Transform your manufacturing enterprise into an intelligent enterprise
Create a culture of continuous innovation throughout your ecosystem with IoT and Big Data

The manufacturing industry is undergoing revolutionary changes. Connected technologies, big data and analytics offer manufacturers the opportunity to realize new levels of efficiency, and the industrial internet of things (IIoT) is beginning to convert traditional production facilities into smart factories with digitally orchestrated shop floors. At the same time, today’s customers expect increasing levels of personalization, driving manufacturers to change their focus from producing traditional low-margin products to creating highly personalized relationships with customers.

These new demands for greater personalization, innovative business models and integrated services call for new insights based on data from production operations, products, suppliers, and the customers themselves — via digital interaction, supply chains and sensors. As if that’s not enough, increasing competition is driving manufacturers to improve the flexibility and cost-effectiveness of their IT systems to reclaim resources so that they can provide faster support and create new offerings and processes. To gain competitive advantage in this environment, manufacturers today need to focus their investments more on transformation than on business operations — and Mindtree can help.

Two transformation streams are driving efficiency, innovation and customer satisfaction

At Mindtree, we have mined our deep experience with automotive and industrial manufacturing to reveal two streams of transformation that are helping companies improve operational efficiencies, accelerate innovation and drive customer loyalty: Growth Transformation and Operational Transformation.

To enable operational transformation, manufacturers must build connected business networks that enable faster responses to new market demands. By creating smart, connected factories and supply chains, manufacturers can automate processes and easily scale to meet production and aftermarket requirements. This transformation improves the connections with suppliers, distributors, customers and consumers through collaborative portals, API-led platforms, and robust customer relationship management (CRM) systems. These changes must be supplemented by transforming existing enterprise resource planning (ERP) systems to more modern ERP systems. These operational transformations subsequently enable funding for growth transformation initiatives.
To achieve growth transformation, organizations are focusing on expanding beyond pure-play manufacturing to a services-based model to ensure customer “stickiness” and long-term revenue streams, and to increase their customer base by focusing on creating outstanding customer experiences. They do this by creating smart products and services, connecting to customers by using new business and revenue models. Moving from a model where the manufacturer is at times twice-removed from the customer to a customer-connection model enables the workforce to collaborate and innovate faster through tighter feedback loops. Companies that want to remain competitive need to pursue both of these crucial transformation streams.

The current pandemic has accelerated the need for operational as well as growth transformation changes. We have identified the following four trends which will also drive our offerings for the next few years.

**Trends driven by the new normal**

**Focus on new short-cycle revenue streams driven by digital and aftermarket services**

Manufacturers are focusing on Digital sales, services and selling outcomes/Services vs products through digital channels. They are also increasingly turning their attention on aftermarket services, not only as a means to enhance customer satisfaction but also as a revenue-generating opportunity.

**Investments in differentiated and resilient supply chains by customer segment**

Given the significant operational and supply chain disruptions due to COVID, there is an increased realization for the need for supply chain visibility, transparency, reducing complexity of supplier onboarding, increase resiliency, agility and predictability.

**More flexible & digitally enabled workplace and workforce**

This has become critical for companies to quickly scale up or down and dynamically adapt to changing business needs by investing in technology for working remotely as well as rapidly deploy collaboration tools across the organization and build bridges with customers, partners and suppliers.

**Resilient and distributed IT infrastructure and systems**

Companies are operating under a new reality that puts great strain on their systems. There is significant investment in the resilient systems including applications, architecture, data, cloud, infrastructure and network.
To address these trends head on, at Mindtree, we have identified four essential pillars to deliver our services & solutions. These transformation pillars will set the stage for our customers in the manufacturing industry to become truly agile, resilient, customer focused and successful enterprises.

The Four Pillars of manufacturing transformation

**Pillar One: Enable “Connected Customer experience”**

For many manufacturers, creating connected personalized experiences for end customers and channel partners is the new battlefield leading to greater loyalty, larger customer base and new revenue models. This is being enabled by product, marketing, sales and after-sales transformation initiatives.

By creating connected products and linking them to either your own services or to a services or replenishment partner, as a manufacturer, you enable a world of new possibilities. Product transformation allows you to leverage data-driven insights to drive personalized interactions with your customers and partners, further innovation, monetize your data for added revenue and develop innovative pricing models. The connected product becomes both the new product and the new marketplace e.g. the connected vehicle which not only uses driver’s personal preferences to make driving more informed, safer and enjoyable but also creates a personalised marketplace for the driver.

Mindtree offers several solutions to help manufacturers accelerate product transformation and build new revenue opportunities. From connecting assets throughout your production ecosystem to device engineering that includes IoT and sensor integration, we deliver a powerful foundation for developing new product features and capabilities. We provide data usage analytics through our Decision Moments data analytics platform, which includes a modelling sandbox that allows you to perform rapid exploratory data analysis before you invest at scale. The solution also enables predictive analytics capabilities for more informed, strategic and operational decisions that help you rapidly gain the full value of your company’s digital transformation. We also have our own Bluetooth stack which is embedded in several connected vehicle platforms.

Meeting hyper-personalization expectations requires not only a consolidated view of customer data and insights, but an evolution from a business-to-business (B2B) model to a more consumer-centric business-to-business-to-customer (B2B2C) model.

Mindtree helps manufacturers transform the customer experience and meet demands for greater personalization. We develop B2B e-commerce capabilities that drive new levels of efficiency and added profits for manufacturers, as well as mobility and sensor-enabled apps for IoT, interface devices and remote controls. We also provide solutions that leverage augmented reality/virtual reality (AR/VR) service enablement, demand sensing and predictive analytics to guide improvements in creating more personal, connected experiences for customers.
For many manufacturers, creating connected personalized experiences for end customers and channel partners is the new battlefield leading to greater loyalty, larger customer base and new revenue models. This is being enabled by product, marketing, sales and after-sales transformation initiatives.

By creating connected products and linking them to either your own services or to a services or replenishment partner, as a manufacturer, you enable a world of new possibilities. Product transformation allows you to leverage data-driven insights to drive personalized interactions with your customers and partners, further innovation, monetize your data for added revenue and develop innovative pricing models. The connected product becomes both the new product and the new marketplace e.g. the connected vehicle which not only uses driver’s personal preferences to make driving more informed, safer and enjoyable but also creates a personalised marketplace for the driver.

Mindtree offers several solutions to help manufacturers accelerate product transformation and build new revenue opportunities. From connecting assets throughout your production ecosystem to device engineering that includes IoT and sensor integration, we deliver a powerful foundation for developing new product features and capabilities. We provide data usage analytics through our Decision Moments data analytics platform, which includes a modelling sandbox that allows you to perform rapid exploratory data analysis before you invest at scale. The solution also enables predictive analytics capabilities for more informed, strategic and operational decisions that help you rapidly gain the full value of your company’s digital transformation. We also have our own Bluetooth stack which is embedded in several connected vehicle platforms.

Meeting hyper-personalization expectations requires not only a consolidated view of customer data and insights, but an evolution from a business-to-business (B2B) model to a more consumer-centric business-to-business-to-customer (B2B2C) model.

Mindtree helps manufacturers transform the customer experience and meet demands for greater

**Pillar Two: Create “Connected & Intelligent Enterprise”**

As markets & business environments continue to evolve, there is immediate and critical need for manufacturing organizations to re-imagine & modernize their core systems and business processes with the end goal to create a connected & intelligent enterprise.

To optimize and accelerate product & service delivery, manufacturers must modernize their aging infrastructures, standardize core systems, and consolidate backend systems. Companies also need to satisfy a number of regulations and they must prove compliance or risk stiff penalties.
Mindtree offers a complete selection of managed services to help manufacturers in these endeavours. We provide cloud transformation, ERP modernization, and tool life cycle management services to modernize and consolidate existing systems. And with Mindtree’s training and diagnostics services based on AR/VR and mixed reality (MR), your team will be well-prepared to meet compliance requirements and maximize the value of your investment.

Mindtree also offers next gen technologies to automate and enhance business processes using RPA, artificial intelligence (AI), machine learning (ML) and block chain solutions across the manufacturing value chain & functional landscape. We have our own automation and integrated services platform called CAPE to enable this transformation. We have also built more than 600 BOTs to automate our internal business processes that we will bring to bear for our clients. We also bring in 40+ proven tools and frameworks to enable faster modernization assessment and automated migration.

**Modernized the Core: Migrated and consolidated monolithic mainframe landscape to drive standardization and maintainability**

A multinational manufacturing company who is world’s second largest manufacturer of heavy-duty trucks had a large mainframe landscape that powered the core processes of the organization. It was becoming difficulty to maintain, scale the landscape and align to fast changing business needs, as the architecture of the existing system was complex and difficult to maintain at resulting in high cost. Mindtree as a strategic partner optimized and modernized core enterprise applications across purchasing, material handling, assembly, inspection, warranty and dealer management processes etc. We also centralized the Dealer System to standardize the Dealer process across Markets and consolidated 30+ Core Purchase Systems into 4 application. This resulted in 50 million SEK(Swedish Kronor) savings & 60% reduction in support effort and 20% improvement in time to market.

**MINDTREE USE CASE: TRANSFORMING AGRIBUSINESS WITH IoT AND ANALYTICS**

One of the largest agribusiness operators in the world relies on tractors to spray fertilizers and other enhancers that promote healthy vegetable and fruit growth. However, the company needed to reduce the time tractors spent being refilled with the spray materials (currently more than 50 percent of the time) to improve the company’s efficiency and optimize its effort. Mindtree designed an edge infrastructure solution that included devices placed on tractors. The devices integrate with sensors that identify sprayer locations and amount of material remaining in the vats. The sensors notify mobile refill stations when to refill spray material. Now, instead of having to drive all the way back to a central refilling station, the spray trucks are automatically met in the field with refilling services when they run low. The solution will transform the company’s trucks using IoT, sensors and analytics, create a connected experience for its suppliers, truck and refilling station operators, empower the workforce with IoT tools, optimize operations, and save the company more than 40 percent in operational costs associated with spraying.
Pillar Three: Create “Connected Operations”

In a globally connected business environment with geographical expansion, supplier diversity & ability to overcome significant shifts in demand & supply like in the case of the current pandemic being the key to sustained success, Manufacturers needs to focus on creating agile operations by connecting & retooling supply chain, plant & workforce. This includes Digital Transformation of workforce & workplace (including Smart Factories), Supply Chain modernization, analytics & reporting, Real-time Asset & Resource monitoring, Manufacturing data analytics as well as AI/Deep Learning enabled shop floor transformation. Lot of these changes are to the changes are driven by new technologies for shop floor (industrial) automation, additive manufacturing, lot sizes of one, cloud computing, analytics, mobility, and the Industrial Internet of Things (IIoT).

At Mindtree, we are able to execute workplace & workforce transformation as well as help our customers leverage cloud computing to harness operational and business data for greater visibility, efficiency, control, and customer satisfaction. Using our solutions and services, we are able to connect employees, processes, and supply chains gives our customers end-to-end visibility and control which is critical.

Amongst all our differentiators, our Unique Selling Proposition which is our “Edge to Experience” capability is key to this pillar. Mindtree is focused on driving digitization across the manufacturing value chain and delivering tangible operational efficiencies while driving an enhanced employee engagement and significantly differentiated customer experience. In order to drive the “Edge to Experience” proposition, Mindtree is also leveraging the scale of industrial automation that has been executed at our parent company, L&T where we have developed solutions and IPs to integrate thousands of machines, tools and people by integrating sensors, telemetry data and visual data.

Digitalization at scale achieved within our own company - Larsen & Toubro Group

| 11,000+ Plant & Machinery Connected | 350+ Projects Monitored Online | 25,000+ Workmen Connected |
| 22,000+ PPE Tagged | 6,700+ GPS Enabled Vehicles | 1,65,000 Mobile Forms Per Month |
| 400+ Sites Use Digital Applications | 224 Projects use Geospatial technologies | 20,000+ Active Digital Users |
| | | 6,935 Tools Tagged |
Optimized operations in action: Streamlining predictive quality analysis

A leading chip maker that generates huge quantities of manufacturing test data needed to reduce the time required to analyse chip test data to help predict operational failures. Mindtree used data from IoT-enabled sensors and predictive analytics to identify issues and improve the manufacturing process. The Mindtree solution also used SAP Vora and Dynamic Tiering, 2,000 cores of Lenovo processing and 1 petabyte (PB) of EMC storage to take trillions of rows of data and visualize it on screen in less than 15 seconds. The solution allowed engineers to reclaim time to work on other tasks and identified manufacturing trends in seconds instead of days, enabling faster, better-informed decisions.

Modernized and automated operations: Build a real time data enabled platform to ensure brand safety

A global leader in technology and services that provide and protect clean water, safe food, abundant energy and healthy environments faced challenges with perishable goods. The company needed to predict when refrigerated goods would spoil, replenish perishable goods at major store chains on time — and increase food safety to protect brands while keeping costs low. Mindtree created a collaborative environment that leveraged multiple technologies to provide real-time, proactive food protection that used sensors and alerts to predict and notify service teams when refrigerated items were about to expire. The solution enabled the company's customers to validate environmental health and conditions at their locations daily and automatically generate specific health and safety reports.

Pillar Four:
Create “Lean & Nimble Organizations”

As markets and business environments continue to evolve faster than ever before, there is a dire need to create a lean and agile organization that drives efficiencies and faster innovation. Many manufacturing organizations are beginning to think of transformation to product-oriented way of operating which is a significant departure from the traditional plan-build-run way of structuring teams within each business function. The core tenets of this transformation are product based team structure and an organization culture driven by Agile and DevOps processes and continuous improvement. This entails significant organizational change management initiatives and investment by working with partners like Mindtree who have taken customers through this journey over several years.

Not only is Mindtree a transformative partner in this area but we also have our own IPs to enable the same. Mindtree has a managed services framework called “ATLAS” to standardize, optimize and enable this transformation. We have a platform called “CAPE” for Lifecycle and DevOps Automation Platform enabling continuous deployment. We also have a knowledge management and learning platform called “Yorbit”. It is no surprise therefore that Mindtree is considered a leader in Agile, CloudOps and DevOps by several analysts and advisors.
Product based delivery across digital marketing and ecommerce domains: Faster time to market for enhancing digital marketing customer engagement

For a multinational company which creates paints & performance coatings and produces specialty chemicals, Mindtree built a target operating model aligned to digital initiatives based on DevOps for digital marketing sites, apps, backend data processing engine & some other legacy systems. Over the past 3 years, we have deployed several feature teams, including those for upcoming tracks on industrial paints. We also have a number of feature teams active in between for long-running feature developments such as the e-commerce domain. This has resulted in cost saving of more than 40% and also efforts savings due to automation in deployments, day-to-day tasks as well as improved reliability: due to failovers and backups implemented more efficiently.

Transforming to a product based operating model: Higher accuracy, agility and speed of delivery of products & services

One of the pioneers in the navigation and mapping products space needed to enable faster release of products, maps, navigation software and eCommerce services to maintain market leadership. To achieve this vision, Mindtree helped them in their journey of transforming towards a product based operating model by reconfiguring towards key business domains like Maps, Devices, Traffic systems, eCommerce and Corporate systems. We also aggressively adopted Agile & DevOps practices as part of the product based operating model encompassing both Owning up engineering and operations responsibilities. This operating model was aligned to all major customers (OEMs) and involved large number of distributed scrum teams with 200+ team members of 200+ minds. This transformation has helped our client achieve as much as 50% improvement in time to market in addition to significantly higher accuracy.
Why Mindtree for manufacturing transformation

New business models, customer expectations and connected technologies create new frontiers for manufacturers. To take advantage of emerging opportunities, companies need a partner with experience in growth and operational transformation to build smart, connected factories. Mindtree has the combined IT and OT strengths to transform your organization across the manufacturing value chain from warehouse operations and logistics distribution to B2B consumer-to-product execution and services. We’ve helped manufacturing organizations across the world transform their operations to gain market share, and we can do the same for you. Mindtree’s four pillars of transformation provide the foundation for seamlessly transforming your organization into an automated enterprise. And our industry-leading strengths in industrial IoT, analytics and the cloud allow us to tailor solutions that promote a culture of continuous innovation. As a result, we’ve built a global team of manufacturing experts that have been recognized for their accomplishments.

Industry recognition

Mindtree’s industry-leading strengths in industrial IoT, analytics and the cloud have been recognized by several global organizations:

- ISG Provider Lens™ 2018
  - “Rising Star” in Managed Public Cloud Services and Public Cloud Transformation
  - “Leader” in Next-Gen Application Development & Maintenance (ADM) Services
  - “Leader in SAP Cloud Platform services and a “Rising Star” in SAP S/4HANA and SAP BW/4HANA.
- Awarded the Adobe 2018 Business Experience Award for Omni-channel Experience Management.
- Zinnov 2018 Leader of “Overall IoT Services,” along with IoT Engineering, System Integration and Deployment, Connected Vehicles, Predictive Maintenance, Customer 360, Sensors and Devices Competency, Platform and Application Competency, and Communications Competency.
Conclusion

Mindtree is the digital transformation partner for some of the leading manufacturing companies including 15 of the top 50 manufacturers in the world and some of the largest companies in their segments. We have become a more valuable anchor partner for this transformation in the recent years thanks to the acceleration of Industry 4.0 initiatives & our significant strengths in reimagining customer engagement & experience, data & analytics, cloud and enterprise modernization. This journey will only speedup further with the significant capabilities brought in by our parent company and the digital transformation initiatives going into hyper drive in the new normal.

Our deep partnerships with platform vendors such as SAP, Microsoft, Salesforce, Amazon, Google, PTC & Siemens as well as our own IPs and platforms make Mindtree an ideal digital-anchor partner to power your digital transformation. Our “Edge to Experience” capability enables IoT-led transformation and our IPs, platforms and solution partners cater to manufacturing industry needs.

Now is the time to accelerate manufacturing transformation. Mindtree can help you reimagine your manufacturing enterprise through artificial intelligence, machine learning and deep learning to keep pace with industry changes — and stay ahead of competitors.

Visit Mindtree at www.mindtree.com to learn how we can help you transform your factories and become an intelligent enterprise.