LTIMindtree

WHITE PAPER

4-step holistic manufacturing strategy for the 4th Industrial Revolution

Adopt Industry 4.0 successfully to create exceptional business and customer value

Insights and advice for manufacturers wondering what's next on the road to Industry 4.0

Until 2020, progress towards digital transformation for most manufacturers was slow. But the urgency for manufacturers to make successful digital transformations escalated during the first 8-12 months of the global pandemic. As COVID-19 reshaped consumer buying behaviors, the pace jumped from a crawl to a sprint: According to one study, 85% of organizations accelerated their digital transformation initiatives in 2020.[1] Some industry observers believe we witnessed 6.5 years of digital progress in the last eight months of 2020 alone.[2]

The pandemic was largely responsible for worldwide supply chain disruptions that slowed down goods production and delivery. As a result, manufacturers justifiably focused on managing and fixing the supply chain problems first. But as the pandemic continued, it became clear that the supply chain issues were a symptom of something deeper than the short-term disruptions.

3 key challenges faced by Manufacturers in the post-pandemic world

As the world emerged from the pandemic in 2021, manufacturers realized the below key learnings:

First, it became clear that much of the digital investment and progress made so far was conducted in silos. While adoption of advanced technologies like AI/ML, robotics, and IoT had occurred before 2020, it didn't contribute much to the companies' bottom lines. Most of the digital transformation had occurred within individual areas, such as supply chain, transportation, engineering, IT, or product management, which failed to deliver the cohesive enterprise-wide view of business needed to make fast decisions. Thus, advanced digital integration initiatives are needed to break down these silos to unlock data value and extract relevant insights needed to create action plans that work across the entire organization.

Secondly, the importance of connectivity between customers, innovation teams, and manufacturing teams became more essential than ever. People who buy products are willing to tell the brands everything they need to know to expand their relationships and drive brand loyalty. Real-time feedback of customers has become increasingly important for maintaining brand value and customer loyalty. Successful and mature digital strategies need to be based on this reality for both parties to achieve the desired results. Most of the larger companies have started on the journey of real-time sentiment analysis to mitigate large-scale customer dropouts.

Third, while the industry was reeling from the pandemic, the big players were increasingly adopting newer technologies, but the mid-market segment was lagging, mainly due to the lack of investments and knowledge. The gap between operational efficiency and per-unit cost is widening day by day, and mid-market companies are falling behind due to the lack of optimized operational strategy. For them, it was more about keeping the lights on rather than increasing market share. The mid-market businesses are also struggling to keep their digital initiatives abreast with the right technologies to compete with the large enterprises, as their IT spending on daily business operations and cybersecurity is limited to only 11% of total budgets[3]– stifling the possibilities for any large-scale digital transformation. As per a recent Gartner research, 36% of heavy manufacturing CIOs whose enterprise had experienced some disruption said that operating cost competitiveness had fallen behind.[4]

Welcome Industry 4.0

When properly designed and executed, the digital ecosystems of industry 4.0 include manufacturing systems that communicate with each other, share data, and self-improve. Innovative combinations of these technologies allow manufacturers to close skill gaps, resolve labor shortages, reduce energy consumption, cut costs, improve efficiency, and create profitable digital connections with customers and business partners anywhere in the world.

Most importantly, the connectivity and data-driven processes of Industry 4.0 naturally break down the silos that exist between parts of an organization—and are the root cause for productivity, quality, efficiency, and safety problems–that plague manufacturers today. Secure IoT connections also allow authorized users to optimize processes, service equipment, collect data, and monitor supply chains from anywhere they can get an internet connection.

Outcomes Delivered

FIG 1: EXAMPLE OF OUTCOMES THAT LTIMINDTREE HAS BEEN ABLE TO DELIVER FOR ITS CUSTOMERS

Craft a strategy: Avoid the temptation to just buy technology

One troubling statistic about digital transformation is that about 70% of organizations fail to meet their stated objectives, which typically include metrics like revenue growth, market share, efficiency, and productivity. The reasons for failure vary greatly, but the most common cause is the lack of a cohesive strategy. Too often, people leading digital transformation efforts become enamored with specific technologies, or they get locked into the idea of upgrading legacy systems to make them more "digital." While choosing and deploying the right technologies is a part of every transformation, it's only part of the journey—and it's typically a tactical consideration after a plan is developed.

At LTIMindtree, we've helped several manufacturers develop effective strategies that drive desired outcomes, rather than simply building an expansive tech stack. From our experience, these are the top considerations to keep in mind when building your digital transformation plan:

Focus on revenue growth and customer value—and less on cutting costs

It's important to connect your investments and ROI models to customer value. Digital transformation is less about cutting costs than it is about creating stronger connections with customers, leveraging data to drive innovation, and bringing efficiency to the manufacturing process. Too many organizations keep the immediate goal of cost reduction without any real plan to create business and customer benefits, resulting in many individual business units with different goals and timelines. The traditional business models are simply not enough, and along with legacy and paper-based systems ingrained into the processes, they reduce revenues, erode margins, and simply never scale-up. Cost savings being the goals rather than the result keeps organizations restricted to the initial stages of any digital transformation journey. A long-term value can only be generated via a shift in attitudes, a combination of efforts across the enterprise, and looking at the greater goal of business value, and customer value creation. One of the key steps for integrating and understanding the business processes is to combine the business units, and then break them down them into smaller pieces of individual attributes to find commonalities and differences. An 80X20 principle can help maximize results through common and repeatable digital initiatives.

Data becomes a key factor...

Unlock the full value of your data

Your strategy needs to include a defined plan for evaluating your data, identifying what's valuable, and then leveraging analytics to make it useful and accessible to authorized users throughout your enterprise. Siloed data in different business units can be a challenge on this journey. Blockchain–a new entrant in the market allows you to track every component, part, and product throughout the manufacturing process, from the moment raw materials are shipped from your vendor to when final products are delivered to your consumers. A real-time view of materials and products can help gain total control over tackling counterfeiting, managing cost-effective returns, complying with regulations, and maintaining brand value. But, a digital transformation initiative like Blockchain adoption cannot be implemented for disparate systems, which calls for an integration of business operations to business processes, CRMs, ERPs, and even beyond.

Integration is important…

Integrating existing machines and creating virtual replicas

LTIMindtree has worked with manufacturers to connect older machines using relatively inexpensive IoT sensors. This has proven to be a cost-effective way to aggregate a wide array of data on the shop floor. The manufacturing enterprises are increasingly adopting and unleashing the power of digital twins. Tweaking a blueprint for analyzing the effect on end-product serves as a game-changer for the manufacturing industry. The manufacturing industry, especially those with high R&D costs, such as aerospace, have been at the forefront of using digital twin as part of their R&D processes. The time has come to replicate this agile methodology across other manufacturing companies. Beyond R&D, one of the major challenges that manufacturers and buyers face is post-sale maintenance, where digital twins can help accurately schedule predictive maintenance, thus improving efficiency and lowering operational costs.

Value-driven insights can only be gained by relevant analytics…

Deploy prescriptive and predictive analytics

A modern digital infrastructure should provide leaders on your factory floors with the ability to predict everything from raw material discrepancies to machine quality. The key to this is to extract data from your core systems, integrate it, and apply analytics tools to turn that raw data into prescriptive and predictive analytics results. Building your digital journey with analytics and data science as your key solutions and using them as building blocks of the digital strategy can help you get business results much sooner.

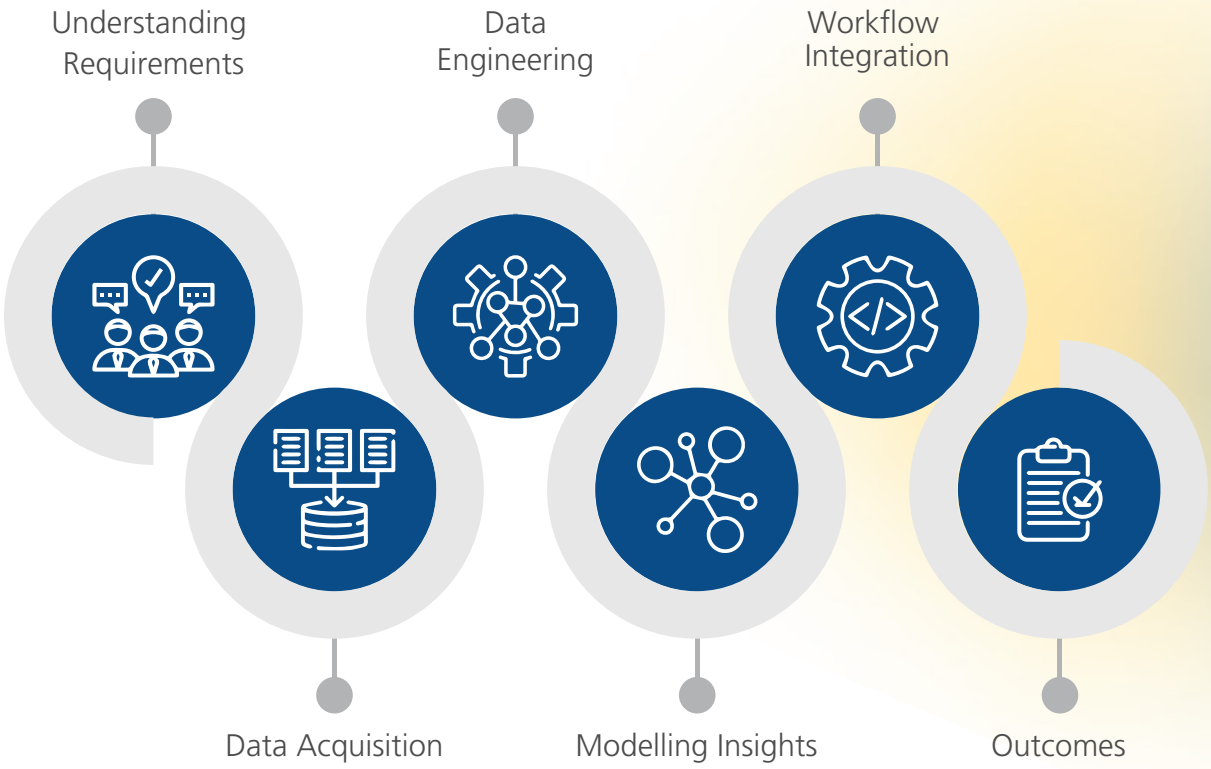

FIG 2: DIGITAL MANUFACTURING MILESTONES

Where to start: LTIMindtree can help

The potential for digital manufacturing is so immense, it can be difficult to know where to start. That's why some manufacturers lag in comparison to others in terms of progressing towards Industry 4.0. At LTIMindtree, we have compiled our experience of working with hundreds of manufacturers. We know how to identify the first steps that make sense for each organization. One approach is to select an operational area or manufacturing process where you can conduct some initial testing.

Our Edge to Experience Vision

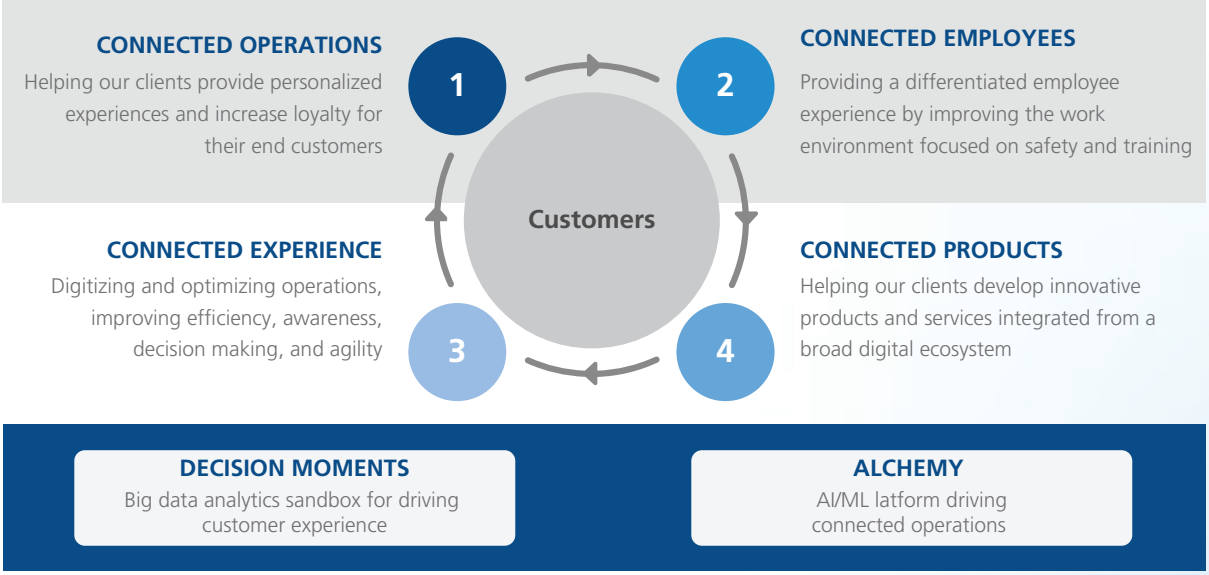

FIG 3: LTIMINDTREE'S VISION FOR CONNECTED MANUFACTURING FOCUSED ON BUSINESS AND CUSTOMER VALUE CREATION

The initial testing approach is often easier to be approved by senior leadership. It also makes it easier to determine which technologies and processes work best in your environment. This measured approach allows you to identify which data is most valuable and gives you ample time to apply analytics tools and unlock its full value.

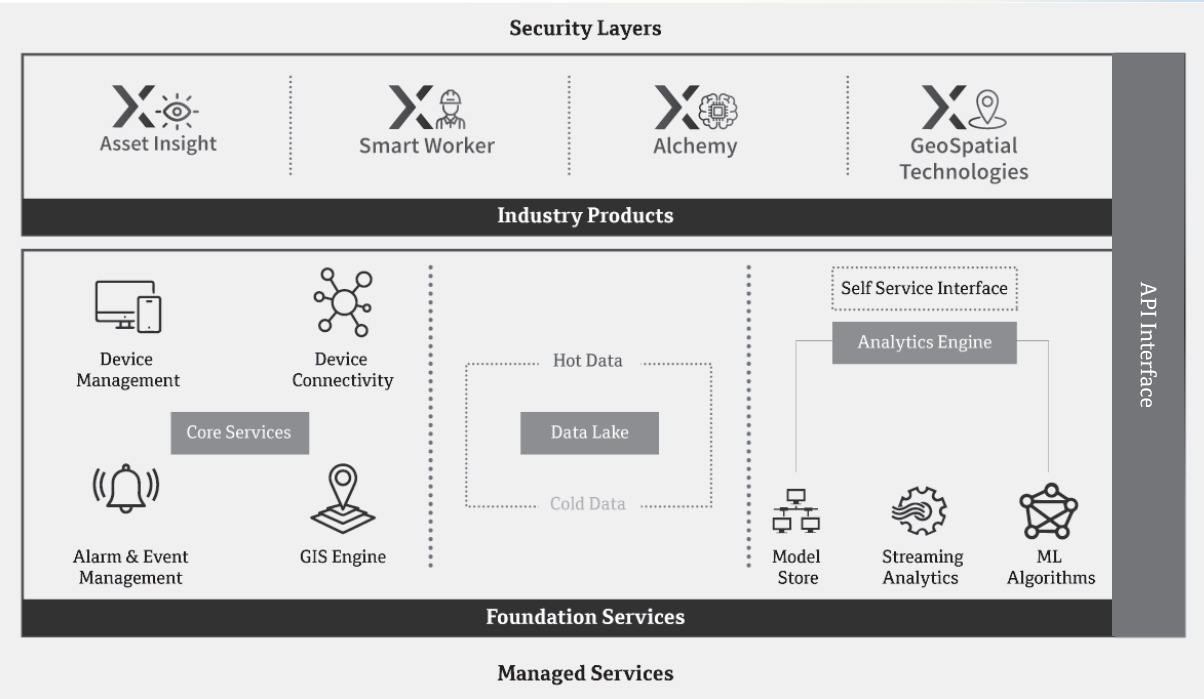

FIG 4: INSIGHT NxT PLATFORM

Insight NxT Platform

Connected operations platform that autonomously drives intelligence and action by connecting machines, materials, processes, and workers.

A pilot testing-driven approach also makes it easier to onboard and connect your various teams. Digital manufacturing requires workers to think and act differently. LTIMindtree can help train your teams and provide change management services that allow you to make the transition to digital manufacturing without disrupting your operations.

DIGITAL CAPABILITIES	PRODUCTS & SOLUTIONS	RECORD OF EXCELLENCE		
Industrial IoT Solutions *Sensors/Devices—Equipment, Material Ruggedized IoT* *Gateways I Edge Computing Device Management I IoT* *Data Lifecycle | Communication*	Asset Insight	**11,000** Plants & machinery connected	**6,000** Tools tracked and traced	**40 GB** Data processed per day
Artificial Intelligence *ML, NLP, Vision Analytics I Stockpile Analysis* *People & Crowd Analytics* *Asset Utilization, Productivity, and Efficiency*	Alchemy	**400** Projects monitored online	**5,000** Active digital users	**35,000** Mobile forms per month
Connected Worker and Safety *EHS Management Platform* *Worker Onboarding and Skills* *Worker Safety*	Smart Worker	**300,000** Workers onboarded	**18,000** EHS platform users	**25,000** Safety harnesses tagged

DIGITAL CAPABILITIES	PRODUCTS & SOLUTIONS	RECORD OF EXCELLENCE		
Track & Trace *Material Diversity* *Factory Warehouse I Remote Stockyard* *High Interference Areas I Low Network Areas*	Smart Materials	**10** Unique material types tracked	**1.5 M** Material units tagged	**6,700** GPS-enabled commercial vehicles
AR/VR/XR *VR: Worker Safety & Training Solutions* *XR: Assisted 0perations* *AR: Training Solution*	Sparsh	**40** AR/VR training modules	**5** Industry domains	**50,000+** Workforce trained using VR/ AR
Geospatial Technology *3D Scanning I Spatial Analysis* *Quantity Estimations I GIS based Progress Monitoring* *O&M I Quality | Drones*	GeoSpatial	**740** Geospatial/ GIS projects	**140** Photogrammetry LIDAR projects	**15** BIM GIS integration scan to BIM Solution

FIG 5: LTIMINDTREE DIGITAL SOLUTIONS ACROSS MANUFACTURING VALUE CHAIN, WHEN DEPLOYED AT SCALE

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About LTIMindtree

LTIMindtree is a global technology consulting and digital solutions company that enables enterprises across industries to reimagine business models, accelerate innovation, and maximize growth by harnessing digital technologies. As a digital transformation partner to more than 700 clients, LTIMindtree brings extensive domain and technology expertise to help drive superior competitive differentiation, customer experiences, and business outcomes in a converging world. Powered by 82,000+ talented and entrepreneurial professionals across more than 30 countries, LTIMindtree — a Larsen & Toubro Group company — combines the industry-acclaimed strengths of erstwhile Larsen and Toubro Infotech and Mindtree in solving the most complex business challenges and delivering transformation at scale. For more information, please visit https://www.ltimindtree.com/.