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LOGISTICS - STORES PART 2

The aim of the lecture is to discuss performance of stock operations and handling technology

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lecturer

**Logistics
-
Stores
Part 2**

Structure of the
lecture

**Measurement and evaluation of
stock operation productivity
Information support of storage
Financial aspects of storage
Materials handling equipment**



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MEASUREMENT AND EVALUATION OF STOCK OPERATION PRODUCTIVITY

- productivity - workload - performance
- "You cannot control what is not measured,,
- most important measurement areas:
 - CS
 - data accuracy
 - capacity utilization
 - labour productivity



Syndromes of inefficient storage function

- excessive handling
- low utilization of store area and space
- excessive maintenance costs and outages due to obsolete equipment
- outdated ways of receiving and dispatching goods
- obsolete methods of computer processing of routine transactions



Financial aspects of storage

- storage = risk
- need to track costs by activity
- problem of lack of financial data
- small production series = low stock volume vs. costs of frequent reset of the production line
- economies of scale = larger stocks and increased storage requirements



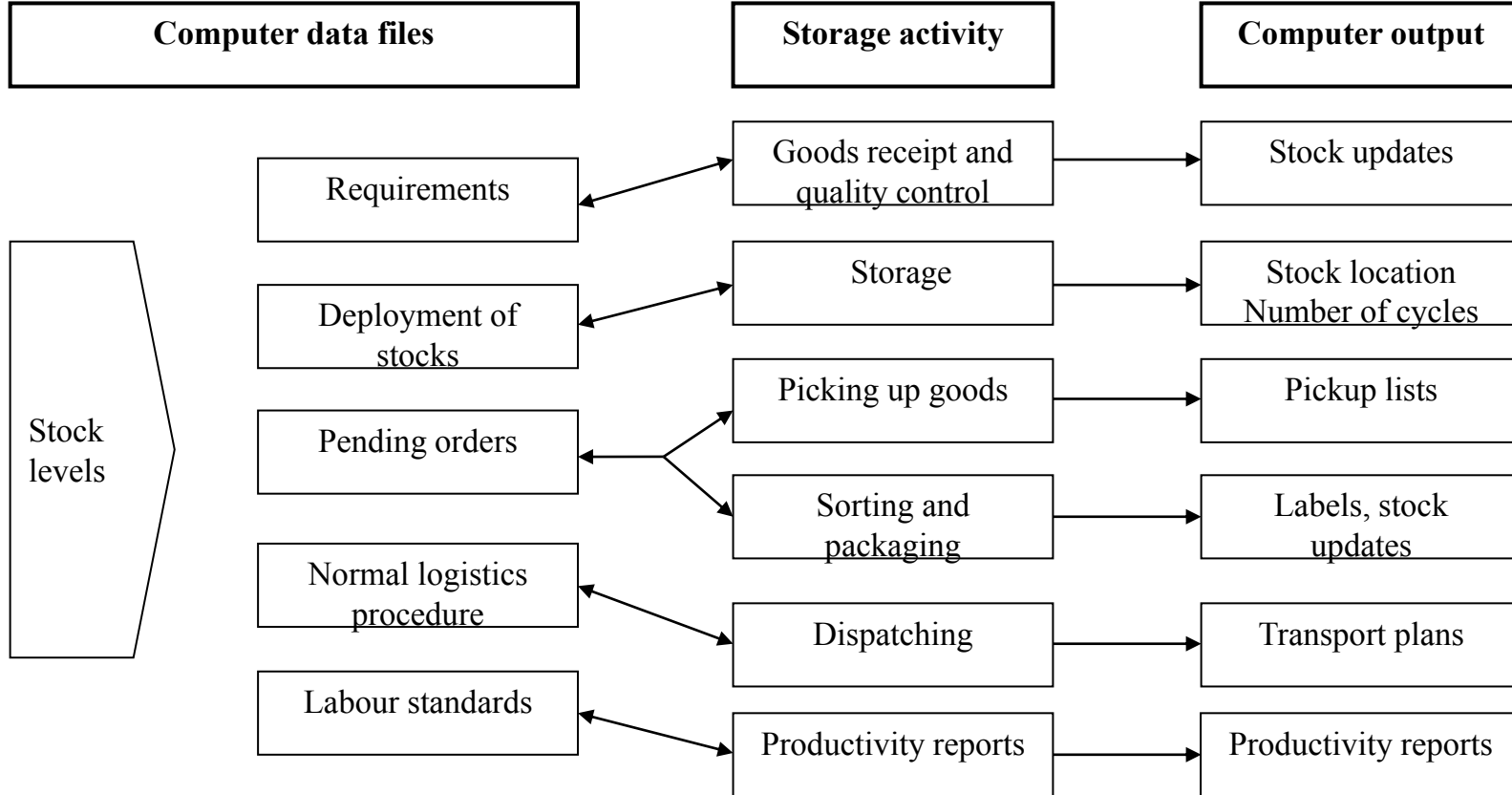
Productivity improvement programs

- Method-based programs
- Technology-based programs
- System-oriented programs
- Programs based on motivation / training



Transmission of information on stored materials and products

- along with moving and storing products
- need for up-to-date information
- importance of IT in all storage functions
- introduction of IT has significant benefits





MATERIALS HANDLING EQUIPMENT

- supporting elements of storage
- one of the major capital investments
- classification by the function:
 - storage
 - picking up goods
 - transport and sorting
 - dispatching of goods



Manual systems

- high degree of flexibility - using the most flexible handling system – people
- people = errors
- less investment intensive



Equipment for storage and picking up of goods

- racks
- shelf systems
- pull-out shelf systems
- mechanical equipment with operator (e.g. fork-lift trucks)

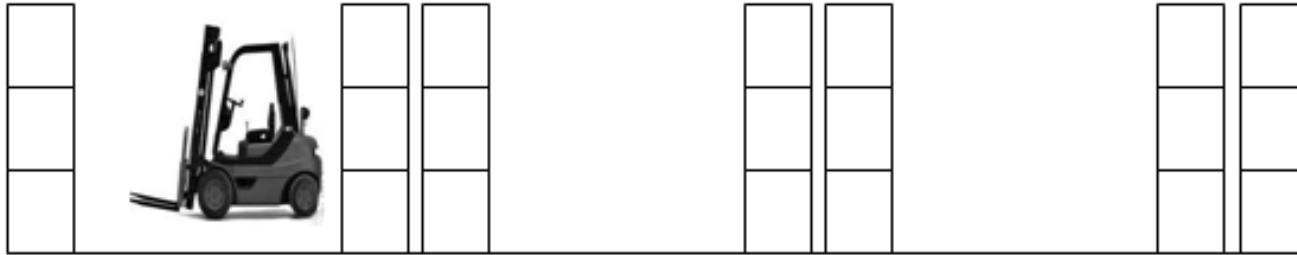


Equipment	Type of material	Benefits	More information
Classic pallet racks	Goods on pallets	Good stocking density, good security of goods	Storage density can be increased by placing two pallets in a row
Entrance pallet racks	Goods on pallets	Fork-lift trucks can be used, good storage density	Lift trucks can only be accessed from one direction
Passage pallet racks	Goods on pallets	Fork-lift trucks can be used, good storage density	Lift trucks can be accessed from both sides
High-rise rack stackers	Goods on pallets	Very high storage density	Used in combination with an automated storage and retrieval system
Cantilever racks	Goods of long length or in rolls	Suitable for storing goods with problematic shape (exhausts,...)	Each item can be stored in a separate rack

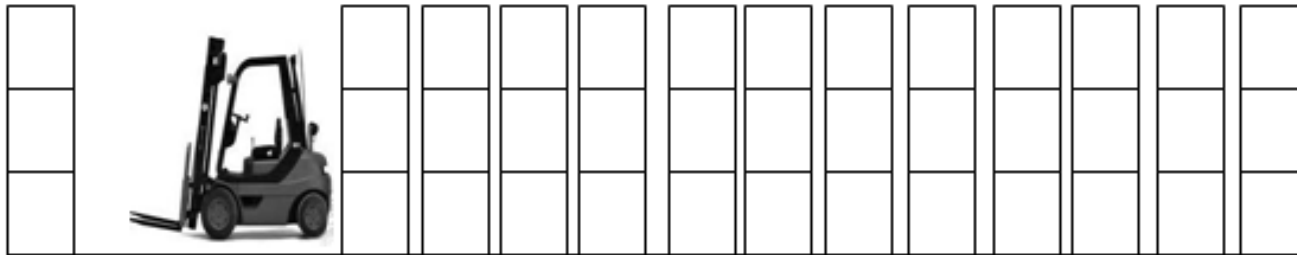


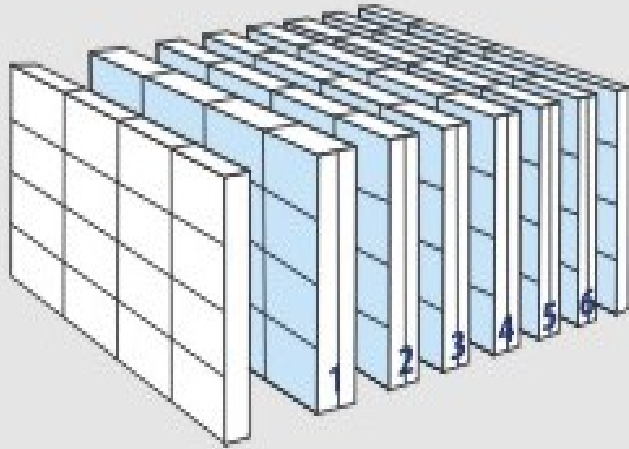
Pallet stacking structures	Special shapes or breakable parts	Unstackable products can also be stacked	They can be disassembled
Stacking racks	Special shapes or breakable parts	Unstackable products can also be stacked	They can be folded and stacked
Gravity racks	Individually packaged products / boxes	High storage density, goods are shifting by gravity	Material flow in the FIFO or LIFO system
Shelf systems	Individually packaged products / boxes	Low cost	Can be combined with pull-out shelf for greater flexibility
Pull-out shelf systems	Small parts and tools	All parts are easy to access, good goods security	The system can be divided into many types of stock items
Sliding rack or shelf systems	Goods on pallets, bulk materials, boxes	It can reduce the required storage area by up to half	Comes equipped with safety equipment

Stationary rack system

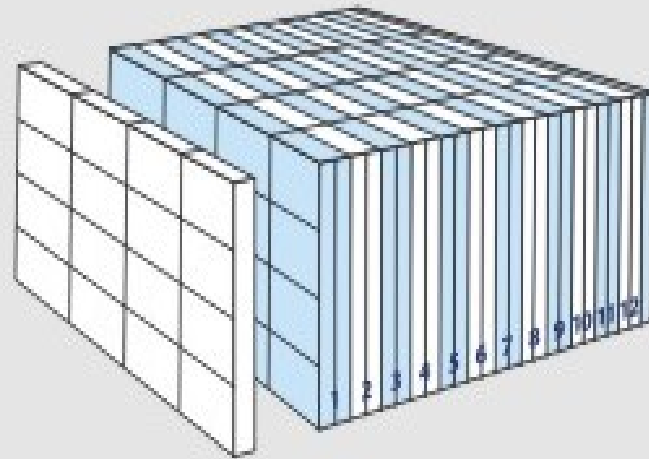


Sliding (mobile) rack system





kapacita skladu: **672 palet**



kapacita skladu: **1248 palet**



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Equipment for transport and sorting

- motor or non-motorized equipment (fork-lifts, platform trucks, cranes, various hand trucks)
- manual sorting of items:
 - consolidation and deconsolidation of items based on specific customer orders
 - physical inspection and loading on a pallet or in a box / container intended for a specific consignment
 - time-consuming process subject to human error
 - efforts to minimizing



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Dispatching of goods

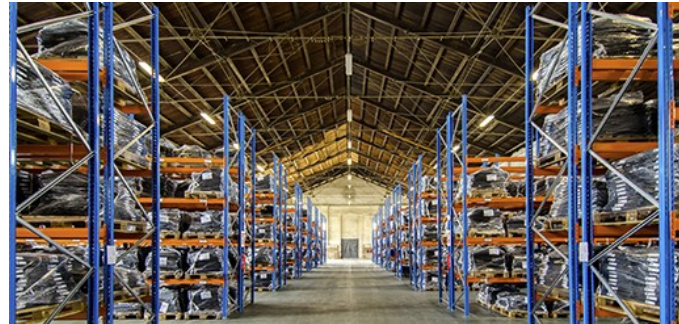
- preparing goods for shipment
- loading of goods into means of transport - equipment for handling output and input means of transport
- motor or non-motorized equipment described above + pallets, palletisers or various packaging equipment



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Automated systems

- types:
 - systems of automatic storage and search of goods (AS / RS)
 - rotary containers (carousels)
 - equipment for picking up boxes or items
 - belt conveyors
 - robots and scanning systems
- common part of modern storage facilities
- can be divided into the same categories as manual devices

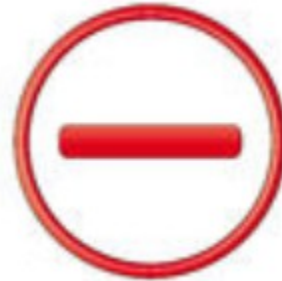


- **benefits:**
 - increase in the productivity of the process of order processing
 - decrease in product damage
 - improving the level of accuracy of stock information
 - improving customer service
 - less need for staff





- shortcomings:
 - initial capital costs
 - outages or unreliability due to equipment interruption or maintenance
 - SW related problems
 - capacity problems





- lack of flexibility to respond to the environmental change
- high maintenance costs
- user interfaces and user training
- adoption of the system by workers
- obsolescence

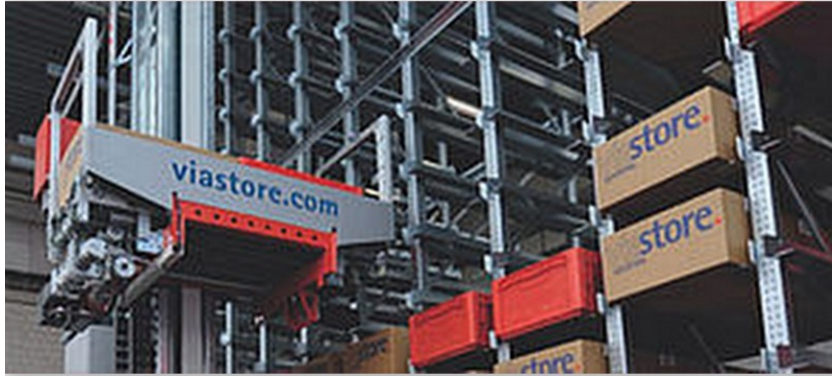




Equipment	Type of material	Benefits	More information
Systems of automatic storage and search of goods (AS / RS)	Palletized goods, wide selection of sizes and shapes	Very high storage density, computer control	
Automatically guided vehicles (AGV systems)	Palletized goods and other compact loading units	Very high storage density	In warehouses and production
Minisystem AS/RS	Small parts	Very high storage density, computer control	Multiple configurations can be installed to increase flexibility
Horizontal carousels	Small parts	Easy access to goods, relatively inexpensive system	Can be stacked more on top of each other



Vertical carousels	Small parts and tools	High storage density	In multi-storeyed equipment it can perform a dual function - storage and delivery
Human-controlled machines	Small parts	Very flexible	Can be used on high shelf systems or modular pull-out shelf systems



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Summary of the lecture



You can:

- Explain the reasons for measuring and evaluation of the productivity of storage operations
- Briefly characterize the information security of storage operations
- Describe manual systems for handling
- Characterize automated handling equipment