King Saud University

College of Engineering

IE – 462: "Industrial Information Systems"

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Chapter 2

Information System Development – p2

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Lesson Overview

- Sources of Software
- Criteria for Selecting Software

Sources of Software

Sources of Software

- There are various sources of software for organizations

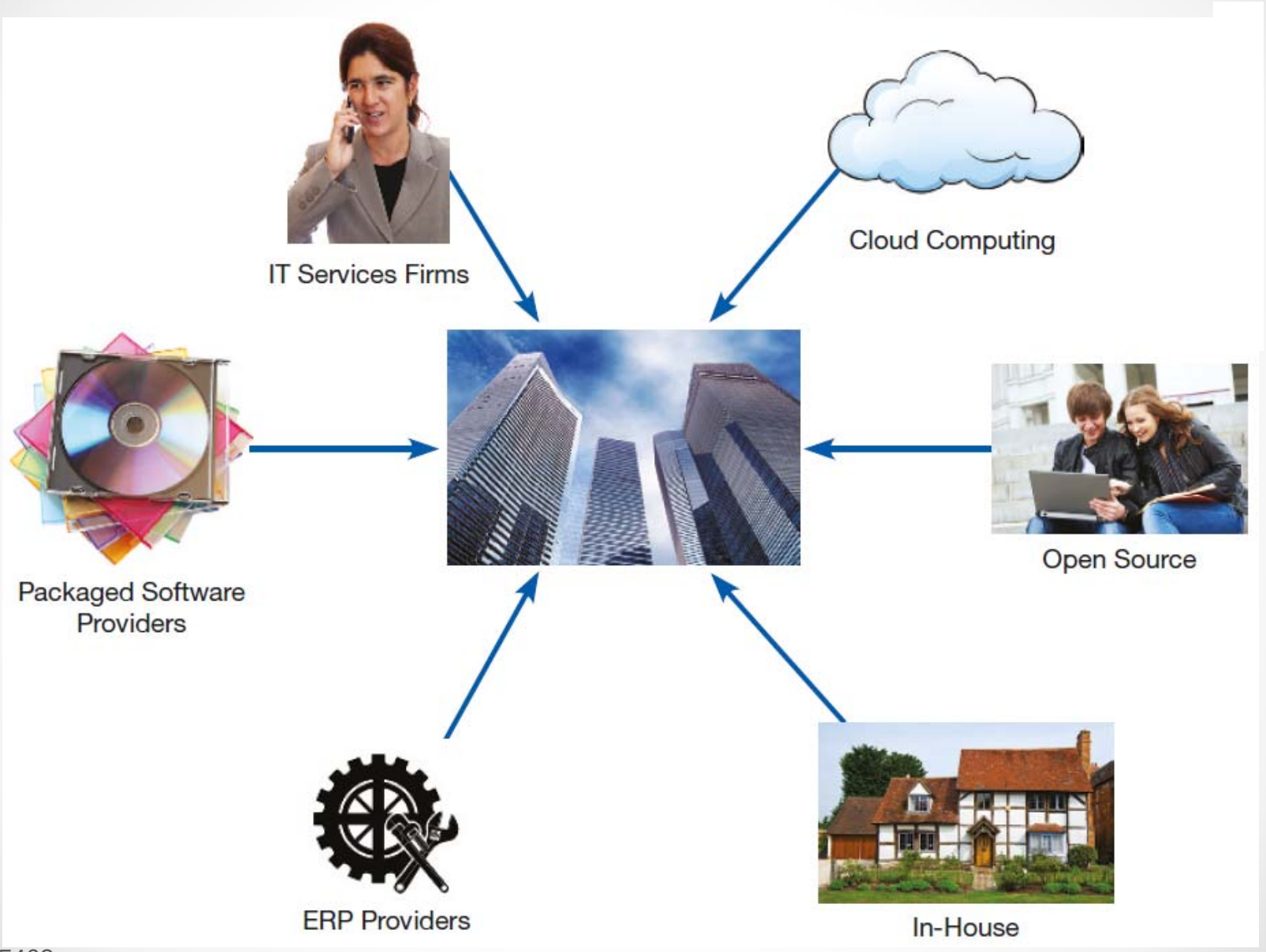
- First administrative information system: US, General Electric's (GE) payroll system (1954) as *in-house development*

- There are various criteria used to evaluate software

Sources of Software

1. Information technology services firm (**outsourcing**)
2. Packaged software producers
3. Enterprise-wide solutions (ERP)
4. Cloud computing
5. Open source software
6. In-house development

Sources of Software



Sources of Software

TABLE 2-1 Leading Software Firms and Their Development Specializations

Specialization	Example Firms or Websites
IT Services	Accenture Computer Sciences Corporation (CSC) IBM HP
Packaged Software Providers	Intuit Microsoft Oracle SAP AG Symantec
Enterprise Software Solutions	Oracle SAP AG
Cloud Computing	Amazon.com Google IBM Microsoft Salesforce.com
Open Source	SourceForge.net

1. Information Technology (IT) Services Firms

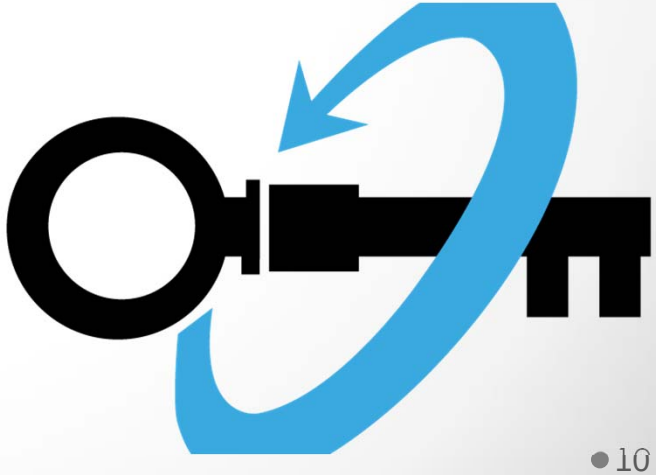
- **Outsourcing**: turning over responsibility of some or all of an organization's information systems applications and operations to an **outside firm**

1. Information Technology (IT) Services Firms

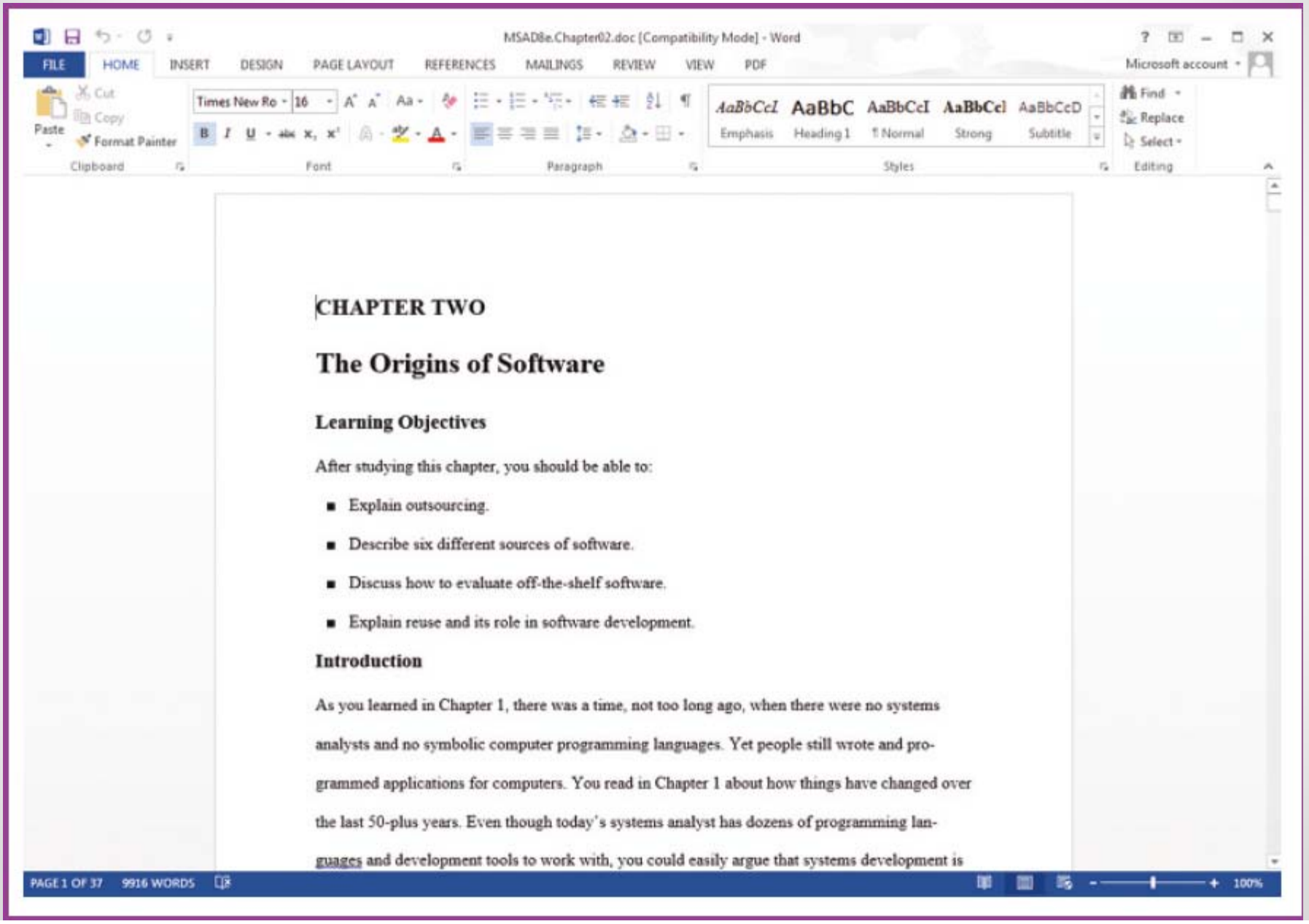
- **Reasons to outsource:**
  - Cost-effective
  - Take advantage of *economies of scale*
  - Free up internal resources
  - Reduce *time to market*
  - Increase process efficiencies
  - When system development is a non-core activity for the organization
  - Help companies develop custom IS for internal use
  - IT service firms develop, host, and run applications for customers

2. Packaged / Off-The-Shelf Software Producers

- Serve many market segments
- Provide variety of software:
  - broad-based packages (e.g. productivity tools)
  - specialized packages (e.g. software to manage small store)
- Software runs on all size computers, from *microcomputers* to large *mainframes*
- Prepackaged software is:
  - off-the-shelf (e.g. MS. Project)
  - *turnkey* software
    (i.e. not customizable*); see e.g.



2. Packaged / Off-The-Shelf Software Producers



3. Enterprise Solutions Software

- **Enterprise Resource Planning (ERP)** systems:
  - *integrate* individual traditional business *functions* into *modules*
  - thus, enabling a single *seamless transaction* to cut across functional boundaries
  - e.g. series of modules will support entire order entry process:
    - from receiving order
    - to adjusting inventory
    - to shipping
    - to billing
    - to after-the-sale service*

3. Enterprise Solutions Software

- Top ERP producers:
  - **SAP AG:** German company; since 1972 is the leading vendor of ERP systems
  - **Oracle:** US company; famous for database software; both control 36% of ERP market

3. Enterprise Solutions Software

- Advantages of ERP system:
  - single **repository of data** for *all* aspects of a business process
  - flexibility of the modules (easy to integrate new modules)
  - consistent and accurate data
  - less maintenance

3. Enterprise Solutions Software

- Disadvantages of ERP system:
  - systems are very complex
  - implementation can take a long time to complete
  - usually very expensive to hire consultants to install system
  - “migration” to new system involves changing how organizations do business

3. Enterprise Solutions Software

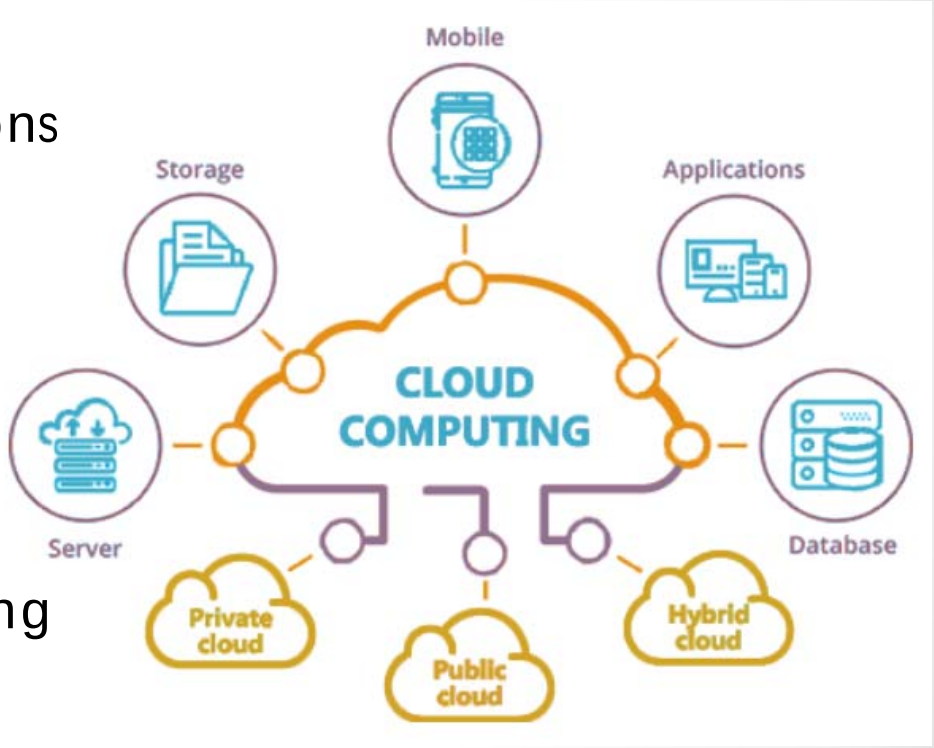
- Example here:
  - SAP's *Business ByDesign* product
  - designed for medium-sized companies

4. Cloud Computing

- Cloud Computing in brief:
  - it is the provision of computing resources, including applications, *over the Internet*
  - customers do not have to invest in the *computing infrastructure* needed to run and maintain the resources
  - third-party providers run applications at remote sites
  - users have access to applications through the Internet or through virtual private networks
  - application provider buys, installs, maintains, and upgrades the applications

4. Cloud Computing

- Advantages of cloud computing:
  - o freeing internal IT staff
  - o gaining access to applications faster than via internal development
  - o achieving low-cost access to corporate-quality applications
  - o no expensive, time-consuming system implementation
  - o cost effectiveness, speed to market, and better performance

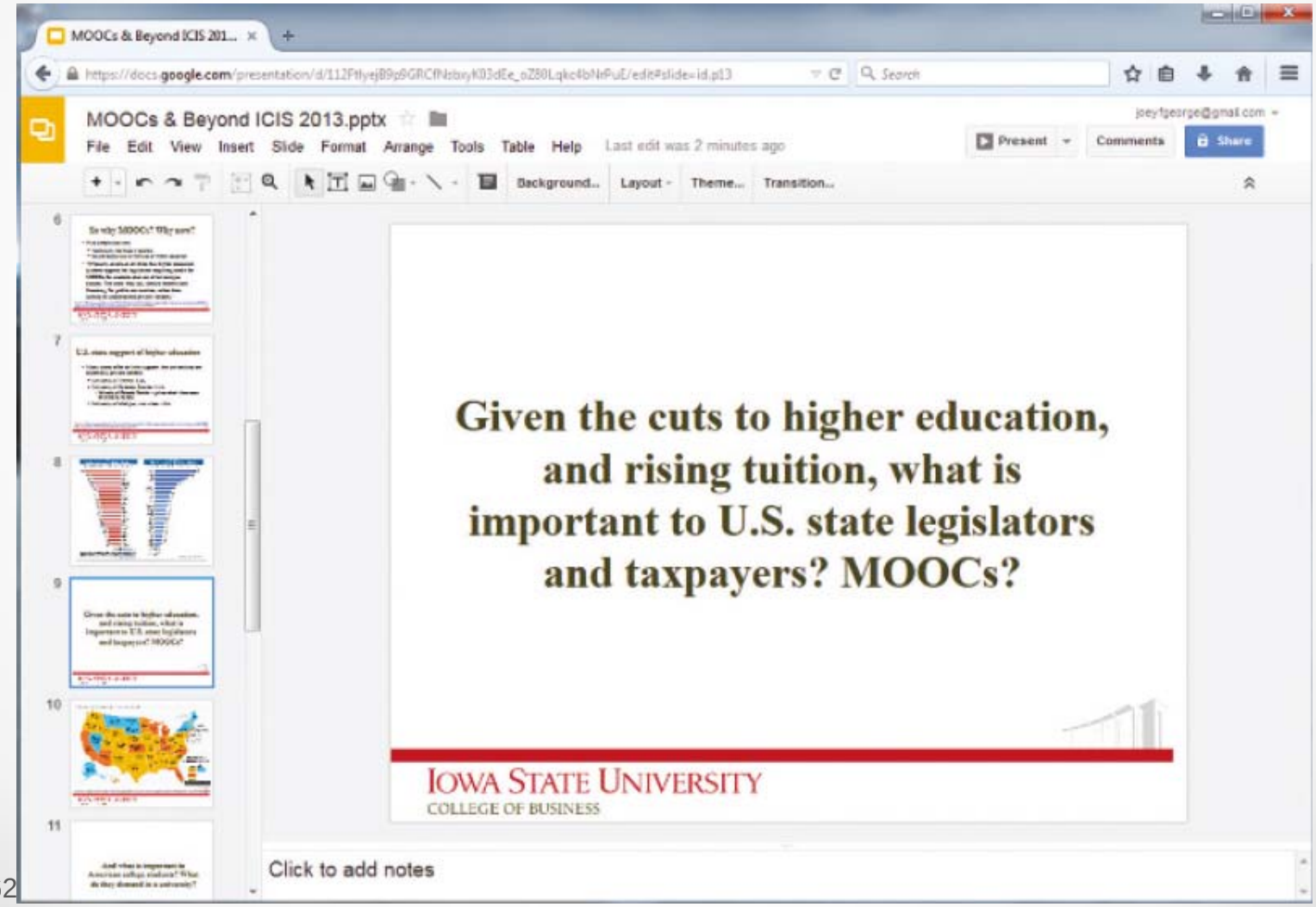


4. Cloud Computing

- Disadvantages of cloud computing :
  - *security* concern: storing company data (e.g. customer information) on machines one does not own and that others can access
  - reliability: vulnerable to unexpected risks due to its complexity
  - compliance with government regulations

4. Cloud Computing

- A presentation edited in *Google Apps*:



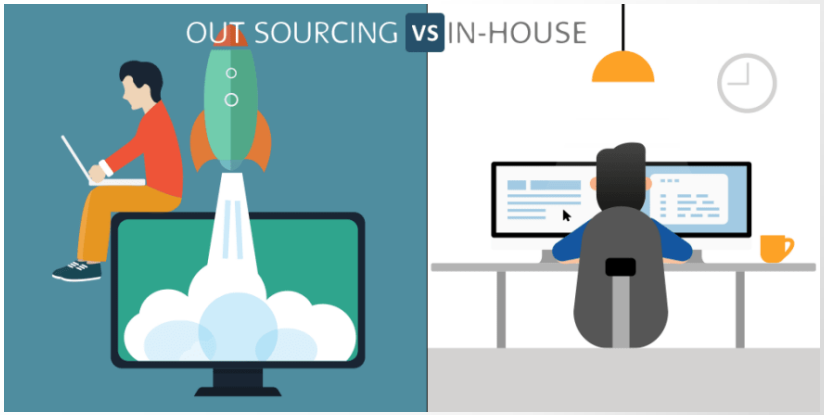
5. Open Source Software

- Freely available, including source code
- Developed by a large community* of interested people
- Performs the same functions as commercial software (e.g. operating systems, e-mail, database systems, web browsers)
- e.g. *Linux*, *mySQL* (database system), *Firefox*
- Note, companies/people can make money through maintenance, support, and selling fully-featured versions

5. Open Source Software

6. In-House Development

- In-House Development in brief:
  - some or all of the system is developed by the organization's own staff
  - condition: sufficient system development expertise (for the chosen platform) exists in-house
  - becoming a progressively smaller piece of all systems development work that takes place in and for organizations (due to large maintenance burden)*
  - *hybrid solutions* involving some purchased and some in-house components are common



Criteria for Selecting Software

Comparing Sources of Software Components

TABLE 2-2 Comparison of Six Different Sources of Software Components

Producers	When to Go to This Type of Organization for Software	Internal Staffing Requirements
IT services firms	When task requires custom support and system can't be built internally or system needs to be sourced	Internal staff may be needed, depending on application
Packaged software producers	When supported task is generic	Some IS and user staff to define requirements and evaluate packages
Enterprise-wide solutions vendors	For complete systems that cross functional boundaries	Some internal staff necessary but mostly need consultants
Cloud computing	For instant access to an application; when supported task is generic	Few; frees up staff for other IT work
Open-source software	When supported task is generic but cost is an issue	Some IS and user staff to define requirements and evaluate packages
In-house developers	When resources and staff are available and system must be built from scratch	Internal staff necessary though staff size may vary

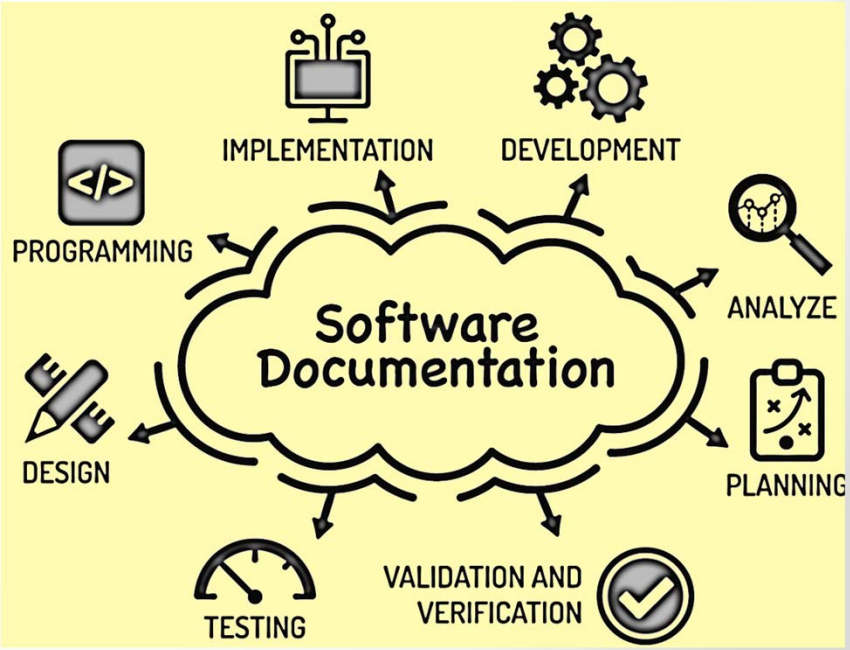
Criteria for Selecting Software

- **Cost**: comparing the cost of developing in-house with the cost of purchasing or licensing the software pack

- **Functionality**: tasks that the software can perform
- **Vendor support**: how much support the vendor provides and at what cost
- **Viability of vendor**: can the software adapt to changes in systems software and hardware

Criteria for Selecting Software (cont.)

- **Flexibility**: how easy it is to customize the software
- **Documentation**: is the user's manual and technical documentation understandable and up-to-date?
- **Response time**: how long it takes the software package to respond to the user's requests in an interactive session
- **Ease of installation**: a measure of the difficulty of loading the software and making it operational



Source

- Modern Systems Analysis and Design. Joseph S. Valacich and Joey F. George. Pearson. Eighth Ed. 2017. Chapter 2.