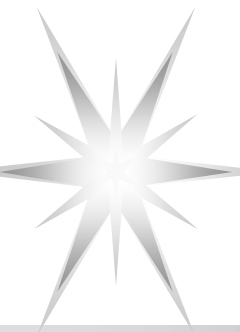




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ROYAL UNIVERSITY OF PHNOM PENH



Information Systems in Organizations

MIS

Chea Daly



Why Learn About Information Systems in Organizations?

- ❑ After graduating, a marketing major might use a software application to analyze customer needs in different areas of the country.





Why Learn About Information Systems in Organizations?

- ❑ An accounting major might work for a consulting firm using an information system to audit a client company's financial records.





Why Learn About Information Systems in Organizations?

- ❑ A biochemist might conduct research for a drug company and use a computer model to evaluate the potential of a new cancer treatment.





Why Learn About Information Systems in Organizations?

- Although your job might be different from those in the previous examples, throughout your career, you will almost certainly use information systems to help you and your organization become more efficient, effective, productive, and competitive.

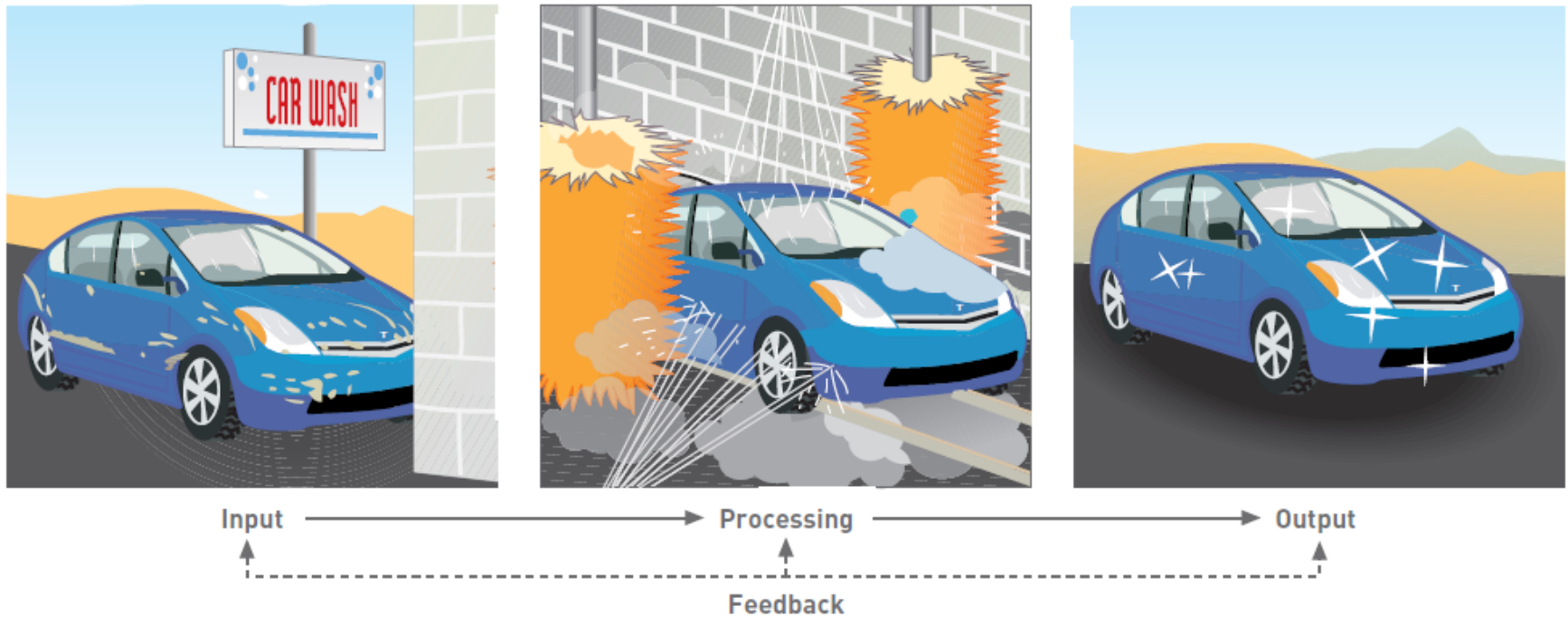


System Concepts

- System:
 - Set of elements or components that interact to accomplish a goal.
- Components of a system:
 - Inputs
 - Processing
 - Outputs
 - Feedback



System Concepts





Information Systems

- **Information System (IS)** is a single set of hardware, software, databases, networks, people, and procedures that are configured to collect, manipulate, store, and process data into information.



Components of Information Systems

- ❑ **Input:**
 - ❑ Activity of gathering and capturing raw data
- ❑ **Processing:**
 - ❑ Converting data into useful outputs
- ❑ **Output:**
 - ❑ Production of useful information, usually in the form of documents and reports
- ❑ **Feedback:**
 - ❑ Information from the system that is used to make changes to input or processing activities



The Use of Information Systems

Information systems are also used in nearly every industry such as:

- Agriculture
- Health care
- Banks
- Education
- ...



Information Systems Used in Agriculture

- Geographic Information System (GIS):
 - It helps farmers in precision agriculture by analyzing soil conditions, and managing crop health, etc.
- Remote Sensing Systems
 - Utilizes satellite or drone imagery to monitor crops, soil, and weather conditions. It helps in assessing crop health, detecting diseases, and improving yield predictions.
- ...



Information Systems Used in Healthcare

- Healthcare organizations use information systems to diagnose illnesses, plan medical treatment, track patient records, and bill patients.



istockphoto.com/Susan Chiang



Information Systems Used in Healthcare

- ❑ Clinical Decision Support Systems
 - ❑ A system that analyzes data to help healthcare providers make decisions and improve patient care.
- ❑ Appointment Scheduling Systems
 - ❑ Helps manage patient appointments efficiently by optimizing schedules for healthcare providers, minimizing wait times.



Information Systems Used in Healthcare

- ❑ Laboratory Information Management System
 - ❑ Manages laboratory operations, including managing laboratory workflow, and storing test results.
- ❑ Health Management Information System
 - ❑ Collects, processes, and reports data related to patient admissions, bed availability, and staff management.
- ❑ ...



Information Systems Used in Mining Industry

- ❑ Mining companies use global positioning systems to identify and evaluate promising areas for mineral exploration, model mine construction





Information Systems Used in Retail

- Point of Sale (POS) Systems
 - Facilitates in-store transactions, tracking sales, processing payments, managing inventory in real time, and generating sales reports.



Information Systems Used in Retail

- Customer Relationship Management (CRM) Systems
 - Helps manage customer data, track customer interactions, and personalize marketing strategies to improve customer engagement and loyalty.
- ...



Information Systems Used in Business

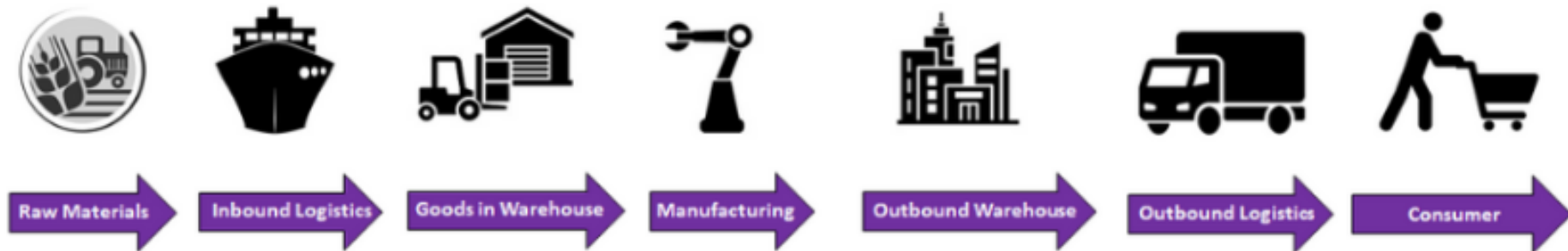
Information systems are used in all functional areas of business organizations:

- ❑ Accounting and finance
- ❑ Customer service
- ❑ Human resources
- ❑ Research and development
- ❑ Sales and marketing
- ❑ ...



Supply Chain

Supply Chain is an entire system of producing and delivering a product or service, starting from the raw materials all the way to delivering the final product or service to consumers.





Supply Chain Activities



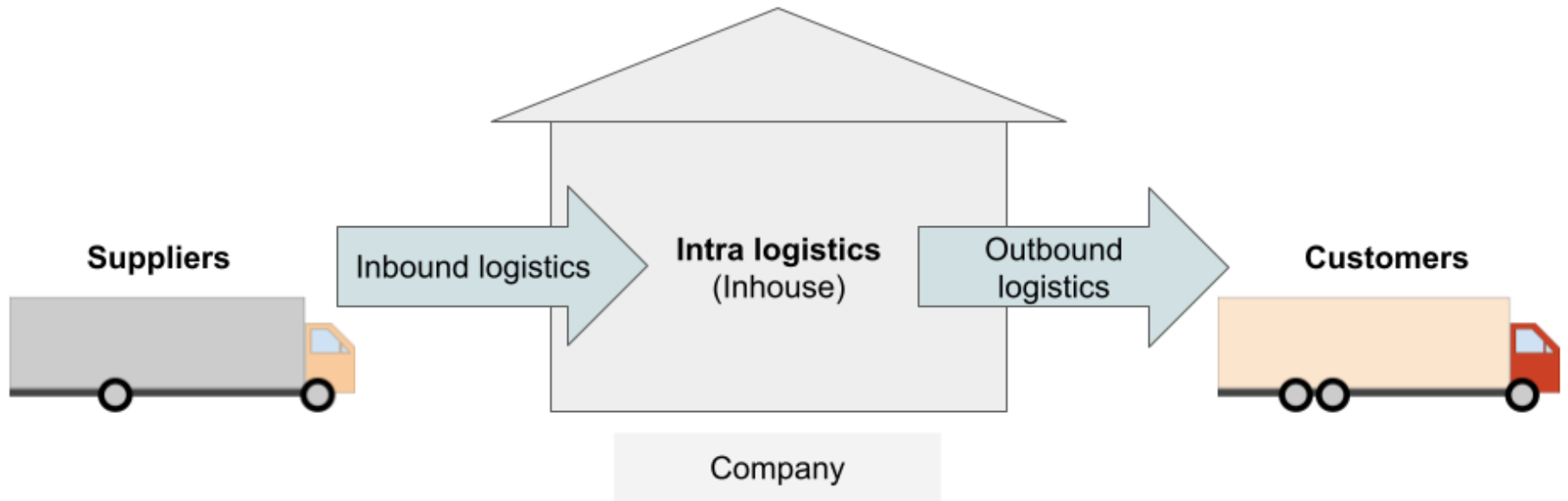


Primary Activities

- ❑ **Inbound Logistics:** all activities associated with the receiving, distributing and storing of incoming materials
- ❑ **Operations:** converting inputs (raw materials, energy and labor) into outputs (the final product)
- ❑ **Outbound Logistics:** all activities associated with the storage and movement of the final product to the end user
- ❑ **Marketing and Sales:** all activities involved in the assessment and encouragement of customers to purchase and the activities associated in providing a mean to purchase the product.
- ❑ **After-Sales Service** refers to activities related to maintenance and enhancement of value to the end user after the product is sold.



Inbound and Outbound Logistics





Secondary Activities

- ❑ **Procurement:** the acquisition of goods or services from an external source.
- ❑ **Human Resource Management:** all activities associated with the management of people as per the requirements.
- ❑ **Technology Development:** all activities related to the equipment, hardware, software, technical knowledge and procedures to transform the inputs into outputs.
- ❑ **Infrastructure:** all other activities including legal, finance, accounting, public relations and quality assurance.

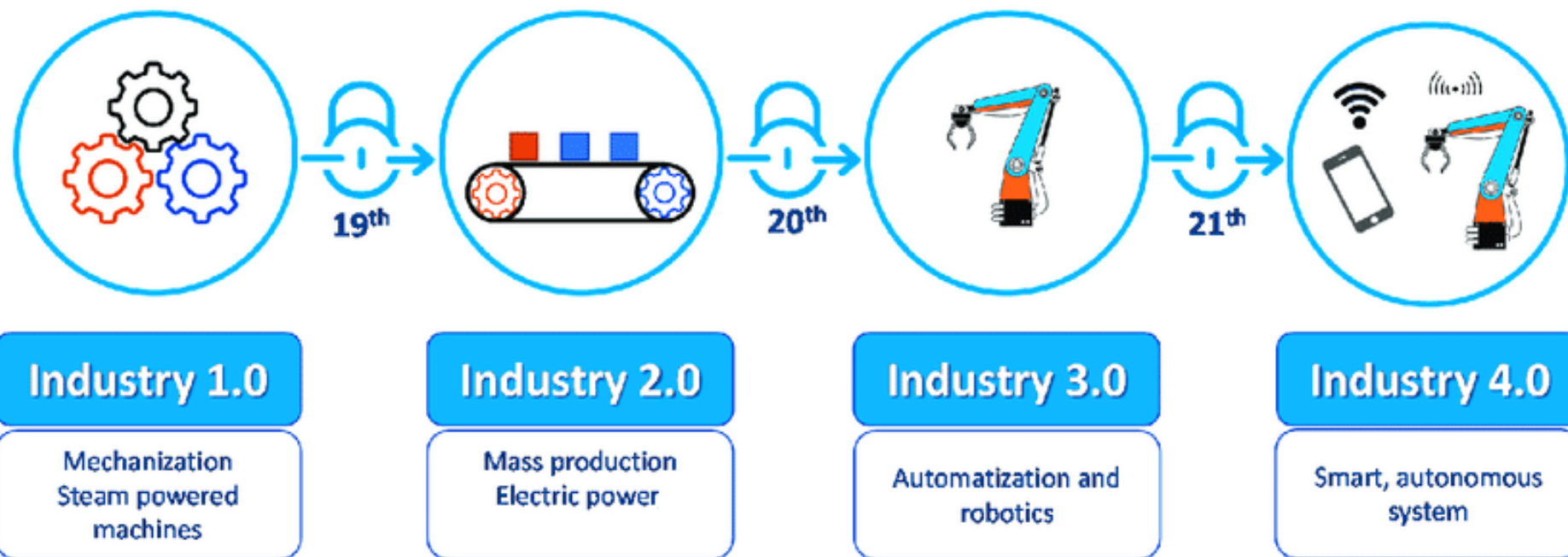


Margin

- ❑ **Margin** refers to the profit margin the company makes out of the activities of its value chain.
- ❑ A high margin means the company is able to sell a product or a service for a much higher price than the cost of all the activities of the value chain.



Types of Industry





Information Systems Used in Supply Chain

- ❑ Supply Chain Management Systems
- ❑ Warehouse Management Systems
- ❑ Transportation Management Systems
- ❑ Inventory Management Systems
- ❑ Demand Forecasting Systems
- ❑ Supplier Relationship Management Systems
- ❑ Order Management Systems
- ❑ Product Lifecycle Management Systems
- ❑ Supply Chain Analytics Systems
- ❑ ...



Case Study: Ford Motor Company

FIGURE 2.3

Ford Motor Company assembly line

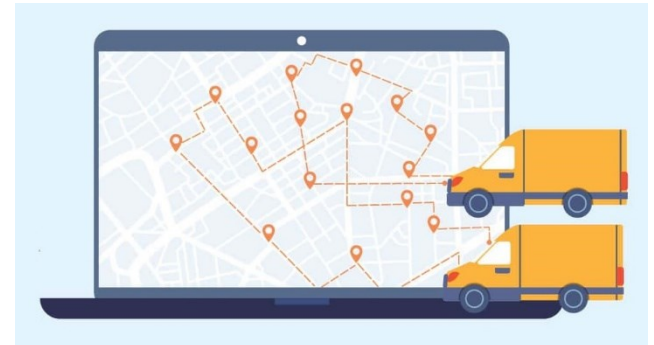
Ford Motor Company's use of information systems is a critical support activity of its supply chain. The company gives suppliers access to its inventory system so that the suppliers can monitor the database and automatically send another shipment of parts, such as engine parts or bumpers, eliminating the need for purchase orders. This procedure speeds delivery and assembly time and lowers Ford's inventory-carrying costs.





Case Study: Coca-Cola

- ❑ Coca-Cola Enterprises is the world's largest distributor of Coca Cola products.
- ❑ Using analytics software, the firm implemented a vehicle-routing optimization system that resulted in savings of \$45 million a year from reduced gas consumption and reduction in the number of drivers required.





Case Study: Zara

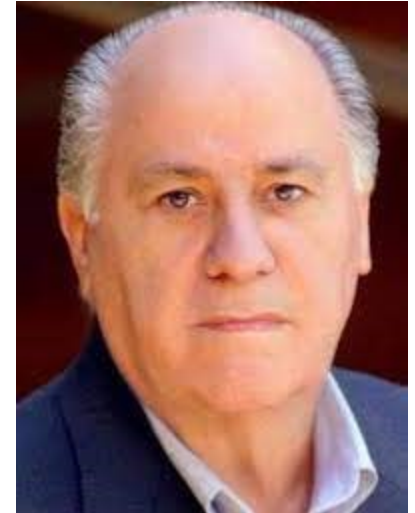
- For example, Zara is world's largest fashion clothing retailers with 2,000 stores spread across 88 countries.





Case Study: Zara

- ❑ Zara's founder, Amancio Ortega, had humble origins, but today is one of the richest men in the world.



The World's Billionaires



Case Study: Zara

- Consumer clothing trends are constantly changing, creating a highly competitive environment in which companies compete not only on price and quality but also on their ability to deliver products that are new and stimulating to their customers.



Case Study: Zara

- To meet this challenge, Zara has developed an extremely responsive supply chain that enables it to go from design stage to sales floor in a maximum of three weeks rather than the six-month industry average.
- Zara can deliver new products twice a week to its stores around the world.



Case Study: Zara

- At Zara, Information systems are used to capture and review data from stores on an hourly basis to spot new trends as early as possible.
- This data includes sales, inventory data, and information obtained by sales assistants as they chat with customers, and as the sales assistants gather unsold items that customers tried on, but left in fitting rooms.



Case Study: Zara

- All the data is sent to Zara's headquarters where it is carefully analyzed by design teams who decide what new designs will be prototyped and produced in small quantities to see what sells.
- In addition, inventory optimization models help the company determine the quantities and sizes of existing items that should be delivered to each store.



Case Study: Zara

- ❑ Zara's outstanding supply chain (which includes information systems as an integral component) has led to improved customer satisfaction, decreased risks of overstocking the wrong items, reduced total costs, and increased sales.



Competitive Advantage

- ❑ **Competitive advantage** refers to factors makes the company's products or services more desirable to customers than that of any other rival.
- ❑ These factors includes higher-quality products, better customer service, and lower costs than its rivals.
- ❑ Increasing competition will lead companies to seek competitive advantage.



Information Systems—A Means to Achieve Competitive Advantage

- ❑ Managers have a key responsibility to identify and use information systems to gain a competitive advantage.



Information Systems—A Means to Achieve Competitive Advantage

- Here are a few examples of using information systems in this manner:
 - Boeing employs sophisticated information systems that enable the digital design of various aircraft-related systems. These systems allow early detection and removal of design defects and reduce development cost and time.



Information Systems—A Means to Achieve Competitive Advantage

- ❑ Walmart employs a vendor-managed inventory system. This system reduces the administrative costs of managing inventory, lowers inventory holding costs, and increases sales through reductions of out-of-stock situations in its stores.



Information Systems—A Means to Achieve Competitive Advantage

- Skanska USA, a construction firm, employs an information system to track and analyze the movement and tasks of subcontractors on the job. With this system, Skanska can relocate tools and materials to more optimal locations and rearrange workflows to speed up the building process and to reduce labor costs.
- ...



Organizational Culture

- Culture:
 - Set of major understandings and assumptions shared by a group.
- Organizational culture:
 - Major understandings and assumptions shared by people with an organization.



Organizational Culture

- ❑ Also known as **company culture**. It is the personality of your organization and it plays a large part in your employees' overall satisfaction.
- ❑ For example:
 - ❑ Do employees feel valued?
 - ❑ Do we tell the truth to each other?
 - ❑ Do we speak the truth to leaders?
 - ❑ Do leaders always “win” the conversation?
 - ❑ ...



Organizational Change

- **Organizational change** refers to the actions in which an organization alters its culture.
- **Causes Organizational Change** might include:
 - New leadership within the organization
 - The implementation of new technology
 - The adoption of new business models
 - ...



Organizational Change

- Implementing change, such as a new information system introduces conflict, confusion, and disruption.
- It can affect:
 - people's roles and responsibilities,
 - their day-to-day routines and processes for accomplishing work,
 - what skills and knowledge they need, and



Organizational Change

- The resulting changes can be highly disruptive and agonizing to work through, and as a result, change often faces considerable resistance.
- As a manager in an organization undergoing such change, you must anticipate resistance and work actively to mitigate it.



Organizational Change

- Successful implementation of change only happens when people accept the need for change and believe that the change will improve their productivity and enable them to better meet their customers' needs.



Lewin's Change Model

- Change model:
 - Represents change theories by identifying stages of change and the best way to implement them.
- A three-stage approach for implementing change that involves **unfreezing, moving, and refreezing**.



Lewin's Change Model

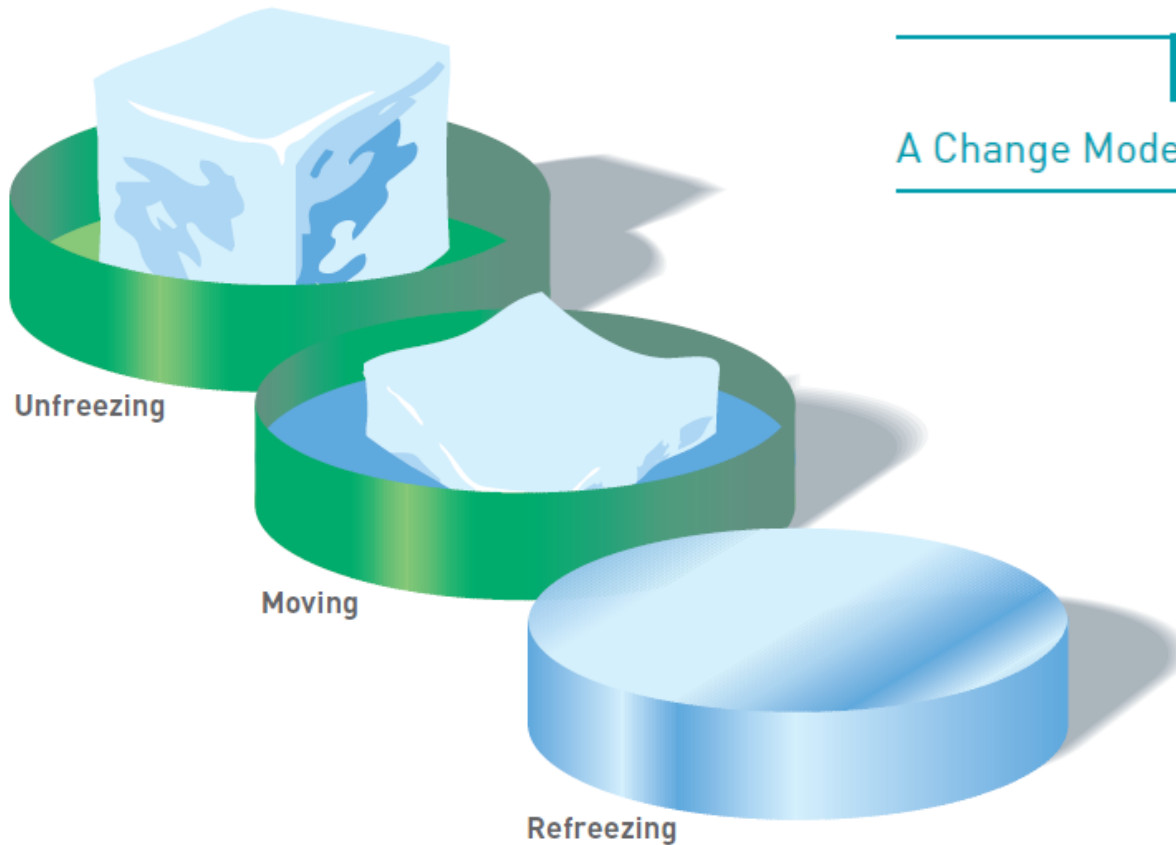


Figure 2.7

A Change Model



Lewin's Change Model

Unfreezing Preparing for change	Moving Making the change	Refreezing Institutionalizing
Key Tasks Communicate what, why, when, who, how Draw on others, and seek input, ideas Define objectives, success criteria, resources, schedule, budget Finalize work plans Assign leaders and implementation teams	Key Tasks Motivate individuals involved or affected Coach, train, lead, encourage, manage Provide appropriate resources Provide on-going feedback	Key Tasks Monitor progress against success criteria Establish processes, systems to institutionalize change Establish controls to ensure change is occurring Recognize and reward individuals for exhibiting new behavior Provide feedback, motivation, additional training to individuals not exhibiting new behavior



User Satisfaction and Technology Acceptance

- Perceived usefulness:
 - is defined as the degree to which individuals believe that use of the system will improve their performance.
- Perceived ease of use:
 - is the degree to which individuals believe that the system will be easy to learn and use.



User Satisfaction and Technology Acceptance

- Both **perceived usefulness** and **ease of use** can be strongly influenced by:
 - the expressed opinions of others who have used the system and
 - the degree to which the organization supports use of the system (e.g., providing incentives and offering training and coaching from key users).



User Satisfaction and Technology Acceptance

- ❑ **Perceived usefulness and ease of use** strongly influence whether someone will use an information system.
- ❑ Management can improve that perception by demonstrating that others have used the system effectively and by providing user training and support.



Case Study: Avon Products

- Avon Products is an international manufacturer and direct seller of beauty, household, and personal care products.
- Avon products are sold through six million independent and mostly part-time sales representatives worldwide who sell direct to family, friends, and personal contacts.



Case Study: Avon Products

- ❑ In 2013, Avon piloted a new sales system in Canada. The system was intended to streamline the ordering process through the use of iPads, which would allow the sales rep to display products to customers, check inventory and place orders online.
- ❑ It was estimated that the project would generate some \$40 million per year in cost savings and increased sales.



Case Study: Avon Products

- ❑ Unfortunately, the system did not meet the sales rep's expectations in terms usefulness and ease of use.
- ❑ As a result, about 16,000 Canadian sales reps quit in large part out of frustration with the new system.
- ❑ Avon dismissed the project at a cost of nearly \$125 million.



Diffusion of Innovation Theory

- When promoting an innovation (a new idea or product) to a target population, it is important to understand the characteristics of the target population that will help or hinder adoption of the innovation and then to apply the appropriate strategy.



Diffusion of Innovation Theory

- The diffusion of innovation theory explains how adoption of any innovation does not happen all at once for all members of the targeted population.
- This theory can be useful in planning to start implementing a new information system in an organization.



Diffusion of Innovation Theory

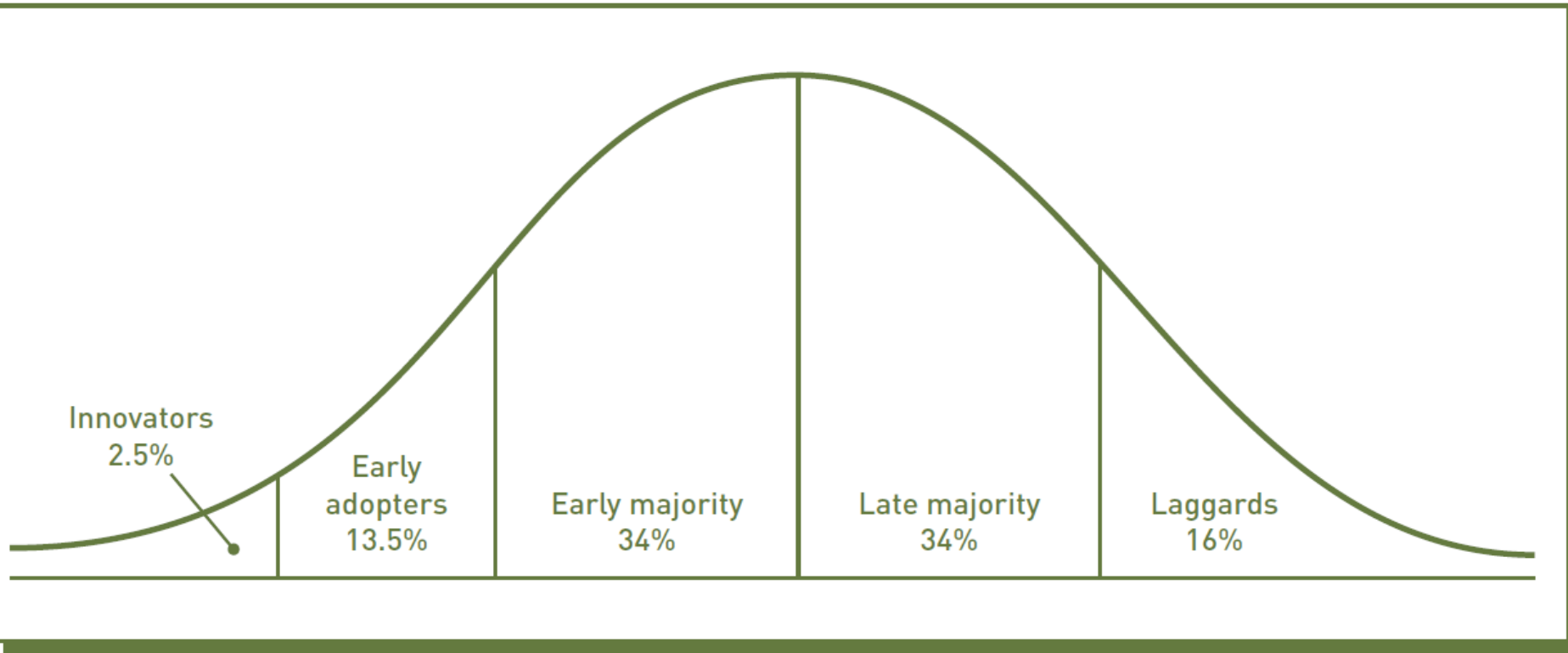


FIGURE 2.11

Innovation diffusion

Adoption of any innovation does not happen all at once for all members of the targeted population; rather, it is a drawn-out process, with some people quicker to adopt the innovation than others.



Five Categories Of Innovation Adopters

Adopter Category	Characteristics	Strategy to Use
Innovator	Risk takers; always the first to try new products and ideas	Simply provide them with access to the new system and get out of their way
Early adopter	Opinion leaders whom others listen to and follow; aware of the need for change	Provide them assistance getting started
Early majority	Listen to and follow the opinion leaders	Provide them with evidence of the system's effectiveness and success stories
Late majority	Skeptical of change and new ideas	Provide them data on how many others have tried this and have used it successfully
Laggards	Very conservative and highly skeptical of change	Have their peers demonstrate how this change has helped them and bring pressure to bear from other adopters



Careers in Information Systems

- Today, most organizations cannot function or compete effectively without computer-based information systems.

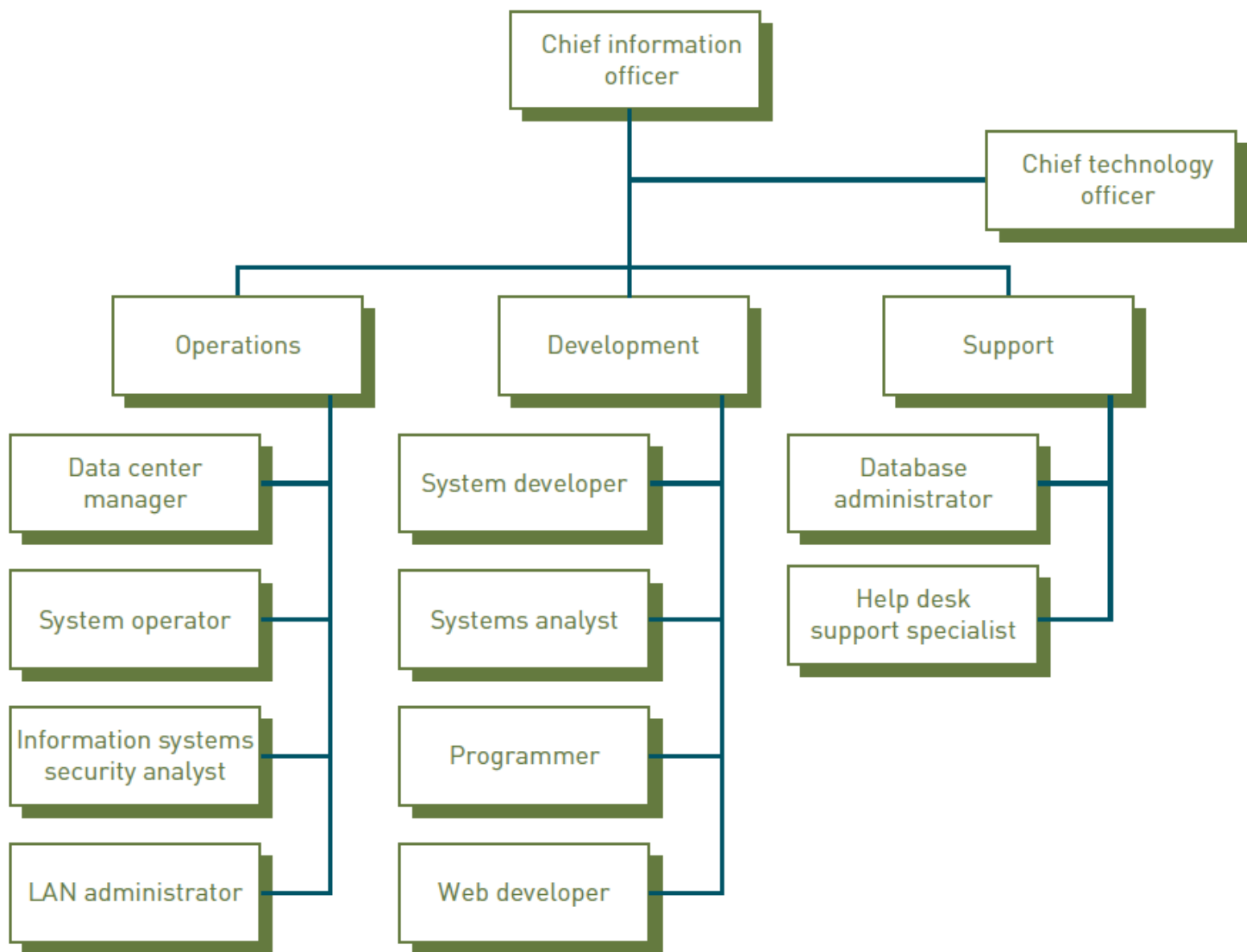


FIGURE 2.14

Three primary functions of the information systems organization

Each of these functions—operations, development, and support—encompasses several different IS roles.



Careers in Information Systems

TABLE 1.3 Median annual salary for different information system positions

Job Title	2018 Median Annual Salary	Number of Jobs, 2016	Number of New Job Openings, 2016–2026
CIO	\$202,500	N/A	N/A
Software Developer	\$115,000	1,256,300	302,400
Information Systems Security Analyst	\$115,250	100,000	28,500
Systems Analyst	\$89,500	600,500	54,400
Programmer	\$65,000	294,900	–21,300
Web Developer	\$66,100	162,900	24,400
Business Analyst	\$92,000	N/A	N/A

SOURCES: Robert Half 2018 Salary Guide for Technical Professionals and the Bureau of Labor Statistics Employment Projections, 2016–2026



Careers in Information Systems

- ❑ Successful information system workers:
 - ❑ must enjoy working in a fast-paced, dynamic environment where the underlying technology changes all the time.
 - ❑ must be comfortable with solving unexpected challenges.
 - ❑ need good communication skills and often serve as translators between business needs and technology-based solutions.



Technical skills for IS Workers

Technical skills that are important for IS workers to possess include the following:

- ❑ Capability to analyze large amounts data
- ❑ Programming Skill
- ❑ Ability to design and build applications for computers and mobile devices
- ❑ Technical support expertise
- ❑ Knowledge of networking and cloud computing
- ❑ Web design and development skills
- ❑ ...



Other IS Careers

- ❑ Related career opportunities include computer training, computer and computer-equipment sales, and computer-equipment repair and maintenance.
- ❑ Other IS career opportunities include being employed by technology companies, such as Oracle, IBM, HP, Microsoft, Google, and Dell.



BLS Projections of Computer-related Jobs, 2012 to 2022

- ❑ Technology is one of the fastest-growing areas of the U.S. economy, and information systems professionals are in high demand.
- ❑ The U.S. Bureau of Labor Statistics (BLS) forecasts an increase of 1.2 million new computing jobs in the time period 2012 to 2022, as shown in Table 2.3. This is an average of 124,000 new jobs per year.



BLS Projections of Computer-Related Jobs, 2012 to 2022

National Employment Matrix Title	Number		Change	Job Openings due to Growth and Replacements
	2012	2022		
Computer and math occupations (all numbers in thousands)				
Computer and information research scientists	26.7	30.8	4.1	8.3
Computer systems analysts	520.6	648.4	127.8	209.6
Information security analysts	75.1	102.5	27.4	39.2
Computer programmers	343.7	372.1	28.4	118.1
Software developers, applications	613.0	752.9	139.9	218.5
Software developers, system software	405.0	487.8	82.8	134.7
Web developers	141.4	169.9	28.5	50.7
Database administrators	118.7	136.6	17.9	40.3
Network and computer systems administrators	366.4	409.4	43.0	100.5
Computer network architects	143.4	164.3	20.9	43.5
Computer support specialists	722.3	845.3	123.0	236.5
Computer occupations, all other	205.8	213.6	7.8	40.2
Total	3,682.1	4,333.6	651.5	1,240.1
Yearly average				124.0

Source: "Employment by Detailed Occupation 2012–2022," Bureau of Labor Statistics, www.bls.gov/emp/ep_table_102.htm, accessed August 13, 2015.



Degree Programs Related to Information Systems

- Degree programs:
 - Computer science
 - Management information systems
 - Information technology
 - Software Engineering
 - Business information systems
 - Information science
 - Informatics
 - ...



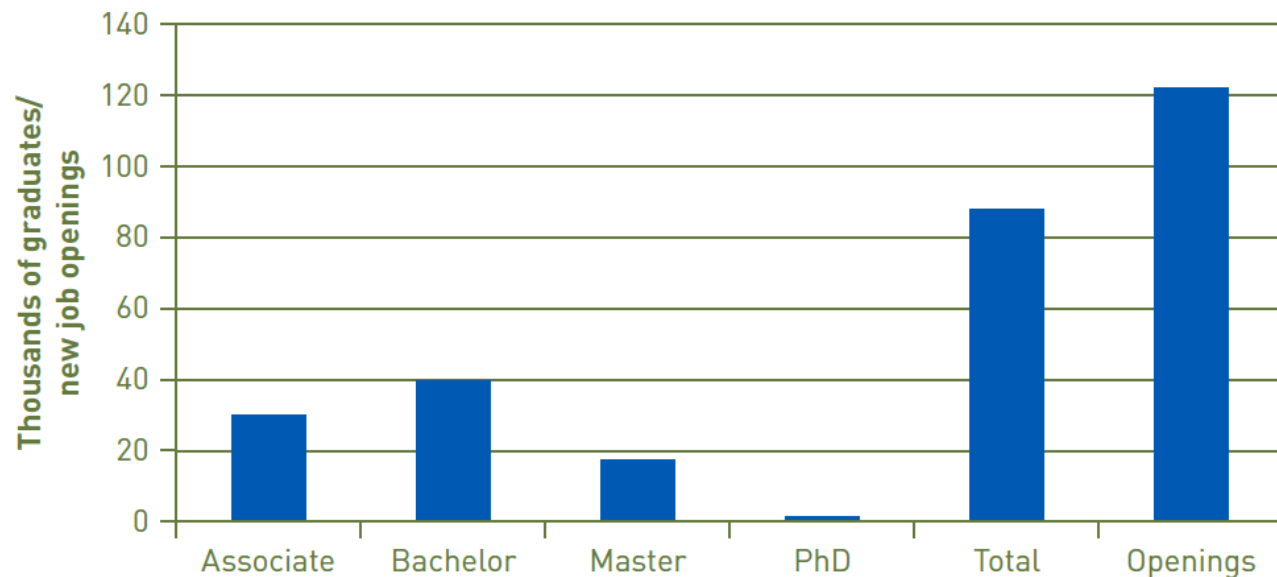
Supply Vs. Demand for IT Workers

FIGURE 2.13

Supply versus demand for IS workers

The total number of IS-related job openings is expected to average about 124,000 per year between 2012 and 2022, while the number of IS-related graduates is expected to average about 88,100 per year—for a shortfall of 35,900 workers.

Source: “Computer Science Job Statistics”, Exploring Computer Science, www.exploringcs.org/resources/cs-statistics, accessed August 19, 2015.





Opportunities for Foreign IT Workers to Work in United States

- ❑ It appears that, United States, there will be a shortfall of about 33,900 workers per year.
- ❑ Opportunities in information systems are also available to people from foreign countries.
 - ❑ The U.S. L-1 and H-1B visa programs seek to allow skilled employees from foreign lands into the United States.



References

- ▣ **Reynolds, George Walter, Stair, Ralph M.**
“Principles of information systems”, 13e – 2018,
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