ptc

The State of Industrial Digital Transformation

Craig Melrose
EVP, Digital Transformation Solutions

Nick Leeder
VP, Digital Transformation Solutions

David Immerman
Senior Research Analyst

Introduction

Companies across the world have navigated an unpredictable and unprecedented 2020. The COVID-19 pandemic and corresponding economic uncertainty has exposed vulnerabilities for businesses and pushed many to self-reflect on past, current, and future strategy.

A constant through this disruption is the increasing use of digital technologies. IDC puts global spend on digital transformation (DX) technologies and services for these programs at $1.3 trillion in 2020.
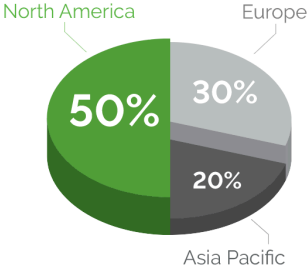
Our global survey of industrial companies supports this sentiment with 92% already on their DX journey. However, our analysis exposes critical nuances to DX strategies based on their maturity, which fall into three distinct stages: Planning, Piloting, and Rollout. The evolving mindsets for attainable value shifts for each stage from understanding where value is (planning), proving value exists or is realizable (piloting), and scaling value across the organization (rollout).

Companies at these different stages have distinct needs, project priorities, and potential blind spots. In this report, we complement data-driven insights and key takeaways from our global survey with case-study driven recommendations for each of these stages. The result is a framework for industrial organizations to use as a benchmark for where they are in their DX journey and how their priorities compare with the market.
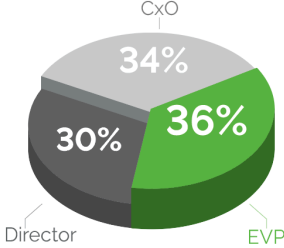
Methodology and Firmographics

PTC surveys over 360 global Senior-level leaders at industrial companies annually to define their state of digital transformation. Respondents have DX decision-making and influencing roles in their respective companies. These DX leaders represent an array of discrete and process manufacturers across regions and organizational functions.
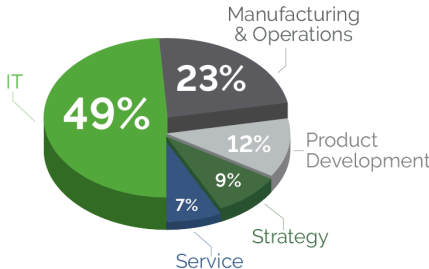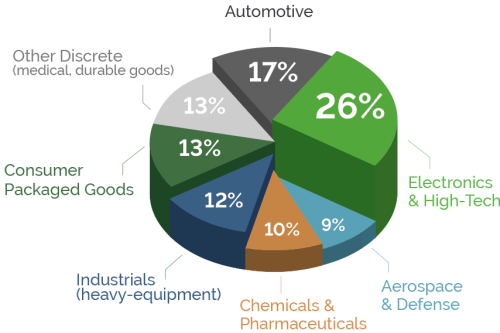
Region

North America 50%
Europe 30%
Asia Pacific 20%

Position

CxO 34%
EVP 36%
Director 30%

Roles

IT 49%
Manufacturing & Operations 23%
Product Development 12%
Strategy 9%
Service 7%

Industry

Automotive 17%
Electronics & High-Tech 26%
Aerospace & Defense 9%
Chemicals & Pharmaceuticals 10%
Industrials (heavy-equipment) 12%
Consumer Packaged Goods 13%
Other Discrete (medical, durable goods) 13%

Revenue

Over $1 billion 54%
Between $250 million- $1 billion 46%

DX Program Authority

Final Authority 80%
Joint-decision maker 16%
Decision-influencer 4%

The State of Industrial DX

Key Takeaway #1: DX is a million (or more) dollar annual investment

Spend

Up to $1M — 23%
$1M-$5M — 47%
$5M+ — 30%

Spend by Company Size (Revenue)

Up to $1M — 35% / 11%
$1M-$5M — 52% / 41%
$5M+ — 13% / 48%

● Between $250 million-$1 billion in revenue

● Greater than $1 billion in revenue
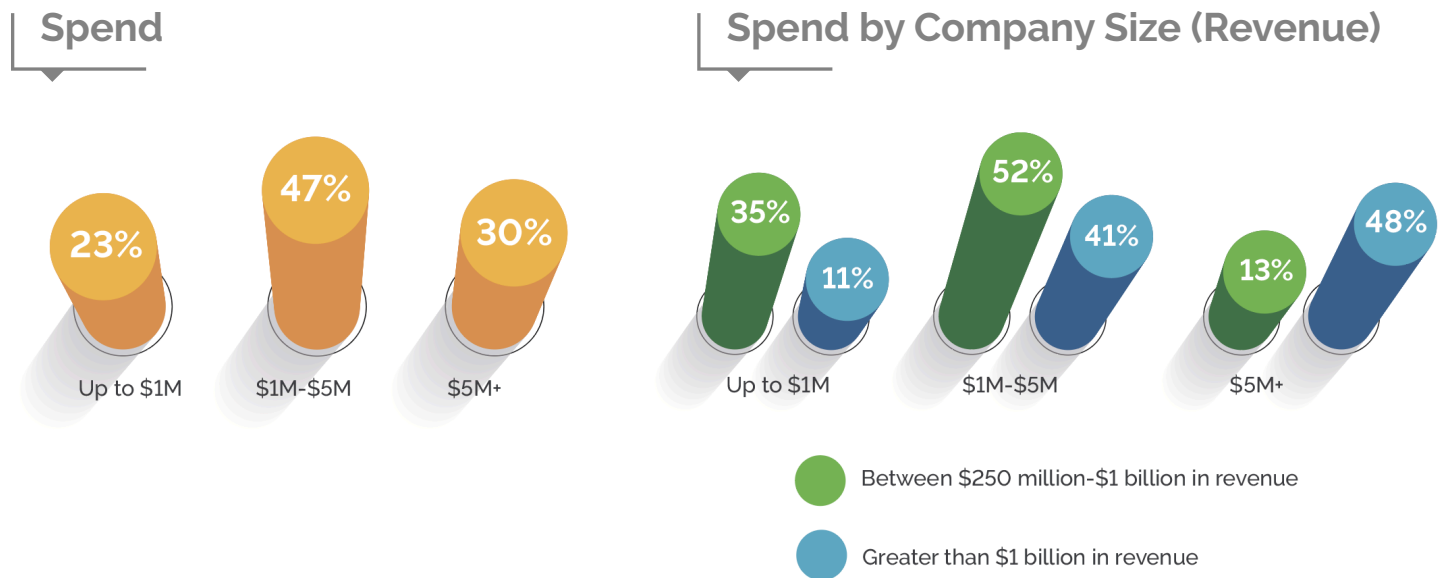
Q: In the current fiscal year, approximately what did you spend on DX technologies? Survey conducted in 2020. n=361

The majority (77%) of digital transformation programs spend over $1m and 30% spend over $5m annually. Large companies (with over $1 billion in revenue) have sizeable DX budgets; nearly 50% spend more than $5 million annually on digital transformation projects.

Industrial products (heavy-equipment, machinery) and other discrete manufacturers (medical devices, durable goods, apparel) have the highest number of respondents spending over $1m (83% and 84%, respectively) and $5m (36% and 34%) on their DX programs.

Key Takeaway #2: DX strategy and budget ownership lives with CxOs

With company DX annual spending commonly seven-figures, it is sensible that strategy and budget responsibilities are falling to CxOs (CEO, CIO, CTO, etc.). Nearly 90% of respondents cite CxOs as the leaders of DX strategy and a similar number of CxOs also own DX budget management responsibilities.
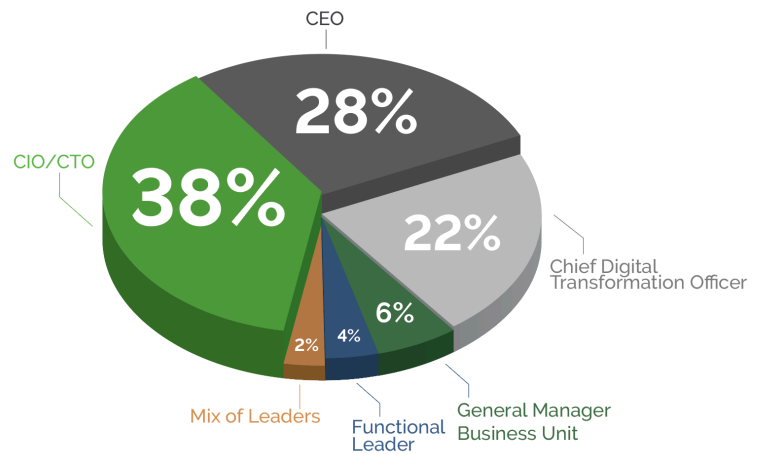
DX Program Leadership

DX Strategy
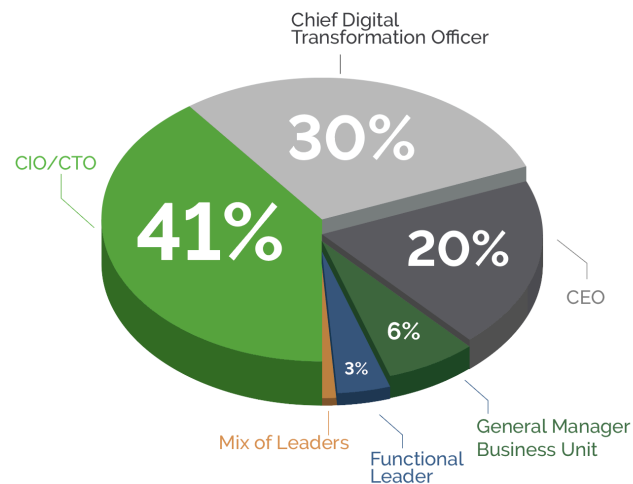
Q: Who leads the DX vision & strategy in your organization? n=361

DX Budget

Q: Who owns the budget for implanting DX initiatives in your organization? n=361

71% of DX programs have technology-oriented CXOs (CIO, CTO, CDO) as strategic leaders and 60% have budget responsibilities. Technology leaders are unquestionably critical to digital projects, however tech-first programs can lead to lapses in business impact. General managers and functional leaders are usually the beneficiaries of DX programs and need to have some influencing power.

With the entire organization's purview in mind, CEOs are best positioned to enact the culture shift across departments to capitalize on digital best practices and business models.

Key Takeaway #3: DX goals are evenly divided between cost, growth, and experience

Successful digital transformations have a high-level goal tied to financial and operational metrics. Respondents' DX goals were focused on three areas: cost/efficiency, growth, and quality/experience. The results were nearly even, demonstrating the broad applicability of DX efforts.

DX Driven Strategic Goals

Cost	Growth	Experience
37%	**32%**	**31%**
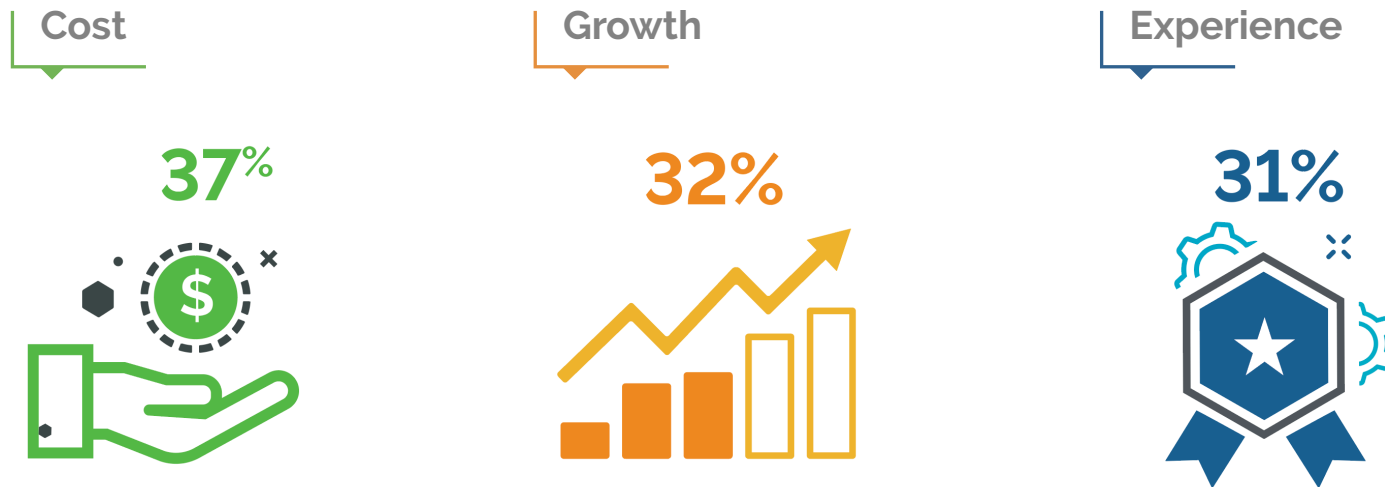
Q: What best describes the primary strategy behind your organization's drive towards DX? n=361

Companies that initially focus DX initiatives on improving the efficiency of their current operations are often in a better position to then capitalize on growth and experience focused goals. Given the current COVID-19 inflicted state of the economy, many (62% according to Gartner) are adopting this 'cost-first' mindset.

Cut Costs to Improve Efficiencies, Productivity, and Margins

Industrial companies are constantly looking for areas to cut costs and improve margins. Through digital transformation there are five areas they are targeting:

1. **Asset efficiency:** Improving the availability, reliability, and performance of machines, equipment, and other industrial assets impacting overall equipment effectiveness (OEE) between 11-30% and downtime by up to 30%.

2. **Workforce productivity:** More effective onboarding of new employees by reducing time-to-impact. Streamlining and empowering current workers with tasks including assembly, tending, maintenance, and service to improve overall labor effectiveness.

3. **Cost of goods sold:** Reducing direct costs including materials and labor required to produce the goods sold by the company.

4. **Operational and manufacturing costs:** Reduce overhead and production costs associated with maintaining operational continuity or expenses with manufacturing a product. Other relevant metrics include labor, materials, energy, supplies, and capital expenditures.

5. **Service costs:** Cutting labor, asset, part, and customer costs across the service lifecycle. Improving service team metrics including truck rolls, first-time fix rates, and asset downtime.

Drive Exponential Growth through Product Innovation

Organizations invest heavily in emerging areas with high-growth and attainable market share. Deloitte classifies industry leaders as more likely to prioritize growth rather than costs.

1. **Time-to-market:** Reducing the amount of time to get new and existing products to customers including product development (design iteration time reduction) and manufacturing (throughput, cycle time) metrics.

2. **Introduce new products:** Reducing allocated time in product development processes including new product introduction and development rates.

3. **Introduce new business models:** Forming alternative methods to drive new revenue streams such as product-as-a-service.

4. **Throughput:** Reducing the time for a product to travel through a manufacturing process by increasing production rates and volume.
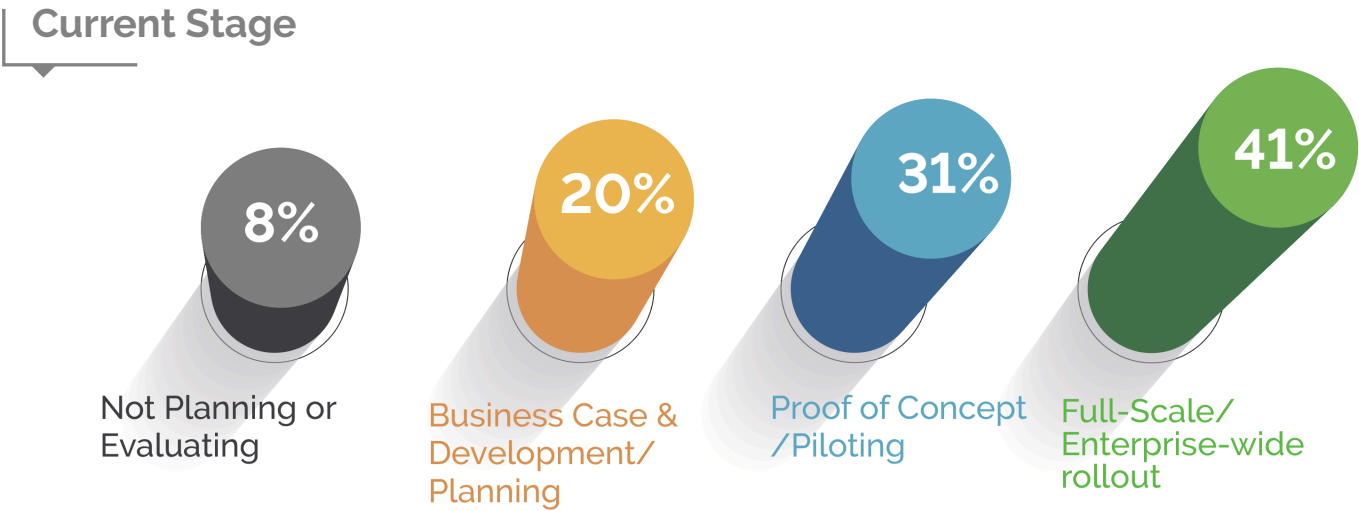
Improve Quality and Engage Customers

Becoming customer-centric is a long-standing sought-after goal for manufacturers and acting on this ambition can take a few different forms.

1. **Product quality:** Consistently creating high-quality customized products with conformity for performance. Reducing manufacturing scrap and rework and operational impacts for customers including defects in the field and recalls.

2. **Customer experience & engagement:** Products, features, or services added to existing customer delivery models improving experience and engagement. Includes customer's perception of products and services through net promoter scores, usage rates, and verbatim feedback.

3. **Service quality:** More reliable, responsive, and empathetic service operations. Impacts internal service metrics (truck roll) and customer-facing ones including mean time to repair by up to 83%.

Key Takeaway #4: 92% of industrial companies are on a DX journey

Current Stage

8% **Not Planning or Evaluating**

20% **Business Case & Development/ Planning**

31% **Proof of Concept /Piloting**

41% **Full-Scale/ Enterprise-wide rollout**

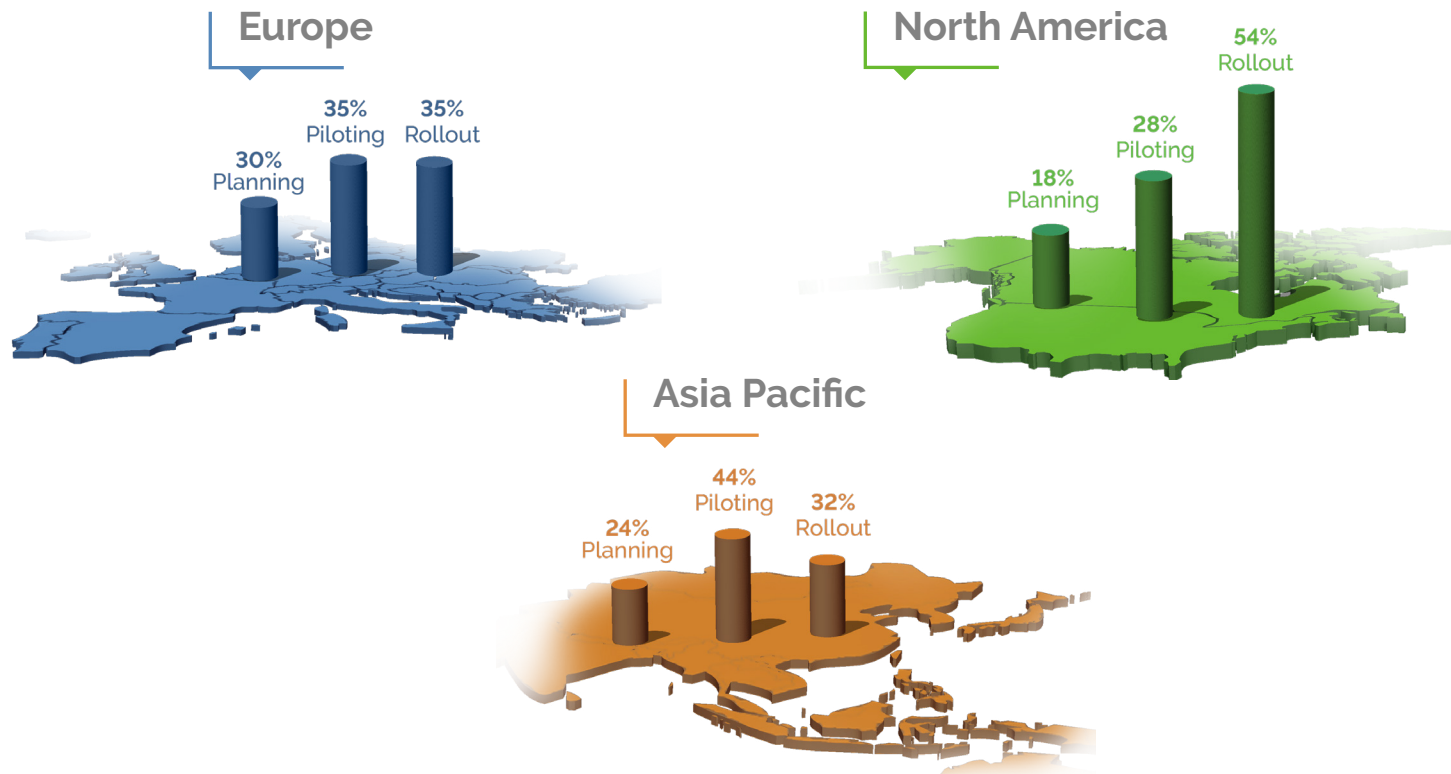Q: What is your organization's current stage in its digital transformation journey? n=392

The vast majority (92%) of organizations are at some point in their digital journey but are spread across three different stages of maturity. Around half (51%) are still evaluating (planning) and experimenting (piloting), but we're nearing a tipping point. The percentage of digital laggards is decreasing; IDC predicts 75% of organizations will have a comprehensive DX implementation roadmap by 2023, up from 27% today.

Key Takeaway #5: Where you are in your DX journey determines priorities and challenges

There are clear regional and industry differences in DX maturity. North America has the greatest number of respondents in the rollout stage of their DX journey, while APAC has the same for piloting, and EU has a balance across each. The majority of Industrials (57%) are in the rollout stage and only 30% are in the piloting stage. Automotive and Consumer Packaged Goods have a near balance between pilots (36% and 38%, respectively) and rollouts (39% and 40%).
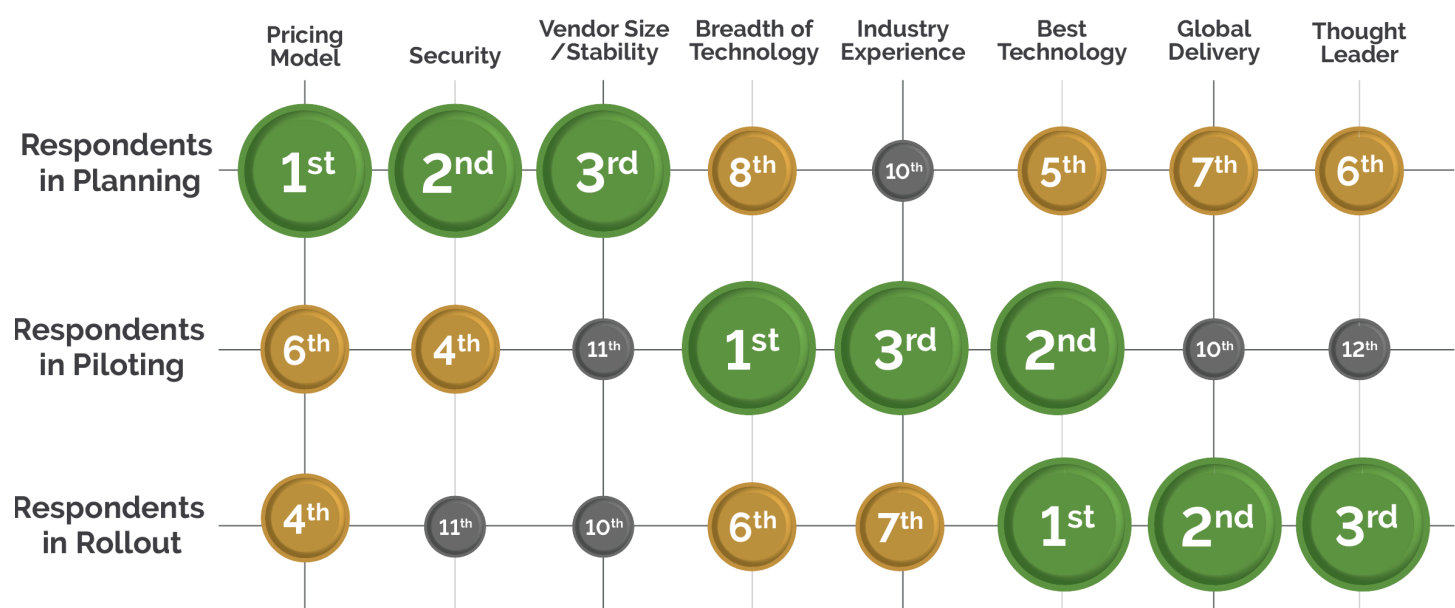
Distribution of Project Phases across Regions

Europe

30% Planning
35% Piloting
35% Rollout

North America

54% Rollout
28% Piloting
18% Planning

Asia Pacific

24% Planning
44% Piloting
32% Rollout

Q: What is your organization's current stage in its digital transformation journey?' Survey conducted in 2020. 'n=361

Where a company is in its DX journey dictates priorities, and we have benchmarked the priorities for companies at each stage in their DX journey. DX leaders need to be aware of the biases inherent in each stage and gain visibility into what matters next along their DX journey.

Respondents in each project stage rank importance of vendor capabilities

	Pricing Model	Security	Vendor Size /Stability	Breadth of Technology	Industry Experience	Best Technology	Global Delivery	Thought Leader
Respondents in Planning	1st	2nd	3rd	8th	10th	5th	7th	6th
Respondents in Piloting	6th	4th	11th	1st	3rd	2nd	10th	12th
Respondents in Rollout	4th	11th	10th	6th	7th	1st	2nd	3rd

Q: What vendor criteria is most important to you at your current stage of your DX journey? Survey conducted in 2020. n=361

In the following section, we explore the questions companies are asking and correlating priorities based on their stage on the DX journey - and offer strategic guidance along the way.

DX Maturity Stages

Planning

1. Pricing Model   2. Robust Security   3. Vendor Size/
                                                     Financial Stability

Pricing Model: How much will this cost?

The common question posed by CxOs for any considerable investment is 'how much will this cost us?' Unsurprisingly 'pricing model' is the most frequently cited criteria by respondents in the planning stage. DX initiatives involve many new and diverse investments across software, hardware, and services, which makes defining costs a complex, but necessary exercise. One notable trend, 'Pay-as-you-go' subscription software models are obviating massive upfront capital investments of traditional perpetual software licensing. IDC claims 53% of all software revenue will be generated from a subscription model by 2022.

Robust Security: How much of a risk is this?

Increasingly ubiquitous internet accessibility paired with a mobile workforce and sensitive digital intellectual property creates a growing cyberattack surface area and much needed security strategy. With cyber risks as a top five business concern for 2020 and the greatest technological organizational priority due to COVID-19, evaluating robust information security capabilities are a prerequisite to selecting DX software that will tie to critical business systems.

Vendor size/financial stability: Will you be around for the foreseeable future?

Many consider vendor size & financial stability to ensure they can support their current and future DX ambitions. With most DX projects taking over five years, DX buyers must evaluate the vendor's realistic longevity to support long-term projects.

Planning Recommendations: Internal Evaluation with Stringent Levels of Scrutiny

Companies should unquestionably put potential DX partners through rigorous evaluations. However, companies with these traditional purchasing criteria must also put themselves through a rigorous evaluation of these questions:

- **How does this enable or accelerate our business strategy and goals?**
- **What is the expected financial impact of this investment?**
- **How do we plan to achieve this value?**

Leaders of new DX programs should be able to directly tie DX goals to their business strategy. Aligning business priorities and related financial drivers with the DX initiative is more likely to secure executive buy-in and commitment. Financial-impact value exercises measure the anticipated monetary impact of the DX program.

Conducting these intensive internal exercises provides a tangible roadmap to obtain value and guidance to source required resources. Mapping or 'planning value' in increments across the program's roadmap will help keep it on schedule and allocating the right resources will fuel its pace.

For example, if an automaker's strategic differentiation requires maintaining the highest levels of product and service quality (our automotive respondents cite as a top DX goal), then its DX plan should enable or accelerate this goal. Reducing manufacturing costs for scrap and rework are relevant financial-impact indicators as well as defects in the field, recalls, and customer satisfaction.
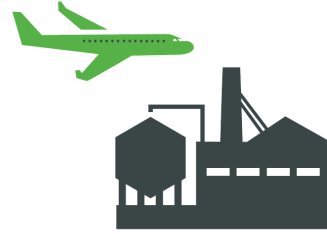
Piloting
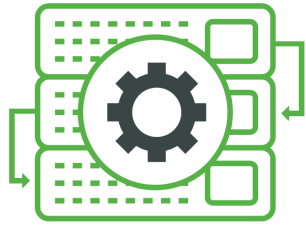
1. Breadth of Technology Capabilities

2. Best in Class Technology

3. Industry Experience/ Vertical Expertise

Breadth of Technology: Where else can we apply technology?

Many companies use the pilot stage to experiment with a variety of goals and correlating use cases in simulated scenarios across the enterprise. As such, companies value vendors with breadth of technological capabilities at this stage to support these several different pilots and the many technologies at play.

Best in Class Technology: Is this the best technology solution in the market?

Companies want to pilot with cutting-edge, innovative, and best in class technologies. Many turn to external sources for evaluation criteria to determine which technology is best-in-class, but each company should prioritize their own unique variables to determine what technology is 'best' for them.

Industry Experience/Vertical Expertise: Have you done this before?

With companies contemplating many use cases, vendors with industry experience implementing these solutions in the real world can make the difference between completing projects in one year versus five, and achieving marginal financial improvements versus double-digit impact. Vendors with proven industry and vertical domain expertise possess the know-how to overcome piloting challenges.

Piloting Recommendations: Prioritize High Value Use Cases

The pilot stage is unfortunately where many DX projects fail; only 30% of pilots in digital programs scale from proof of concept (PoC). Two misinformed market mindsets are creating these failures: prioritization of technology-oriented use cases and the pursuit of too many parallel use cases. Companies can circumvent these dire projections by answering these questions.

> **· How do we evaluate and measure the success of pilot programs?**
>
> **· How do we prove the value of this digital program?**

Many DX teams 'open Pandora's box' and become enamored with numerous technologically innovative use cases. In fact, manufacturers on average start with eight digital projects, with 75% of these failing to scale. Instead, companies must define the success criteria in a way that results in prioritizing the use case that drives the greatest business value.

To thwart pilot purgatory, companies need an aligned roadmap that prioritizes one or two high-value use cases to take into production. Many factors and inhibitors can arise in this prioritization process that impact time to value. Weighing positive and negative attributes will relieve headaches downstream. These could be burdensome brownfield technology integrations requiring lengthy production downtime or extraneous sourcing of disparate operational data needed to feed an analytics model in the DX use case.

Proving value of an initial use case by measuring its impact is key validation for fortifying ongoing program investment and expansion. Implementing benchmarks that quantify value and measure KPI improvements will prove the use case's impact to stakeholders.

Rollout

| 1. Best in Class Technology | 2. Global Delivery Model | 3. Visionary/Thought Leader |

Best in Class Technology: Do we use the best technology across our products, processes, and people?

While DX use cases should be financially driven, technology is at the core of DX. To unlock these tangible improvements, the technology underpinning the use case in production must be foolproof and scalable.

Global Delivery Model: Can we expand this program globally?

With the successful implementation of a DX use case driving recognizable benefits, the purview expands globally. DX adopters in the rollout stage value providers with a global delivery model and provide on-ramps to scale use cases across regions, departments, and sites. These global methods include leveraging more scalable technologies like cloud computing and strategic alliances with regional and industry partners.

Visionary/Thought Leader: How will our program evolve over time?

With continuous economic, business, and technological waves of disruptions, it is critical for DX partners to be ahead of the trends and considered visionaries or thought leaders. Partnering with forward-thinking vendors and aligning roadmaps lessens the severity of these disruptive swells.

Rollout Recommendations: Achieve Growth with Program Support, Speed, and Scale

It is common for companies to rollout a single use case and ask themselves 'now what?' Many are not prepared to duplicate initial successes across the organization and recognize the compounding financial value if they could. Programs slowing to a tenuous pace of incremental time-intensive use case installments fail to create transformational outcomes and risk being defunded due to lack of perceived benefits. Below are a few questions companies should consider to recognize these benefits when in rollout:

- **Does our technology ecosystem support program growth?**
- **How does our program achieve speed at scale?**
- **How do we ensure the program's governance?**

With collaboration from industry partners, companies need to embed technology internally and form technology ecosystems. Ecosystems are key to creating enterprise architectures to support myriad use cases across the value chain. Leveraging digital-native partners to adopt scalable cloud infrastructure and Industrial Internet of Things platforms are common elements of an enterprise architecture for industrial companies.

The ultimate goal of DX should be to achieve unprecedented speed at global scale that unlocks exponentially compounding financial impact.

Establishing repeatable DX processes that can be easily adopted across departments propels scalability. Creating 'playbooks' provides 'how-to' recipes for adopting use cases in different scenarios and include learning resources for best practices, user roles and responsibilities, governance models, and roadmaps.

Couple these playbooks with agile process methods, which are two-to-four week sprints where cross-functional teams strive toward targeted goals and a 'Minimum Viable Product'. Establishing parallel activities through collaboration with other teams implementing the use case creates tangible culture change. Having team leaders sit-in on use case rollouts in other departments enables visibility into the process and promotes cross-organizational knowledge sharing.

As the program expands, managing multiple global deployments in parallel through a governance model is important to support scaling. Forming a steering committee of internal stakeholders and external partners creates a charter to ensure alignment and accountability across teams and facilitates seamless transitions from planning to piloting to rollout.

The time for Digital as a strategic organizational pillar is now

Even with economic uncertainty, COVID-19 hasn't delayed digital projects and, in many cases, has pushed them further along. 41% of companies are continuing with their original program timeline and 25% cite newly introduced or accelerated DX projects. 93% of digital leaders claim digital investments made prior to the pandemic allowed them to be more agile in their response.

Digital is here to stay, and the competitive landscape will shift in favor of 'digital leaders' versus 'digital laggards' over the next decade and beyond. Leverage our data to benchmark your DX program's current status, ensure your priorities and goals are aligned with your stage, and execute on our recommendations to achieve unparalleled impact, uncompromising speed, and unrestricted scale in unprecedented times.

PTC, Inc.

February 2021
Copyright © PTC, Inc.
www.ptc.com