Enterprise System

Unit I

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Global Competition and Innovation

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- IT enables manufacturers to compete globally by offering tools for real-time data analysis, innovation, and collaboration. Companies leverage IT for designing, prototyping, and introducing new products faster, reducing the time-to-market.

Digital Transformation

The adoption of smart manufacturing through technologies like IoT, AI, and cloud computing optimizes production processes, enhances efficiency, and provides actionable insights. IT is the backbone of the Industry 4.0 revolution.

Global Supply Chains

IT supports global supply chain management by enabling visibility and traceability across complex networks. Platforms like ERP (Enterprise Resource Planning) and SCM (Supply Chain Management) systems ensure seamless coordination between stakeholders across geographies.

Global Sourcing of Raw Materials/Components

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Manufacturers use IT-driven tools like procurement platforms and supplier management software to evaluate suppliers worldwide, negotiate better terms, and ensure uninterrupted supply chains.

Reducing Cycle Times

Advanced IT systems enable automation, predictive analytics, and process optimization, which reduce cycle times in manufacturing and delivery processes, enhancing efficiency and customer satisfaction.

Increasing Complexity in Logistics

Logistics management benefits from IT through tools like fleet tracking, route optimization, and warehouse automation. These reduce errors, improve delivery times, and manage the increasing complexity of global logistics networks.

Industry Consortiums

Industry consortiums supported by IT create platforms for collaboration, standardization, and innovation. These alliances share resources and knowledge to tackle challenges like sustainability and global competition collectively.

Predictive Maintenance

IoT sensors and AI analytics monitor equipment in real time to predict potential breakdowns, minimizing downtime and improving operational efficiency in manufacturing plants.

Smart Factories and Automation

- Technologies such as robotics, AI, and machine learning are transforming traditional factories into smart factories, where automation enhances productivity, reduces errors, and lowers costs.

Real-Time Data Integration

- Cloud-based IT systems enable real-time data integration across the value chain, providing visibility into production, inventory, and customer demands, which enhances decision-making and responsiveness.

Cybersecurity in Manufacturing

- As IT adoption increases, so do cyber risks. Cybersecurity solutions protect sensitive production data, intellectual property, and supply chain operations from threats.

New IT-Driven Business Models

- Emerging models like as-a-service offerings, digital twins, and virtual simulations are reshaping how manufacturing and supply chain operations are managed. These models leverage IT to improve collaboration, reduce costs, and optimize resource allocation.