ACS-1803
Introduction to Information Systems

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Functional Area Systems
Accounting Transaction Systems

Lecture Outline 4, Part 1

System Examples: Functional Area Info Systems

Functional Area	Information System	Examples of Typical Systems
Accounting and Finance	Systems used for managing, controlling, and auditing the financial resources of the organization	▌ Inventory management ▌ Accounts payable ▌ Expense accounts ▌ Cash management ▌ Payroll processing
Human Resources	Systems used for managing, controlling, and auditing the human resources of the organization	▌ Recruiting and hiring ▌ Education and training ▌ Benefits management ▌ Employee termination ▌ Workforce planning
Marketing	Systems used for managing new product development, distribution, pricing, promotional effectiveness, and sales forecasting of the products and services offered by the organization	▌ Market research and analysis ▌ New product development ▌ Promotion and advertising ▌ Pricing and sales analysis ▌ Product location analysis
Production and Operations	Systems used for managing, controlling, and auditing the production and operations resources of the organization	▌ Inventory management ▌ Cost and quality tracking ▌ Materials and resource planning ▌ Customer service tracking ▌ Customer problem tracking ▌ Job costing ▌ Resource utilization

Accounting
Transaction Cycle
• Revenue
• Expense

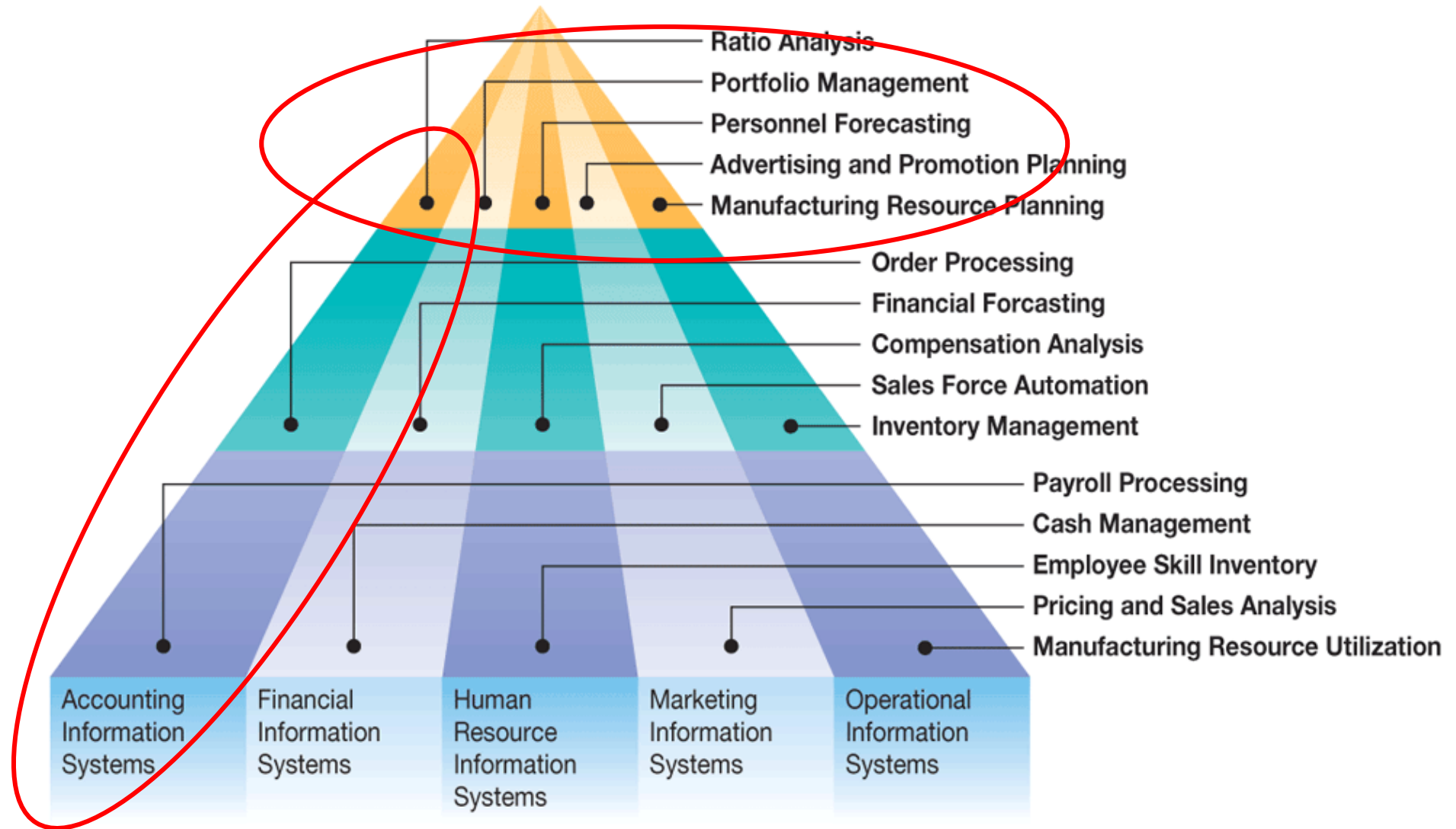# Functional Area Information Systems

Figure 6.34 Functional area information systems.

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Functional Area Systems: Accounting

- An Accounting Information System (AIS) monitors/documents the operations of the aspects of business operations that have do with:
  - Accountability for the assets/liabilities of the enterprise
  - The determination of the results of operations leading to the computation of comprehensive income
  - The financial reporting aspects of the business operations.

- Evidence of financial transactions must be contained in one main accounting system that is capable of producing (at least) two main financial statements that are required for a business: **the balance sheet** and the **income statement**.

Accounting Information Systems (AIS)

- By Definition, accounting is a data collection, identification and storage process, as well as an information system
  - AIS collects, records, stores and processes accounting and other data to produce information

- AIS helps managers answers questions such as:
  - How much, and what kind of debt is outstanding?
  - Were sales higher this period than last?
  - What assets do we have?
  - What were our cash outflows and inflows?
 - Did we make a profit last period?

Business Processes – Transaction Cycles

- Many business activities are part of events involved in a give-get exchange.

- Organizations engage in many of those give-get exchanges e.g giving cash in exchange for something, or giving employees a paycheque in return of their labour

- To properly gather data needed to support processes and to create information for decision-making, businesses must identify their business processes as groups of those give-get exchanges – those are known as Transaction Cycles.

  - Then they can record data (TPS) as those business processes occur.

- These cycles process a few related transactions repeatedly

Transaction Processing Cycles

- <u>Revenue Cycle</u>: Goods and Services are sold for Cash or a future promise to receive cash

- <u>Expenditure Cycle</u>: Companies purchase raw materials to use in productions, or inventories for resale in exchange for cash or a future promise to pay cash

- <u>Production or Conversion Cycle</u>: Raw materials transformed into finished goods

- <u>Human Resources/Payroll Cycle</u>: Employees are hired, trained, compensated, evaluated, promoted, and terminated

- <u>Financing Cycle</u>: Companies sell shares to investors and borrow money, where investors are paid dividends and interest is paid on loans

AIS Subsystems
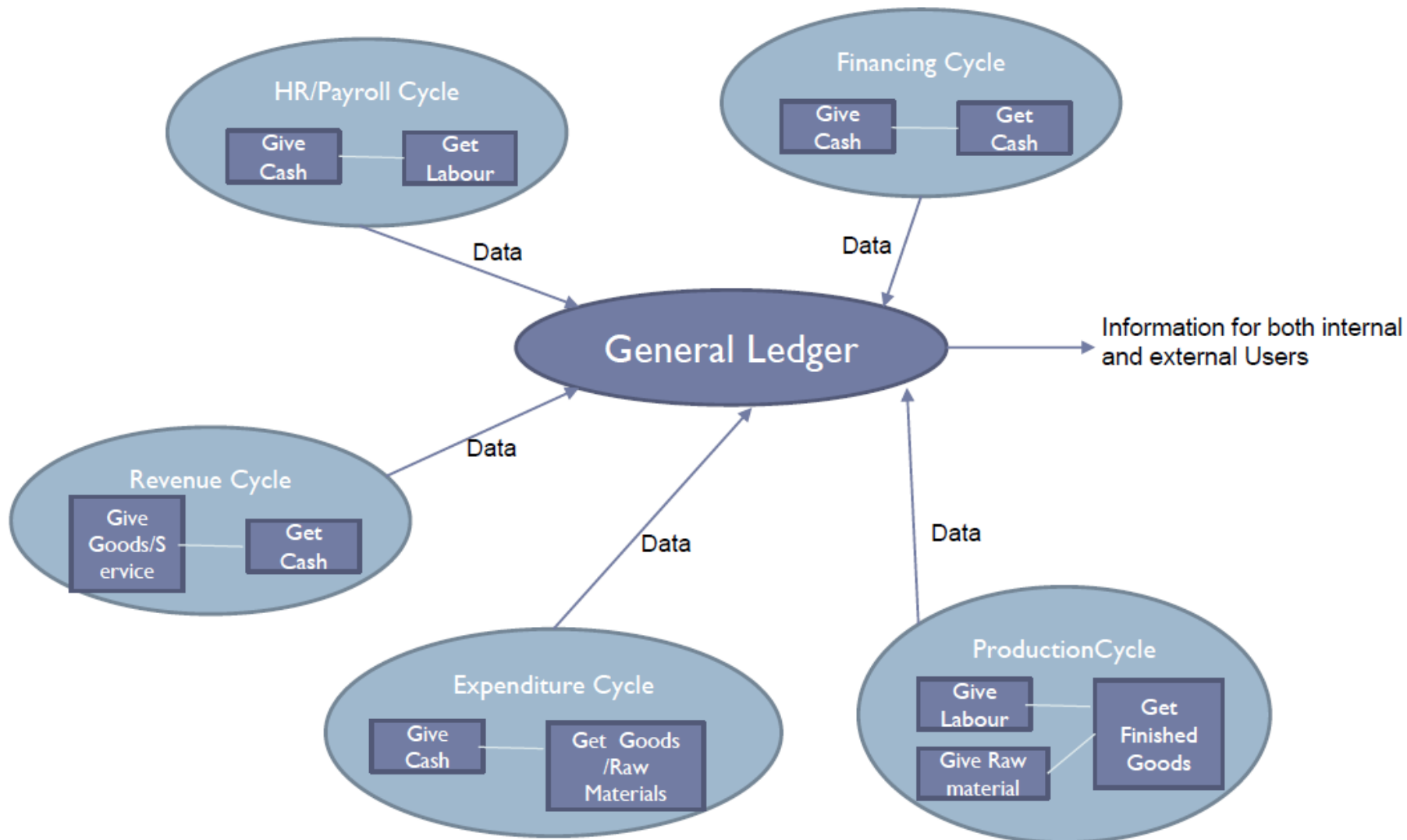
Accounting TPS: Transaction Cycles

- Every Cycle can be implemented on Information Systems with modules for each cycle.
  - Not every organization needs to implement every module
- Each Cycle can include many different processes and activities
- The last activity in each cycle, is to send appropriate information to other cycles
- In the end all the data ends up in the General Ledger and Reporting System, which is the information-processing operation involved in updating the general ledger and preparing reports for both managers and external parties

# Transaction Processing Systems (TPS) for Accounting

- Order entry, Accounts Receivable, Accounts payable, purchasing and receiving, inventory, Fixed Assets are all information systems that support the accounting operation.

Transaction Processing Cycle

- The transaction processing cycle is a process:

  - Begins with capturing data about a transaction

  - Ends with an information output, such as financial statements

Accounting Transaction Cycle

- The two major transaction cycles
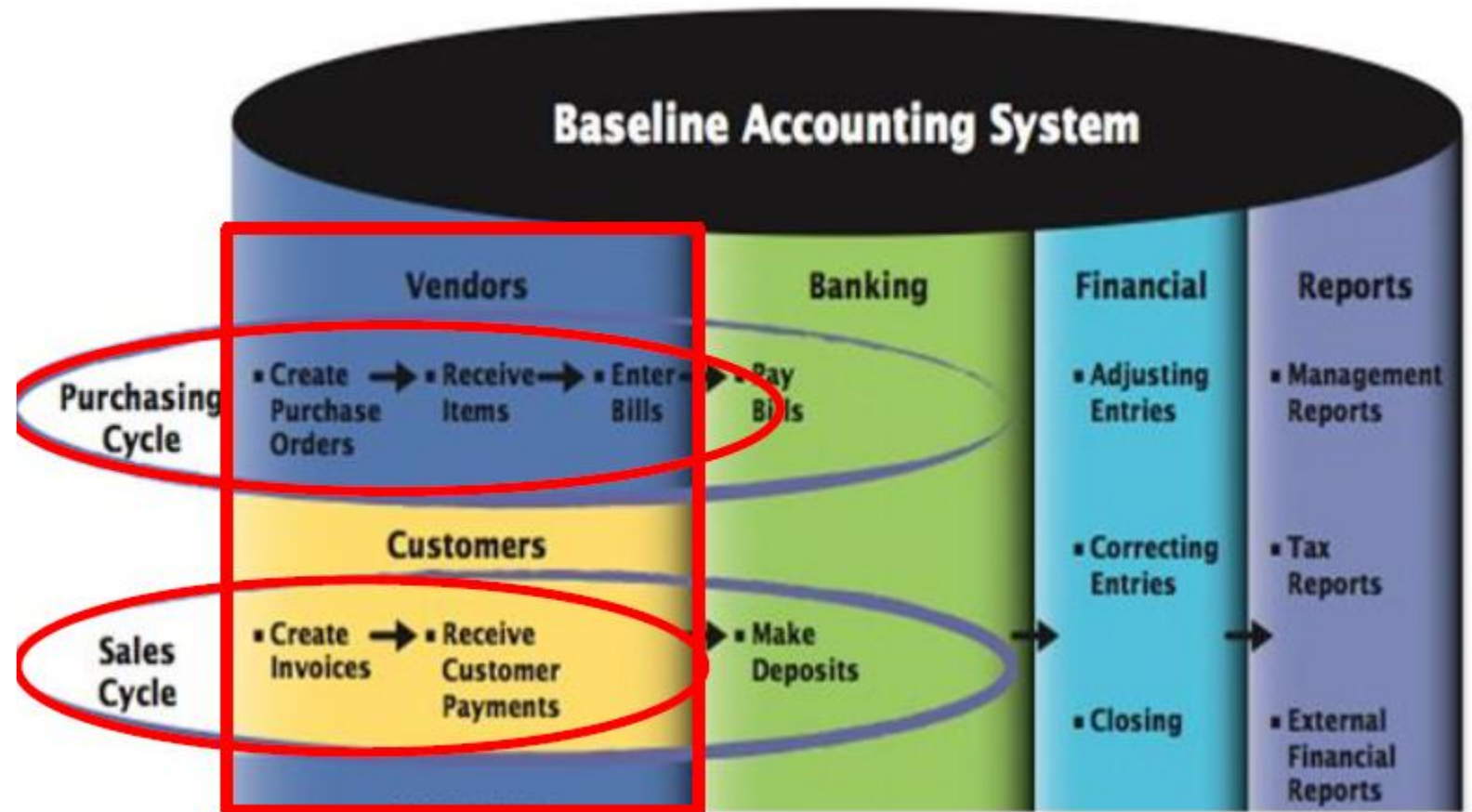 1. Revenue cycle
  2. Expenditure cycle
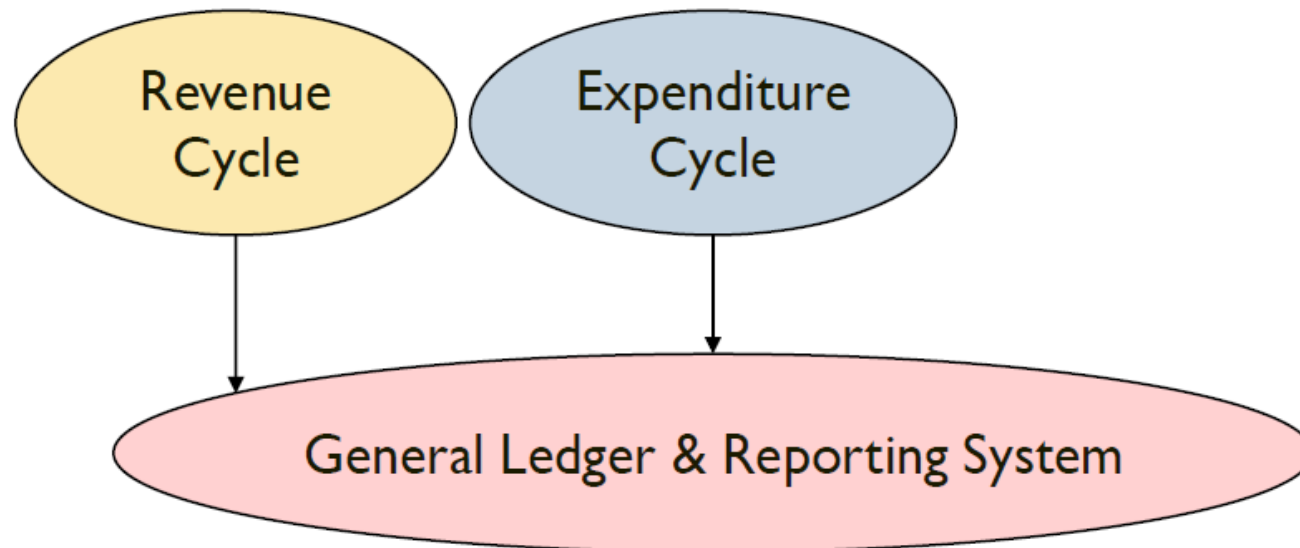
Accounting Transaction Cycle

1. The revenue cycle: involves activities of selling goods or services and collecting payment for those sales.

2. The expenditure cycle: involves activities of buying and paying for good or services used by the organization.

Baseline Accounting Transaction Cycles

Each transaction cycle is expanded to show the transactions in the cycle.
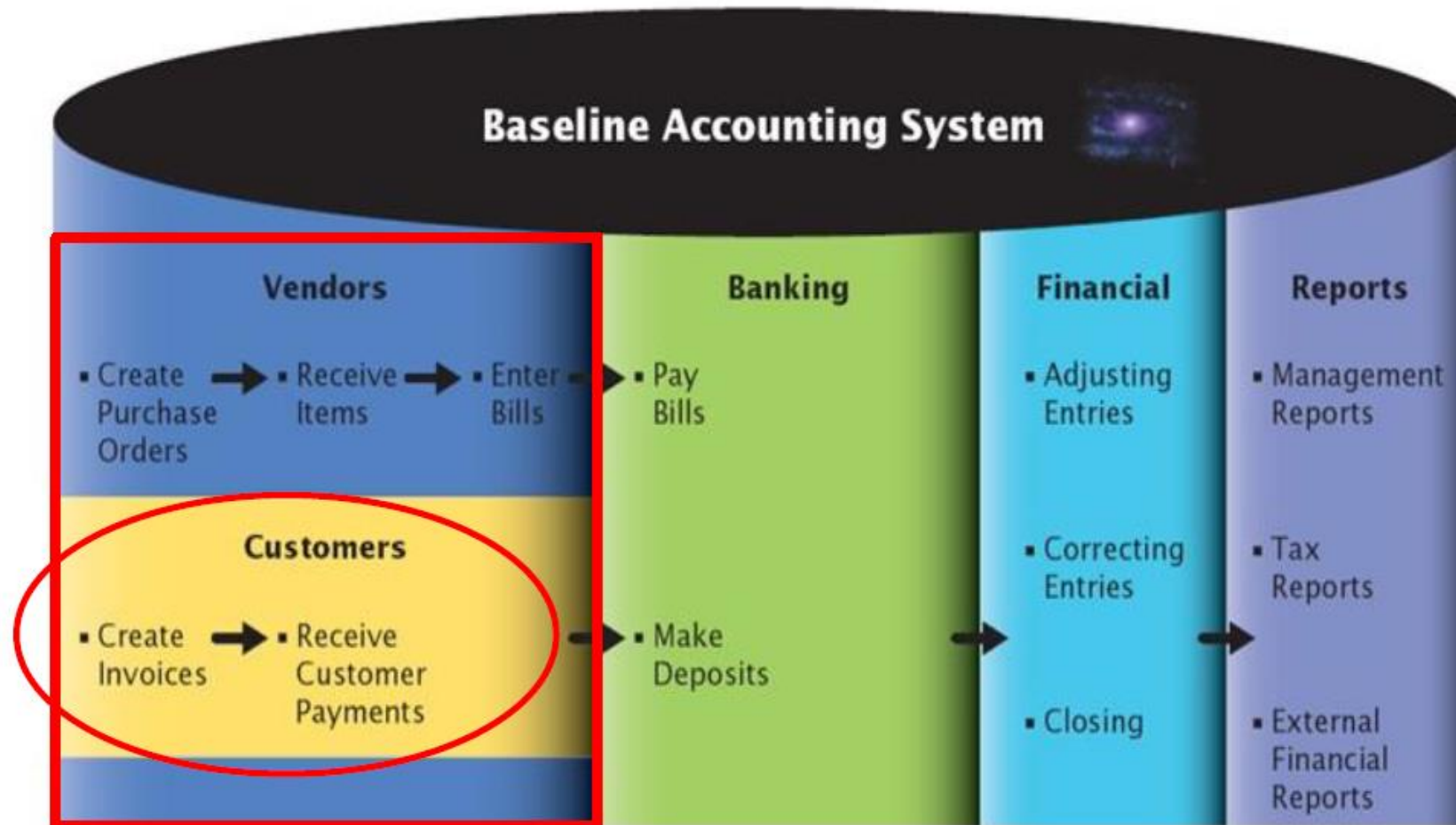
Accounting Transaction Cycles

Revenue (Sales) Cycle

Source Document	Function
Sales order	Take customer order.
Delivery ticket	Deliver or ship order
Remittance advice	Receive cash.
Deposit slip	Deposit cash receipts.
Credit memo	Adjust customer accounts

Baseline Accounting Transaction: Revenue (Sales) Cycle
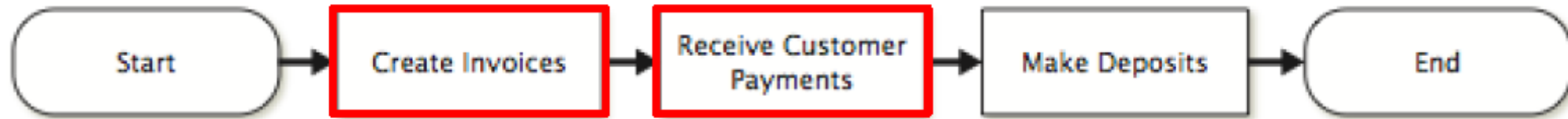
Sales Cycle Activities
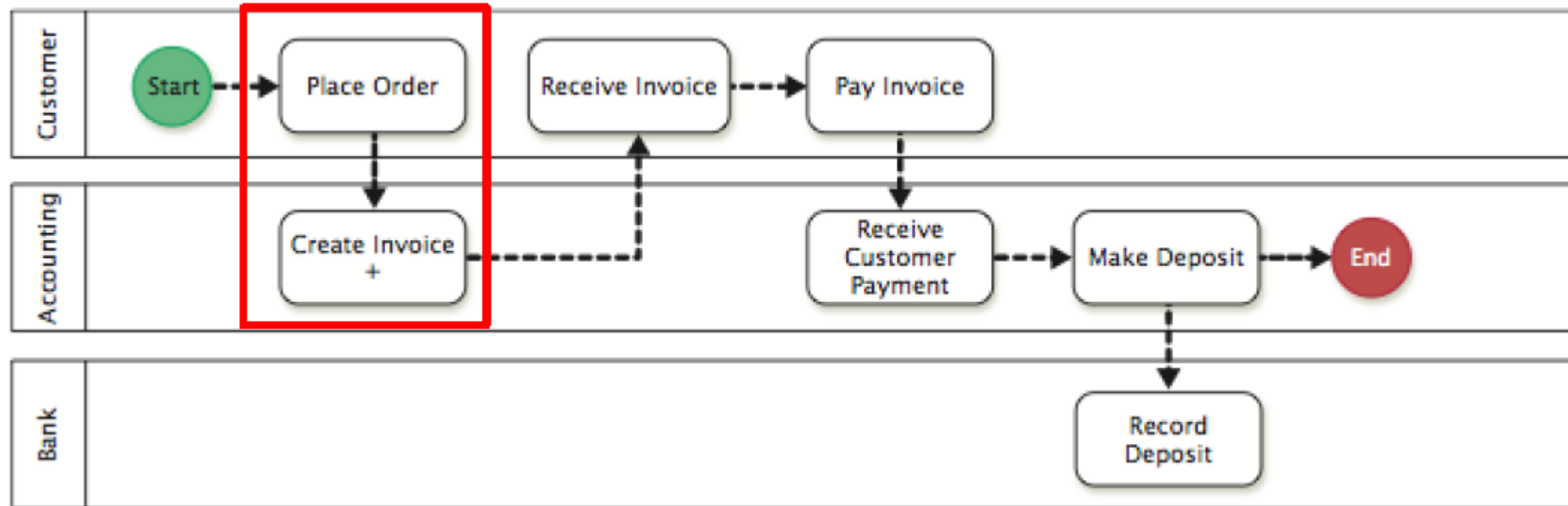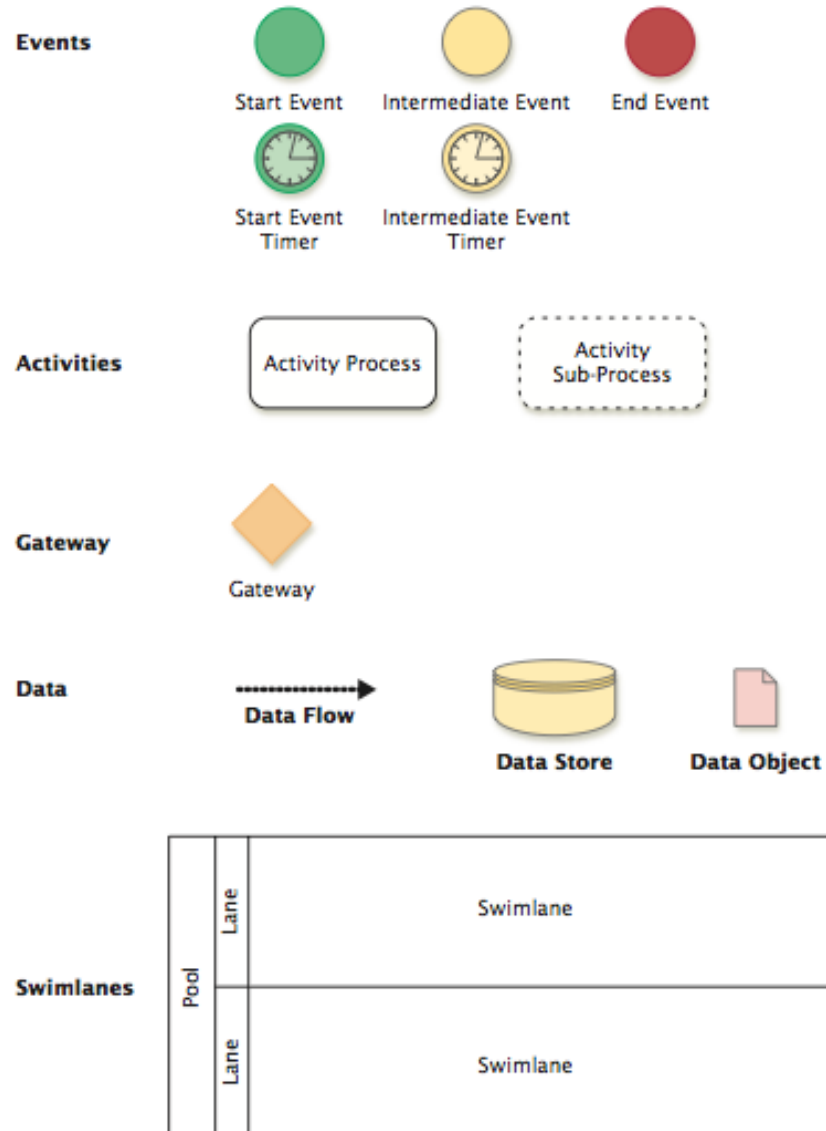
Flow Chart Diagram for Sales Cycle Activities

Swim Lane Diagram
for Sales Cycle Processes

Business Process Modeling Notation (BPMN)

Events

Start Event · Intermediate Event · End Event

Start Event Timer · Intermediate Event Timer

Activities

Activity Process · Activity Sub-Process

Gateway

Gateway

Data

Data Flow · Data Store · Data Object

Swimlanes

Pool · Lane · Swimlane · Lane · Swimlane

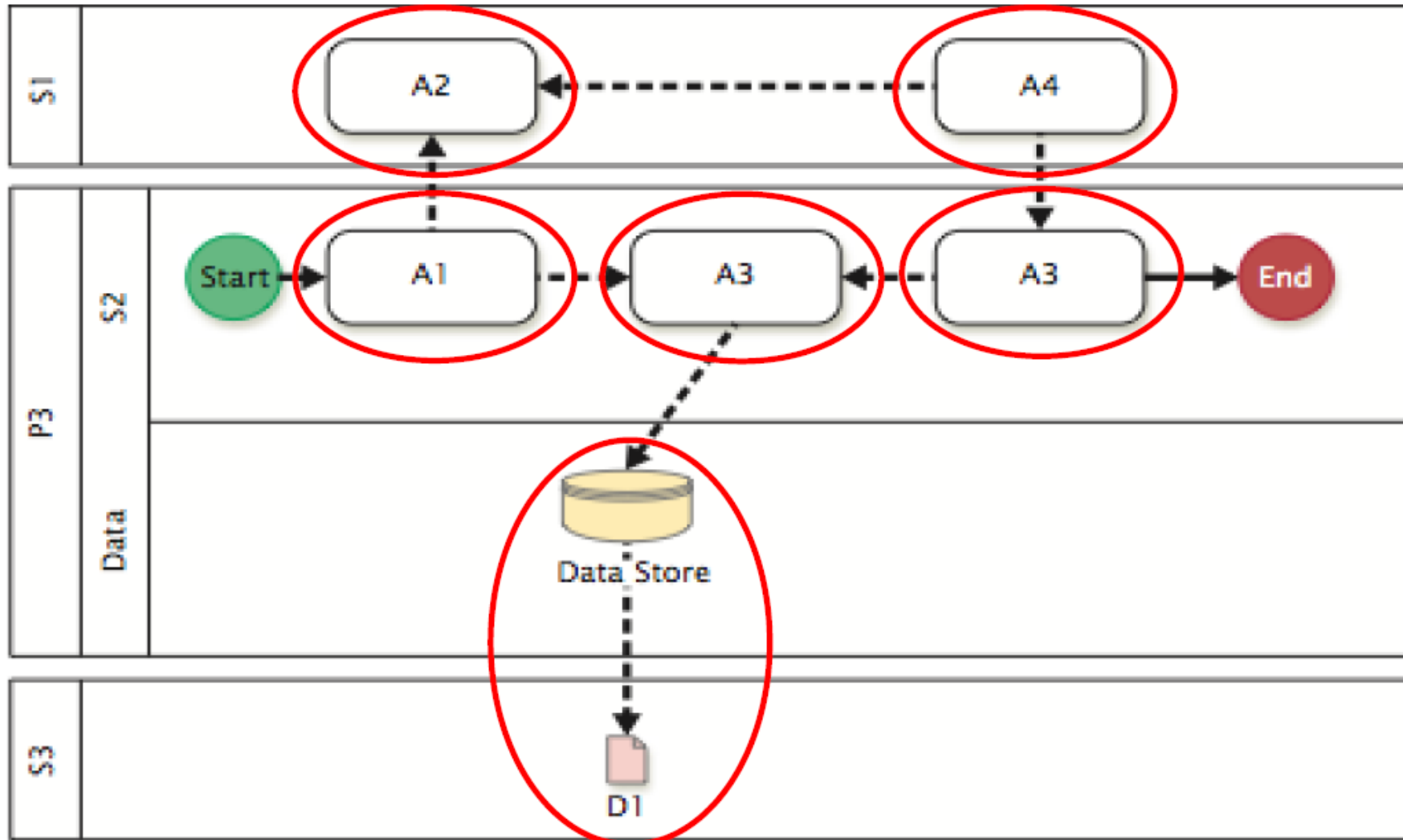# Guidelines for Well-Designed Business Process Map

Avoid
- **Black Holes,**
- **Miracles, and**
- **Gray Holes**
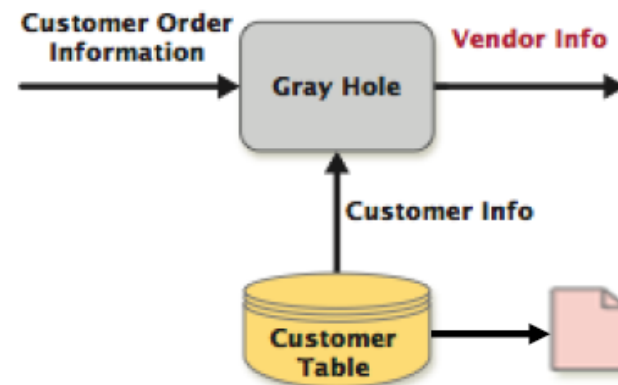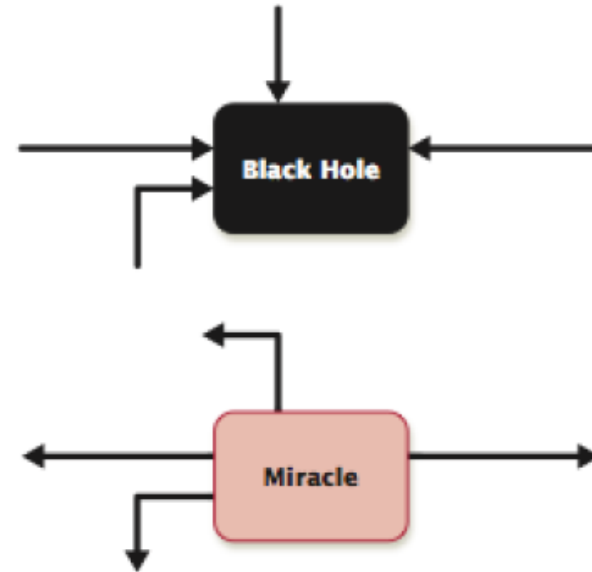
BPMN Exercise

Identify and list the errors that you see in this BPMN

Understanding the Accounting Process Model for a Customer/Sales Transaction

- Let's examine the baseline accounting process for a customer/ sales transaction within a company:
  - Company: ExpressoCoffee
  - Customer places and online order
  - ExpressoCoffee processes the order
  - The order shipment is confirmed and sent to ExpressoCoffee's warehouse – which fulfils the order, ships the product and notifies Accounting
  - Accounting generates the invoice and sends to the customer

How do we design the accounting/sales system to manage this business process?

Customer Module: Process Order BPMN Example

Customer Module: Create Invoices BPMN 2.0 DIAGRAM
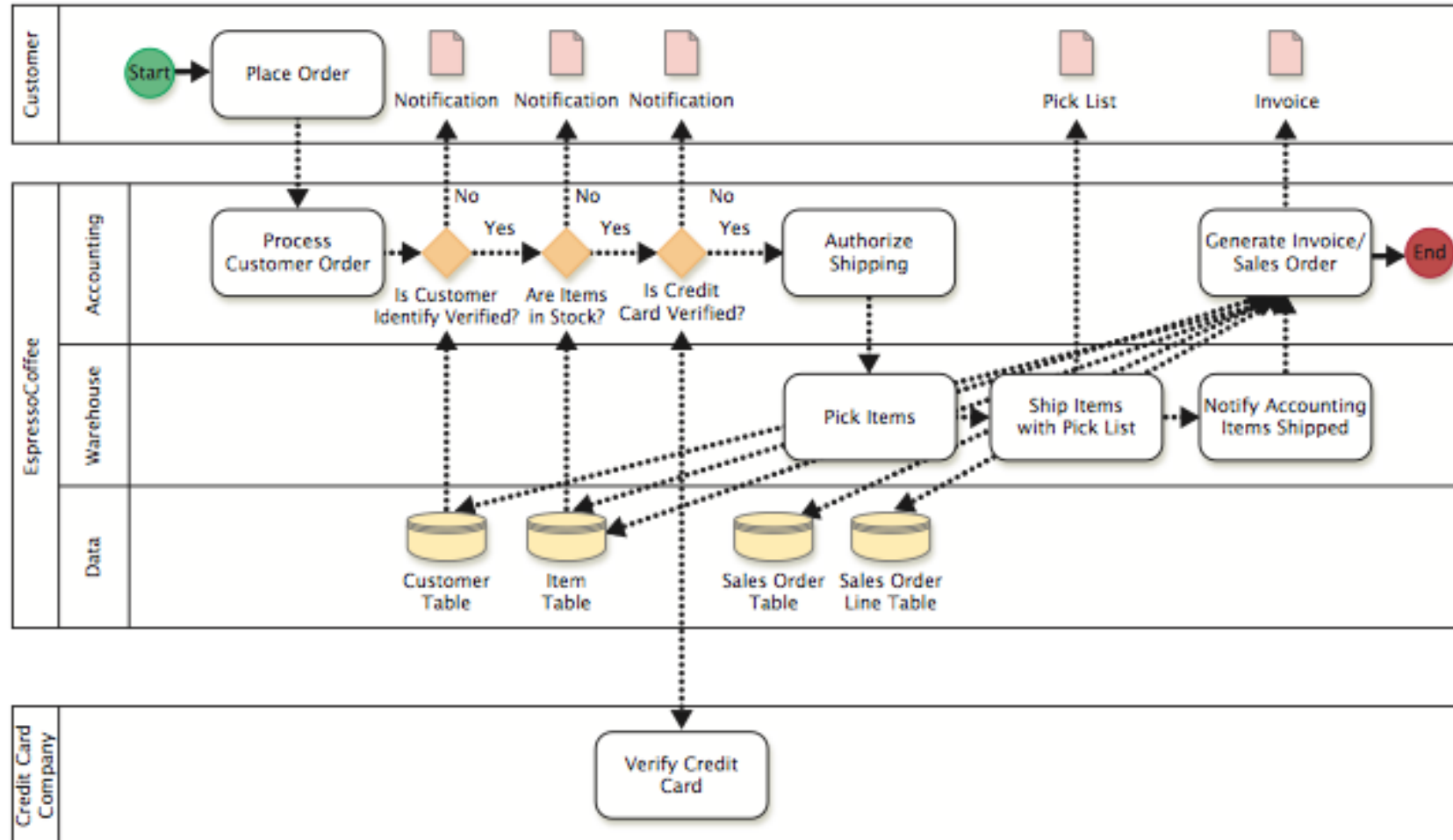
Reading a BPMN:
Who does What, When, Where & How?

1. Review the high-level and detail process maps

   a) Identify the Start Event that triggers the process

   b) Identify the activities

   c) Identify the gateways where decisions on the process and data flow occur

   d) Identify data objects

   e) Identify data stores

   f) Trace data flows

   g) Identify the End event

2. Create a Process Map Organizer to organize the activities

3. Write a Narrative for the business activity

4. Annotate the Narrative and cross-reference to the Process Map Organizer

5. Create Database Tables and link to Process Map

Reading a Business Process Map

Step 1. Review the high-level process map

Customer Module: Create Invoices FLOWCHART

Start → Process Customer Order → Proceed with Order?
- Yes → Process Shipping → Generate Invoice → End
- No → Incomplete Order or Customer Payment Card Declined → (back to Process Customer Order)
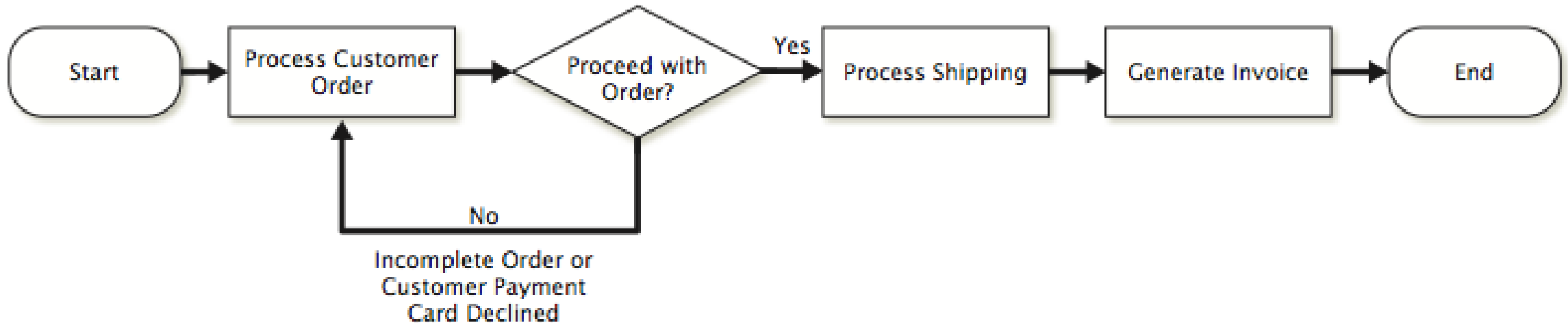
Reading a Business Process Map

Step 1. Review the detail process map and identify the key activities, gateways, objects and data stores

Customer Module: Create Invoices BPMN 2.0 DIAGRAM
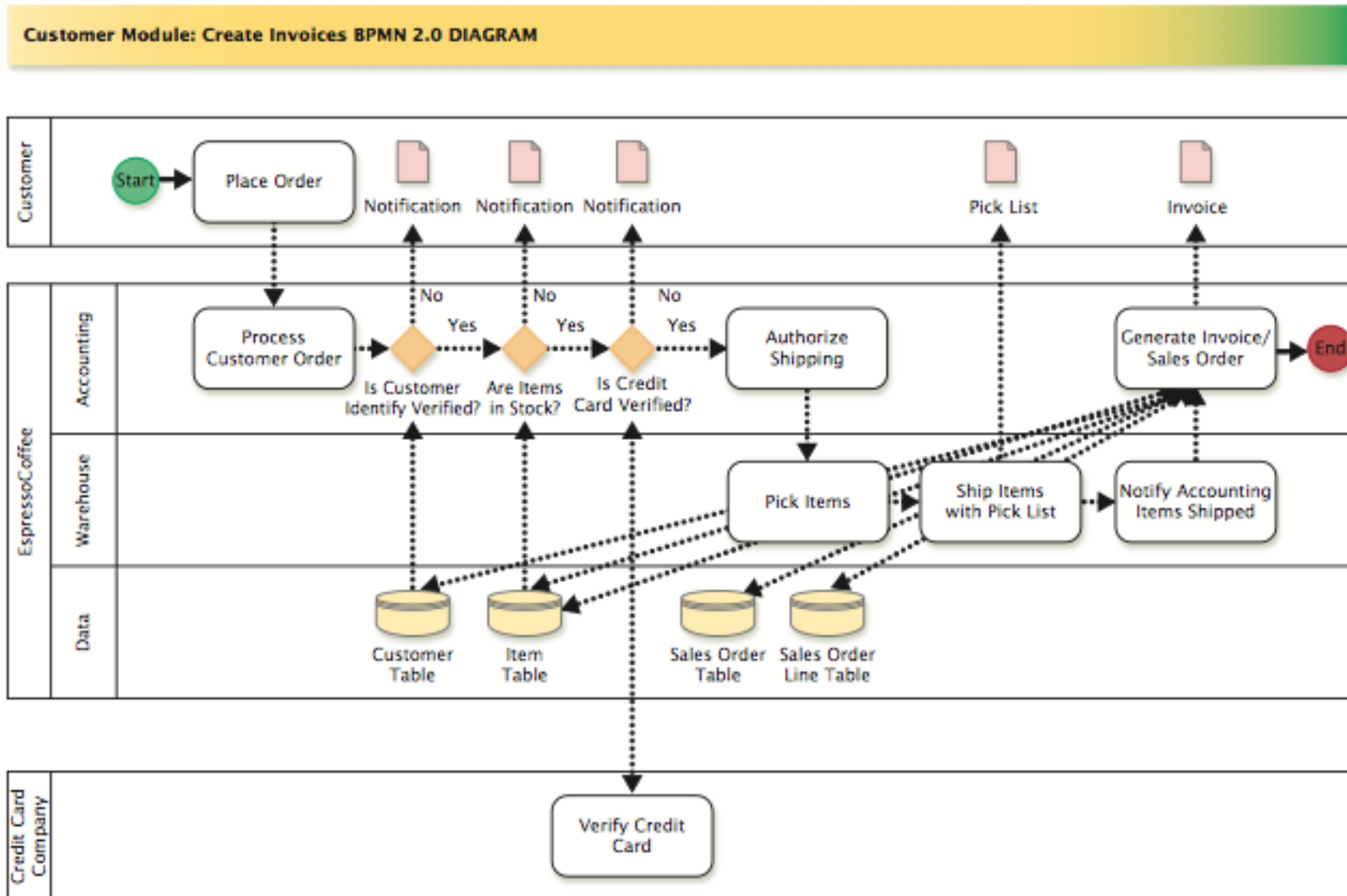
Reading a Business Process Map

Step 2. Create a process map organizer to organize activities

Business Process Map Organizer			
Activity	**Gateway (Decision)**	**Swimlane (BPMN Only)**	**Data Store (BPMN Only)**
Place Order		Customer	
Process Customer Order		Accounting	
	Verify Customer Identity	Accounting	Customer Table
	Verify Items Available	Accounting	Item table
	Verify Credit Standing	Accounting	
Authorize Shipping		Accounting	
Pick Items		Warehouse	Item table
Ship Items with Pick List		Warehouse	
Notify Accounting Items Shipped		Warehouse	
Generate Invoice		Accounting	Customer table Sales Order table Sales Order Line table Item table

Step 2. Create a process map organizer to organize activities

Business Process Map Organizer

	Activity	Gateway (Decision)	Swimlane (BPMN Only)	Data Store (BPMN Only)
(1)	Place Order		Customer	
(2)	Process Customer Order		Accounting	
(3)		Verify Customer Identity (NO)	Accounting	Customer Table Notify Customer
(4)		Verify Items Available (NO)	Accounting	Item table Notify Customer
(5)	Verify Credit with Financial Institution	Verify Credit Standing (NO)	Accounting	Notify Customer
(6)	Authorize Shipping		Accounting	
(7)	Pick Items		Warehouse	Item table
(8)	Ship Items with Pick List		Warehouse	
(9)	Notify Accounting Items Shipped		Warehouse	
(10)	Generate Invoice		Accounting	Customer table Sales Order table Sales Order Line table Item table

Reading a Business Process Map

Step 3. Write narrative for business activity

Example: EspressoCoffee customers place an online order. EspressoCoffee processes the customer order by verifying the customer identity, verifying the items are available, and sending a request to the credit card company to verify the customer's good credit standing. The shipment authorization is sent to the warehouse. The warehouse picks the items from stock. The items are shipped to the customer with a pick list enclosed. The warehouse notifies accounting that the items have shipped. Accounting generates an invoice from the sales information and emails the invoice to the customer. The corresponding database tables are updated.

Step 4. Annotate the narrative

Example: EspressoCoffee customers <u>place an online order</u>. EspressoCoffee <u>processes the customer order</u> by verifying the customer identity, verifying the items are available, and sending a request to the credit card company to verify the customer's good credit standing. The <u>shipment authorization is sent</u> to the warehouse. The <u>warehouse picks the items</u> from stock. The <u>items are shipped</u> to the customer with a pick list enclosed. The <u>warehouse notifies accounting</u> that the items have shipped. <u>Accounting generates an invoice</u> from the sales information and emails the invoice to the customer. The corresponding database tables are updated.
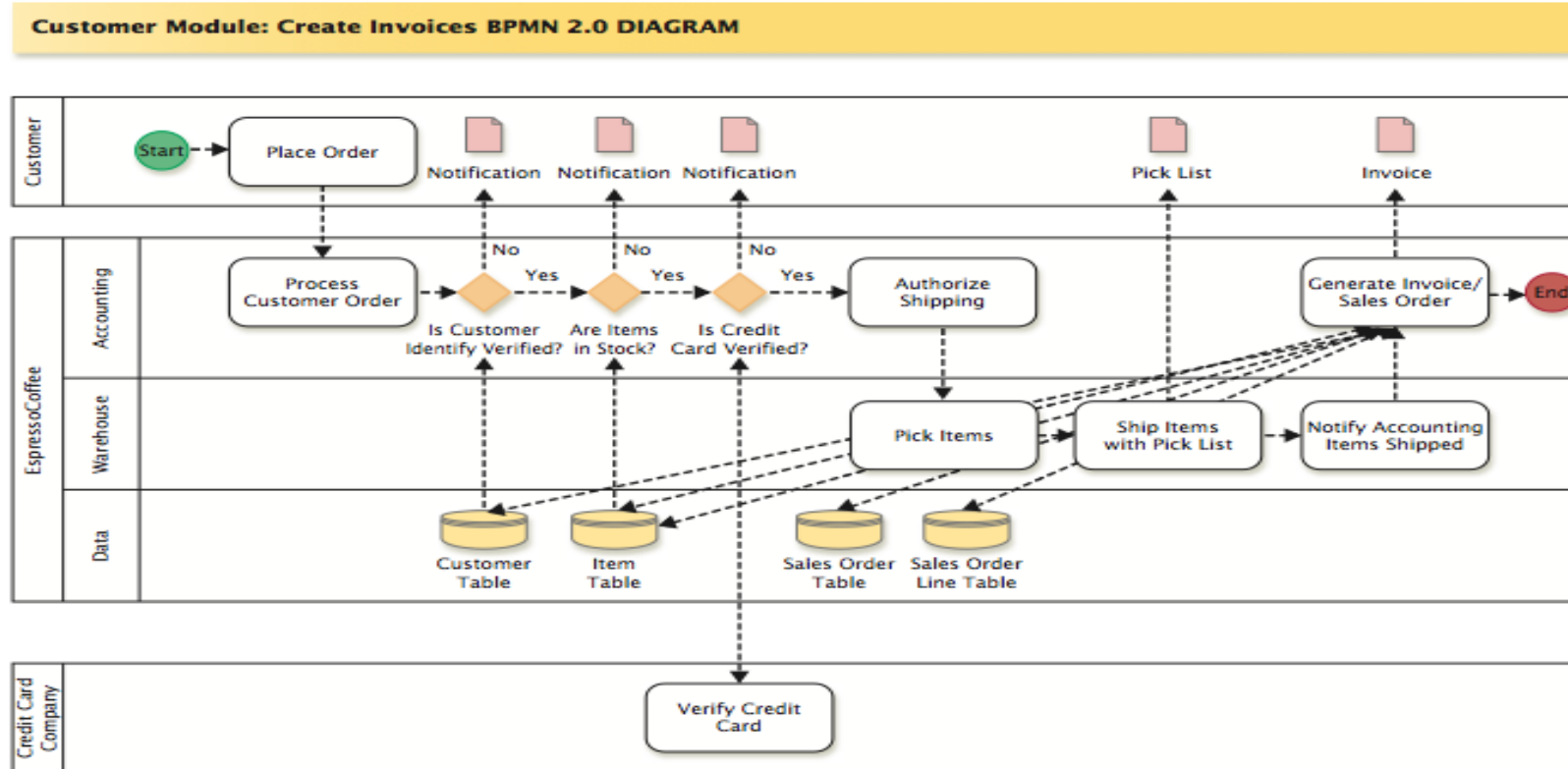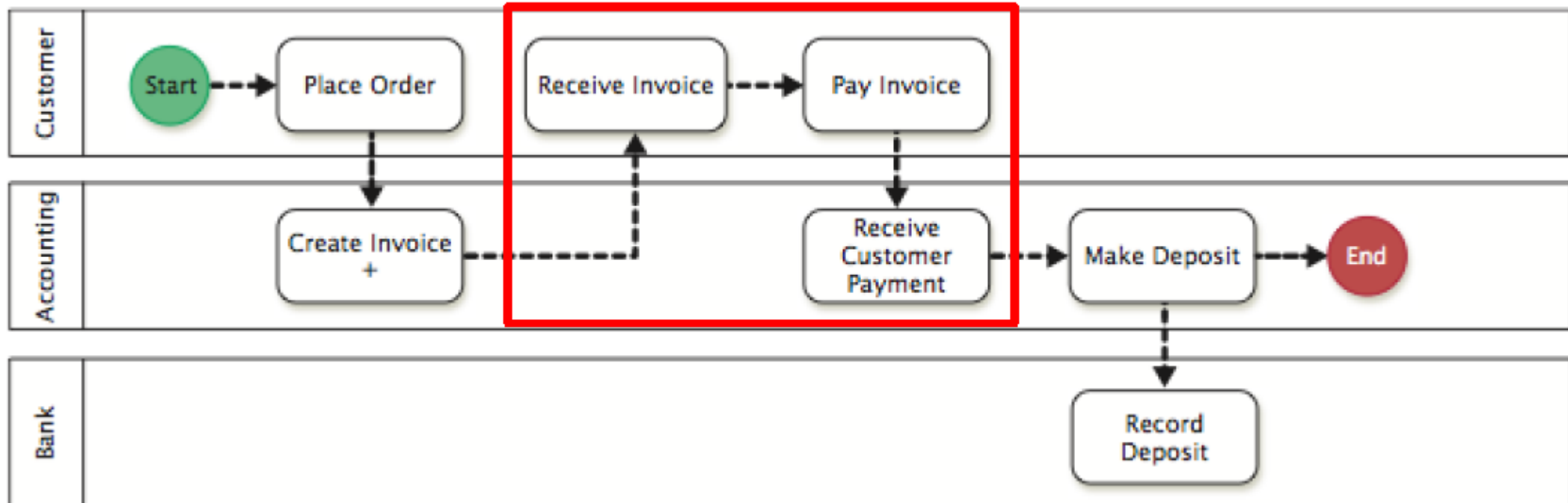
Building a Business Process Map

Step 5. Create database tables and link to business process map

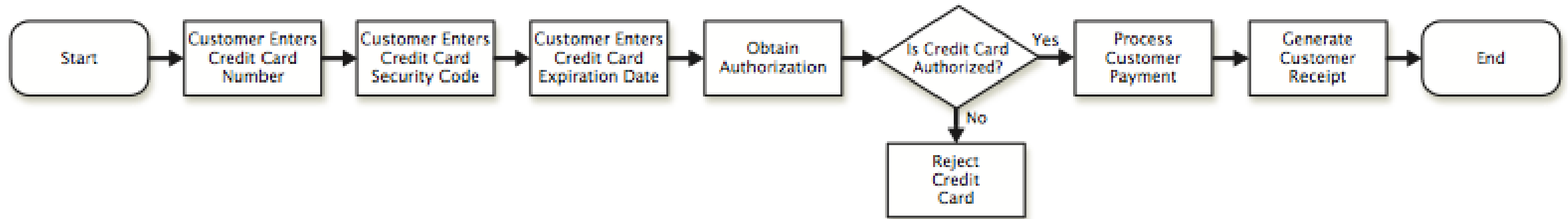Customer Module: Create Invoices BPMN 2.0 DIAGRAM

Database Tables

Swim Lane Diagram for Sales Cycle Processes

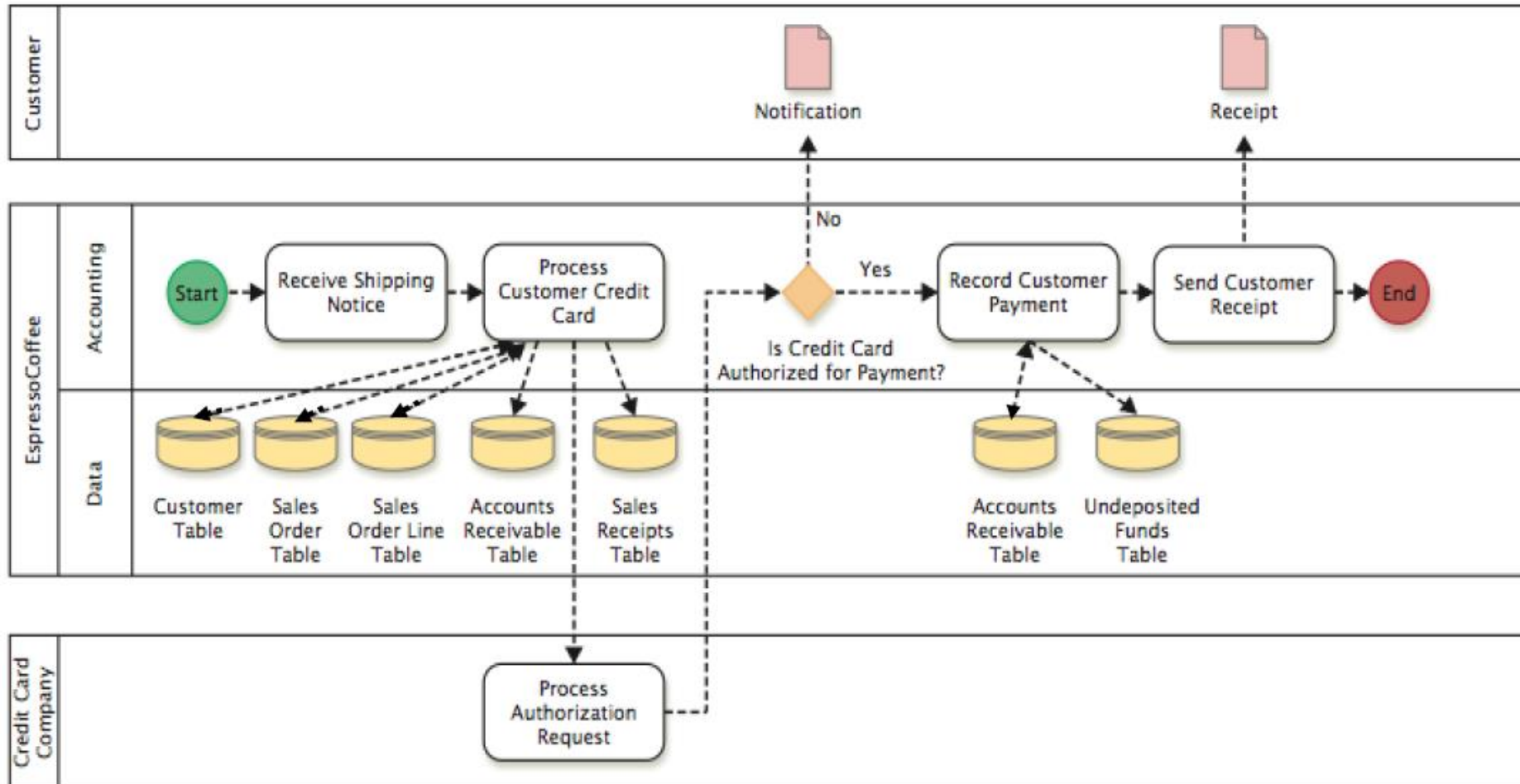# Customer Module: Receive Customer Payments Flowchart Example

Customer Module: Receive Customer Payments FLOWCHART

1. Create a process map organizer to organize activities

2. Write narrative for business activity and annotate

Customer Module: Receive Customer Payments BPMN Example

Customer Module: Receive Customer Payments BPMN 2.0 DIAGRAM

Customer Module: Receive Customer Payments BPMN Example

Business Process Map Organizer			
Activity	Gateway (Decision)	Swimlane	Data Store

Customer Module: Receive Customer Payments BPMN Example

ExpressoCoffee (Accounting) receives shipping notice.

Customer Module: Receive Customer Payments BPMN Example (Answer Key)

	Business Process Map Organizer			
	Activity	Gateway (Decision)	Swimlane	Data Store
(1)	Receive Shipping Notice		Accounting	
(2)	Process Customer Credit Card		Accounting	Customer Table Sales Order Table Sales Order Line Table Accounts Receivable Table Sales Receipt Table
(3)	Process Authorization Request		Credit Card Company	
(4)		Is Credit Card Authorized? (No)	Accounting Customer	Notification – Credit not approved
(5)	Record Customer Payment		Accounting	Accounts Receivable Table Undeposited Funds Table
(6)	Send Customer Receipt		Accounting	Receipt to customer

Answer: ExpressoCoffee (Accounting) receives shipping notice. ExpressoCoffee (Accounting) processes customer credit card by verifying the customer account (identity), verifying the sales order and line items, updating accounts receivable (debit) and sales receipts (credit). The customer enters credit card security code and expiration date. ExpressoCoffee (Accounting) sends a request to the credit card company to verify the customer's good credit standing. The credit card company verifies the customer's credit card security code and expiration date and customer's credit standing. A notification issued to ExpressoCoffee validating the customer's credit. ExpressoCoffee (Accounting) processes payment by updating accounts receivable (credit) and undeposited funds (debit). ExpressoCoffee (Accounting) issues a receipt to the customer.

Baseline Accounting Transaction: Expenditure (Purchasing) Cycle
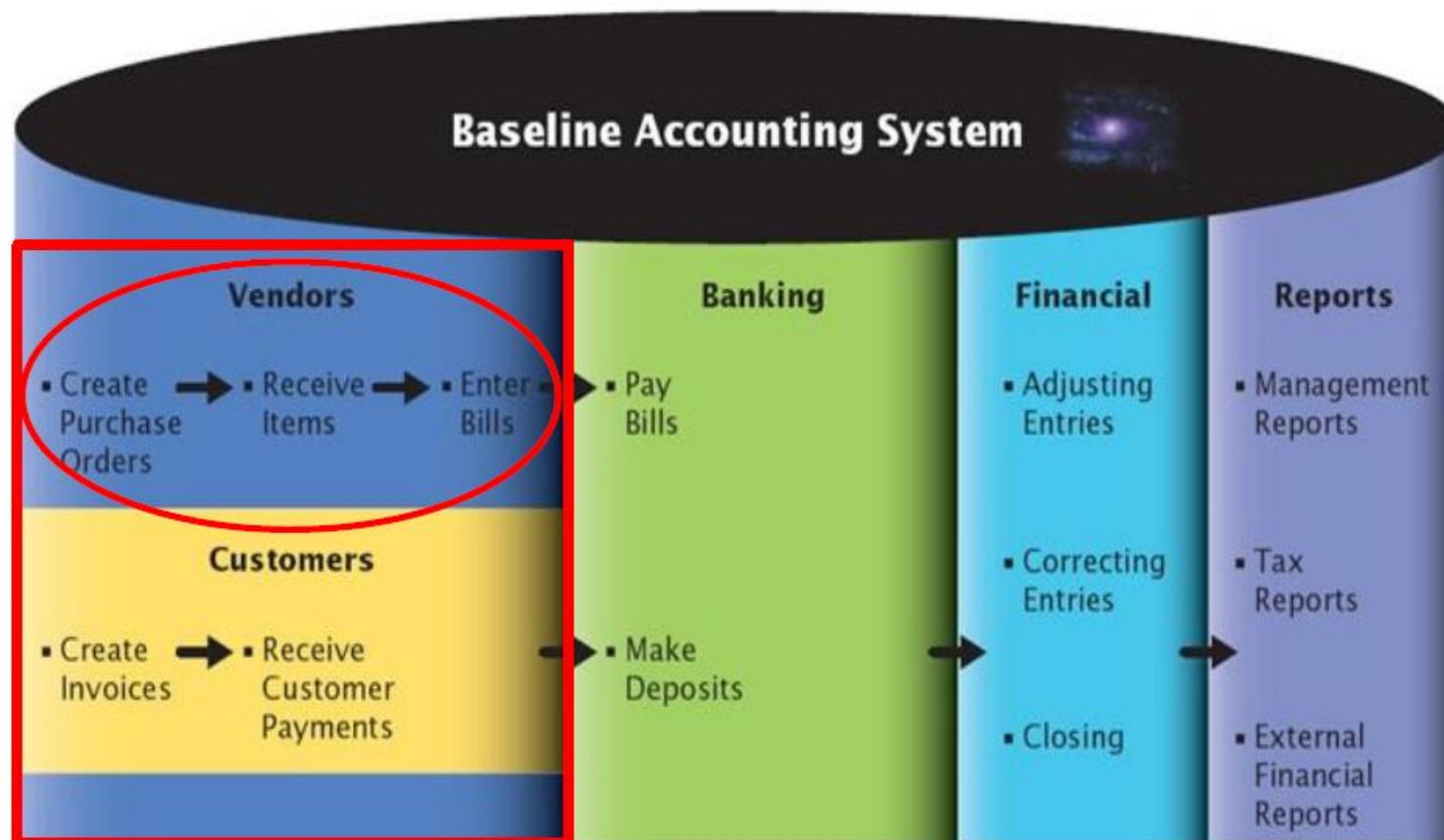
Accounting Transaction Cycles

Expenditure (Purchasing) Cycle

Source Document	Function
Purchase requisition	Request items.
Purchase order	Order items.
Receiving report	Receive items.
Check	Pay for items.

How Do I Customize the Purchasing Cycle?

- Create purchase orders
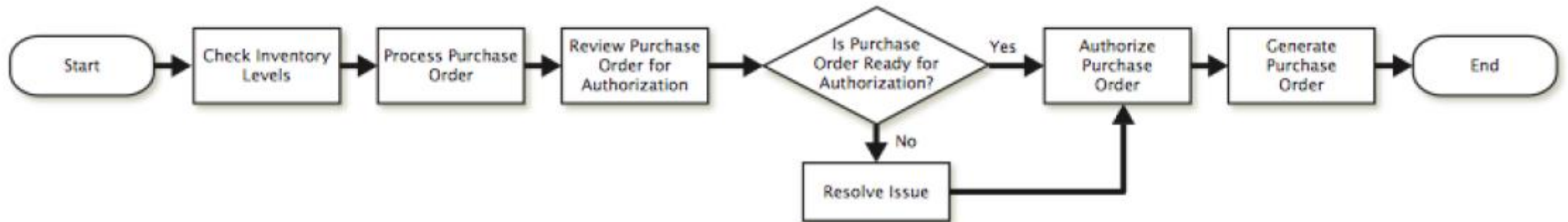- Receive items
- Enter bills
- Pay bills

Understanding the Accounting Process Model for a Purchase Order Transaction

- Examine the baseline accounting process for a purchase order transaction within a company:
  - Company: ExpressoCoffee
  - ExpressoCoffee creates a purchase order for the supplier
  - The order shipment is confirmed and sent to ExpressoCoffee's warehouse – which receives the order into inventory
  - The warehouse generates a receiving report and updates Accounting
  - Accounting receives the bill from the supplier and matches to the receiving report – processes bill
- How do we design the accounting/purchasing system to manage the business process?
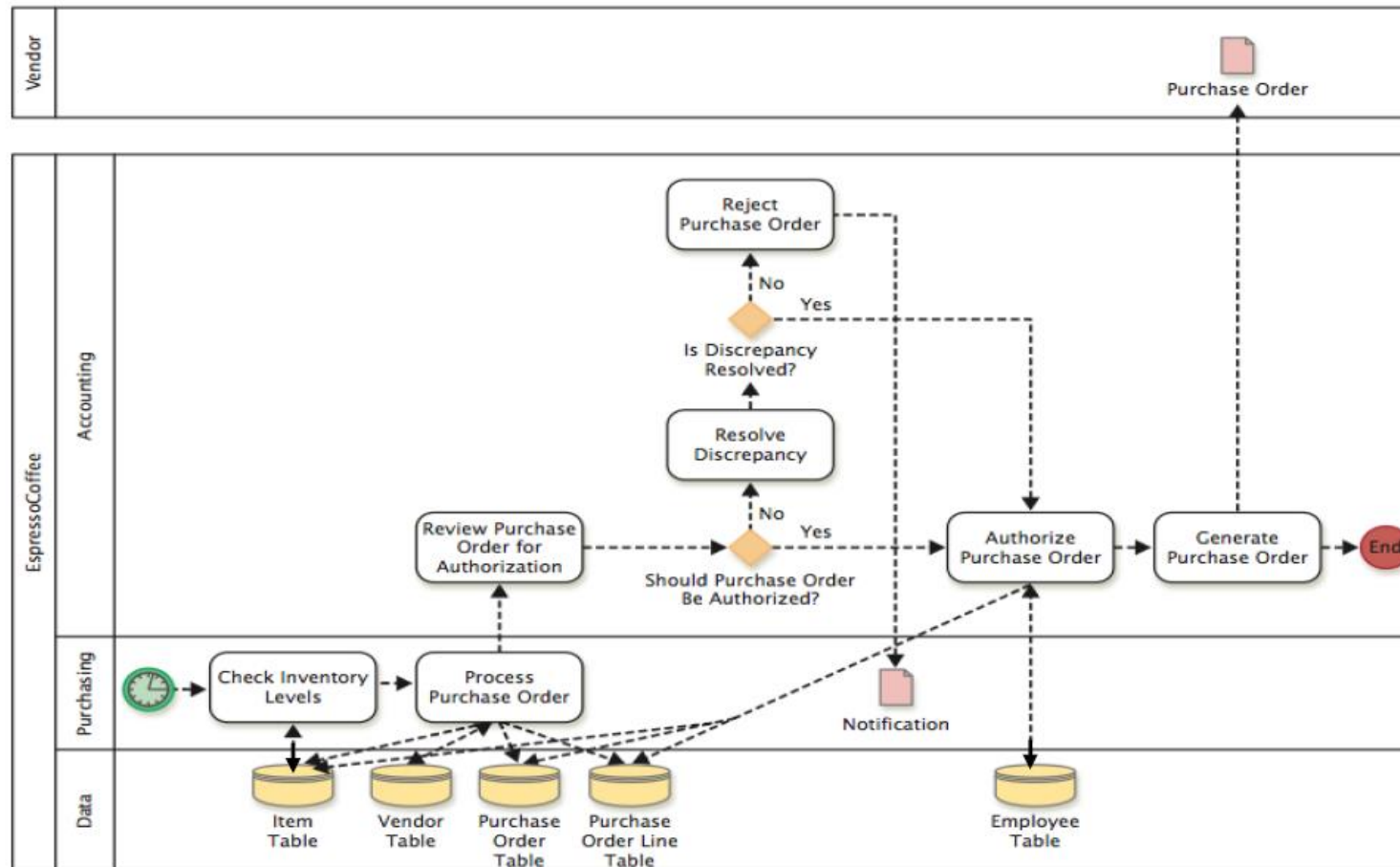
EspressoCoffee: Create Purchase Orders

EspressoCoffee: Create Purchase Orders BPMN

Vendor Module: Create Purchase Orders BPMN 2.0 DIAGRAM

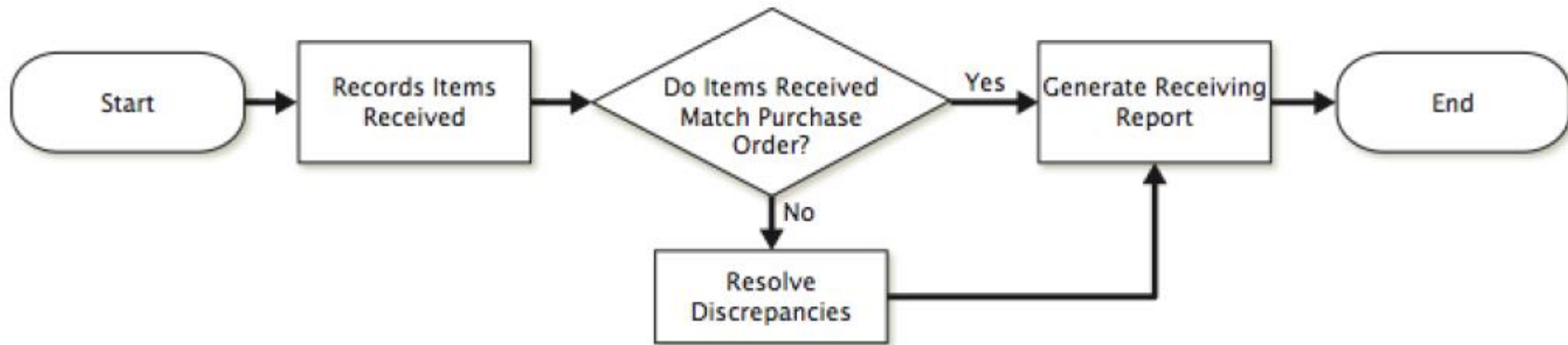# EspressoCoffee: Create Purchase Orders BPMN (Answer Key)

	Business Process Map Organizer			
	Activity	Gateway (Decision)	Swimlane	Data Store
(1)	Receive Purchase Order (P.O.)		Purchasing	
(2)	Check Inventory Levels	Item Required/ Approved?	Purchasing	Item Table
(3)	Process Purchase Order		Purchasing	Item Table Vendor Table P.O. Table/ P.O. Line Table
(4)	Review P.O. for Authorization	Should P.O. be Authorized? (Yes)	Accounting	
(5)	Resolve/ Reject Discrepancy	Discrepancy Resolved?	Accounting	Notification – Proceed with authorization
(6)	Authorize P.O.		Accounting	Employee Table
(7)	Generate P.O.		Accounting	P.O.

EspressoCoffee: Receive Items

Vendor Module: Receive Items FLOWCHART

Start → Records Items Received → Do Items Received Match Purchase Order? — Yes → Generate Receiving Report → End

No → Resolve Discrepancies → Generate Receiving Report

EspressoCoffee: Receive Items

Vendor Module: Receive Items BPMN 2.0 DIAGRAM

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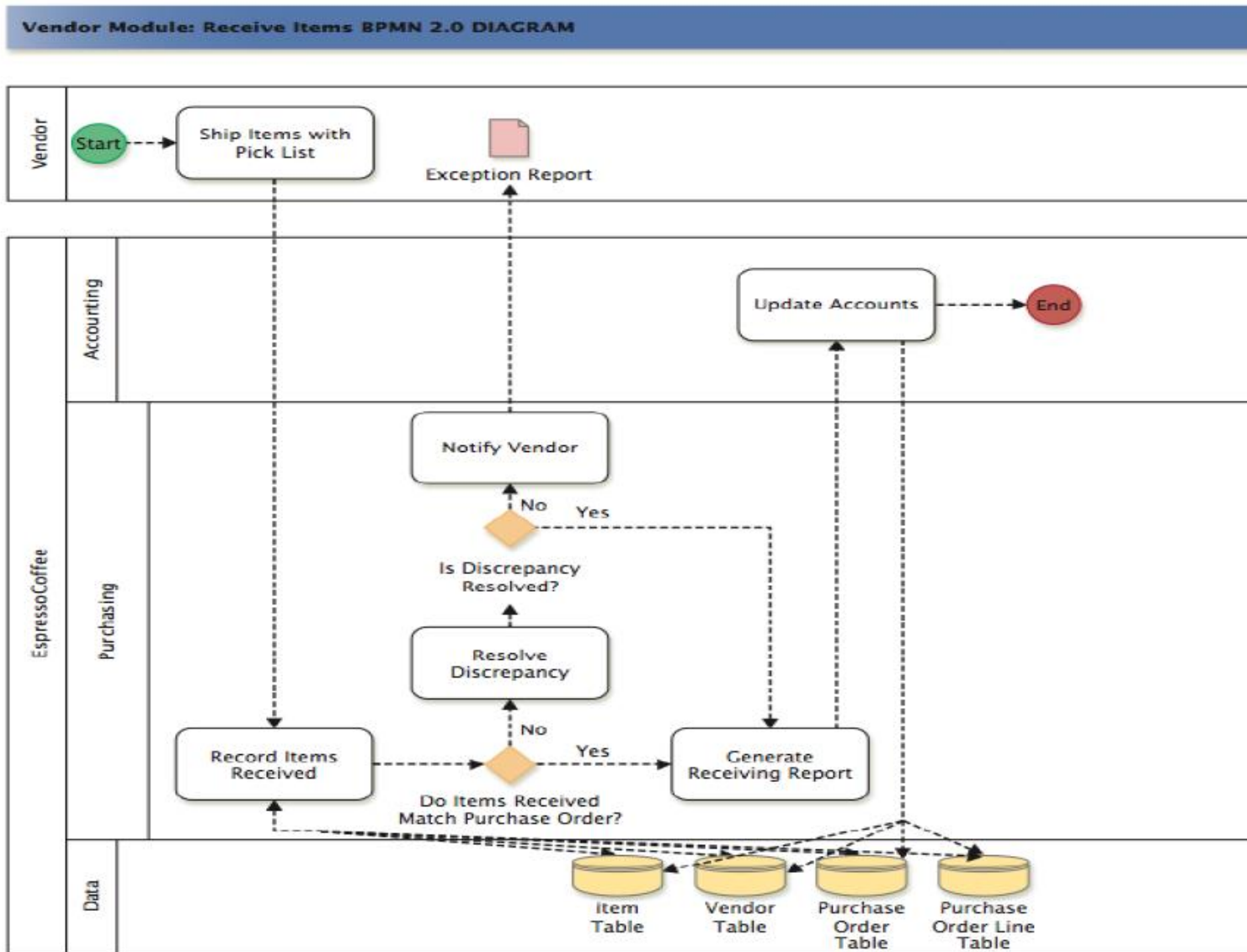
EspressoCoffee: Receive Items BPMN

	Activity	Gateway (Decision)	Swimlane	Data Store
	Business Process Map Organizer			
(1)	Ship Items with Pick List		Vendor	
(2)	Record Items Received		Purchasing	Item Table
(3)	Generate Receiving Report	Items Received? (Yes)	Purchasing	
(4)	Update Accounts		Accounting	Item Table Vendor Table P.O. Table/ P.O. Line Table
(5)	Resolve Discrepancy	Items Received? (No) Discrepancy Resolved? (Yes)	Purchasing	
(6)	Notify Vendor		Purchasing	Exception Report

EspressoCoffee: Process Bill

Vendor Module: Enter Bills FLOWCHART

Start → Receive Bill → Does Bill Match Purchase Order and Receiving Report? → Yes → Record Bill → End

No → Resolve Discrepancies → Record Bill
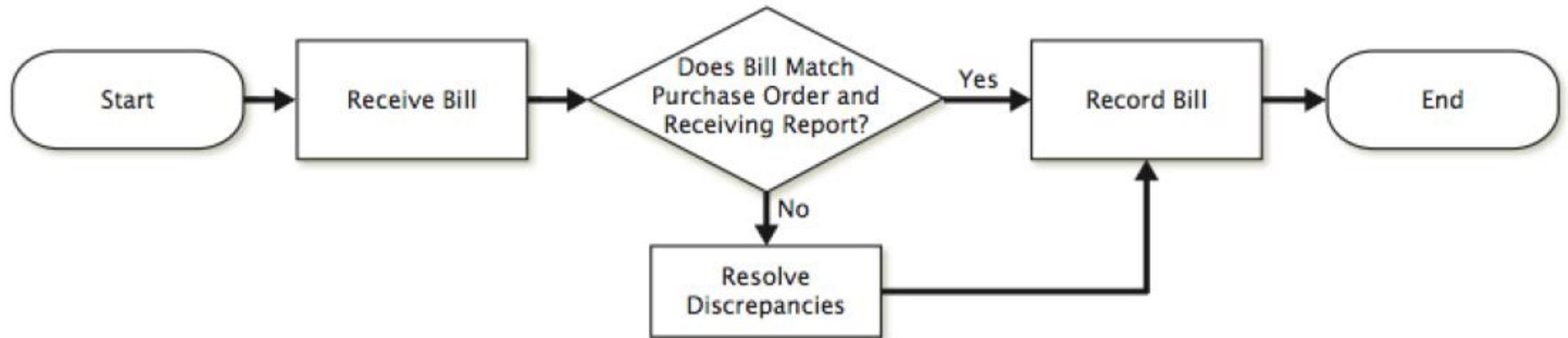
EspressoCoffee: Process Bill

Vendor Module: Enter Bills BPMN 2.0 DIAGRAM
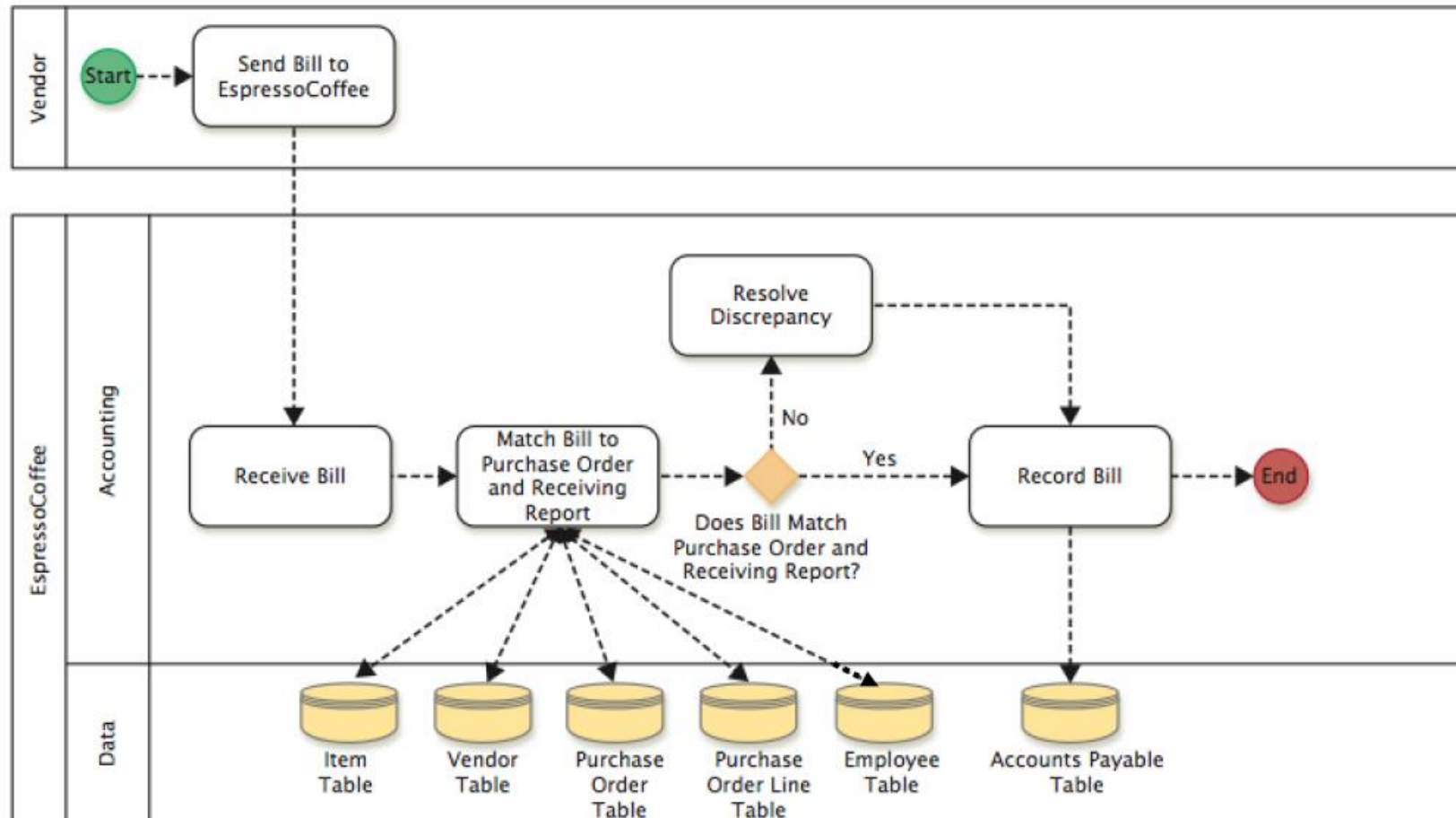
EspressoCoffee: Pay Bill BPMN (Answer Key)

	Business Process Map Organizer			
	Activity	Gateway (Decision)	Swimlane	Data Store
(1)	Send Bill to Espresso Coffee		Vendor	
(2)	Receive Bill		Accounting	
(3)	Match Bill to P.O. and Receiving Report	Does Bill Match P.O. and Receiving Report? (Yes)	Accounting	Item Table Vendor Table P.O. Table/ Line Item Table Employee Table
(4)	Resolve Discrepancy – Bill doesn't match		Accounting	
(5)	Record Bill – Bill Matches		Accounting	Accounts Payable Table

BPMN Map Organizer Template

Business Process Map Organizer			
Activity	Gateway (Decision)	Swimlane	Data Store

Business Process Modeling Notation (BPMN) Template

Answer:

Functional Area Systems
Accounting Transaction Systems

End of Lecture 4-1