UNIT 10 ARTICLE:
INTRODUCTION TO KANBAN SYSTEM

Introduction:

The term Kanban comes from Japanese, where "Kan" means "visual" and "ban" means "card." Together, Kanban refers to visual cards used as a signaling system in Lean manufacturing to trigger actions, such as resupplying materials. Originally developed as part of the Toyota Production System, Kanban is closely linked to the design of pull systems and the concept of delivering goods just-in-time.

What is a Pull System?

A pull system bases production processes on customer demand, where each component is manufactured in sync with another process to meet exact delivery expectations. This approach minimizes excess inventory and promotes a leaner business operation by producing only what is needed.

In a pull system, actual customer orders signal when production should begin. This reduces the need for high levels of raw materials, work-in-progress, or finished goods, as resources are allocated based on demand. Modern manufacturers use sophisticated scheduling software to plan production, with real-time information exchanged between suppliers and customers via Electronic Data Interchange (EDI) to ensure accuracy and efficiency.

How Kanban Works:

Kanban cards are the most common form of this system, used to track production needs. Originally simple physical cards, modern systems may use emails, sensors, or digital dashboards to trigger actions. For example, in a supermarket, a red flag on an empty shelf signals the need to restock, and an automated system may then reorder supplies once stock levels fall below a critical point.

The Six Rules for an Effective Kanban System:

Toyota established six key rules to ensure an effective Kanban system:

1. Customer (downstream) processes withdraw items in exact quantities specified by the Kanban.
2. Supplier (upstream) produces items in precise quantities and sequences according to the Kanban.
3. No items are made or moved without a Kanban.
4. Every item must always have an accompanying Kanban.
5. Defects or incorrect amounts are never passed to the next process.
6. The number of Kanban's is gradually reduced to lower inventories and expose process issues.

This structure ensures that production flows smoothly while promoting continuous improvement and efficiency.

Advantages and Disadvantages:

Advantages	Disadvantages
Visual Workflow: Kanban provides a clear, visual representation of tasks and their progress, enhancing transparency and accountability.	**Limited to Existing Processes:** Kanban focuses on improving existing processes rather than redesigning or transforming workflows.
Continuous Improvement: The system naturally promotes incremental changes to improve workflow efficiency over time.	**Over-complication with Complex Projects:** Kanban can become difficult to manage for very large or complex projects without proper customization.

Reduced Bottlenecks: By visualizing bottlenecks, Kanban helps teams quickly identify and address areas of inefficiency.	**Lack of Structure:** The absence of prescribed roles or methodologies can be confusing for teams used to more structured systems like Scrum.
Balanced Workload: Work-in-Progress (WIP) limits help prevent overloading team members, promoting focus and steady progress.	**Requires Discipline:** Success with Kanban relies on consistent updating and participation from all team members, which can be challenging to maintain.
Promotes Collaboration: Daily stand-up meetings and visual task boards enhance team communication and collaboration.	**May Not Suit High Variability Environments:** In fast-changing environments, a Kanban board may not be flexible enough to handle unpredictable workloads.