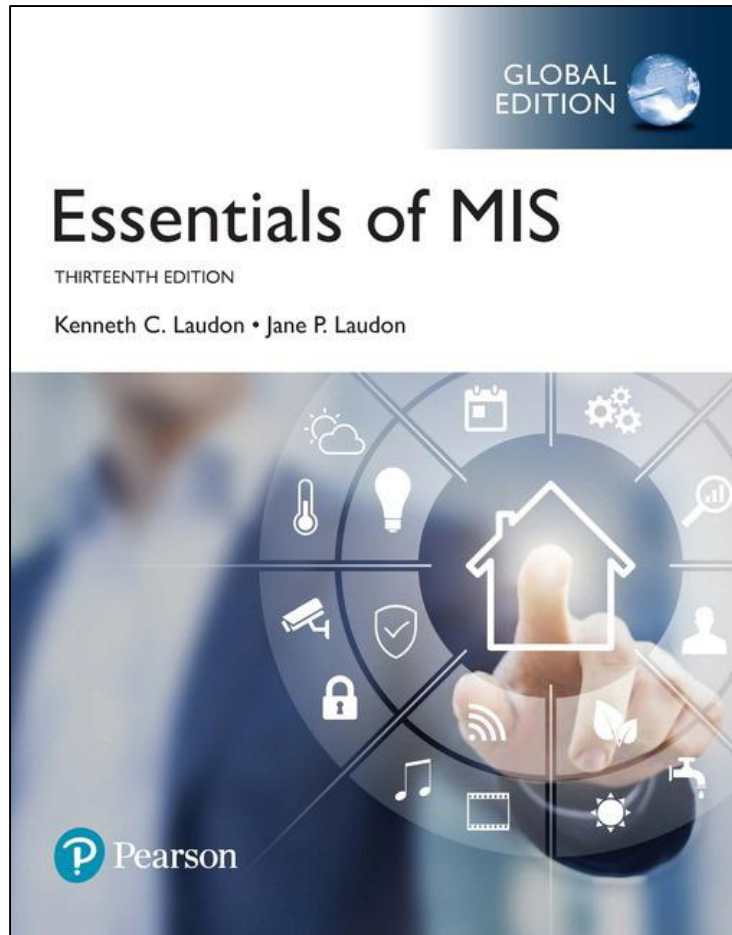


Essentials of Management Information Systems

Thirteenth Edition



Chapter 12

Building Information Systems and Managing Projects

Learning Objectives

12.1 What are the core problem-solving steps for developing new information systems?

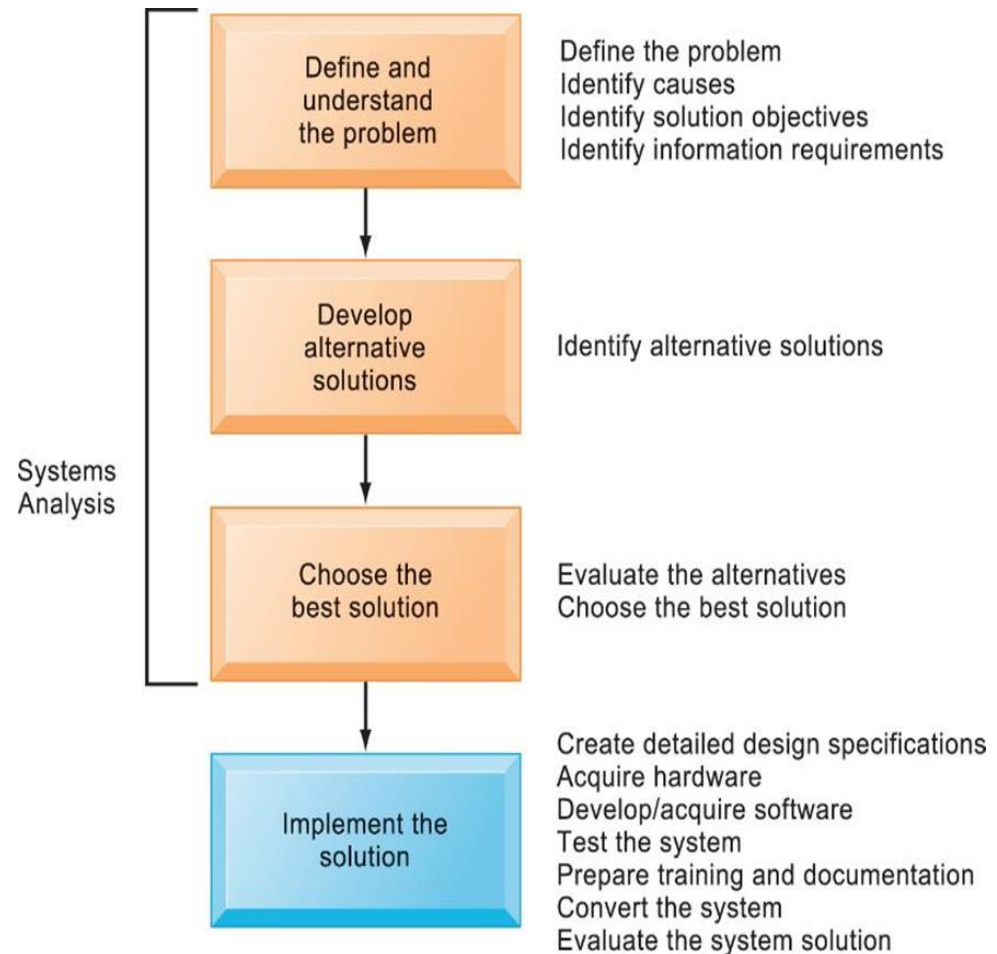
12.2 What are the alternative methods for building information systems?

12.3 What are the principal methodologies for modeling and designing systems?

12.4 How should information systems projects be selected and managed?

Core Problem-Solving Steps for Developing New Information Systems

- New information systems are built as solutions to problems
- Four steps to building an information system
 - Define and understand the problem
 - Develop alternative solutions
 - Choose a solution
 - Implement the solution
- The first three steps are called systems analysis



Defining and Understanding the Problem

- Different people may have different ideas about the nature of the problem and its severity
 - What caused the problem?
 - Why does it persist?
 - Why hasn't it been solved?
 - What are the objectives of a solution?
- Information requirements
 - Identifies who needs what information, when, where, and how
 - Requirements analysis

Developing Alternative Solutions

- Paths to a solution determined by systems analysis.
- Some solutions do not require an information system.
- Some solutions require modification of existing systems.
- Some solutions require new systems.

Evaluating and Choosing Solutions

- Feasibility study:
 - Is solution feasible from financial, technical, and organizational standpoint?
- Systems proposal report
 - Describes, for each alternative solution
 - Costs and benefits
 - Advantages and disadvantages

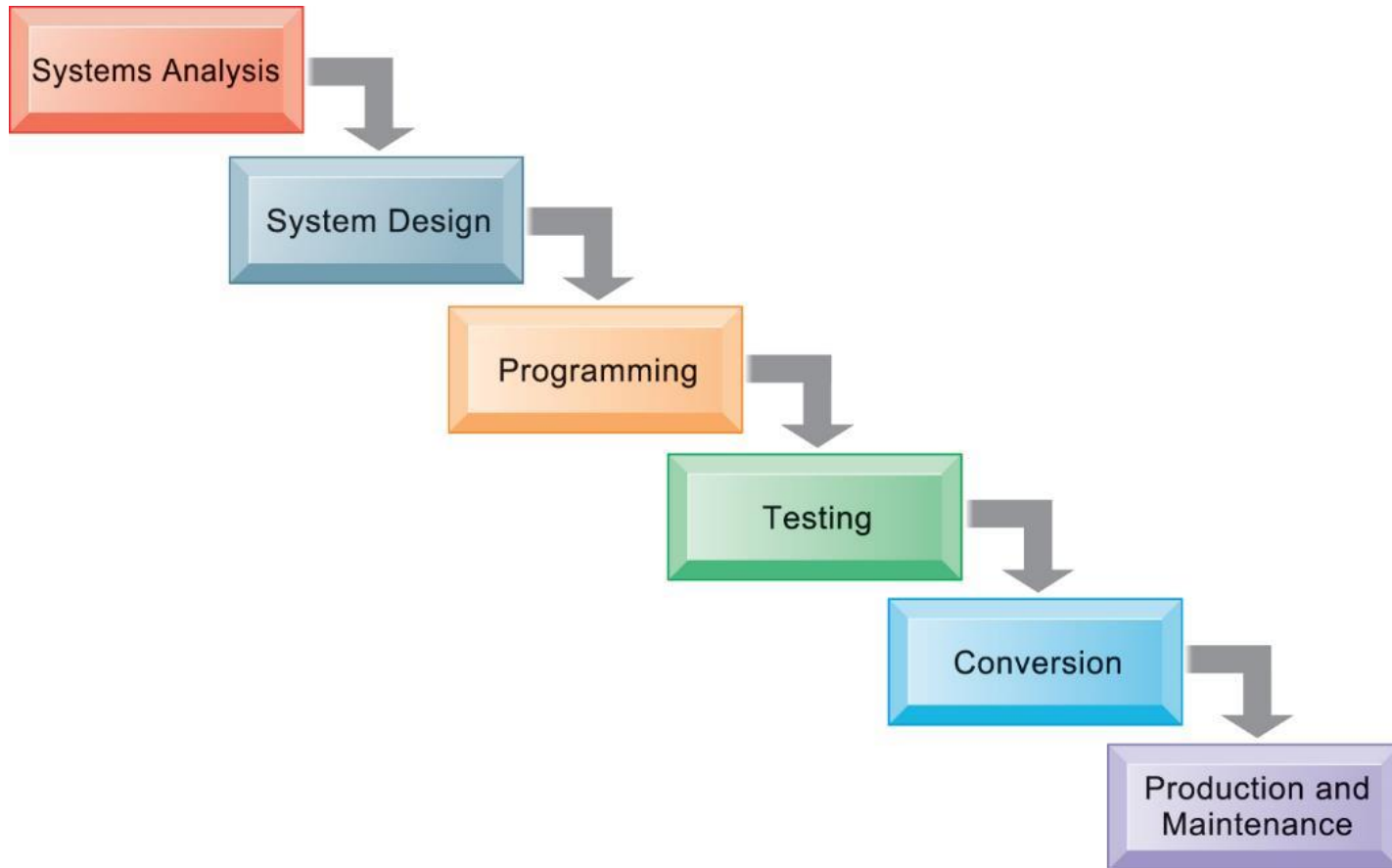
Implementing the Solution

- Systems design
- Completing implementation
 - Hardware selection and acquisition
 - Software development and programming
 - Testing
 - Training and documentation
 - Conversion
 - Production and maintenance
- Managing the change

Traditional Systems Development Lifecycle

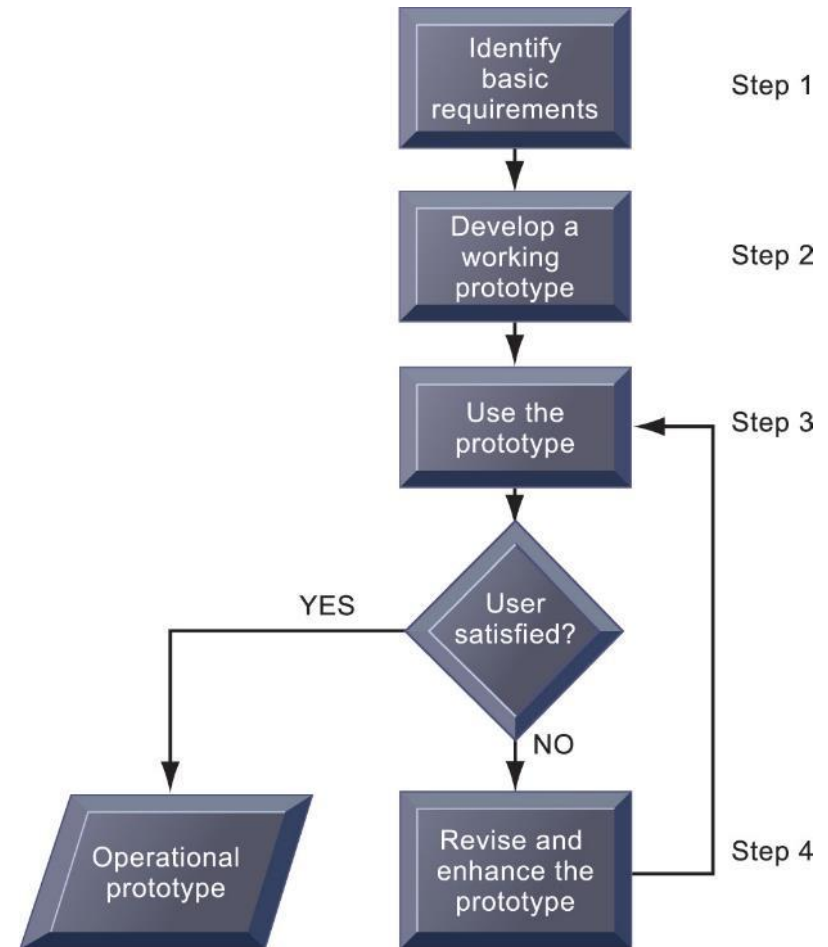
- SLDC: Oldest method for building information systems
- Phased approach with formal stages
- Waterfall approach
- Formal division of labor
- Used for building large, complex systems
- Time consuming and expensive to use

The Traditional Systems Development Life Cycle



Prototyping

- Preliminary model built rapidly and inexpensively
- Four-step process
 - Identify the user's basic requirements
 - Develop an initial prototype
 - Use the prototype
 - Revise and enhance the prototype
- Especially useful in designing a user interface



End-User Development

- End users create simple information systems with little or no assistance from specialists
- Completed more rapidly than systems developed with conventional tools
- Often leads to higher level of user involvement and satisfaction with systems
- Cannot handle large numbers of transactions
- Organizational risks

Application Software Packages, software Services, and Outsourcing

- Request for Proposal (RFP) is a business document that announces a project, describes it, and solicits bids from qualified contractors to complete it.
- Application software packages are Application software programs are **designed to perform specific tasks, simplify workflows, and improve team communication**. The most common examples of applications used by millions daily are listed below. A suite of Microsoft products such as MS Office, PowerPoint, MS Word, Excel, and Outlook.
- cloud software packages is **software that runs its processing logic and data storage between 2 different systems: client-side and server-side**. Some processing takes place on an end user's local hardware, such as a desktop or mobile device, and some takes place on a remote server.
 - Generalized systems for universal functions with standard processes
 - Customization features
- Outsourcing
 - Domestic outsourcing **also known Onshore outsourcing, is the obtaining of services from someone outside a company but within the same country.**
 - Offshore outsourcing is when an organization recruits a third party supplier to conduct operations from an outside country.

Mobile Application Development

- Mobile websites, web apps refer to **applications for mobile devices that require only a Web browser to be installed on the device.**
- Native apps is a software program that is developed for use on a particular platform or device.
- Different requirements for mobile devices than for PCs
 - Reduced size of screens
 - Touch screens
 - Saving resources: bandwidth, memory, processing, data entry
- Responsive web design is a **web development approach that creates dynamic changes to the appearance of a website, depending on the screen size and orientation of the device being used to view it.**

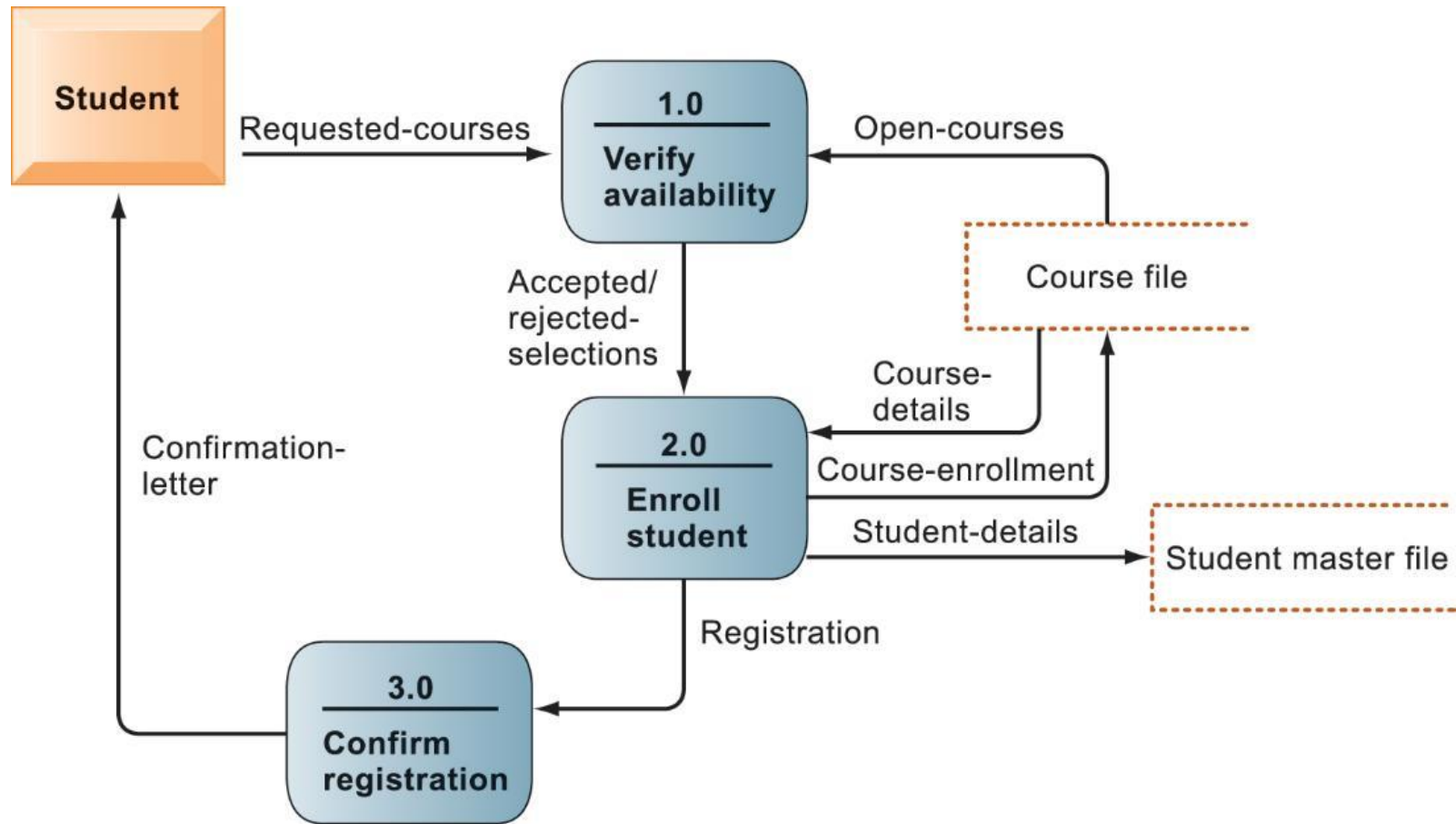
Rapid Application Development

- Need for agility, scalability, and fast-cycle techniques
- Rapid application development (RAD) **is a development model that prioritizes rapid prototyping and quick feedback over long drawn-out development and testing cycles.** With rapid application development, developers can make multiple iterations and updates to a software
 - Creating workable systems in a very short period of time
- Joint application design (JAD) **is a process used in the life cycle area of the dynamic systems development method (DSDM) to collect business requirements ...**
 - End users and information systems specialists working together on design
- Agile development
- DevOps **is a culture, fostering collaboration among all roles involved in the development and maintenance of software. Agile is a development methodology designed to maintain productivity and drive releases with the common reality of changing needs.**

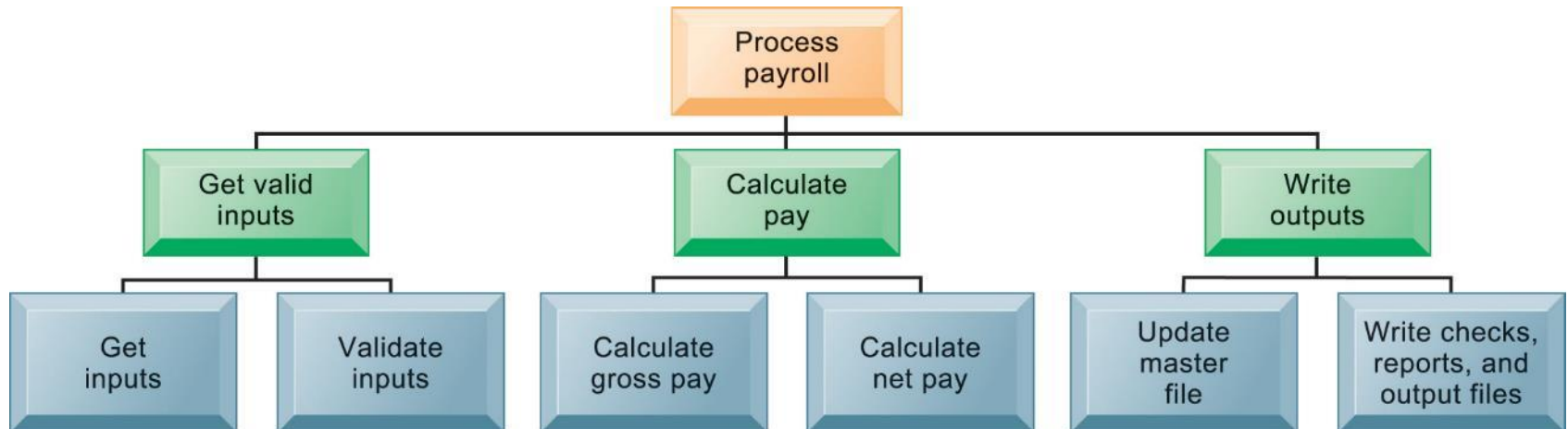
Structured Methodologies

- Step by step techniques'
- Top-down modeling
- Separate data from process
- Tools:
 - Data flow diagram is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement
 - Process specifications defines what must be done to transform inputs into outputs. It is a detailed set of instructions outlining a business procedure that each elementary level business activity is expected to carry out.
 - Structure chart shows the breakdown of a system to its lowest manageable levels. They are used in structured programming to arrange program modules into a tree. Each module is represented by a box, which contains the module's name.

Data Flow Diagram for Mail-in University Registration System



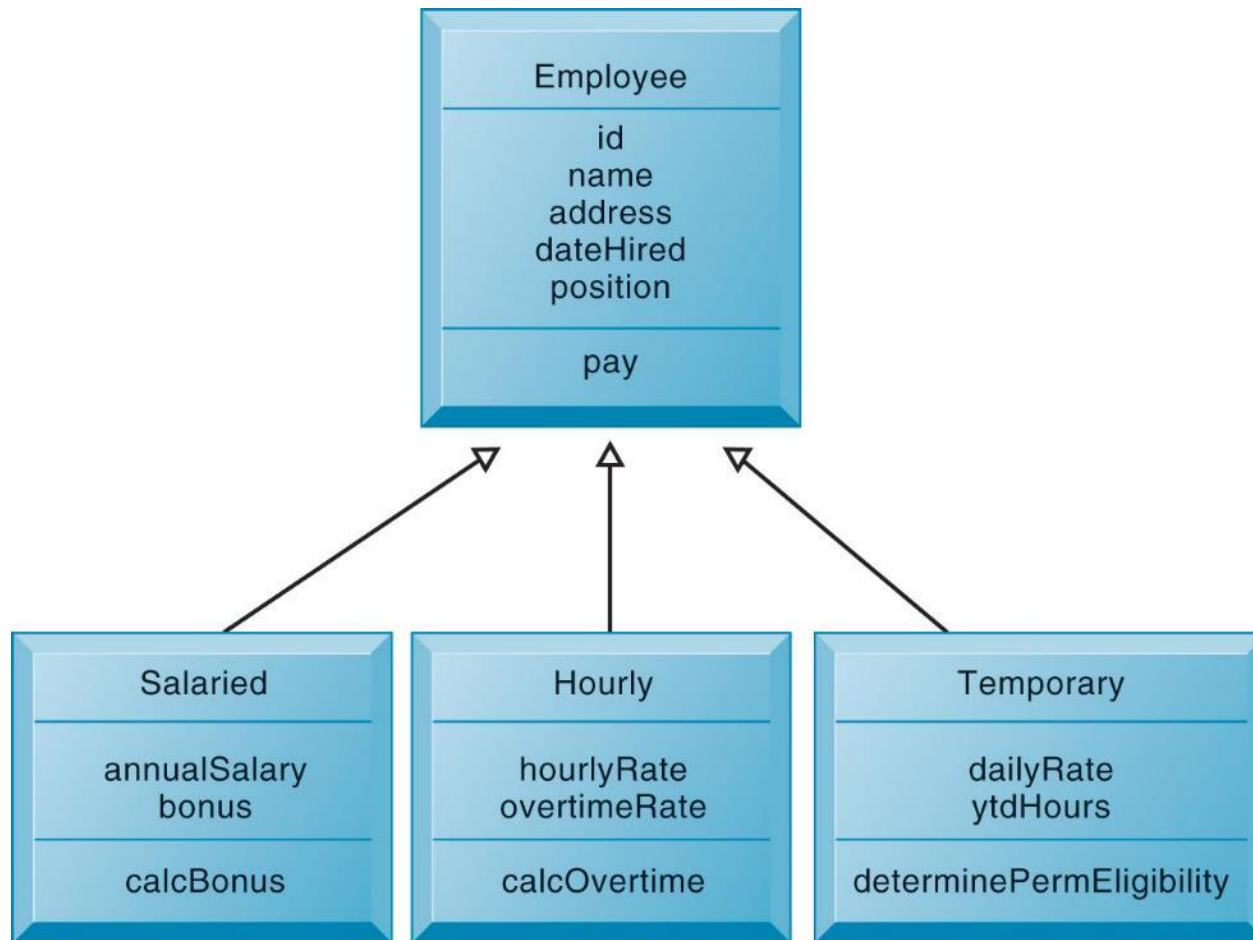
High-Level Structure Chart for a Payroll System



Object-Oriented Development

- Uses the object as the basic unit of systems analysis and design
 - Class
 - Inheritance
- More iterative and incremental than traditional structured development
- Component-based development
 - Groups of objects assembled into software components
 - Used to create e-commerce applications
 - Web services, cloud-based development

Class and Inheritance



Computer-Aided Software Engineering (CASE)

- Provides software tools to automate the previously described methodologies
- Reduces repetitive work in systems development
- CASE tools facilitate
 - Clear documentation
 - Coordination of team development efforts
 - Modest productivity benefits if tools are used correctly

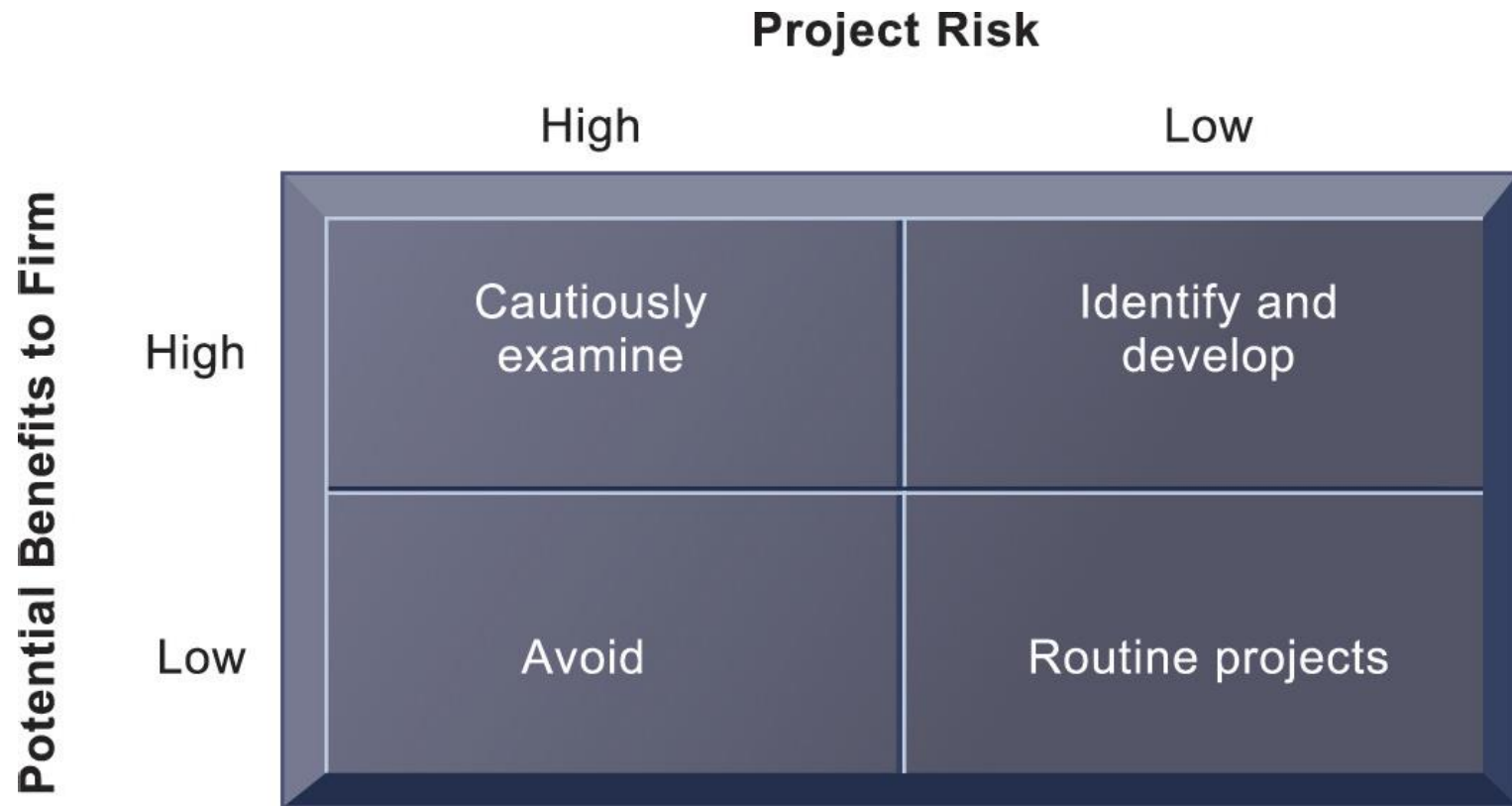
Project Management Objectives

- Project management
 - Application of knowledge, skills, tools, and techniques to achieve targets within specified budget and time constraints
- Five major variables:
 - Scope
 - Time
 - Cost
 - Quality
 - Risk

Selecting Projects

- Determining project costs and benefits
 - Tangible benefits
 - Intangible benefits
 - Capital budgeting methods
- Information systems plan
- Portfolio analysis
- Scoring model

A System Portfolio

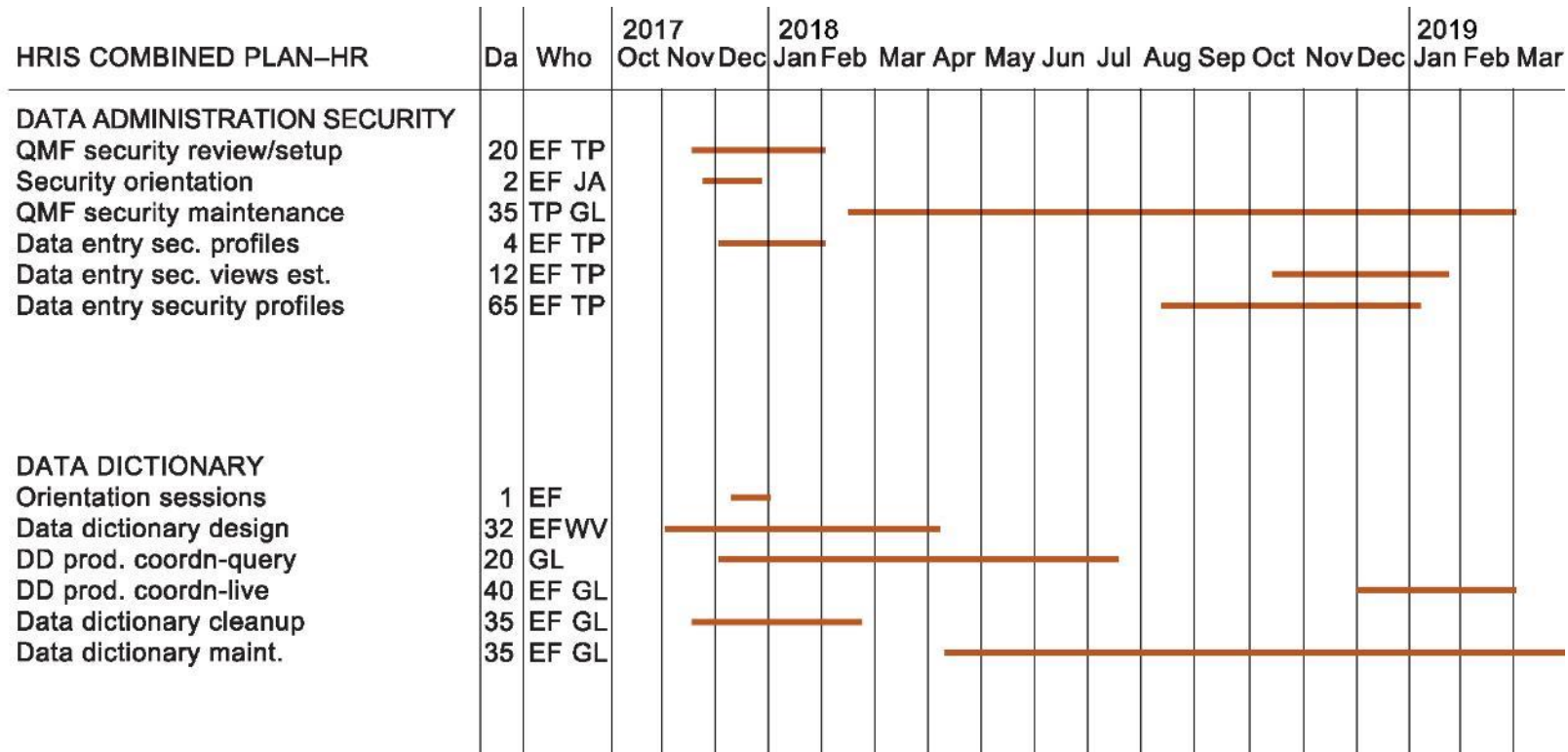


Managing Project Risk and System-Related Change

- Implementation and change management
 - Implementation
 - User-designer communications gap
- Controlling risk factors
 - Formal planning and tools
 - Gantt chart, PERT chart
 - Project management software
- Overcoming user resistance
 - Ergonomics
 - Organizational impact analysis

A Gantt Chart (1 of 3)

A:



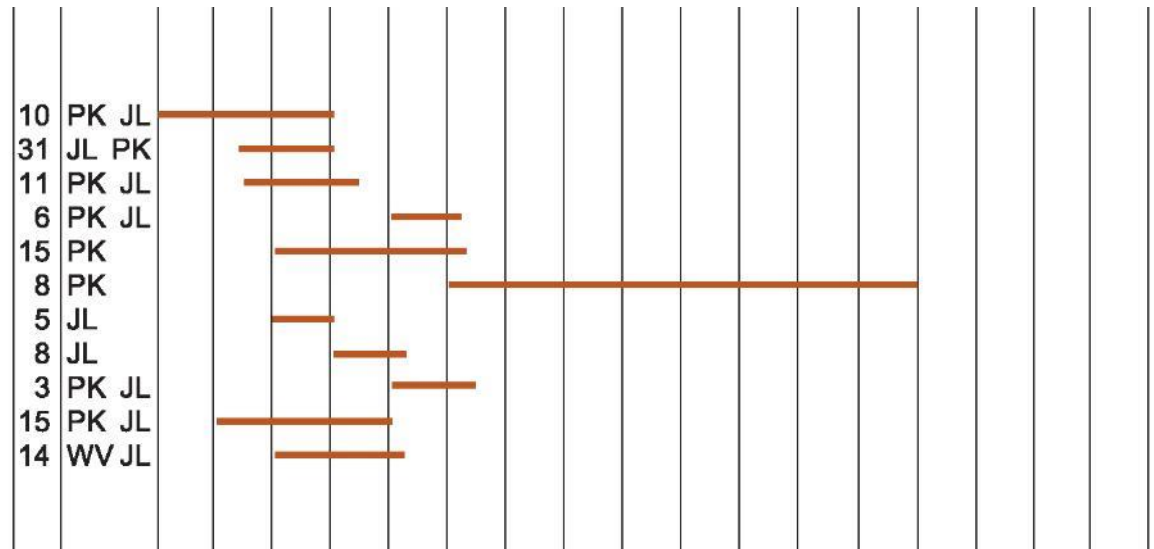
A Gantt Chart (2 of 3)

B:

PROCEDURES REVISION

DESIGN PREP

Work flows (old)
Payroll data flows
HRIS P/R model
P/R interface orient. mtg.
P/R interface coordn. 1
P/R interface coordn. 2
Benefits interfaces (old)
Benefits interfaces (new flow)
Benefits communication strategy
New work flow model
Posn. data entry flowsc



A Gantt Chart (3 of 3)

C:

| RESOURCE SUMMARY | | | | | | | | | | | | | | | | | | | | |
|------------------|-----|------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Edith Farrell | 5.0 | EF | 2 | 21 | 24 | 24 | 23 | 22 | 22 | 27 | 34 | 34 | 29 | 26 | 28 | 19 | 14 | | | |
| Woody Vinton | 5.0 | WV | 5 | 17 | 20 | 19 | 12 | 10 | 14 | 10 | 2 | | | | | | | 4 | 3 | |
| Charles Pierce | 5.0 | CP | | 5 | 11 | 20 | 13 | 9 | 10 | 7 | 6 | 8 | 4 | 4 | 4 | 4 | 4 | | | |
| Ted Leurs | 5.0 | TL | | 12 | 17 | 17 | 19 | 17 | 14 | 12 | 15 | 16 | 2 | 1 | 1 | 1 | 1 | | | |
| Toni Cox | 5.0 | TC | 1 | 11 | 10 | 11 | 11 | 12 | 19 | 19 | 21 | 21 | 21 | 17 | 17 | 12 | 9 | | | |
| Patricia Knopp | 5.0 | PC | 7 | 23 | 30 | 34 | 27 | 25 | 15 | 24 | 25 | 16 | 11 | 13 | 17 | 10 | 3 | 3 | 2 | |
| Jane Lawton | 5.0 | JL | 1 | 9 | 16 | 21 | 19 | 21 | 21 | 20 | 17 | 15 | 14 | 12 | 14 | 8 | 5 | | | |
| David Holloway | 5.0 | DH | 4 | 4 | 5 | 5 | 5 | 2 | 7 | 5 | 4 | 16 | 2 | | | | | | | |
| Diane O'Neill | 5.0 | DO | 6 | 14 | 17 | 16 | 13 | 11 | 9 | 4 | | | | | | | | | | |
| Joan Albert | 5.0 | JA | 5 | 6 | | | 7 | 6 | 2 | 1 | | | | 5 | 5 | 1 | | | | |
| Marie Marcus | 5.0 | MM | 15 | 7 | 2 | 1 | 1 | | | | | | | | | | | | | |
| Don Stevens | 5.0 | DS | 4 | 4 | 5 | 4 | 5 | 1 | | | | | | | | | | | | |
| Casual | 5.0 | CASL | | 3 | 4 | 3 | | | 4 | 7 | 9 | 5 | 3 | 2 | | | | | | |
| Kathy Mendez | 5.0 | KM | | 1 | 5 | 16 | 20 | 19 | 22 | 19 | 20 | 18 | 20 | 11 | 2 | | | | | |
| Anna Borden | 5.0 | AB | | | | | 9 | 10 | 16 | 15 | 11 | 12 | 19 | 10 | 7 | 1 | | | | |
| Gail Loring | 5.0 | GL | | 3 | 6 | 5 | 9 | 10 | 17 | 18 | 17 | 10 | 13 | 10 | 10 | 7 | 17 | | | |
| UNASSIGNED | 0.0 | X | | | | | | | | | | 9 | | | 236 | 225 | 230 | 14 | 13 | |
| Co-op | 5.0 | CO | | 6 | 4 | | | | 2 | 3 | 4 | 4 | 2 | 4 | 16 | | | 216 | 178 | |
| Casual | 5.0 | CAUL | | | | | | | | 3 | 3 | 3 | | | | | | | | |
| TOTAL DAYS | | | 49 | 147 | 176 | 196 | 194 | 174 | 193 | 195 | 190 | 181 | 140 | 125 | 358 | 288 | 284 | 237 | 196 | 12 |

A PERT Chart

