Lecture eleven: Technology in Logistics

Text 11.1:

The Technology has revolutionized logistics, substantially enhancing supply chain performance and visibility. Modern logistics significantly relies on sophisticated information systems, such as Inventory Management Systems (IMS), Manhattan Associates WMS, Oracle Transportation Management (OTM), Transportation Management Systems (TMS), Enterprise Resource Planning, and Demand Forecasting Systems to facilitate operations. (Cook, 2006; Xu & Shiina, 2018).

Text 2:

Technologies like barcoding, Radio Frequency Identification (RFID), and GPS tracking ensure real-time monitoring of goods, lowering errors and enabling just-in-time delivery. Moreover, advancements in automation and robotics are transforming warehouses and improving storage, retrieval, and order fulfilment processes. For instance, automated guided vehicles (AGVs) and robotic arms are commonplace in modern warehouses, significantly reducing labour costs and increasing throughput. As logistics operations progress, integrating these technologies becomes essential for maintaining competitive advantage and operational efficiency (Cook, 2006; Xu & Shiina, 2018).

Related Terms:

- **Enterprise Resource Planning (ERP) (تخطيط موارد المؤسسة):** A system for combining and managing core business processes. ERP systems unify diverse business functions such as finance, HR, manufacturing, and SC into one system to facilitate processes and information across the organisation. (SAP, 2024).
- **Warehouse Management Systems (WMS) (أنظمة إدارة المستودعات):** Software that assists in controlling and managing day-to-day warehouse operations. WMS solutions optimise inventory management, order fulfilment, and warehouse space utilisation. (Manhattan Associates, 2024).
- **Radio Frequency Identification (RFID) (تحديد الهوية بموجات الراديو):** A technology that uses electromagnetic fields to identify and track tags attached to objects automatically. RFID systems enhance inventory visibility and accuracy by providing real-time tracking information. (Gartner, 2023). E.g., RFID technology is widely used in retail to manage inventory and reduce shrinkage (Gartner, 2023).
- **Automated Guided Vehicles (AGVs) (المركبات الموجهة الآلية):** Mobile robots used in industrial applications to transport materials around a manufacturing facility or warehouse. AGVs improve material handling efficiency and reduce labour costs (KUKA, 2023). For example, AGVs are commonly used in automotive manufacturing to transport parts between assembly stations (KUKA, 2023).

Real-World Examples:

    a. Example: Amazon employs advanced WMS to manage its vast network of warehouses, guaranteeing efficient storage and retrieval of goods.

    b. Walmart uses RFID technology to track inventory in real-time, decreasing stockouts and enhancing supply chain visibility.

    c. Tesla's Gigafactory utilises AGVs to transport materials within the factory, enhancing production efficiency and reducing labour costs.