

Infusing intelligence and predictability with digital process twins

HFS Research in partnership with IBM and Celonis

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Infusing intelligence and predictability with digital process twins

HFS Research, in partnership with IBM and Celonis, reached out to 260 enterprise leaders (including GBS leaders, shared services heads, and CXOs) spanning various geographies, industries, company sizes, and other demographics across goods-producing industries. The goal of our study has been to document through research the uses, benefits, and financial value of using digital twins in multi-process environments, especially in shared services operations.

Some of the key findings are:

- Ninety percent (90%) of goods-producing firms identify supply chain disruption as a key market challenge, and 77% identify market volatility as a challenge.
- Process intelligence has become the #1 way to address process debt; ERP alone cannot do it.
- Eighty-eight percent (88%) of enterprise leaders expect increases in process intelligence investments, despite the harsh economic climate.
- About 29% of enterprises on average have not yet bought into process intelligence technologies. While the journey for some may be longer, the benefits are sure to eventually draw the late adopters.
- Visibility into cross-functional operational performance is the key game changer for operations, which 95% of enterprises seek from the use of process intelligence.
- Eighty-two percent (82%) of enterprises believe that collaboration between internal business functions will be one of the key changes in the ways of working.
- Talent and data challenges need to be addressed to drive process intelligence expansion.
- Only 17% of enterprises are driving digital process twins across multiple business functions. Sixty-three percent (63%) expect to link process insights as a fully operational digital command center in the next one to three years.



We're at a point in the evolution of process intelligence where the majority of enterprises have gotten their feet wet with initial projects. Our research shows the high potential for this set of technologies to drive radically new sources of insight and business value in the near future.

Reetika Fleming, Executive Research Leader, HFS Research



Harnessing the power of process intelligence by creating digital process twins allows our clients to have real-time visibility into cross-functional processes, helping our BPO team to deliver efficiency, effectiveness, and experience for all stakeholders in the business process.

Neeraj Manik, Americas BPO and Growth Leader, IBM



Process mining provides unparalleled visibility into how a business runs, uncovering value opportunities hidden by complexity within and across processes. With Celonis, teams can analyze multiple processes simultaneously and create a digital twin of their organization. These digital twins can be used to enable quick wins, advanced simulation, and expert decision-making.

Wil van der Aalst, Chief Scientist, Celonis

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Study summary:
Demographics, roles,
and responsibilities

Study summary

HFS Research, in partnership with IBM and Celonis, reached out to more than 260 enterprise leaders across several demographics, including geographies, industries, roles, and company sizes (see page 7). We also interviewed a series of these leaders in depth.

260

Process intelligence
enterprise leaders



2

Continents



4

Dominant operating
models: outsourcing,
shared services, hybrid,
and internal business
units



\$500M-\$5B+

Range of company
sizes



Even

Split between leaders
primarily focused on
process intelligence
implementations in
enterprises



6

Major industry groups,
including retail, CPG,
manufacturing, energy
and resources,
logistics, and pharma
and life sciences



**CXOs to GBOs
and functional
leaders**

Seven seniority levels



27%, 56%, 17%

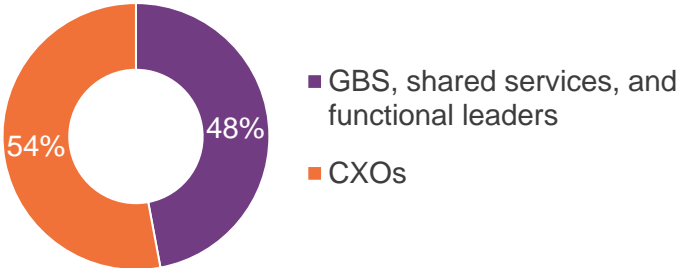
Process intelligence
leaders in Stage 1,
Stage 2, and Stage 3,
respectively



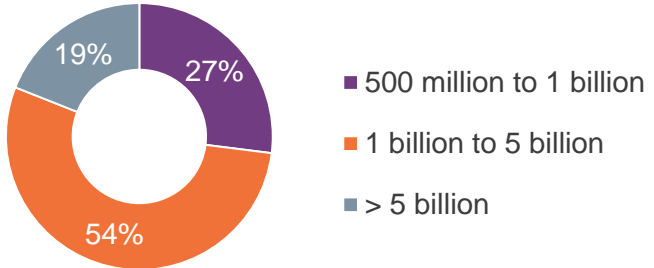
Sample: N=260 enterprise leaders
Source: HFS Research, 2023

Demographics

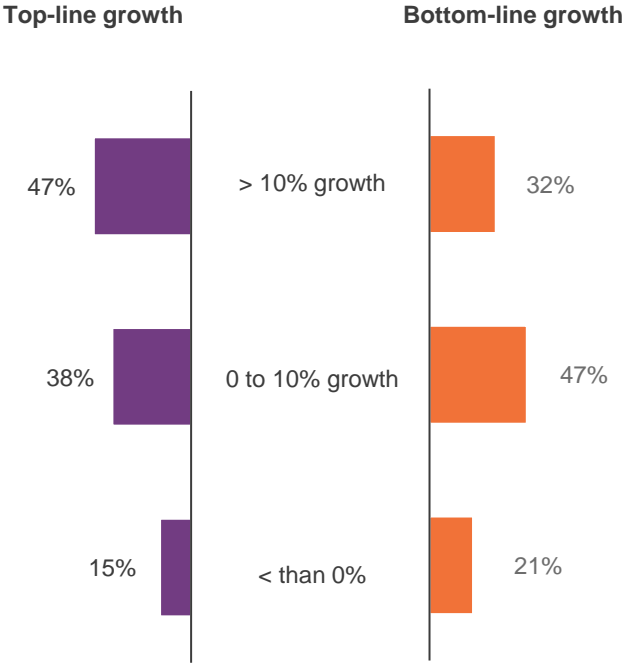
Respondent titles



Annual company revenue

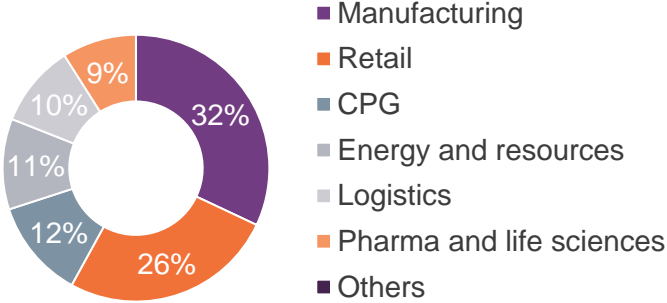


Company growth

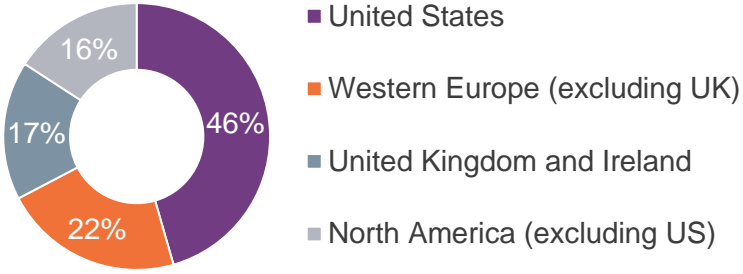


Bars represent percentage of companies reporting each level of growth.

Industry



All company locations



Sample: N=260 enterprise leaders
 Source: HFS Research, 2023
 Base: 200

2

Outperforming market volatility:
The biggest focus for process
transformation today

In challenging times, enterprises seeking greater operations visibility and efficiencies quickly turn to process intelligence

Goods-producing industries are majorly impacted by market volatility

Approximately 90% of enterprise leaders cited supply chain disruption as having a major impact on their industries, and more than 75% cited the volatile market conditions of inflation and recession. Global organizations need to manage growth and profitability goals amid constant disruptions in the form of supply chain shortages, demand drops, productivity outages, and inventory and delivery missteps.

Process transformation efforts continue to chase efficiency gains

More than half of the enterprise leaders (54%) see efficiency and productivity as the biggest benefit, while close to half (42%) also feel operating cost reduction is their biggest focus area for process transformation initiatives. In challenging times, large enterprises are doubling down on productivity gains across their operations, whether managed internally or through third-party service partners.

ERP modernization isn't a silver bullet that can get you superior business operations

ERP modernization has often been hyped as the prescription for every ailment related to business processes, but few (36%) strongly believe it is essential today. Designing and running superior business processes will require enterprises to address their process debt, a factor only 31% strongly believe does not exist in their organization.

Process intelligence has quickly become the #1 way for enterprises to address process debt

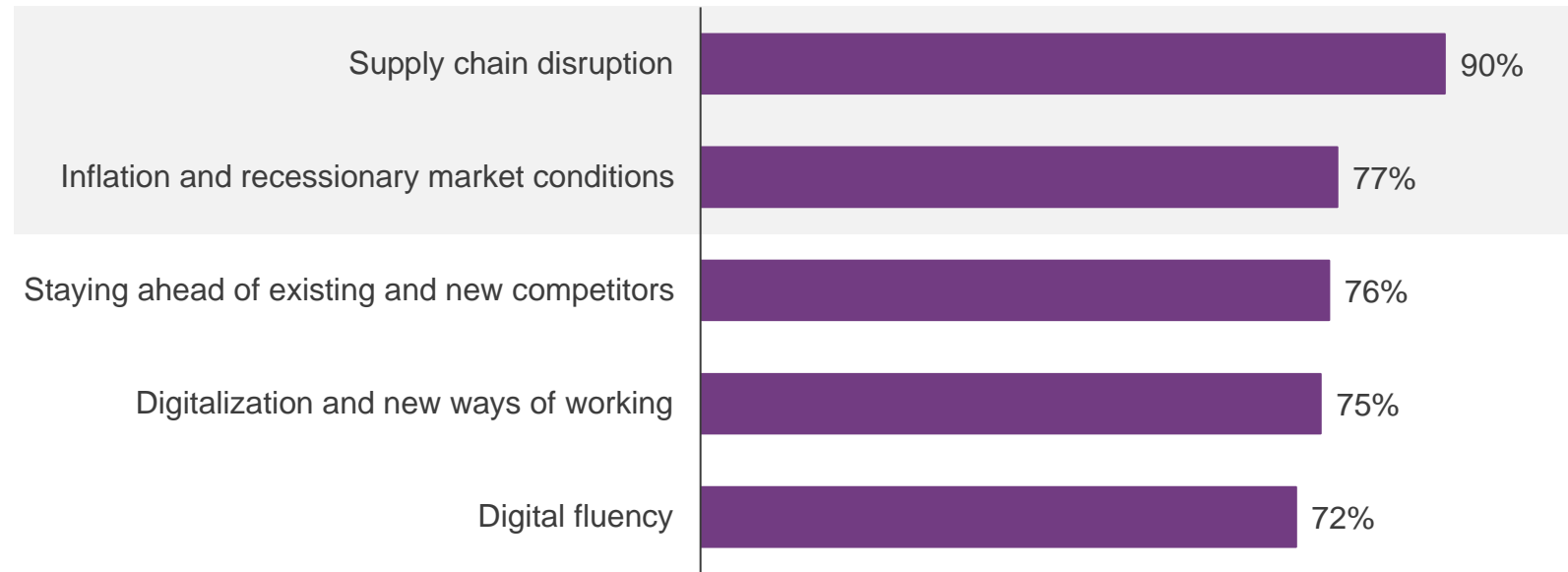
Nearly half (41%) of enterprise leaders acknowledge process intelligence as the go-to solution to address process debt; 30% also recognize process re-engineering, a methodology we see often combined with process intelligence to design processes based on data.

Source: HFS Research, 2023; N=260 enterprise leaders

Volatile market conditions and supply chain disruption continue to be top of mind for goods-producing and distributing industries

Q: This challenge or opportunity has a high impact in my industry.

Percentage agreeing by answering “Yes”



- Eighty-four percent 84% of retail firms and 90% of energy and resources firms identify volatile markets as a top challenge.
- Sustainability was one of the answer options provided for this question. However, “climate change and sustainability” is not yet perceived as a top high-impact area to these industries associated with physical goods production and distribution—an alarming sign.
- Also, digital fluency, superior customer experience, and talent upskilling don’t feature in the top three challenges. These factors are being drowned out by the urgency of addressing supply chain disruption and market volatility.

“

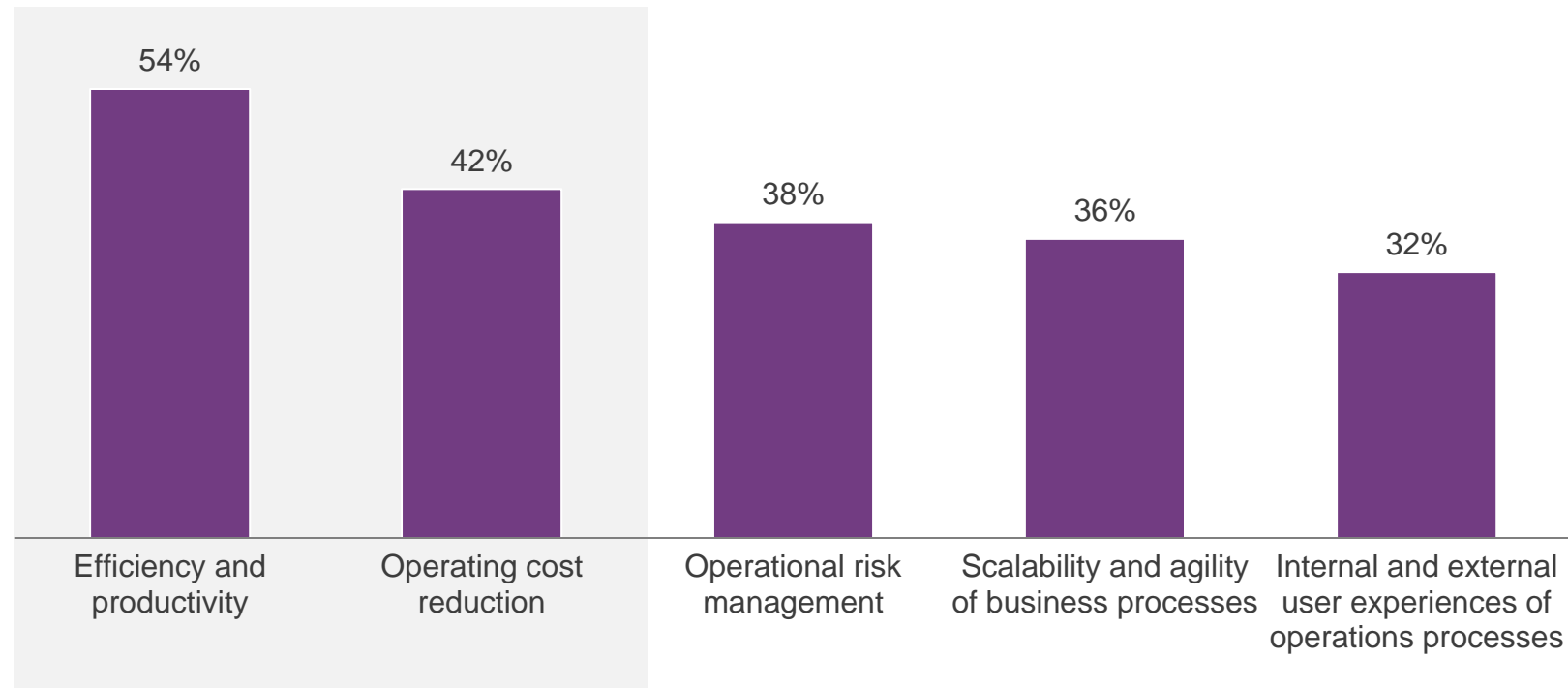
Supply chain disruption and material availability is the biggest challenge in the market.

– Anastasiia Glebova, Global process mining leader, Kone Cranes

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

Process transformation efforts have been focused on bottom-line metrics: Efficiency and productivity and operating cost reduction

What are the biggest benefits you sought through the execution of process transformation initiatives in the last 12 months?



“

We have decided to do process mining to help in end-to-end process development and to support the on-time delivery improvement.

– Anastasiia Glebova,
Global process mining leader, Kone Cranes

- Operating cost reduction is a key focus area for 51% of retail firms, 48% of energy and resources firms, and 52% of firms are experiencing de-growth.
- In challenging times, large enterprises are doubling down on productivity gains across their operations, whether managed internally or through third-party service partners.

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

ERP isn't a silver bullet, and process debt is a recognized challenge; process intelligence has quickly become the #1 way for enterprises to address the chasm

How much do you agree or disagree with the following statements:

36%

Strongly agree that:

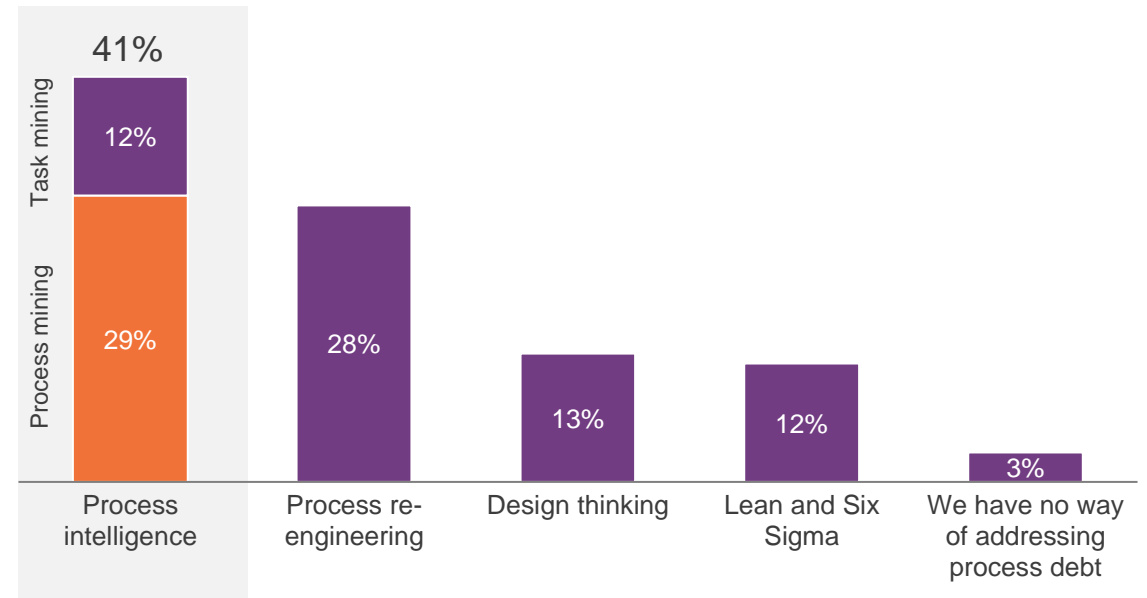
“ERP modernization will solve most of our process problems.”

31%

Strongly agree that:

“Process debt is almost nonexistent in our organization.”

What is the primary way that process debt is being addressed in your organization?



ERP modernization has often been hyped as the prescription for every ailment related to business processes, but few (36%) strongly believe it is essential today. Designing and running superior business processes will require enterprises to address their process debt, a factor only 31% strongly believe does not exist in their organization. As a corollary to “technical debt,” HFS sees process debt as the creation of awkward and often manual processes that are designed to buttress aging technologies that must be redesigned and modernized to improve business operations. While migrating to cloud-based ERP will certainly have a role in operations modernization, enterprises must revisit the design and execution of their processes to have a bigger impact. Our study finds that many organizations are turning to process and task mining as the primary way to hit these challenges.

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

3

Process intelligence is already in play to address macro challenges

Process intelligence is ready to take on the macro challenges organizations face

Supply chain and customer service lead functional adoption for process and task mining

Process mining is more scaled up and industrialized vs. task mining, but both sets of technology are being applied to similar functions. Process mining adoption is led by customer service (56% in production or scaled up), IT (53% in production or scaled up), and supply chain (55% in production or scaled up).

Process intelligence is the #1 emerging tech investment expected to impact process transformation

Automation and business intelligence feature in the top three emerging tech adoptions today. If advanced analytics is expected to become the top emerging tech in two years, then process and task mining products and solutions will need to level up to be able to deliver to the needs of automation and AI.

Seventy-eight percent (78%) of enterprise leaders expect modest to significant increases in process intelligence investments despite the harsh economic climate

Investments in process intelligence are staying high, despite being a discretionary category of emerging technology spending. Most (78%) expect modest to significant increases in spending, and 10% expect exponential increases of 50%–100% in spending on process intelligence to underpin process transformation.

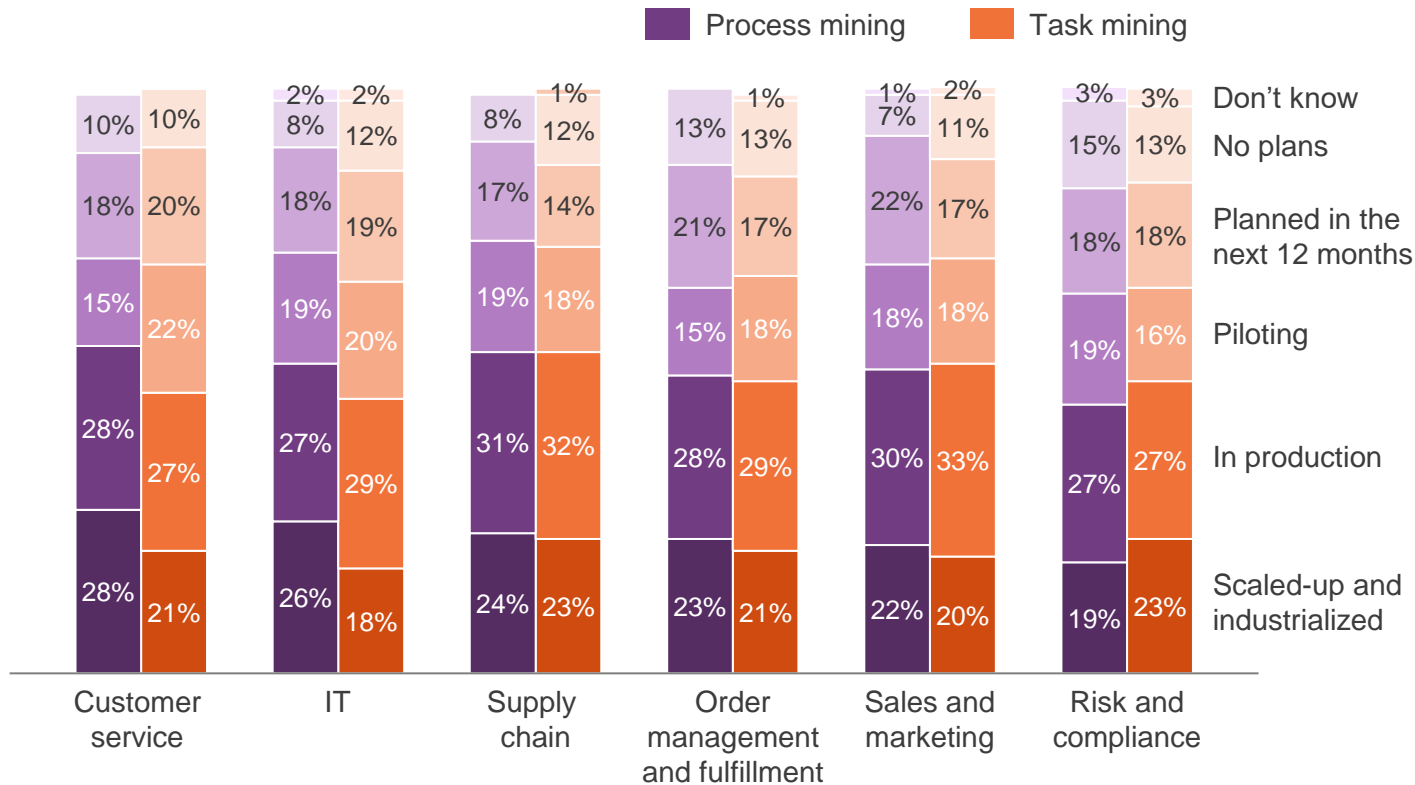
About 29% of enterprises on average have not bought into process intelligence technologies.

They have yet to start any piloting and are either planning to start process intelligence projects (14%–22%) or are selecting to wait and watch with no plans yet (7%–15%). Competing transformation initiatives are evident worldwide. Some companies may not be able to justify new investments, while some might focus only on automation initiatives. Some enterprises expect ERP modernization to help process simplification. While the journey for some may be longer, the benefits are sure to draw the late adopters sooner or later.

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

Supply chain and customer service lead functional adoption for process and task mining

Q. In which of the following business units, lines of business, or functions in your organization have you implemented (or plan to implement) process intelligence technologies including task and process mining?



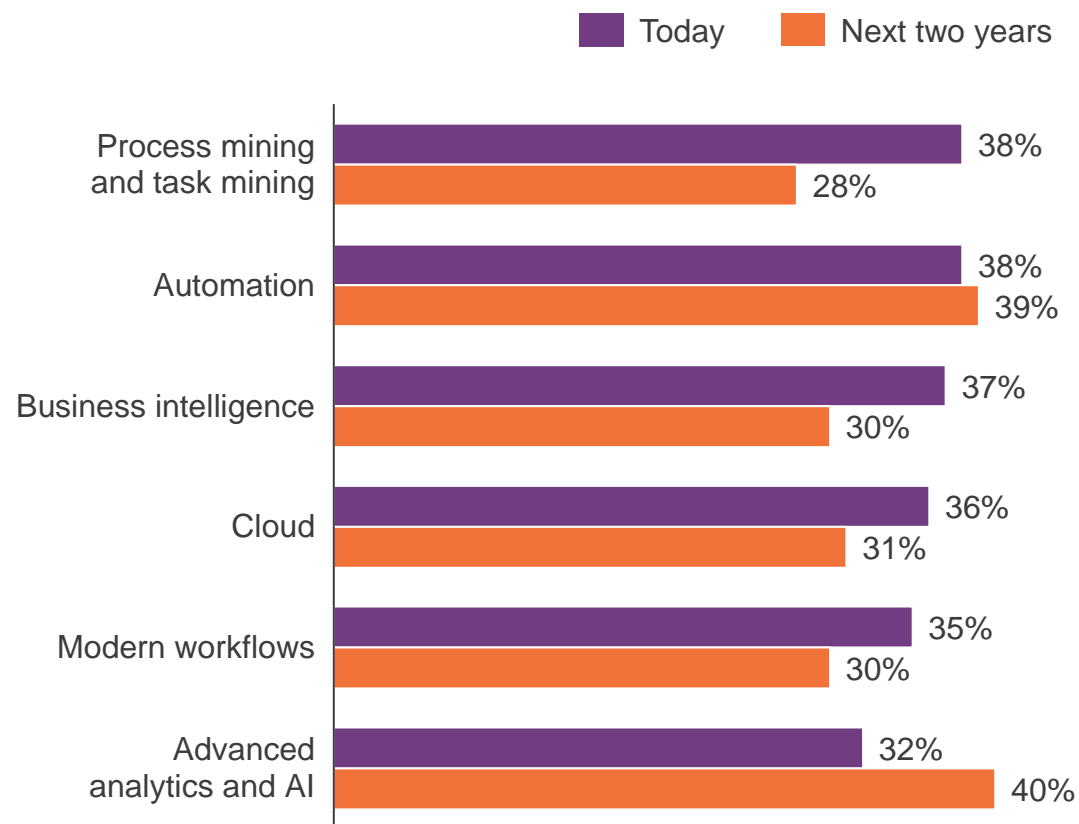
Process mining is more mature. It's more scaled up and industrialized vs. task mining, but both sets of tech are being applied to similar functions of supply chain and customer service.

- The most prevalent use cases for process intelligence in these business functions include
 - Predictive analytics and real-time monitoring: optimize inventory levels, prevent stockouts, address seasonal and geographic fluctuations, and monitor goods flow
 - Supplier management: identify high-performing suppliers and monitor delivery timelines and contractual terms
 - Performance measurement: measure delivery lead times and order processing time and identify gridlocks
 - Customer service: lower resolution times, improve self-service efficiencies, and analyze rejection and cancellation rates
- About 29% of enterprises on average have yet to start any piloting and are either planning to start process intelligence projects (14%–22%) or are selecting to wait and watch with no plans as of now (7%–15%).

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

Process intelligence is the #1 emerging tech investment expected to impact process transformation today

Q. What emerging technologies is your organization investing in to impact process transformation in the next 12 months



Process intelligence, automation, and business intelligence are the most invested technologies that impact process transformation, with 38%, 38%, and 37% respectively.

If advanced analytics is expected to become the top emerging tech in two years, then process and task mining products and solutions will need to level up to be able to deliver to the needs of automation and AI.



The goal of my organization is to enable Sanofi to shape, transform, and continuously improve our processes. When you take my team in the context of a Formula One race, we are the pit stop crew. With a perfect framework for changing the tires, you will for sure win the race, but you will for sure lose it without the change.

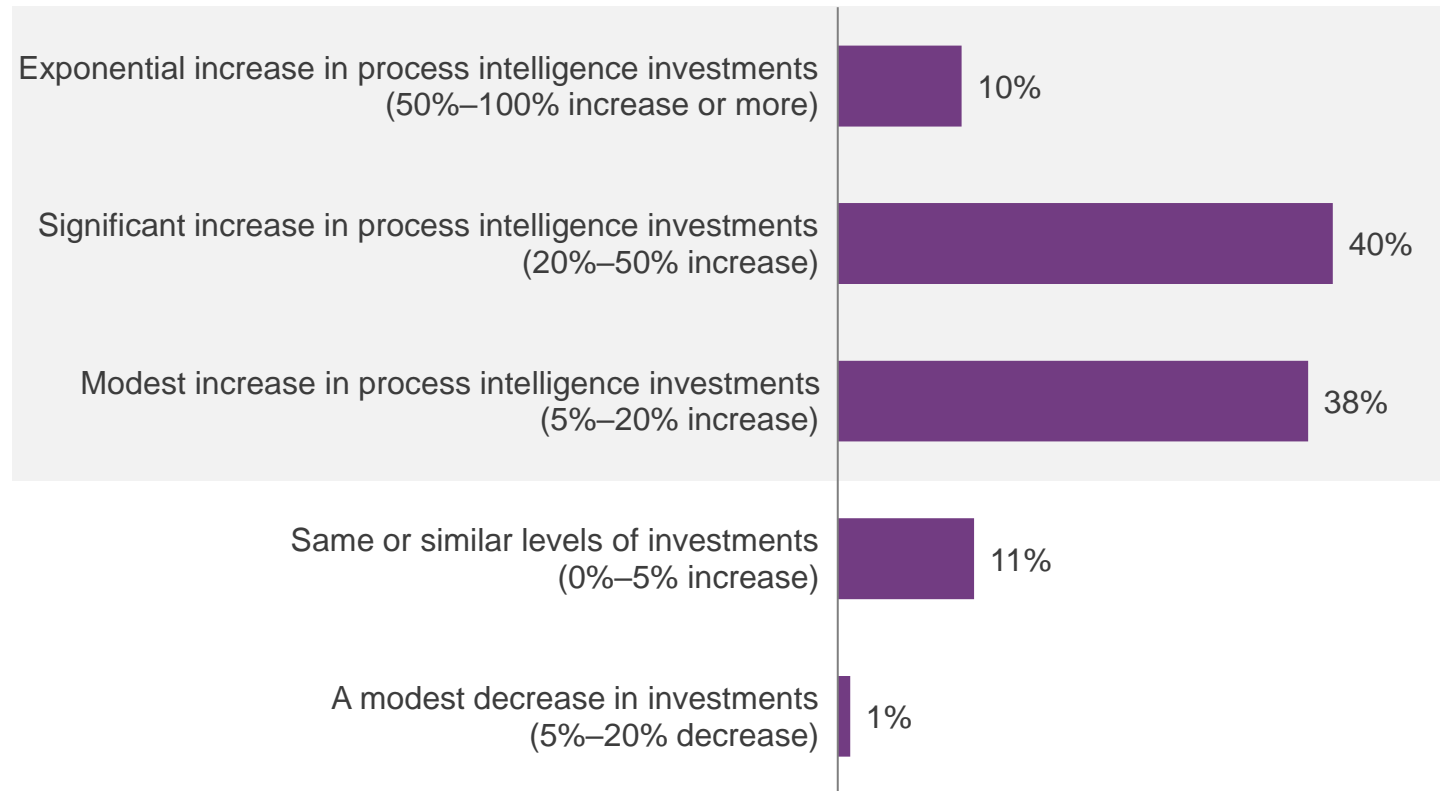
You can have the best car and the best driver in the world, but when the change of tires takes 60 seconds (like 50 years ago), you are out. Without process intelligence capabilities, it will be very difficult in the future to catch up. We are living in a fast-changing world and need to continuously maintain and adapt in regard of global challenges.

– Christian Mueller, Head of Process Intelligence, Sanofi

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

Eighty-eight percent (88%) of enterprise leaders expect increases in process intelligence investments despite the harsh economic climate

Q. What are your plans for investments in process intelligence to underpin process transformation efforts in the next 12-18 months?



- Investments in process intelligence are staying high, despite being a discretionary category of emerging technology spending. Seventy-eight percent (78%) expect modest to significant spending increases, and 10% expect exponential spending increases of 50-100% in process intelligence to underpin process transformation.
- Significant increases in process intelligence investments were mentioned by:
 - 57% of pharma and life sciences firms
 - 54% of large enterprises with revenues exceeding \$5 billion

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

4

Visibility into cross-functional operational performance: The biggest game changer for operations

Key changes expected in moving the process intelligence space to the next level

Visibility into cross-functional operational performance combined with monitoring is seen as a game changer by 95%+ organization leaders

Nearly all (95%) of enterprise leaders believe visibility into cross-functional operational performance, monitoring current state of operations, and having the ability to create new visibility or insights into cross-functional operational performance are game changers.

Almost 50% enterprise leaders are still exploring ways to become more predictive with data

For a lot of firms, now that they have some of the basics of process intelligence in place, the next stage of development is getting more predictive. This next stage will mean not just looking at historical analysis, but really anticipating changes and how they might impact operations, flagging exceptions coming down the line.

However, enterprises will need to address talent and data challenges to support the expansion of process intelligence initiatives

Additionally, 38% of enterprise leaders expect improving data quality to have a significant impact on the journey to Stage 3.

“

Process transparency is just an early level of process improvement. It can sort out obvious bottlenecks and loops but is not leveraging the whole potential. Process mining is as of today mainly used as a measurement instrument to analyze historical data from an ‘outside’ view. Usually, stakeholders are quite relaxed as we are looking at ‘past’ data which cannot be changed. The next level would be to integrate process mining as an active part of the ‘process’ to use prediction and automation capabilities to prevent ‘bad cases’ without human interaction.

– Christian Mueller, Head of process intelligence, Sanofi

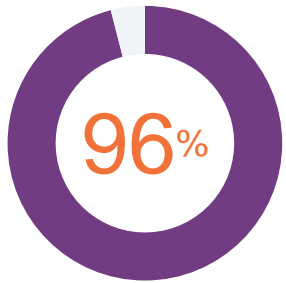
Sample: N=260 enterprise leaders
Source: HFS Research, 2023

95%+ of organization leaders see combining visibility into cross-functional operational performance and monitoring as a game changer

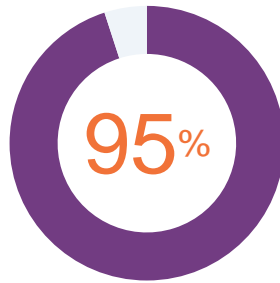
What key aspects of the future use of process intelligence are critical to the operational performance of your organization?

“Game-changing” for our operations
Percentage of respondents who agree

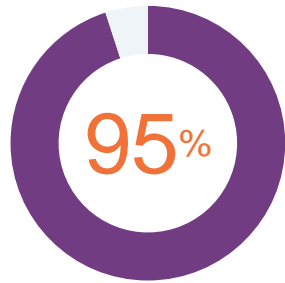
Agree



Ability to create new visibility or insights for managing dynamic constraints



Monitoring the current state of operations



Visibility into cross-functional operational performance

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

“

The #1 driver was to see the bottlenecks we have in the processes and where we should make the **incremental improvements**.

– Anastasiia Glebova, Global process mining leader, Kone Cranes

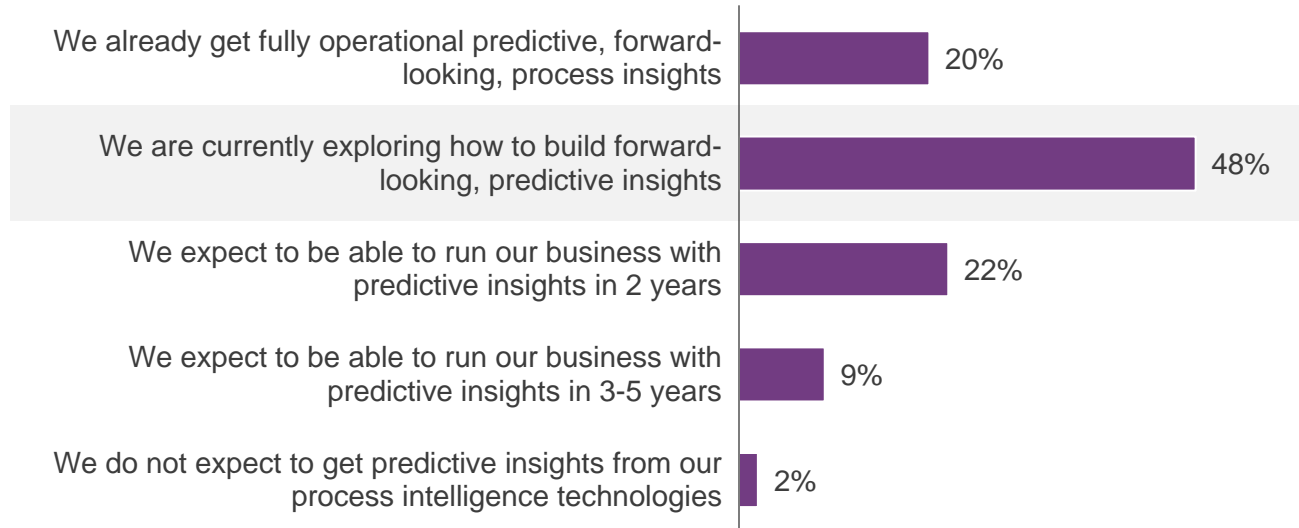
“

We have a goal to **analyze and monitor** the processes and to search and find enhancements for efficiency, automation, and digitization of processes. I think the solution by our process intelligence vendor is innovative in the correct way.

– Process intelligence leader, retail industry

Almost 50% of enterprise leaders are still exploring ways to become more predictive with their data

Do you foresee being able to design and plan for future impact on business processes using process intelligence technologies?



“

We kicked off a process efficiency initiative with our process mining vendor, where on one hand we looked at stuff like Six Sigma but in parallel we also started looking at process mining. The latter promised an edge. So, they did a small pilot and started with two processes, and we realized how valuable process mining is and how much it improved our processes, and that's what made us go large with process mining solutions and scale it.

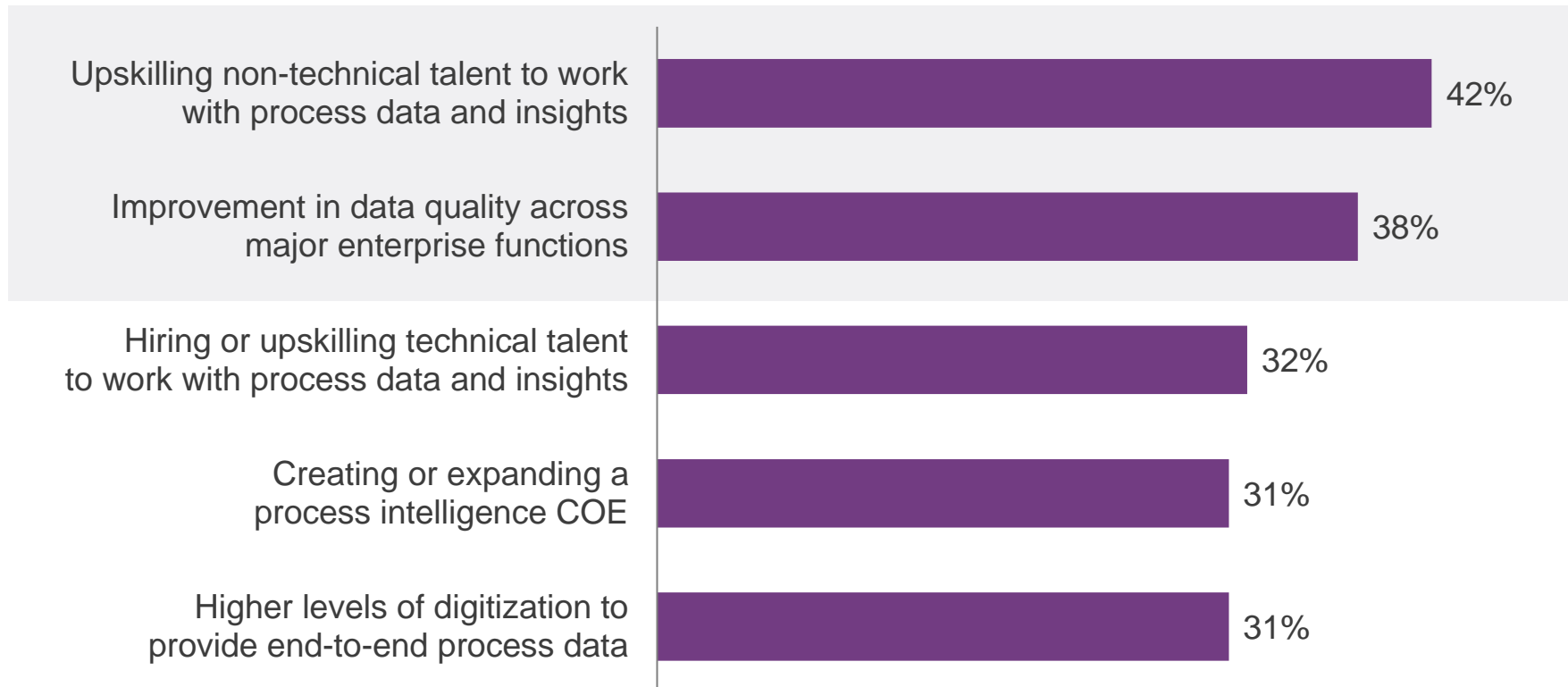
– Dr. David Heise, Aldi Sud, Manager - Center of Excellence Business Process Management

- For a lot of firms, now that they have some of the basics of process intelligence in place, the next stage of development is getting more predictive. This next stage will mean not just looking at historical analysis but anticipating changes and how they might impact operations, flagging exceptions coming down the line. Typically, in the past, we've seen this to be a three-to-five-year journey for most organizations. Instead, with this study, we see it as a here-and-now design plan for business operations.
- Becoming predictive with data is a higher focus among retail firms and in firms based in North America (excluding the US).
- More logistics and pharma and life sciences firms based in Western Europe and firms with >US \$5 billion in revenues believe they are already getting fully operational predictive insights.

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

However, enterprises need to address talent and data challenges to support the expansion of process intelligence initiatives

What would have the biggest impact on your organization's ability to develop or improve a fully operational digital command center that shows multi-functional process insights?



Additionally, 38% of enterprise leaders expect improving data quality to have a significant impact on the journey to Stage 3.

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

5

The Bottom Line: Connected digital process twins are on the horizon

Connected digital process twins are on the horizon

Would you expect process intelligence technologies to evolve in the following ways in your organization?

On a scale of 1-5, where 1 represents “low expectation” and 5 represents “high expectation”

83%

Have high expectations
(rated 4 or 5) of
Greater **internal
collaboration** by sharing
process data and insights
across different functions

69%

Have high expectations
(rated 4 or 5) of
Strategic use of shared
process data between
multiple organizations to
seek new sources of value

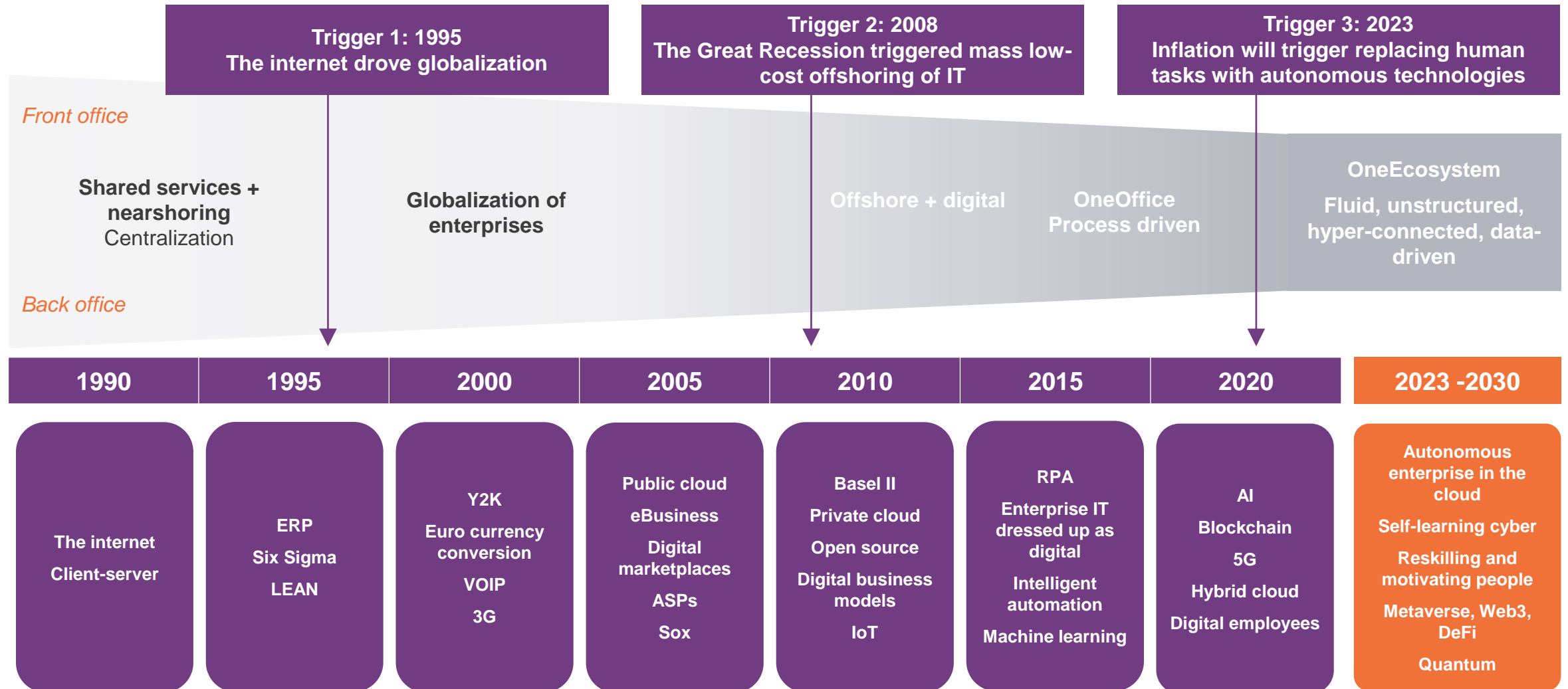
82%

of enterprises believe that
collaboration between internal
business functions will be one
of the key changes in the
ways of working because of
process intelligence

- Our findings show high expectations for this set of technologies to drive internal collaboration by being able to share process data and insights across functions. This theme was further reinforced when we studied how enterprises expect their ways of working to change due to the greater use of process intelligence. One of the highest-ranked factors was once again this aspect of better internal collaboration, followed by greater productivity.
- Further, almost 3/4 of enterprises (69%) rank strategic data use between multiple organizations as a highly expected outcome from the greater use of process intelligence.

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

OneOffice™ and OneEcosystem™: Aspirations for enterprises that want to prioritize internal and external business collaboration



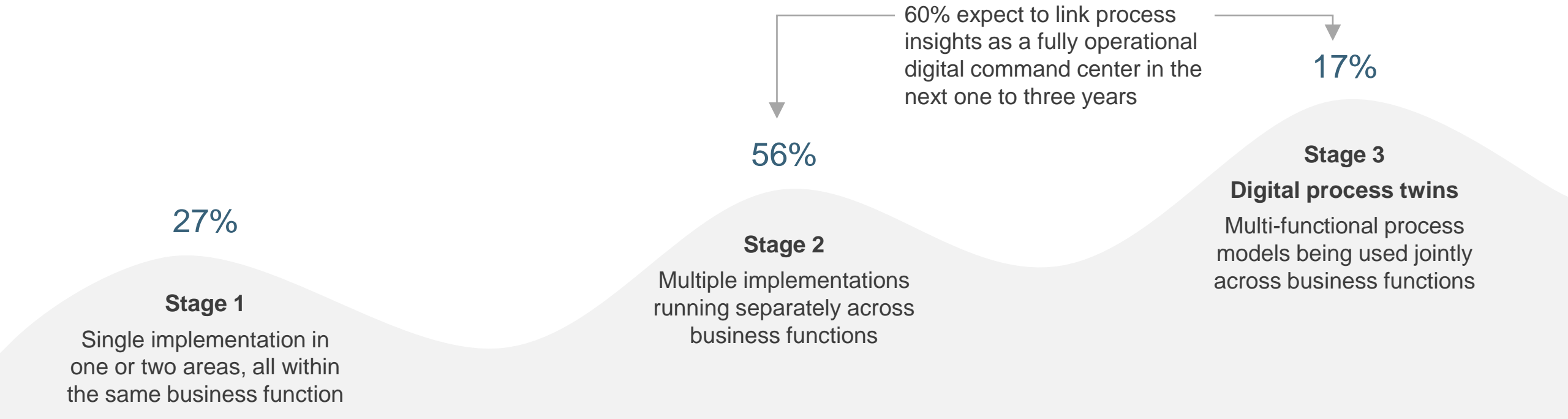
The near-term and long-term future of process intelligence: Supporting OneOffice and OneEcosystem collaboration

- **Now—Functional transformation:** This research study finds that enterprises focus on functional transformation, seeking efficiency and effectiveness and using process and task mining in many ways to meet these goals.
- **Near-term—Digital process twins:** At HFS, we talk about the concept of OneOffice to guide process and digital transformation efforts, with the goal of enabling enterprises to break boundaries and find cross-functional synergies. We believe the near-term potential for process intelligence is to underpin OneOffice transformation by helping organizations better connect their internal business functions.
 - Instead of deploying process intelligence in siloed projects, enterprises can consider connecting multiple data models to get a true picture of, for example, an order going in through sales, being invoiced in finance, delivered, and settled through last-mile delivery. Creating these digital process twins would allow organizations to develop a new enterprise architecture, predicated on process intelligence, going across multiple technologies and methodologies including automation, workflow, business intelligence, analytics, and AI in combination with process intelligence.
 - With the potential for multi-functional process data visibility and execution, we can see why enterprise leaders in our study expected high internal collaboration through their continued use of process intelligence.
- **Long-term—Digital process data exchanges:** Moving even further out into the future, HFS sees OneEcosystem as the opportunity for organizations to drive inter-organizational collaboration and co-innovation, sharing data and assets to drive entirely new sources of value. Making this a reality will require enterprises to make investments in digitally fluent talent and emerging technologies that facilitate external partnering. Process intelligence has the opportunity, in our view, to deliver on an element of OneEcosystem through the development of digital process data exchanges in the future.
 - Similar to how process visibility shared internally can help align internal business functions, external partners can benefit from greater transparency of business data. For example, CPG companies and retailers could exchange inventory and payment data for mutual decision-making benefits, CPG manufacturers and third-party logistics firms could share shipment and delivery data to improve end-customer satisfaction.

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

Only 17% are driving digital process twins across multiple business functions

Q. Please pick the description that most closely matches your organization's current process adoption of process intelligence technologies?



- The maturity curve shows that most organizations are targeting discrete, functional transformation goals through the siloed use of process intelligence technologies.
- Most organizations still have a one-to-three-year journey ahead before digital process twins (Stage 3) are a reality.

Sample: N=260 enterprise leaders
Source: HFS Research, 2023

The evolution of process intelligence into digital process twins and digital process data exchanges

Tackling functional business inefficiencies is today's focus when it comes to process and task mining projects. Our research study shows that the future is about OneOffice transformation, where these technologies will develop into digital process twins that can connect multi-functional data and insights to help business leaders predictively manage business uncertainties through digital command centers. Lastly, the potential for external collaboration with shared process data exchanges is on the horizon for ambitious businesses that want to seek entirely new sources of value.

Horizon 1: Process intelligence

Functional transformation—impact on individual business functions

- Typically, single process or defined set of processes and data targeting a functional area
- Fixing and standardizing “happy paths” for processes
- Root cause analysis
- Monitoring current state
- Single tool within process intelligence domain
- Examples include accounts payable, purchase requisition processes within F&A

Diagnostic, deterministic use of process intelligence technologies—looking backward and addressing process debt

Horizon 2: Digital process twins

OneOffice transformation—internally linking the front, middle, and back offices

- Multi-process, multi-function, and blending multiple datasets
- Designing and planning for future impact on business processes across the organization
- Scenario modelling and planning
- Stress testing and simulations
- Multiple technologies and methodologies including automation, workflow, business intelligence, analytics, and AI in combination with process intelligence
- Examples include creating a digital twin that encompasses the working of an entire F&A function and, further, links procurement, finance, and supply chain

Predictive and prescriptive use of multiple emerging technologies—looking forward and addressing business uncertainties through a digital command center

Horizon 3: Digital process data exchanges

OneEcosystem transformation—externally linking multiple ecosystem partners

- Collaboration across organizations (multi-party and multi-tech)
- Addition of collaborative data exchange technologies such as distributed ledgers and Web 3.0 to digital twins
- Focus on employee experiences (EX), customer experiences (CX), and partner experiences (PX)
- Examples include CPG companies and retailers exchanging inventory and payment data for mutual decision-making benefits

Diagnostic, predictive, and prescriptive use of multi-party digital process insights—looking for new sources of value through data exchanges

HFS Research authors



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Reetika Fleming leads coverage for smart analytics, insurance, and finance and accounting at HFS Research. She studies the broad use of data and analytics within enterprises, with a research focus on emerging strategies to institutionalize machine learning and other AI techniques. Her research extends into the impact of digital business models, IoT, smart analytics, and AI on business process services for insurance specifically, and finance and accounting broadly.



Hridika Biswas

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Hridika joined the HFS team in 2021. She focuses on the F&A and general and business process outsourcing domains. She also analyses how emerging tech, mainly process intelligence, intelligent document processing (IDP), and artificial intelligence (AI), can enable enterprises to reach their transformation goals.

About HFS

Insight. Inspiration. Impact.

HFS is a unique analyst organization that combines deep visionary expertise with rapid demand-side analysis of the Global 2000. Its outlook for the future is admired across the global technology and business operations industries. Its analysts are respected for their no-nonsense insights based on demand-side data and engagements with industry practitioners.

HFS Research introduced the world to terms such as “RPA” (Robotic Process Automation) in 2012 and more recently, Digital OneOffice™ and OneEcosystem™. The HFS mission is to provide visionary insight into the major innovations impacting business operations such as Automation and Process Intelligence, Blockchain, the Metaverse and Web3. HFS has deep business practices across all key industries, IT and business services, sustainability and engineering.

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