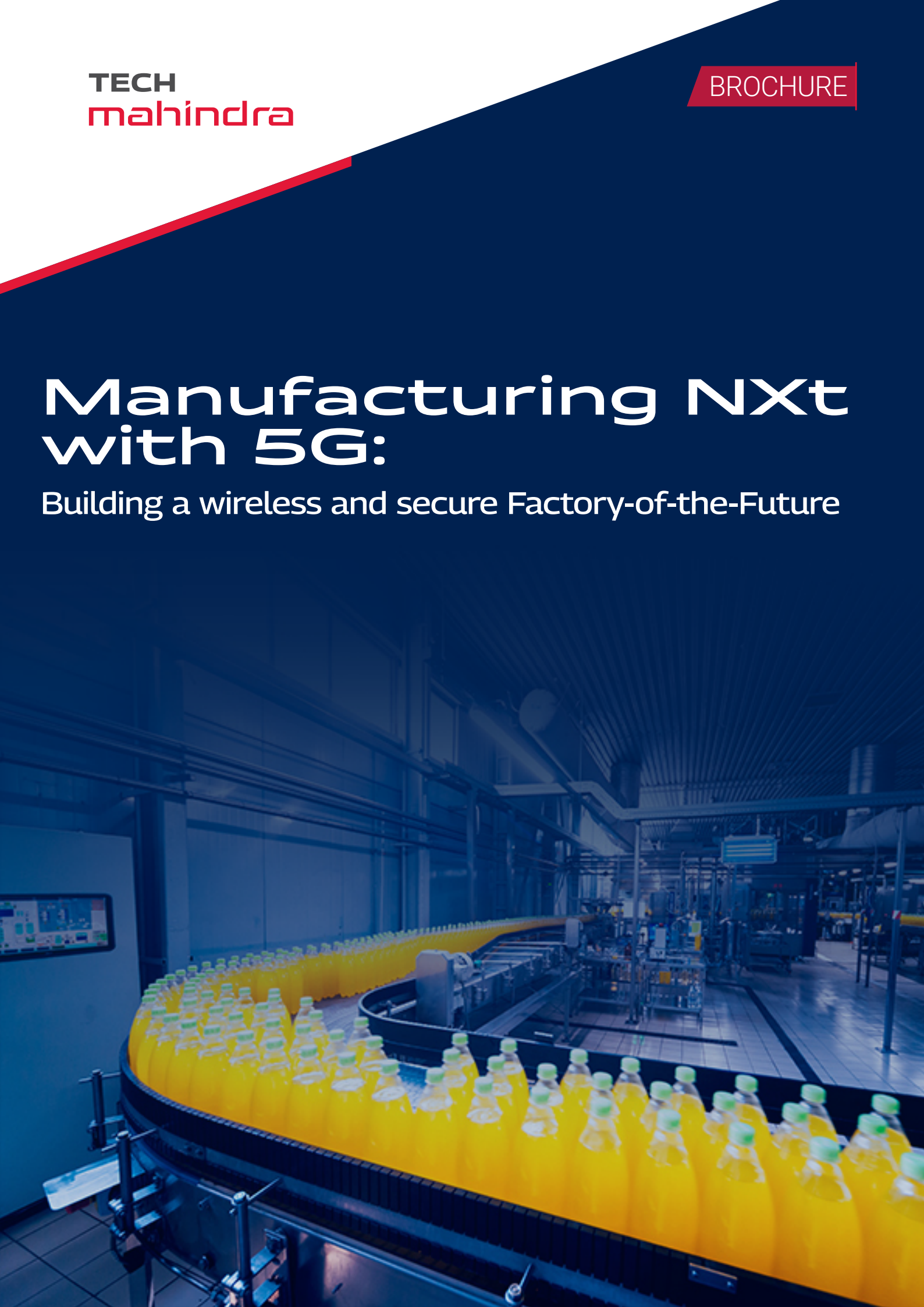
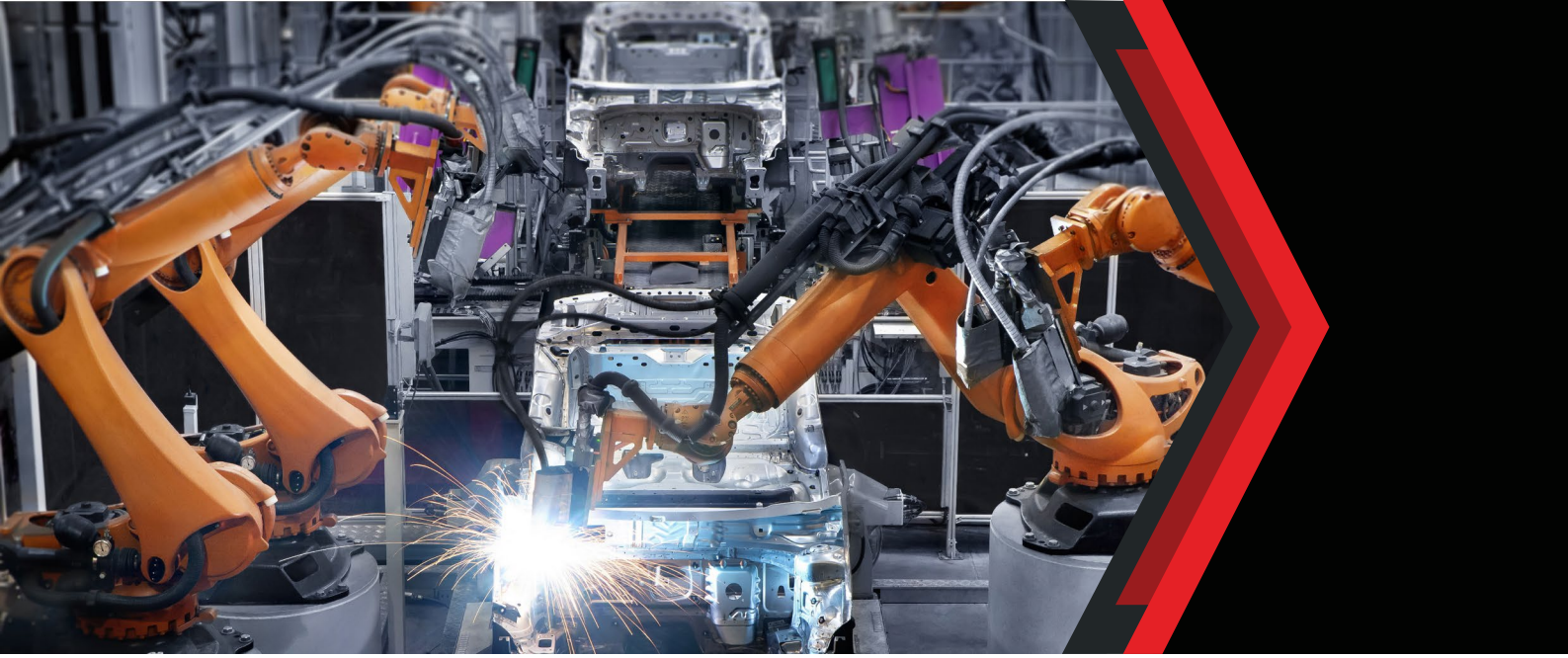
TECH mahindra

BROCHURE

Manufacturing NXt with 5G:

Building a wireless and secure Factory-of-the-Future





The global manufacturing sector is at the cusp of a major digital revolution fueled by adoption of Industry 4.0 technologies that can improve 'Overall Equipment Effectiveness' by enhancing process availability, reducing defects, and increasing productivity. These 'connected' digital technologies are drivers that will enable enterprises to reduce time-to-actions through better analytics and enhanced visibility of shop floor performances.

Roadmap to Smart Factories and Connected Manufacturing

The manufacturing sector is gearing up to overcome current challenges, and shift to build future-ready businesses by adopting 'smart' technologies that improve overall efficiency.

Today's challenges:

30% higher downtime through traditional asset management

20-30% erroneous quality due to manual inspections

50% additional picking time due to manual picking of orders

Transcending Challenges with 5G assisted Connected Manufacturing:

5G and Edge Computing enables seamless adoption of Industry 4.0 technologies that improve machine and process efficiency, system availability, reduce defects, and enhance productivity. The factory-of-the-future is powered by technologies that enable intelligent, connected, and digitized manufacturing processes. These technologies will reduce time-to-action through real-time insights, better analytics, and enhanced performance visibility.

5G opens doors to numerous use cases:

Typical use cases:

- Predictive Maintenance
- Condition based Monitoring
- AR/VR based Maintenance
- AGVs and COBOTs
- Vision based Quality Inspection

Use Case Requirements:

- Higher Bandwidth
- Improved Reliability
- Ultra-low Latency
- Higher Connection Density

Catalysing the change to 'Intelligent' and 'Connected' Manufacturing

5G promises high-speed wireless network coupled with ultra-low latency, network slicing, and ability to seamlessly manage connected devices. The benefits offered are poised to revolutionize the manufacturing industry and help realize potential across the value chain from Supply Chain and Production to After Sales Services.

The advancements in technologies like IIoT, Robotics, AR/VR, and analytics enable manufacturing units to have end-to-end visibility of operations. Additionally, the data generated by the connected devices (or sensors) helps gain useful insights to enable data-driven decision making.

Unlocking potential with 5G:

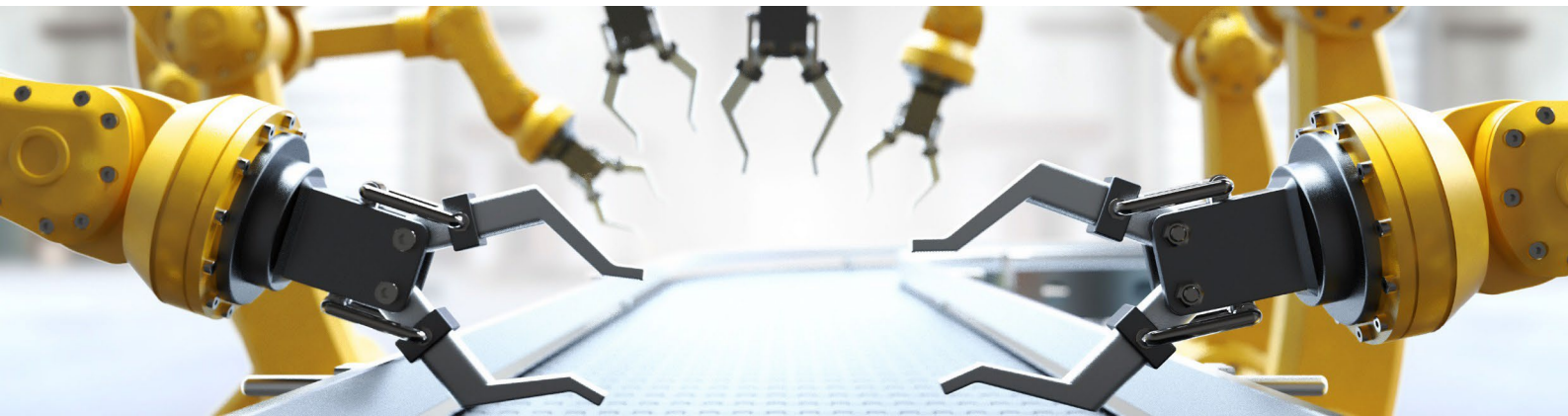
Manufacturing will see the largest share of 5G- enabled economic activity in 2035 - 3.4 trillion USD or 28% of 12.3 trillion USD sales enablement [1]

41.6 billion IoT devices in the field by 2025 including machines, sensors and cameras and industrial tools

Machines, sensors and cameras will generate 79.4 zettabytes of data in 2025 [2]

IoT-enabled manufacturing operations spend will reach up to $470 billion/year by 2025 from $102.5 billion in 2016 [3]

Market for privatized 5G networks is expected to grow at CAGR of around 30% to $356 billion by 2028 [4]



Benefits:

5-10% reduction in overall maintenance costs

30% drop in inspection time and error rates

10% improvement in production efficiency

50% reduction in training time

Business KPIs impacted:

- Operation Efficiency
- Inventory
- Equipment Efficiency
- Training Time
- Downtime
- Rework
- Scrap
- Production Throughput
- MTTR
- MTBF
- Expenditure
- OEE

The Tech Mahindra Solution Suite - Crafted for manufacturers

Digital Supply Chain

Enable automation of material movement and processes within the manufacturing premise and enable real-time monitoring and tracking of inventory health with notifications to reduce response times.

Smart Logistics: Automates material identification and movement in the manufacturing premise, with complete visibility and Automated Intelligent Vehicle (AIV) technology.

Asset Track and Trace: Monitors and tracks inventory health and storage conditions in real-time, with sensor data ingestion and live location tracking.

Digital Production and Operations

Automate and digitize manufacturing processes and activities to improve efficiency, effectiveness, reduce rejects and reworks, and improve workforce and equipment safety.

Automated Quality Control: Leverages Machine Learning based Automated Quality Inspection and Control for early fault detection.

Condition Monitoring and Predictive Maintenance: Monitors critical machines in real- time, gives timely notifications, and predicts residual life as well as maintenance needs, using Machine Data Analytics on wear and tear levels of assets.

Remote Maintenance Assist: Enables maintenance assistance with AR/VR based instructions from remote experts, improving error rates and MTTR.

Digital Twin: Creates virtual replicas of physical systems that ingest, process, and analyze sensor data in real-time, to gather performance insights, operational deviations, etc.

Connected workforce: Monitors worker health vitals with fall detection, and controls access to restricted areas. Also enables AR/VR based workforce training to reduce training times.

Distributed Over-the-Air (OTA) software/firmware upgrade: Allows concurrent, faster, and region-specific software/firmware upgrades driven from Public/Private network.

Digital Services

Garner machine insights to predict maintenance needs and remotely assist maintenance activities, to reduce machine downtimes.

Field Service: Remotely monitors machine data to predict maintenance needs of assets, and assists in machine repair from experts using AR/MR technology.

Digital Customer Experience: Enhances customer experience through immersive, interactive, engaging, and intuitive demonstrations using AR/VR technology.

Unlock potential with our unique 5G and Edge assisted Digital Factory solutions

Tech Mahindra brings together an end-to-end Suite of pre-integrated, production ready, secure, and all-encompassing OT- centric enterprise solutions that enable digitization at scale.

Our comprehensive manufacturing solution offerings include:

- A Secure and private network, multi-access edge computing, inter-connected premises and cloud over SD-WAN
- A digital solution stack that comprises devices, platforms, applications, and technology stacks
- A Solution Integrator bringing together digital solutions and networks, enterprise network operations management, and transformation of legacy applications into a 3-tier architecture - The Device Edge, Enterprise Edge and Cloud, with end-to-end cyber security overlay.

Our vast global experience with Enterprises and Telcos as well as Cloud, IoT, Digital Platforms and Applications makes Tech Mahindra the preferred Solution Integrator among enterprises.

References:

1,2,3 International Data Corporation
4 Harbor Research

For more details about our offerings, please contact us at
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