Staying Competitive in the Post-pandemic Decade

Transformative technologies to ignite innovation and accelerate your advantage in the Manufacturing Sector.

Introduction

The World Economic Forum expects India to regain its position as the fifth-largest economy by 2025 and emerge as the third-largest economy by 2030 (Source: World Economic League Table 2021).

To achieve this goal, we will have to do more with fewer resources, scale up to international productive standards, and create unique differentiations that enable us to compete on global platforms. Technology - in the form of digital working and more - will play a crucial supporting role in this saga of achievement.

Even before the pandemic, organisations that truly embraced digital working experienced an increase in employee productivity even as the overall cost of operations reduced. The new work models also allowed them to access untapped talent pools and reduce staffing costs by hiring in Tier 2 and Tier 3 cities.

Moving forward, advancements in multiple emerging technologies will converge to create unprecedented value. It's up to us to anticipate and make the right strategic technology choices. So, what technologies should you be tracking and investing in?

Here's our definite round-up of the foundational technologies to keep on your radar:

By Anuj Vaid
Executive Director, CMS IT SERVICES

Foundational Technologies for 2022

Zero Trust architecture

India is the third-most cyber-attacked country in the world. Distributed workloads, remote working and connected devices make networks, services, apps and data more vulnerable than ever before. Fortification of endpoints and a zero trust posture is imperative.

Cloud maturity

Intelligent workload management and operational stability through custom cloud configurations is the way forward. According to Gartner, "The rapid pace of innovation in cloud infrastructure and platform services (CIPS) makes cloud the de facto platform for new digital services and existing traditional workloads alike, which is why 40% of all enterprise workloads will be deployed in CIPS by 2023, up from only 20% in 2020." (Source: Gartner Predicts the Future of Cloud and Edge Infrastructure, Katie Costello, February 8, 2021).

Hyperautomation

Gartner expects that by 2024, organizations will lower operational costs by 30% by combining hyperautomation technologies with redesigned operational processes. (Source: Gartner - Forecast Analysis - Hyperautomation Enablement Software, Worldwide, Cathy Tornbohm, 22 March 2021). This will reduce/replace manual resource allocation, system tuning and configurations, data management and mining, service management and systems provisioning.
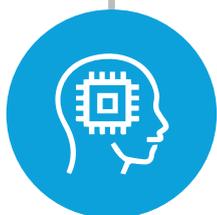
Conversational AI

Just like cloud brought scale and speed within reach of small companies with small budgets, chatbots empower small teams with small budgets to deliver the 24/7 customer-first experience typically associated with enterprises.
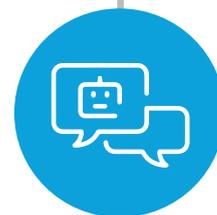
IoT everywhere

By 2022, there will be 29 million connected devices on the internet and 50% will be IoT devices (Source: Telecommunications Industry Association). Smart homes, wearables, smart cities, smart grid and industrial internet will be the most popular applications.

Intelligence at the edge

Gartner predicts that by 2025, 75% of business-generated data will be generated and processed at the edge. (Source: Gartner - Technology Insight - Edge Computing in Support of the Internet of Things, Santhosh Rao, 13 July 2017). AI at the edge allows mission-critical and time-sensitive decisions to be made faster, more reliably and with greater security.

Data

By 2024, we will have generated 149 zettabytes of data globally (Source: Statista). The velocity and quality of data enables businesses to think less sequentially and more disruptively.
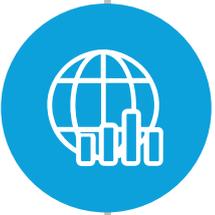
5G connectivity

5G ushers in an era of unprecedented connectivity - superfast, ultra-reliable, low latency networks that seamlessly support up to 1 million devices per square kilometre. This 1000x increase in compute capacity (compared to 4G) is the foundation on which IoT, big data, AR/VR, etc deliver immersive experiences.

"

The next frontier in IT services will evolve beyond the discrete consumption of service models and technologies, and instead will be driven by the nexus of cloud, edge, 5G, AI, IoT, and data and analytics.

"

Sid Nag, VP Analyst, Gartner

Trends in Manufacturing Sector

Making it in India

India's industrial manufacturing system is in the midst of a radical transformation. Smart manufacturing - powered by artificial intelligence, connected sensors, robotics, advanced analytics, 3D printing, new materials, and automated workflows - is redefining operational efficiency and efficacy. It's also making possible new business models, products, and processes previously thought unimplementable.

> The Indian smart manufacturing market size is projected to grow at a CAGR of 14.8% during 2020-26.

Source: Orion Market Research

The Make In India (MII) mission relies heavily on tech-forward ventures to turn the country into a global production hub. Coupled with favourable parameters such as a youthful population, increased domestic demand, and considerable return on investment, India is all set to emerge as an exciting new incubator for Industry 4.0.

Industry evolution

25 sectors including pharmaceuticals, aviation, IT and BPM, automobiles and biotechnology are at the centre of the objective of India becoming a high-tech manufacturing hub with a 1 trillion USD manufacturing GDP, in no less than a decade.

- Supply chain integration will reduce the production time and wastage, leading to substantial cost savings. It will also create digital flyovers for distribution and delivery

- Self-healing machinery will enable lean manufacturing via automated routine checks, sensory devices etc to reduce response time drastically

- 5G will quickly become the communication standard and companies will leverage private network slices to enable customization, data backup and advanced analysis

- Real-time processing of historic data encompassing the entirety of incidents across the production cycle will help predict failures as well as improve current processes

- Actuators, effectors, sensors, controllers, and control loops will collect real-time production information and provide contingent actionable outcomes

- Storage, inventory and mobility management will be machine-run in order to amp up productivity and safety standards

- Environmentally conscious production with a low carbon footprint, lesser resource utilization, zero emissions etc will be considered ideal

- Durable, tech-advanced materials linked to computational engineering will become mainstream

- New managerial concepts that are agile, autonomous and goal driven like Intelligent Composable Business will be adopted by manufacturers

Challenges

- IoT and IT operate under different protocols and the complexity and costs associated with the same will subsequently increase for Smart Factories

- The enormous data collected, stored, and processed stands the risk of theft/leaks and leads to the subsequent loss of competitive edge

- Although substantially digitized, India is still lacking in terms of the proper digital infrastructure required to provide high bandwidth, connection density etc to exponentially grow its industrial complex

- The Power deficit situation in India has left the industrial sector with some serious reservations regarding production continuity and efficiency

Smart manufacturing is the digital transformation of the workshop and system-wide operations, delivering real-time decision making, enhanced productivity, flexibility and agility. It's an incredible opportunity to increase automation, undertake self-optimization of process improvements and, above all, develop a whole new level of efficiency and responsiveness.

> "
> Smart factories create increased competitiveness and cultivate new forms of productivity, flexibility, and human interactions, while simultaneously minimizing risk and either maintaining or improving performance.
> "
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> *Michelle Duerst,*
> *VP Analyst, Gartner*

Enabling Technologies

Smart factories that maximize production with minimal human intervention are on the horizon. Industry 4.0 relies heavily on Advanced Digital Production (ADP) technologies - not just the ability to implement technology, but also capture the learnings that come from running and optimising smart factories.

- Robotics, LiFi, Radio-frequency identification (RFID), bar codes, algorithmic merchandising optimization and drone technology will be employed to run factories and warehouses.

- Nano-technology-based materials tend to be more pliable, long-lasting, and wear-resistant, thus improving production quality

- AR/VR driven troubleshooting can improve OTJ training capabilities to create a more efficient, technically advanced, and adept workforce

- Distributed cloud gives manufacturers the ability to be flexible, localize and speed up operations without compromising quality standards

- Hyper-automation brings optimization to end-to-end production activities and allows remote-control, thus reducing lags and bottlenecks and improving cost margins

- Artificial Intelligence and Machine Learning are instrumental in reducing the response time of self-remediating machines

- IoT in tandem with 5G-powered networks and cloud allows Smart Factories to monitor production, respond to incidents quickly, reduce wastage and maximise output

- 3D printing will provide provisions for prototypes and boost innovation, without driving up costs or production time

- Big Data will optimize the supply chain, provide quality assurance, and even predict risk probabilities

- Secure cloud-based ERPs can improve cybersecurity posture and reduce data breach threats

126.6
in April 2021

The manufacturing component of the Index of Industrial Production (IIP) stood at 116.9 between April 2020 and March 2021 and rose to **126.6 in April 2021**. (Source: Ministry of Statistics and Programme Implementation)


$2.58
Billion during 2020-24

The industrial automation and instrumentation market in India is expected to grow by **USD 2.58 billion during 2020-2024** (Source: Technavio)
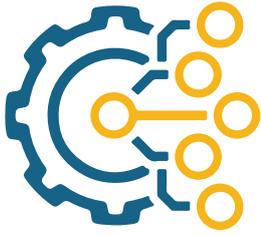
4 New centres for promoting ADP technologies

The government of India opened 4 new centres for promoting ADP **technologies in Bangalore, New Delhi, and Pune** (Source: UNIDO Industrial Development Report 2020)
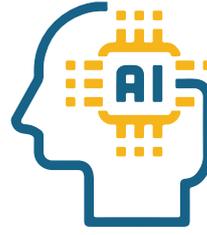
94% CEOs are For AI-adoption

94% of the **200 chief executives** surveyed in August-September 2020, affirmed of either having adopted or planning to adopt AI in their organizations (Source: PwC)

$11573.16 million by FY2027

The IoT in the Indian manufacturing market is forecast to **grow at a rate of 13.81%** to reach USD 11573.16 million by FY2027 (Source: TechSci)

40% of Indian factories

Over 40% of Indian factories will be **transformed into 'smart'** in the next five years (Source: Smart Factories @Scale)

3/5 Smart Factories

By 2025, three out of five manufacturer's smart factory initiatives will stall from a **lack of supply chain integration**. (Source: Gartner)

Into the resilient future: a path forward

Now that the pandemic has changed how we do business forever, it's time to find pathways to a responsive and resilient future. It's time to enable agility with scalable digital systems purpose-built for distributed workforces. It's time to embrace hybrid-computing and multi-cloud models as pivotal components of business infrastructure.

As you lay the foundation of a digitally transformed future, you will want to evaluate the technology and vendors you choose. Here are a few things to consider.

What to look for in technology solutions

- You will want a technology stack - hardware, software and business applications - that **fits your business** just right, and keeps your customers happy.

- Your technology will need to integrate and work seamlessly with your existing infrastructure, so it augments and **amplifies your previous IT investments.**

- Solutions that are easily and quickly deployed substantially **accelerate your time to market** and drive quick returns.

- Cloud-native solutions offer you **unlimited elasticity** at an unbeatable price, allowing you to start small, learn what works for your business and scale fast.

- As threat actors become more sophisticated, **in-built security** may be the single-most critical consideration for your business's reputation and safety.

- Bespoke solutions that **automate and auto-learn** in your unique operating environment will drive higher ROI and keep your business future-fit.

What to look for in a digital transformation partner

- **Culture fit** is critical. A win-win approach and a strong desire to create value are at the heart of every good vendor relationship.

- Pick a partner who brings a **complete team** to the table, not just techies. You will want to involve business enablers, domain consultants, and support teams to ensure you've built a holistic solution for your users

- A partner with the right **intellectual property, frameworks and best practices** will make your life immeasurably easier by delivering risk-free and error-free repeatable deployment models.

- A partner with **global know-how and local insights** is a strategic advantage for your teams and your customers.

The bottom line - be it technology or transformation partners, **long-term sustainability** is the key. You want technology solutions that scale and adapt to the future and relationships that last the distance.

We hope you find these insights and commentary as illuminating as we do, and we welcome the chance to discuss what they mean for your business.

Explore Tech Trends in other Major Industries

Banking & Financial Services

Education

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Retail

Healthcare

GICs

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