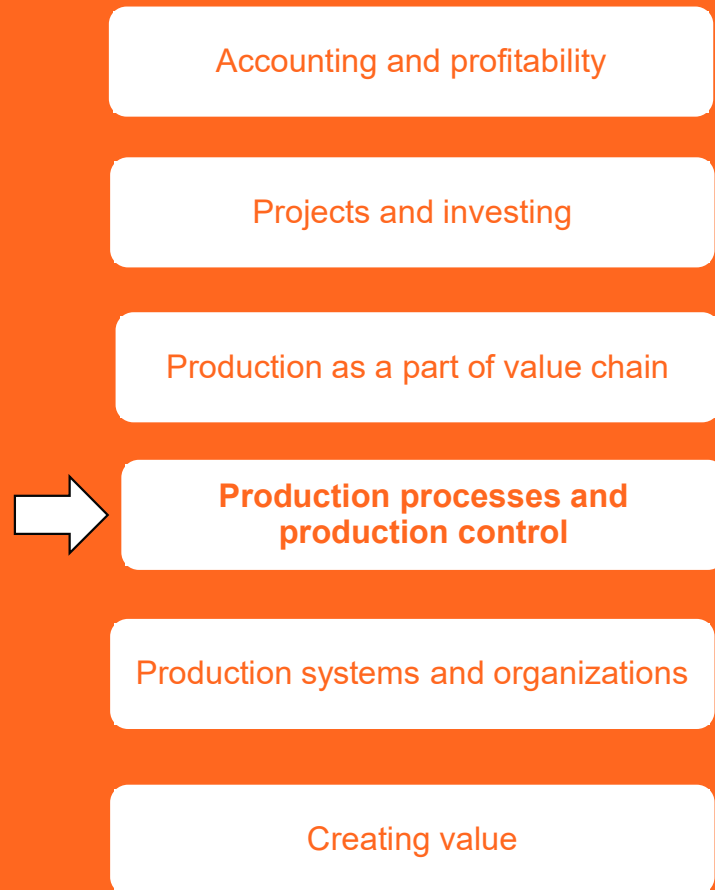


Production processes and production control

Case-examples



In this exercise:

- Toyota production system
- Virginia Mason Production System
 - Reduction of waste
 - Workstation layout
 - Benefits of reducing waste

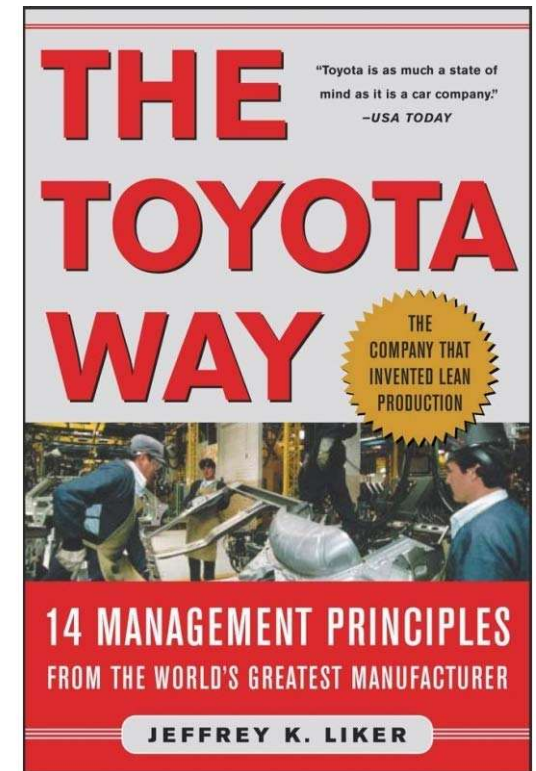


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In this exercise:

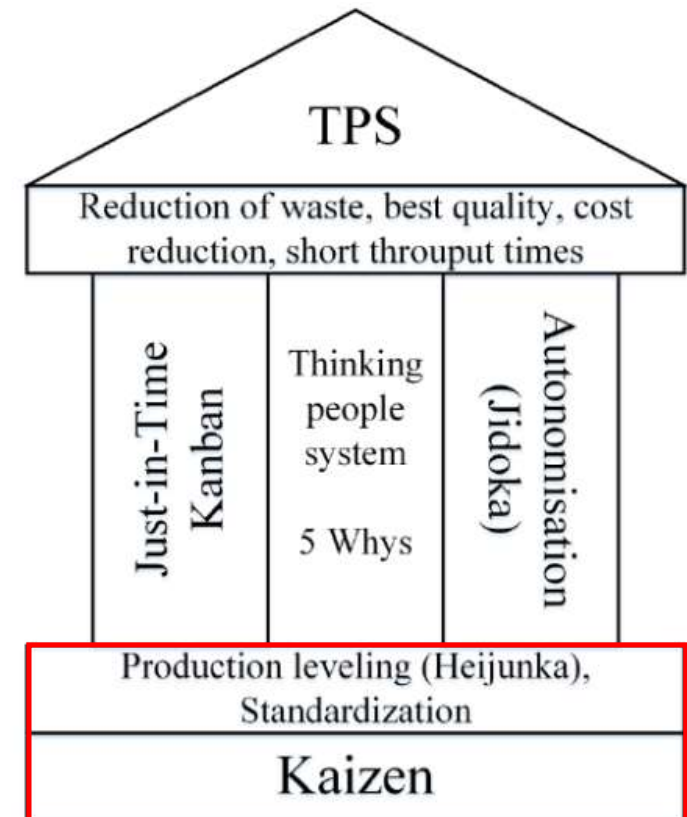
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Toyota Production System (TPS): Production system without waste



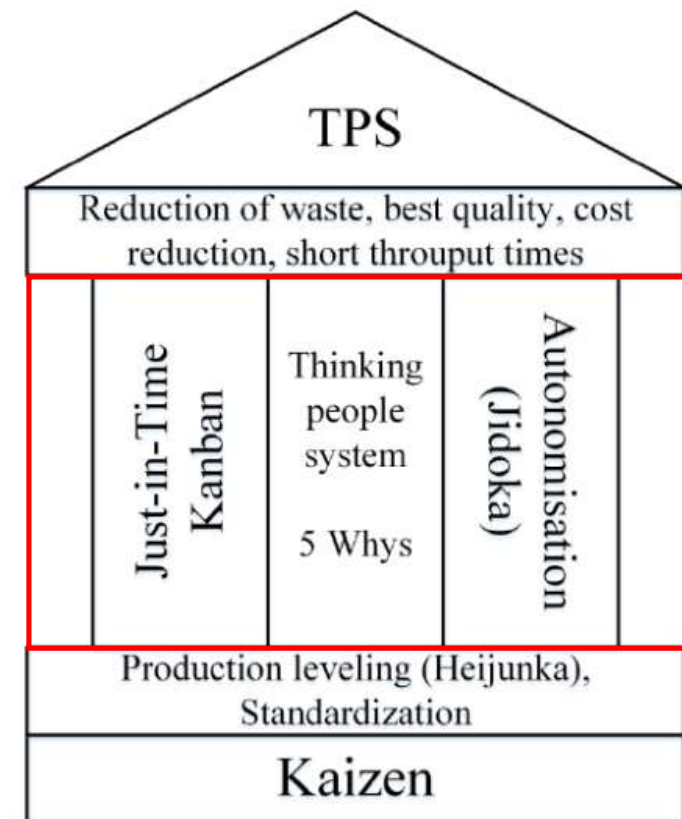
Founding principles

- **Production leveling (Heijunka)**
 - Production of intermediate products and procurement are executed in specific time intervals and same sized batches
- **Standardization**
 - Production system phases are performed the same way
 - Instructions how to perform phases are documented
- **Kaizen**
 - Continuous improvement which aims to improve the quality and efficiency of the production system



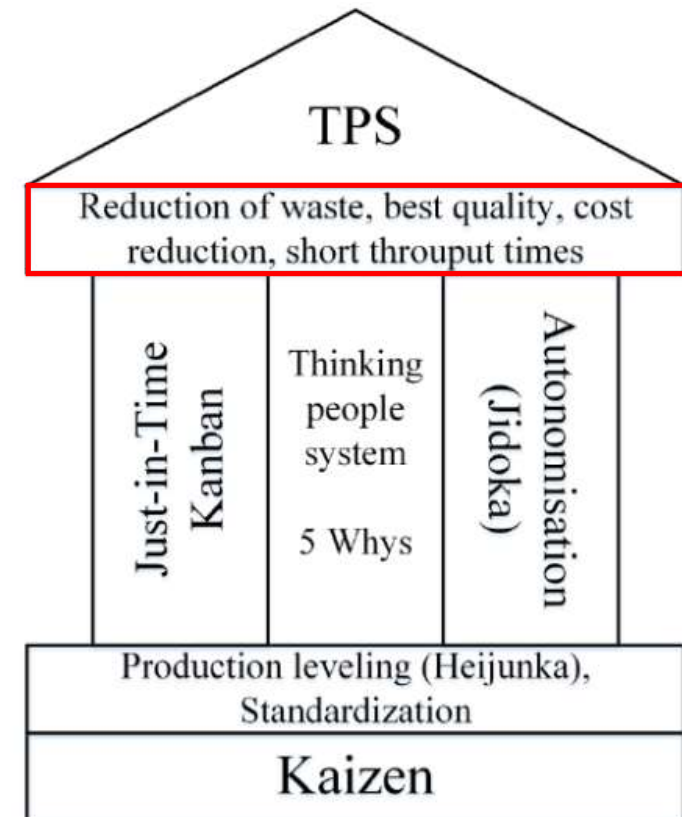
Methods

- **Just-in-time (JIT)**
 - Raw materials are always available when needed, without unnecessary storing
- **Kanban**
 - Demand in the system's downstream starts production in the system's upstream
- **Autonomisation (Jidoka)**
 - When a problem occurs in the production system, the production is stopped and the cause of the problem is sought
- **Thinking people system**
 - Every employee is responsible for pointing out faults in the production system
- **5 Whys**
 - When problems arise the root cause of the problem is sought by asking 'why the problem occurred?' multiple times



Goals

- **TPS aims to minimize waste, and by this reduce costs and throughput time, and improve quality**
- **Seven types of waste**
 1. Overproduction
 2. Waiting
 3. Transportation
 4. Processing
 5. Inventory
 6. Motion
 7. Defective products





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Virginia Mason Production System



Virginia Mason Production System

- **Virginia Mason** is a private hospital located in Seattle Washington
- **Problems the hospital faced:**
 - Poor service quality and safety
 - Waste in service production
 - Kustannusten kasvun aiheuttamat taloudelliset ongelmat
- **Traditional methods for pinpointing and fixing problems**
 - Simple quality management methods
 - Educated staff
- **The traditional methods were not effective enough**
 - The methods did not include the whole organization

In this exercise:

- Toyota production system
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Reduction of waste

- Hospital's staff visited production facilities in Japan
- **As a result new production system was created**
 - Virginia Mason Production System (VMPS)
- **Goal of VMPS was to improve service quality by minimizing waste**

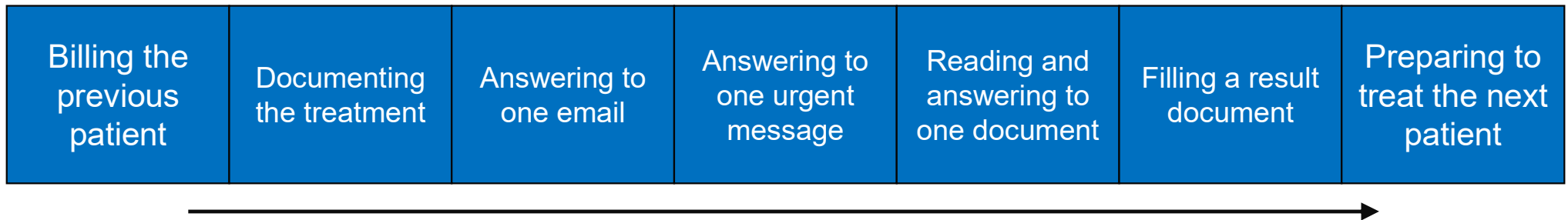


In this exercise:

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Workstation layout

- VMPS streamlined the work routine of physicians
- U-shaped workstations were placed in front of physician's offices
 - Stations had predefined tasks that were completed in sequence
- The U-shaped 'production line type' layout increased the production capacity by 10 %



In this exercise:

- Toyota production system
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Benefits of reducing waste

- The hospital pinpointed the source tasks of waste
- Pinpointing the procedures allowed Virginia Mason to reduce waste and improve service quality

Type		Source
Over-production	=	Over-documenting
Transportation	=	Patient transportation
Over-processing	=	Billing process
Inventory	=	Medicine and supplies
Motion	=	Accessing documents
Defective service	=	Staff accountability
Waiting	=	Large machinery

Benefits of reducing waste

- 11-million-dollar savings in investments
- Over one-million-dollar savings in inventory costs
- The overall daily walking distance of staff reduced by 97 kilometers (60 miles)
- Half a million dollars saved in labor costs in one year

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