Cognizant

Toward Resilience:

The Modern Enterprise in a Post-COVID-19 World

Forward

While employee and workplace safety will undoubtedly – and rightfully – remain the focal point for manufacturers, the pandemic should also provide an opportunity of reevaluating overall business needs for effective revenue and cost management.

As the world regroups after a long shutdown, businesses of every type are emerging to find the competitive landscape changed beyond recognition. What does that mean for manufacturers and what does it take to be a modern enterprise in the post-COVID-19 age? This white paper addresses these questions and offers a structure and operational roadmap to carry manufacturers through recovery and beyond.

COVID-19 -- the most significant public health crisis in modern history -- has helped us to understand on a gut level the need for planning and disaster recovery. For manufacturers, the pandemic starkly puts a premium on agility and the ability to pivot, both to avoid extinction and reap new opportunities. Workforce and employee safety – while always important – is taking on new meaning.

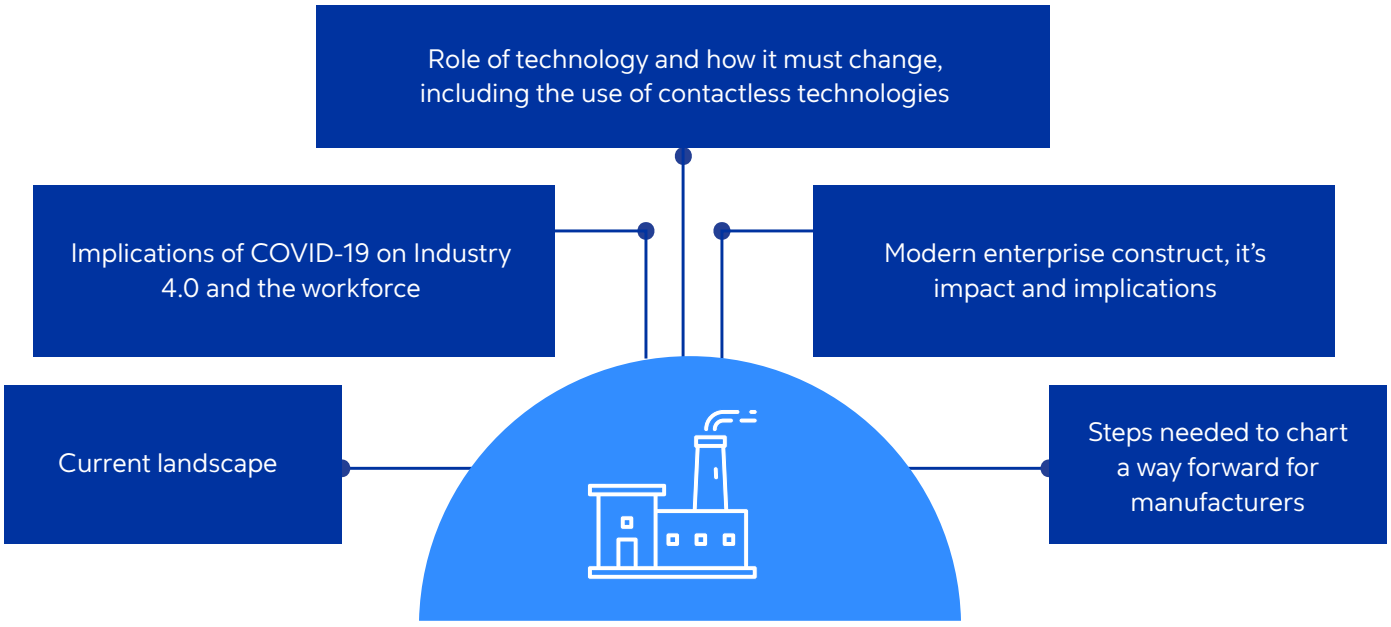
As initial quarantines are eased and lifted, companies will need to decide how to safely and smartly re-integrate workers into factory operations. New safety protocols and operating procedures must be agreed upon by leadership, such as a minimum distance standard, handshake policies, handwashing requirements, fever scans, and mandatory equipment requirements (masks, gloves, booties, etc.). The communication, implementation, and maintenance of these policies will have deep implications on learning and development: how will procedures be conveyed to employees; do companies need to document acknowledgment and agreement of the new procedures for legal purposes, what new testing and maintenance plans need to be implemented?

The emphasis on workforce safety will happen in the context of rethinking everything – starting with corporate DNA. The pandemic provides an opportunity to reevaluate everything – starting with an understanding of core competencies and the operational agility needed to support them. This will put a premium on new digital initiatives and the application of modern technologies, whether to enable new contract OEMs or blue-collar roles on site[1]. For some, it will mean the ability to heighten the focus on innovation, inspiration, product design, and the manufacturing process to bolster their intellectual property and marketplace differentiation.

Case in point: General Motors. The $137 billion automaker abruptly ceased making cars in March and in April, turned its production to ventilators and personal protective gear for medical personnel. Under a $490 million contract with the U.S. government, GM recalled laid-off workers and reopened its long-shuttered Kokomo, IN., plant to produce 10,000 ventilators per week along with other gear, a flawless demonstration of the kind of agility it will take to thrive during and after the pandemic.

The Modern Enterprise

If nothing else, the pandemic has underscored the fact that manufacturers – and service providers in any industry – are capable of executing quick business pivots through brute force and sweat equity. In this paper, we'll explore the way manufacturers in particular can become more operationally agile by exploring the:



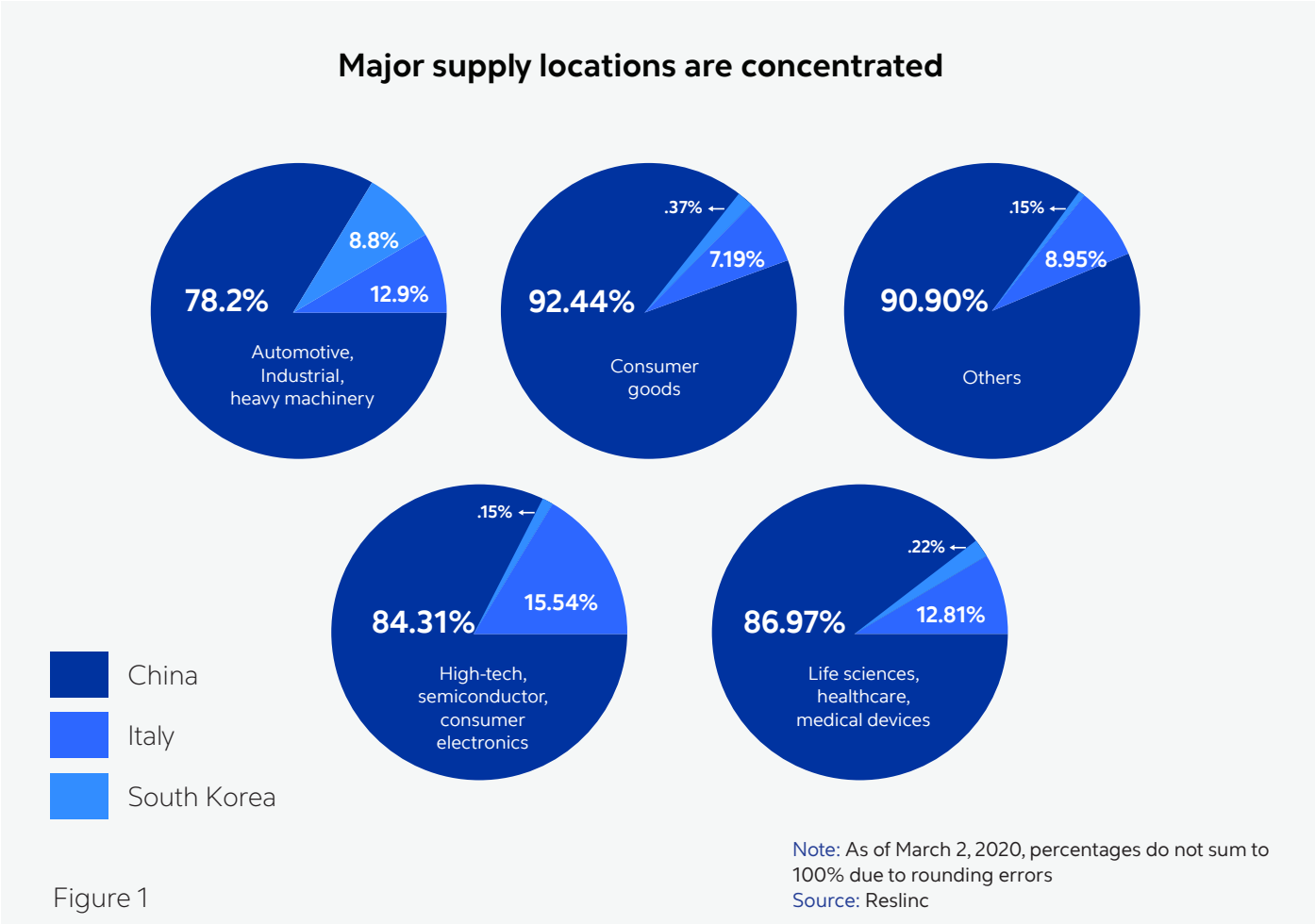
[1] The Renaissance of Blue Collar Work, Dec. 2019, Cognizant Center for the Future of Work

The Manufacturing Landscape: Unsolved issues + New challenges + Pandemic-induced complications

As the businesses regroup, organizations of every type are finding a vastly changed competitive battleground. What does this mean for manufacturers and what does it take to be a modern enterprise in the post-COVID-19 age?

Accustomed to producing on a mass scale and interacting with consumers only at a distance, manufacturers have long grappled with how to meet consumer-driven expectations for highly-personalized experiences and omni-channel interaction. For many manufacturers, this was a "nice to have"; a market dynamic that was not necessarily a showstopper if not met. The pandemic has shown how being able to pivot quickly – whether in adjusting from a wholesale to retail model or in sources of supply (see Figure 1) – can be the difference in keeping operations going or shutting them down.

However, with limited resources to invest in new technology, manufacturers need to take the opportunity to build a coherent digital strategy tied to concrete business outcomes with a clear path toward funding, execution, and measurement.



Note: As of March 2, 2020, percentages do not sum to 100% due to rounding errors
Source: Reslinc

Figure 1

Excessive reliance by U.S and European companies on commodities sourced from quarantined areas in China

Those that do can realize a positive impact on revenue and costs. According to a recent Cognizant study, digital transformation focused on digital strategy, automation, and workforce transformation can give manufacturers a 10% bottom line boost. Leaders are getting the biggest additional payoff from data management, software deployment, and AI—other firms looking to join their ranks should focus their efforts there. The cumulative digital net impact, at 10.3%, is the third highest among all industries in the study.[2]

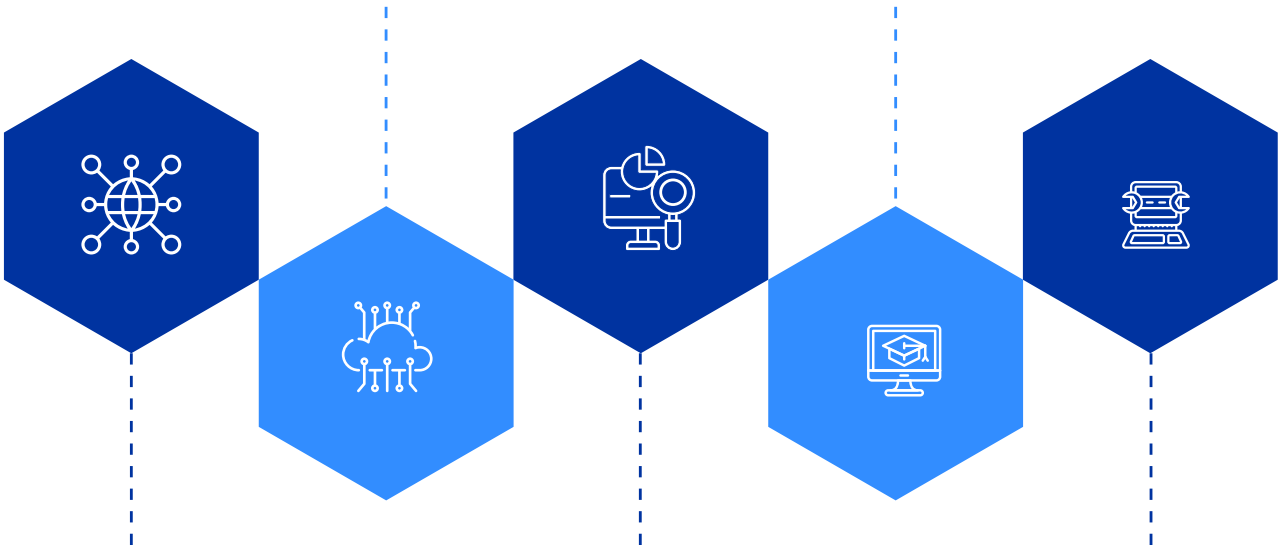
Now, many manufacturers find themselves at a crossroads, needing to get real about technology investments or risk falling behind for good. As our November 2019 survey of nearly 2,500 business and IT leaders bore out: companies that are further along the maturity curve are ahead on revenue, profitability, and more. While the highest returns originate from the basics — notably the cloud and mobility - leaders separate from the pack with investments in digital strategy.[3]

Business and industrial operations will need to be reimagined in a world of social distancing norms. Savvy employers will use the pandemic to push long-overdue reevaluations of core competencies, associated IP, and the operations needed to support a new normal. The result will be reconfigured factory floor operations and reimagined supporting processes.

Now, amid a crisis era where there is heightened pressure on every investment dollar, manufacturers are grappling with multiple issues both new and perennial, including:

Cloud strategy: Hybrid, private, multiple, public to extract more value from sunk investments and accelerate the transition for Cap-Ex to Op-Ex models.

Institutionalize knowledge through e-learning and development strategies to train, retain and cultivate employees as the economy recovers.



The reconciliation of multiple enterprise business systems, cloud instances, and disparate approaches to technology to streamline and simplify operations and reduce costs.

Data modernization and the use of advanced analytics to compete as a modern digital business.

Build the "IT organization of the future" that is responsive to the business and bridges organizational silos.

[2] The Path to Digital Leadership – Industrial Manufacturing, April, 2020, Cognizant/ESI ThoughtLab
[3] ibid

Technology and Manufacturing

Manufacturing operations have traditionally been defined by the different pillars of technology that support their value chain:

- **Transactional systems (chiefly, enterprise resource planning (ERP) and supply chain management (SCM) and decision-support tools (including analytics)** need to be rewired. Platform vendors (including SAP and Oracle) have continuously modernized their applications. SAP's journey, for example, has progressed all the way to S/4HANA in-memory computing and other toolsets for modern experience with Leonardo and Fiori. Despite the enormous advancements in these systems, to maximize the value of these technologies post COVID-19, it is necessary to consider collaboration and remote execution as part of the process design.
- **Customer-facing systems (customer relationship management, or CRM, and customer-experience management, CEM) no longer stand alone.** These systems connect to existing ERP and HR systems, frequently as layered applications, providing a suite of capabilities that are focused on the customer – not just the employee – experience enabling engagement using social channels. Salesforce is the top example in this category. Customer-facing systems are receiving a huge boost from AI, enabling manufacturers to interact directly with customers for the first time. Close-looping these systems with connected product infrastructure/platforms is a key imperative for most manufacturers.

Product engineering and product lifecycle management (PLM) are critical digital foundational elements. This class of applications supports the design and development of products. Digital twin development and the ability to create a digital thread are now critical parts of business transformations.

The Modern Manufacturing Enterprise

The technology stack critical to post-pandemic success.

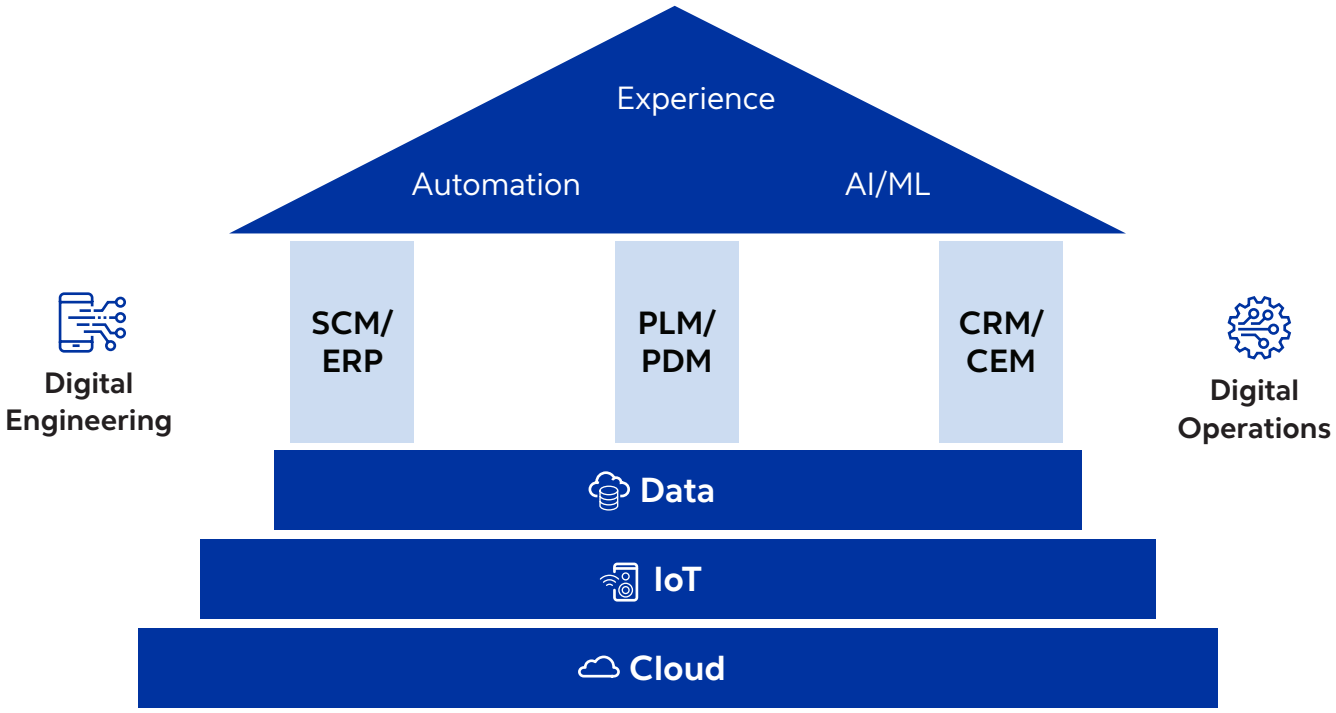


Figure 2

Source: Cognizant

These pillars build on a foundation of data, Internet of Things (IoT) and cloud needed to support a range of contactless technologies that will become more pervasive in a post-pandemic world. In order to operate at full production capacity while adhering to new social-distancing norms (which will likely drive a reduction in shop-floor headcount), manufacturers must speed their adoption of virtual reality and augmented reality (VR/AR).

For example, consider a scenario in which only one-third of the workforce is managing the factory floor, with the remaining two-thirds working remotely. In such a scenario, if drilling or milling equipment requires servicing or maintenance in the factory, the specialist on duty that day may use an AR headset or hologram to perform the work with virtual support from remote specialists.

The Impact of COVID-19 - Industry 4.0 Imperatives and the Impact on Humans at Work

As manufacturers implement components of Industry 4.0 (see Figure 3), it's vital that they have a strong business vision underlying and unifying their efforts. Pandemic readiness should be one aspect of that vision. That entails securing the plant and keeping employees and partners safe — at the same time making their specialized knowledge readily available, both in the facility and across the supply chain.

Accelerating digital enhancement and Industry 4.0 will help achieve those goals, while also enabling the business to run with greater resiliency and flexibility to meet competitive demands. Achieving this will require a level of employee enablement that defines the "workplace" and enables work to take place anywhere, or WFA.

Specialists at home can be alerted via video and analysis of data from IoT to review a connected process workstation and help diagnose issues or guide on-site workers to make repairs. The technology also could be used for remote visual inspections.

"The high capacity, speed, and low latency of new 5G wireless networks will make it possible to stream video data to a local cloud endpoint for quick analysis."

But it is not enough to implement up-to-date versions of each of these types of systems. Functioning as a truly modern enterprise requires the ability to view the organization in its entirety, and understand how technology initiatives fit together and, most importantly, drive business objectives.

Manufacturing Value Chain: Future Capability Map

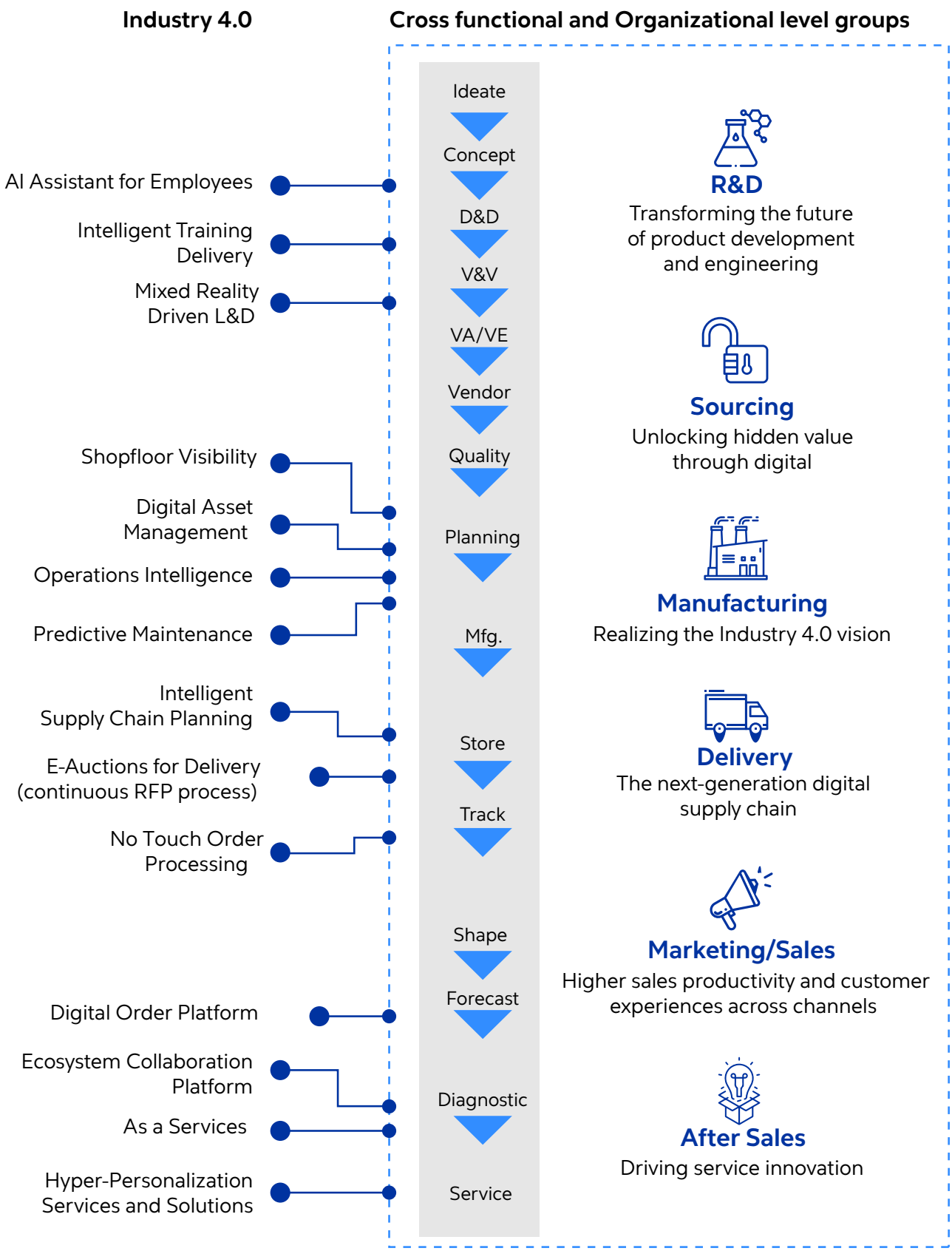


Figure 3

Cognizant - For more COVID-19 pandemic insights, visit our COVI D-19 response page.

So, Where to Start? The Modern Enterprise Construct

"When a business faces challenges that require a deviation or adjustment to an existing strategy, it is often left not knowing how to proceed. Frequently, it's because the strategy is really a tactic, driven around a particular technology or platform."

Initiatives driven in this fashion are bound to further complicate the existing process execution and usually fall short of a wholesale business model change.
Perhaps for this reason, our research found that investing in strategy and a roadmap the topmost priority now and in the future.[4]

Key components of the modern enterprise

Percent of respondents in the implementation. maturing or advanced stage of each area of the digital maturity framework.

Figure 4

Source: Cognizant
Response base: 2491 business and technology leaders

Manufacturers must undertake advanced technology initiatives in concert with an underlying motive of achieving business objectives. A modern enterprise needs to construct these strategies by viewing its operations holistically, reimaging its business processes, and from that perspective decide what technology investments make sense and where. This places technology in the context of what the business needs to be successful.

[4] The End of the Beginning, November 2019, Cognizant/ESI ThoughtLab

Change Across the Manufacturing Continuum

Agility and resilience are the key attributes of the modern manufacturing enterprise. Unlocking these fundamentals is dependent on the following strategies, which include:

- **The need to leverage data and partnerships to bring new sources of revenue.** The infrastructure that supports enterprise operations tends to grow along organizational lines with associated technology footprints that stunt interoperability and collaboration.

  "The modern enterprise construct demands a holistic approach to business operations, one that is designed to eliminate operational silos and unlock data. Once done, data can be integrated with business and engineering systems and converted to information that can be utilized to drive down operating expenses or launch new service lines."

- **Merging of the physical and the digital worlds.** The true value of IT and OT integration can only be achieved if data generated by physical assets is integrated with the IT systems designed to support them. For factory operations, this means integrating systems affiliated with different manufacturing processes on the factory floor with ERP and PLM systems. This provides a 360-degree perspective on operations that, once analyzed, can anticipate and adjust for equipment failure, production bottlenecks, and supply chain issues.

- **Democratization of data.** The need for manufacturers to deliver highly personalized experiences requires access to client records, which were previously unavailable due to systems incompatibilities. The underlying technologies that facilitate the modern enterprise, such as cloud computing and application modernization, help to unlock critical data that might have been previously inaccessible. However, without data modernization, a modern architecture, strong management, and data governance foundation, businesses will struggle to fully realize the potential of these approaches. Data modernization efforts that aggregate and normalize data make it much easier to store, use and share. From here, a manufacturer can do more with their data as it shifts from a hard to manage and expensive to store liability into an asset that helps leaders drive revenue growth, contain costs and increase business value. Accessible data also holds insight that can be mined using AI.

- **Human skills augmented with AI.** The integration that the modern enterprise construct provides is expected to raise the bar where insight and decision-making is concerned. Employees will rely on AI to assist in the conceptual design phase of the R&D process, swiftly unraveling complex production bottlenecks on the factory floor.

Smart businesses will extend this to parts of their operations that had historically been digitally "disenfranchised," merging traditional blue-collar work with white-collar, creating a "digital craftsperson" in the process.

- **Continuous development, deployment and operation.** The use of advanced technologies will enable more agile product development that can be executed using an "any shore" model. This not only means the ability to leverage agile development methods and tools, but the capability to create a common product foundation. The approach helps to institutionalize organizational agility, ensuring prompt development and delivery of products and services that meet–and anticipate–regional market requirements.

- **Superior experience at every touchpoint.** The ultimate goal for integrating operations using a modern enterprise approach is to enable manufacturers to become hyper-responsive to customer needs across the value chain by building the products they want, when they want them, at a price they are willing to pay with matching service and support.

The opportunity presented through the democratization of data, its modernization, integration and conversion to insight takes on more urgency in a post-pandemic world.

Connecting Technology with Business Strategy

For business operations, the opportunity to combine transactional data and new data sources (such as conditions of use intelligence) can lead to new revenue streams and accelerate the transition from Cap-Ex to Op-Ex funding models. For instance, taking sensor data generated by trucks in a mining company's fleet and integrating it with cloud-based analytics can mean a five-fold increase in the number of vehicles monitored with the information shared immediately to service partners, saving as much as $100K a year in IoT-related systems.

The modern enterprise construct addresses new challenges (such as the greater need for agility and customer experience) and unsolved issues (such as the need to manage shorter lead times and costs). Supply chain operations, an inherently integrated process, is another case in point.

Consider how proactive insight and rapid scenario modeling could help save millions of dollars in contract pricing annually by repricing contracts for key commodities, raw materials or parts as conditions are changing, automatically optimizing the structure and terms of counterparty deals and streamlining customer interactions. Machine learning (ML) can be applied to analyze variable data from customer contracts to more accurately predict emerging patterns that could affect contract negotiations. This produces precise information—on timing, alternative providers, external forces, or all three—enabling the business to earn a higher profit per contract while reducing their risk due to financial and market changes.

Organizations are ill-equipped to address these and need to modernize

TRADITIONAL ENTERPRISE	NEW IMPERATIVE	MODERN ENTERPRISE
Focus on Internal	**Customer led**	Customers are the starting point
Decisions based on experience and gut instinct	**Insights driven**	Decisions based on data
Activities are labor intensive	**Lean**	Automation to shorten and improve processes
Phases are sequential	**Concurrent**	Phases are agile (iterative and overlapping)

Figure 6

Source: Cognizant

Dominant Characteristics

Modern enterprises align around a digital operating model (DoM), which consists of:

- Ability to dynamically align capabilities to support business model innovations.
- Ability to enable consistent delivery of your value proposition across all products, services, and channels.
- Ability to quickly adapt to new disruptions (technology, customer demand, regulatory, etc.).
- Ability to scale and adapt to address the opportunities, disruptions, and challenges from digital forces.
- Ability to effectively utilize ecosystems to extend values and channels.
- Ability to create insightful/actionable intelligence to help guide strategic decisions.
- Ability to promote a collaborative culture that empowers employees to create and contribute to value creation.

The Way Forward for Manufacturers

As the smoke of the pandemic begins to clear, the pathway to the future starts with an honest assessment of where your organization stands today in achieving its business objectives through the use of modern technology. This analysis should include all digital initiatives -- the good, the bad, and the ugly. It's time to step back and see if these projects have made a material difference in your ability to build additional capabilities, differentiation in the market and your ability to withstand disruption.

A business-first approach will drive discussions that cross organizational lines and an evaluation of the technology footprints that support them and how they need to be integrated. This puts into context the foundational elements needed to deliver fundamental agility that unlocks the data to be consumed by the transactional systems that need it for use with advanced technologies that provide automation, intelligence, and insight.

Charting Strategy for the Modern Enterprise: What it Looks Like?

We recently helped a global provider of recyclable glass and metal packaging solutions chart its course for becoming a modern enterprise.

Clients often undertake strategic endeavors as a result of losing competitive advantage or needing to cut costs. With this client, it was the converse: Success was the impetus for the work. The company was executing extremely well, with a level of operational excellence that combined high utilization of its physical plant with a collaborative, flexible workforce. It was a winning equation, providing the agility necessary to meet the needs of clients looking for highly customized finished products. In this way, it was already demonstrating many of the characteristics of modern enterprise and a digital operation model.

However, this also presented a host of associated problems ranging from complex account relationships to increasingly complicated product lines, demand volatility, the need for better talent and knowledge management. As a result, the client wasn't sure its investment strategy was consistent with the market dynamics they were experiencing and the growth management wished to achieve.

We used our Modern Enterprise framework and proprietary NorthSTAR consulting methodology (Figure 7) to identify and assess a range of disruptive business factors ranging from market dynamics driving future product line requirements to innovation initiatives, all of which provided a context for digital transformation. We evaluated the company's maturity via 36 core and 60 cross-functional digital capabilities that identified the interventions and process reengineering needed to drive the client's business functions now and in the future across five key areas. In the end, the client's executive leadership was able to adjust its transformation strategy in a way that better served its business and, most importantly, gain buy-in at the board level to execute it globally.

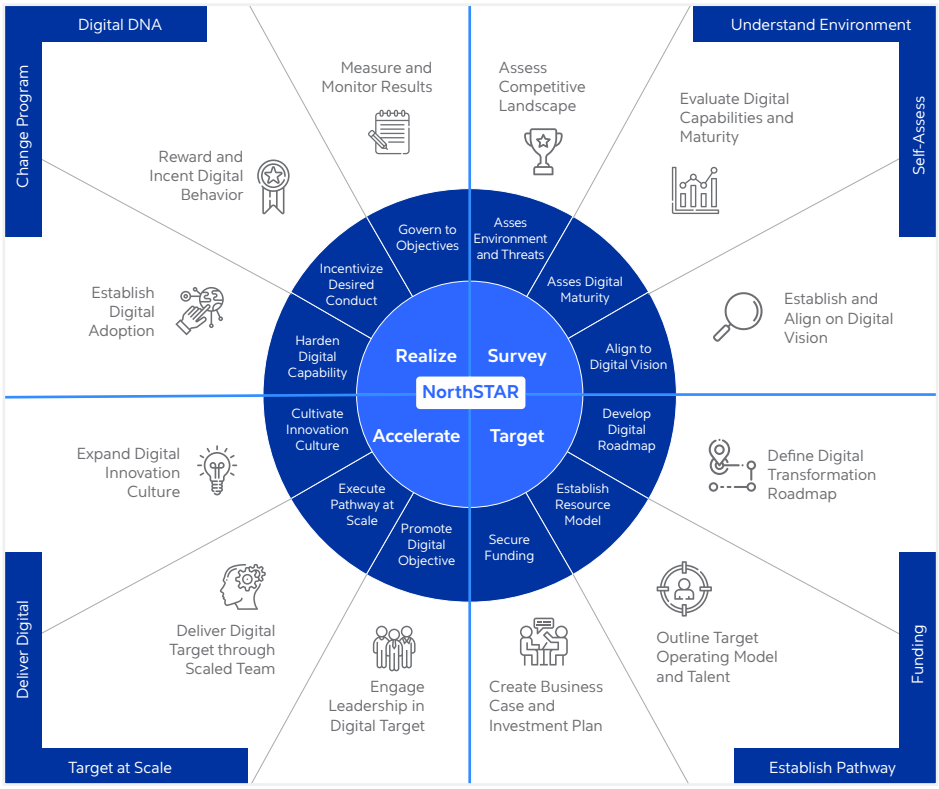
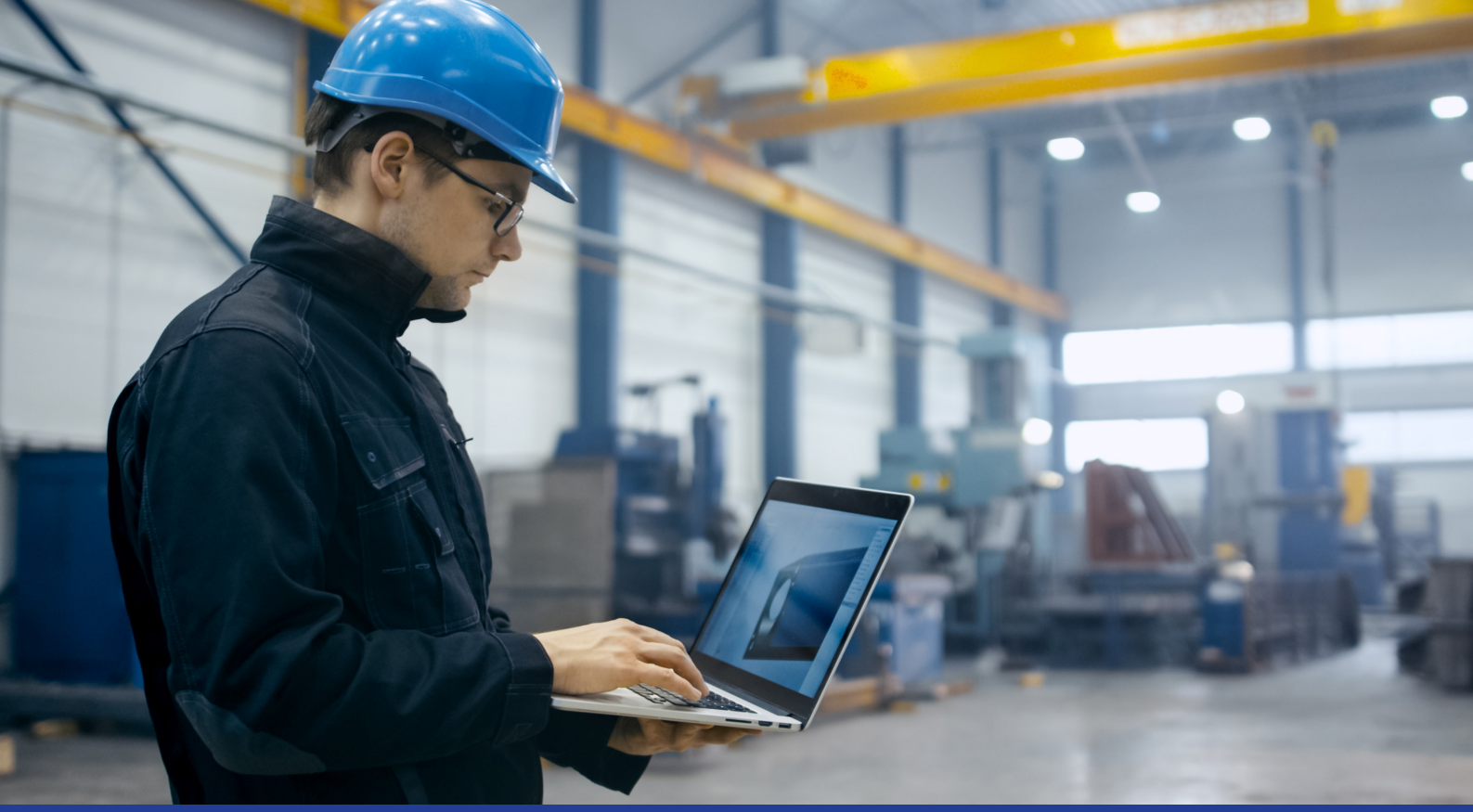


Figure 7



How to Get Started

Developing a digital operating model aligned to business needs involves the following steps:

- An assessment of the current business that identifies operational gaps.
- Digital diagnostics that inform a roadmap of initiatives and the business cases to justify them.
- Creation of a target operating model, the organization, and funding needed to support it.
- Delivering digital at scale through internal awareness building of the to-be state that institutionalizes change management.
- Enhancement of digital DNA through ongoing hardening and refinement of digital capability.

Cognizant

World Headquarters
500 Frank W. Burr Blvd.
Teaneck, NJ 07666 USA
Phone: +1 201 801 0233
Fax: +1 201 801 0243
Toll Free: +1 888 937 3277

European Headquarters
1 Kingdom Street
Paddington Central
London W2 6BD England
Phone: +44 (0) 20 7297 7600
Fax: +44 (0) 20 7121 0102

India Operations Headquarters
#5/535 Old Mahabalipuram Road
Okkiyam Pettai, Thoraipakkam
Chennai, 600 096 India
Phone: +91 (0) 44 4209 6000
Fax: +91 (0) 44 4209 6060

APAC Headquarters
1 Changi Business Park Crescent,
Plaza 8@CBP # 07-04/05/06,
Tower A, Singapore 486025
Phone: + 65 6812 4051
Fax: + 65 6324 4051