

Predicts 2020: Resilience in Industrie 4.0 for Advanced Manufacturing Builds on Data and Collaboration Models

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Initiatives: [Manufacturing Digital Transformation and Innovation](#)

Manufacturing resilience in a time of extreme uncertainty will require sophisticated data analytics and collaboration capabilities. CIOs driving Industrie 4.0 programs must demonstrate leadership skills that support a cross-team data culture and information policy to overcome crises like COVID-19.

More on This Topic

This is part of an in-depth collection of research. See the collection:

- [Over 100 Data and Analytics Predictions Through 2025](#)

Overview

Key Findings

- Successful resilience strategies in manufacturing are based not only on direct and indirect influences in a specific regional enterprise environment, but also on a comprehensive analysis of ecosystem dependencies.
- Discrete manufacturing companies — especially in the automotive sector — are increasingly focusing on exchanging, offering or selling data and algorithms and Industrial Internet of Things (IoT) platform services as a means of optimizing their existing businesses.
- The most successful manufacturing CIOs position themselves not only as technology leaders, but also as digital transformers who are able to initiate, drive and demonstrate the benefit, or value, based on the culture of the organization.

Recommendations

Manufacturing CIOs driving digital transformation and innovation:

- Work to ensure digital transformation success by building a product management organization that acts as an internal service provider team to develop projects as products. This team should consist of both IT and business stakeholders with deep skills in aligning their value-generating processes.
- Develop a collaborative culture, clearly defining the new employee behaviors that are desired, introducing best practices and offering examples and of specific situations and behaviors.
- Determine the success or failure of business and IT initiatives by periodically applying data valuation methods to the enterprise's entire portfolio of data assets.
- Work to improve enterprise resilience by designing models that take into account data governance across all Industrie 4.0 environmental data that relies on data exchange mechanisms.

Strategic Planning Assumptions

By YE24, following the COVID-19 pandemic, more than 30% of manufacturers will have changed their business models, compared with just 10% before the crisis.

By YE22, half of all Industrie 4.0 transformation programs will be failing because they are not linked to, accompanied by and measured by change leadership strategies.

By YE23, half of all successful artificial intelligence (AI) implementations in manufacturing enterprises will be driven by a CIO-chief data officer (CDO) collaboration.

By YE21, half of all manufacturing enterprises will have failed to recover from the impacts of the COVID-19 pandemic due to inconsistent analysis of ecosystem dependencies.

Analysis

A vast array of social, economic and cultural factors, most notably the ongoing COVID-19 pandemic, are stressing every aspect of manufacturers' operations, and these same stresses are impacting their customers, their suppliers and their external partners. Digital transformation journeys in manufacturing enterprises — strategies taking the approach that is now widely known as "Industrie 4.0," which extends across a company's operations and deep into its ecosystem — are now more critical concerns for CIOs than ever.

What You Need to Know

Manufacturing enterprises worldwide have been in crisis and recovery mode ever since the onset of the worldwide COVID-19 pandemic, making resilience a mission-critical concern for manufacturers. In this time of literally unprecedented uncertainty, CIOs and other senior manufacturing decision makers must develop and review their digital transformation strategies to ensure maximum resilience (see [“COVID-19 Fast Response for Manufacturing CIOs”](#)). They need to reprioritize foundational projects, shifting from maximization of production output or profits to short-term cost optimization, resilience, sustainability and risk avoidance (see [“Design Resilience Into Your Supply Chain With Scenario Planning to Weather the Unexpected”](#)). There are long-term costs associated with pursuing stand-alone projects, and even with extensive IT-specific digitalization initiatives that don’t have a digital business outcome. Industrie 4.0 digital transformation now requires continuous investment to improve transparency and enable faster, better decision making (see Figure 1). This process extends across the full range of manufacturer’s operations, processes, systems and risks, and across its entire ecosystem — an ecosystem that is itself likely to be under extreme stress.

These efforts are extremely expensive, however, and the current crisis makes already constrained business and IT resources even more scarce and spending even more difficult to justify. Manufacturers need to improve their resilience in governance and decision making, but they have to focus these efforts on areas where they’ve already made investments, reprioritizing those investments for the current environment.

Figure 1. Industrie 4.0 Resilience Orchestration**Industrie 4.0 Resilience Orchestration**

Source: Gartner

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Manufacturing CIOs need to make targeted, cost-effective investments in digital technologies, especially advanced data analytics, AI and other tools that foster ecosystemwide collaboration (for example, in automotive supply chain management). Any capabilities that can be digitalized – whether by buying tools, migrating systems to the cloud, using third-party service providers or other means – should be considered. The business value of an IT investment – a critical issue at a time when cost optimization is an urgent priority – is easier to recognize when there’s clear enterprisewide and ecosystemwide demonstration of business value. This will enable CIOs to make sound decisions based on production capabilities and market demand. And it will enable them to make technology investments that they can leverage in the postpandemic period.

It’s important for CIOs to recognize that there are clear regional differences in terms of speed of recovery and impact on a manufacturer’s transformation efforts. Their decisions must be based on regional factors like labor laws, market readiness, setup of production lines and supply chain dependencies, as well as regional, national and even local differences in demand. While the automotive sector and other heavy industries are facing a dramatic decline in demand, other sectors, such as like food and beverage, healthcare and life sciences, are seeing increases in demand for some of their products.

All these factors mean that manufacturing CIOs must take into account choices that would have been unthinkable before the pandemic. They need to embrace agile change capabilities instead of concurrent reprioritization. Cloud computing will be one of the key components of this approach, because by offering this as a main option, CIOs can reduce the proliferation of shadow IT. Advanced analytics, AI and algorithms will be needed to deliver data-driven decisions once pandemic conditions have passed. CIOs may, for example, be able to offer journey routing to workers, or identify needed changes in spatial locations for work orders for the layouts of production facilities and workbenches.

Many manufacturers have already taken important steps along this path. Some have successfully introduced information and communication technology (ICT) in the digital workplace or data exchanges across the value chain, and begun building out capabilities across internal and external partnerships. They may even have started to offer these capabilities as services to their partners, exchanging best practices or creating blueprint models.

Strategic Planning Assumptions

By YE24, following the COVID-19 pandemic, more than 30% of manufacturers will have changed their business models, compared with just 10% before the crisis

Analysis by: Alexander Hoeppe

Key Findings:

Digital transformation in manufacturing is now well advanced and, in many cases, extends well beyond factory modernization and internal process improvements. It may involve a fundamental transformation in a manufacturer's business model, from a product- or asset-focused enterprise to a service provider. This transformation is not, however, simply a technical challenge. It also requires changes in process, organization and even culture, and this makes a smooth transition critical to success.

One of the key trends in manufacturing is the fact that products are becoming more customized and unique, enriching products with services to enhance the customer experience. The physical product may be less important than its capabilities. KAESER KOMPRESSOREN, for example, wants to sell volumes of compressed air instead of compressors, and Caterpillar's Cat Connect platform aims to improve worksite efficiency.

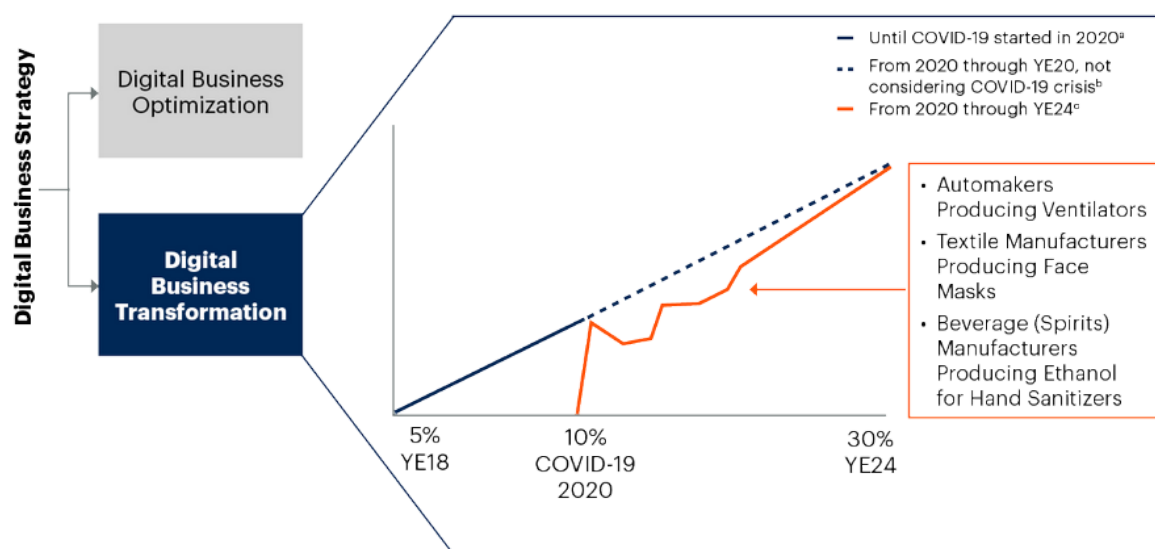
The COVID-19 pandemic and other crises have the potential to accelerate these transformation processes, shifting from heavily impacted core businesses to areas where demand has increased enormously. One example: Ford Motor and GE Healthcare are partnering to produce urgently needed ventilators (see “[Supply Chain Brief: The 4 Questions to Ask When Repurposing Capacity to Combat the Coronavirus](#)”).

Gartner’s 2019 CIO Survey showed that 11% of manufacturing respondents’ enterprises’ business models had already changed, and 29% are expected to do so by 2021.¹ Another 34% reported that they were in the process of changing their business models. As seen in our next prediction, Gartner estimates — that half of all Industrie 4.0 projects will fail. If we’re right about that, we can conclude that only half of all transformation initiatives will be successful. The bottom line: While just 5% of manufacturers had transformed and scaled to new business models by YE18, 30% will have done so by YE24.

Figure 2 shows the percentage of manufacturing companies that will have transformed their business models by YE24.

Figure 2. Business Model Transformation in Manufacturing During the COVID-19 Crisis and Beyond

Business Model Transformation in Manufacturing During the COVID-19 Crisis and Beyond



Source: Gartner (May 2020)

^a Assumed growth in percentage of manufacturing enterprises (based on CIO Survey 2019) that have changed their business model until COVID-19 started in 2020

^b Assumed growth in percentage of manufacturing enterprises (based on CIO Survey 2019) that have/will have changed their business model from 2020 through YE20, not considering the COVID-19 crisis

^c Assumed course of change percentage of manufacturing enterprises considering COVID-19 that have/will have changed their business model from 2020 through YE24

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The dotted blue line shows predicted transformation without the impact of COVID-19 effect, while the nonlinear yellow curve takes COVID-19 into account. It assumes a slowdown in IT spend in 2020 (see [“Forecast: Enterprise IT Spending for the Manufacturing and Natural Resources Market, Worldwide, 2018-2024, 1Q20 Update”](#)), but a growth acceleration from 2021. This acceleration will be driven by manufacturers that, faced with decreased demand or interrupted supply chains, engage in new business models. By the time the crisis ends (the timing is impossible to predict, but will likely be before YE24), the non-COVID-19 line will likely intersect with the COVID-19 curve.

The assumption that both curves could meet again by YE24 can be explained by the fact that only 18% of CFOs responding to Gartner’s COVID-19 Financial Leader Survey reported IT budget cuts of more than 10% (see [“CFO Cost Reduction Actions During COVID-19 as of 30 March 2020”](#)). Digital transformation initiatives that have already been budgeted have not as yet been cut. They will be reprioritized, however, and we even expect some additional short-term funding to be allocated in response to the crisis.

Market Implications:

Manufacturers’ digital transformation initiatives —have two primary drivers, before, during and after the current crisis:

- **Changing customer needs.** Demand for customized products and enhanced customer experience — For example, more product variants and products are enriched with services or even replaced by services, so that a product’s capability is given higher priority than its ownership.
- **Recession scenarios.** Manufacturers must be able to manage disruptions, such as the current COVID-19 pandemic. This means that they must transform operating and even business models to overcome impending crises with the least possible damage and to be better prepared for any kind of downturn or even cyclical crises in the future.

IT service providers and software vendors that follow a modular, platform-based deployment approach that combines technology skills (AI, analytics and IoT) with industry process skills and business transformation skills are especially well positioned to help manufacturers transform to digital businesses. This will, of course, depend on the severity of the distortions caused by disruptive changes in customer demand patterns, recessionary conditions or other problems. Manufacturers will need partners that can strike the right balance between Mode 1 (planned and orchestrated implementation of solutions) and Mode 2 (agile and flexible introduction of technologies to minimize risks or generate benefits).

Recommendations:

- Work to ensure digital transformation success by building a highly capable product management organization that acts as an internal service provider team. This team should consist of both IT and business stakeholders with deep skills in aligning their value-generating processes.
- Make the best use of your industry and business transformation skills. Avoid “reinventing the wheel” by working with product and service providers that have been proven to deliver scalable solutions aligned with established standards and reference architectures.
- Collaborate in partner ecosystems capable of tailoring implementation approaches to different scenarios using faster, more-agile methods in times of crisis, and predictable and orchestrated solutions in regular business operations, and switching between the two approaches as required.

Related Research:

- [“Digital Business Ambition: Transform or Optimize?”](#)
- [“Forecast: Enterprise IT Spending for the Manufacturing and Natural Resources Market, Worldwide, 2018-2024, 1Q20 Update”](#)
- [“Top 10 Strategic Technology Trends for Manufacturing Industries: Data Monetization”](#)
- [“Align IoT Capabilities to Client Needs to Succeed in Manufacturing”](#)
- [“Product Managers’ Guide to Create Compelling Smart Factory Offerings”](#)

- [“Leverage Ecosystems to Increase Effectiveness in Creating Solutions for Manufacturing Industries”](#)
- [“Supply Chain Brief: The 4 Questions to Ask When Repurposing Capacity to Combat the Coronavirus”](#)

Strategic Planning Assumption: By YE22, half of all Industrie 4.0 transformation programs will be failing because they are not linked to, accompanied by and measured by change leadership strategies.

Analysis by: Bettina Tratz-Ryan and Ivar Berntz

Key Findings:

Many CIOs are struggling to scale their transformation initiatives for reasons related not to technology, but to organizational culture. Some try to drive transformation through individual technology initiatives. Others, however, rightly see their positions and their leadership roles as the key to changing the IT culture and expanding their digital transformation comfort zone. They’re working to connect with their peers across industry, across the supply chain and in human resources.

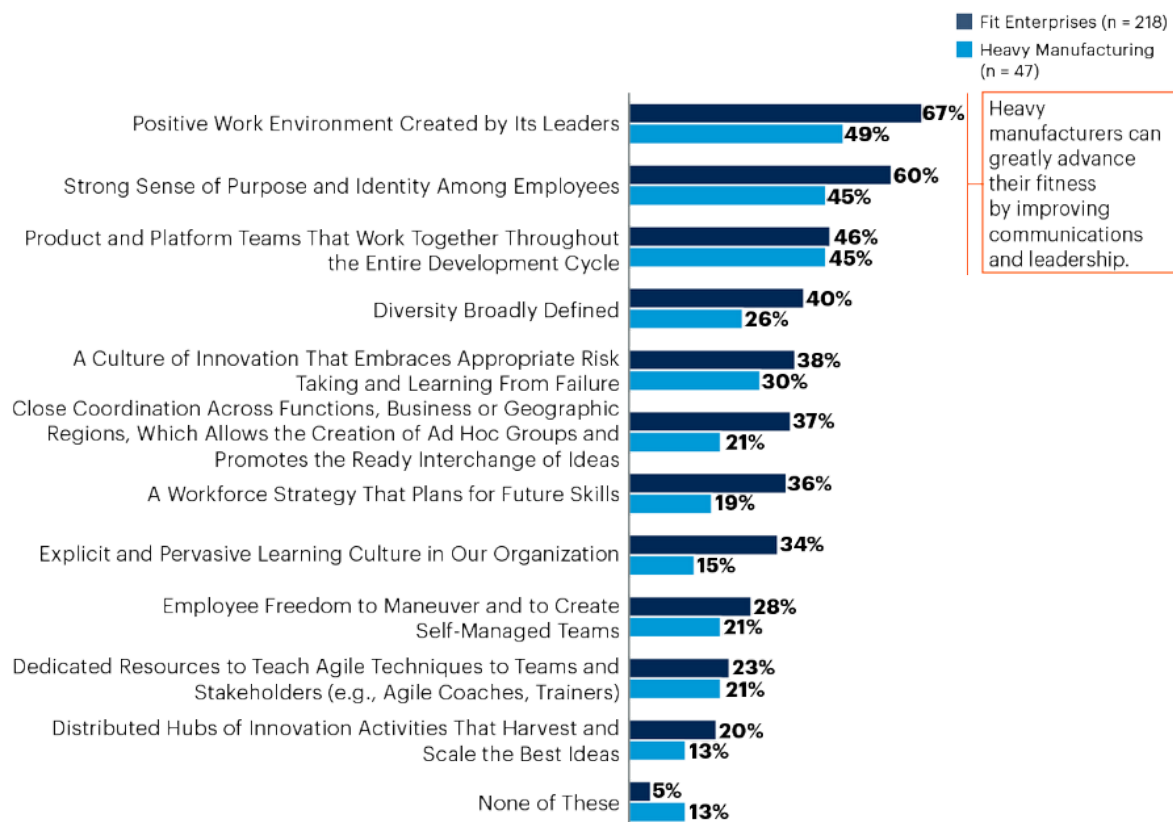
Gartner research shows that culture change is a critical priority for 93% of all enterprises (see [“Culture Change Succeeds or Fails in Leadership Moments”](#)). Digital transformation initiatives are impacted especially strongly by the intersection of technology implementation and the advancement of organizational culture. Gartner’s manufacturing scenario, for example, shows that adopting and scaling innovative products involves a different mentality from initiatives related to organizational structure (see [“Use Gartner Scenarios to Tackle Culture Barriers in Manufacturing Organizations”](#)). CIOs driving digital transformation programs, especially those taking a holistic Industrie 4.0 approach, will need to apply digital knowledge exchange to generate, or support, a shift in mentality in both the business and the IT organization. This will enable them to collaborate on digital solutions, starting with workplace issues, data exchange, information governance and adaptive enterprise architecture.

Figure 3 is based on the 2020 CIO Survey results specific to heavy manufacturing, and shows the people and culture issues that CIOs in many manufacturing enterprises are facing (see [“2020 CIO Agenda: Global Perspectives in Heavy Manufacturing”](#)). Note: The survey was conducted before the pandemic began to disrupt manufacturing.

Figure 3. Factors Advancing Fitness and Agility in Heavy Manufacturing

Factors Advancing Fitness and Agility in Heavy Manufacturing

Percentage of Respondents



n = n varies by segment; all answering

Q: Which of these exist in your enterprise? Multiple responses allowed.

Source: 2020 Gartner CIO Survey

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A majority of the CIOs surveyed listed the need for a positive work environment as a key issue for people and culture. This is especially true, because in traditional manufacturing organizations, change tends to be associated with disruption and job losses. Against this backdrop, measuring the success of manufacturing transformation using traditional key performance indicators (KPIs) can become a significant problem, because it's based on units produced. This has trained employees to consider only finished projects and products, instead of thinking or developing outside the box. KPIs that are more quantitative and inspire risk taking and collaboration are driving an innovative business and IT culture.

Manufacturing culture is historically risk-averse, and failed innovation or change is often seen as a risk that has failed, not an opportunity that was taken by thinking outside the box. CIOs need to be not only technology leaders, but also digital transformers who are able to initiate, drive and demonstrate transformative benefit or value based on the culture of the organization. This is especially true of CIOs who come in from other industries to support transformation in midsize manufacturing enterprises. They need to “market” how, for example, a maintenance prediction using IoT and AI can also provide support functions for employee training, skills development through virtual reality or better personnel assignment.

Besides demonstrating leadership, CIOs need to articulate a clear, transparent and consistent vision to employees, partners and consumers. CIOs will only have the necessary organizational support to scale a transformation program if they are successful communicators, as well as technology leaders.

Market Implications:

It will not be enough for a successful manufacturer to strategize with an Industrie 4.0 plan on conventional acceptance of operational plans. In addition, the strategy should include a feedback value chain approach that includes factors outside the CIO's control. Showing strong leadership in an Industrie 4.0 value chain requires that CIOs move beyond discussions of technology- and silo-based benefits. This means inviting the various internal and external stakeholders to broaden their horizons, and to consider economic, consumer or ecosystem challenges that need to be addressed. It also means moving away from a top-down management approach and embracing a collaborative and scenario-driven transformation environment.

CIOs driving change management in culture and professional development for centralized IT in manufacturing organizations and pushing a mentality shift down to the business may face obstacles and differing perceptions of IT and business priorities. Industrie 4.0 projects are often regarded as innovation-focused initiatives that cannot scale or be developed at pace with business opportunities. In addition, legacy IT systems requiring specialized operational know-how also require the reengineering of entire business processes (see [“Choose the Right Approach to Modernize Your Legacy Systems”](#)). In these instances, the willingness to flexibly change Industrie 4.0 outcome projections based on preexisting conditions needs to be part of a CIO's culture change approach.

Recommendations:

- Develop a collaborative culture by clearly defining desired new employee behaviors, establishing new job performance metrics that reflect those behaviors, introducing best practices and offering examples of specific situations and behaviors.
- Create a sense of community and offer an interactive exchange of ideas using new communications platforms such as town halls, culture hack videos, social media conversations or virtual hangouts.
- Develop employees' desired behaviors on an ongoing basis by examine their current habitual responses in various situations and using 360-degree feedback for an objective assessment of their behavior.
- Accelerate digital programs by investing in knowledge-sharing platforms that will professionalize business-led IT learning and leverage enterprisewide talent more effectively.

Related Research:

- [“Culture Change Succeeds or Fails in Leadership Moments”](#)
- [“Digital Business Transformation Strategy Needs a Change of Perspective”](#)
- [“2020 CIO Agenda: Global Perspectives in Heavy Manufacturing”](#)

Strategic Planning Assumption: By YE23, half of all successful AI implementations in manufacturing enterprises will be driven by a CIO-CDO collaboration.

Analysis by: Bettina Tratz-Ryan

Key Findings:

The success of an Industrie 4.0 implementation depends on the CIO's ability to collaboratively create a comprehensive IT strategy that encompasses both central IT support for the business and the ICT requirements of products and the supply chain. Data-driven system modeling and analytics have emerged as a key prerequisite for enabling the scale of IT digitalization initiatives, even those that start small, if they need to scale up across internal and external ecosystems.

AI implementations in particular will be required to support the increasing flood and diversity of different data sources and management systems in the business, the IT organization and the ecosystem, and develop logical process steps and findings. This is especially true when autonomous data sharing between processes and machines for predictive analytics and forward-looking operations is required. The question is always how AI can support changes in the environment efficiently through learning mechanisms. The relationship between IT and data is becoming instrumental in making this possible.

According to the 2020 CDO Survey, 24% percent of all CDOs report to the CIO, and 19% to the CEO (see [“Survey Analysis: Fifth Annual CDO Survey – Growth Must Continue in Order to Achieve Real Impact”](#)). This reporting line means that the CDO is part of strategic cross-industry business- and IT-driven value chains. It also supports the expansion of digitalization projects so that data generated by any given business function or IT system can and should be used by ancillary business processes or systems in Industrie 4.0. The executive team of Spain’s Gestamp, for example, is collaborating to leverage an AI wiki that contains AI and machine learning (ML) algorithms. Wikis of this type can be shared quickly across the enterprise and in multiple locations.

Market Implications:

A successful AI implementation requires a holistic strategy that drives skills, commitment to data analytics and learning, and ownership of AI and ML strategies enterprisewide. This makes alignment between CIO, CDO and functional leads key to developing engagement models that include data scientists and data analysts, together with business and factory leads, to understand business capabilities and weed out unrealistic expectations (see [“Organizational Best Practices for Successful AI and ML Initiatives”](#)). AI is frequently deployed in innovation mode, and while this approach circumvents traditional legacy obstacles, it may result in use cases that could potentially be scaled across the Industrie 4.0 value chains being missed.

AI and ML remain innovative, noncommodity areas, and many enterprises still need to learn about them and gain experience with them. It is difficult to make full use of these technologies when they are approached as “business as usual.” Instead, they require a solid business case and a well-defined project plan.

The creation of successful AI-driven outcomes requires that CIOs and CDOs drive the alignment with a shared understanding of both IT programs and business projects measures. This is why Industrie 4.0, which provides a holistic outlook on the value of manufacturing transition, is becoming so important. This approach can help to decentralize AI initiatives in business units by providing a platform, tools, resources, knowledge sharing, governance, compliance, standards and other enablers.

Recommendations:

- Determine the success or failure of business and IT initiatives by periodically applying data valuation methods jointly with the CDO to the enterprise's entire portfolio of data assets.
- Enhance communication and collaboration by creating a joint CIO-CDO language — a standard lexicon of shared terminology — that the CFO, business unit leaders in production and supply chain, information leaders and IT can use to discuss information issues.

Related Research:

- [“The CIO-CDO Partnership: A Step Toward Successful CX Outcomes”](#)
- [“How to Achieve Better Business Model Strategies With Industry Data Governance”](#)
- [“10 Ways CDOs Can Succeed in Forging a Data-Driven Organization”](#)
- [“Survey Analysis: Fifth Annual CDO Survey — Growth Must Continue in Order to Achieve Real Impact”](#)

Strategic Planning Assumption: By YE21, half of manufacturing enterprises will have failed to recover from the impacts of COVID-19 due to inconsistent analysis of ecosystem dependencies.

Analysis by: Bettina Tratz-Ryan and Frank Ridder

Key Findings:

While the impact of the COVID-19 pandemic is ongoing worldwide, manufacturing CIOs have to keep their operations working in times of production limitations, resource shortages, remote working conditions for salaried employees and supply chain challenges. Ecosystem dependency needs to be assessed immediately. This includes supply disruption, because, for instance, available capacity needs to meet inventory from suppliers again. In Gartner's view, the first step is to assess the risks and challenges directly connected to ongoing operations by simulating challenges and prioritizing products and facilities. At this stage of assessment of immediate options, data-driven decision making becomes a critical tool in guiding the CIO.

While it is obviously necessary to make near- and midterm decisions based on the direct and subsequent influences of the environment, longer-term remedies and impacts also need to be included in terms of information analysis of ecosystem dependencies. This is especially true of global supply chains connected across regions and industries and the influence of widely varying environmental factors, which need to align with the expectation of employees and customers (see ["Coronavirus Alters Supply Chain Dynamics Impacting People, Products and Costs"](#)).

The reality is that data exchange in structured production cycles between ecosystem partners is critical – and often misaligned. This rapidly accelerating data exchange is being tested by cybersecurity threats, incomplete data semantics, and limited or nonexistent information about real-time or projected plans and projects. Very few enterprises have business continuity plans in place that include not only the primary business, but also the wider ecosystem impacts. That ecosystem uncertainty is a critical element in the assessment of:

- The innovation and R&D pipeline, especially when supply chain impacts or resource shortages are taken into consideration
- Digital skill and talent acquisition in the aftermath of recovery, and changes to labor assignments
- The prioritization of product portfolio and production facilities across regions that are less affected or face less supply chain risk

Benchmarking ecosystem dependencies are critical in all resilience and recovery assessments, and these assessments can only be driven by rigorous business continuity scenario planning. Modeling ecosystem dependencies is a complex undertaking. The challenges of maintaining a consistent understanding of the ecosystem of which the enterprise is a part of is difficult, and many CIOs have not yet built the business continuity assessment skills needed to maintain effective impact analysis. Another important aspect of the changing landscape is that COVID-19 will unquestionably push many enterprises into economic difficulties, and some may choose to end their ecosystem participation as a result. All these factors are likely to be highly disruptive. To address this disruptive potential, CIOs will need to constantly analyze how the pandemic is impacting their organizations and their roles to understand the risks and develop mitigation plans.

Market Implications:

Manufacturing enterprises that have not built ecosystem dependency models face supply chain and logistics risks in servicing customers and markets. Markets will have to reassemble and reorganize — especially once the crisis is over — and this will require agility in planning and production to address changes quickly and effectively. This will require data alignment between internal customer management systems, as well as appropriate allocation of resources and their virtual or physical assignment to the production environment. This becomes key to backtracking and forecasting vulnerability on an operational and strategic level.

Resilience indexes like FM Global's "[2019 FM Global Resilience Index](#)" show supply chain risk in terms of business, region and resources. These indicators, together with some regional risk tools and data governance models, use common definitions of datasets that offer a view of scenarios that can be used to build an intelligent ecosystem model. Most manufacturing CIOs are unaware of all the resources available to do business IT modelling across the ecosystem. For this reason, they lack a comprehensive understanding of how to advance resilient operation. CIOs need to be able to understand where the gaps are and how to address organizational readiness.

Recommendations:

- Work to improve enterprise resilience by designing models that take into account remote working and offer access via data governance across all Industrie 4.0 ecosystem data.
- Create a consistent and concurrent digital workplace and virtual production environment by adopting applications that enable a richer remote work environment.

- Collaborate with the CFO and CDO to develop an IT resilience plan that includes a “facing the future” taskforce with the responsibility to identify critical partners who enable a resilience-focused alliance.
- Constantly assess your ecosystem by working with your executive teams to evaluate the risk of disruption in terms of partners going out of business or simply changing strategies. Based on this risk assessment, quickly develop a mitigation plan that is tightly aligned with the own business directions.

Related Research:

- [“COVID-19 Technology Can Mitigate Car Sales Slump”](#)
- [“COVID-19 Scenarios for Automotive and Transportation CIOs”](#)
- [“COVID-19 Fast Response for CPG Manufacturing CIOs”](#)
- [“Automotive CIOs’ Guide to COVID-19 Crisis Management”](#)
- [“COVID-19 Crisis Response Guide for Travel and Hospitality”](#)
- [“CIO Guide: How Location Services Can Help Mitigate COVID-19 Spread”](#)
- [“Post-COVID-19 Lockdown: Lessons From China for Manufacturing’s Return to Work”](#)
- [“How Can CIOs Keep the COVID-19 Pandemic From Overshadowing Their Sustainability Efforts?”](#)

A Look Back

In response to your requests, we are taking a look back at some key predictions from previous years. We have intentionally selected predictions from opposite ends of the scale – one where we were wholly or largely on target, as well as one we missed.

On Target: 2018 Prediction — By 2021, the effectiveness of manufacturing IoT initiatives will be tracked within a targeted process initiative by 80% of organizations, up from less than 20% today.

Manufacturing enterprises have recognized that a decentralized, unorchestrated proof-of-concept (POC)-based approach to implementing new technologies will lead to major inefficiencies in terms of redundant work, poor strategic alignment, poor knowledge sharing and therefore inability to scale.

The introduction of industry data governance is now seen as a basic requirement in manufacturing. This is promoted by industry consortia and technology service providers. Governance models not only promote collaboration across diverse business functions, but also enable a holistic view of data and information across the enterprise and even beyond its boundaries. Governance helps make the influence of technologies and process changes on the current corporate architecture transparent — not only during the design phase, but also in the later stages of the digital journey (deliver, scale and refine).

A governance model in place also makes it possible to have a better understanding of external influences, such as the COVID-19 outbreak, and to develop appropriate business continuity plans. On the other hand, manufacturers that have not yet invested in governance may set such actions aside for now, so that they can take short-term, pragmatic measures to cope with the immediate impacts of the virus. The pandemic is expected to lead to reprioritization of IT and infrastructure investments due to constraints on available resources and a focus on short-term risk mitigations.

It's important to note that this prediction is being written while the COVID-19 crisis is still developing, and is based on current conditions and assumptions. If the crisis continues, or if the situation eases only very slowly, this prediction could go off track by YE21.

Related Research:

- [“How to Achieve Better Business Model Strategies With Industry Data Governance”](#)
- [“Adopt a Data Governance Strategy for Long-Term Building Information Modeling Success”](#)
- [“Data and Analytics Leaders Must Use Adaptive Governance to Succeed in Digital Business”](#)
- [“Adopt a Data Governance Strategy for Long-Term Digital Twin Success”](#)

Missed: 2016 Prediction — By 2020, every company located in smart urban corridors will have adopted Industrie 4.0 to leverage their digital skills and innovation hubs.

Economic development in cities often entails the establishment of innovative and futureproof industrial parks and centers, where midsize organizations can find a business-driven ecosystem. While some cities, such as Rotterdam in the Netherlands and Essen in Germany, have implemented industrial development and change into their strategies, many enterprises lack the business capabilities to translate ICT digitalization into their organizational structures. This has a great deal to do with the fact that digital talent is not only a hiring challenge, but also an attractiveness indicator for the enterprise itself.

CIOs who are not actively involved in communicating about innovation and attractive digital changes will not present the enterprise as a good career choice for talent. Such a CIO might, for example, describe the company as a “manufacturer of industrial sanitation equipment,” rather than an “innovation hub for 3D printing or digital hackathons” using new research and digital workplace tools. This has much to do with the need for culture leadership by CIOs and executive management discussed in the 2020 Predicts. So, while there are many instances where this collaboration between urban development and Industrie 4.0 has worked, we don’t see a majority of enterprises actively contributing to it.

Evidence

¹ 2019 Gartner CIO Survey

The 2019 Gartner CIO Survey was conducted online from 17 April through 22 June 2018, among Gartner Executive Programs members and other CIOs. Qualified respondents are the most senior IT leader (CIO) for their overall organization or a part of their organization (for example, a business unit or region). The total sample was 3,102, with representation from all geographies and industry sectors (public and private). The survey was developed collaboratively by a team of Gartner analysts, and was reviewed, tested and administered by Gartner’s Research Data and Analytics team

Document Revision History

[Predicts 2019: Industrie 4.0 in Advanced Manufacturing Is Driving Digital Differentiation Through Data Innovation - 13 March 2019](#)

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

[Covid-19 Fast Response for Manufacturing CIOs](#)

Design Resilience Into Your Supply Chain With Scenario Planning to Weather the Unexpected

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