



VLAAMS INSTITUUT VOOR DE LOGISTIEK  
FLANDERS INSTITUTE FOR LOGISTICS

# From RFID to Intelligent Supply Chains

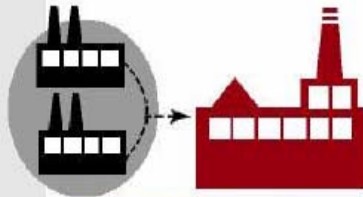
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By 2008, P&G will have shortened the end-to-end replenishment cycle for a box of Tide from four months to one day. Here's how:



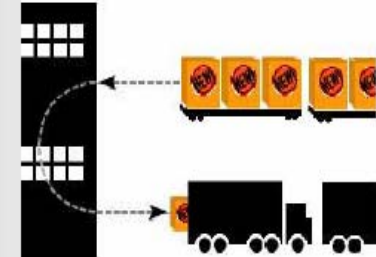
**1** It's 2008, and P&G has replaced its numerous specialized plants with a few "flexi-plants" – highly versatile facilities with quick turnaround capabilities



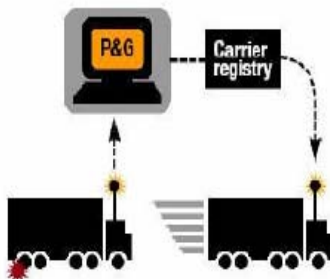
**2** Software agents of a key supplier detect a looming hurricane that threatens a Puerto Rico operation. They alert P&G's software agents and work with them to create an alternative delivery schedule so P&G's Miami plant doesn't face a material shortage.



**3** The Miami facility, like every P&G plant, bids via software agents for its next production run based on its capability to deliver its current job, its queued work orders and its just-in-time materials supply capability. Its low-cost bid to produce Tide wins.



**4** When pallets of Tide reach P&G's distribution centers, they're dynamically dispatched, with priority given to retailers whose inventories are very low.



**5** When a tire blowout threatens to delay a shipment of Tide, P&G's agents detect it and prequalify an alternative trucker, who picks up the product and delivers it to Wal-Mart just in time.



**6** Wal-Mart has replaced all of its costly warehouses with docking facilities it shares with suppliers. These docking/distribution facilities ship products like Tide to stores within hours of receiving them.



**7** Software agents collect real-time sales data on each P&G product from multiple retail stores. They aggregate it and relay it to P&G's sales and marketing for trend analysis.

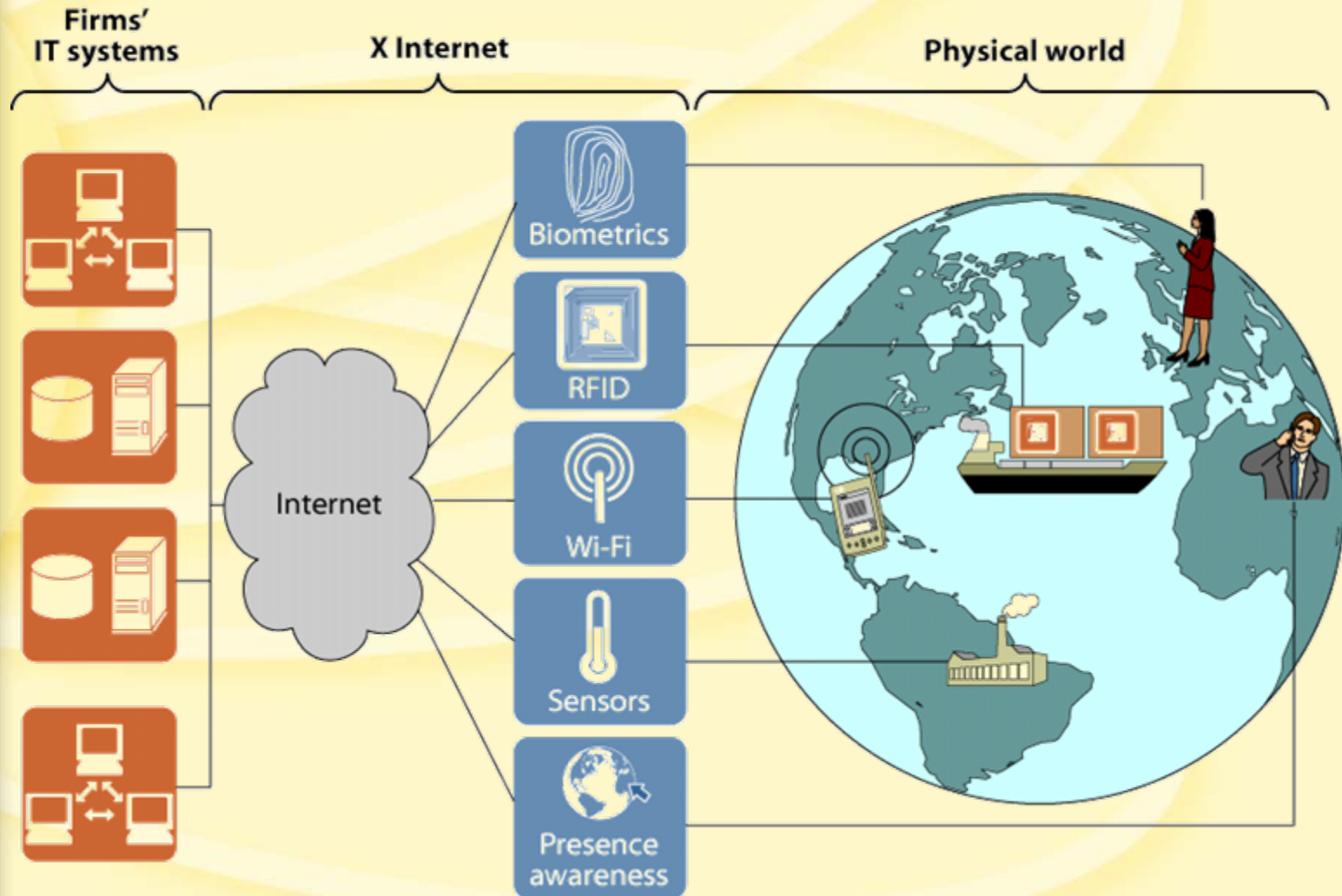


**8** Wal-Mart's smart shelves alert a stocker to immediately retrieve Tide from the back room and place it on the shelf. Tide is restocked just seconds before the last box would have been taken off the shelf.

SOURCE: FORRESTER RESEARCHING, AND PROCTER & GAMBLE CO.

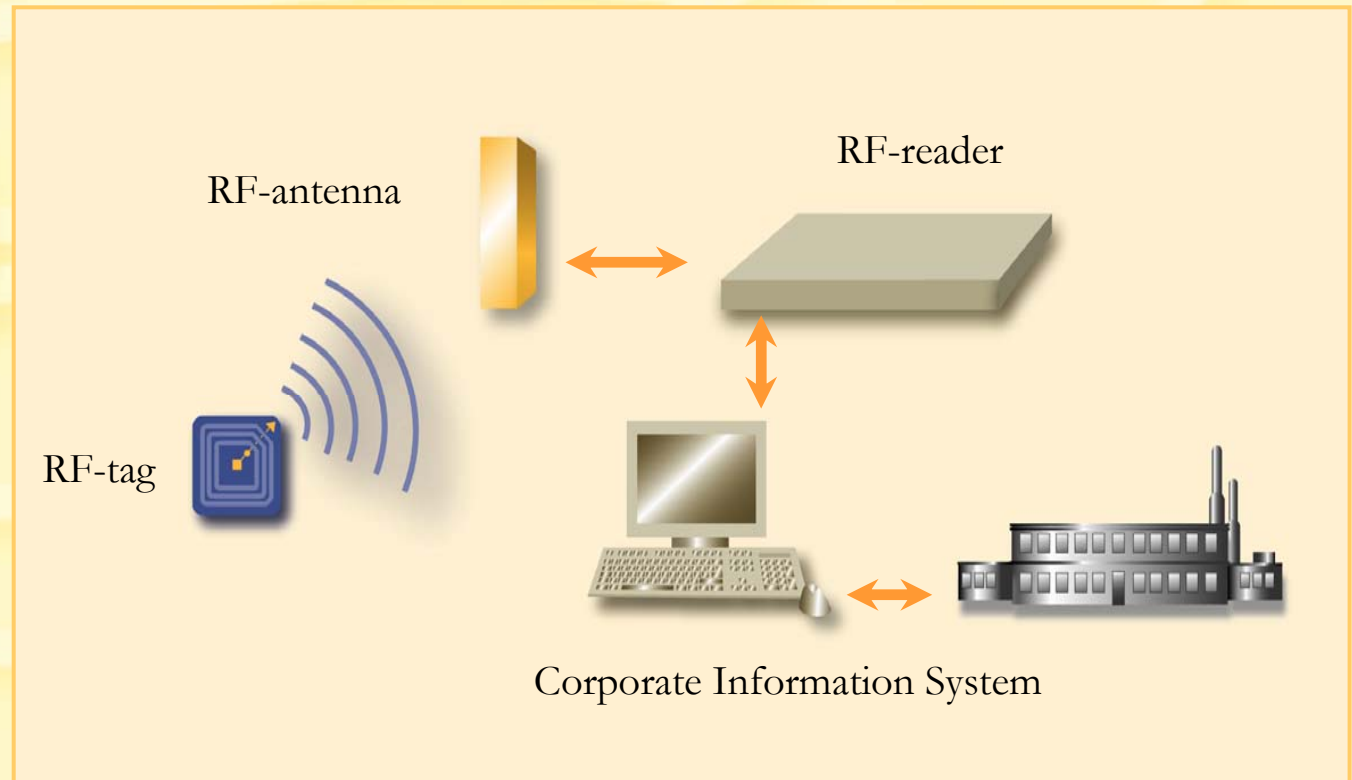
# Physical and digital world are converging

The X Internet is a set of technologies that connect firms' IT systems to physical objects

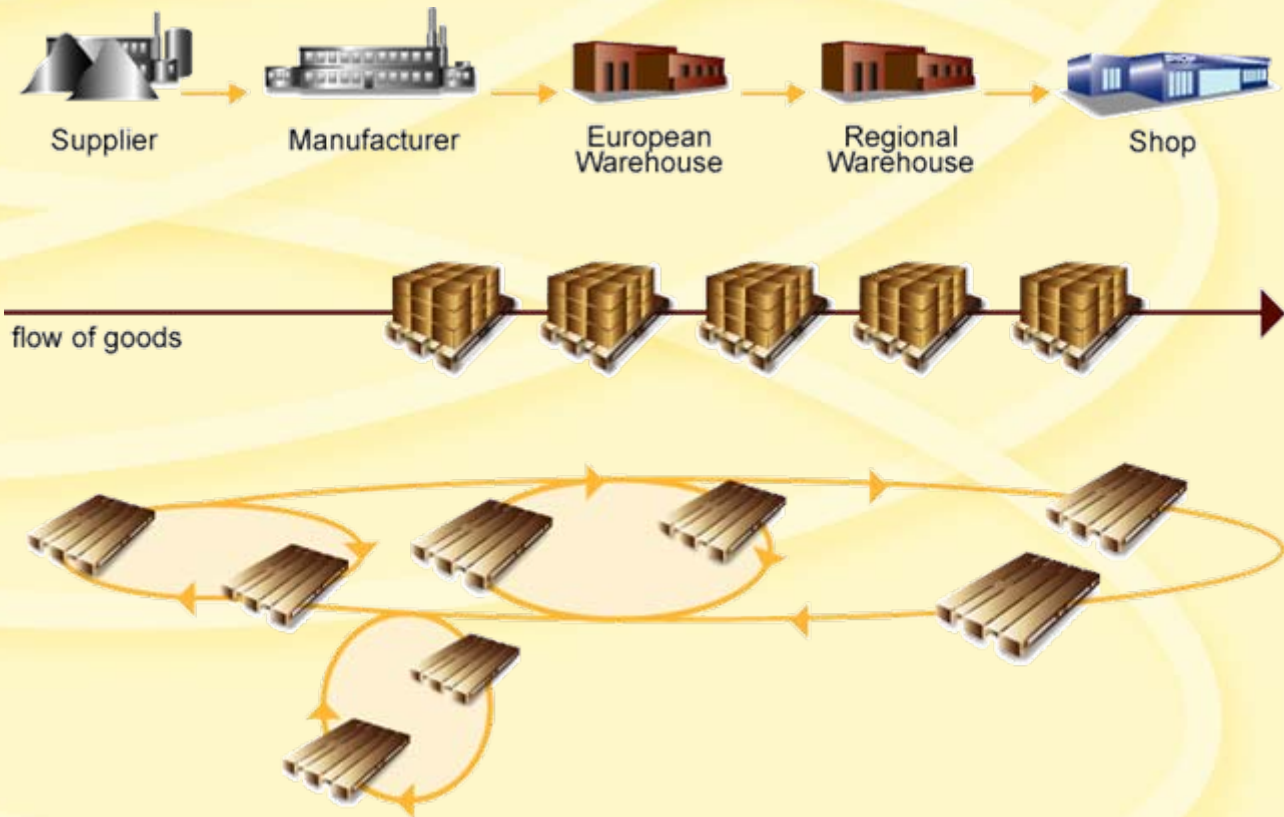


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# RFID Principle



# RFID in the supply chain



# RFID in the supply chain



# Added Value of RFID for SCM

- ▶ Cross supply chain applications
  - ▶ Inventory: visibility – forecasting – replenishment
  - ▶ Tracking & tracing
  - ▶ Security
- ▶ Warehousing and transport
  - ▶ Reception
  - ▶ Warehousing operations
  - ▶ Inventory visibility
  - ▶ Counting
  - ▶ Transit
  - ▶ Value added logistics
  - ▶ Delivery
- ▶ Other
  - ▶ Yard management
  - ▶ Asset management
  - ▶ Theft prevention
- ▶ Distribution management



# Why RFID?

- ▶ Demand-driven SCM: pull to push
- ▶ Shift of buying power downstream the supply chain
- ▶ Pressure on inventory reduction
- ▶ Better cost management
- ▶ Increased regulation and legislation (e.g. food, terrorism,...)
- ▶ Need for connectivity en transparency
- ▶ Other:
  - ▶ Me too
  - ▶ Authentication
  - ▶ Shrink



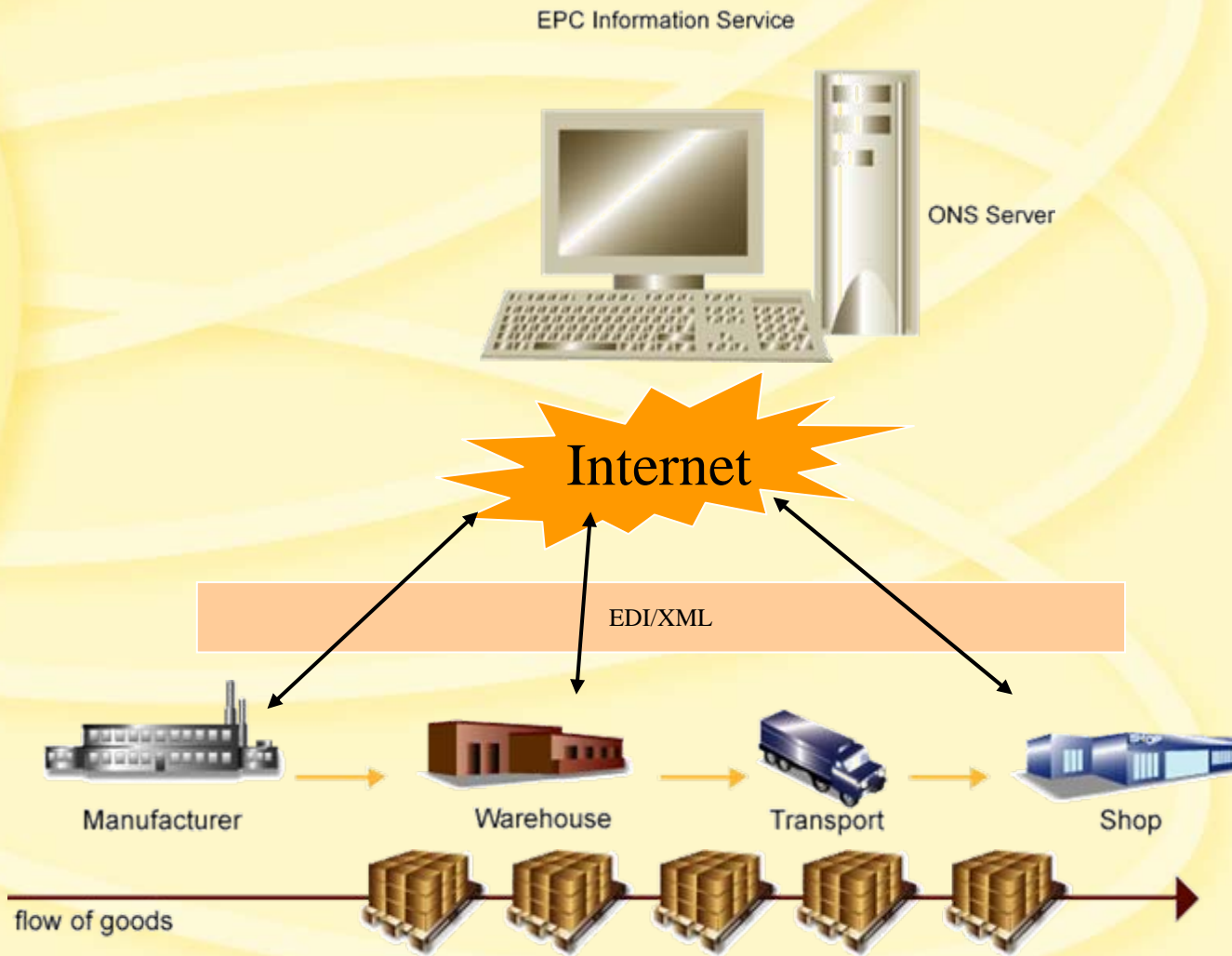


# ROI of RFID

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Increased operational profit	Increased revenue	Higher ROCE
Reduced (operational) costs	Increased market share	Less assets
Reduced cost of goods sold	Increased volume	Increased working capital
<ul style="list-style-type: none"><li>▶ reduced waste</li><li>▶ improved customer service</li><li>▶ reduced inventory costs</li><li>▶ reduced costs of warehousing, distribution and transportation</li></ul>	<ul style="list-style-type: none"><li>▶ improved inventory control at the retailer's</li><li>▶ shorter delivery times</li><li>▶ less shrink due to less theft and losses</li></ul>	<ul style="list-style-type: none"><li>▶ increased RTI rotation speed</li><li>▶ reduced RTI losses</li><li>▶ reduced safety stock</li><li>▶ reduced slow moving SKU's</li></ul>

# RFID – EPC Global

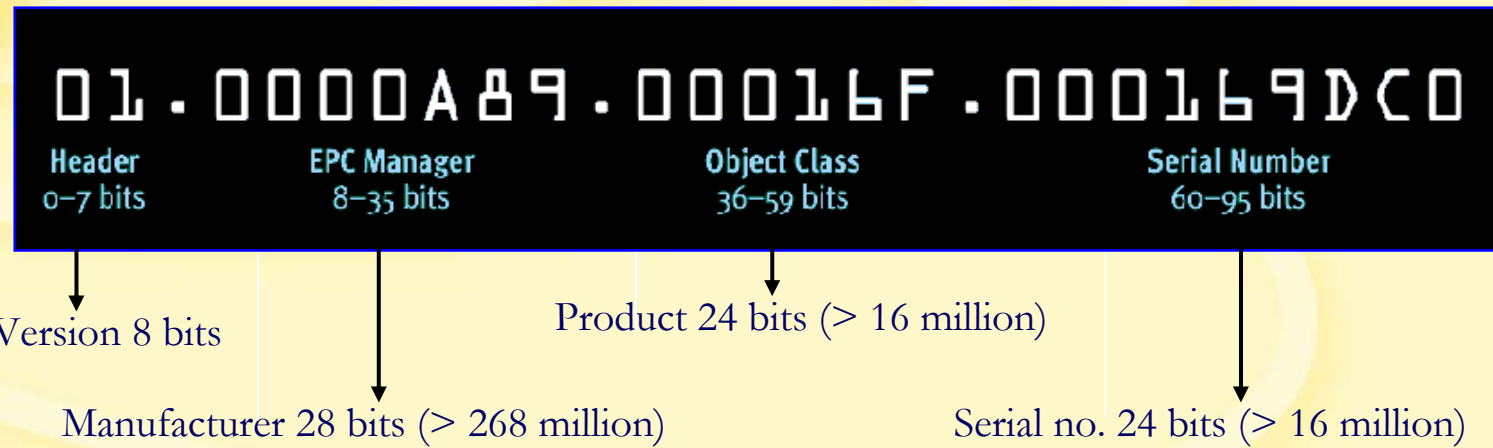


# RFID – EPC Global

- ▶ **EPC (Electronic product code)**
  - ▶ Open global standard (EPC-Global)
  - ▶ Unique key and content for a tag
  - ▶ Unique key for item information



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# RFID Evolution

2005

2008

		ITEM Tags	
	RTI Tags	CASE Tags	
	<ul style="list-style-type: none"> <li>▶ Inbound/Outbound processes</li> <li>▶ Warehousing automation</li> <li>▶ Order picking</li> <li>▶ Error reduction</li> <li>▶ Inventory management</li> <li>▶ Real time product visibility</li> <li>▶ Theft prevention</li> </ul>	<ul style="list-style-type: none"> <li>▶ Warehouse counting</li> <li>▶ Order picking</li> <li>▶ Inventory assignment</li> <li>▶ Better planning &amp; matching of supply &amp; demand</li> <li>▶ Shelf availability</li> <li>▶ POD</li> <li>▶ Traceability</li> <li>▶ Theft prevention</li> </ul>	<ul style="list-style-type: none"> <li>▶ Interaction with end consumer</li> <li>▶ Dynamic promotions</li> <li>▶ Analysis of customer behavior</li> <li>▶ Automatic counter payment</li> <li>▶ Retail applications</li> <li>▶ Link with payment</li> <li>▶ Order control on item level</li> <li>▶ New types of quality control</li> <li>▶ Product traceability</li> <li>▶ Theft prevention</li> </ul>

Potential advantages

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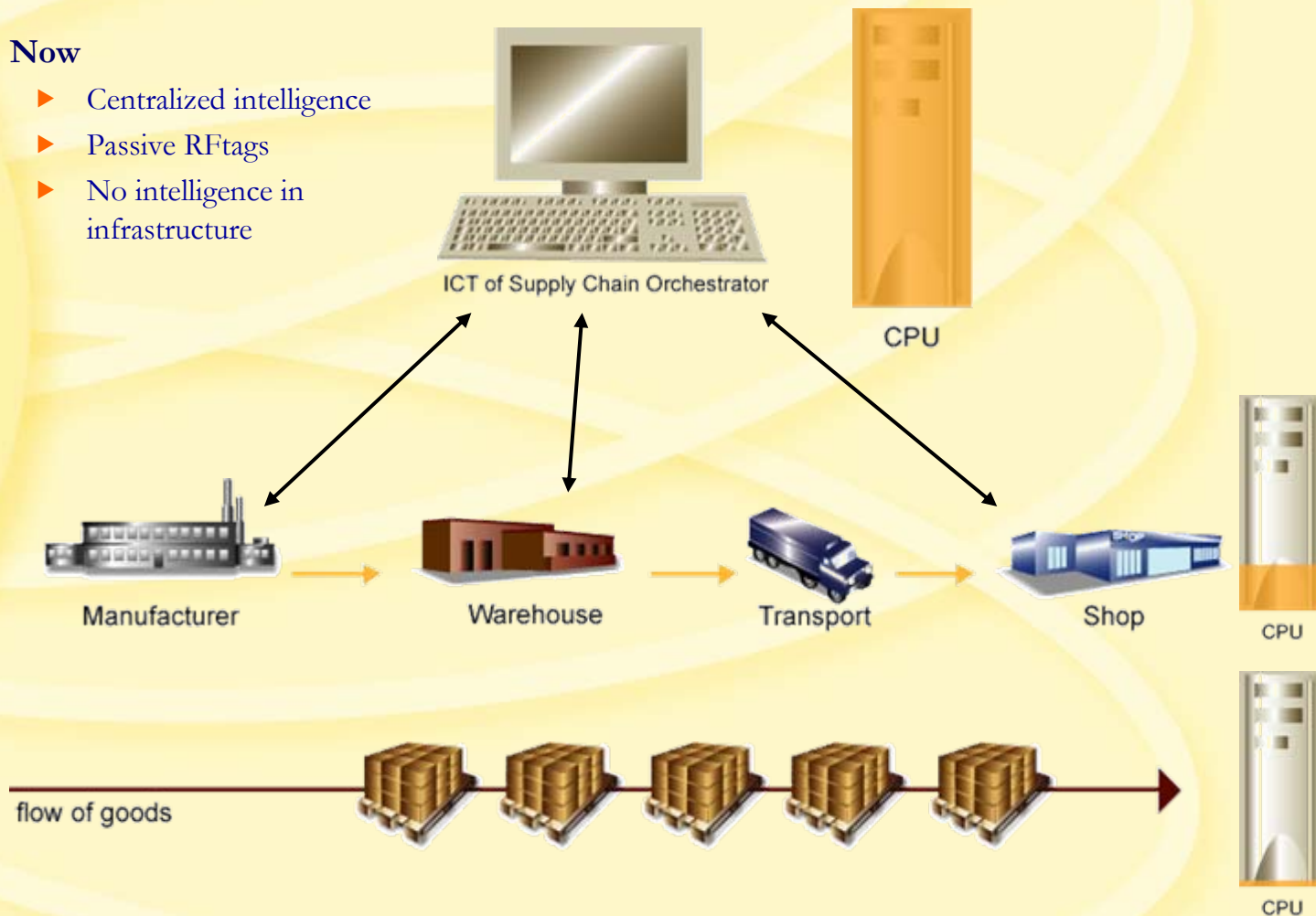


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# RFID → Intelligent Supply Chains

► **Now**

- ▶ Centralized intelligence
- ▶ Passive RFtags
- ▶ No intelligence in infrastructure

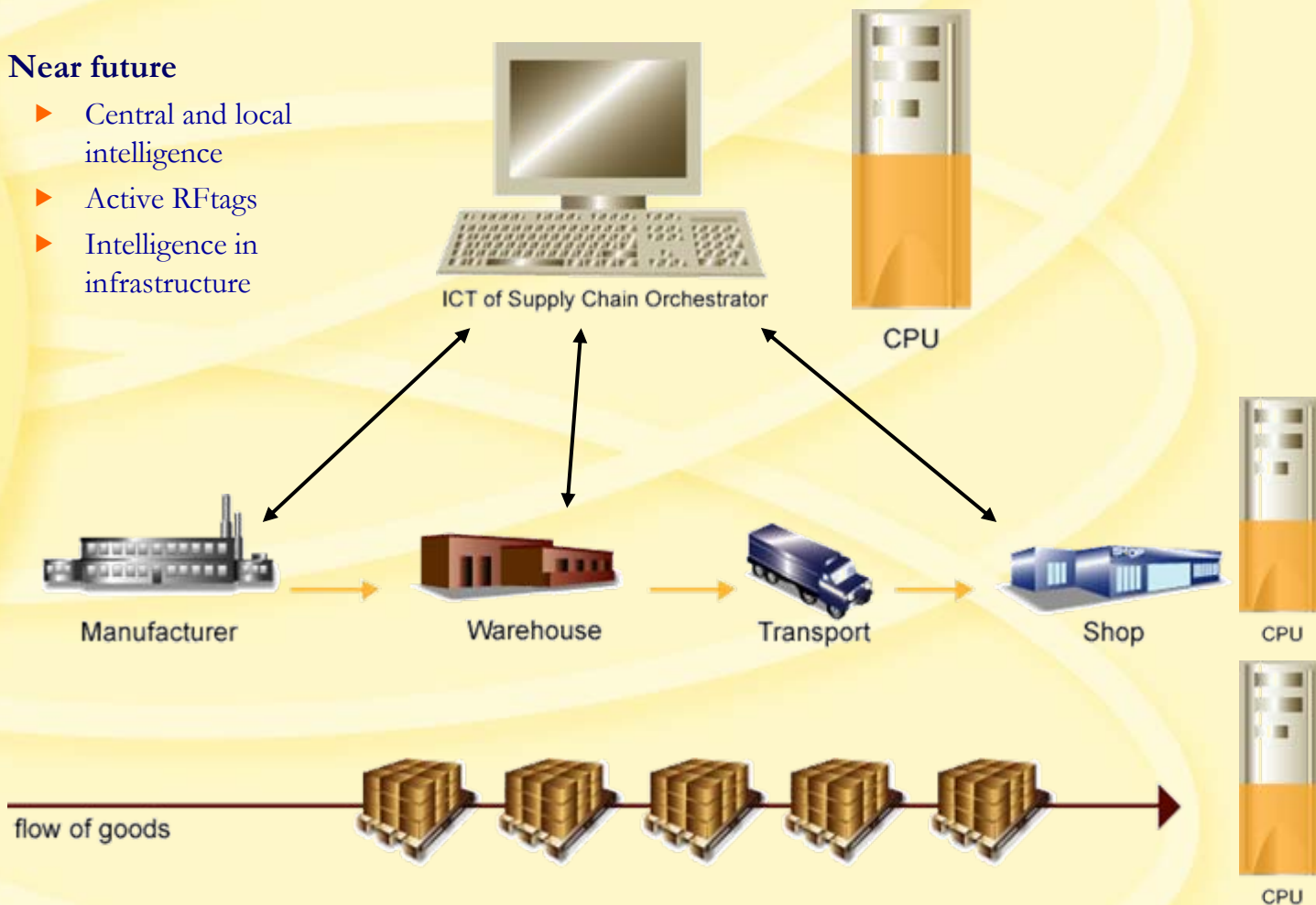


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# RFID → Intelligent Supply Chains

## ▶ Near future

- ▶ Central and local intelligence
- ▶ Active RFTags
- ▶ Intelligence in infrastructure

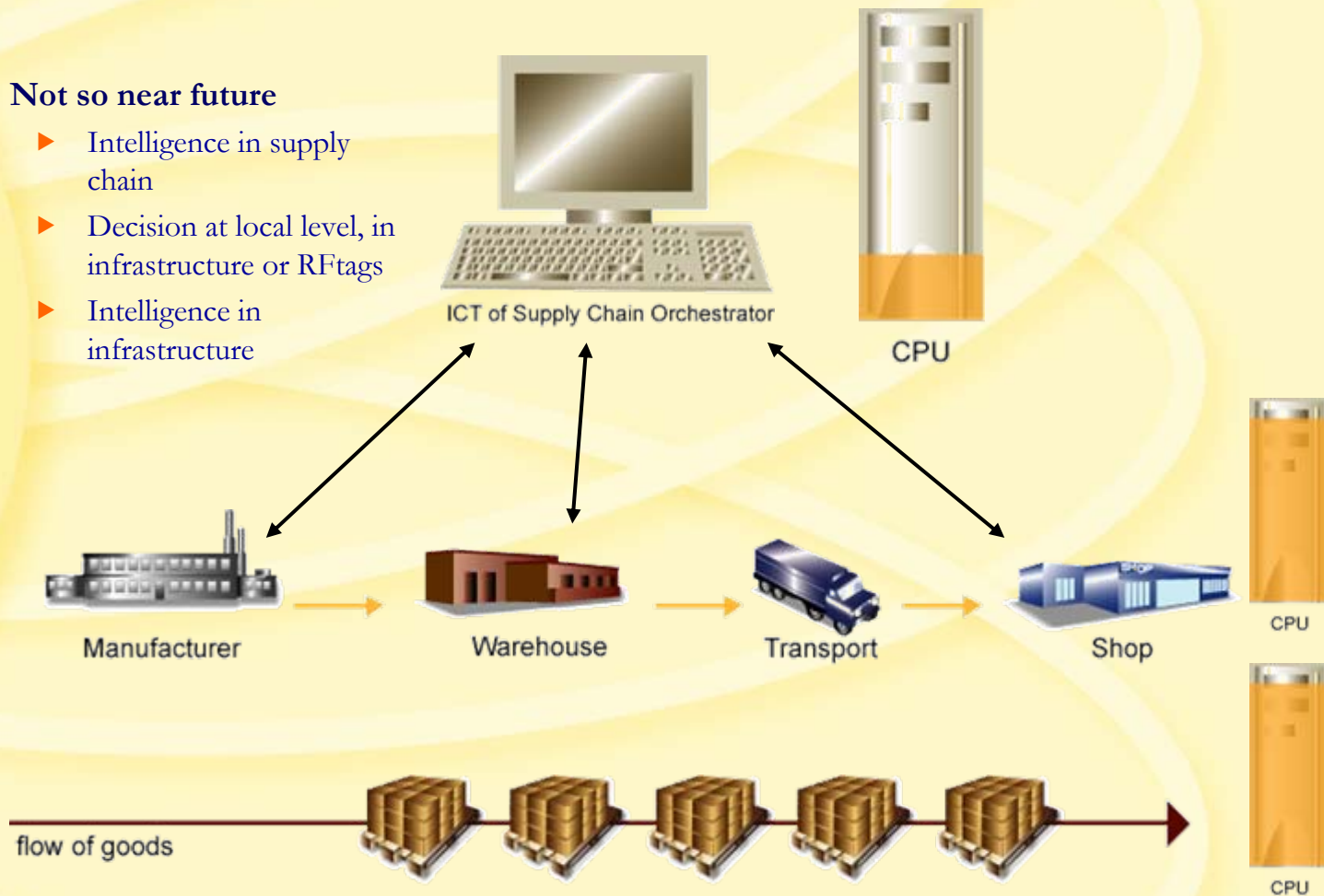


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# RFID → Intelligent Supply Chains

▶ **Not so near future**

- ▶ Intelligence in supply chain
- ▶ Decision at local level, in infrastructure or RFtags
- ▶ Intelligence in infrastructure



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