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Information Systems
ISM 3011

Fall 2004

Unit 4A

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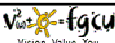
Assignment for Next Class

- Read chapter 5
- Self-Assessment test chapter 5
- Check that you know the key terms listed on p. 218
- Prepare review questions Chapter 5: 1, 4, 5, 8, 11
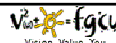
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Flextronics /QuoteWin

- Review the case (see p. 131)
- What is the problem with QuoteWin from a supplier's perspective?

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An Overview of Software

- **Computer program** - sequences of instructions for the computer
- **Documentation** - describes program functions
- **Systems software** - coordinates the activities of hardware & programs
- **Applications software** - helps users solve particular problems

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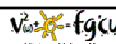
The Importance of Software in Business

FIGURE 4-1

The Importance of Software in Business
Since the 1950s, businesses have greatly increased their expenditures on software as compared with hardware.

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The Role of the Operating System
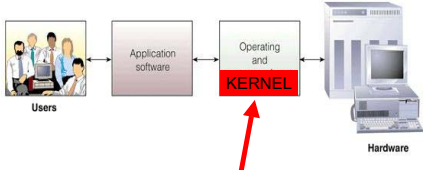
Users — Application software — Operating and KERNEL — Hardware

FIGURE 4-2

The role of the operating system and other systems software is as an interface or buffer between application software and hardware.

KERNEL

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Hardware Independence

Application Program Interface Links Application Software to the Operating System

Examples:

• Accessing Printers (Windows-API) or

• Scanners and Digital Cameras (TWAIN)

Application Software

Application Program Interface

Operating System

Computer System Hardware

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Memory Management

An Example of the Operating System Controlling Physical Access to Data

The user prompts the application software for specific data. The operating system translates this prompt into instructions for the hardware, which finds the data the user requested. Having successfully completed this task, the operating system then relays the data back to the user via the application software.

Application Software

What is the price of TIBA35 (TIBA35$)

OS

Fetch TIBA35$ from hard disk, track 1, sector 7

Find and reserve free blocks etc.

1	2	3	4	5	6
		Memory segments			

TIBA35$

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Processing Tasks

• **Multitasking -** more than one program (task) can run at a time using a single processor

• **Multi-User OS -** multiple users can simultaneously use the resources of a single processor

• **Scalability -** easy adaptation to more users or tasks

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System Speed and RAM

• Why does a bigger primary storage capacity (more RAM) increase your PCs speed?

• Does more memory always lead to a higher system performance?

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Off-the-Shelf Software

• The book says on page 147 that one should check whether the software manufacturer is financially solvent and reliable. Why?

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Sources of Software

Sources of Software: Proprietary and Off-the-Shelf

Some off-the-shelf software may be modified to allow some customization.

Application software

Proprietary software

Off-the-shelf software

In-house developed

Contract

Customized package

Standard package

In-house customized

Contract customization

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Proprietary vs. Off-the-Shelf Software

Proprietary Software		Off-the-Shelf Software	
Advantages	**Disadvantages**	**Advantages**	**Disadvantages**
You can get exactly what you need in terms of features, reports, and so on.	It can take a long time and significant resources to develop required features.	The initial cost is lower since the software firm is able to spread the development costs over a large number of customers.	An organization might have to pay for features that are not required and never used.
Being involved in the development offers a further level of control over the results.	In-house system development staff may become hard pressed to provide the required level of ongoing support and maintenance because of pressure to get on to other new projects.	There is a lower risk that the software will fail to meet the basic business needs—you can analyze existing features and the performance of the package.	The software may lack important features, thus requiring future modification or customization. This can be very expensive because users must adopt future releases of the software as well.
There is more flexibility in making modifications that may be required to counteract a new initiative by one of your competitors or to meet new supplier and/or customer requirements. A merger with another firm or an acquisition also will necessitate software changes to meet new business needs.	There is more risk concerning the features and performance of the software that has yet to be developed.	Package is likely to be of high quality since many customer firms have tested the software and helped identify many of its bugs.	Software may not match current work processes and data standards.

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What is Integrated Software?

- Data Integration: "One fact at one place"
- Functionality Integration: one function can interact with others (copy and paste inside one program)
- Application Integration: Two or more software applications can interact.
- Process Integration: Two or more business processes are connected.

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Compiler

FIGURE 4-16

How a Compiler Works
A compiler translates a complete program into a complete set of binary instructions (Stage 1). Once this is done, the CPU can execute the converted program in its entirety (Stage 2).

Stage 1:   Convert program

Computer program → Compiler → Machine language program

Stage 2:   Execute program

Machine language program → Program execution

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Object-Oriented Programming Languages

- **Objects** - data and actions that can be performed on the data
- **Encapsulation** - group items into an object
- **Polymorphism** - one procedure can work with multiple objects
- **Inheritance** - an object in a particular class gets attributes of that class

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Object-Oriented Programming Languages

Internally designed objects

Commercial objects

Internally designed objects

Existing objects   New objects   New object-oriented program

FIGURE 4-17
Reusable Code in Object-oriented Programming
By combining existing program objects with new ones, programmers can easily and efficiently develop new object-oriented programs to accomplish organizational goals. Note that these objects can be either commercially available or designed internally.

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Thank you!

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Unit 4B

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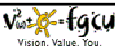
Case 1: Offshore Outsourcing Question 1

- Reason 1:
  - Savings due to lower wages (cost of hiring programmers 1/7)
- Reason 2:
  - Shortage of U.S. programmers
- Reason 3:
  - Work can be done around the clock (-> time-zone differences)

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Case 1: Offshore Outsourcing Question 2

- Lack of Control
  - Need for strong project management, budget and quality control
- Communications
  - Language, cultural, and social barriers
  - U.S. everyday tasks and requirements must be specified in detail (SSN format,…)

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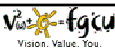
Case 1: Offshore Outsourcing Question 3

- Knowledge must be revealed
  - internal procedures etc.
- Possible Project Failure
  - The results cannot be used as planned.
  - Serious Delays
- Loss of Skills

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Case 1: Offshore Outsourcing Question 4

- Send U.S. Project Management Team to Offshore Site
- Establish Short Feedback Cycles
  - Compile prototype daily

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Case 2: Crystal Flash, ASP Question 1

- Crystal Flash Can Focus on Its Competitive Advantages.
- Free Human Resources

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Case 2: Crystal Flash, ASP Question 2

- Flexibility
  - Crystal Flash can define its own sales processes.
- Less Paperwork
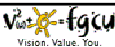 - Sales staff saves time
- Real-time Information/Reports

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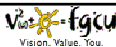## Case 2: Crystal Flash, ASP Question 3

- Check www.salesnet.com

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Case 2: Crystal Flash, ASP Question 4

- Customer Data, Sales Processes, etc. Contain Extremely Sensitive Information
  - Nobody else should have access
- Sales Processes Tolerate No Outages
  - Internet outages, technical problems, and the risk of bankruptcy are serious dangers.

Summary: Sales Processes Are Not Suited for Outsourcing/ASP

(please feel free to disagree: mhepp@computer.org ☺)

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Case 3: Microsoft Question 1

- Think of lost work, missed deadlines, nightshifts, unsatisfying grades,…

…Always make and keep backup copies of important work,
  at least once a day, in the very final stage several times a day.

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Case 3: Microsoft Question 2

- Bug-fixes Can Be Delivered Easily Via The Internet
  - Compare that to product recalls in the automotive industry…
- Market Share Is Extremely Important for Success in the Software Industry

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Case 3: Microsoft Question 3

- Long History of Bugs in MS Software
- Programming Style and Company Culture
- Focus on Innovation and Speed
- Consumer Software: Trade-off between Quality and Price

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Case 3: Microsoft Question 4
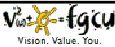
- Change Release Procedures
- Modify Software Architecture

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