Digital transformation at scale for industrial products

Three actions for enterprise-wide change

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Key takeaways

Criticality of digital transformation

Scaling digital transformation is no longer optional; rather, it is necessary to address critical business objectives like reducing operational cost and growing organically. However, only two-out-of-five industrial products executives surveyed say they are executing an enterprise-wide digital strategy.

Learning from frontrunners

We identified a small group of industrial products organizations that are very effective at addressing their most important business objectives—they also lead in revenue growth and profitability. Two times more "frontrunners" are effective at developing and executing enterprise strategy, compared with their peers. More than nine in ten of these organizations say their digital initiatives over the last three years have exceeded expectations in terms of value.

Three elements to scale digital transformation

Frontrunners execute a digital business blueprint. They infuse their processes with technologies. And they establish a new enterprise experience for employees, customers, and ecosystems.

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Digital transformation is essential

Changing market dynamics are compelling industrial products companies to take another look at every aspect of their business. Empowered customers have increasingly high expectations of their supply base. According to a worldwide survey of over 6,700 buyers, nearly 70 percent of business buyers expect an "Amazon-like" buying experience from their business vendors.[1] Customers demand product customization and rapid delivery turnarounds for the products they've ordered. In fact, 72 percent of business buyers expect vendors to personalize engagement to their needs.[2]

Rapid technological change is enabling more efficient manufacturing, asset management, and maintenance. While the proliferation of connected devices and Internet of Things (IoT) technologies has enabled automation, remote monitoring, and even new partnerships, it also has created overwhelming amounts of raw data. For example, one production line at a modern plant might have 2,000 different pieces of equipment. Each piece could have 100 to 200 sensors that collect data continuously, generating 2,200 terabytes of data each month.[3] Insights based on the aggregation, classification, and analysis of this data through AI and predictive analytics could increase productivity and reveal opportunities for data monetization.

72%

of industrial products executives say digital initiatives will be critical to the success of their organization in the next three years.

Leading industrial products organizations—the "frontrunners"—report an average return on investment of

24%

over the past year for their digital initiatives.

94%

of frontrunners have implemented digital initiatives to support reducing operational costs, which they rank as their most important business objective.

On top of existing industry dynamics, the COVID-19 pandemic has highlighted the shortcomings of existing digital capabilities for many industrial products organizations. For example, processes in the engineering and construction segment are still largely analog and manual with only limited automation. Without real-time supply chain coordination and execution, companies have limited ability to forecast work schedules and material and equipment needs. Analysis of a Gartner Group survey measuring businesses' current and intended technology investments revealed that construction and manufacturing/natural resources organizations have the largest gaps between expected and actual spend on emerging technologies across all industries.[4] While construction and manufacturing/natural resources industries claim to be interested in digital technologies, their actual investments fall short of intentions.

Digital transformation is more than just digitizing individual capabilities and functions or digitally transforming business processes or activities. It's about combining multiple exponential technologies to fundamentally reimagine the way a business operates and engages with its stakeholders. It includes developing new ways of realizing and monetizing value through market-making business platforms. It encompasses digitizing products, services, and processes that help redefine customer experiences and create differentiation. And it is about creating and sustaining a digital organization with compelling experiences for employees and partners and the ability to optimize the potential of the human-technology partnership.

This environment requires organizations to reshape their strategies and continually adjust how they compete and operate. Scaling digital transformation is a necessity. To understand how industrial products companies are faring with digital transformation, the IBM Institute for Business Value and Oxford Economics surveyed 600 industrial products executives in 18 countries about their organizations' digital strategies and/or enterprise initiatives (see "Study approach and methodology" section at end of report).

Existing digital investments have generated value for industrial products organizations, including an average 5 percent reduction in expenses.

Forty-one percent of the industrial products executives surveyed tell us digital initiatives are important to the success of their organization today. And that number is expected to increase to nearly three-quarters in just three years. Digital transformation can help these organizations address their most important business objectives: reducing operational costs (cited by 64 percent) and growing market share organically (stated by 61 percent).

In fact, existing digital investments have generated value for industrial products organizations, with averages of 15 percent return on investment, 5 percent expense reduction, 4 percent increase in revenues, and a 62-day reduction in time to market for new products/services. For an average USD 5 billion company with a 10 percent margin, this translates to an additional USD 425 million in profit. These benefits clearly point to the essential nature of digital transformation in helping organizations address their most important priorities.
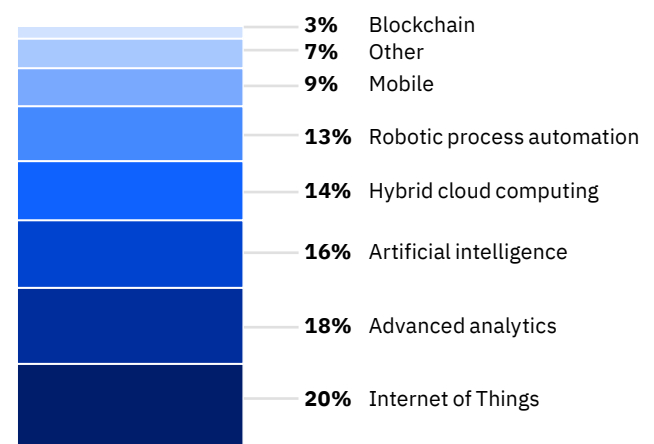
Still framing the digital opportunity

While the benefits of digital transformation are evident, experimentation is still the norm. Only two in five respondents are executing an enterprise-wide digital strategy. Looking specifically at industry segments, even fewer are implementing that strategy in forestry, pulp, and paper (36 percent); engineering and construction (34 percent); and mining (32 percent).

The good news is that the digital investments are focused on a combination of technologies (see Figure 1), which is expected to stay consistent in the future.

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Figure 1

Industrial products technology budgets are spread across digital technologies

3%	Blockchain
7%	Other
9%	Mobile
13%	Robotic process automation
14%	Hybrid cloud computing
16%	Artificial intelligence
18%	Advanced analytics
20%	Internet of Things

Question: What percentage of your organization's technology budget is invested in the following technologies today?

Yet, the ability to leverage these technologies is challenged without these elements: the right cultural environment, the ability to manage data across the enterprise, an enterprise IT architecture that supports data initiatives, and enough of the right resources.

It appears most industrial products organizations surveyed don't have the culture to support digital transformation. Only 44 percent understand and embrace agile techniques as a way of working, and only 37 percent are building a data-driven culture. Without sufficient agility, these organizations are "frozen," with teams unable to pivot and take advantage of new opportunities or address emerging challenges.

Only half of industrial products organizations have the required people and skills to execute their digital strategies.

A trove of useful data for industrial product companies is collected by sensors from technology solutions, assets, services, and equipment. By 2025, according to IDC, over 25 percent of data created in the global datasphere (across industries) will be real time in nature, and more than 95 percent of it will be IoT generated.[5] Without the ability to manage and analyze this data under an umbrella of proper data governance, companies could miss out on crucial insights that reveal new business opportunities.

In support of their digital initiatives, only half of industrial products organizations have established a comprehensive and consistent enterprise architecture that aligns with business activities. Leveraging AI insights to respond to new market dynamics, customer demands, digital initiatives, or user needs requires a nimble enterprise IT architecture. In addition, just over a third of organizations have developed a hybrid multicloud environment that supports the business strategy. Without this cloud environment, organizations can struggle in managing customer touchpoint data and bundling products and services for broader customer solutions.

Finally, only half of respondents say they have the required people and skills to execute their digital strategy. Without this talent, organizations are unable to leverage the true power of exponential technologies to address their most important business objectives. As a result, digital transformation programs are likely to stall, and enterprises are likely to lose the strategic bets they are making.

The frontrunners: Seizing the digital opportunity

As part of our research, we identified a small group of industrial products "frontrunners" who rate their organizations as very effective at addressing their most important business objectives.

Representing 18 percent of our survey sample, these leaders self-report better financial performance than their industry peers. Eighty-eight percent of frontrunners report having outperformed their competitors in revenue growth over the last three years versus 55 percent of other respondents. For profitability, 88 percent of frontrunners tell us they outperformed the competition compared to 52 percent of others.

Their success is also reflected in their outperformance in agility and innovation relative to competitors. Frontrunners are also more effective at developing (81 percent) and executing (80 percent) their enterprise strategy than their peers (45 percent and 46 percent respectively). This strategy execution success can translate to financial outperformance, since organizations collectively tend to lose 40 percent of a strategy's potential value through breakdowns in execution.[6]

Where the frontrunners really stand out is the value derived from their digital initiatives. More than nine in ten of these leaders say their digital initiatives overachieved expectations over the last three years versus just 35 percent of all others. Frontrunners have been more successful than their peers in leveraging digital investments to help reduce costs, increase revenues, and control capital spend (see Figure 2). Using an average USD 5 billion company with a 10 percent margin as a model, we calculate a USD 130 million profit advantage for frontrunners compared to their peers.

To determine what actions set the frontrunners apart, we analyzed their survey data and specific approaches for improving digital transformation capabilities. We identified three common actions frontrunners take to scale digital transformation:

– Execute a digital business blueprint.
– Infuse processes with technologies.
– Establish a new enterprise experience.
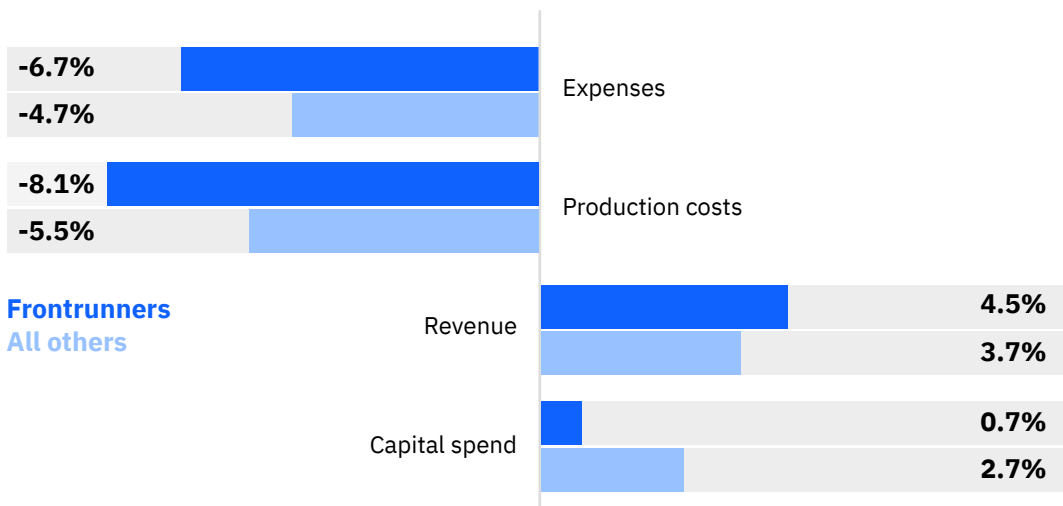
Execute a digital business blueprint

Frontrunners have elevated digital transformation to the strategic level in their organizations. More than four in five understand the value of digital technology and the changes needed to implement it compared to just 57 of their peers. And similarly, more than four in five frontrunners have a well-defined digital strategy that their employees understand.

Frontrunners also are further along with executing their enterprise-wide digital strategy. Eighty-six percent of frontrunners have either fully implemented their organization's digital strategy or have taken steps to transform against their strategy and execution plan versus 30 percent of others. By providing a holistic transformation program that focuses on their strategic plays, these leaders avoid multiple digital experiments cropping up across various functions.

For frontrunners, digital big bets come in the form of new business models and investments. These could include moving into new or adjacent industries, increasing cross-industry collaboration, redefining existing industries, or creating entirely new ones. They could also involve shifting the organization's role in the value chain by changing relationships with suppliers, customers, employees, and others.

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Figure 2

Impact of digital investments

-6.7%
-4.7%
Expenses

-8.1%
-5.5%
Production costs

Frontrunners
All others

Revenue
4.5%
3.7%

Capital spend
0.7%
2.7%

Question: How has your organization's digital investment over the last three years affected the following?

Oren Marketplace: Creating the first B2B marketplace for mining and industrial sectors[7]

Shell and IBM have combined strengths to create Oren, a B2B marketplace for mining and industrial sectors. Oren offers solutions, software, services, and integrated workflows to accelerate digital and sustainability transformations across the end-to-end value chain. For example, its MachineMax service provides IoT for fleets and machines through wireless sensors. Using artificial intelligence capabilities, the solution generates actionable analytics that help operators and site managers lower maintenance costs and optimize vehicles to reduce idling and fuel use, which also lowers CO_2 emissions.

Marketplace members can search for the right fit-for-purpose solutions, access a one-stop-shop view of the latest industrial solutions addressing their use cases, and connect with innovative technologies and intelligent tools. Solution providers can generate new and recurring revenue streams, forge new industry co-selling and ecosystem partnerships, co-create next-gen solutions, and accelerate the selling process.

Nearly three-quarters of frontrunners have a partnership ecosystem strategy in place compared to fewer than a third of all others. Four out of five frontrunners quantify target value and investments to realize relevant ecosystem opportunities versus just 37 percent of their peers.

Frontrunners also focus on market-making platforms (see Figure 3) as defined in the survey:

– *Industry platforms* deliver key process capabilities on behalf of partners and/or competitors.
– *Technology platforms* provide technology that underpins workflows and business offerings.
– *Internal platforms* enable operational efficiency and effectiveness within an organization using new technologies and skills.
– *Consumer platforms* generate and monetize consumer data and insights.

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Figure 3

Investment in platform business models—today

Technology platforms
81%
69%

Internal platforms
77%
63%

Consumer platforms
65%
52%

Industry platforms
44%
34%

Frontrunners
All others
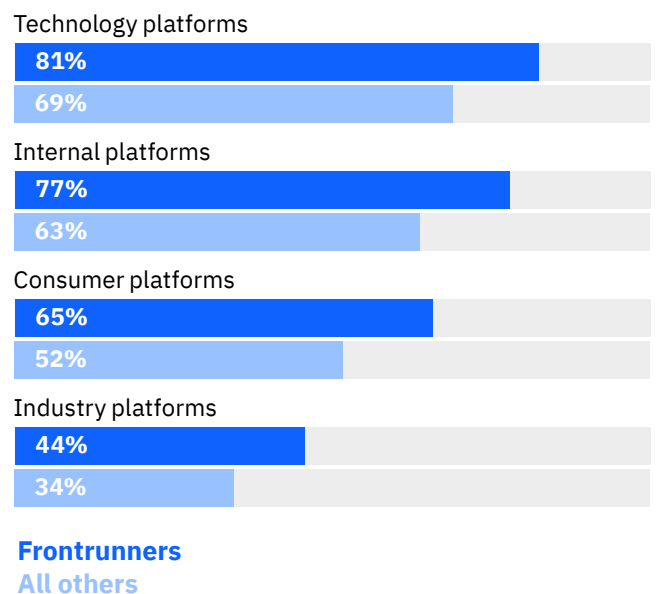
Question: In which of the following type/s of platform business models is your organization investing today?

Frontrunners apply exponential technologies to address their most important business objectives.

With *industry platforms*, multiple industry players benefit from digital capabilities, especially AI and cloud. For instance, MineHub, a technology company focused on applications for the mining and metals industry, established a consortium of mining, technology, and banking companies as part of a blockchain platform. Designed to manage high-value assets across the supply chain, the platform offers members real-time visibility on the movement of assets to intended recipients.[8] Another example is the Responsible Sourcing Blockchain Network (RSBN), an open industry-wide blockchain platform that tracks cobalt across the supply chain from mine to smelter, to battery manufacturers, and ultimately to automotive OEMs.[9]

Technology platforms in engineering, operations, maintenance, production planning, and process control and reliability underpin internal platforms. These technology platforms perform a variety of functions, including managing information and metrics, directing workflows, and supporting effective user experiences.

Internal platforms embed differentiated workflows that define competitive advantage. And they support operational competitiveness by introducing exponential technologies into typical workflows, creating new ways of working and new skills. For example, in mining, these could include adding predictive capabilities to the blast process to help unearth high-quality deposits of ore and incorporating intelligence into plants to optimize operations.

Building materials supplier CEMEX offers an example of a *consumer platform.* The company is using its Go platform to pilot technologies that bring immediate value to customers. Using customer feedback, CEMEX can continually improve the platform by adding new capabilities. The CEMEX Go platform began as a customer integration platform to provide real-time, detailed information enabling order placement, live tracking of shipments, and managing invoices and payments for CEMEX's main products. Based on customer concerns about cycle time, CEMEX added Quarry Link to CEMEX Go, automating many aspects of material pick up to reduce customer wait time.[10]
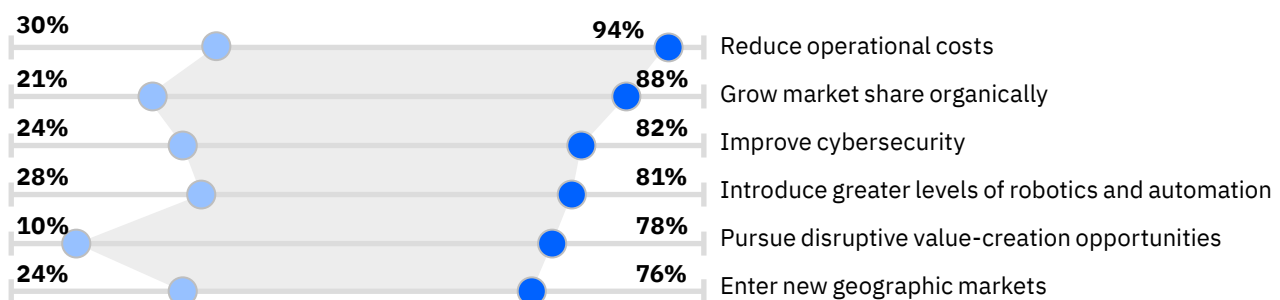
Infuse processes with technologies

Frontrunners have applied exponential technologies to address their most important business objectives (see Figure 4). In fact, more than three quarters and up to 94 percent of frontrunners have made these digital implementations operational or fully implemented and optimized.

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Figure 4

Supporting business objectives with digital

	Frontrunners	Objective
30%	94%	Reduce operational costs
21%	88%	Grow market share organically
24%	82%	Improve cybersecurity
28%	81%	Introduce greater levels of robotics and automation
10%	78%	Pursue disruptive value-creation opportunities
24%	76%	Enter new geographic markets

Frontrunners
All others

Question: To what degree has your organization implemented digital initiatives to support these business objectives?

Frontrunners embrace AI as part of their digital transformations— up to three times more than their peers.

How do digital initiatives support these objectives? Success involves intertwining digital technologies across the entire value chain from core industry processes, such as R&D and product manufacturing, to support processes including finance and accounting and health, safety, and environment. In R&D, for instance, advanced analytics support portfolio allocation decisions and product development lifecycle optimization. In another example, intelligent manufacturing leverages potent combinations spanning advanced analytics, additive manufacturing, artificial intelligence (AI), automation, cloud computing, digital twins, edge computing, 5G, and the IoT to transform operations. The foundation is an edge- and cloud-computing infrastructure for localized optimization and connected assets. Sensors on assets and equipment and AI-driven robotics propel machine learning.[11] Intelligent manufacturing can help improve production defect detection by as much as 50 percent and yields by 20 percent.[12]
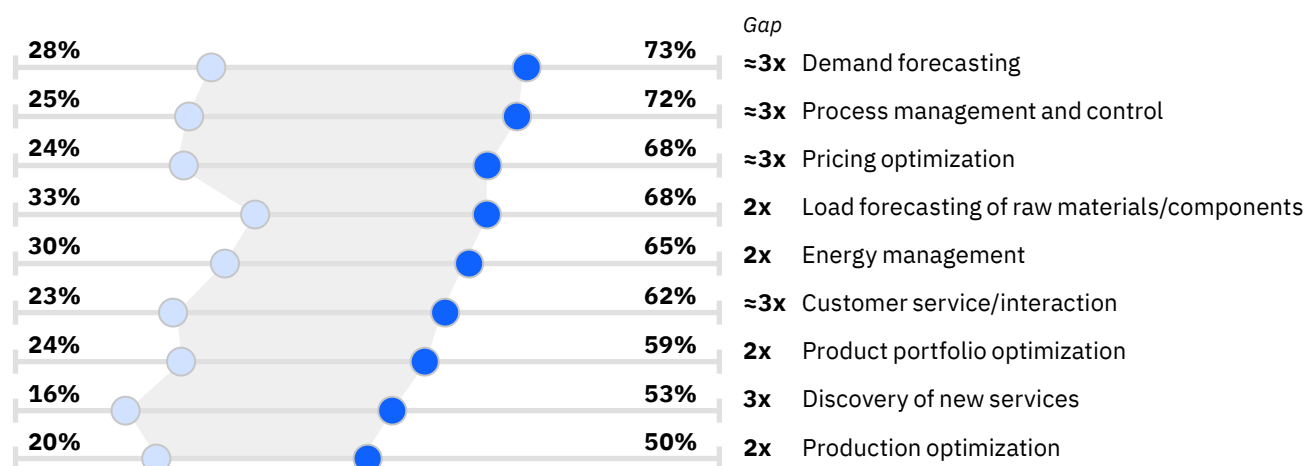
As another example, the finance function can employ robotic process automation to input budgets and capital plans into systems to generate financial planning and analysis reports. In addition, predictive analytics and AI capabilities can support automation of more routine tasks with very little intervention, enabling the finance workforce to focus on higher-value activities. Better insights into an enterprise's strategic, operational, and financial performance can be generated by leveraging automation, analytics, and AI.

Frontrunners also embrace AI as part of their digital transformation—up to three times more than their peers. They are applying AI to a variety of industry-specific activities to capture new value (see Figure 5).

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Figure 5

Using AI across the value chain

AI implementation operational or fully implemented and optimized

		Gap	
28%	73%	≈3x	Demand forecasting
25%	72%	≈3x	Process management and control
24%	68%	≈3x	Pricing optimization
33%	68%	2x	Load forecasting of raw materials/components
30%	65%	2x	Energy management
23%	62%	≈3x	Customer service/interaction
24%	59%	2x	Product portfolio optimization
16%	53%	3x	Discovery of new services
20%	50%	2x	Production optimization

Frontrunners
All others

Question: To what degree has your organization implemented AI in industry-specific activities?

Frontrunners also implement AI for customer care workflows. Compared to their peers, two to three times more frontrunners rely on AI solutions to help evaluate customer satisfaction, increase value from existing customer relationships, improve customer acquisition strategies, optimize marketing ROI across the acquisition funnel, and service products after sales. AI allows these leaders to integrate external data for insights marketers can use to identify prospects and understand customers at an individual level with scale. AI can perform deep knowledge discovery for insights that help sellers take the next-best action. With respect to service, AI systems can perform initial diagnostics and provide resolution recommendations.

In addition, frontrunners harness AI to help their organizations close skills-related gaps by personalizing at scale. AI helps bring meaningful, personalized employee experiences to life by understanding an individual employee's current skills, knowing where the company and individual want or need to progress, and personalizing a learning and career path. Fifty-six percent of frontrunners have implemented AI to identify current skills and future skills gaps compared to one fifth of all others. And 41 percent of frontrunners have installed AI to personalize learning versus 14 percent of their peers.

AI is the cornerstone to support and track strategy execution for frontrunners. In fact, nearly nine out of ten of these leaders have adopted AI for this purpose, as opposed to 28 percent of their peers. A company's strategy execution is guided by its KPIs. AI can help determine what KPIs are measured, how they are measured, and how best to optimize them. These KPIs create accountability for the execution of enterprise strategy by providing analytically enhanced oversight.[14]

Hitachi Zosen: Operating Hitz Advanced Information Technology Center[13]

Hitachi Zosen, a major Japanese industrial and engineering corporation, created the Hitz Advanced Information Technology Center as an in-house hub of remote monitoring and use of information and communications technology, including the IoT, big data, and AI. The Center supports three services: remote monitoring and operational support; IoT, big data, and AI development; and open innovation.

The remote monitoring and operational support services are for power generation facilities focused on energy-from-waste plants. The Center leverages accumulated data to provide after-sales, operation, and maintenance services including life extension of facility equipment and advanced operational support and control.

The Center uses Hitachi Zosen technologies—energy-from-waste, AI image recognition, drone control, GPS, failure analysis, and so on—to collect and store data, analyze it, visualize it, and use it to expand into new services and business planning.
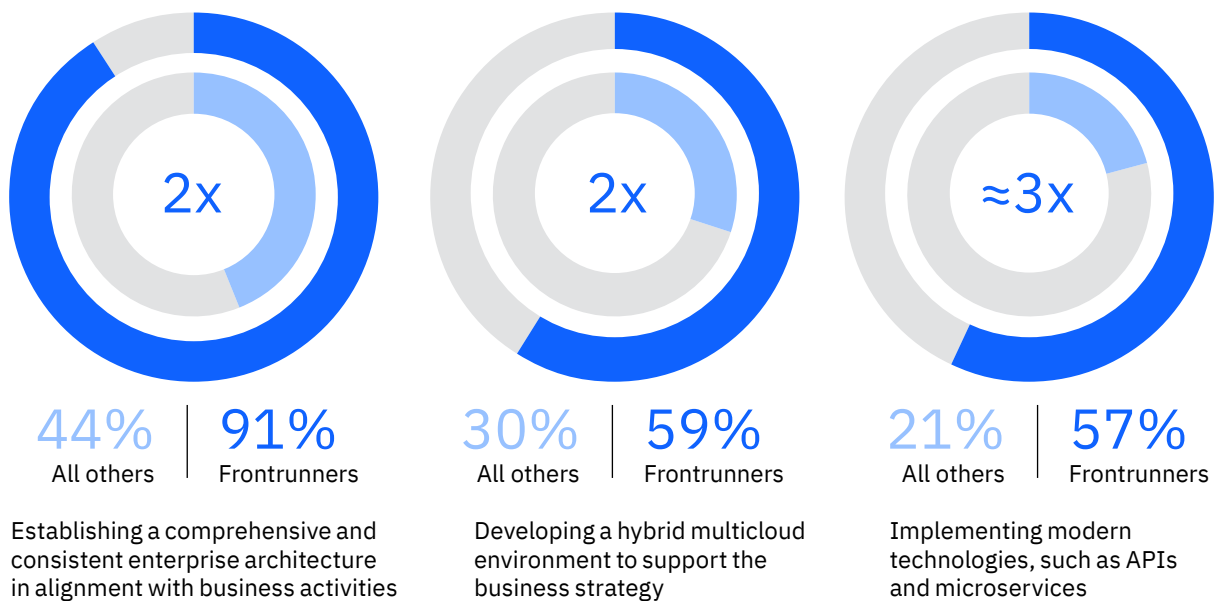
To drive open innovation, the Center includes facilities for collaboration with external firms and university research institutes. By fusing external digital technology with its own expertise, Hitachi Zosen speeds up the development process.

To take advantage of digital technologies and a plethora of data sources, frontrunners have established an enterprise IT architecture (see Figure 6). This comprehensive and consistent enterprise architecture is important to the scaling and compatibility of modular workflows. The foundation also enables the openness needed for market-making business platforms. And hybrid clouds allow access to exponential technologies and enable a seamless flow of data, which frontrunners can use in new ways.

The value of digital technologies is predicated on an organization's ability to create trust from data. Reduced complexity in data structures is a precondition. This requires a common information architecture, an enterprise data-governance framework, data standards, and central data repositories. Our study shows that frontrunners outpace their peers in data-management initiatives (see Figure 7).

Figure 6

An enterprise IT architecture creates flexibility and openness

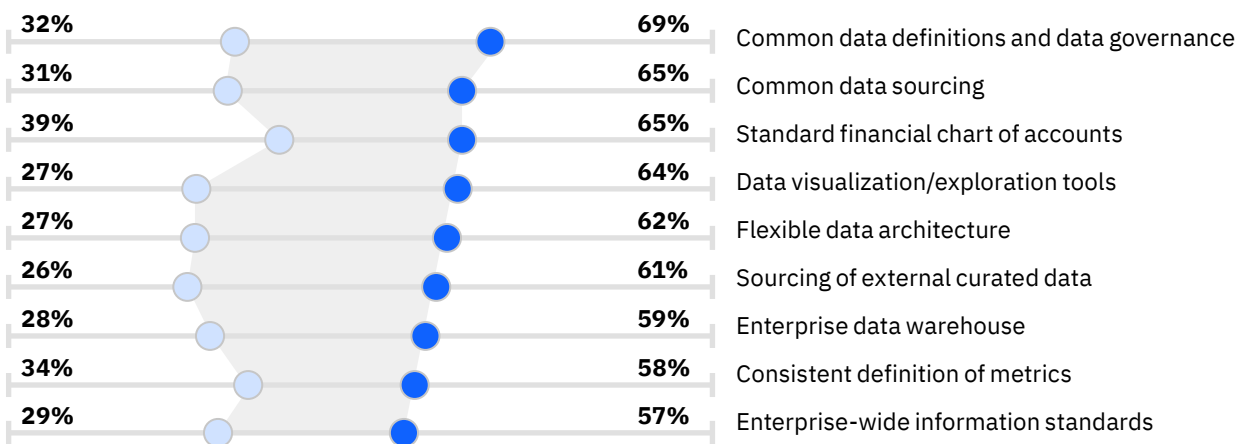| 2x	2x	≈3x
44% All others **91%** Frontrunners	**30%** All others **59%** Frontrunners	**21%** All others **57%** Frontrunners
Establishing a comprehensive and consistent enterprise architecture in alignment with business activities	Developing a hybrid multicloud environment to support the business strategy	Implementing modern technologies, such as APIs and microservices

Question: Thinking about orchestrating enterprise IT architecture to support your digital initiatives, to what extent has your organization made progress against each of the following goals? Percentages represent the number of respondents who selected 4 or 5 on a 5-point scale.

Frontrunners have established enterprise-wide information standards and implemented common terminology for metrics.

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Figure 7

Frontrunners build trust in data through standardization and commonality

32%	69%	Common data definitions and data governance
31%	65%	Common data sourcing
39%	65%	Standard financial chart of accounts
27%	64%	Data visualization/exploration tools
27%	62%	Flexible data architecture
26%	61%	Sourcing of external curated data
28%	59%	Enterprise data warehouse
34%	58%	Consistent definition of metrics
29%	57%	Enterprise-wide information standards

Frontrunners
All others

Question: To what extent have you implemented the following data management improvements as part of your support for digital initiatives? Percentages represent the number of respondents who selected 4 or 5 on a 5-point scale.

Frontrunners have established enterprise-wide information standards—with the emphasis on "enterprise-wide"—and implemented common terminology for metrics. This consistency makes it easier to effectively measure success, which drives accountability in strategy.

Frontrunners have also reduced the time needed to prepare, validate, and cleanse data. Nearly six in ten have implemented an enterprise data warehouse—two times more than their peers. As a result, they can curate their existing data and apply it to decision making.

Finally, 64 percent of leaders are leveraging data visualization/exploration tools, compared to 27 percent of peers. Empowered staffs can dive into data, process information faster, and take advantage of insights to improve performance.

Frontrunners recognize that successful digital transformation starts at the top with leadership that can steer investments to accelerate growth and guide systematic change across the organization.

Knowledge and insights can be extracted from vast amounts of structured and unstructured data about the business environment and operational conditions (see Figure 8). Leaders take advantage of available data sources to adjust operations, identify workforce needs, adjust competitive responses, and act on emerging trends. For example, weather forecasts and market-demand projections influence raw-material sourcing, inventory updates, and energy consumption. This translates to cost savings, improved production processes, and proactive decision making.

Establish a new enterprise experience

Frontrunners curate rich experiences for both employees and customers. As exponential technologies become pervasive in their organizations, these leading organizations are elevating employees' tasks and skills and innovating with customers as part of their digital initiatives.

To succeed, frontrunners recognize that digital transformation starts at the top with leadership that can steer investments to accelerate growth and guide systematic change across the organization. Over nine in ten tell us that they have the necessary strong leadership in place. And 91 percent of frontrunners say a focus on outcomes guides the direction of their digital initiatives versus 67 percent of other respondents.

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Figure 8

Leaders take advantage of new data sources at a greater clip

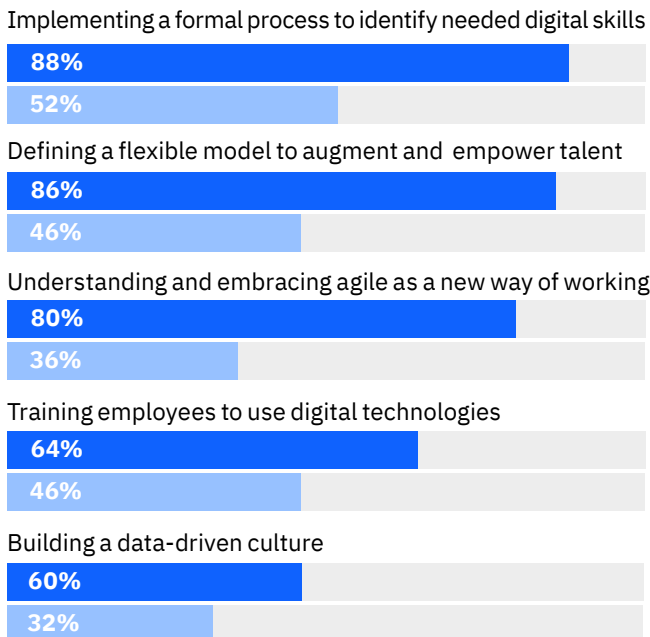| Frontrunners (right) / All others (left)	Data source
51% — 82%	Workforce data
50% — 80%	Customer profiling/segmentation
53% — 79%	Demand data
41% — 77%	Social media
52% — 77%	Competitor information
45% — 72%	Supply chain information
49% — 70%	Finance transactional data
46% — 69%	Area/regional population/growth
49% — 66%	News/events
43% — 64%	Fuel/energy prices
37% — 63%	External data from syndicated news providers
46% — 58%	Weather
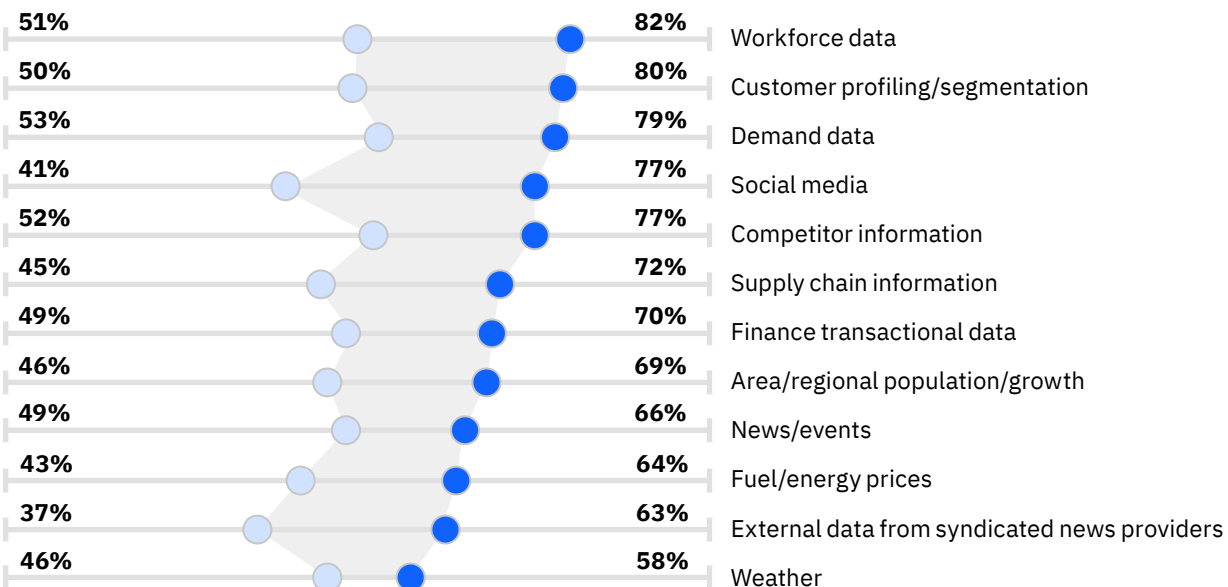
Frontrunners
All others

Question: To what extent are you using the following data sources to take advantage of your digital capabilities? Percentages represent the number of respondents who selected 4 or 5 on a 5-point scale.

To stay ahead of the market and move or shift with changing dynamics and opportunities, organizations must remain nimble. Seventy-two percent of frontrunners embrace the agility necessary to boost the spirit of digital transformation compared to just 35 percent of their peers.

Solid leadership, direction, and agility are supported by strong talent management initiatives (see Figure 9). Frontrunners invest in agile methods that allow modifications based on real-time feedback from testing, iterating, and making improvements throughout the product development and operational processes. And they have created a culture that fosters the use of data and digital technologies. The combination of their enterprise digital strategy with a data-driven culture and agile operations supports organizational dexterity.

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Figure 9

Frontrunners invest in talent

Implementing a formal process to identify needed digital skills

88%	
52%	

Defining a flexible model to augment and empower talent

86%	
46%	

Understanding and embracing agile as a new way of working

80%	
36%	

Training employees to use digital technologies

64%	
46%	

Building a data-driven culture

60%	
32%	

Frontrunners
All others

Question: To what extent has your organization invested in each of the following talent initiatives associated with your digital initiatives? Percentages represent the number of respondents who selected 4 or 5 on a 5-point scale.

JFE Steel: Infusing AI into maintenance[15]

If an equipment malfunction occurs during the steelmaking process and the production line is stopped for a prolonged period, huge losses can be incurred. Therefore, equipment should be operated 24X7 and, in case of emergency, recovery should be quick. As experienced staff members with advanced maintenance experience and know-how retire one after another, companies can find themselves with middle career and early career staff members who are thin both in terms of number and technical know-how.

JFE Steel, one of the world's leading integrated steel producers, deployed an AI maintenance solution that can search vast numbers of documents such as daily work reports, failure reports, and work manuals created over the past several decades. The solution can identify past events and solutions, allowing maintenance personnel rapid access to collective knowledge that supports timely results.

In September 2018, the company's controllers and instrumentation failure recovery support system was implemented in all lines of steel mills/manufacturing plants in six regions. The system has since helped reduce manufacturing downtime from equipment failures by 20 percent or more.

Siemens: Innovating employee support[16]

A German multinational conglomerate headquartered in Munich, Siemens is the largest industrial manufacturing company in Europe, with a presence in almost every country.

As part of a digital transformation initiative, the company's corporate HR leaders were eager to embrace digital technologies to better support a 379,000-person global workforce. The team envisioned providing employees with interactive experiences and quicker, more accurate answers to questions—regardless of location, device, or time of day.

CARL, an AI-based HR chatbot, was created to provide HR-related support for 280,000 Siemens employees across 20 countries. Now fluent in German, English, French, Spanish, and Portuguese and well-versed in 200-plus topics, CARL responds to approximately one million standard employee queries a month.

CARL helps make life easier for the company's employees as well as its HR departments. Employees have a faster, more straightforward way to find relevant HR-related information—increasing employee satisfaction and reducing the time HR staff spend answering employee support requests.

Twice as many frontrunners than others have invested in skills associated with social media data mining, big data-related information management, and data curation. With the right talent and digital technologies, organizations can generate prescriptive insights that recommend next-best actions for closing performance gaps in strategy execution.

Frontrunners' investments in personal skills drive purposeful agility. Over four in five have invested in project management skills compared to just 48 percent of all others. Nearly three-quarters have invested in soft skills such as collaboration, leadership, and social and emotional intelligence versus 43 percent of their peers. Frontrunners recognize that navigating a continually evolving environment requires people who can communicate effectively, change course quickly, apply problem-solving and critical-thinking capabilities to drive digital transformation, and draw and act on insights from vast amounts of data.

Finally, frontrunners change the game with customers by focusing on customer experience innovation. Over three quarters of these leaders are creating personalized customer experiences for microsegments, compared to 30 percent of their peers. With the customer journey as the driver, teams can identify customer needs and engagement and use richer insights to make informed decisions about customer experience improvements. Over three-fourths of frontrunners rely heavily on data to make customer experience strategy decisions by maintaining a single view of the customer, and nearly three fourths make customer knowledge available to their employees at each customer touchpoint.

Frontrunners generate fresh ideas to create new products and services by using business platforms and working with partners.

Frontrunners support open forms of innovation, actively encouraging new ideas from outside the organization through co-creation (see Figure 10). They generate fresh ideas to create new products and services by using business platforms and working with partners. Partnerships can offer process expertise, industry-specific technologies, and access to new and emerging technologies. These leaders also team directly with customers to develop new experiences.

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Figure 10
Frontrunners innovate through multiple channels

With partners

83%

43%

Directly with customers

57%

26%

On business platforms

57%

45%

With dedicated innovation teams

57%

46%
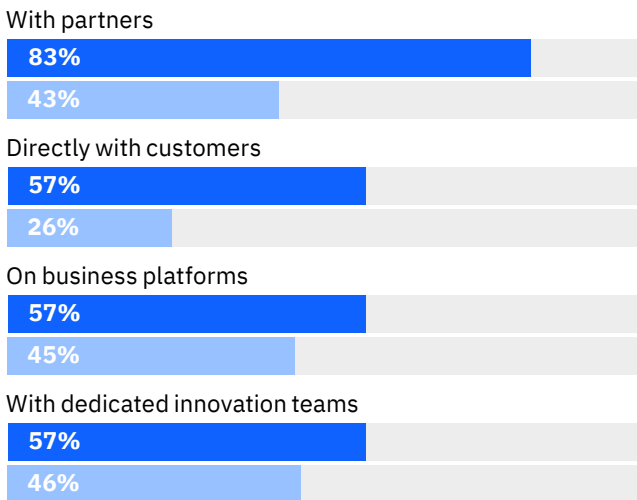
Frontrunners
All others

Question: To what extent does your organization conduct innovation through the following channels? Percentages represent the number of respondents who selected 4 or 5 on a 5-point scale.

ABB: Transforming customer support[17]

ABB is a global pioneering technology leader, producing power generation, distribution, automation, and consumption equipment.

The company had an enormous number of customer comments in multiple languages stored across numerous customer care systems. It wanted a solution that not only could collect, analyze, and translate the comments into English to identify trends at scale, but also understand how customers were feeling. If customer sentiment and emotions were captured, the company could use the information to improve the manufacturing process and avoid future problems.

An AI customer service solution was implemented that includes both natural language processing (NLP) to understand customer comments and translate them into English and natural language understanding (NLU) to analyze the text to extract metadata from the content such as concepts, entities, keywords, categories, relations, and semantic roles to learn and understand sentiment, emotion, and tone. By linking this information with structured data, the company can map an issue to the root cause and build analytical models around the cause-and-effect analysis for better decision making and improved workplace productivity. As a result, quality engineers have become more efficient and knowledgeable about the root cause of problems.

Action guide

Digital transformation at scale for industrial products

Frontrunners have created a framework for digital transformation to thrive. Following their lead, industrial products companies can focus on three priorities:

1. Execute a digital business blueprint

Set an enterprise-wide digital strategy, with initiatives by value chain area, coordinated technology investments, and necessary resources. For example, Caterpillar, the world's largest construction equipment manufacturer, has developed a focused, long-term digital strategy, with a common technology platform and data architecture for connecting all of its equipment and a series of applications to make its products smarter and help customers improve productivity and safety.[18]

In addition, expand market opportunities by tapping into new data sources and ecosystem partners to curate new offerings and experiences. Choose business platforms that create differentiating advantage and align to your capabilities related to data and relationships across your ecosystem. Develop proactive change management associated with digital initiatives.

2. Infuse processes with technologies

Overlay exponential technologies across front- and back-office activities, with an emphasis on those most aligned to business objectives. Track strategy execution using AI. Establish a comprehensive, consistent enterprise architecture to support open flexibility. Deploy hybrid cloud to access data and put it to new use and house workflows. Modernize legacy and deploy new applications with open and agile principles.

Establish commonality and governance to engender trust in data. Embrace the integration of IT and OT domains, a necessity for AI-driven information and recommendation exchange. Leverage curated new data sources to mine the most important value pools.

Uncover ways to apply intelligence to R&D, production, distribution, and customer-facing functions and activities. For instance, AI can help procurement make data-driven decisions by answering the question "What is my next-best action?" In marketing, data on buyer behavior, customer profiles, and social sentiment can be used to analyze customers through multiple lenses to better design customer experience. Predictive sales modeling and product/service data, descriptions, and use cases are critical data for sales to narrow targets and close deals.

As an example of leveraging intelligence for customer-related activities, consider Japanese construction equipment manufacturer Komatsu. The company includes its Komatsu Machine Tracking System (KOMTRAX), a remote monitoring system, as a standard feature on most products. Using sensors and GPS incorporated into the machines, the system can provide customers with real-time information including utilization, maintenance condition, and fuel consumption.[19]

3. Establish a new enterprise experience

Put in place a leadership team that understands the power of exponential technologies and empower the organization to seize new opportunities. Create a new learning organization, with programs for hiring, training, and managing talent. Tailor employee career, skill, and learning development by identifying the current skills of individual employees, discovering where the company and employees want or need to progress, and personalizing learning and career paths.

Add data, personal, and tech-savvy skills to supplement existing resources. Team across boundaries (partners, customers, platforms) to accelerate innovation. Adopt agile principles, determine digital initiative outcomes with clarity, and set milestones.

Finally, curate rich experiences to delight and engage customers. For example, KONE, an elevator and escalator company, has pinned its new business models around the customer experience. After understanding the customer's needs, KONE embraced AI and IoT technology to obtain real-time insights to proactively predict maintenance needs and help its customers improve "people flow" in buildings, resulting in more seamless service experiences.[20]
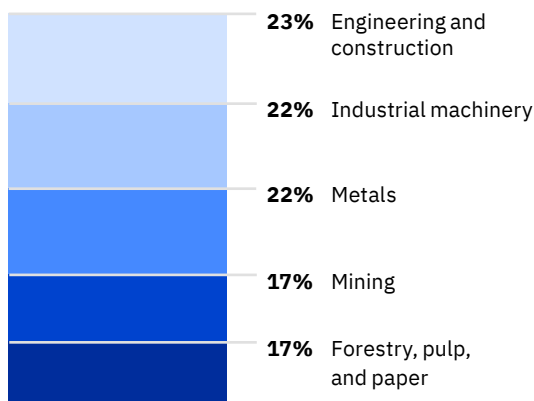
Study approach and methodology

In cooperation with Oxford Economics, the IBV surveyed 600 industrial products executives in 18 countries between January and February 2020. We collected responses from Chief Executive Officers, Heads of Strategy or Heads of Innovation, Chief Financial Officers, Chief Marketing Officers, Chief Operating Officers, Chief Information Officers, Chief Human Resources Officers, and executives whose main job responsibility is strategic alliances or partnerships. Participants were from companies located in the Asia Pacific, Europe, the Middle East, North America, and South America. The 600 industrial products executives represent different segments and different-sized organizations. All data is self-reported.

Frontrunners were defined as those whose executives self-reported the organizations as very effective at addressing the most important business objectives. Respondents selected three to five of the following:

– Grow market share organically

– Reduce operational costs

– Introduce greater levels of robotics and automation

– Enter new geographic markets

– Pursue disruptive value-creation opportunities across the industry value chain and beyond, including new platform business models

– Improve cybersecurity

– Launch new products, services, or value propositions

– Increase partnerships/alliances (or collaboration)

– Provide a personalized and seamless omnichannel customer experience

– Pursue mergers and acquisitions.

Respondents by segment

23% Engineering and construction

22% Industrial machinery

22% Metals

17% Mining

17% Forestry, pulp, and paper

Respondents by enterprise size

26% USD 500—749 million

15% USD 750 million—1 billion

42% USD 1—5 billion

10% USD 5—10 billion

8% USD 10+ billion
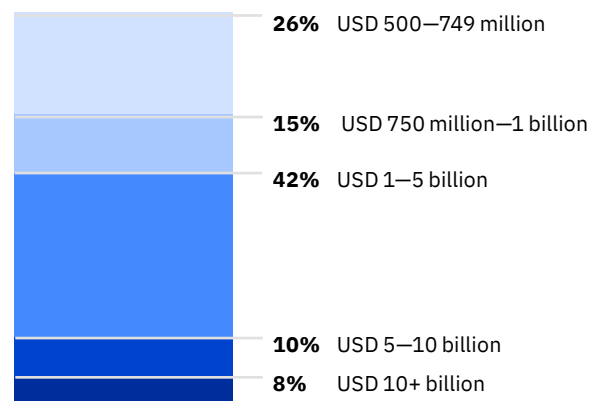
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