Manufacturing Digital Services 2020-2021 RadarView™ – Report Excerpt

Addressing Pandemic-related challenges

December 2020

Table of Contents

About the Manufacturing Digital Services 2020-2021 RadarView™ Report

1. Manufacturing industry is undergoing several fundamental changes to align with pandemic-related challenges. High dependency on human workforce, restricted trade movements, shift in the buying behavior of customers, and shrinking working capital has led to major disruptions in the demand-supply equation. In this challenging times, digital adoption is the best option to contain cost, optimize operations, and unlock growth opportunities.

2. Avasant's ongoing interactions with industry leaders indicate that there is growing awareness about digital transformation being the key lever ahead. However, the key challenge is to balance the digitalization of the foundational elements of technology environment with the implementation of cutting-edge technologies across the value chain. Thus, there is an increasing need to partner with the right service provider.

3. The Manufacturing Digital Services 2020-2021 RadarView™ Report provides information to assist enterprises in charting out their action plan for digital transformation and identifies key global service providers and system integrators that can expedite their transformation journey.

4. Avasant evaluated 30 manufacturing service providers using a rigorous methodology against the key dimensions of Practice Maturity, Partnership Ecosystem, and Investments and Innovation. The report recognizes 21 that generated the greatest value over the past 12 months.

5. The report also highlights key market trends and offers Avasant's view of the road ahead for the manufacturing companies in the coming years.

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Executive Summary

Key Recommendations for Manufacturers

Accelerate transformation to smart manufacturing for remote accessibility and cost reduction	• Assess, prioritize, and invest in appropriate digital technologies across the value chain (such as 3D for product design or autonomous vehicles for logistics) to reduce cost and drive efficiencies. • Digitize manual processes such as technical assistance, training, and inspection leveraging to reduce human dependency.
Digitalize supply chain for improving visibility and effective warehouse management	• Integrate AI and predictive analytics for supply chain disruption. Analyze supplier data and reoptimize inventory level based on demand. • Digitize the warehouse by leveraging robots, drones, IoT, and analytics to facilitate order picking, product assortment, and real-time inventory monitoring for reducing cost and manual efforts.
Prioritize customer demands and reimagine the overall experience	• Explore investing in different business models such as direct-to-consumer (DTC) and as-a-service to engage directly with customers and expand customer base. • Expand into higher margin business (aftermarket) by investing in advanced digital technologies such as intelligent automation to detect and avert fraud and AI for recommendations-based experience.
Focus on employee safety and training/upskilling	• Leverage digital training options such as AR/VR-based remote learning, app-based microlearning, and on-demand training modules. • Deploy digitally-enabled safety measures specific to employees (wearables for health monitoring) and manufacturing facilities (sensors to track temperature) to reduce injuries.
Evaluate organizational restructuring and strategic alliances	• Evaluate divestment or launching new entities to reduce operational costs and increase revenue through monetizing evolving opportunities. • Partner with IT and business process service providers to integrate digital capabilities and expedite transformation across the entire value chain.

Avasant has recognized 21 top-tier providers supporting manufacturing industry in digital transformation

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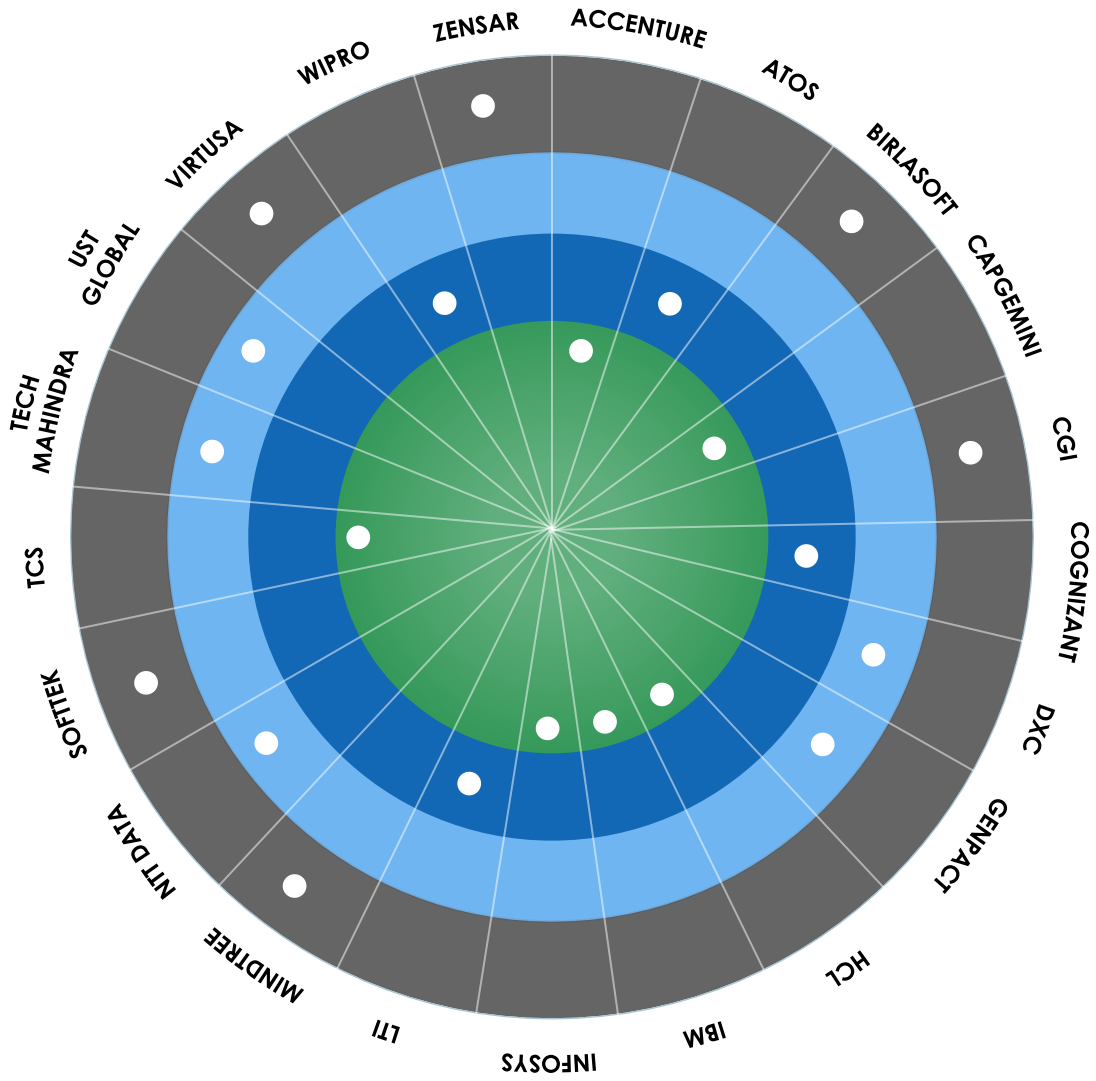

LEADERS

Accenture	Capgemini
HCL	IBM
Infosys	TCS

INNOVATORS

Atos	Cognizant
LTI	Wipro

DISRUPTORS

DXC	Genpact
NTT DATA	Tech Mahindra
UST Global	

CHALLENGERS

Birlasoft	CGI
Mindtree	Softtek
Virtusa	Zensar

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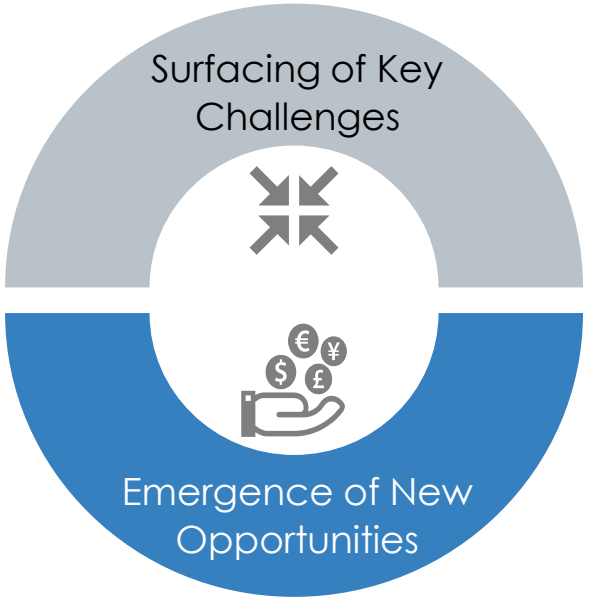
Lay of the Land

The pandemic has led to new challenges and opportunities…



Workforce Shortages

~8.6% Y-o-Y projected loss in global working hours, corresponding to 245 million FTE jobs in Q4 2020

Lookdown Restrictions

11.2% Y-o-Y decline in the global manufacturing output due to containment measures in the Q2 2020

Operations and Supply Chain Disruptions

36% of manufacturers are facing supply chain disruptions, and 53% of them anticipate a change in operations due to COVID-19 as of Q2 2020

Disruption in Global Trade

13%-32% Y-o-Y fall in merchandise trade is expected in 2020

Shift in Consumer Spending on Essentials

13.2% Y-o-Y increase in grocery store sales in the US, while 89.3% Y-o-Y decline in clothing retail sales in Q2 2020

Boost in Production of Healthcare Equipment

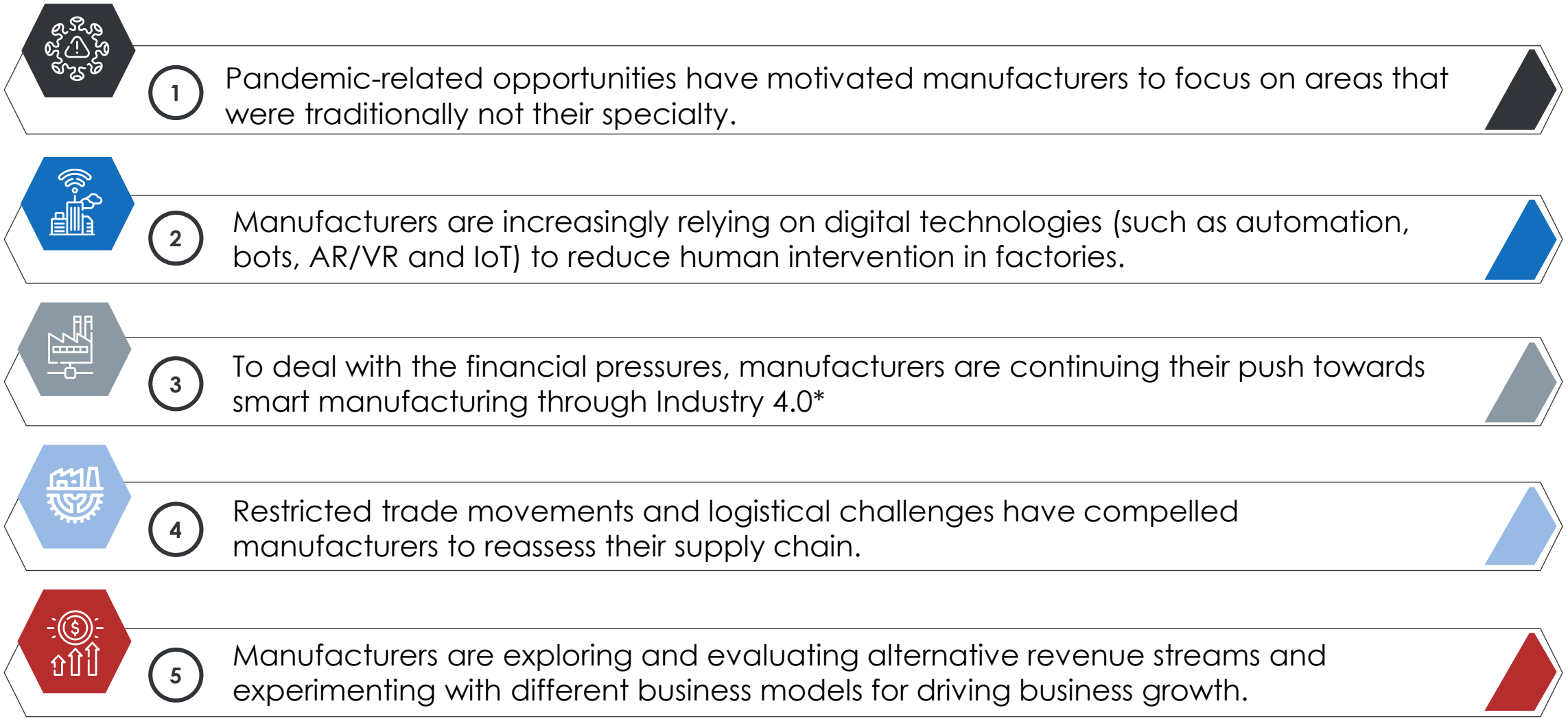
~200% M-o-M increase in US ventilator production in Q2 2020

Increased Traction in Different Business and Operating Models

Higher investment in direct-to-consumer channels, subscription models and aftermarket services

Sources: Avasant Research, UNIDO, National Association of Manufacturers (NAM), ILO, WEF, WTO, OECD

…leading to key manufacturing trends



* Industry 4.0 (the fourth industrial revolution) refers to the automation of traditional manufacturing and industrial practices. It primarily focuses on interconnectivity, automation, machine learning, and real-time data

Sources: Avasant Research

Manufacturers are monetizing emerging opportunities due to the pandemic

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1

Growing demand for preventive measures …

~89 Mn

Estimated medical masks are required for the COVID-19 response each month starting March 2020

… has compelled manufacturers to formulate new strategies for utilizing their existing facilities and resources

- Monetize the opportunity by utilizing inactive production lines to produce in-demand products. For, example, automakers producing ventilators and respirators
- Leverage core raw materials and facilities to produce new products, such as beverage companies producing alcohol-based hand sanitizers
- Switch the production lines of chemical manufacturing companies to prioritize production of disinfectants, antiseptics and PPE kits
- Ramp up in-house production of commercial and personal medical equipment and ventilators
- Invest resources and working capital on prioritized SKUs to fulfill spike in demand. For example, CPG companies manufacturing disposable products

As customers will continue to focus on preventive measures, manufacturers must revisit and develop agile business strategies by reassigning resources for business sustainability and growth.

Source: Avasant Research, WHO

Adoption of advanced digital technologies is critical for reducing human intervention while ensuring business continuity

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2

Employee safety and social distancing have compelled manufacturers to invest in automation, bots, AR/VR and IoT

		Illustrative Examples
Reduce labor, maintenance, and downtime by using remote assistance	• ~22% efficiency gains observed during equipment assembly process by aerospace manufacturers through AR glasses and VR software tools • >34% gain in efficiency realized by industrial manufacturers through guided repairs and maintenance	AIRBUS, BOEING, GE, Munters
Real-time equipment monitoring and movement of materials on the shop floor by deploying bots	• >46% increase in shop floor productivity for healthcare equipment manufacturers primarily using bots • ~30% reduction in lead time for industrial manufacturers due to standardized and streamlined operations through AI	GE Healthcare, JABIL, Baker Hughes
Enable on-demand training with AR, apps, and IoT to reduce onboarding time and simplify reskilling	• >30% rise in training efficiency using immersive technologies for real-time guided work • Increased productivity by removing paper-based manuals and reduced travel time through mobilization of resources	ThermoFisher, BMW, VOLVO, BAE SYSTEMS
Detect defects by implementing AI-based visual inspection based on deep learning and computer vision	• >40% improvement in defect detection through automated quality testing and AI-powered visual inspections • Conduct compliance and quality audits through video analytics	Ford, thyssenkrupp

By reducing human intervention and investing in real-time monitoring and AR/VR-based remote assistance, manufacturers could potentially realize >11% productivity gains

Sources: Avasant Research, Company Websites, Press Releases and Presentations

Transformation to 'Smart Manufacturing' is essential for improving efficiency and reducing costs

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Growing financial pressures have led to increased investment in automation, IoT, 3D printing, and predictive analytics

~10-20% Reduction in cost through bot deployment and 3D simulation	>60% reduction in costs with 3D printing	>15% fall in maintenance cost through predictive analytics	>10% Employee productivity with reduction in manual data gathering	>85% reduced inventory management efforts and stock holding time
Designing, optimizing and verifying production feasibility by leveraging AI-based industrial robots and 3D simulation	Creating prototypes and customized products, and manufacturing machine parts in-house by using 3D printing	Optimizing efficiency, identifying issues proactively, and controlling systems dynamically by using AI-based predictive maintenance	Monitoring equipment health and analyzing operations by deploying IoT sensors and advanced data analytics in the cloud	Optimizing inventory management, tracking movement of parts, and enabling real-time performance measurement indicators by deploying automation
VOLVO, Midea	GE, Ford, BOEING	MUELLER INDUSTRIES, INFRAREL Right On Track	TESLA, GE, BLACK+DECKER	PEPSICO, UPS

Manufacturers must integrate the right digital technology across the value chain to reduce cost, ensure product quality, and improve productivity

Sources: Avasant Research, Company Websites

To manage supply chain, manufacturers must reduce single nation dependency, explore substitutes, and optimize inventory

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4

~75%
Of US companies reported supply chain disruptions due to coronavirus-related transportation restrictions.

Manufacturers are restructuring their sourcing strategies to align with evolving challenges

Restructure supplier network to reduce dependency on one nation	• Explore local companies for sourcing the raw materials to reduce the impact of disruption in global trade
	• Adopt a "China Plus One" strategy, wherein they are shifting away from a single country to include Asian and European countries with lower operational costs
Identify alternative raw materials	• Evaluate similar businesses and product specification requirements to derive alternative raw-material substitutions or components
Reoptimize inventory levels	• Reoptimize inventory levels to mitigate the risks of supply abundance and shortages resulting from high demand and supply variability

To hedge supply chain disruptions, manufacturers must conduct analysis to identify low-cost destinations, substitutes of raw material and manage the inventory.

Sources: Avasant Research, Institute for Supply Chain Management

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Manufacturers are selling directly to customers, offering subscription services, and prioritizing SKUs

Manufacturing is transforming in the wake of the pandemic

Companies must modify their business approach to enhance customer satisfaction and restore profitability

			Illustrative examples
Business Models	**Direct-to-consumer (DTC)** ~10% share of e-commerce platforms in revenue	• Exploring digital models and engaging electronically with end customers • Developing an e-commerce platform that supports both B2B and B2C sales operations	Kraft Heinz, Bedford, X-Chair, PepsiCo
	As-a-service model Increased focus on subscription model	• Automakers shifting towards car subscription, as it makes vehicle ownership more accessible and consumers prefer personal vehicles to public transport	Ford, Mercedes-Benz, Volvo, Tesla
Revenue Streams	**Aftermarket services** >40% share in company revenue for industrial OEMs	• Industrial OEMs drive higher value through long-term maintenance contracts and monitoring services • Automakers are incentivizing customers through OTA deployment and integrated infotainment systems	Caterpillar, Otis, GM, BMW
	Prioritizing SKUs 40-80% of SKUs prioritized for production, primarily by CPG companies	• Rationalizing SKUs by diverting resources to ensure continuous flow of supply and to meet shift in customer demand	Coca-Cola, P&G, Mattel, Unilever

To retain and drive value for customers, manufacturers will have to explore adjacent spaces through transformational business models and different revenue streams

Sources: Avasant Research, Company Case Studies, Presentations, Annual Reports

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Road Ahead

Embrace digitalization to facilitate 'Smart Manufacturing'

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Industry 4.0 components can realize gains across the product manufacturing lifecycle

	Recommendations	Indicator
Strategy Planning and Designing	• Assess Industry 4.0 implementation and prioritize digital investments gaps • Perform structure scenario analysis for forecasting and planning • Invest in smart product engineering and regulatory compliance management	~10% rise in sales demand accuracy for electronic manufacturers
Supply Chain	• Drive predictive production planning • Enhance supply chain visibility/tracking to reduce lead time and manage inventory costs	>20% reduction in the order cycle time across industries
Production	• Track plant performance and optimize processes • Invest in predictive asset management (primarily machine downtime and maintenance) • Manage energy consumption	>10% reduction in machine downtime for industrial manufacturers
Sales and Marketing	• Devise omnichannel digital marketing strategies • Enable contactless sales and develop virtual sales assistant • Provide immersive customer experience	Increase lead-conversion rate across industries
Aftermarket	• Develop connected products with intelligent user interface • Enable remote diagnostics and provide hyper personalized services • Invest in servitisation to generate higher value for customers	Service calls reduction, improved technician productivity and higher customer retention

To gain competitive edge through reduced cost and expedited production cycle, its imperative for manufacturers to accelerate their investments across the value chain.

Sources: Avasant Research, Company Case Studies, Presentations, Annual Reports

Develop customer-centric strategies to enhance the experience and explore new revenue streams

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Digital technologies play a pivotal role in understanding customers

Omnichannel Marketing

Enhance customer experience for industrial manufacturers by investing in an omnichannel experience

Virtual Assistant

Conversational AI results in 5% improvement in customer experience index and reduce call volumes and operating costs

Personalization

~17% increase in menu clicks for cosmetic manufacturer after developing personalized products based on users' past shopping behaviors

7X increase in customer engagement seen by automakers through behavioral retargeting strategy and personalized ad messaging

Direct Engagement with Customers

Explore DTC business model and invest into different channels (such as e-commerce) to mine customer data for strategy and planning

Customer Lifecycle Management

Combine CRM, inventory, management reporting, and operational tools for customer lifecycle management.

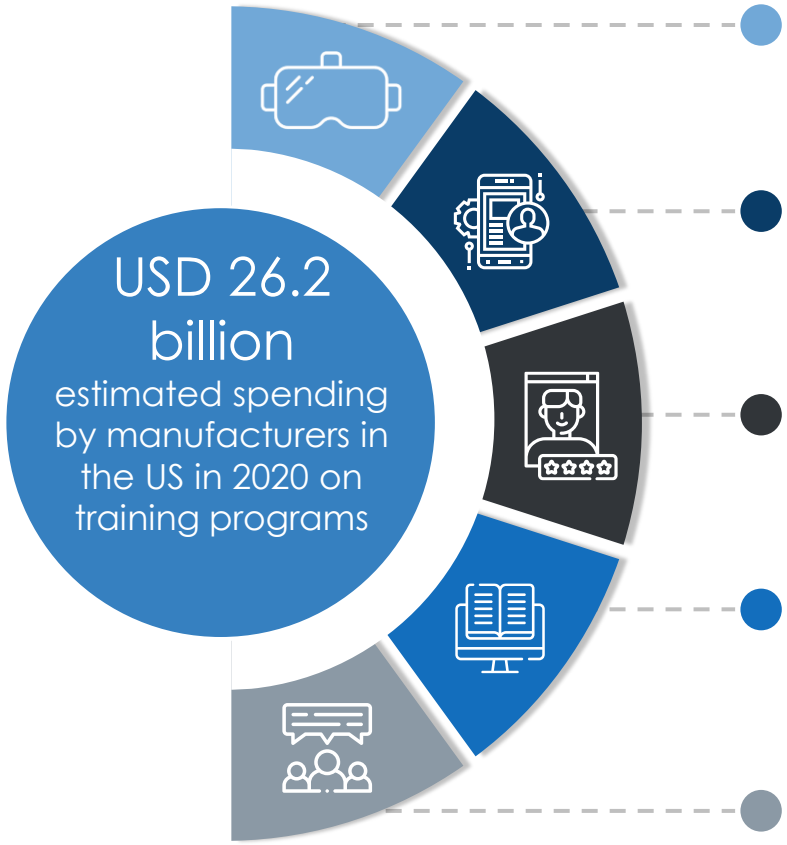
Connected Products

Provide elevated customer experience by analyzing real-time data. This leads to increased revenue through auto-replenishment and enhanced experience through predicting defects and faults

To capture the mindshare of the customers for their retention and acquisition purposes, manufacturers must develop data-driven customer-centric strategies.

Sources: Avasant Research, Company Websites

Achieve organizational goals and meet employee needs through upskilling



Initiatives to optimize cost and time and increase customization

Remote Learning	Increase focus on remote learning through immersive technologies – AR, VR and MR, for trainings with comparatively higher complexity
Microlearning	Use app-based microlearning that is focused specifically on a concept, skill or an idea, instead of extensive training
Employee Performance Metrics	Implementation of cloud-based, real-time employee performance metrics, such as changeover time and capacity utilization
On-demand Training	Offer on-demand training by partnering with digital training companies, such as Coursera for 'Advanced Manufacturing Analysis,' to fulfil a specific need for a team or an employee
Open-source LMS	Use open-source LMS, such as Moodle and Dokeos, and discussion forums to increase knowledge about a software/tool, and learn from people outside the organization who are familiar with the technology

Manufacturers need to further increase spending on upskilling their employees to stay ahead of the competition and counter the widening skill gap in the sector.

Sources: Avasant Research, The Manufacturing Institute

Deploy next gen technologies to ensure workplace and employee safety

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64%
of total workers compensation are direct costs for non-fatal claims represented by top five injury causes in the manufacturing industry

Safety Measures for Employees

Monitor Worker Health
Provide wearables to workers to track temperature changes, harmful gases, chemical exposure, and health parameters such as blood pressure variations and stress levels

Comply with Social Distancing Guidelines
Deploy an AI system that uses visual analytics and neural network models to analyze videos and images to detect breach of safety and social distancing guidelines

Delegate Hazardous Work to Robots
Introduce 'cobots' (collaborative robots) to perform repetitive and dangerous tasks, gain access to hazardous regions, and monitor the environment in real-time

Safety Measures for Facilities

Monitor Machinery and Equipment Health
Install sensors to monitor equipment health, send alerts in case of breakdown, detect hazardous gases, overheating, vibration, shock, moisture and sound levels in the facility

Ensure Shop Floor Safety
Deploy a real time location system to send alerts if unauthorized people walk into restricted areas and provide aid at their exact location instantly in case of emergency

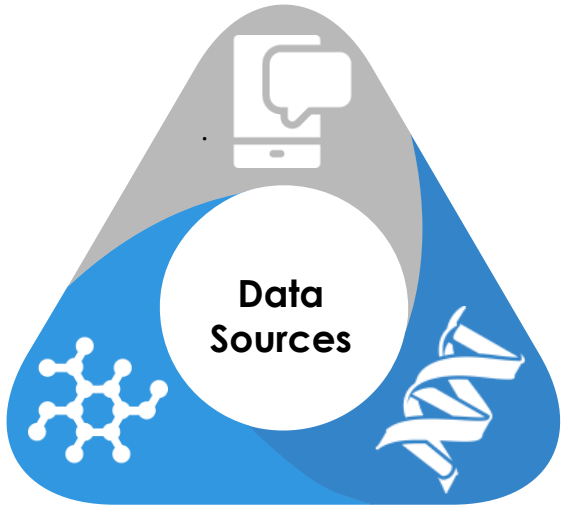
The pandemic has compelled manufacturers to invest more into novel methods to ensure employee safety

Sources: Avasant Research, Liberty Mutual Workplace Safety Index (WSI)

Leverage predictive analytics and AI to optimize operations

Triangulation of data from various sources…

Real-time data generated by IoT applications, consumer technologies, and social media



Structured enterprise data from online and offline portals

Structured data from partners within the ecosystem

…to develop predictive analytics and AI use cases to transform processes, manage inventory and sourcing, and optimize operations

Product Design and Planning

Product Development
- Expedite product development and R&D by reducing test times and driving more concrete insights from customer data and demands
- Make informed and cost-effective design decisions

Demand Planning
- Predict shifts in customer behavior due to external factors to develop new SKUs
- Cost savings owing to lower reliance on overstocking and reduced waste

Regulatory Compliance
- Perform what-if analyses on product variants to understand how design changes affect compliance status
- Provide methods and controls to ensure regulatory compliance

Supply Chain Management

Supplier Management
- Improve visibility into supplier data (approved suppliers, quality, performance, delivery mechanism, material availability, and cost) by combining silos of data from multiple sources

Inventory management
- Identify optimal inventory levels at warehouses and stores by monitoring sales trends, customer preferences, and buying patterns
- Real-time tracking of products to facilitate online sales

Warehouse management
- Scan pallets to read labels and identify damaged or missing components
- Ensure safety by monitoring forklift positions and movements

Production

Production Management
- Prioritize the manufacturing of SKUs based on market analysis
- Analyze schedules, costs, and resources to ensure optimal product development

Maintenance
- Predict and prepare for asset failure, reducing (or even avoiding) downtime
- Improve uptime and availability, leading to high overall equipment effectiveness (OEE)

Defect Detection
- Analyze quality data from manufacturing, customer support, adverse events/non-compliance issues to gain insights for initiating corrective and preventive actions
- Reduce cost of quality assurance

Adopting AI-based predictive analytics will enable manufacturers to make data-driven decisions across the value chain.

Source: Avasant Research

Evaluate organizational restructuring to unlock growth opportunities and become agile and resilient

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Divest

Redirect resources and working capital to high-growth portfolio

MERCK

40% higher operating margin over 4 years through removal of NPAs (Women's Health and Biosimilars segments)

Divest to focus on a specific customer segment

SUNPOWER

>10% annual rise in new customer accounts by focusing on distributed solar, storage and energy services

Re-structure

Reduce cost through synergies of consolidated business units

KraftHeinz

~8% decrease in operating expenses through reorientation of 55 individual categories to six business units

Carve Out New Entity

Monetize new opportunities arising from supply chain disruptions

SANOFI

~3% annual growth in revenue through marketing and production of APIs in Europe

Focusing on core sectors and high-growth products is vital for manufacturers to combat financial pressures. Streamline operating models and sharpen growth focus.

Sources: Avasant Research, Company Websites

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Explore acquisitions to increase outreach and optimize cost

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Manufacturers are acquiring companies to achieve strategic goals

Illustrative examples

Increase outreach and gain market share	Integrate with companies to compliment the product portfolio. For example, industrial machinery manufacturers acquiring other tools and equipment manufacturers	Danfoss, Eaton Hydraulics
	Venture into adjacent space, such as CPG companies exploring sports and health segments through acquisitions	PepsiCo, Rockstar Energy Drink
Optimize cost	Acquire players within the ecosystem, like automakers acquiring parts and components manufacturers	Tesla, HIBAR Systems Limited
	Co-invest in R&D initiatives with counterparts. For example, pharmaceutical companies acquiring oncology-focused biopharma companies	gsk, TESARO
Gain technological advancements	Expedite product development by acquiring technological capabilities such as IoT, AI and machine learning, such as automakers acquiring CASE[1] technology providers	Volkswagen, WirelessCar
	Focus on increasing customer base and elevated consumer experience by investing in immersive technologies like AR-based app developers	L'ORÉAL, MODIFACE

M&A can enable manufacturers to focus on the long-term strategy of maintaining continuity, growth and sustainability.

1) CASE refers to Connected, Autonomous, Shared, Electrified

Source: Avasant Research

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Embrace disruptive technologies across the value chain

	Product Design, Development, Strategy and Planning	Procurement, Logistics, Supply Chain Management	Manufacturing	Warehousing and Distribution	Sales and Marketing	Aftermarket	Customer Engagement
Robotics & Automation	• Build customized designs by Integrating MES • Adjust production based on real-time updates	• Enable remote collaboration to ensure continuity • Streamline vendor selection process through bots	• Automate workflows and shop floor • Quality checks through computer visions	• Autonomous bots for inventory management • Self-driving Forklifts to optimize resources	• Generate and analyse potential sales lead • Translate the promotions in different language	• Detect and avert fraud • Forecast warranty cost • Remote diagnostics	• Elevate contact centre and field repair capabilities • Fix issues remotely
Internet of Things (IoT)	• Quality control mechanism • Workplace safety and security	• Smart transportation for temperature-sensitive products • Asset tracking	• Real-time asset monitoring through sensors • Energy management	• Inventory management through embedded sensors, RFID	• Trigger alerts for cross-sell and up-sell opportunities • Outcome-based model by using performance data	• Move towards service-based models	• Provide real-time information to anticipate maintenance and repair needs
Artificial Intelligence	• Prediction of failure modes • Generative design • Behavioural analysis for planning	• Demand forecasting • Autonomous vehicles for logistics • Fleet efficiency	• Validate consistency in production processes • Assembly line optimization	• Assortment rationalization • Warehouse automation	• Price and loyalty program optimization • Sales activation optimization • Dynamic pricing	• Provide recommendatio ns-based experience	• NLP-powered chat bots • Create personas to recommend products • Automate order placements
AR/ VR/ 3D/ Digital Twin	• Test ergonomics, safety features • Real-time testing of manufacturing capacity through digital twin	• Secured delivery system through VR scans • Remote collaboration with suppliers	• Remote assistance during breakdown • Employee training, sharing of knowledge	• Locate, scan, sort, and move inventory using smart glasses • Inventory management	• Virtual events • Showcasing interactive product configurators	• Field service management • Product tracking through digital twin and blockchain	• Better online shopping experience through AR-based apps • Creating virtual encounters

While manufacturers have been conservative in leveraging emerging technologies due to high upfront investment, the pandemic is forcing them to rapidly adopt and integrate digital technologies.

Source: Avasant Research

Partner with service providers to prioritize digital adoption

>90%
of new outsourcing contracts include digital

List of recent outsourcing engagements

Key segments and processes leveraging digital transformation within the scope of outsourcing contracts

Applications and systems integration
- API-based portals
- Cloud-based infrastructure
- Intelligent automation

Product design
- RPA/ IA
- AI and analytics
- 3D printing
- Digital Twin
- AR/VR

Strategy and Planning
- AI
- Analytics
- RPA
- Cloud-based infrastructure

Procurement, supply chain management
- RPA/IA
- IoT
- AI and analytics
- AR/VR
- Robots

Productivity tools implementation
- RPA
- AI and analytics
- IoT
- AR/VR

Revenue and expense management
- Intelligent automation
- Predictive Analytics
- AI

Aftermarket
- Apps and chatbots
- AI and analytics
- IoT
- Intelligent automation

Employee management
- RPA
- AI and Analytics
- IoT
- Cloud database
- AR/VR

Customer engagement
- AR/ VR
- AI and analytics
- Cloud-based infrastructure
- Intelligent automation

As digital and business transformation is a top priority for manufacturers, the role of the service provider has evolved beyond cost optimization to that of strategic partner and growth promoter.

Source: Avasant Research

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RadarView Overview

Avasant Manufacturing Digital Services 2020-2021
RadarView™ assesses service providers across 3 dimensions:

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Practice Maturity	• This dimension includes measures around the type, market acceptance and quality of offerings for the industry. It also assesses the strength of the industry practice with respect to its size, certified employees, embedded expertise in emerging technologies and coverage of industry sub-segment. • The width and depth of the client base, verticalized business revenues and usage of proprietary/outsourced tools and platforms, response to COVID-19, and future strategy are important factors that contribute to this dimension.
Investment and Innovation	• This dimension measures the strategic direction of investments and resultant innovations in the offerings and commercial model, and how it aligns with the future direction of the industry. • The overall strategic investments, both organic and inorganic ones, towards capability and offering growth, technology development, and human capital development, along with the innovations that the service provider develops with its partners, are critical aspects of this dimension.
Partner Ecosystem	• This dimension typically assesses the nature of the partnerships and ecosystem engagement that the provider has entered into. It evaluates the objective of the partnership (co-development, co-innovation, etc.), its engagement with technology solutions or product providers, start-up communities and industry associations. • The kind of joint development programs around offerings, go-to-market approaches, and the overall depth in partnerships are all important aspects.

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Research methodology and coverage

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Avasant based its analysis on a number of sources:

Public disclosures	Publicly available information such as SEC filings, annual reports, quarterly earnings calls, executive interviews and statements.
Market interactions	Discussions with enterprise executives leading digital initiatives and influencing service providers selection and engagement.
Provider inputs	Inputs collected through their capability decks and structured briefings in October – November 2020.

Of the 30 service providers assessed, the final 21 featured in RadarView for 2020-2021 are:

accenture, Atos, birlasoft, Capgemini, CGI, Cognizant, DXC.technology, genpact, HCL, IBM, Infosys, LTI Let's Solve, Mindtree, NTT DATA, Softtek, TATA CONSULTANCY SERVICES, Tech Mahindra, UST Global, virtusa, wipro, ZenSar

Note: Assessments for Accenture, CGI, DXC, NTT DATA, and Virtusa have been conducted based on public disclosures and market interactions only.

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Manufacturing Digital Services RadarView™

2020-2021

Reading the RadarView

Avasant has recognized service providers in 4 classifications:

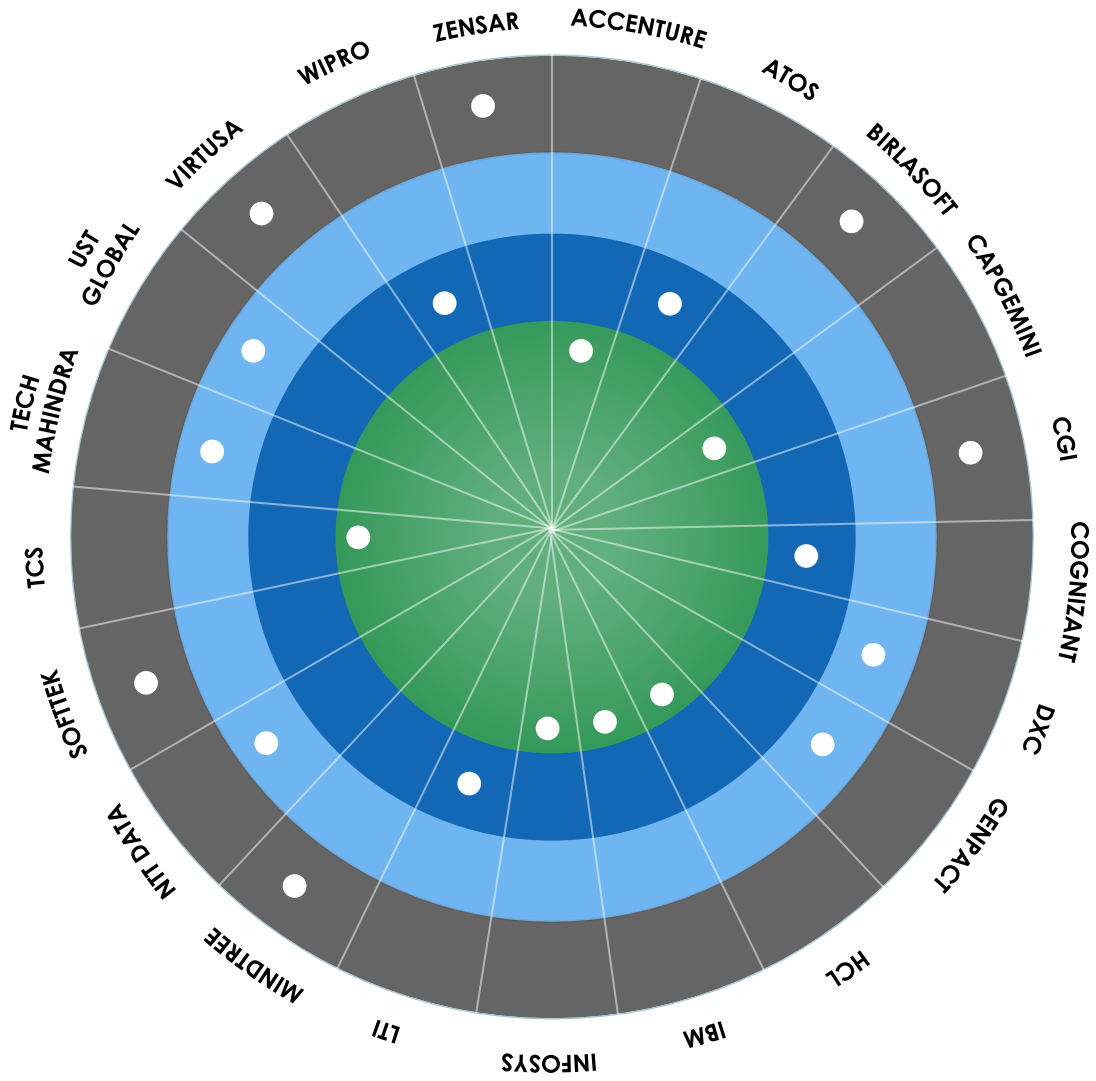
Leaders show consistent excellence across all the key dimensions of the RadarView assessment (practice maturity, partnership ecosystem, and investments and innovation) and have had a superior impact on the market as a whole. These providers have shown true creativity and innovation and have established trends and best practices for the industry. These providers have proven their commitment to the industry and are recognized as thought leaders that set the standard for the rest of the industry to follow. Leaders display a superior quality of execution and a reliable depth and breadth across verticals.

Innovators show a penchant for reinventing concepts and avenues, changing the very nature of how things are done from the ground up. Unlike the Leaders, Innovators have chosen to dominate a few select areas or industries and distinguish themselves on the basis of superior innovation. These radicals are always hungry to create pioneering advancements in the industry and are actively sought-after as trailblazers redefining the rules of the game.

Disruptors enjoy inverting established norms and developing novel approaches that invigorate the industry. These providers choose to have a razor-sharp focus on a few specific areas, and address those at a high level of granularity and commitment that results in tectonic shifts. While Disruptors might not have the consistent depth and breadth across many verticals like the Leaders or the innovation capabilities of the Innovators, they exhibit superior capabilities in their areas of focus.

Challengers strive to break the mold and develop groundbreaking techniques, technologies and methodologies on their way to establishing their unique position. While they may not have the scale of the providers in other categories, Challengers are eager and nimble, and use their high speed of execution to great effect as they scale heights in the industry. Challengers have a track record of delivering quality projects for their most demanding Global 2000 clients. In select areas and industries, Challengers might very well have capabilities that match or exceed those of the providers in other categories.

Avasant Manufacturing Digital Services 2020-2021 RadarView™



LEADERS

- Accenture
- Capgemini
- HCL
- IBM
- Infosys
- TCS

INNOVATORS

- Atos
- Cognizant
- LTI
- Wipro

DISRUPTORS

- DXC
- Genpact
- NTT DATA
- Tech Mahindra
- UST Global

CHALLENGERS

- Birlasoft
- CGI
- Mindtree
- Softtek
- Virtusa
- Zensar

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Infosys profile

Infosys: RadarView Profile

Practice Maturity ★★★★★

Investments & Innovation ★★★★★

Partner Ecosystem ★★★★★

Delivering business benefits to clients through industry-specific IPs and solutions, strategic acquisitions, focused investments on next gen technologies, and robust partner ecosystem.

Practice Overview

- Practice Size: 70,000
- Active Clients: 400+
- Delivery Highlights: 100+ global development centers

28%	10%
Share of total company revenue	Annual revenue growth

Industry-Specific Solutions/Offerings

KRTI 4.0	An AI and ML based platform for asset management, remote operations and management
Digital Factory Framework	A factory cloud canvas driving improved operational performance
Digital Control Tower	A digitally connected platform orchestrating the entire value chain for customer centric-process
Virtual Showroom	Simulating a real showroom with immersive experiences and engagements

Sample Clients

- A leading Swedish industrial manufacturer
- A large machine tools OEM
- A leading aeronautic engine manufacturer
- A leading heavy equipment manufacturer
- A major agro equipment maker
- A global forklift manufacturer

Partnerships/Alliances

DASSAULT SYSTEMES	Develop 3D solutions and platform for collaborating multiple CAD tools
RENISHAW apply innovation™	For additive manufacturing solutions and product development
NOKIA	With AI framework enabling secure and reliable connectivity
PÖYRY	Leverage AI and ML based solution for KRTI 4.0 for entire lifecycle management
Microsoft	Leveraging cloud services and AI for smart building products, connected vehicles and IIoT
aws	Leveraging cloud and AI for smart building products, IIoT, and machine connectivity
IOTICS	Digital twin capability with real time data driven insights
Rockwell Automation	Automated assets to improve plant visibility and transform operation

Value Chain Coverage

- Product Design and Development
- Strategy and Planning
- Procurement, Logistics, and Supply Chain
- Manufacturing
- Warehousing
- Sales and Marketing
- Aftermarket
- Customer Engagement

Darker color indicates higher coverage through digital services

Infosys: Case Studies

Client	Capability	Summary	Business Impact
A leading Swedish industrial Manufacturer	• Analytics • Automation • Digital Thread • IoT	• Need to collaborate between R&D and sales teams to increase sales and reduce design to manufacture period of a products • Implemented Industrial Digital Thread (IDT) to drive efficiency, speed, and flexibility through digitization and automation. Deployed 3D visualize models and orchestrated engineering, manufacturing and transactional systems to connect 100 manufacturing sites across the globe	• Improved sales order by 20% • Improved efficiency by 10% • Reduced rejections by 20% • (Engineer to order) ETO down by 50%
A largest machine tools OEM	• AR • Analytics • Mobility	• Need to automate and modernize factories across different locations for better operations • Deployed mobility and AR solutions for better quality in the factories. Realtime analytics and intelligent dashboards for data reporting. Overall a smart manufacturing unit with digital alert and notifications	• Increased efficiency by 20% • Eliminated data duplication • Reduced manual & paperwork by 90%
A leading aeronautic engine manufacturer	• AI • Analytics	• Need to transform from traditional testing methods, analytics, and improved integrated system. • Implemented artificial neural networks for predicting balanced weights in the fans of the engines of aircraft. This resulted in less testing time.	• Cost reduction by 50% • Reduced aircraft testing time by 50%
A leading heavy equipment manufacturer	• Robots • Cloud	• Need to modernize the old infrastructure to reduce service interruptions • Designed and deployed robots. Connected products and conductors. Increased capacity and profit	• Increased ampere capacity by 25% • Lowered operating temperature by 30% • Reduced cost by 20% cost

Infosys: RadarView Profile

Analyst Insights

Practice Maturity

- With annual growth of 10%, manufacturing accounts for 28% of Infosys's total revenue. It is gaining more traction by providing differentiating solutions aligning to product upgrades (smarter and connected), new business and operating models (Servitization, direct to consumers), and digitalizing the processes (across the value chain).
- Infosys's vast domain experience of over 30 years and technological expertise has led to development of industry-specific IPs which are leveraged to achieve tangible business goals. Specifically, to contain cost and improve efficiencies, Infosys is extensively using its Asset Efficiency Platform (for predictive maintenance) and KRTI 4.0 (for remote operations and maintenance).
- Its industry-specific solutions leverage emerging technologies – RPA, analytics, IoT, and AI for clients across multiple sub-industries. For example, for a large OEM, Infosys, integrated AR, mobility, and analytics to modernize the factory to reduce duplication and increase efficiency.
- Infosys has developed AI-driven solutions to create predictive models and mitigate pandemic impact for optimizing supply chain network, integrating social analytics for forecasting, and automating factories with computer vision solutions.

Investments & Innovation

- Infosys made four strategic acquisitions in 2020. It acquired Kaleidoscope innovation to bolster smart product design capabilities and Simplus and Guidevision for enhancing Salesforce and Servicenow cloud capabilities, respectively.
- Infosys is aggressively investing in co-developing digital solutions across the value chain. Strategic investments are made for next gen data centers, designing prototypes for new spaces, virtual equipment maintenance, and a digital twin solution for aircraft turbine.
- It is also leveraging the Living Labs for developing and demonstrating industrial use cases such as RFID based field and plant asset management, advanced monitoring solution for driving real time visibility, and IOT gateway framework for shop floor machine connectivity.

Partner Ecosystem

- To deliver end-to-end solutions and expedite clients' digital transformation journey, Infosys has partnered with technology providers including AWS for cloud transformation, IIoT, and smart spaces, Microsoft for connected vehicle platform, IIoT, and smart building products.
- It has also partnered with specialized companies for developing industry-specific solutions. For example, it has partnered with Dassault Systems for integrating 3D capabilities and PTC for Thingsworx platform.
- To keep pace with the technological advancements, it has partnered with several start-ups such as IOTICS for digital twin capabilities, universities such as RWTHAACHEN University for industry 4.0 offerings, and industrial associations such as Acatech.

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