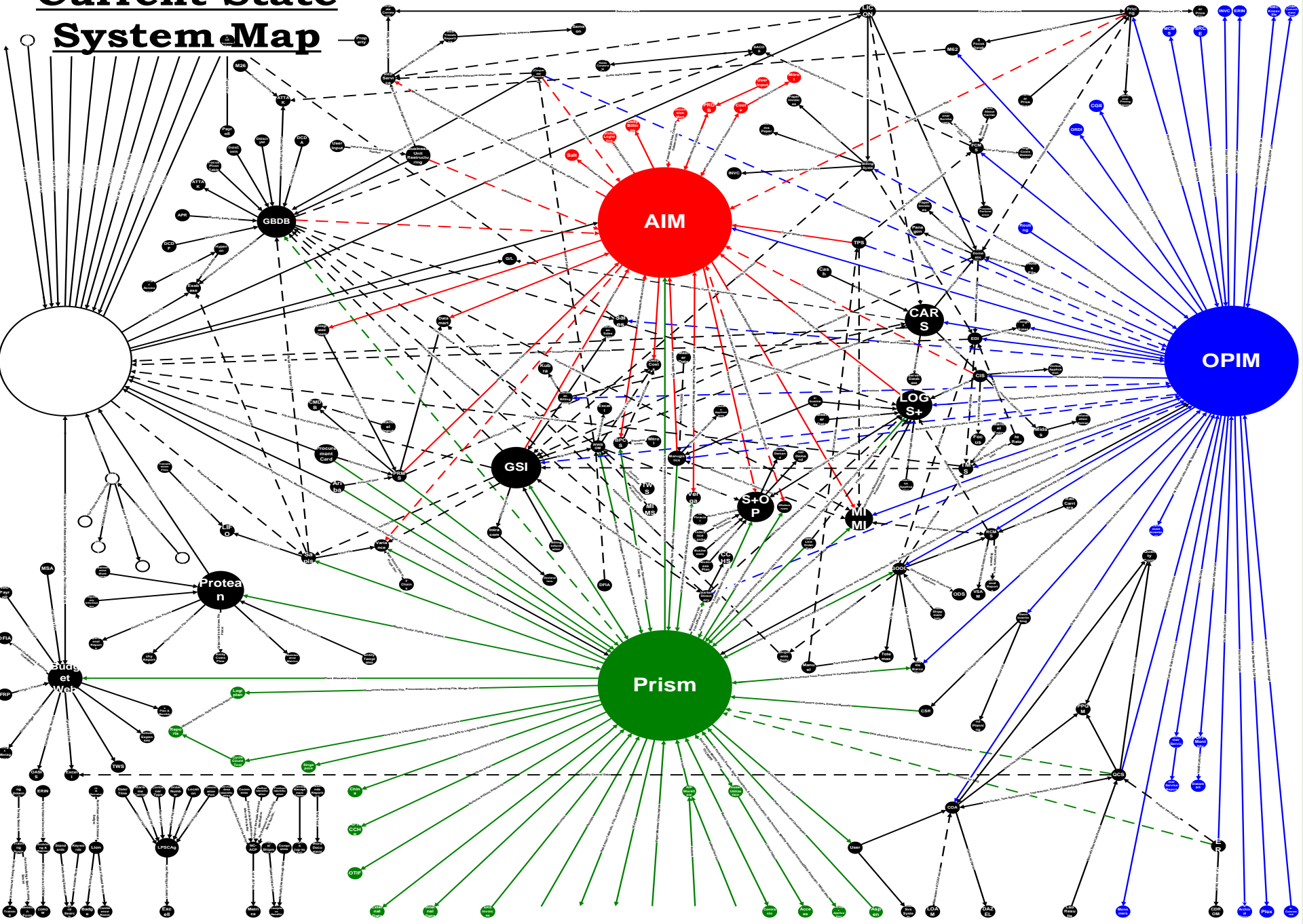# Chapter 6

Supporting Processes with ERP Systems

Current State System Map

Future State System Map

Version #5
Date: 01/04/01

Top-level nodes:
- BW
- Panagon
- Lotus Notes
- Financial Institution Systems
- Treasury Workstation
- Supplier System
- Market Places
- Ariba
- Supplier System(s)
- R/3 HR
- Hewitt Benefits System
- TMS
- Customer System
- Distributor Systems
- Brokers
- Canada Trade Orgization System
- Totemax
- ERFCMS
- Freight Forwarder System
- Weigh Bridge or Load Rack Scale
- TPS
- Shopfloor Systems, Multiple
- LIMS
- Carrier System
- Transportation Safety Info Systems
- Railmax

Central SAP bar:
- R/3 Any (Common Services To All R/3 Modules)
- R/3 FI
- R/3 WM
- R/3 PP/PP-PI
- R/3 QM
- R/3 LO
- R/3 SD

Lower nodes:
- Dazel Fax Software
- Barcode System
- Barcode Scanners
- Aspen Tech's Plantworks
- Atrion
- Toll Mfg System
- Aspen Tech's MIMI
- NetWorks (Manugistics)
- Business Internet Portal (e-presence Services)
- Forms Software
- Hazard Labels
- CPM
- R/3 MM
- InvRA System
- Hyperion
- Other Tax Package
- Misc. Systems TBD
- Vertex
- R/3 CRM
- Market Places
- Remote Tank Monitor
- Trade Organization or Customer
- Rail Fleet Sizing Tool
- e-Commerce Services
- Product Info Databases
- DTO System
- Market Places
- Barcode System
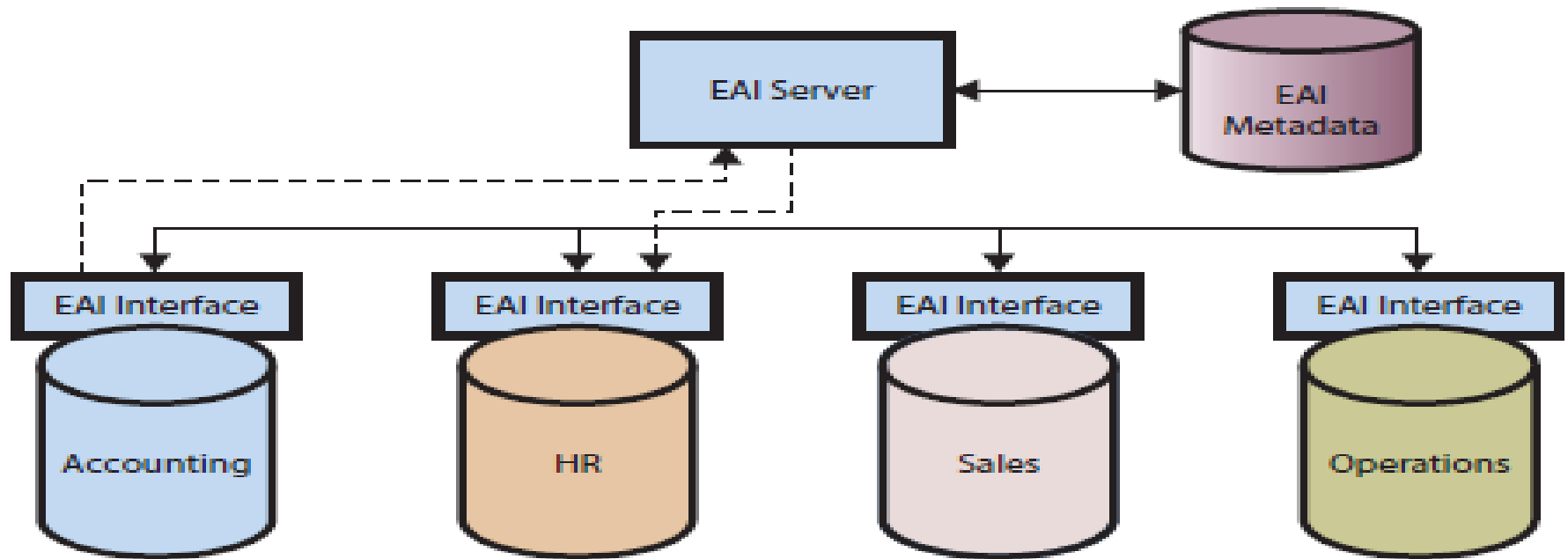- Complaint Handling System
- Palm Pilot

What Problem Does an ERP System Solve?

- Information Silo Problem
  - Data isolated in separate information systems

- Solutions
  - Enterprise Application Integration (EAI)
  - Enterprise Resource Planning (ERP)
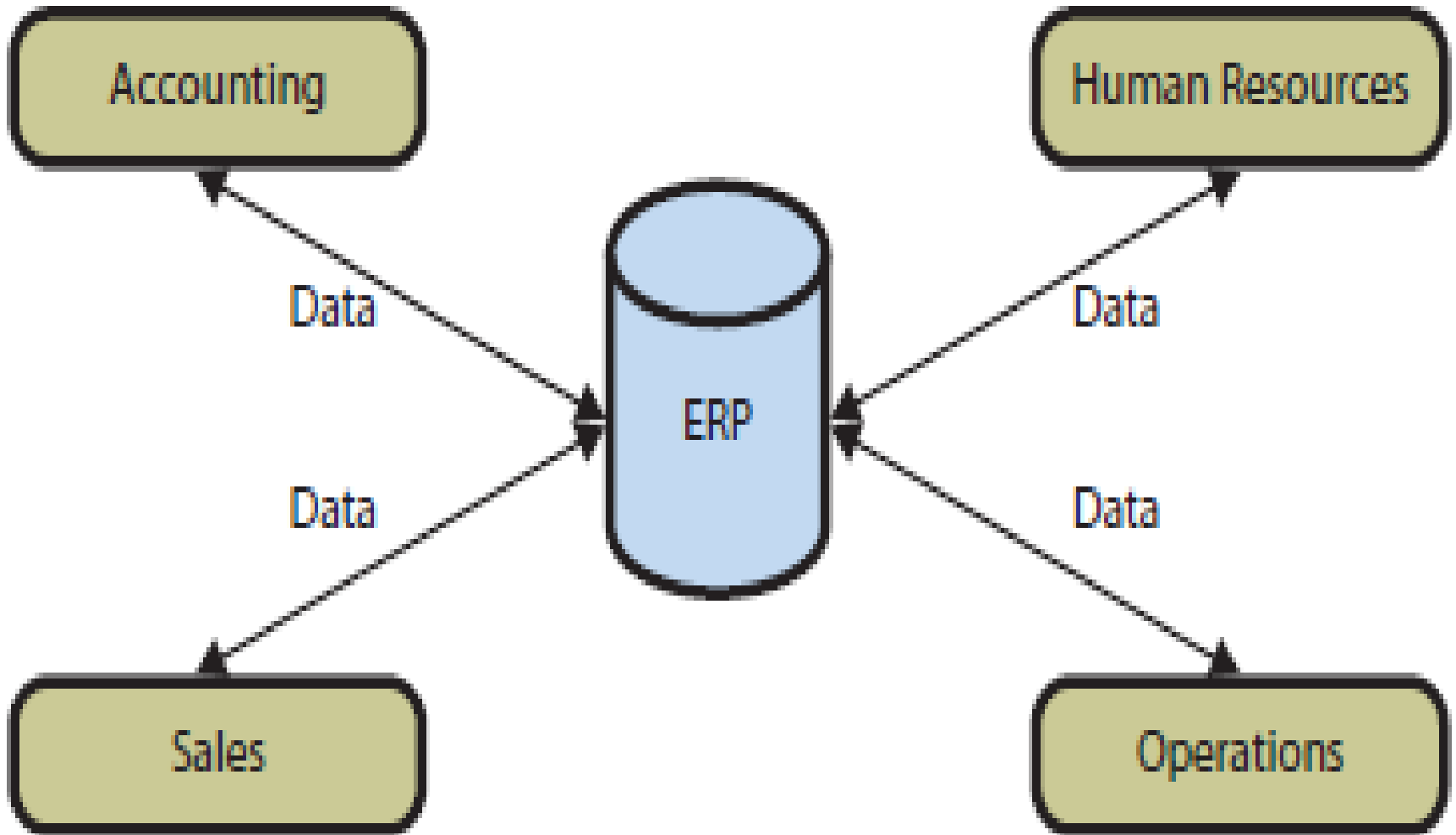
What Problem Does an EAI System Solve?
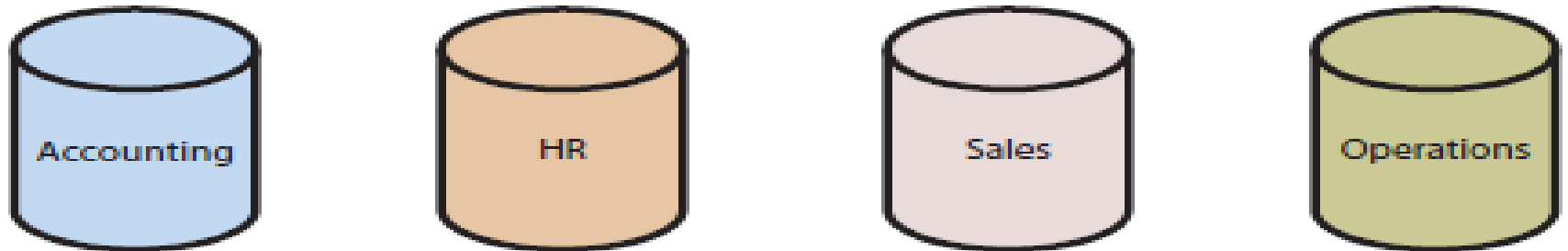
(a) Information Silos Without EAI
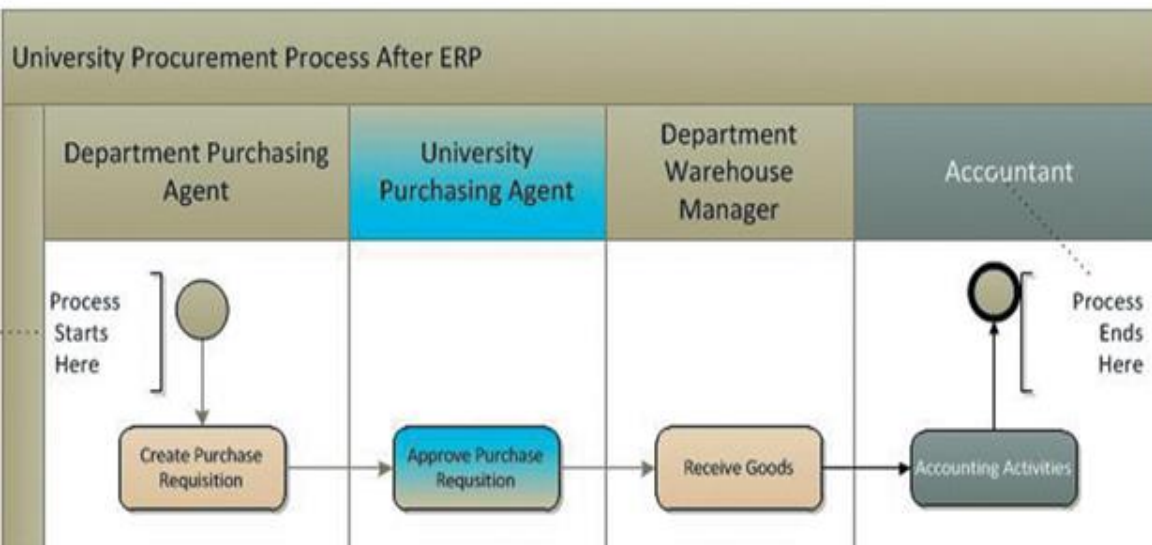
(b) Information Silos Connected with EAI
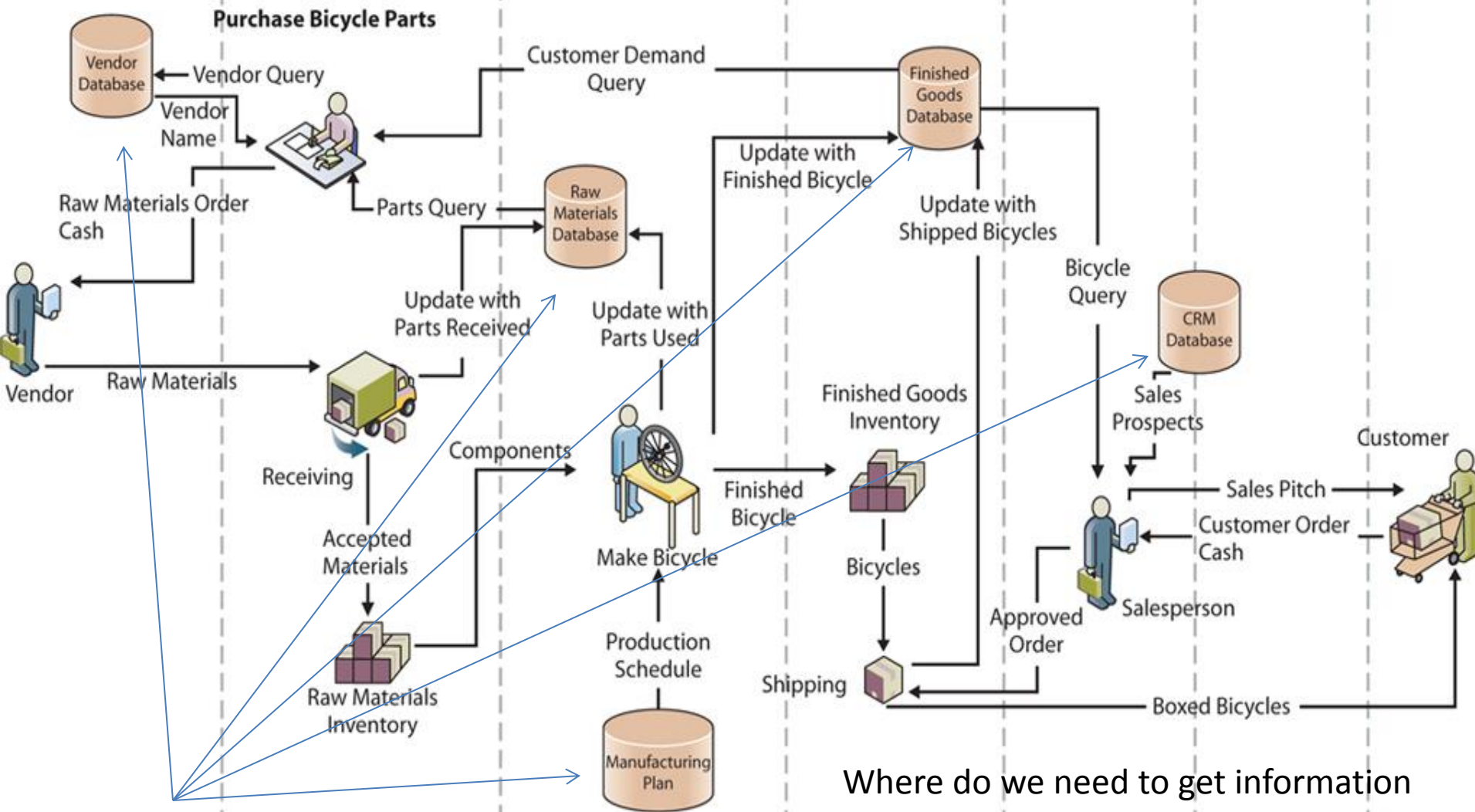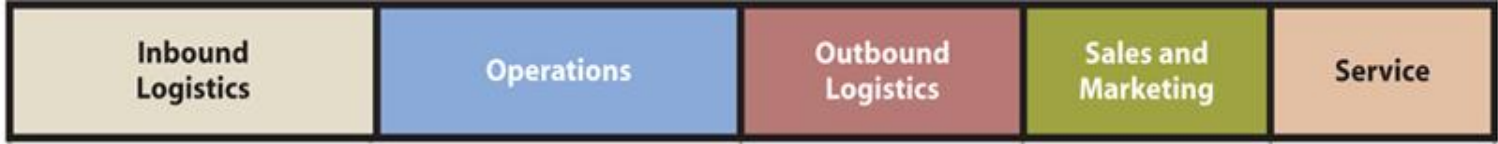
What Problem Does an ERP System Solve?

Accounting — Data — ERP
Human Resources — Data — ERP
Sales — Data — ERP
Operations — Data — ERP

University Procurement Process Before ERP

Department Purchasing Agent	University Purchasing Agent	Department Warehouse Manager	Accountant

Process Starts Here

Create Purchase Order → Receive Goods → Accounting Activities → Process Ends Here

Before ERP Implementation

Objectives	Measures
Use reliable suppliers	Not specified
Use boosters (unstated)	Not specified

University Procurement Process After ERP

Department Purchasing Agent	University Purchasing Agent	Department Warehouse Manager	Accountant

Process Starts Here

Create Purchase Requisition → Approve Purchase Requisition → Receive Goods → Accounting Activities → Process Ends Here

After ERP Implementation

Objectives	Measures
Reduce cost	Cost

Inbound Logistics	Operations	Outbound Logistics	Sales and Marketing	Service

Purchase Bicycle Parts

Vendor Database

Vendor Query

Vendor Name

Raw Materials Order Cash

Vendor

Raw Materials

Receiving

Accepted Materials

Raw Materials Inventory

Parts Query

Update with Parts Received

Raw Materials Database

Update with Parts Used

Components

Make Bicycle

Production Schedule

Manufacturing Plan

Customer Demand Query

Finished Goods Database

Update with Finished Bicycle

Update with Shipped Bicycles

Finished Goods Inventory

Finished Bicycle

Bicycles

Shipping

Approved Order

Boxed Bicycles

Bicycle Query

CRM Database

Sales Prospects

Sales Pitch

Customer Order Cash

Salesperson

Customer

5 information silos

Where do we need to get information from if we need to know if we can fill an order for 1,000 bikes by next week?

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Inbound Logistics | Operations | Outbound Logistics | Sales and Marketing | Service

ERP Database

Purchasing Module | Materials Management Module | Production & Manufacturing Module | Sales & Distribution Module | Customer Relationship Module | Financial & Cost Module

Where do we need to get information from if we need to know if we can fill an order for 1,000 bikes by next week?

Vendor Query
Purchase Bicycle Parts
Customer Demand Query
Vendor Name
Parts Query
Update with Finished Bicycle
Update with Parts Used
Update with Parts Received
Raw Materials Order
Cash
Vendor
Raw Materials
Receiving
Accepted Materials
Production Schedule
Components
Make Bicycle
Finished Bicycle
Finished Goods Inventory
Bicycles
Update with Shipped Bicycles
Update with Sale
Bicycle Query
Sales Prospects
Sales Pitch
Customer
Customer Order
Cash
Sales Prospects
Approved Order
Salesperson
Shipping
Boxed Bicycles
Raw Materials Inventory

1 central database

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Where did ERP systems come from?

- Grew out of manufacturing software
  - MRP – Manage inventory, production & labor
  - MRPII – adds in:
    - Financial tracking of manufacturing processes
    - Ability to schedule capacities
- Other drivers too
  - Y2K
  - Sarbanes-Oxley (SOX)

What Are the Elements of an ERP System?

- SCM – P2P, O2C, inventory management, supplier management

- Manufacturing – scheduling, capacity planning, quality control, BOM

- CRM – sales prospecting, customer management, marketing, customer support, call center support

- Human Resources – payroll, time and attendance, HR management, commission calculations, benefits admin

- Accounting – GL, AR, AP, cash management, fixed-asset accounting

What Are the Elements of an ERP System?

- Five Components of an ERP System
  - Software
  - Hardware
  - Data
  - Procedures
  - People
- What about systems like SAP Business ByDesign?

What Are the Elements of an ERP System?

- ERP Software
  - Configuration
- ERP Databases
  - Over 25,000 tables
- Procedures
  - Train the trainer (in-house training)

6-13

What Are the Elements of an ERP System?

- Hardware
  - ERP Hardware Dilemma
- People
  - Users
  - Analysts
  - Consultants

What Are the Elements of an ERP System?

- Inherent Business Processes in ERP
  - System specified business processes
  - Process blueprints
  - Is it better to change the software to conform to existing business processes or better to change business processes to match software?

What Are the Benefits of an ERP System?

- Implements processes that are industry best practices.

- Data sharing occurs in real time.

- Management can be more insightful and provide better oversight.

- The information silo problem is solved.

How tough is managerial accounting?
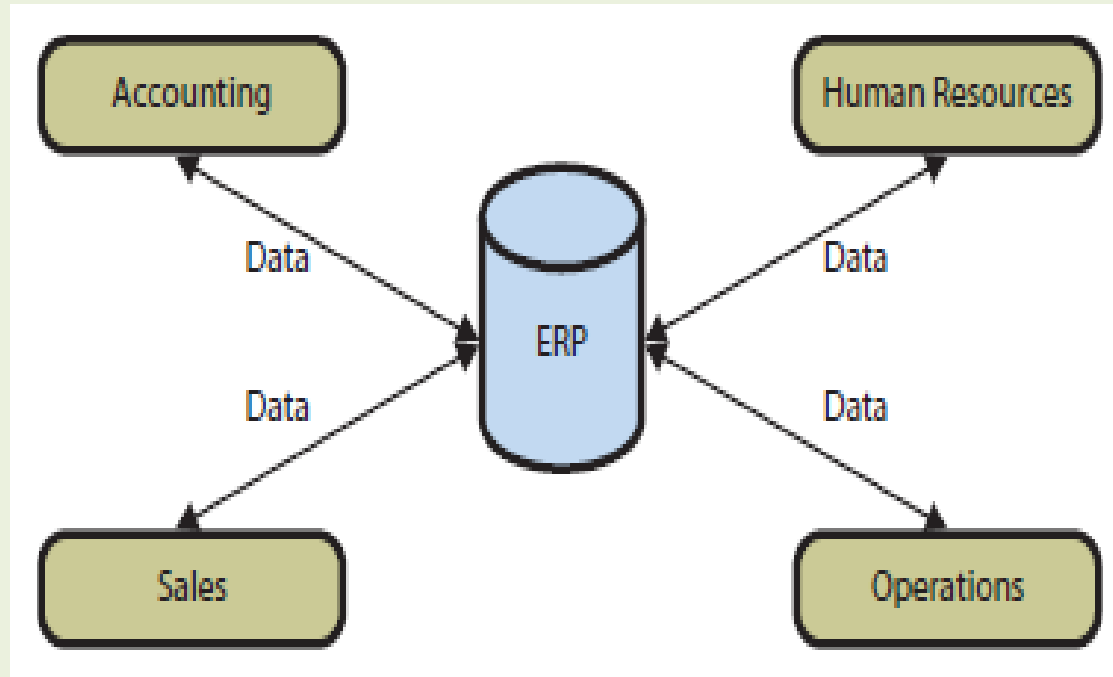
Vs.
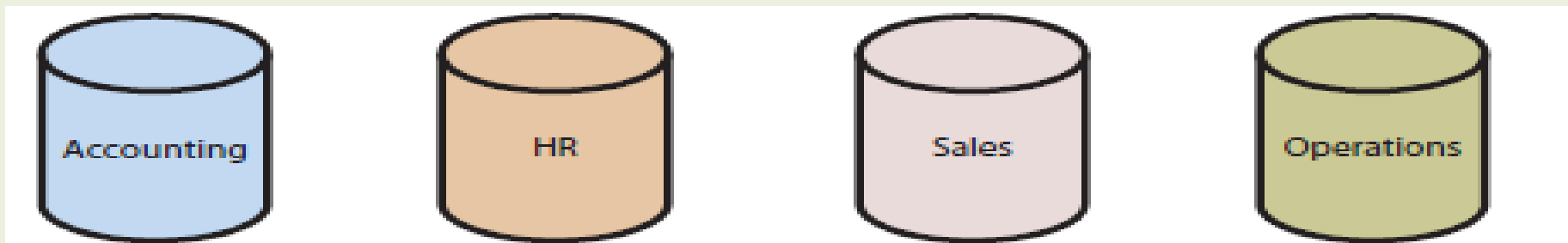
What Are the Benefits of an ERP System?

Example Measures of the Benefits of ERP

Objective	Measure
Reduce inventory	Inventory costs were 25% of sales, now 15%
Reduce costs	Costs of raw materials 10% less than before
Reduce returns	Reduce number of returns by 10%
Reduce end-of-year closing time	Closing time in days was 14, now 4
Volume of cross-selling	Cross-selling revenues double

What Are the Challenges of Implementing an ERP System?

- Sample implementation Decisions

What do we select as our item identifier?
How long are resupply times?
What will be our order sizes?
Which BOM format should we use?
Who approves customer credit (and how)?
Who approves production capacity (and how)?
Who approves schedule and terms (and how)?
What actions need to be taken if the customer modifies the order?
How does management obtain oversight on sales activity?

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What Are the Challenges of Implementing an ERP System?

- People Issues

Work is changed
Top management involvement after initial decision to implement
Top management oversells capabilities
Perceived threat to department autonomy
Failure to specify objectives and measures for new processes

What Types of Organizations Use ERP?

Figure 6-13 ERP by
Industry

- ERP by Industry Type
- ERP by Organization Size
- International ERP

Manufacturing
Distribution
Mining, materials extraction, petroleum
Medical care
Government and public service
Utilities
Retail
Education

Who Are the Major ERP Vendors?

- ERP Vendor Market Share

Company	ERP Market Rank	Remarks	Future
Epicor	5	Strong industry-specific solutions, especially retail.	Epicor 9 designed for flexibility (SOA). Highly configurable ERP. Lower cost.
Microsoft Dynamics	4	Four products acquired by acquisition: AX, Nav, GP, and Solomon. AX and Nav more comprehensive. Solomon on the way out? Large VAR channel.	Products not well integrated with Office. Not integrated at all with Microsoft development languages. Product direction uncertain. Watch for Microsoft ERP announcement on the cloud (Azure).
Infor	3	Privately held corporation that has acquired an ERP product named Baan, along with more than 20 others.	Span larger small companies to smaller large companies. Has many solutions.
Oracle	2	Combination of in-house and acquired (PeopleSoft, Siebel) products.	Intensely competitive company with strong technology base. Large customer base. Flexible SOA architecture. Expensive. Oracle CEO Ellison owns 70% of NetSuite.
SAP	1	Led ERP success. Largest vendor, most comprehensive solutions. Largest customers.	Technology older. Expensive and seriously challenged by less expensive alternatives. Huge customer base. Future growth uncertain.

Who Are the Major ERP Vendors?

- ERP Products

Small Companies <$100M Sales	Midsized Companies $100M to $1B Sales	Large Companies >$1B Sales
Epicor (Epicor 9)		
Microsoft Dynamics (AX, Nav, GP, SL)		
Infor (Baan & many, many others)		
	Oracle	
	SAP	
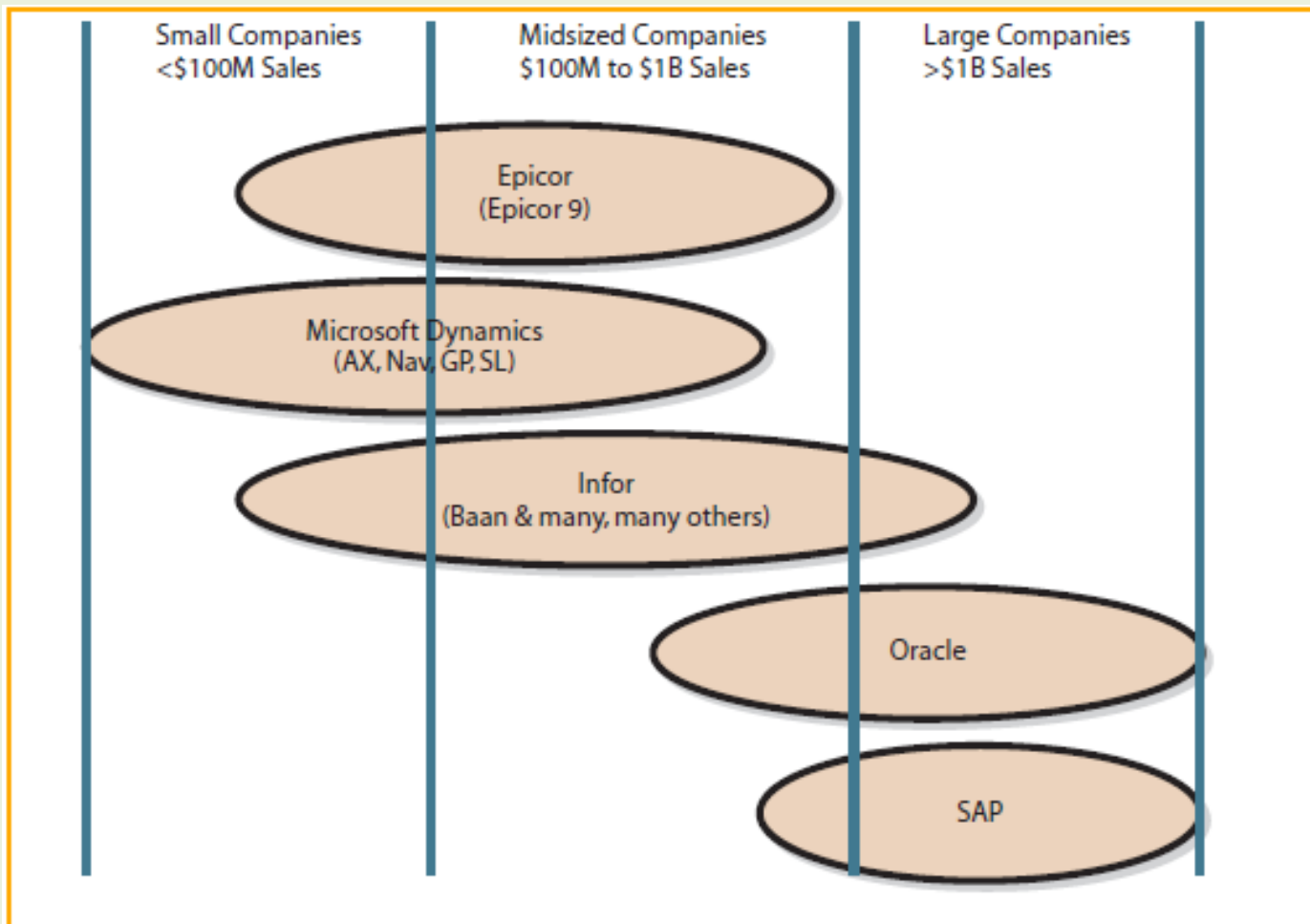
What Makes SAP Different from Other ERP Systems?

- SAP Modules

QM	Quality Management	PP	Production Planning
FI	Financial Accounting	CO	Controlling
PM	Plant Maintenance	SD*	Sales and Distribution
HR	Human Resource	MM**	Materials Management
PS	Project Systems	BI	Business Intelligence

*SD   includes sales processes, the topic of Chapter 8.
**MM   includes procurement processes, the topic of Chapter 7.

What Makes SAP Different from Other ERP Systems?

- SAP Inputs and Outputs - Procurement

What Makes SAP Different from Other ERP Systems?

- SAP Business Suite
  - SAP ERP
  - SAP CRM
  - SAP SRM
  - SAP SCM
  - SAP NetWeaver