An Introduction to Information Systems

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Information Concepts

DATA

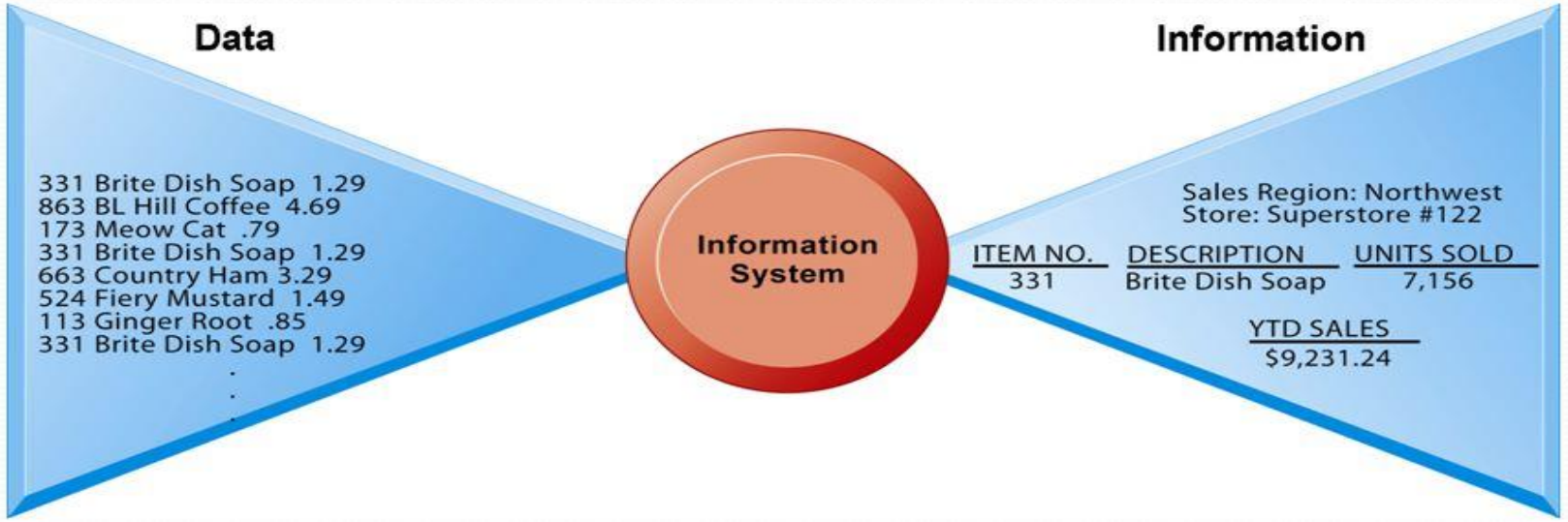
Raw facts, such as an employee number, total hours worked in a week, inventory part numbers, or sales orders.

INFORMATION

A collection of facts organized in such a way that they have additional value beyond the value of the individual facts.

Information Concepts

Data VS. Information



- **Raw data from a supermarket checkout counter can be processed and organized to produce meaningful information, such as the total unit sales of dish detergent or the total sales revenue from dish detergent for a specific store or sales territory.**

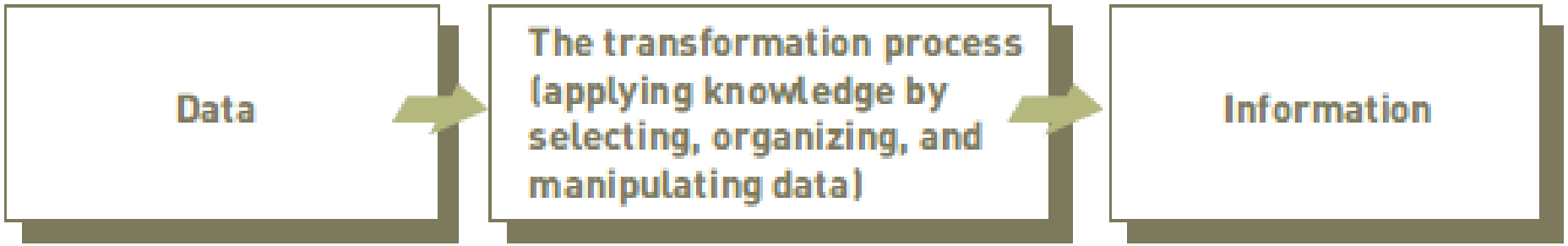
Information Concepts

Types of Data

Data	Represented by
Alphanumeric data	Numbers, letters, and other characters
Image data	Graphic images and pictures
Audio data	Sound, noise, or tones
Video data	Moving images or pictures

Information Concepts

The Process of Transforming
Data into Information

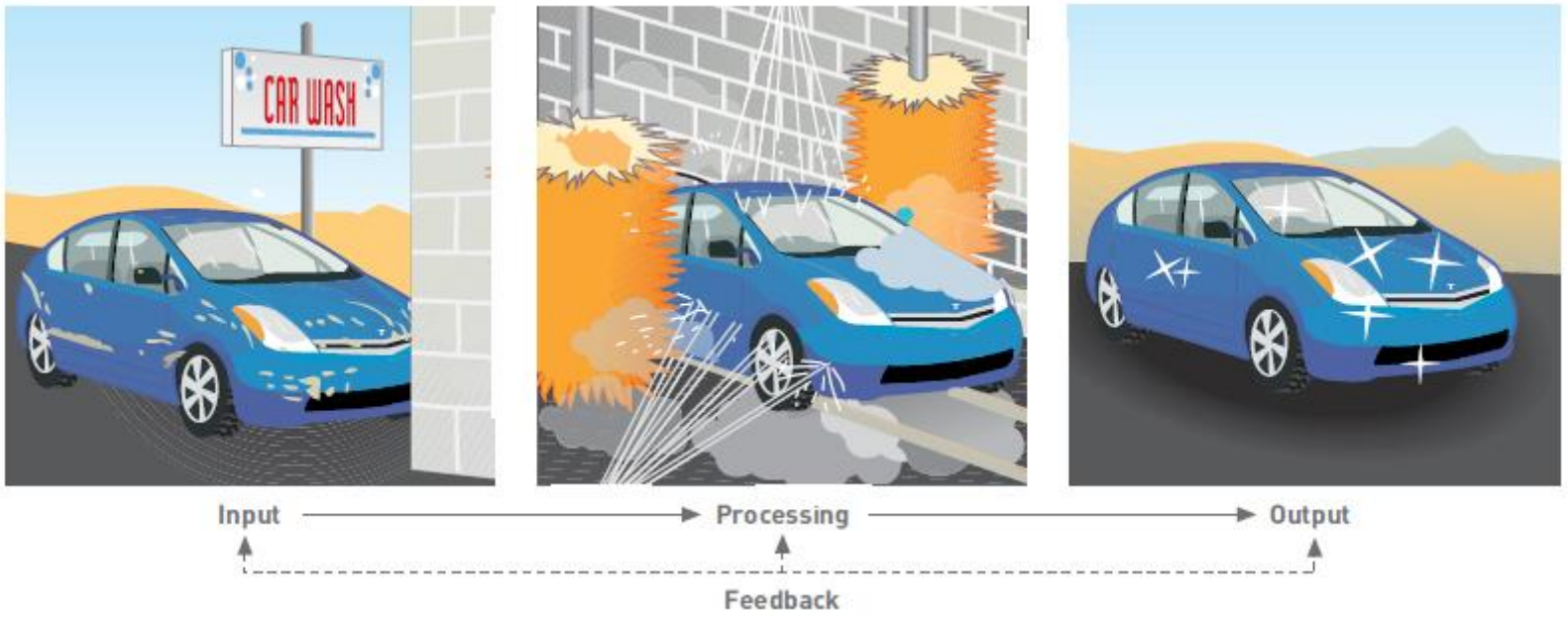


Information Concepts

Characteristics of Valuable Information

Characteristics	Definitions
Accessible	Information should be easily accessible by authorized users so they can obtain it in the right format and at the right time to meet their needs.
Accurate	Accurate information is error free. In some cases, inaccurate information is generated because inaccurate data is fed into the transformation process. (This is commonly called garbage in, garbage out [GIGO].)
Complete	Complete information contains all the important facts. For example, an investment report that does not include all important costs is not complete.
Economical	Information should also be relatively economical to produce. Decision makers must always balance the value of information with the cost of producing it.
Flexible	Flexible information can be used for a variety of purposes. For example, information on how much inventory is on hand for a particular part can be used by a sales representative in closing a sale, by a production manager to determine whether more inventory is needed, and by a financial executive to determine the total value the company has invested in inventory.
Relevant	Relevant information is important to the decision maker. Information showing that lumber prices might drop might not be relevant to a computer chip manufacturer.
Reliable	Reliable information can be trusted by users. In many cases, the reliability of the information depends on the reliability of the data-collection method. In other instances, reliability depends on the source of the information. A rumor from an unknown source that oil prices might go up might not be reliable.
Secure	Information should be secure from access by unauthorized users.
Simple	Information should be simple, not overly complex. Sophisticated and detailed information might not be needed. In fact, too much information can cause information overload, whereby a decision maker has too much information and is unable to determine what is really important.
Timely	Timely information is delivered when it is needed. Knowing last week's weather conditions will not help when trying to decide what coat to wear today.
Verifiable	Information should be verifiable. This means that you can check it to make sure it is correct, perhaps by checking many sources for the same information.

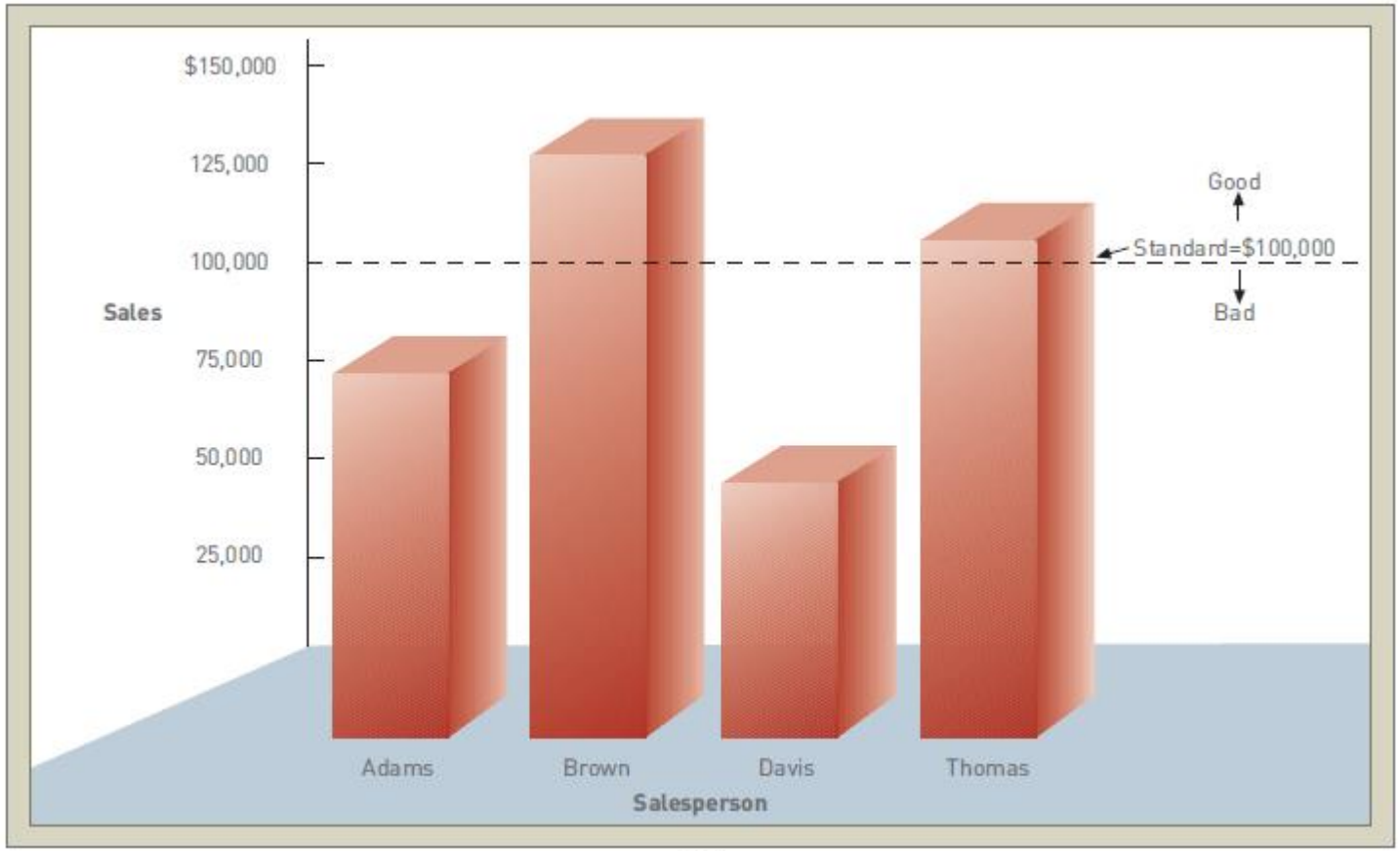
System Concepts



Suatu sistem adalah himpunan elemen atau komponen yang berinteraksi untuk mencapai tujuan. Unsur-unsur itu sendiri dan hubungan di antara mereka menentukan cara kerja sistem. Sistem memiliki input, pemrosesan mekanisme, output, dan umpan balik.

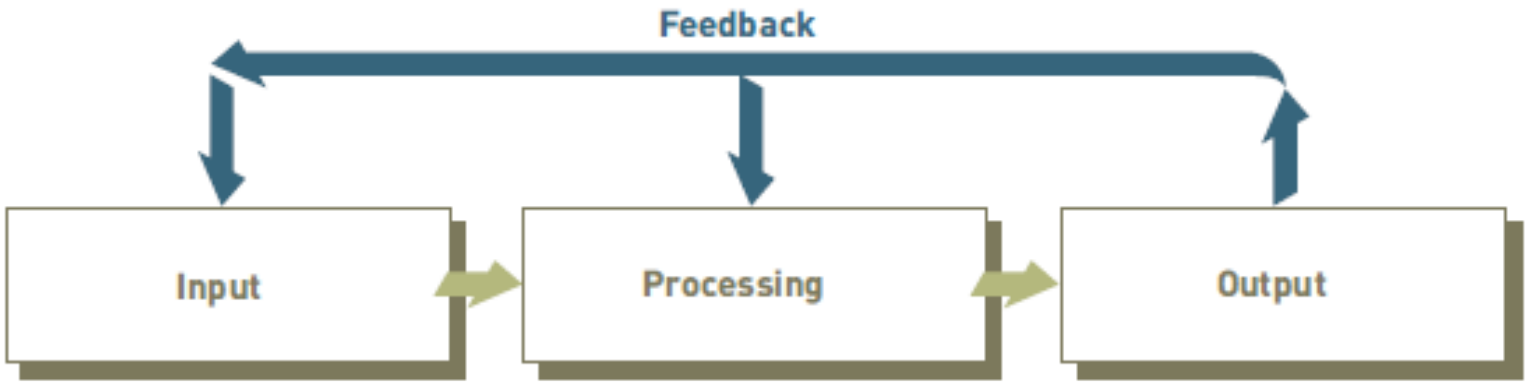
System Concepts

Apakah kinerja sistem dapat diukur?
Dapat, menggunakan pengukuran EFESIENSI



(a)

What is an Information System?

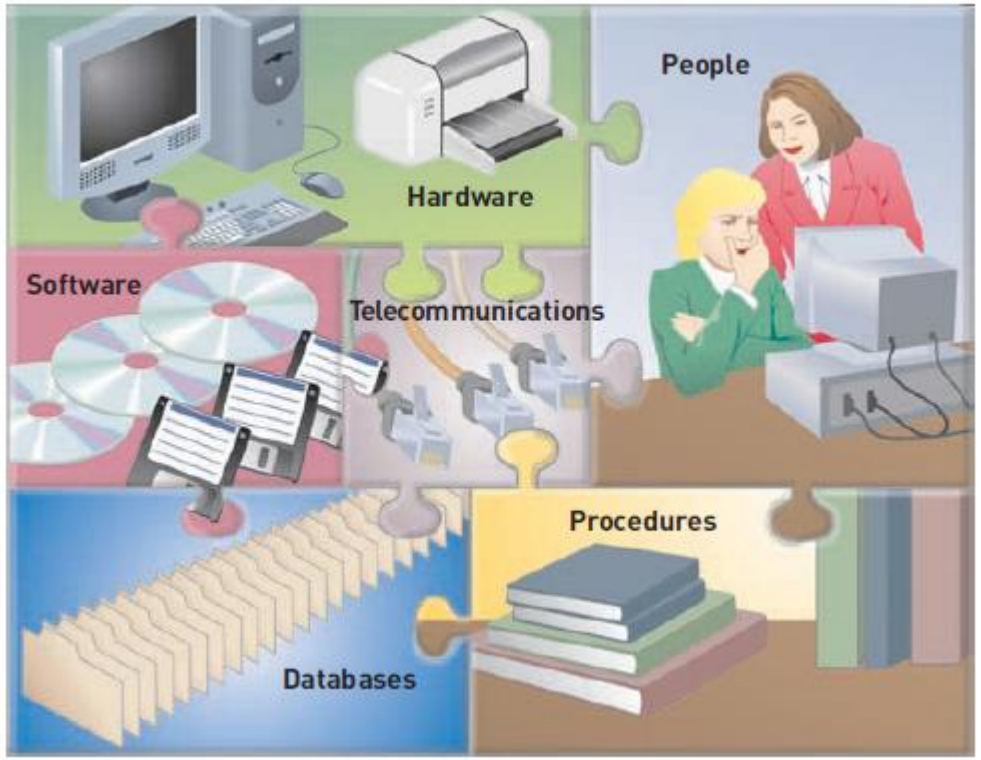


sistem informasi (IS) adalah seperangkat elemen atau komponen yang saling terkait yang mengumpulkan (input), memanipulasi (memproses), menyimpan, dan menyebarkan (output) data dan informasi, dan memberikan reaksi korektif (mekanisme umpan balik) untuk memenuhi suatu tujuan.

What is an Information System?

Manual and Computerized Information Systems

Computer-Based Information Systems



The Components of a Computer-Based Information System.

Business Information Systems

Business Information Systems Business information systems are often integrated in one product and can be delivered by the same software package.

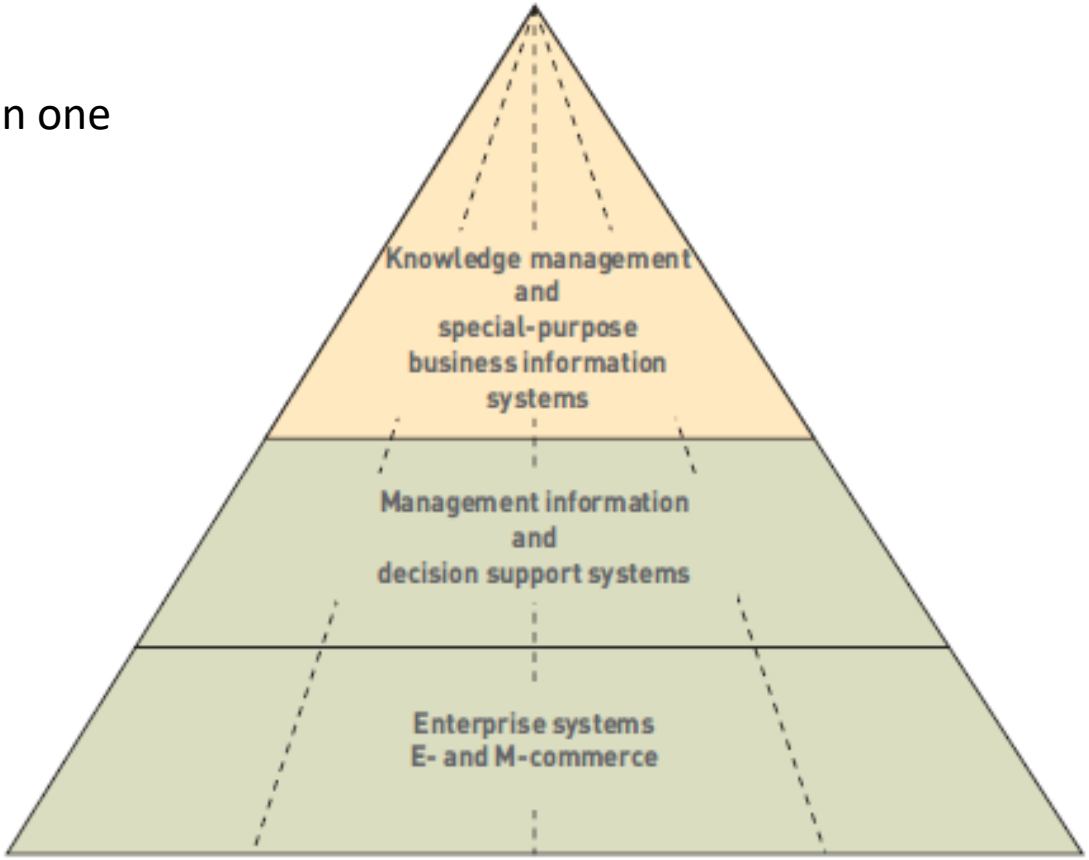
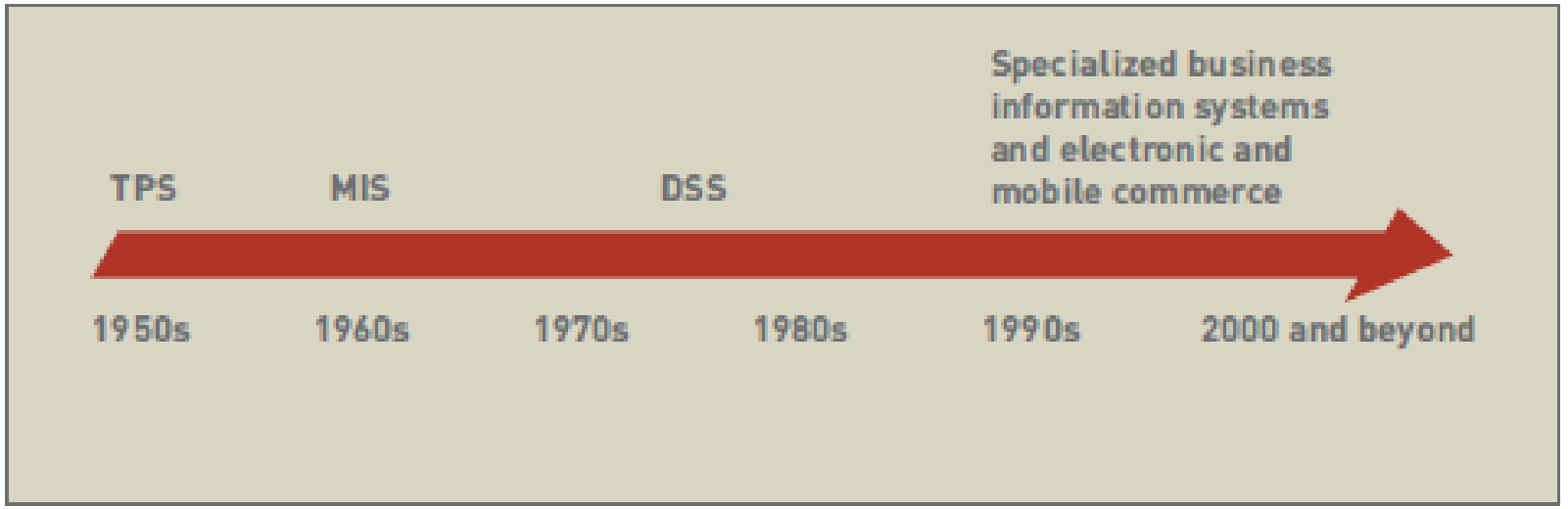


Figure 1.8 shows a simple overview of the development of important business information systems discussed in this section.

Business Information Systems

The Development of Important Business Information Systems



e-commerce
Any business transaction executed electronically between companies (business-to-business), companies and consumers (business-toconsumer), onsumers and other consumers (consumer-toconsumer), business and the public sector, and consumers and the public sector.

mobile commerce
(m-commerce), Transactions conducted anywhere, anytime.

Information Systems @ Work: Welcome to Mobile Banking

Welcome to Mobile Banking

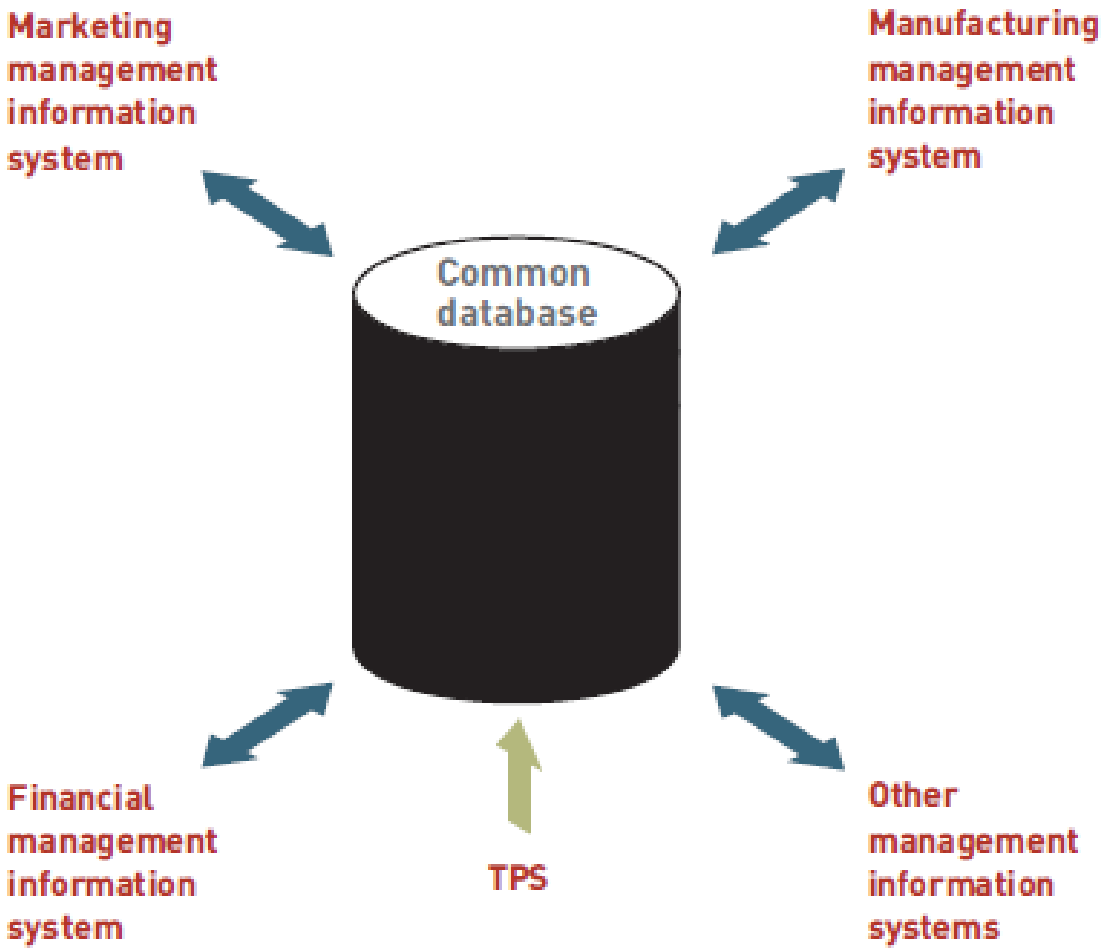
Discussion Questions

1. Would you be comfortable using mobile banking for transferring funds, paying bills, and checking balances? Why or why not?

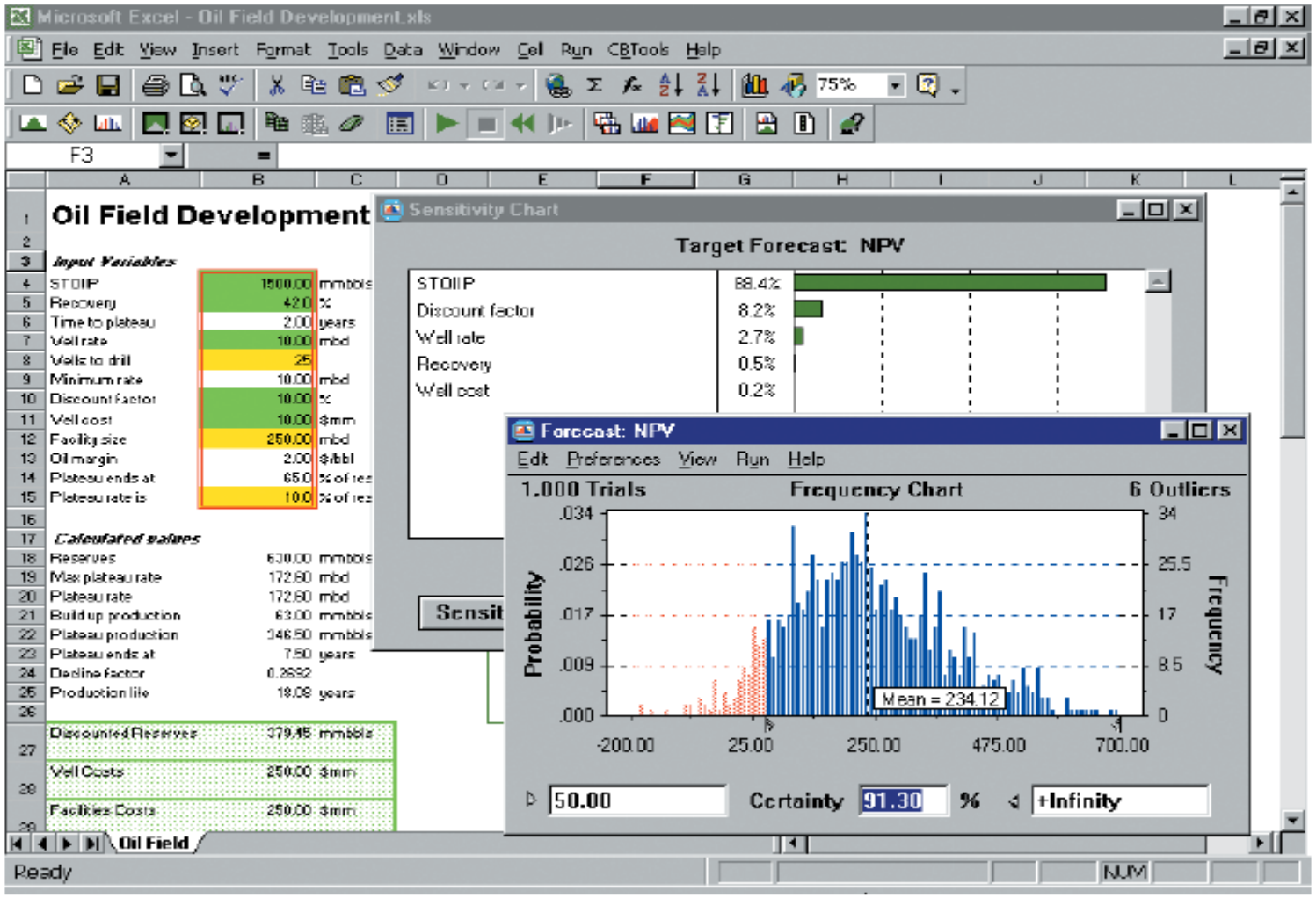
2. How might mobile banking attract the attention of hackers? Are the precautions discussed in this article enough to keep hackers at bay?

Management Information System (MIS)

management information system (MIS)
An organized collection of people, procedures, software, databases, and devices that provides routine information to managers and decision makers.



decision support system (DSS)



Decisioneering provides decision support software called Crystal Ball, which helps businesspeople of all types assess risks and make forecasts. Shown here is the Standard Edition being used for oil field development.

(Source: Crystal Ball screenshot courtesy of Decisioneering, Inc.)

decision support system (DSS) An organized collection of people, procedures, software, databases, and devices used to support problem-specific decision making.

decision support system (DSS)

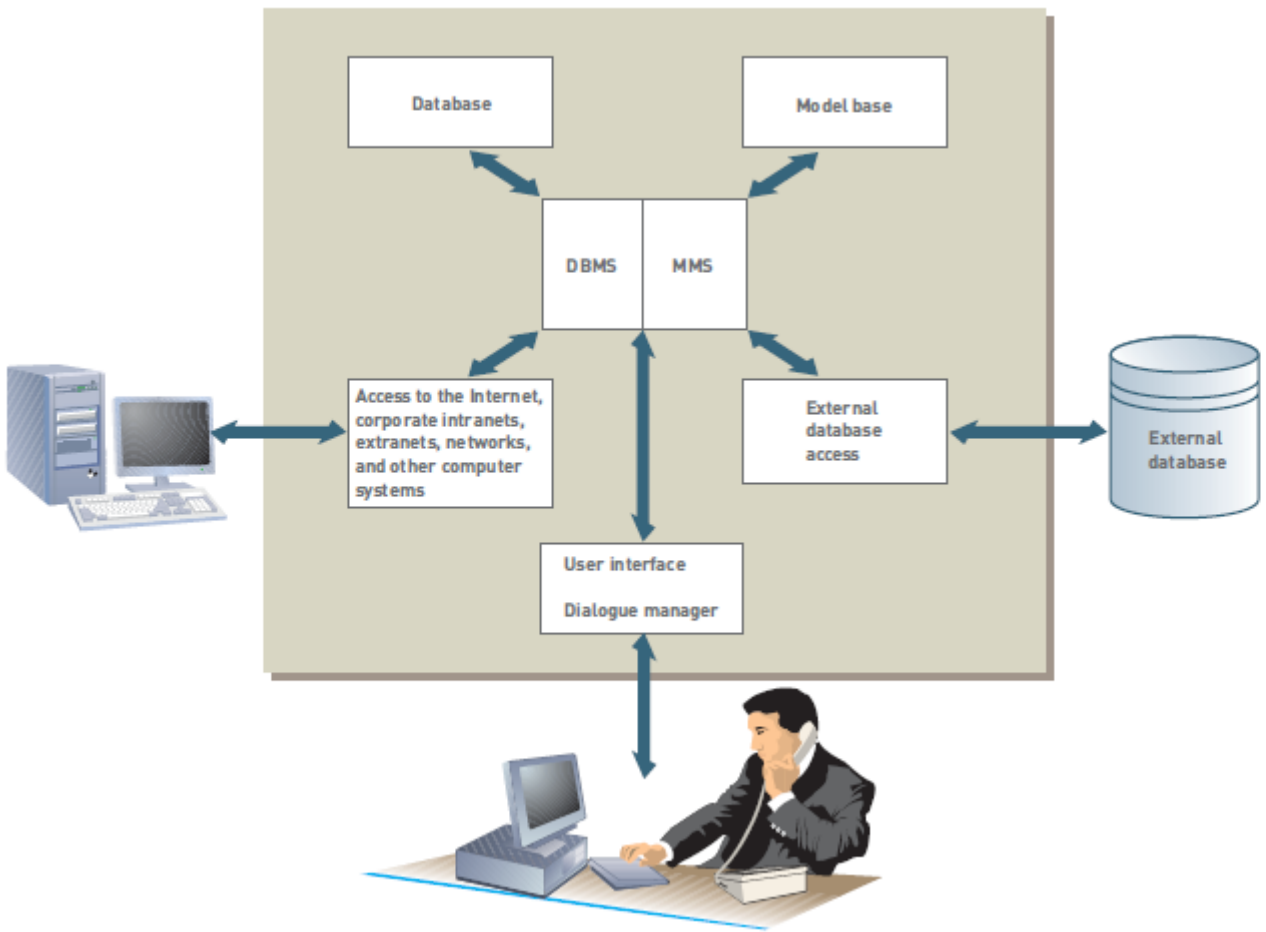


Figure 1.13

Essential DSS Elements

artificial intelligence (AI)

artificial intelligence (AI), A field in which the computer system takes on the characteristics of human intelligence.

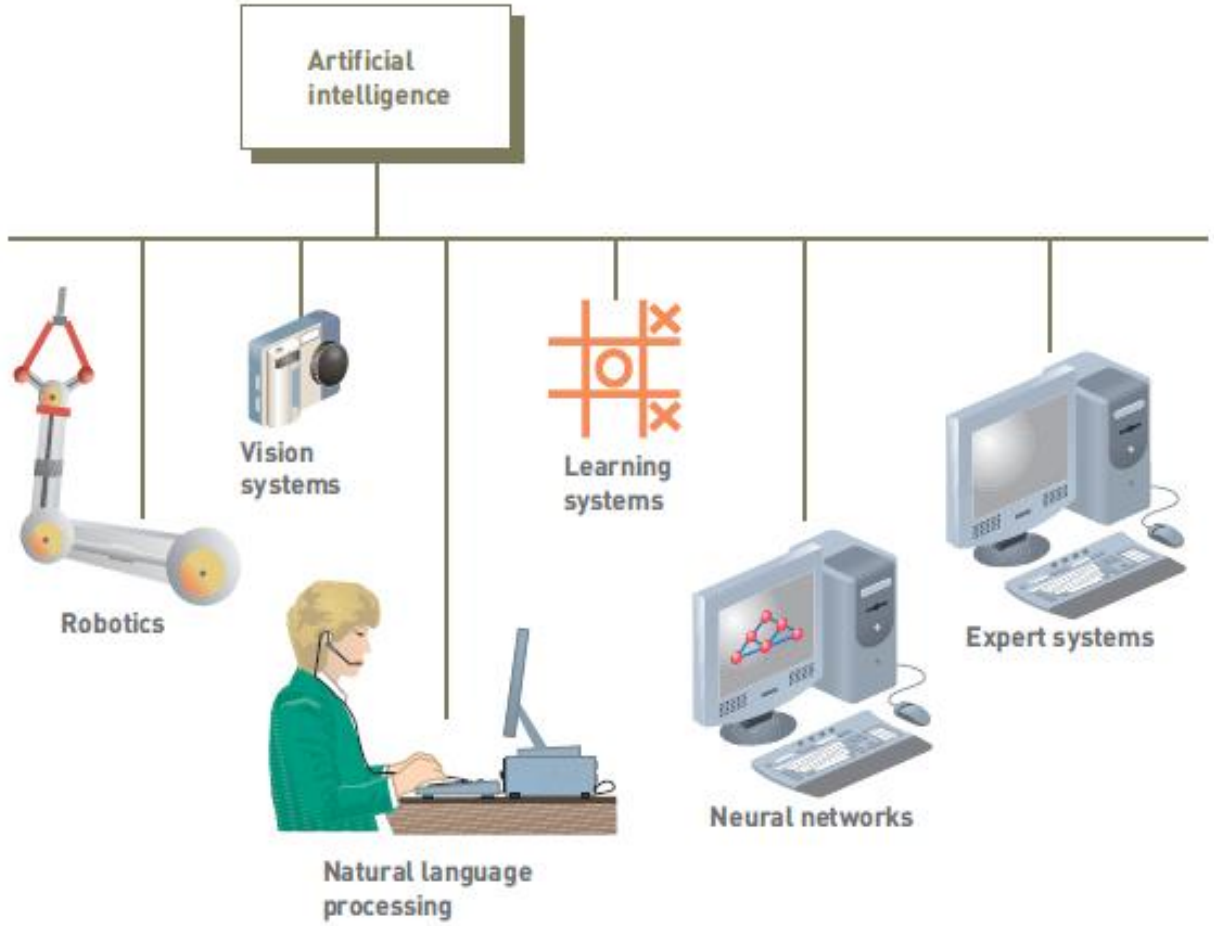


Figure 1.14

The Major Elements of Artificial Intelligence

expert system

A system that gives a computer the ability to make suggestions and function like an expert in a particular field.

knowledge base

The collection of data, rules, procedures, and relationships that must be followed to achieve value or the proper outcome.

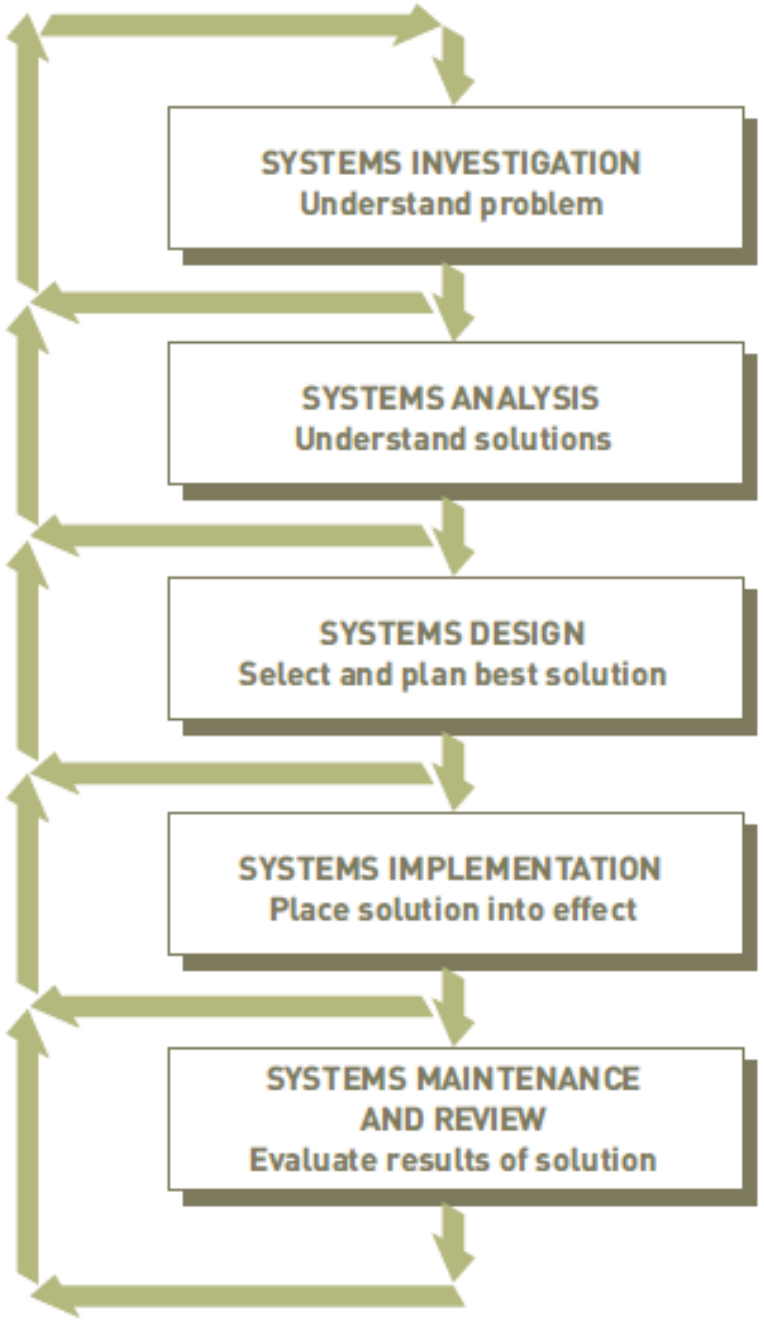
virtual reality

The simulation of a real or imagined environment that can be experienced visually in three dimensions.

systems development

The activity of creating or modifying business systems.

An Overview of Systems Development



Security, Privacy, and Ethical Issues in Information Systems and the Internet

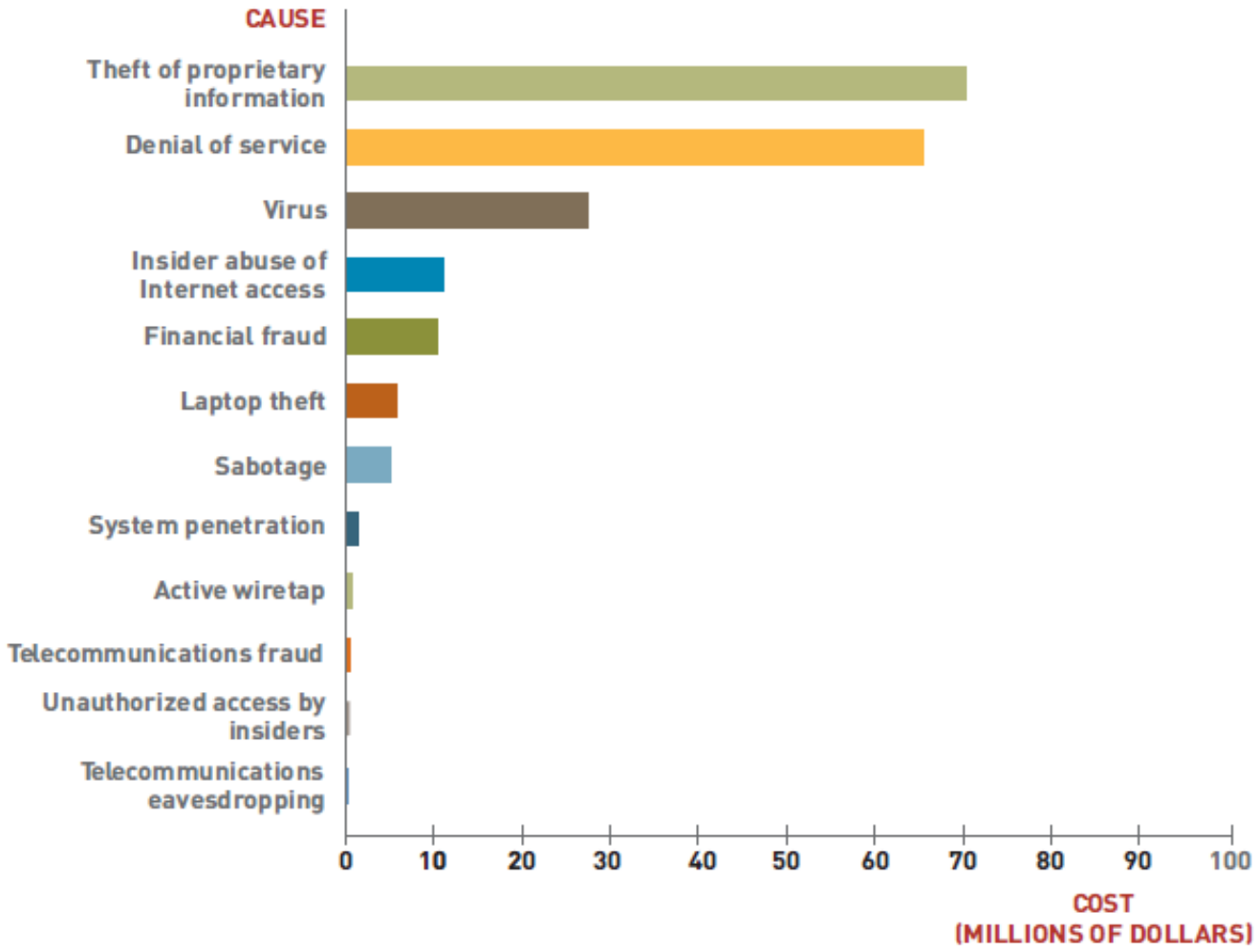


Figure 1.17

The Cost and Cause of Computer Attacks

(Source: Data from Riva Richmond, "How to Find Your Weak Spots," *The Wall Street Journal*, September 29, 2003, p. R3.)

Information Systems in Industry

Information Systems in the Functional Areas of Business

Festo, a global manufacturer of components and controls for industrial automation, uses a CAD system when developing its products.

(Source: Courtesy of Festo AG & Co. KG.)

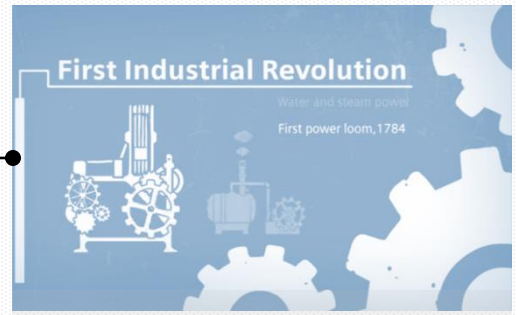
GLOBAL CHALLENGES IN INFORMATION SYSTEMS

Era	Dates	Characterized by
Globalization 1.0	Late 1400–1800	Countries with the power to explore and influence the world
Globalization 2.0	1800–2000	Multinational corporations that have plants, warehouses, and offices around the world
Globalization 3.0	2000–today	Individuals from around the world who can compete and influence other people, corporations, and countries by using the Internet and powerful technology tools

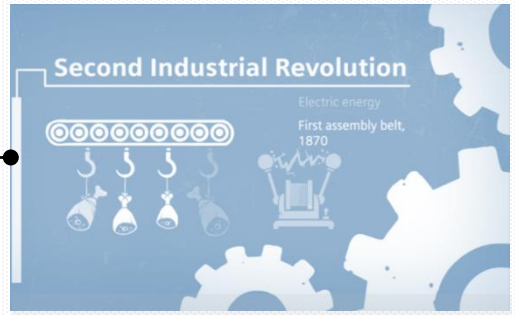
Lini Masa

Tahap-Tahap Revolusi Industri

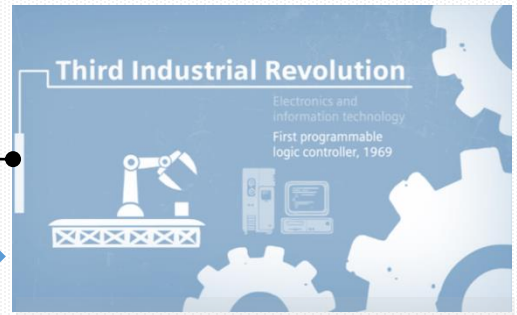
1800 — 1900 — 2000 — now



Penemuan Mesin Uap mendorong munculnya kapal uap, kereta api, dll



Penemuan listrik dan *assembly line* yang meningkatkan produksi barang



Inovasi teknologi informasi, komersialiasi *personal computer*, dll.

Revolusi Industri ke-4

Kegiatan manufaktur terintegrasi melalui penggunaan teknologi *wireless* dan *big data* secara masif

Fase periode Revolusi Industri membutuhkan masa yang semakin singkat dari waktu ke waktu

Wajah Kegiatan Ekonomi Dunia saat Ini

Saat ini berbagai macam kebutuhan manusia telah banyak menerapkan dukungan **internet dan dunia digital** sebagai wahana interaksi dan transaksi

Sharing economy

airbnb · swap · Zopa · Bicycle · CouchSurfing · BookMooch · Zilok.com · NETFLIX · carpooling.com · zipcar

e-Education

coursera · UDACITY · edX · canvas NETWORK · NovoED · iversity · OPEN 2 STUDY · Future Learn

e-Government

Cloud Collaborative

Google Drive · Dropbox · Microsoft Office 365

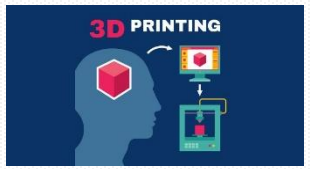
Marketplace

Bukalapak.com · tokopedia

Online Health Services

HealthTap · klikDOKTER.com MENUJU INDONESIA SEHAT

Smart Manufacturing



sculpteo

Smart City

Smart Appliances

Dampak Dunia Digital dan Revolusi Industri Keempat

Era Baru Industrilisasi Digital

Ancaman:

- Secara global era digitalisasi akan menghilangkan sekitar 1 – 1,5 miliar pekerjaan sepanjang tahun 2015-2025 karena digantikannya posisi manusia dengan mesin otomatis (Gerd Leonhard, *Futurist*);
- Diestimasi bahwa di masa yang akan datang, 65% murid sekolah dasar di dunia akan bekerja pada pekerjaan yang belum pernah ada di hari ini (*U.S. Department of Labor report*).

Peluang:

- Era digitalisasi berpotensi memberikan peningkatan *net* tenaga kerja hingga 2.1 juta pekerjaan baru pada tahun 2025
- Terdapat potensi pengurangan emisi karbon kira-kira 26 miliar metrik ton dari tiga industri: elektronik (15,8 miliar), logistik (9,9 miliar) dan otomotif (540 miliar) dari tahun 2015-2025 (World Economic Forum).

Gejala-Gejala Trasnformasi di Indonesia

Saat ini beberapa jenis model bisnis dan pekerjaan di Indonesia sudah terkena dampak dari arus era digitalisasi

- Toko konvensional yang ada sudah mulai tergantikan dengan model bisnis *marketplace*.
- Taksi atau Ojek Tradisional posisinya sudah mulai tergeserkan dengan moda-moda berbasis online

Toko Fisik

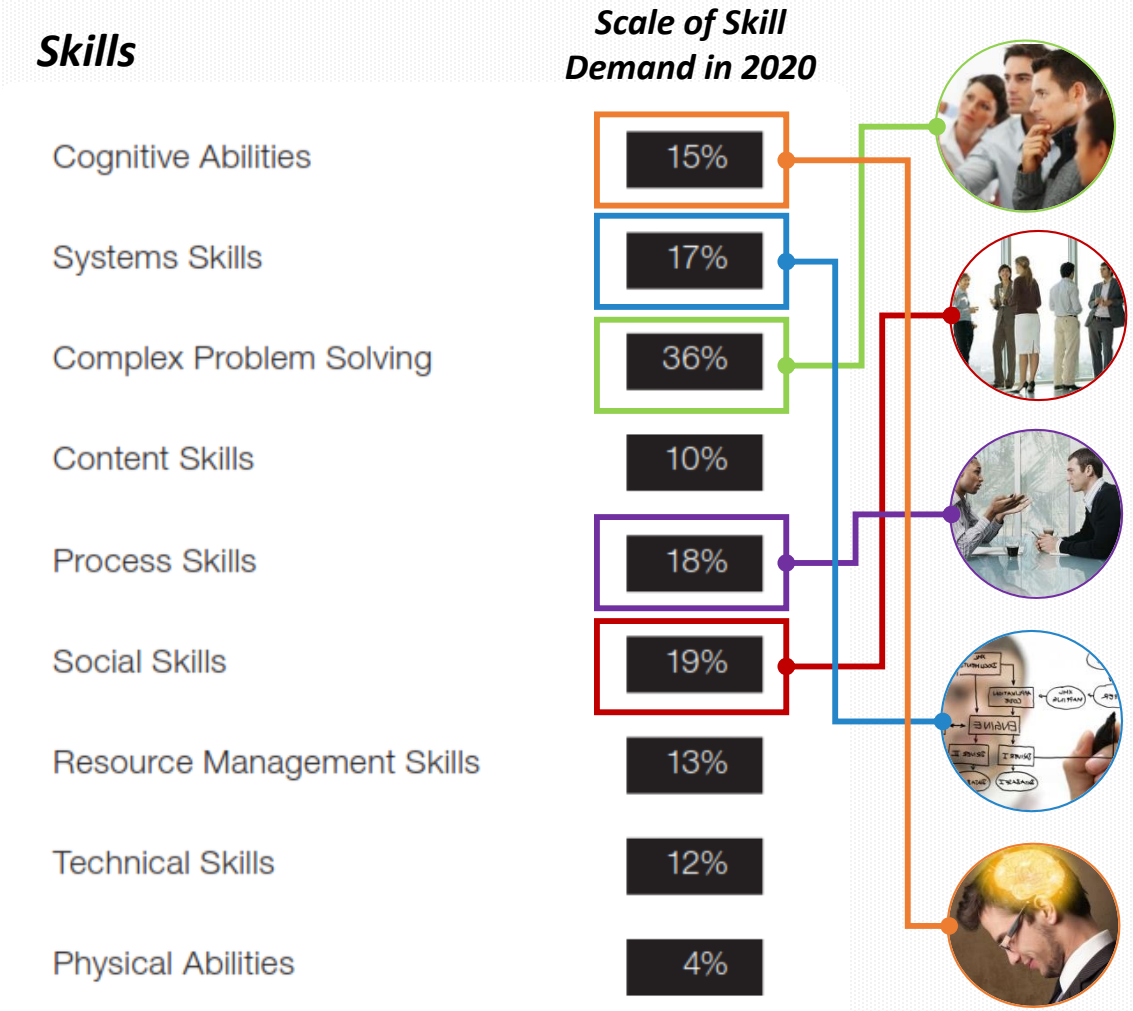
Market Place Online

Ojek dan Taksi Konvensional

GO-Jek, Grab, Uber, dll.

Tantangan-Tantangan

Skill di Industri Masa Depan



(Share of jobs requiring skills family as part of their core skill set, %)

Complex Problem Solving

Kemampuan untuk memecahkan masalah yang asing dan belum diketahui solusinya di dalam dunia nyata.

Social Skill

Kemampuan untuk melakukan koordinasi, negosiasi, persuasi, *mentoring,* kepekaan dalam memberikan bantuan hingga *emotional intelligence*

Process Skill

Kemampuan terdiri dari: *active listening, logical thinking,* dan *monitoring self and the others*

System Skill

Kemampuan untuk dapat melakukan *judgement* dan keputusan dengan pertimbangan *cost-benefit* serta kemampuan untuk mengetahui bagaimana sebuah sistem dibuat dan dijalankan

Cognitive Abilities

Skill yang terdiri dari antara lain: *Cognitive Flexibility, Creativity, Logical Reasoning, Problem Sensitivity, Mathematical Reasoning,* dan *Visualization* .

Sumber: The Future of Jobs Report, World Economic Forum, definisi skill berdasarkan O*NET Content Model, US Department of Labor & Bureau of Labor Statistics