



**RZESZOW UNIVERSITY  
OF TECHNOLOGY**



## **CHAPTER 7**

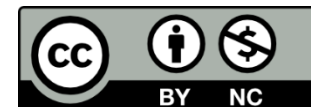
# **TOYOTA PRODUCTION SYSTEM (TPS)**

**LEAN MANUFACTURING**



Co-funded by  
the European Union

TET - The Evolving Textbook  
Project no: 2022-1-SI01-KA220-HED-000088975

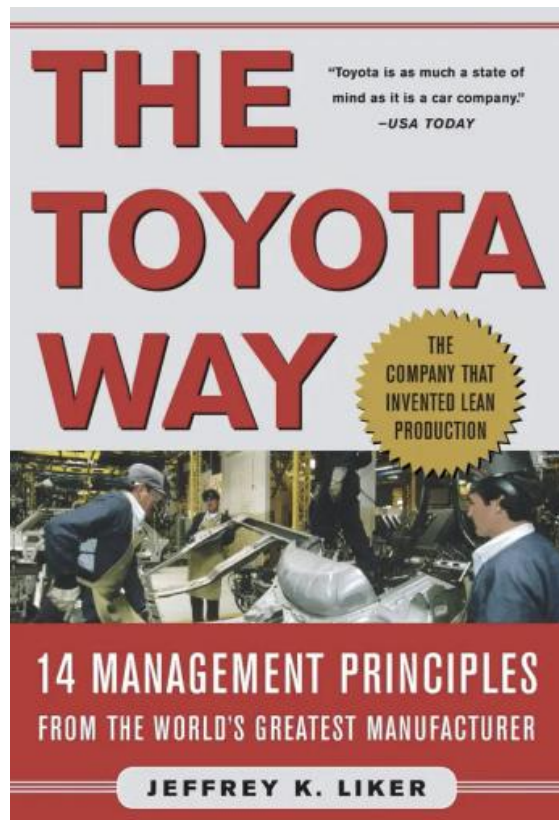


# Introduction to the Toyota Production System (TPS)

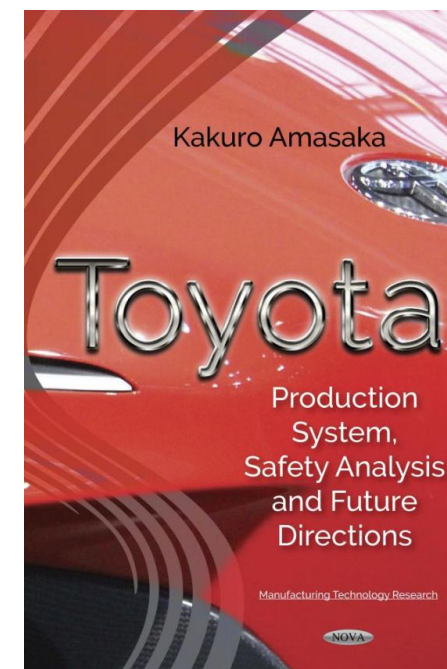
## The Toyota Production System

(TPS) is a comprehensive production management system and philosophy developed by Toyota. TPS forms the foundation of the Lean Manufacturing concept and focuses on eliminating waste (Muda), maximizing value-added activities, and fostering continuous improvement (Kaizen).

Liker, J. (2021). *The toyota way*. Esensi.



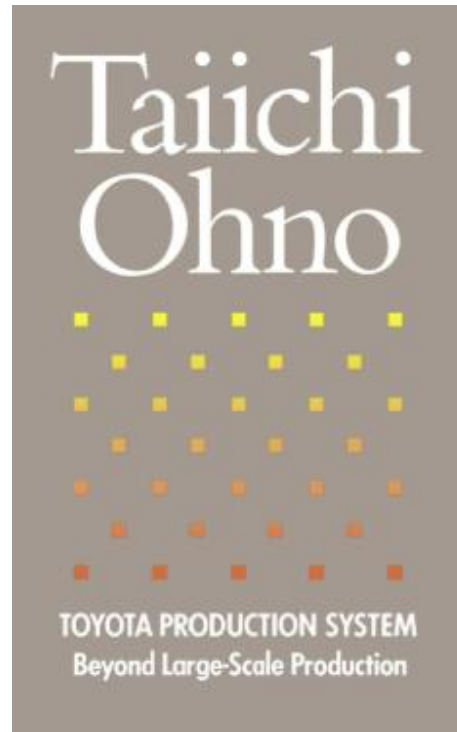
Kakuro Amasaka (2017). [Toyota: Production System, Safety Analysis and Future Directions](#). Nova



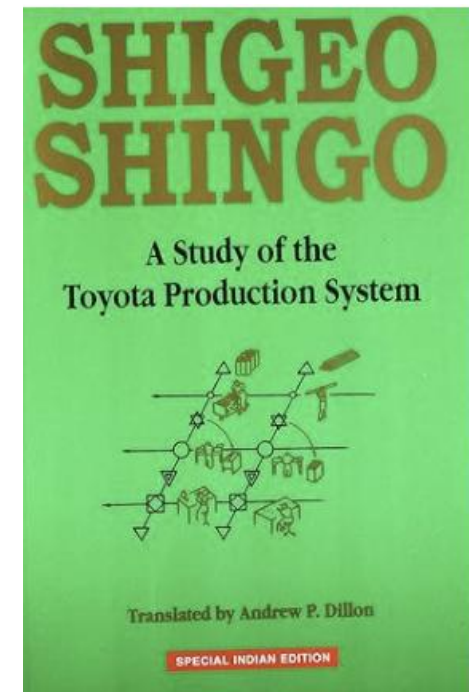
# The Toyota House

**The Toyota House** is a graphical representation of the Toyota Production System (TPS), illustrating its key principles, elements, and interconnections. The structure of the house symbolizes the stability that TPS brings to production processes and the organization.

**Ohno, T. (2019). Toyota production system: beyond large-scale production.** Productivity press.



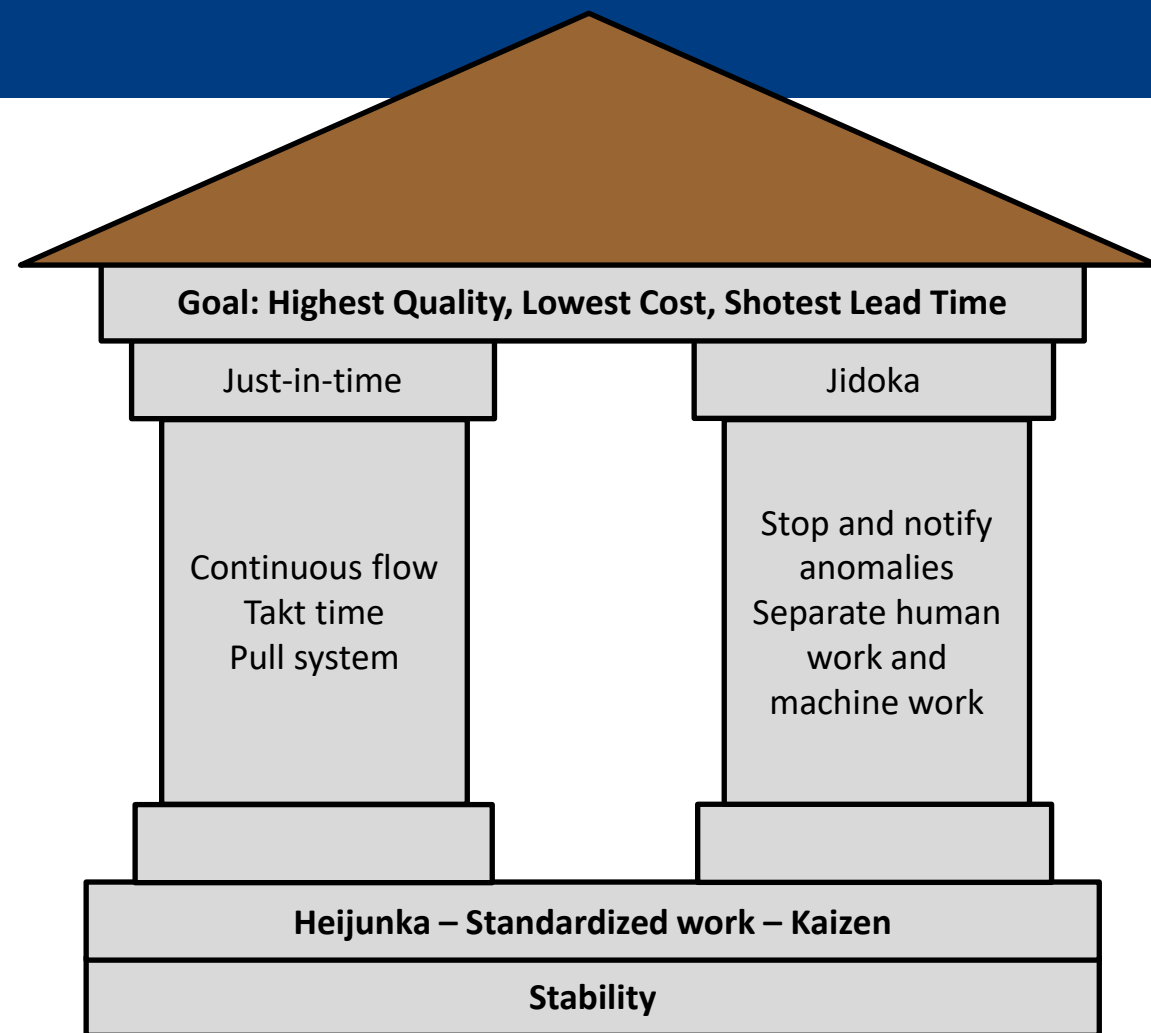
**Dillon, A. P. (2019). A study of the Toyota production system: From an Industrial Engineering Viewpoint.** Routledge.



# Elements of the Toyota House

## Foundation – The base of the system

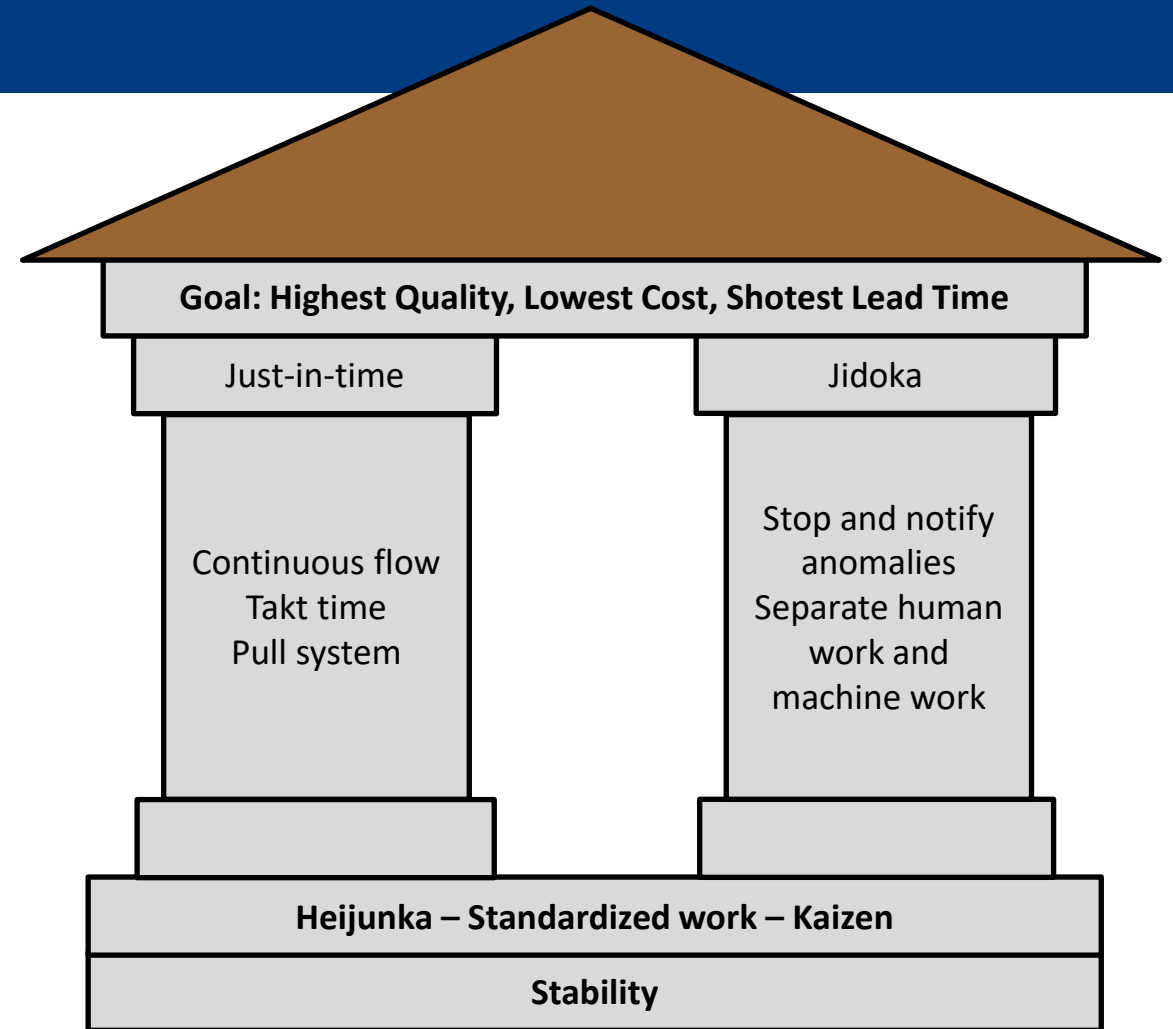
- **Stable processes** – The foundation of TPS relies on the stability of production processes, including standardized work, machine reliability, and quality management.
- **Philosophy of continuous improvement (Kaizen)** – The base emphasizes commitment to ongoing improvement and waste elimination.
- **Heijunka** – Production leveling to minimize overproduction and overburden.
- **Standardized work** – Establishing and following operational standards to ensure consistency and quality.



# Elements of the Toyota House

## Pillars of the house

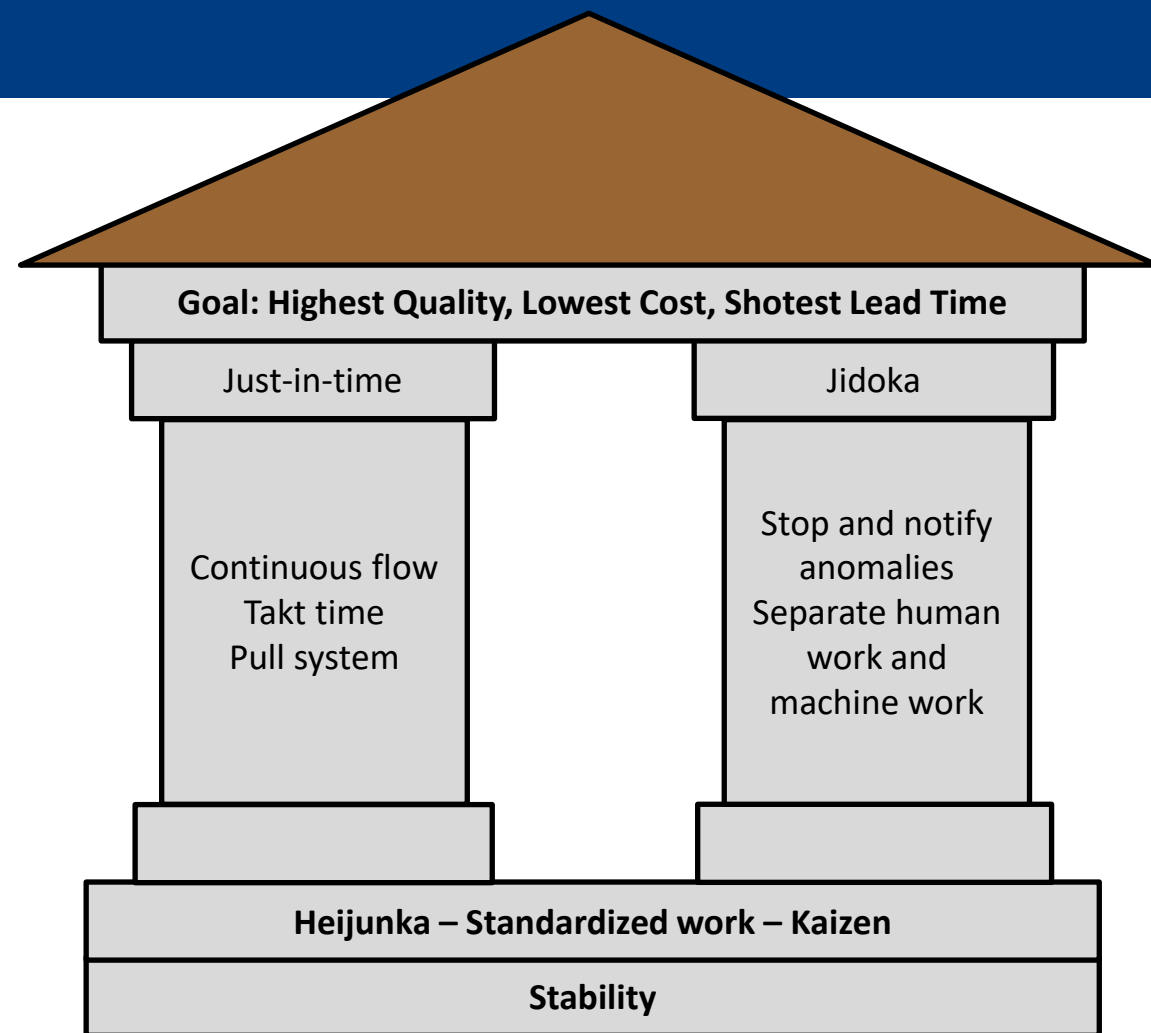
- **Just-In-Time (JIT):**
  - Production and deliveries occur exactly when and in the quantities needed, avoiding overproduction and excess inventory.
  - Key tools: pull systems, production scheduling, and material flow.
- **Jidoka (Automation with a human touch):**
  - Stopping the process when a problem is detected to prevent the production of defective products.
  - Building quality into the process through automatic error detection and correction.



# Elements of the Toyota House

## Roof – The goal of the system

- **Quality** – Ensuring high-quality products that meet customer expectations.
- **Cost** – Minimizing costs through waste elimination.
- **Time** – Reducing lead times.



# Toyota's philosophy and values

**Respect for people** is a key pillar of Toyota's philosophy, based on the belief that employees are the most valuable resource of the organization. It involves building relationships founded on mutual trust, collaboration, and support. Toyota invests in employee development by providing training, growth opportunities, and engagement in continuous improvement processes (Kaizen). Respect also includes creating safe working conditions and giving employees the space to share their ideas. This approach fosters innovation, productivity, and the long-term success of the organization.

Toyota prioritises **talent development** by actively investing in its employees. The company provides extensive training programmes and continuous learning opportunities to enhance skills and knowledge. This approach empowers employees to take ownership of their roles and contribute effectively to organisational goals. Toyota fosters a culture of growth, encouraging workers to identify and solve problems, participate in decision-making, and innovate. By focusing on employee development, Toyota builds a motivated workforce committed to excellence and aligned with the principles of continuous improvement and teamwork.



# Toyota's philosophy and values

Toyota emphasises **collaboration** by building relationships with suppliers and customers based on mutual respect and long-term commitment. The company fosters trust and transparency, ensuring open communication and shared goals. By working closely with partners, Toyota creates a cooperative environment where challenges are addressed collectively, and solutions benefit all parties. This approach strengthens supply chain efficiency, enhances customer satisfaction, and supports sustainable growth. Collaboration is a cornerstone of Toyota's philosophy, enabling innovation and continuous improvement across its network.

Toyota focuses on error prevention through **Jidoka** (autonomation), a principle that ensures problems are detected and addressed at the earliest possible stage. By empowering machines and employees to identify abnormalities during production, defects are prevented from advancing through the process. This approach minimises waste, reduces rework, and ensures higher quality outcomes. Jidoka fosters a culture of accountability and continuous improvement, enabling workers to take corrective actions promptly and ensuring a smoother, more reliable production flow.



## Toyota's philosophy and values

Toyota places a strong emphasis on **prioritising quality** by adhering to the highest production standards. This focus ensures that products meet or exceed customer expectations while minimising the need for rework or corrections. By integrating quality into every stage of the manufacturing process, Toyota reduces waste and enhances efficiency. This commitment to excellence not only improves product reliability but also builds trust and satisfaction among customers, aligning with the company's philosophy of continuous improvement and value creation.

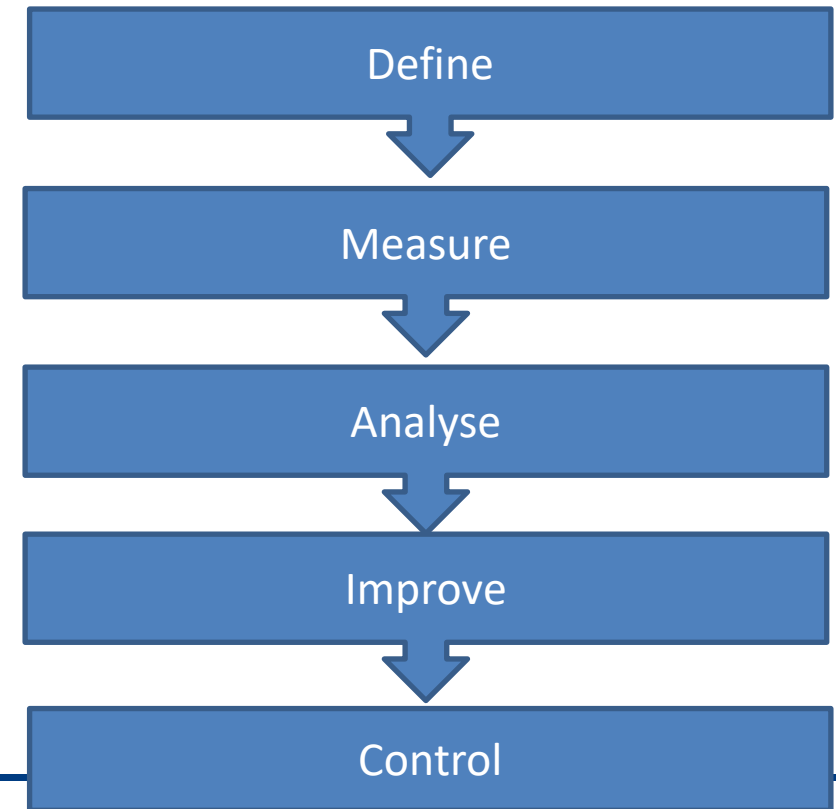
Toyota Production System (TPS) emphasises making **strategic decisions** that prioritise long-term benefits over short-term gains. This approach focuses on sustainability, continuous improvement, and building resilience within the organisation. By aligning decisions with core values, such as quality and efficiency, Toyota ensures lasting success and competitiveness. This philosophy fosters innovation, strengthens relationships with stakeholders, and supports organisational growth, while avoiding the pitfalls of short-term thinking. Long-term decision-making is integral to TPS, guiding the company toward enduring value creation.

# Systems inspired by TPS

The Toyota Production System (TPS) not only inspired the creation of **Lean Manufacturing** but also led to the development of numerous other management systems and methodologies that draw from its principles and tools, adapting them to various industries and contexts.

## Lean Six Sigma

- **Description:** A combination of Lean philosophy (minimising waste) and Six Sigma methodology (reducing variability and defects).
- **Features:** Focuses on process excellence through statistical data analysis and improvements in both production and service processes.



## Agile Manufacturing

- **Description:** An adaptation of TPS principles for environments where flexibility and rapid response to changing market demands are critical.
- **Features:** Emphasises dynamic management, flexible planning, and tailoring processes to meet customer needs.

## Difference Between Agile Manufacturing and Lean Manufacturing

- **Lean Manufacturing** focuses on eliminating waste and streamlining processes for efficiency.
- **Agile Manufacturing** prioritises flexibility and the ability to respond to dynamic market demands.

## Lean Service

- **Description:** The adaptation of TPS principles to service industries such as banking, logistics, and healthcare.
- **Features:** Focuses on reducing service lead times, improving service quality, and eliminating waste in service processes.

## Lean Office

- **Description:** The application of TPS principles to office and administrative environments.
- **Features:** Aims to reduce redundant processes, optimise information flow, eliminate errors, and enhance office work efficiency.

1. What forms the foundation of the Toyota Production System (TPS)?

- a) Heijunka and Jidoka.
- b) Cost minimization through inventory reduction.
- c) Stable processes, Kaizen, and standardized work.

2. What do the pillars in the Toyota House symbolize?

- a) Just-In-Time (JIT) and Jidoka (automation with a human touch).
- b) Respect for people and employee development.
- c) Long-term decision-making and waste elimination.

3. Which of the following goals is located on the "roof" of the Toyota House?

- a) Employee talent development.
- b) Quality, time, and cost minimization.
- c) Optimization of inventory and transportation.

4. What approach characterizes the philosophy of Jidoka?

- a) Automatic detection and correction of problems during the production process.
- b) Producing components just in time and in the required quantities.
- c) Building long-term relationships with suppliers.

6. How does Toyota support the development of its employees?

- a) By organizing daily performance reports.
- b) By investing in training, continuous learning, and engaging employees in improvement processes.
- c) By fully automating their responsibilities.

5. What distinguishes Agile Manufacturing from Lean Manufacturing?

- a) Lean Manufacturing focuses on waste elimination, while Agile Manufacturing prioritizes flexibility and rapid response to market changes.
- b) Agile Manufacturing eliminates waste, while Lean Manufacturing focuses on quality.
- c) Lean Manufacturing applies exclusively to services, while Agile applies to production.

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**Thank you for your attention.**

Dorota Stadnicka



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<https://tet-erasmus.eu/>