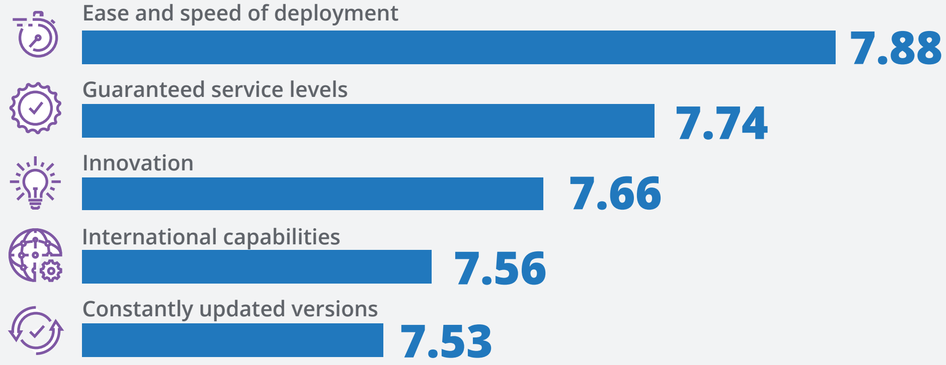



**Source:** Worldwide Manufacturing IT Spending Guide, January 2020

## Cloud ready in your own time:

- Each business has its unique processes and workflows, and some workloads come with their unique challenges as well, all of which affect ERP deployment choices.
- Some companies have already invested in cloud ERP. IDC predicts that, driven by factors such as cost effectiveness and improved functionality, cloud is what will drive ERP growth in the years to come.
- But this is not to say that cloud is the best option for everyone today. Some companies are already enjoying the benefits of having a hybrid cloud approach, enabling them to keep data-sensitive or mission-critical applications on-prem.
- Cloud adoption is a journey; companies should decide the pace of their cloud adoption based on their organisational requirements.

## Top 5 reasons for moving into the cloud




**Source:** IDC SaaS Cloud Survey, January 2020, process manufacturing n = 58
**Note:** 0 = not important at all, 10 = extremely important

# Holding the master data of all products, raw materials and suppliers, ERP becomes the organiser of processes in process manufacturing enterprises

The role of ERP in process manufacturing is **central** to managing and recording formulation and recipes, executing quality control of batches, providing complex gravity calculations, streamlining production, and strengthening customer management. Other manufacturing technologies can benefit from the data ERP handles, including management execution systems (MES).

This is amplified by the fact that there are supporting technologies that enable **seamless collaboration** and foster **decision making** such as advanced analytics and artificial-intelligence-powered engines, which for instance can help manufacturers to model raw materials processing and take efficiency to a new level of accuracy.

| Targets for process manufacturers | ERP | Surrounding business applications | | | | | Supporting technologies | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100% lot tracking per batch over production and supply chain | ERP | MES | | Trac | | | Cld | | | BC | | API |
| Recipe and formula management including specific gravity calculation | ERP | MES | | | | | Cld | AI | | | | |
| Supply chain planning and forecasting — data visibility and transparency in SC | ERP | | | | S&OP | | Cld | AI | | | AA | API |
| Optimised and flexible planning of batch and continuous flow production | ERP | MES | | | PM | CMMS | | AI | IT/OT | | AA | |
| Health, safety and environment in centre of operations | ERP | MES | His. | | | | | AI | | | | |
| Data transparency: insights instead of tons of data | ERP | | His. | | BI | | | | IT/OT | | AA | API |
| Continuous product, performance and asset control | ERP | | | Trac | | | | AI | | | AA | |

**Source:** IDC, 2020

ERP — No ERP per se in place, but works with information recorded from ERP
MES — Manufacturing execution system
His. — Historian
Trac — Traceability SW
S&OP — Sales and operations planning
PM — Predictive maintenance
BI — Business intelligence
CMMS — Maintenance management system
Cld — Cloud
AI — Artificial intelligence/ machine learning
IT/OT — IT/OT integration
BC — Blockchain
AA — Advanced analytics
API — Application programming interface

# In times of disruption, resilience is key to succeeding

## The many faces of manufacturing supply chain disruption

Given the interconnected nature of today's global supply chain and expansive network of production facilities, warehouses and transportation hubs, manufacturing supply chains are more likely to encounter disruptions or breakdowns at more touch points across their supply network.

Manufacturers also face external disruptions, which have become amplified through globalisation. While globalised operations can mean diversification of risk, they also **expose** companies' supply chains to the impacts of regional problems, particularly where those operations play a significant role globally.

Many manufacturers believe themselves to be more resilient than they actually are. For a business to be truly resilient, and to be good at avoiding disruption regardless of the form it takes, it is imperative that it first looks at its own practices and sets in place the appropriate policies, processes and tools.

## The four components of a strategic approach to resilience

**1 RISK ASSESSMENT:**

The vulnerability of the supply chain to both internal and external disruptions

**2 RISK MITIGATION AND RESPONSE PLANNING:**

Readiness assessment and the steps the supply chain has taken to be prepared for potential disruptions

**3 EVENT MANAGEMENT AND COORDINATION:**

The operational capability to effectively manage disruptions and communicate status

**4 TECHNOLOGY LANDSCAPE:**

Enables connectivity, transparency and automation across the wider supply chain

## Resilience comes in different shapes

For some, it may be about **improving inventory performance** (getting to more "agile" inventory); for others, it may be about **visibility** into **mixed factory networks**; and for still others, it may be about **supplier diversification** or even the **reconfiguration of production**.

Between 2020 and 2023, manufacturers worldwide plan to shift their strategy on **being resilient to external disruptions** from 29% to

**44%**.

**Source:** IDC Worldwide Supply Chain Survey, April 2020; manufacturing n = 613

# Case study 1 Empire Candle Co.

How ERP strengthened Empire Candle's business by tackling cost savings and driving far greater efficiency

## Company Overview

**Company name:**
Empire Candle Co.

**Geographic footprint:**
Kansas City, Kansas

**Core business:**
Candle and fragrance manufacturer, founded in 1950

## Background, Key Challenges and Objectives

- In the early 2000s, Empire Candle Co. experienced a resurgence in business, which was a welcome change but came with a number of problems. The expansion of the company had caused inventory and production control challenges in the manufacturing processes.
- Raw materials idled around the warehouse unused for years, while Empire struggled to determine the necessary supplies to meet demand.
- The business needed technology that would help manage its raw materials. According to Austin Mathis, the company's IT director, "Our inventory variances were detrimental to the profitability of the business."

## Actions/Solution

- Empire had implemented Sage X3 in 2008, and even though the company recognised that it has a powerful system on its hands, it knew it was not making the most of the solution. In fact, what Empire heard from other Sage customers was that it was potentially missing out on the value-add available to them by working with a partner on a more intimate level.
- This led to conversations with NexTec Group, a provider of business technology systems and a Sage partner for over 20 years. In its initial visit with the candle manufacturer, NexTec observed Empire's operations and was able to make recommendations on easy-to-tackle problems.
- The core recommendation was to engage in an optimisation project to overhaul some of Empire's practices that had either been poorly implemented originally or had not evolved over time.

## Results and Benefits

- From this optimisation effort, Empire was able to reset critical supply chain, manufacturing and distribution components within the Sage ecosystem, which yielded high-impact results.
- For example, Empire is ordering less, and has less waste sitting in the warehouse today. It is also fulfilling orders more efficiently with X3. More critically, it has finally managed to drive down costs, while driving improved revenue and efficiency.
- As a result, Empire has grown over 300% since implementing Sage X3. After partnering with NexTec, the company saw immediate performance increases, including a 30% reduction in productive labour and consolidation of an entire warehouse facility footprint — an annual saving of around $400,000.

## The Future

- Looking ahead, Mathis sees future needs at Empire for interconnected and ISV solutions. He also wants continual process improvement and ongoing investment in human capital. The company is also on a 24- to 36-month major upgrade schedule to ensure it is utilising the latest that Sage technology has to offer.
- Empire is also looking to the cloud to reach more people and drive more value from its business system.

# Case study 2 Martínez y Cantó

How ERP enabled a tea infusion packaging manufacturer to integrate its sales, production and warehouse

## Company Overview

**Company name:**
Martínez y Cantó

**Geographic footprint:**
Alicante, Spain

**Core business:**
Infusion tea packaging

## Background, Key Challenges and Objectives

- Martínez y Cantó specialises in the automated bagging of infusions for third-party companies, so quality and safety are paramount. Every item produced is traced, and this is no small task. The production line in Alicante bags 600 infusions a minute, receiving ingredients from, and dispatching finished products to, all corners of the world.
- The entire production plant is computerised and overall equipment effectiveness (OEE) software enables the company to manage the automated production elements online and in real time. Materials are traced through a radiofrequency system which registers all the data. Production processes can be monitored and order planning optimised.
- The challenge was to knit together the flow of data and integrate it into the company's financial, sales and supply chain. In addition, the business needed a scalable solution as Martínez y Cantó had upgraded its production facilities in Spain, lifting annual capacity from 3.6 million to 8 million bags.
- The company soon faced another challenge: a sudden collapse of the supplier of its warehouse management software left the business exposed.
- This led it to choose the full suite of Sage software.

## Actions/Solution

- Martínez y Cantó originally deployed Sage X3 to integrate accounting, purchasing, sales, inventory and manufacturing.
- By working alongside Sage partners Datadec and Totware, the company also integrated its warehouse management with Sage X3. Using its proprietary expert SGA tool, Datadec programmed both systems' connection on Sage X3 so that everything could flow as a single entity.
- Both updates were completed within 10 months, with minimal bespoke development. Although Martínez y Cantó had to make some small changes, they account for no more than 10% of the total of the application.
- The process offers complete traceability for every batch in the warehouse. This is crucial for standards certification. Martínez y Cantó is certified according to the IFS Food Standard, and its management system is certified according to the ISO 14001 Standard for the protection of the environment.
- The process is similar to the old one, but much more intuitive now.

## Results and Benefits

- The impact of full functionality became apparent within months. For example, the company now automatically assigns tasks to workers depending on the importance of the task and the worker's profile.
- The Sage software also automates inbound and outbound processes. It informs workers on the best location to deposit an inbound product, or where it should be extracted from to fulfil a production order.

## The Future

- Martínez y Cantó has seen significant improvement with the new corporate and warehouse management solutions.
- Warehouse tasks such as registration, locations, expeditions and receipts are done faster and easier. The system is the one that makes the decisions. It then communicates these decisions to the worker, who only has to carry them out.
- Sage X3 has helped create a more agile business that is better able to forward plan.

# Sage X3 — faster, intuitive, tailored

Sage X3 addresses the complex requirements in the process manufacturing industry. It helps companies to respond faster to customer demands and market fluctuations, and helps to **minimise waste and reduce the risks** of product call-outs, ensuring the quality, **traceability and safety** of all material and ingredients.

Cloud service offerings

Customer first experiences

Connected ecosystem

Global compliance & finance

CLOUD aws MOBILE Windows 10

## Enablers of the process manufacturing industry

Location management

Quality control

Compliance & governance

Ingredients & recipe management

Product traceability

Planning & forecasting

# IDC recommendations

IDC recommends that process manufacturing enterprises consider breaking their ERP-driven digital transformation journey into three horizons. This will enable them to get started quickly and execute their strategic mid- to long-term plans in conjunction with the right use cases.


## Horizon 1:
## Understand where you are today

- Start preparing to move beyond legacy systems to new intelligent applications.
- Instrument your assets with technology to streamline online and real-time information of raw materials and lot tracking per batch into ERP.

## Horizon 2:
## Be ready for tomorrow's challenges

- Meet the ever-changing safety and compliance requirements that your manufacturing environment is facing. Disruption is accelerating.
- The intelligent ERP will enable you to adapt and process data to continuously track and evaluate the quality of production batch and final product, beginning with quality checks even during the raw materials stage.
- Have one source of truth for formula and recipe management.
- Enhance production planning and production control tools with AI and ML technology to improve accuracy in planning scenarios.

## Horizon 3:
## Transform your business model for the future

- Understand how IT/OT convergence empowers you with real-time data from the production environment; ensure that relevant ERP modules are fully integrated with quality control and manufacturing execution systems, receiving trustworthy production and quality data, all while removing complexity and lowering production cost overall.
- Work with a partner that brings together business and IT expertise to ensure you achieve the integration that works best for your business environment and partner ecosystem.

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