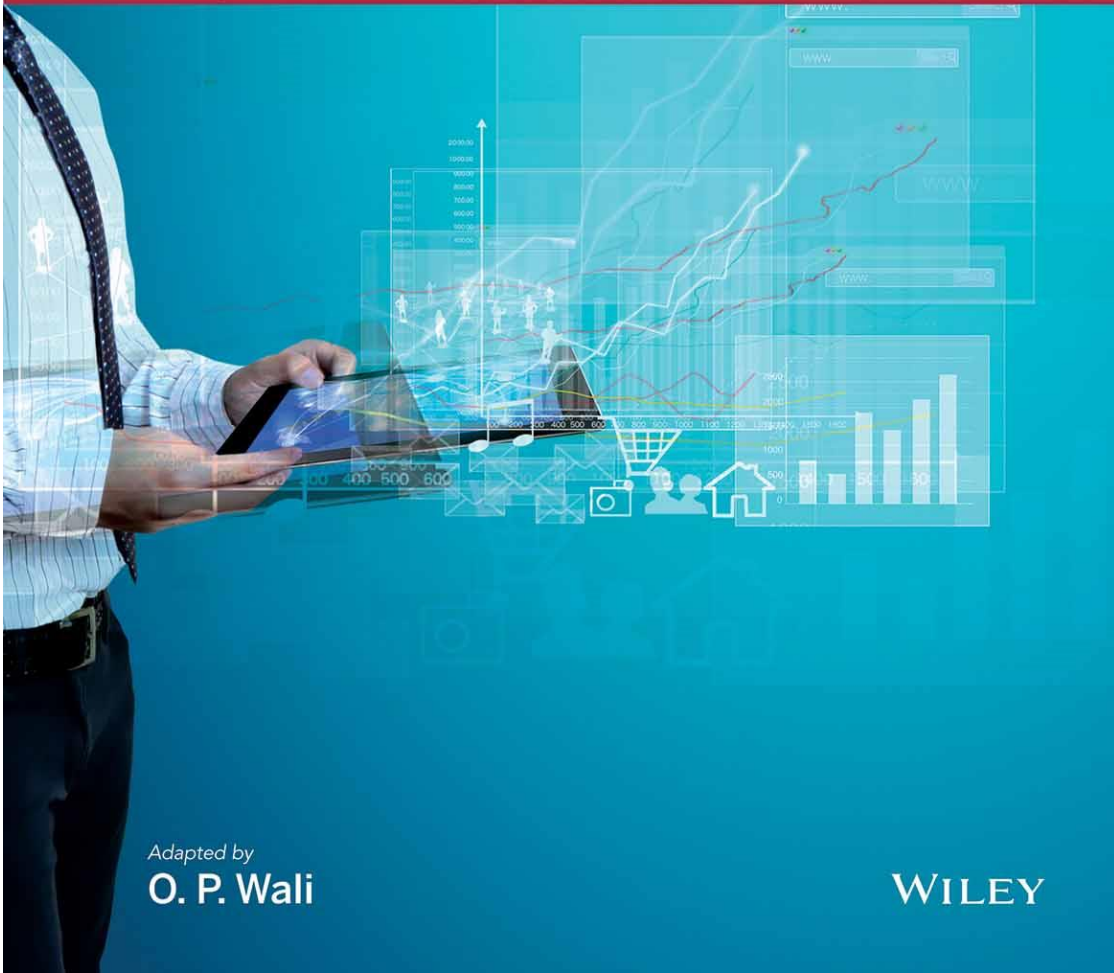


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# Information Technology for Management

Advancing Sustainable, Profitable Business Growth



Adapted by  
**O. P. Wali**

**WILEY**

ns, Inc.

## Chapter 9

# Tactical and Operational Support Systems

# Chapter Outline

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1. [Business Challenges](#)
2. [Manufacturing, Production, and Transport Management Systems](#)
3. [Sales and Marketing Systems](#)
4. [Accounting and Finance Systems](#)
5. [Human Resource Systems and Ethics](#)

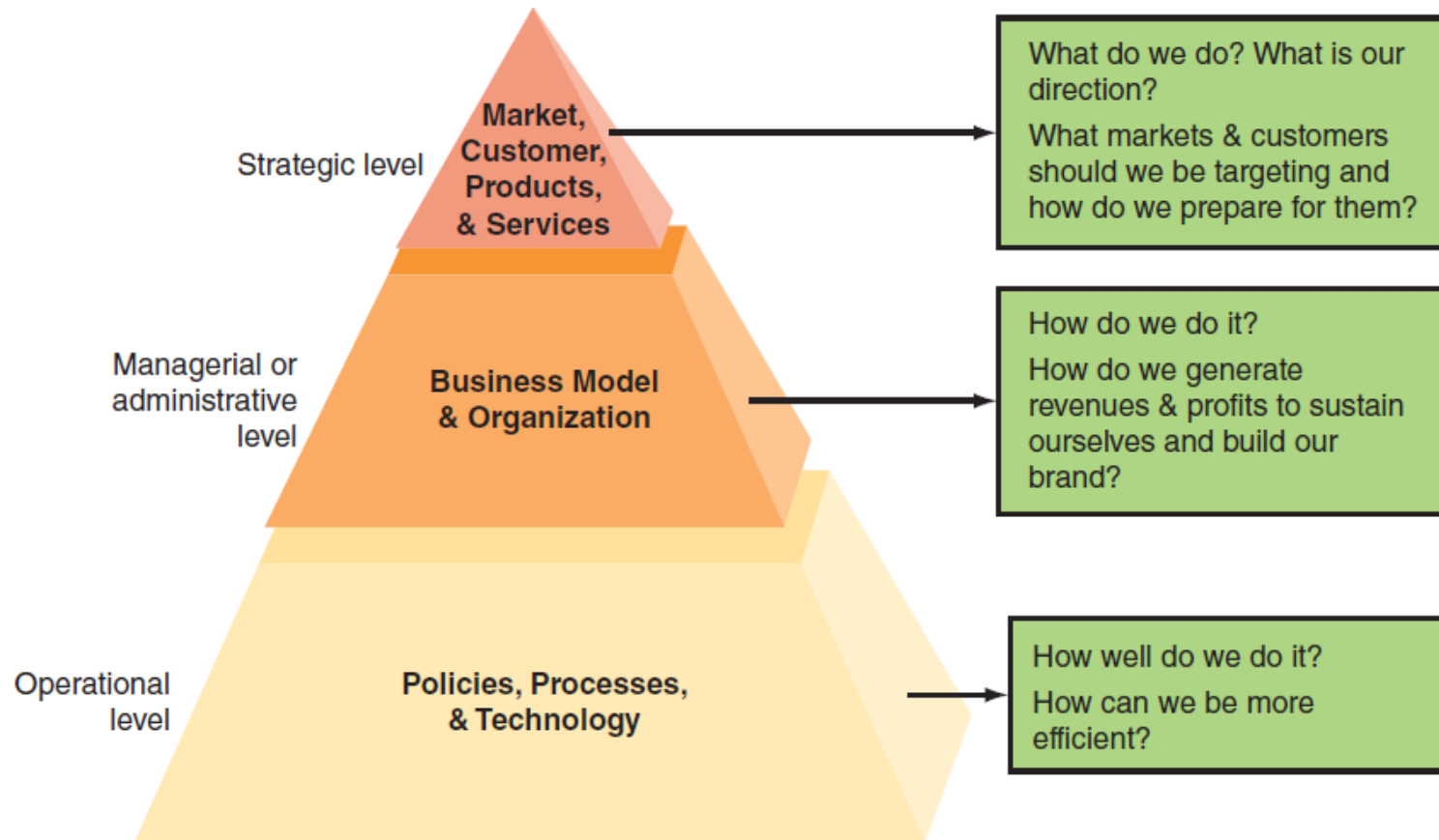
# 1. Business Challenges

# Solving Business Challenges at All Management Levels

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- Mission
  - Set of outcomes an enterprise wants to achieve.
- Strategic Plan
  - A document used to communicate the company's goals and the actions needed to achieve them.

# Solving Business Challenges at All Management Levels



**Figure 9.5** Three organizational levels, their concerns, and strategic and tactical questions, planning, and control.

# Solving Business Challenges at All Management Levels

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- Order Fulfillment Process
  - Moving products from customer order to the customer, including checking credit, collecting payment, picking shipping departments to pack products, printing mailing labels, preparing for shipment, and notifying departments.

# TN 9.1 Standard Operating Procedures

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**SOP** - Set of written instructions on how to perform a function or activity.

- Data Security – data must be protected from:
  - Malicious or unintentional corruption
  - Unauthorized modification
  - Theft
  - Natural disasters
- Data accuracy – validation for correct entries such as name, address of the customer

# Solving Business Challenges at All Management Levels

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- Data integrity – involvement of ACID Test:
  - Atomicity: If all steps in a transaction are not completed, then the entire transaction is cancelled.
  - Consistency: Only operations that meet data validity standards are allowed.
  - Isolation: Transactions must be isolated from each other.
  - Durability: Backups by themselves do not provide durability. Avoidance of loss of data or ability of system to regenerate the data is must.



# Solving Business Challenges at All Management Levels

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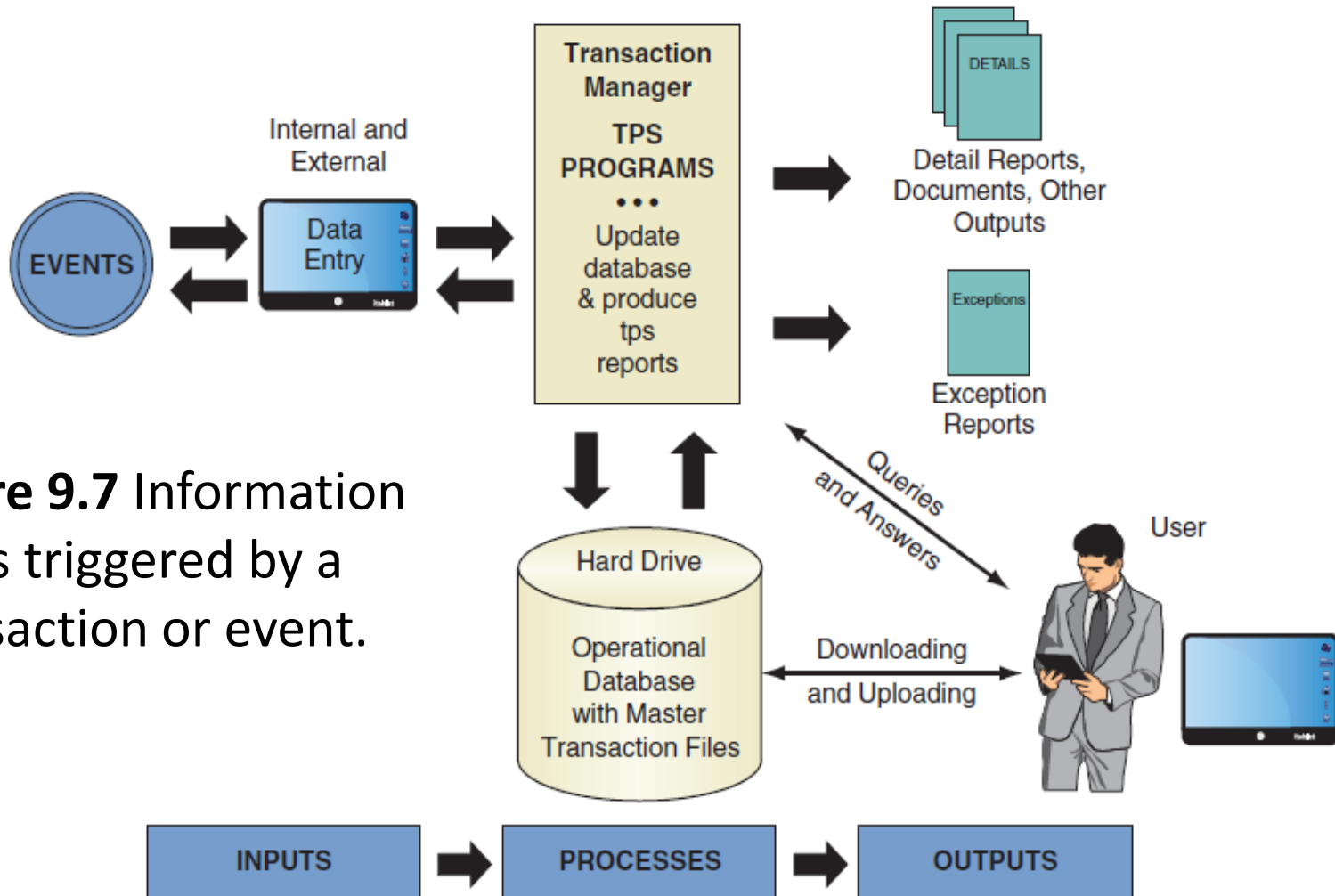
- Basic Functional Area Systems
  - Manufacturing and production: materials purchasing, quality control, scheduling, shipping, receiving.
  - Accounting: accounts receivable, accounts payable, general ledger, and budgeting. Accounting systems keep account balances up to date, disburse funds, and post statements.
  - Finance: cash management, asset management, credit management, financial statement reporting to comply with federal and industry-specific regulations and government agencies.

# Solving Business Challenges at All Management Levels

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- Basic Functional Area Systems
  - IT: cloud computing services, SLA management, software license management, user accounts management, information and network security.
  - Sales and marketing: pricing, social media promotions, market research, demand forecasts, sales campaign management, order tracking, and online and mobile order processing and sales.
  - HR: payroll, recruitment and hiring, succession planning, employee benefits, training, compensation, performance appraisal, compliance with federal and state employment regulations.

# Solving Business Challenges at All Management Levels



**Figure 9.7** Information flows triggered by a transaction or event.

# Solving Business Challenges at All Management Levels

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- Transaction Processing
  - Transaction processing systems monitor, collect, store, process, and distribute all financial and nonfinancial transactions.
  - Batch: events or transactions are processed during scheduled times.
  - Online (OLTP): events or transactions are processed as soon as they occur.

# Solving Business Challenges at All Management Levels

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1. Explain the core concerns and time horizons of each level of management.
2. Define what a standard operating procedure (SOP) is and give an example.
3. Explain each component of the ACID test.
4. Explain the differences between batch and online processing.
5. Describe the flow of information in transaction processing.

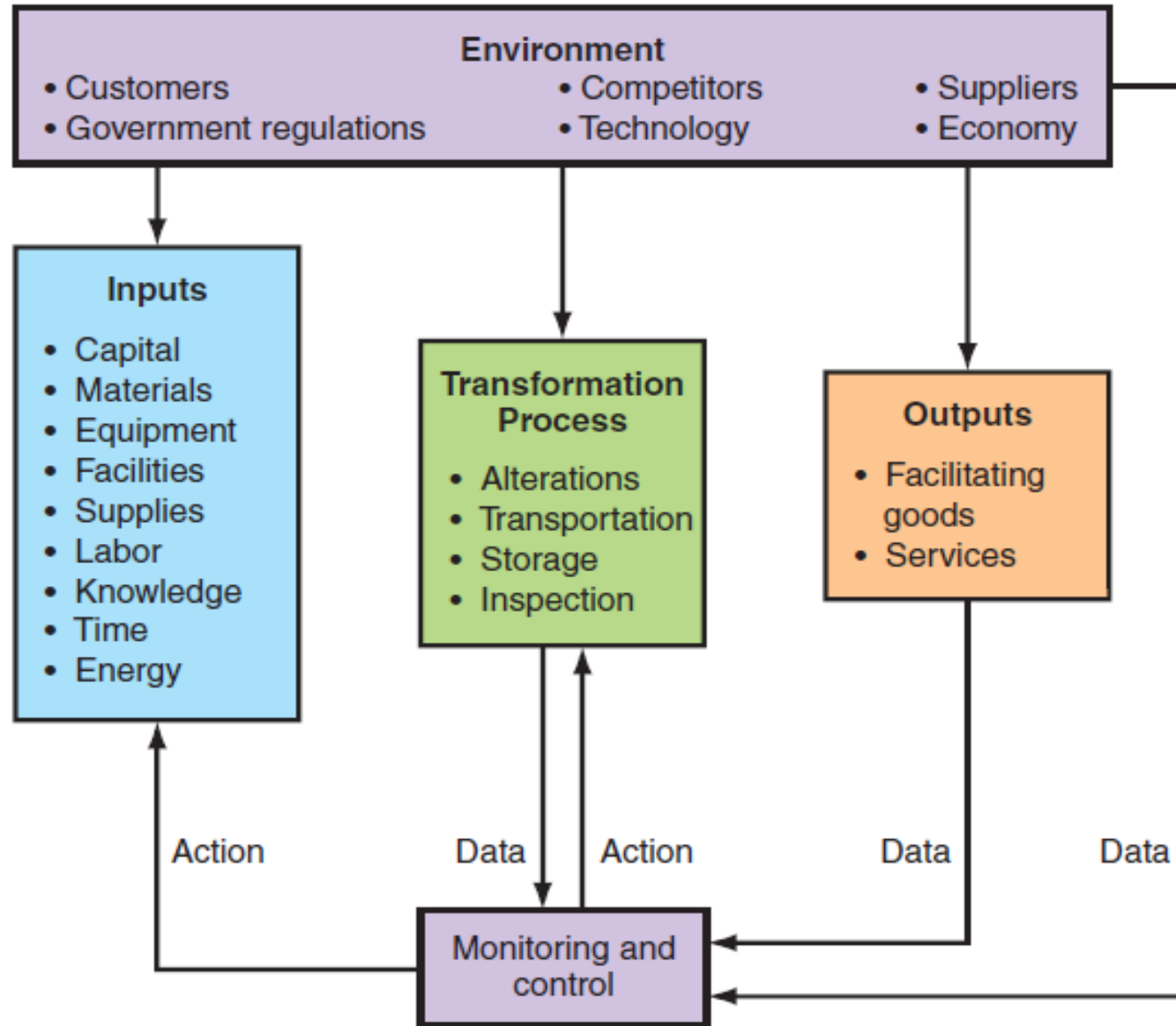
## 2. Manufacturing, Production, and Transport Management Systems

# Manufacturing, Production, and Transportation Management Systems

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- Production Operations Management - is responsible for process that transforms inputs into value added outputs.
- Functional system enables the following:
  - Transparency: being able to access current data to learn what is needed in order to make informed decisions without delay.
  - Quick response: being able to respond appropriately to changes in conditions, demand, or new opportunities.

**Figure 9.6** Production operations management (POM) systems process and transform inputs into outputs.





# Manufacturing, Production, and Transportation Management Systems

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- Transportation Management Systems
  - Relied on to handle transportation planning including shipping consolidation, load and trip planning, route planning, fleet and driver planning, and carrier selection.
  - Four trend factors contributing to TMS growth:
    - Outdated transportation systems need to be upgraded or replaced.
    - Growth of intermodal transport.
    - TMS vendors add capabilities.
    - TMSs handle big data.

# Manufacturing, Production, and Transportation Management Systems

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- Logistics Management
  - Inbound logistics refers to receiving.
  - Outbound logistics refers to shipping.
  - Inventory control systems are stock control or inventory management systems.
  - Logistics management systems:
    - Optimize transportation operations.
    - Coordinate with all suppliers.
    - Integrate supply chain technologies.
    - Synchronize inbound and outbound flows of materials or goods.
    - Manage distribution or transport networks.

# Manufacturing, Production, and Transportation Management Systems

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- Inventory Control Systems are stock control or inventory management systems
  - Inventory control systems minimize the following three cost categories:
    - Inventory holding costs
    - Ordering and shipping costs
    - Cost of shortages
- Safety Stock
  - Needed in case of unexpected events, such as spikes in demand or longer delivery times.

# Manufacturing, Production, and Transportation Management Systems

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- Just-in-Time Inventory
  - Deciding when to order and how much to order is used to answer both questions is the economic order quantity (EOQ) model, taking all costs into consideration.
  - JIT inventory management attempts to minimize holding costs by not taking possession of inventory until it is needed in the production process.

# Manufacturing, Production, and Transportation Management Systems

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- Lean Manufacturing Systems
  - Leverages suppliers delivering small lots on a daily or frequent basis, and production machines are not necessarily run at full capacity.
  - Empowers workers so that production decisions can be made by those who are closest to the production processes.

# Manufacturing, Production, and Transportation Management Systems

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- Quality Control (QC) Systems
  - Stand-alone or part of an enterprise-wide total quality management (TQM) effort providing data about the quality of incoming materials or parts, as well as the quality of in-process semi-finished and finished products.
  - Data collection by sensors or RFID and interpreted in real-time, or stored in a database for future analysis.

# Manufacturing, Production, and Transportation Management Systems

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- Computer-integrated Manufacturing (CIM)
  - Control day-to-day shop floor activities to replace disparate information sources frequently late, unreliable, voluminous, and extremely difficult to assimilate.

# Manufacturing, Production, and Transportation Management Systems

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- Manufacturing Execution Systems (MESs)
  - Manage operations in shop factories, sometimes a few critical machines, sometimes all operations on the shop floor.
  - Typically broader infrastructure than CIM.
  - Based on standard reusable application software instead of customer-designed software.
  - FMS – flexible manufacturing systems can accommodate manufacturing of different parts at different volumes



# Manufacturing, Production, and Transportation Management Systems

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- Benefits of CIM:
  - It simplifies manufacturing technologies and techniques
  - automates as many of the manufacturing processes as possible,
  - integrates and coordinates all aspects of design, manufacturing, and related functions.

# Manufacturing, Production, and Transportation Management Systems

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1. What is the function of POM in an organization?
2. What trends are contributing to the growing use of TMS?
3. Define logistics management.
4. What are the three categories of inventory costs?
5. What are the objectives of JIT?
6. Explain the difference between EOQ and JIT inventory models.
7. What is the goal of lean manufacturing?
8. What is CIM?

# 3. Sales and Marketing Systems

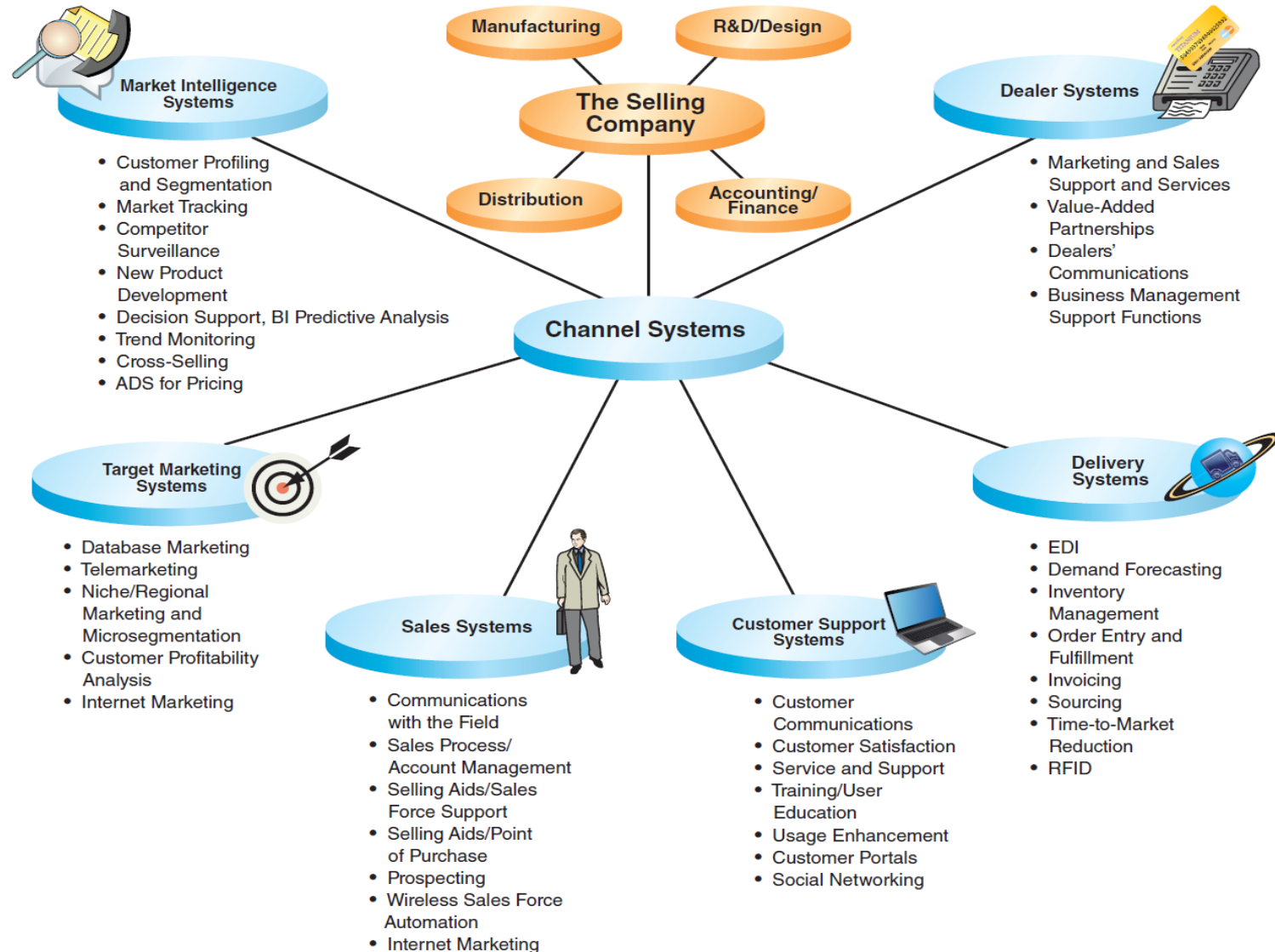
# Sales and Marketing Systems

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Sales and marketing information systems can expand the capacity to create new:

- Products
- Services
- Channels
- Market opportunities

# Figure 9.7 Sales and marketing systems and subsystems.



# Sales and Marketing Systems

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- Data-Driven Marketing
  - Data-driven, fact-based decision making such as *push-through* pay-per-click (PPC) marketing.
  - Push-through ads use data about the person to determine whether the ad should appear based on location, behavior, interest, and demographic information.
  - Pull-through ads appear based on the user's keyword searches.

# Sales and Marketing Systems

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- Sales and Distribution Channel
  - Ways to optimize product and service distribution.
  - Example channels:
    - Electronic channels.
    - Mobile channels.
    - Physical channels.

# Sales and Marketing Systems

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- Marketing management
  - Pricing of products or services
    - Sales volumes as well as profits are determined by the prices of products or services.
  - Salesperson productivity
    - Collected in the sales and marketing TPS and used to compare performance along several dimensions, such as time, product, region, and even the time of day.
  - Profitability analysis
    - Profit contribution or profit margin (profit margin = sale price - cost of good) of certain products and services derived from the cost accounting system.



# Sales and Marketing Systems

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1. Explain push-through marketing and pull-through marketing.
2. List two sales and distribution channels.
3. Describe profitability analysis.

# 4. Accounting and Finance Systems

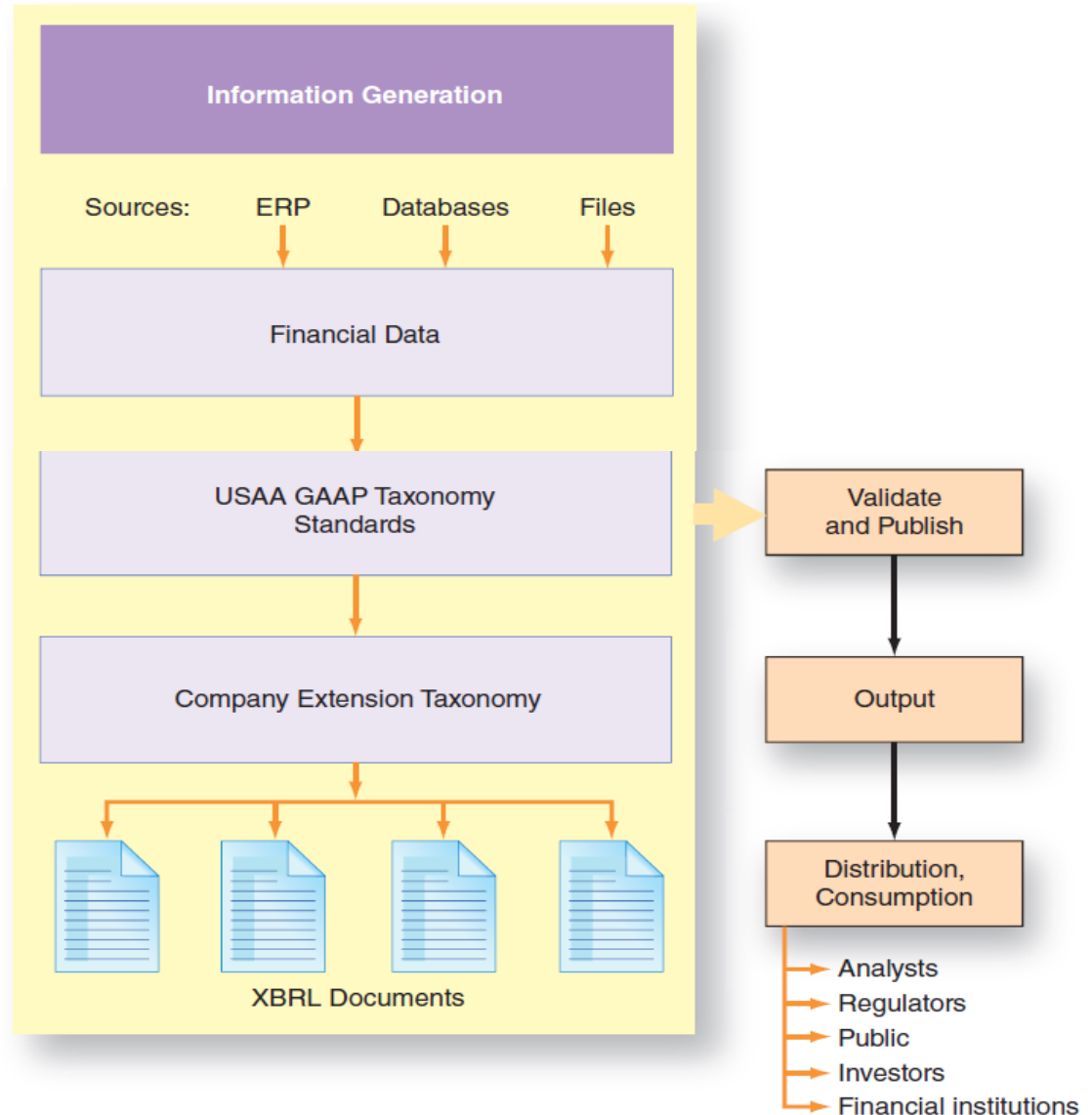
# Accounting, Finance, and Regulatory Systems

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- Income Statement
  - Summarizes a company's revenue and expenses for one quarter of a fiscal year or the entire fiscal year.
  - Also known as a P&L (profit and loss) or earnings statement.
- Compliance
  - Generally accepted accounting principles (GAAP) and the Financial Accounting Standards Board (FASB).
- Financial Misrepresentation
  - Occurs when a company has intentionally deceived one or more other parties.

# Accounting, Finance, and Regulatory Systems

**Figure 9.8** Overview of the creation of XBRL documents.



# Accounting, Finance, and Regulatory Systems

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- eXtensible Business Reporting Language (XBRL)
  - Reporting (disclosure) system designed by the SEC (U.S. Securities and Exchange Commission) to eliminate document “search and find” difficulties and improve how investors find and use information.
  - Designed to:
    - Generate cleaner data, including written explanations and supporting notes.
    - Produce more accurate data with fewer errors that require follow-up by regulators.
    - Transmit data more quickly to regulators and meet deadlines.
    - Increase the number of cases and amount of information that staffers can handle.

# Fraud Prevention and Detection

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- Terms used for *Insider fraud* are internal, employment, or occupational fraud.
- Insider fraud is a term referring to a variety of criminal behaviors perpetrated by an organization's employees or contractors.
- Fraud occurs because *internal controls* to prevent insider fraud – no matter how strong – will fail on occasion.

# Fraud Prevention and Detection

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- Fraud Risk Management
  - A system of policies and procedures to prevent and detect illegal acts committed by managers, employees, customers, or business partners against a company's interests.

# Fraud Prevention and Detection

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- Fraud Risk Factors
  1. A high level of trust in employees without sufficient oversight to verify that they are not stealing from the company.
  2. Relying on informal processes of control.
  3. A mindset (belief) that internal controls and fraud prevention systems are too expensive to implement.
  4. Assigning a wide range of duties for each employee, giving them opportunities to commit fraud.

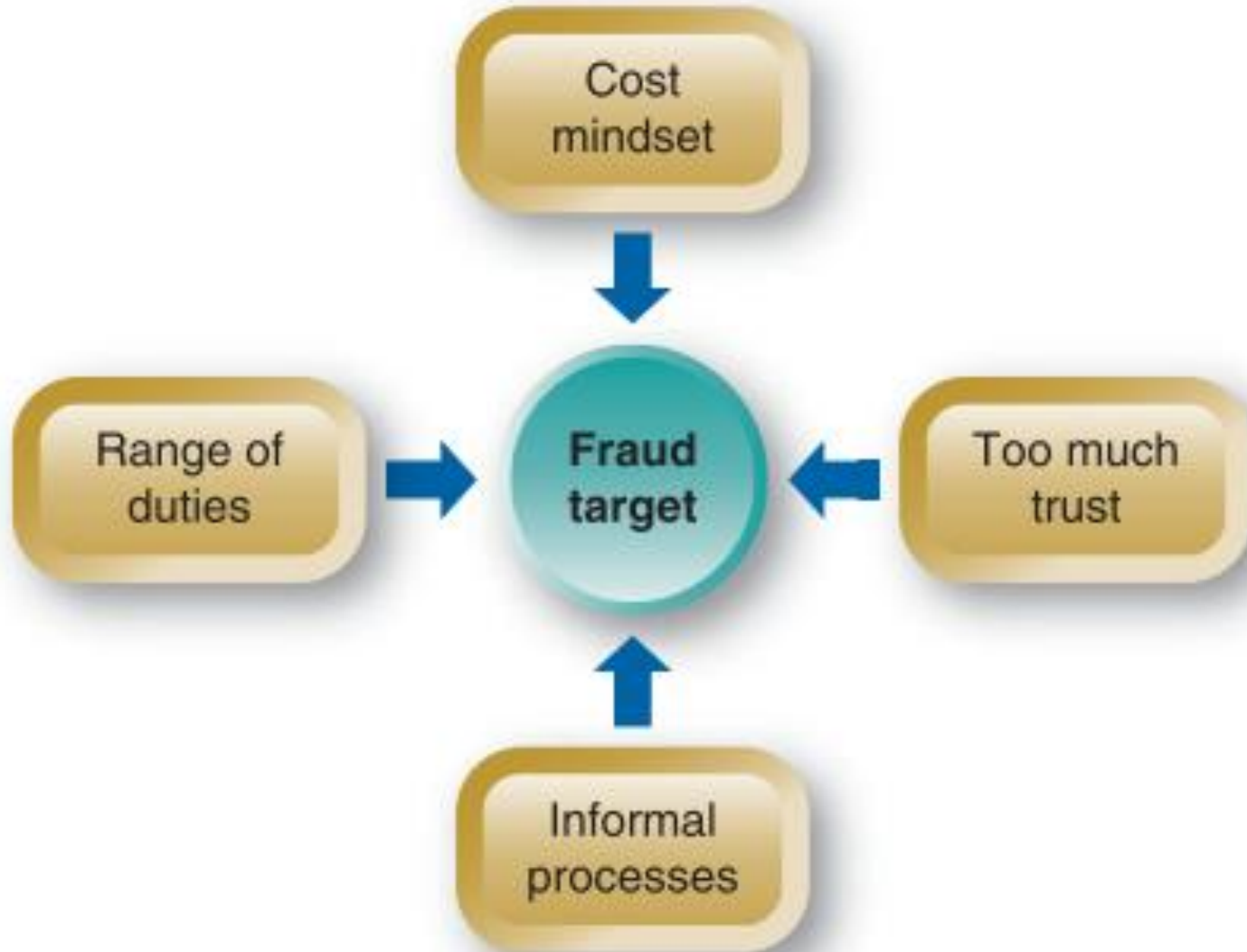


**TABLE 9.2** Three of the Worst Accounting Scandals of All Time

<b>Company and Fraudsters</b>	<b>Damages</b>	<b>How They Did It</b>	<b>Penalties</b>
<b>Bernie Madoff Investment Securities LLC (2008)</b> Bernie Madoff, his accountant David Friehling, and CFO Frank DiPascalli	Tricked investors out of \$64.8 billion through the largest Ponzi scheme in history.	Investors were paid returns out of their own money or money from other investors—rather than from profits.	150 years in prison for Madoff + \$170 billion restitution. Prison time for Friehling and DiPascalli.
<b>Lehman Brothers (2008)</b> Lehman executives and the company's auditors, Ernst & Young	Hid over \$50 billion in loans disguised as sales.	Allegedly sold toxic assets to Cayman Island banks with the understanding that they would be bought back eventually. Created the impression Lehman had \$50 billion more in cash and \$50 billion less in toxic assets than it actually had.	Forced into the largest bankruptcy in U.S. history.
<b>Enron (2001)</b> CEO Jeffrey Skilling and former CEO Ken Lay	Shareholders lost \$74 billion, thousands of employees and investors lost their retirement accounts, and many employees lost their jobs.	Kept huge debts off its balance sheets.	Lay died before serving time; Skilling received 24 years in prison. The company filed for bankruptcy. Arthur Andersen was found guilty of fudging Enron's accounts.

# Factors making companies target for Fraud

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# Factors making companies target for Fraud

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Designing effective fraud response and litigation-readiness strategies (post-incident strategies) is crucial to be able to:

- Recover financial losses.
- Punish perpetrators through lawsuits, criminal charges, and/or forfeited gains.
- Stop fraudsters from victimizing other organizations.

# Fraud Prevention and Detection

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- Internal Controls
  - Segregation of duties
  - Job rotation
  - Oversight
  - Safeguard of assets
  - IT policies

# Auditing Information Systems

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- Fraud can be easy to commit and hard to detect.
- Information systems can provide a *federated* approach to auditing payroll, scheduling, accounts payable/receivable, and other electronic data.
- Federated systems are the combination of independent systems designed with unique functions.

# Financial Planning and Budgeting

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- Budgeting: allocation of financial resources among participants, activities, and projects. Includes the process of analyzing and selecting investments with the highest ROI for the organization or **capital budgeting**.
- Forecasting: estimating expenses, inventory, or other corporate assets to secure sufficient cash flow.

# Financial Planning and Budgeting

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- Financial Ratio Analysis: used by external parties when they decide whether to invest in an organization, extend credit, or buy it.
- Profitability Analysis: understanding the profitability of individual products or services, product lines, or the financial health of the entire organization.
- Cost Control: financial management of assets, through proper estimation, to assure financial health and cash flow.

# Accounting, Finance, and Regulatory Systems

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1. What is eXtensible Business Reporting Language (XBRL)?
2. Why does the SEC mandate data disclosure, whereby data items are tagged to make them easily searchable?
3. What is insider fraud? What are some other terms for insider fraud?
4. What is fraud risk management?
5. What four factors increase the risk of fraud?
6. Explain how accounting ISs can help deter fraud.
7. Define capital budgeting.
8. What is the purpose of auditing?



# 5. Human Resource Systems and Ethics

# Human Resource Systems, Compliance, and Ethics

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- HR Information Systems
  - Systems that focus on legal and compliance responsibilities, employee development, talent management, hiring, and succession planning.
  - HRIS moved into intranets or clouds, including leasing external information system software as a service (SaaS):
    - Reduce demand on internal businesses and IT resources.
    - Dramatically improve time to value without overstressing internal IT resources.
    - Reduce development/implementation times for new systems.

# Human Resource Systems, Compliance, and Ethics

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- Management and Employee Development
  - Performance Evaluation
    - Corporate managers can analyze employees' performances with the help of intelligent systems, which provide systematic interpretation of performance over time.
  - Training and Human Resources Development
    - Provide career development plan for each employee. IT can support the planning, monitoring, and control of these activities by using workflow applications.

# Human Resource Systems, Compliance, and Ethics

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- HR Planning, Control, and Management
  - Personnel Planning and HR Strategies
    - Forecasts requirements for people and skills, planning how to locate sufficient human resources or develop them from within.
  - Benefits Administration
    - Salary/wage, bonuses, and other rewards for service.
  - Employee Relationship Management

# Human Resource Systems, Compliance, and Ethics

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- HR Planning, Control, and Management
  - Employee Relationship Management
    - Self-service personal information tracking, online training, and other employee-focused tasks resulting in better retention and higher productivity.
  - Ethical Challenges and Considerations
    - Recruiting, training, and performance evaluation procedures may involve ethical issues. Information and employee privacy should be protected.

# Human Resource Systems, Compliance, and Ethics

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1. What are the key HR functions?
2. What are the benefits of moving HRISs to intranets or the cloud?
3. Why have companies implemented SaaS HR?
4. What concerns have deterred companies from implementing SaaS HR?
5. How can companies reduce the cost of recruiting qualified employees?
6. Describe IT support for HR planning and control.
7. What are ethical issues related to HRM apps?