



# CFCFA Logistics Management Training

## **Supply Chain Management Technology**

# Supply Chain Management Technology

- Supply Chain Management
- Location Tracking Technologies
  - Satellite-based Positioning System (Global)
  - Cellular-based Positioning System (National/Local )
- Radio Frequency Identification (RFID)
- Enterprise Resource Planning (ERP)
- Supply Chain Management Software
  - Transport Management System (TMS)
  - Warehouse Management System (WMS)

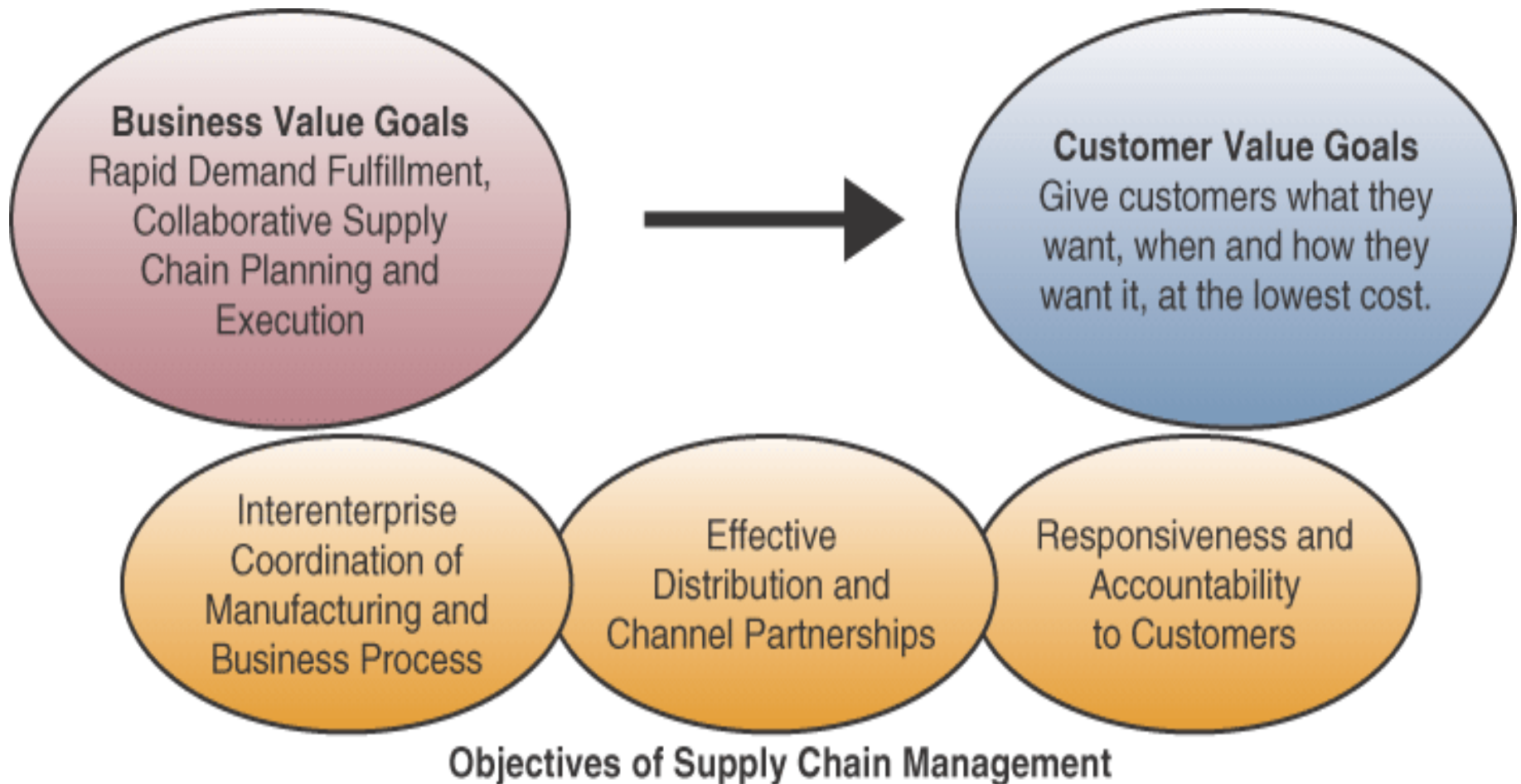
# **Supply Chain Management**

# Supply Chain Management (SCM)

Fundamentally, supply chain management helps a company

- Get the right products
- To the right place
- At the right time
- In the proper quantity
- At an acceptable cost

# Goals and Objectives of SCM



# **Location Tracking Technologies**

# Satellite-based Navigation Systems



# Satellite-based Navigation Systems

- A satellite navigation system is a system of satellites that provide autonomous geo-spatial positioning information
- The original objective was to support military operations.
- However, its navigation, positioning and timing data found widespread applications in civilian use.



# Major Satellite Navigation Systems

- GPS (Global Positioning System) supported by US military is the first system with global coverage and widely adopted for commercial use
- GLONASS (Globalnaya navigatsionnayasputnikovaya sistema) supported by Russia military also has global coverage. Its commercial application is growing.
- Galileo is currently being developed under EU civilian control. It has better coverage than GPS for northern Europe and aims to provide continual service when GPS and GLONASS are switched off.
- BeiDou (Compass) is a satellite navigation system being developed by China for global service in 2020. It became operational in China in 2011, and in the Asia-Pacific region in 2012.

# Major Satellite Navigation Systems

- Interoperability is an major issue (e.g. usage of different frequencies)
- Requires special chips & equipment design to receive signals from different systems (e.g. GPS and GLONASS)
- The most precise data is generally reserved for military use.
- Signals may be turned off or severely degraded during military conflicts (a major reason for EU to develop its civilian operated Galileo)

# Cellular-based Positioning System

- Unlike satellite systems which required direct line of sight, cellular systems are not blocked by tall buildings in urban canyons and by bridges & tunnels
- Cellular systems use cell tower triangulation to track the position
- Some smart phones provides seamless integration of all three positioning technologies (e.g. 3G iPhones are capable of receiving GPS/GLONASS satellite signals as well as cellular and Wi-Fi signals)

# Positioning System Coupled with Supply Chain Management Software Produce Many Benefits



# Benefits to Shippers/Receivers

- Automatic arrival and departure notification
- Support exception-based communications like notification of potential delays
- Higher supply chain visibility
- Stronger supply chain agility
- Improve production planning
- Able to make more precise promise to customers
- Increase comfort level on moving high value, theft prone merchandise or highly time sensitive, highly perishable products
- Optimize receiving schedule and dock manpower planning

# Benefits to Carriers

- Improved asset utilization
- Higher driver productivity
- Better provision of supply chain visibility to customers supports higher transport rates
- Automatic notification of potential delays
- Automatic dispatch when combined with on-board computers
- Reduced loss on moving high value, theft prone merchandise

# Benefits to Carriers

- Optimize route, loading/unloading schedule and manpower planning
- Out or route miles, unauthorized movements can be easily detected and remedied
- Enhance safety and fuel economy
- Help determine the root causes of delays
- Simplifies driver pay calculation using mileage and driver time data captured
- Mobile Apps allows carrier management to retrieve tracking information via smart phones

# **Radio Frequency Identification (RFID)**

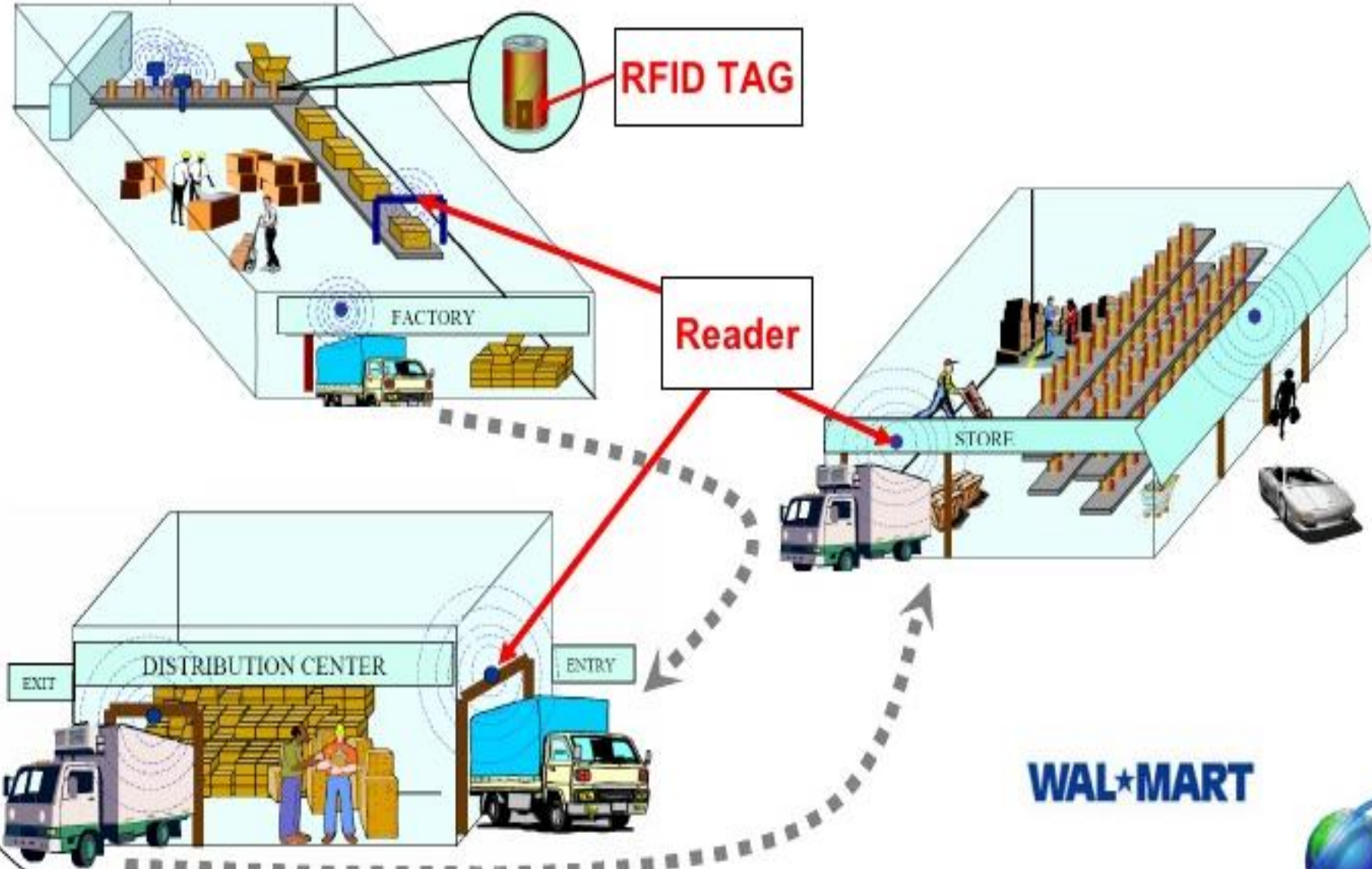


# Movement Towards RFID Usage

- RFID is an electronic tagging technology that allows goods & equipment to be automatically identified from a distance without a direct line-of-sight, using an electromagnetic challenge/response exchange.
- Wal-Mart, US Department of Defense are early adopters.
- Rapidly decreasing RFID tag cost (US\$0.10 - 0.15) is driving increased usage.
- Used for tracking assets (e.g. equipment, staff) as well as products.
- New RFID readers can process 400 items/second



# RFID Usage in Logistics



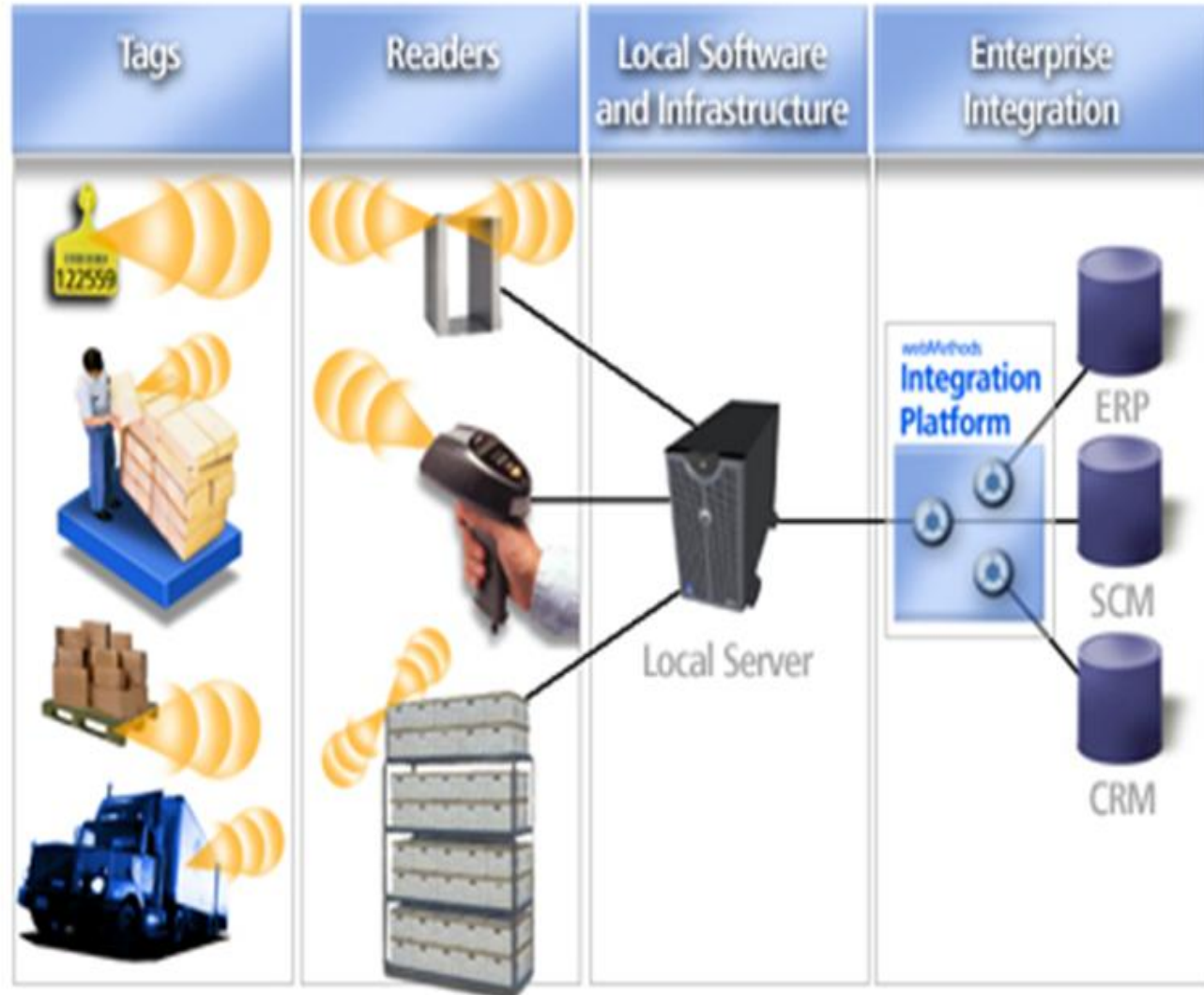
# How does RFID work?

**RFID tags consist of two parts:**

- 1) Antennae
- 2) Processor/storage

**Receives signal from reader and respond with sending ID number & stored information.**

**Reader sends retrieved information to database server.**



# **Enterprise Resource Planning (ERP)**

# ERP – The Backbone of Modern Business

ERP is a cross-functional enterprise software system that integrates and automates the processes within

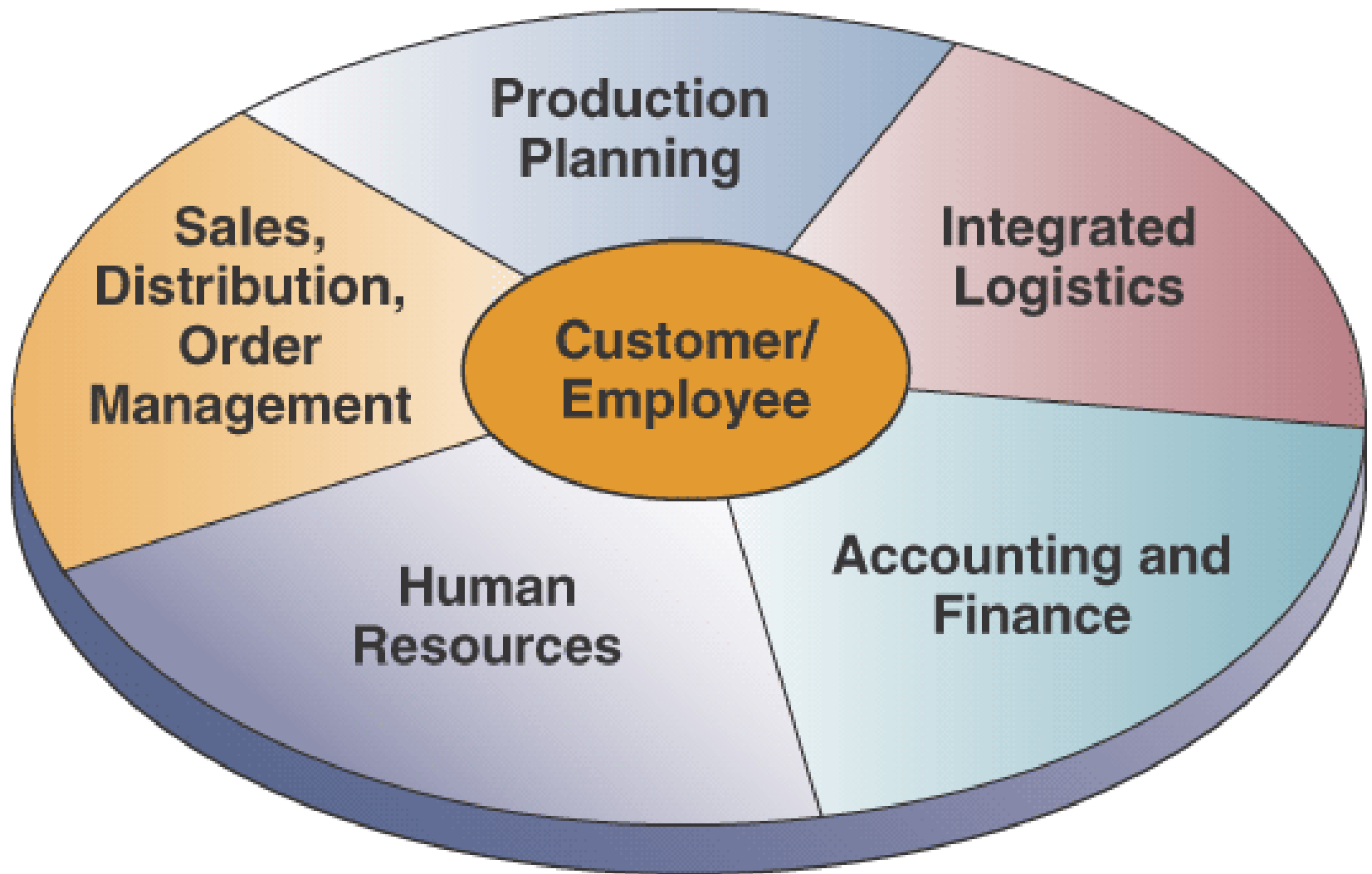
- Manufacturing
- Logistics
- Distribution
- Accounting
- Finance
- Human resources

# What is ERP?

Enterprise resource planning is a cross-functional enterprise system

- An integrated suite of software modules
- Supports basic internal business processes
- Facilitates business, supplier, and customer information flows

# ERP Application Components



# Benefits and Challenges of ERP

## ERP Business Benefits

- Quality and efficiency
- Decreased costs
- Decision support
- Enterprise agility

## ERP Costs

- Risks and costs are considerable
- Hardware and software are a small part of total costs
- Failure can cripple or kill a business



# Causes of ERP Failures

## Most common causes of ERP failure

- Under-estimating the complexity of planning, development, training
- Failure to involve affected employees in planning and development
- Trying to do too much too fast
- Insufficient training
- Insufficient data conversion and testing
- Over-reliance on ERP vendor or consultants

# **Supply Chain Management Software**

# Transport Management System (TMS)

TMS optimizes the execution of inbound & outbound transportation processes.

- Reduce costs through improved load planning, routing and mode selection, and create the optimal carrier mix based on routing guides
- Raise service levels by providing real-time visibility into your shipping processes
- Increase productivity by eliminating manual transportation processes
- Improve on time delivery through better collaboration with carriers, vendors, and customers
- Make better decisions around supply chain processes with business analytics

# Warehouse Management System (WMS)

WMS controls the movement and storage of materials within a warehouse and process associated transactions, including shipping, receiving, put away and picking.

- The receipt of stock and returns into a warehouse
- Enabling a seamless link to order processing and logistics management in order to pick, pack, and ship product out of the facility
- Optimize the rack design/layout and storage location of products
- Tracking where products are stocked, which suppliers they come from, and the length of time they are stored.



# Thank You!

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