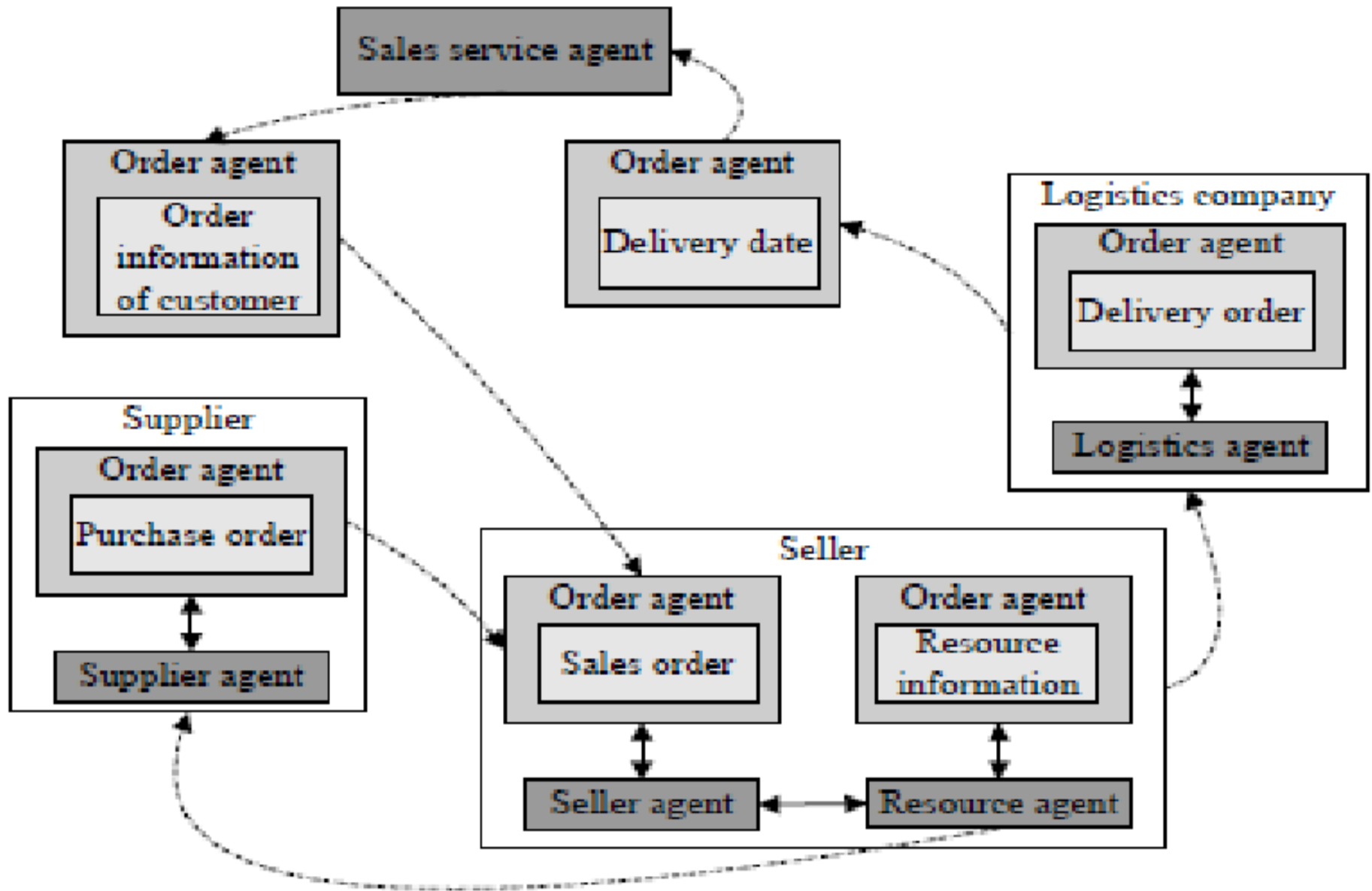


SUPPLY CHAIN MANAGEMENT

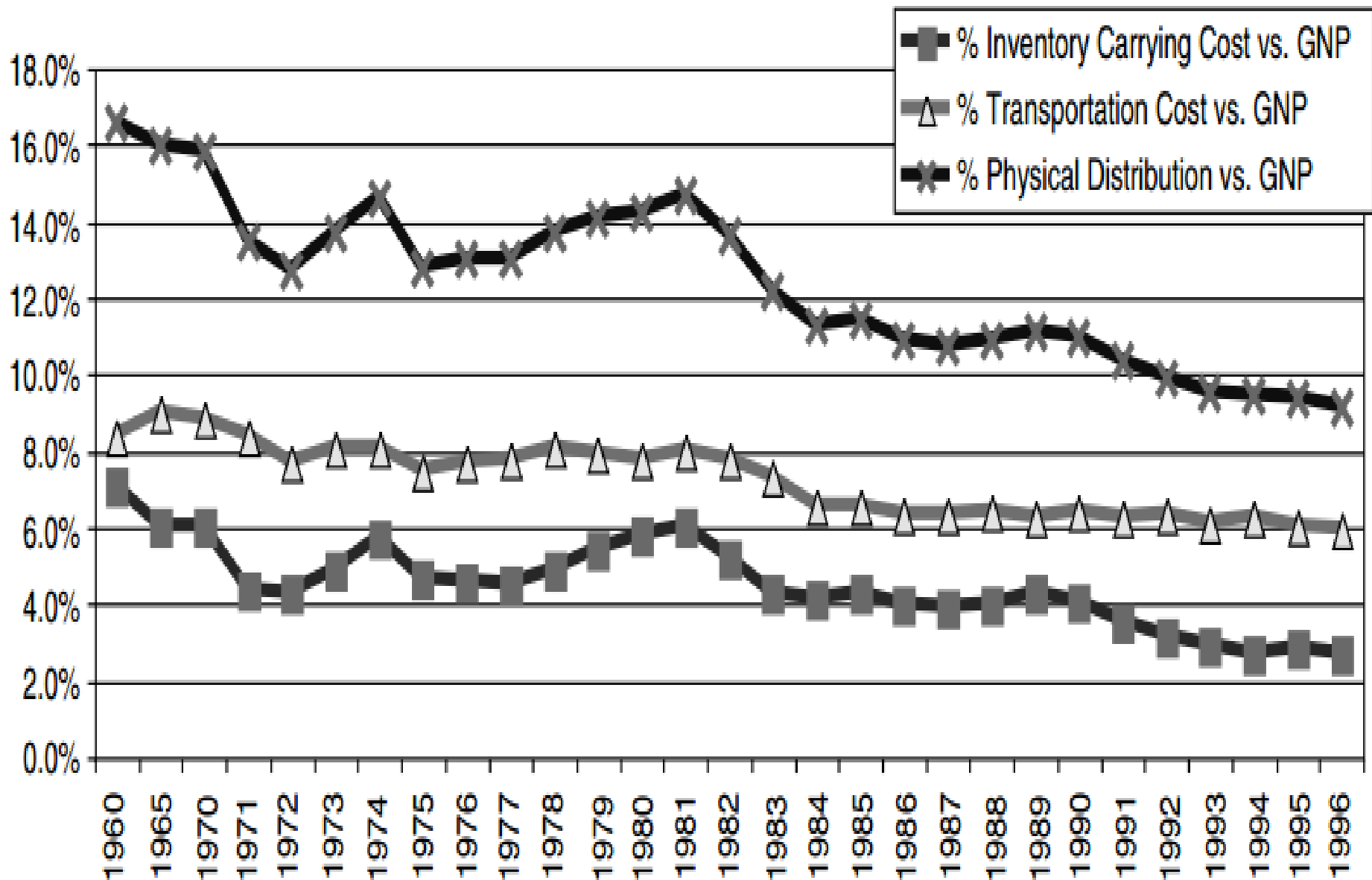


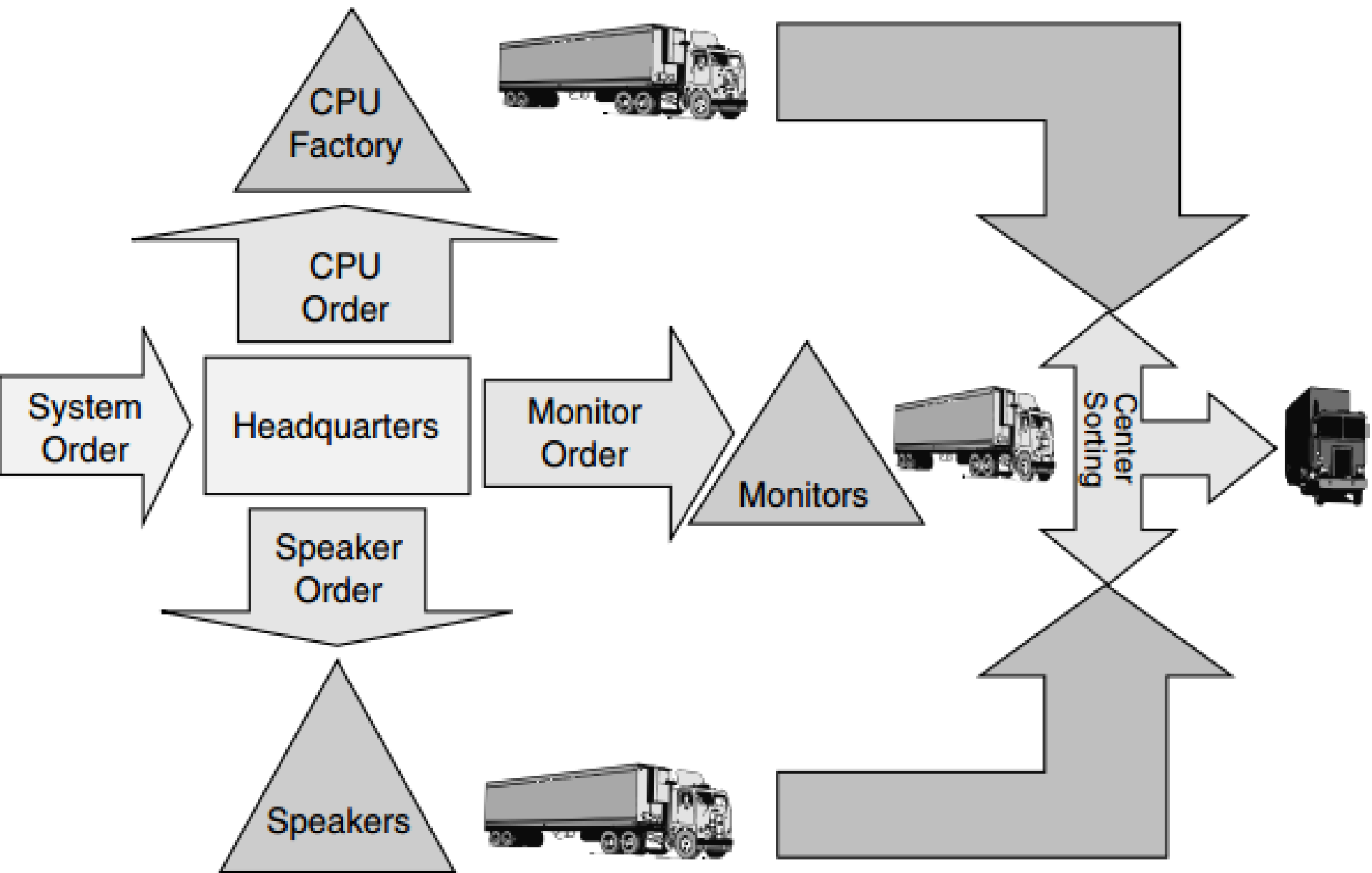
LOGISTICS AND SUPPLY CHAIN INFORMATION SYSTEMS

Information flow chart in supply chain management



Total logistics costs versus GNP —1960-1996





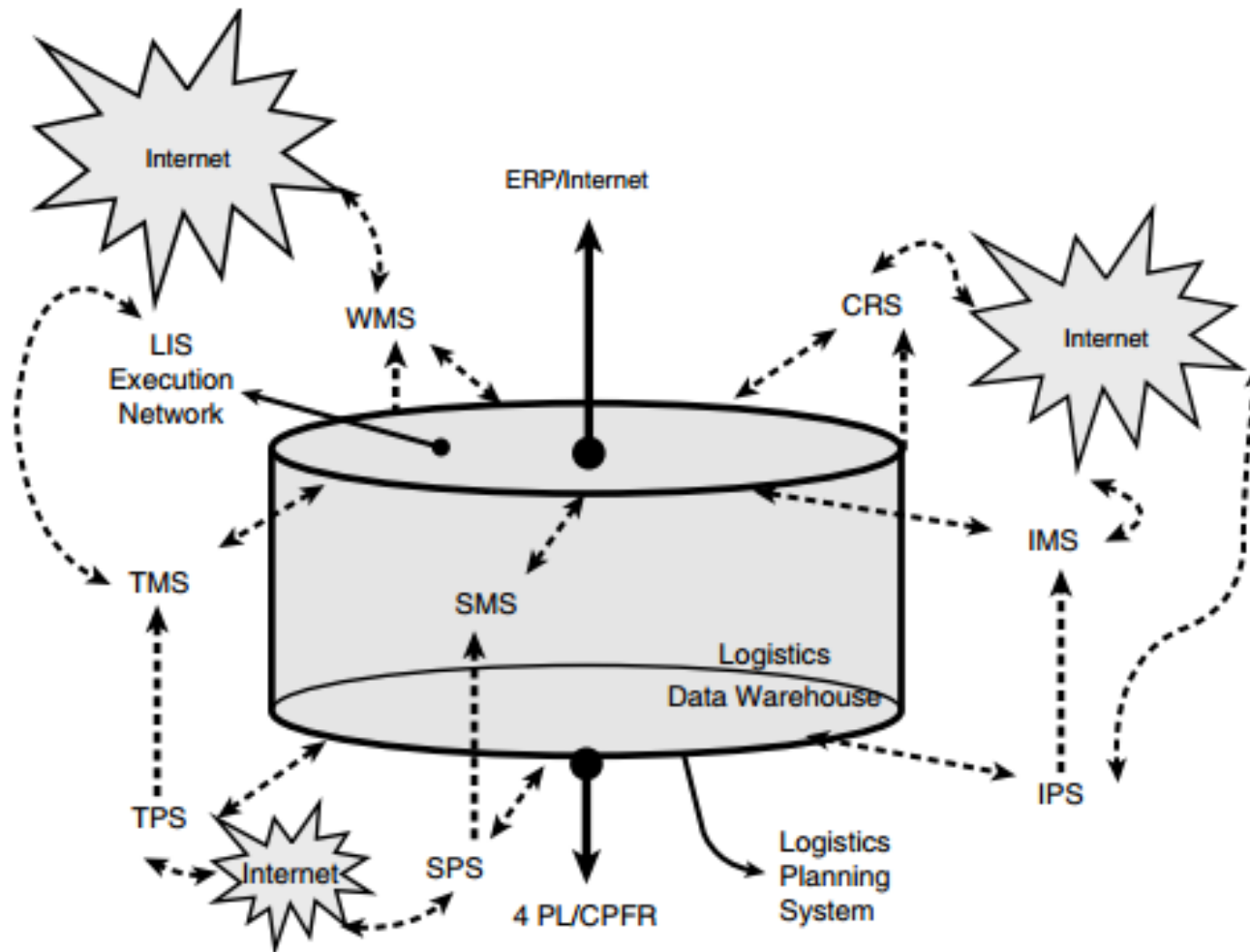
Source: E. Frazelle, McGraw -Hill, 2002

Five key aspects of logistics and supply chain information systems



- Logistics and supply chain management system functionality and architecture**
- Logistics data mining and decision support systems**
- Web-Based logistics**
- Paperless logistics systems**
- Logistics and supply chain management system justification, selection and implementation**

LOGISTICS INFORMATION SYSTEM (LIS) FUNCTIONALITY AND ARCHITECTURES



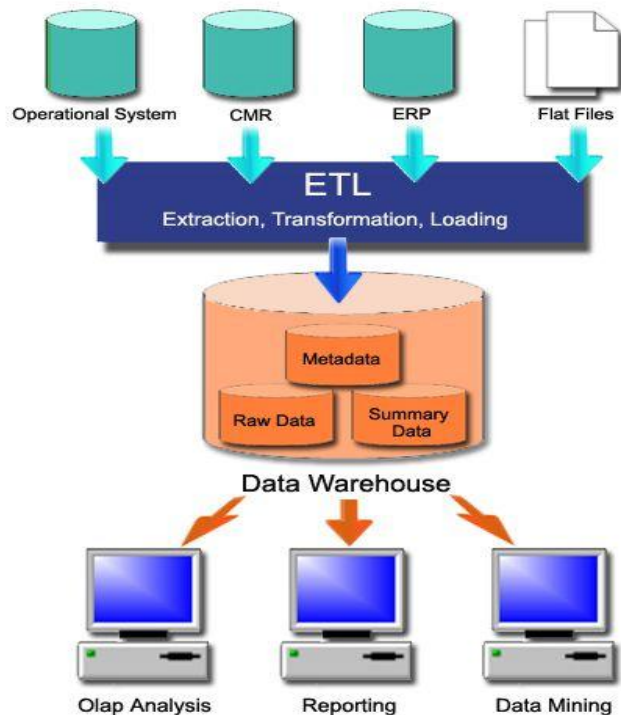
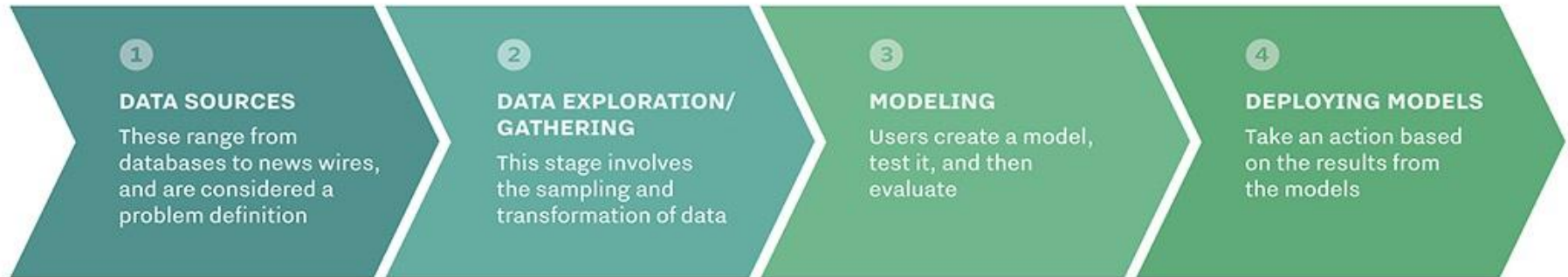
Logistics Information Systems Functions and Vendors

| | | Planning | Execution | Collaboration | ERP |
|----------------------|-----------|---|--|--|----------------------|
| Supply Chain | Functions | DC location, strategic location, sourcing, supply chain simulation, inventory deployment | OnLine supply chain communications | Supply chain scheduling and optimization, supply chain conflict resolution | |
| | Vendors | Aspentech, CAPS Logistics, i2, Logility, Manugistics | i2, Logility, Manugistics | Aspentech, i2, Logility, Manugistics, SyncraSystems, SupplyPoint.com | JD Edwards, QAD, SAP |
| Customer Response | Functions | Customer relationship management, market segmentation, RFM analysis, customer service policy | Order entry, order processing, contact management, customer yield management and pricing, customer tracking, service call scheduling, returns processing, order status | Online customer service | |
| | Vendors | Act, Goldmine, SalesLogix, Siebel | Cambar, Goldmine, i2, Siebel | Goldmine, SalesLogix, Siebel | JD Edwards, QAD, SAP |
| Inventory Management | Functions | Demand planning, forecasting, safety stock optimization, assortment planning, inventory plan simulation | Cycle counting, production scheduling, Available-to-promise, lot tracking, MRP | Inventory auctions, forecast sharing | |
| | Vendors | Aspentech, Cambar, Great Plains, i2, Logility, Manugistics | Aspentech, Cambar, Great Plains, i2, Logility | Aspentech, Cambar, Great Plains, i2, Logility, Manugistics, SyncraSystems | JD Edwards, QAD, SAP |
| Supply Management | Functions | Replenishment planning, DRP, sourcing, order quantities, negotiations | Purchase order creation, purchase order entry, purchase order processing, purchase order tracking, supplier management | Procurement marketplaces, global sourcing, online catalog management | |

(Cont)

| | | Planning | Execution | Collaboration | ERP |
|---------------------------|-----------|--|---|--|-------------------------|
| Supply Management | Vendors | i2, Logility, Manugistics | i2, Logility, Manugistics, | i2, PurchaseCenter.com purchasepro.com, commerceone.net, GEIS.com | JD Edwards, QAD, SAP |
| Transportation Management | Functions | Load planning, routing and scheduling, mode/carrier selection, consolidation planning | Shipment tracking, freight payment/audit, shipment rating, carrier management, container tracking, fleet tracking | Transportation exchanges, transportation auctions | |
| | Vendors | Cambar, Great Plains, i2, Logility, Manugistics, Roadnet | Cambar, Great Plains, i2, Logility, Manugistics, nte.net, Qualcomm | nistevo.com, nte.net, celarix.com, qualcomm | JD Edwards, QAD, SAP |
| Warehouse Management | Functions | Slotting, work measurement, warehouse simulation | Cross-docking, dock management, receiving, storage, order picking, shipping, returns, MHE interface | Storage capacity availability, third-party warehousing availability | |
| | Vendors | LRI, Manhattan Associates, ROM | Cambar, EXE, Great Plains, Manhattan Associates, McHugh, HK Systems, RGTL, TRW, Logility | GoWarehouse.com, 3Plex.com | JD Edwards, QAD, SAP |

Four stages of data mining



Decision Support Systems (DSS) in Logistics

an integrative system of subsystems that has the purpose of providing information to

- assist logistics executives in their decision process.
- support, but not replace, managerial judgment.
- improve the effectiveness of logistics decision.

1. Gather

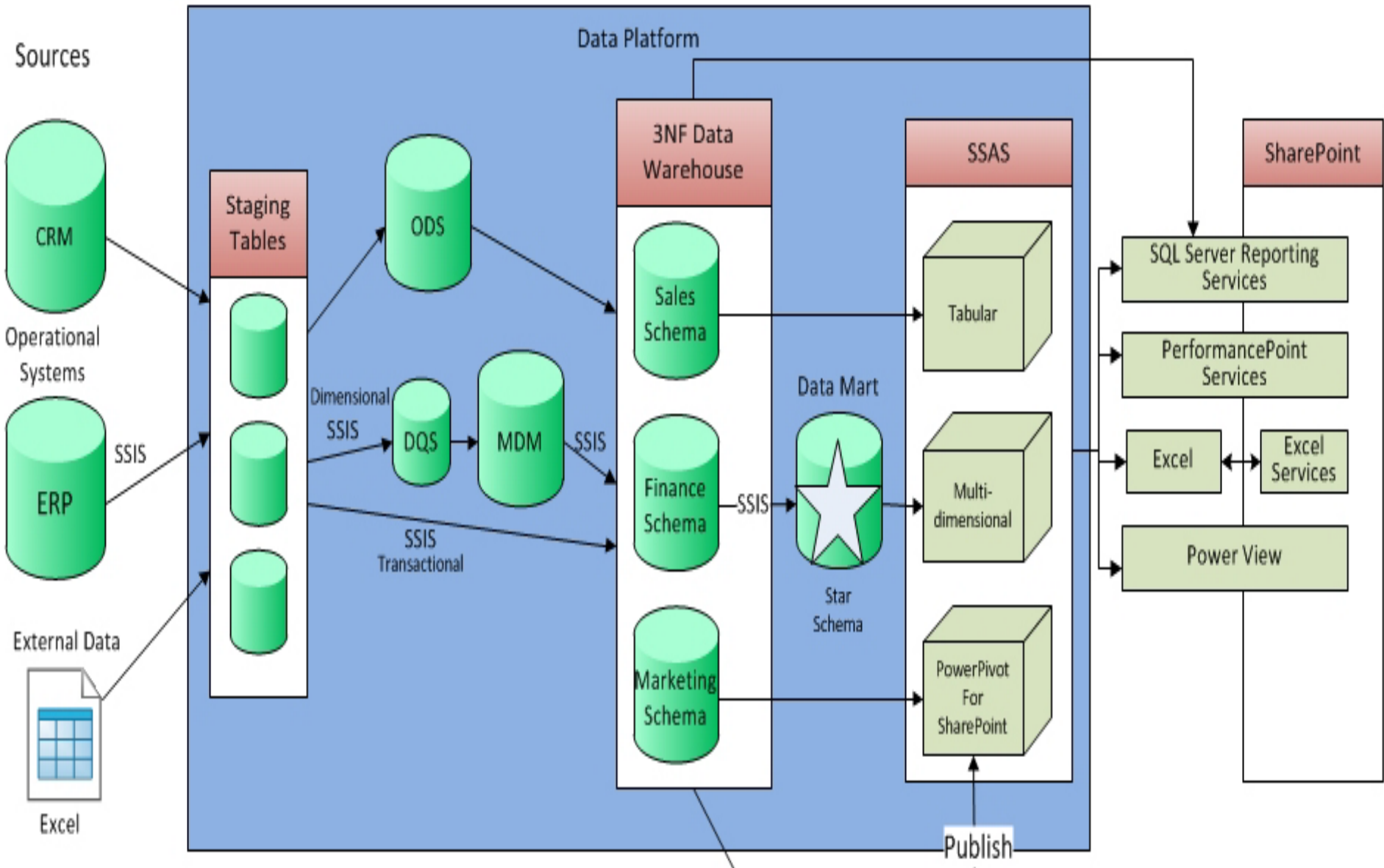
2. Clean/Master

3. Store

4. Model/Present

5. Analyze

6. Share



Source: J. Serra, Building an Effective Data Warehouse Architecture



Specifications for Logistics Activity Profiling and Data Mining

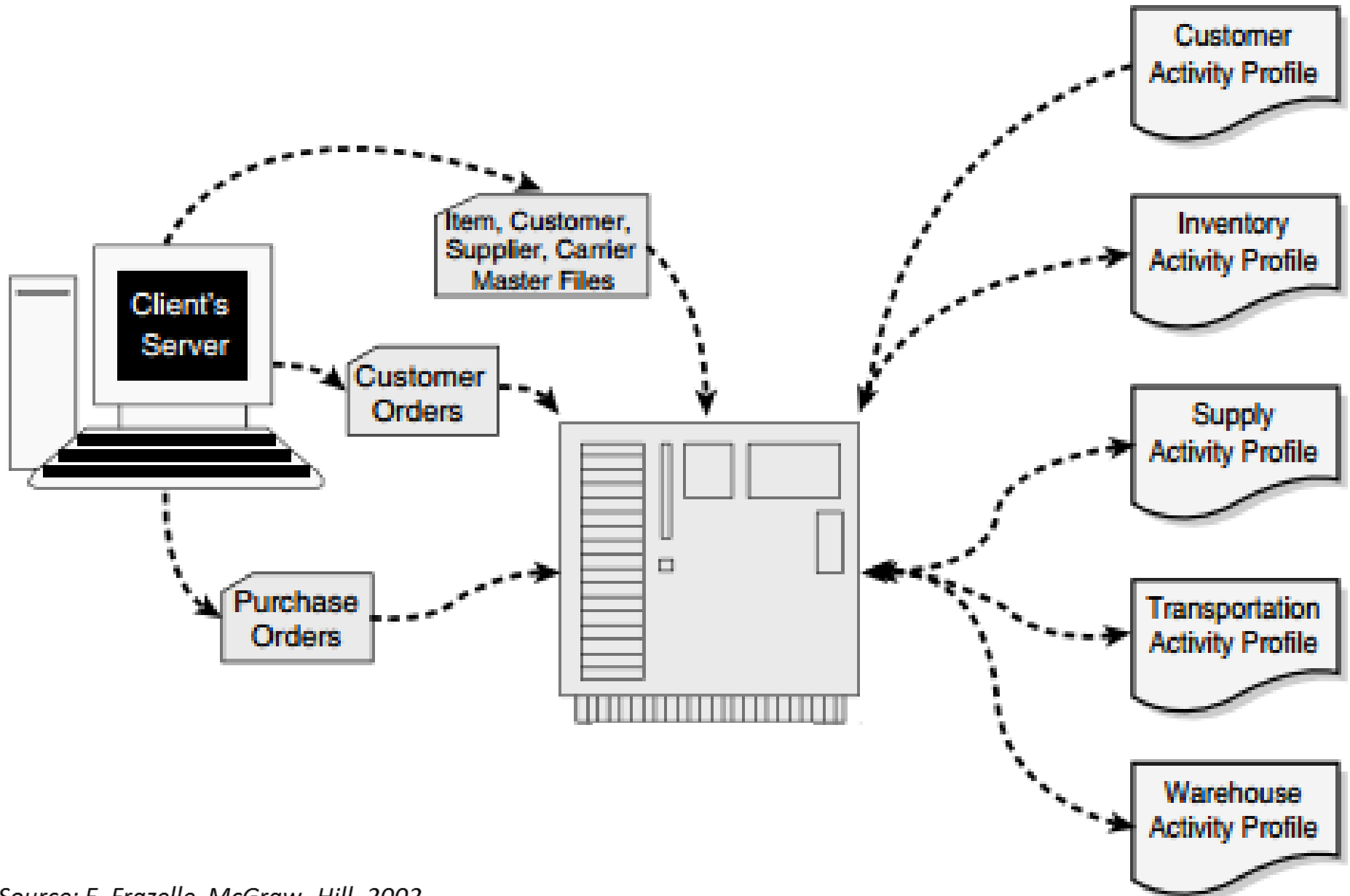
| Profile | Files/Sources | Queries | Profiles | Decisions |
|----------------------------|--|---|---|--|
| Customer Activity Profile | <ul style="list-style-type: none"> Customer order history POS data Customer master file | <ul style="list-style-type: none"> Sales by customer and customer location in dollars, pallets, cases, pieces, weight, volume, frequency, orders, lines, and deliveries Sales by SKU in dollars, pallets, cases, pieces, weight, volume, and lines Sales by customer and SKU in dollars, pallets, cases, pieces, weight, and volume | <ul style="list-style-type: none"> Customer activity—ABC Customers by dollar sales and volume SKU activity—ABC SKUs by dollar sales and volume Customer-SKU activity—ABCxABC customers and SKUs by dollar sales and volume Customer order profile—dollar sales, volume, cube, weight, and lines per order | <ul style="list-style-type: none"> Customer response measures Customer classifications SKU classifications Customer-SKU classifications Customer service policy design |
| Inventory Activity Profile | <ul style="list-style-type: none"> Item master file—snapshots of on-hand inventory POS data Customer order file | <ul style="list-style-type: none"> On-hand inventory in—turns, days-on-hand, dollar value, cube, space, pieces by—location and commodity by—vendor, SKU popularity, SKU usage, and SKU age Forecasting—leadtime, demand variability and forecast accuracy by SKU by location | <ul style="list-style-type: none"> Demand variability by SKU popularity and SKU age On-hand inventory by location and commodity by—SKU popularity ranking, SKU age ranking, SKU popularity and age rankings, and vendor rankings | <ul style="list-style-type: none"> Inventory management performance measures SKU categories for inventory management Inventory turnover and fill rate targets by logistics segments Forecasting models by SKU category Inventory reduction opportunities by logistics segment |
| Supply Activity Profile | <ul style="list-style-type: none"> Purchase order history file Supplier master file | <ul style="list-style-type: none"> Purchasing by supplier and supplier location in dollars, cases, pieces, weight, volume, frequency, orders, lines, and deliveries Purchasing by SKU in dollars, cases, pieces, weight, volume, and lines Purchasing by supplier and SKU in dollars, pallets, cases, pieces, weight, and volume | <ul style="list-style-type: none"> Supplier activity—ABC by \$Purchases, Volume, SKUs SKU Activity—ABC by dollar purchasing, volume, and frequency Supplier-SKU activity—ABCxABC by dollar purchasing, volume, and SKUs Purchase order profile—purchasing, volume, cube, weight, and lines per purchase order | <ul style="list-style-type: none"> Supplier performance measures Supplier categories SKU categories for supply planning Supplier-SKU rationalization Sole versus primary-secondary versus competitive sourcing Make-buy analysis Supplier service policy design |

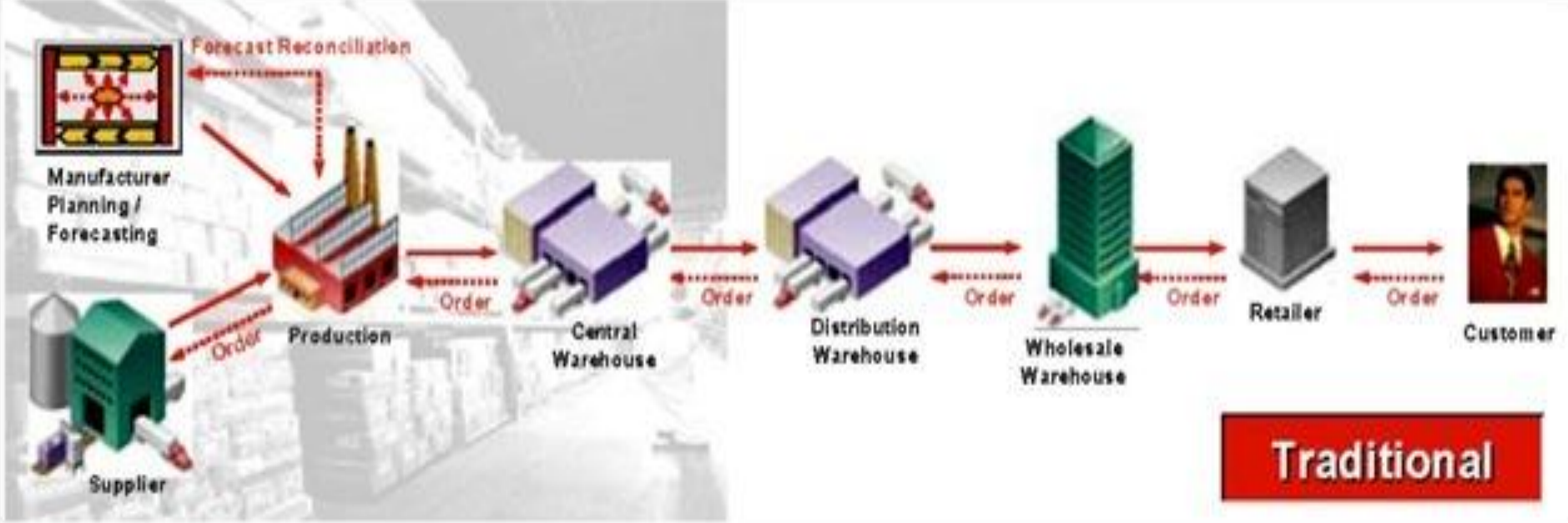
(Cont)

| | Profile Files/Sources | Queries | Profiles | Decisions |
|---------------------------------|---|--|---|--|
| Transportation Activity Profile | <ul style="list-style-type: none"> Shipping manifest history file Carrier master file Customer master file Supplier master file | <ul style="list-style-type: none"> From-to matrix between all pickup-deliver to points including, frequency, volume, weight, dollar value, carriers, carrier capacity, carrier availability, distance, time, freight paid, on-time delivery, damages, and claims | <ul style="list-style-type: none"> Lane activity profile—ABC lanes by dollar freight, volume, and claims Carrier activity—ABC carriers by dollar freight, volume, and shipments Inbound transportation activity—ABC by dollar freight, volume, value, and frequency Outbound transportation activity—ABC by dollar freight, volume, value, and frequency Carrier-shipment activity—ABCxABC by dollar purchasing, volume, and SKUs Manifest profile—shipping, volume, cube, weight, and lines per manifest | <ul style="list-style-type: none"> Transportation performance measures Logistics hierarchy design Logistics network design Inbound freight management Consolidation design Routing and scheduling Fleet configuration Mode and carrier selections Potential roles for third parties |
| Warehouse Activity Profile | <ul style="list-style-type: none"> Item master file Customer order history file | <ul style="list-style-type: none"> SKU Activity by: popularity, usage, cases, pallets, cube, and weight Orders by dollar value, lines, cube, and units | <ul style="list-style-type: none"> Order profile—lines, cube, pieces, dollar value, and weight per order distribution Lines and cube per order distribution Item activity profile—ABC SKUs by picks, usage, and volume by SKU Item-order completion profile | <ul style="list-style-type: none"> Warehouse performance measures SKU categories for warehouse master planning Slotting Storage mode selection Order picking policies Warehouse layout |

Source: E. Frazelle, McGraw -Hill, 2002

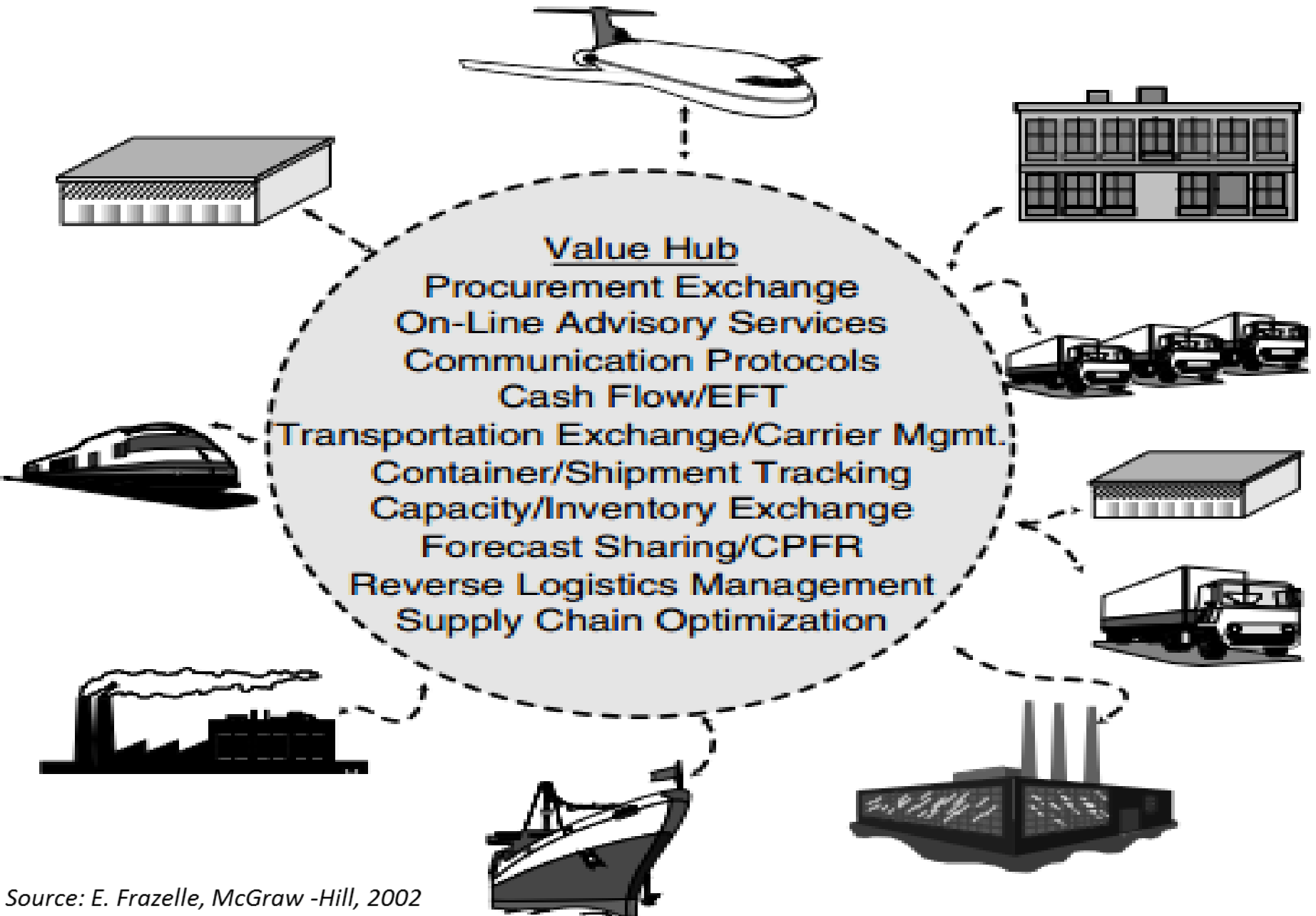
Web-based logistics activity profiling





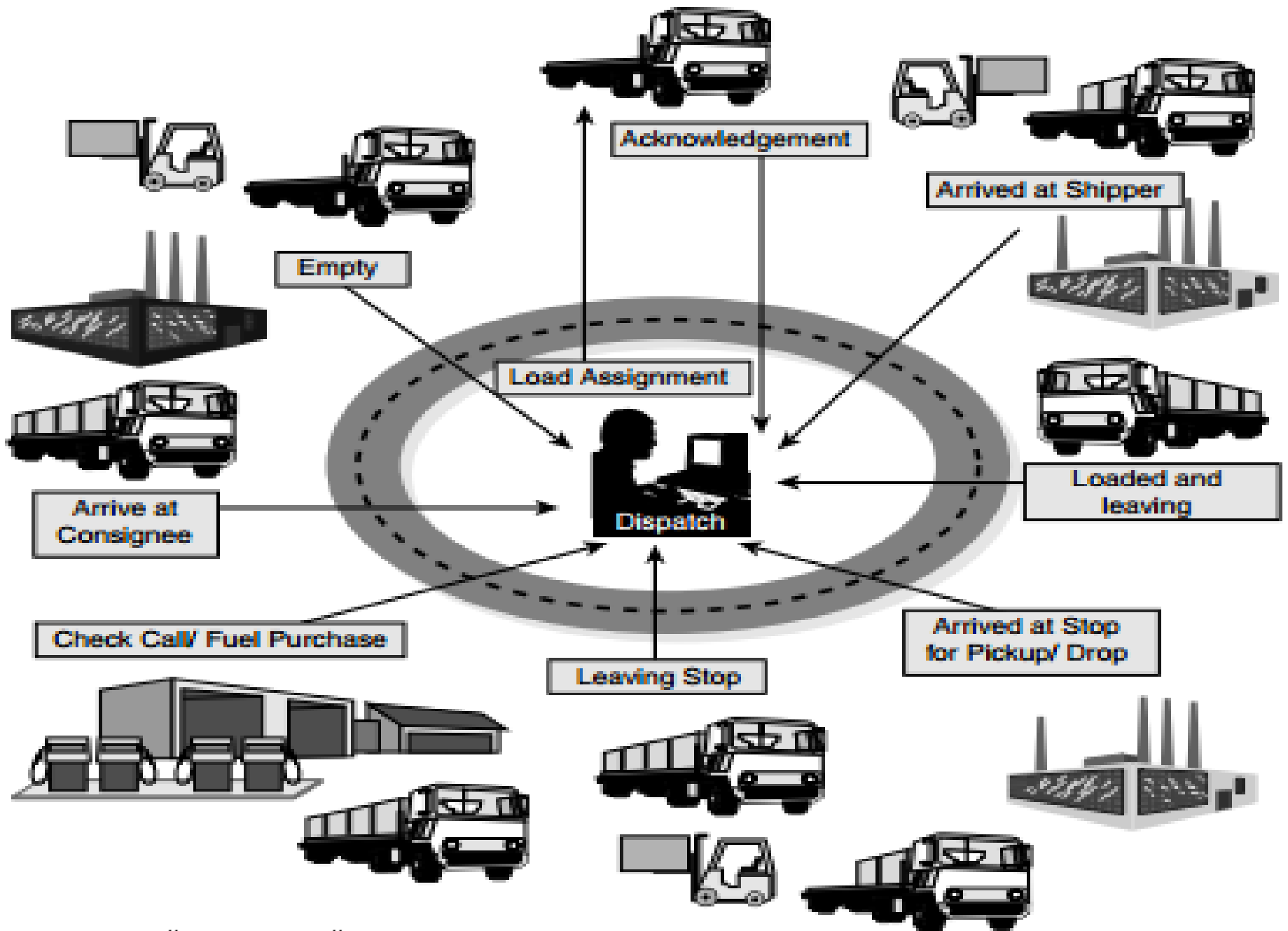
Source: What-When-How.com, Web-based Supply Chain Strategy

Total logistics exchange concept



Online Container and Shipment Tracking

| Container | Associated Document Information | | | | | | |
|-------------------|---------------------------------|--------|---------|-----------|------------------------|-------------|------------------------|
| ID | ID | Type | Transit | Origin | Depart | Destination | Arrive |
| <u>RSK0190213</u> | <u>KCP1102</u> | dkrept | Int | Tokyo | 03, Oct 2000 09:00 GMT | Savannah | 17, Oct 2000 17:00 GMT |
| | <u>MFU9845</u> | ocnbk | Pre | Tokyo | 05, Oct 2000 11:00 GMT | Seattle | 14, Oct 2000 10:00 GMT |
| | <u>XKG5522</u> | ocnbk | Pre | Taiwan | 11, Oct 2000 04:00 GMT | Los Angeles | 22, Oct 2000 12:00 GMT |
| | <u>WSJ1963</u> | ocnbk | Pre | Taiwan | 01, Nov 2000 07:00 GMT | Portland | 12, Nov 2000 17:00 GMT |
| | <u>APP3588</u> | ocnbk | Pre | Hong Kong | 14, Nov 2000 03:00 GMT | Miami | 01, Dec 2000 11:00 GMT |

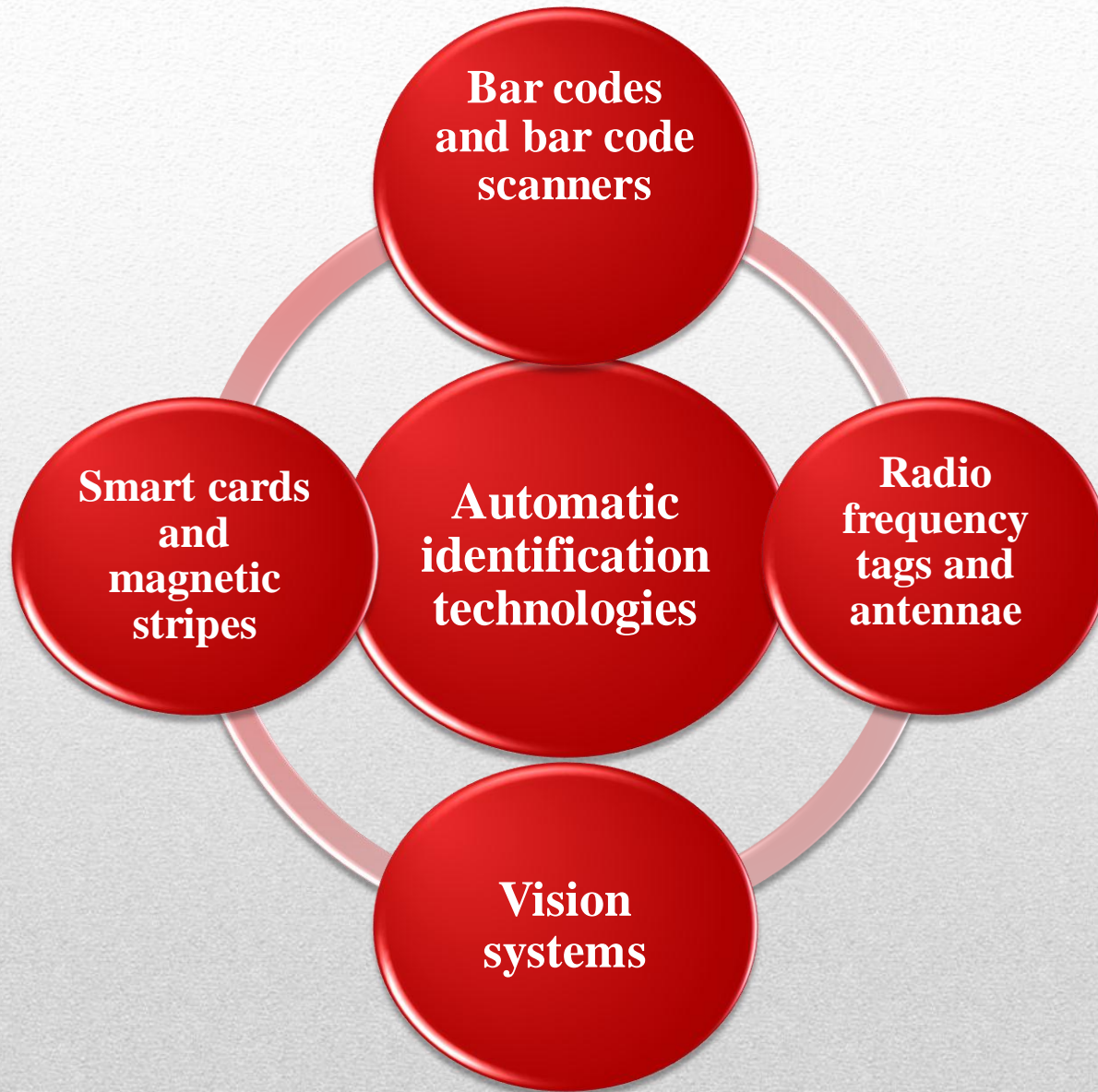


Source: E. Frazelle, McGraw -Hill, 2002

Web-Based Warehouse Management

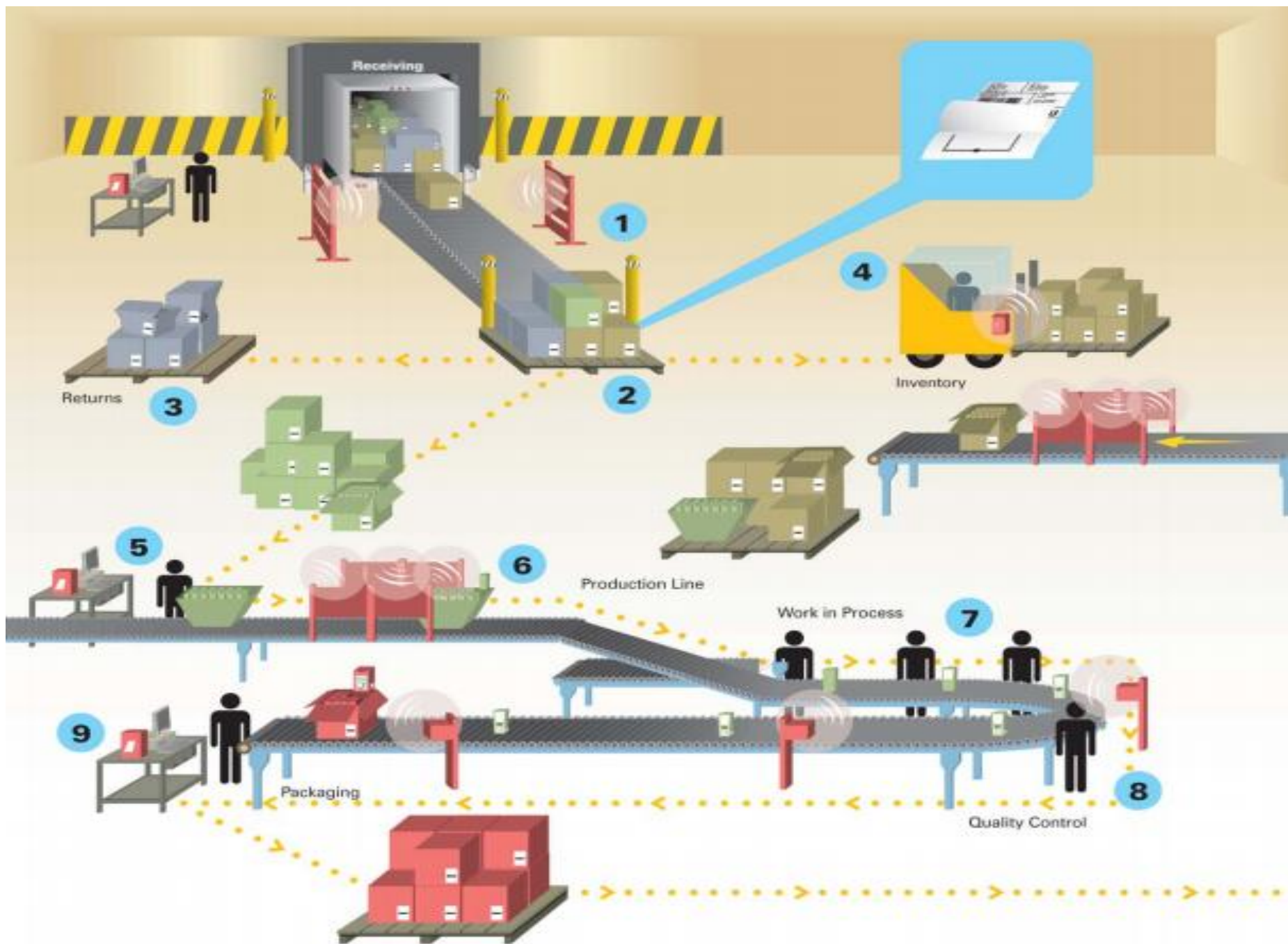
The Impact of E-commerce on Logistics and Web-based Logistics Solutions

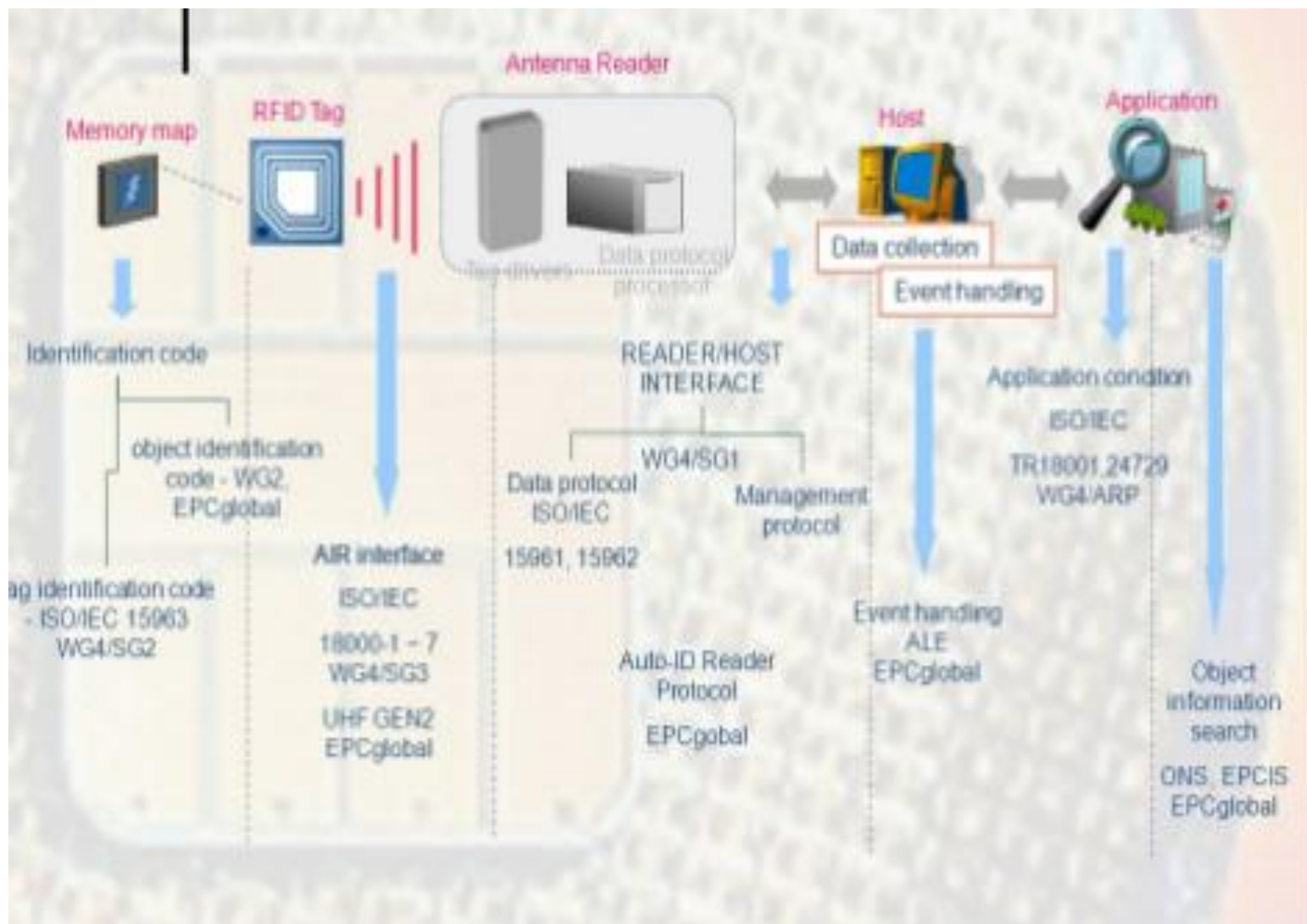
| | New and Increased Requirements | Web-based Solutions |
|--------------------------------------|--|---|
| Customer Response | <ul style="list-style-type: none"> • Returns management • Short-cycle deliveries | <ul style="list-style-type: none"> • Online response to customer inquiries |
| Inventory Management | <ul style="list-style-type: none"> • Fragmented demand streams • SKU proliferation | <ul style="list-style-type: none"> • Forecast sharing • Inventory auctions |
| Supply Management | <ul style="list-style-type: none"> • Profit erosion | <ul style="list-style-type: none"> • E-procurement • CPFR |
| Transportation Management | <ul style="list-style-type: none"> • Home delivery • Short lead times • Smaller shipments • Profit erosion | <ul style="list-style-type: none"> • Shipment bidding, booking, and tracking • Online freight payment |
| Warehouse Management | <ul style="list-style-type: none"> • Returns handling • Short cycle times • Smaller order sizes | <ul style="list-style-type: none"> • Warehouse application service providers |

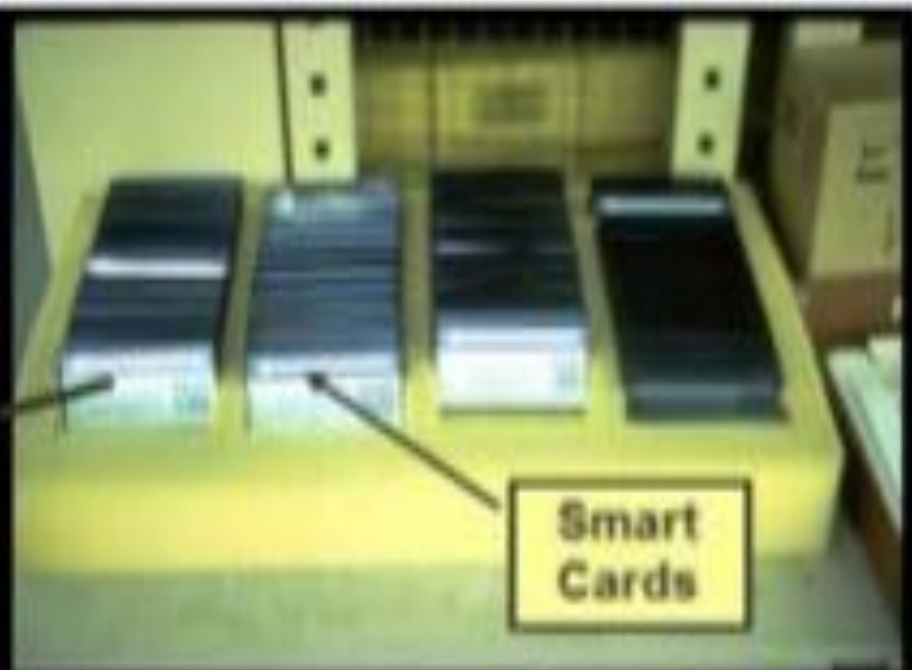














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**Vehicle-mounted
radio frequency
terminals**

**Hands free radio
frequency terminals.**

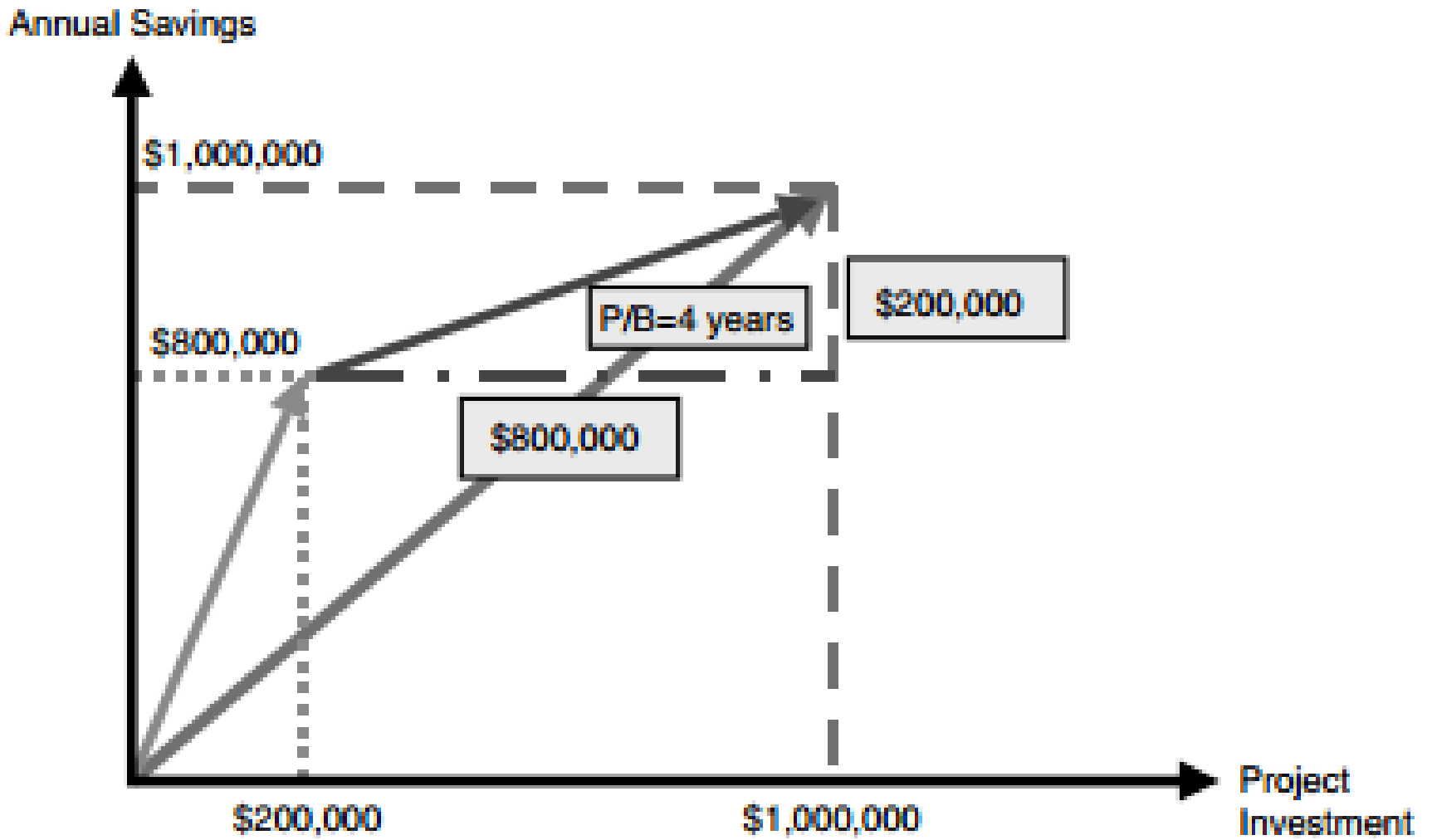


Voice headset



Pick-to-light systems





THE END