Planning Design and Implementation of ERP Systems
Learning Objectives

- Understand the information systems development process for enterprise systems, including planning, design, and implementation
Traditional Systems Development Life Cycle

- Phases
  - Problem Definition
  - Feasibility Study
  - Systems Analysis
  - Systems Design
  - Detailed Design
  - Implementation
  - Maintenance
<table>
<thead>
<tr>
<th>Step</th>
<th>Activities</th>
<th>Tools and Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem definition</td>
<td>Identify problems with the current system</td>
<td>Interviewing and data collection</td>
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<tr>
<td>Feasibility study</td>
<td>Assess the need for a systems project, including technical, economic, and management feasibility</td>
<td>Preliminary cost analysis</td>
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<tr>
<td>Systems analysis</td>
<td>Undertake a detailed analysis of the current system, including processes, information flows, and work organization</td>
<td>Logical process models—present system; Logical data models—present system; Organization charts (functional hierarchy diagrams)</td>
</tr>
<tr>
<td>Systems design</td>
<td>Development of objectives for the new system; re-engineering of processes and information</td>
<td>Logical process models—proposed system; logical data models—proposed system; organization charts—proposed system</td>
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<tr>
<td>Detailed design</td>
<td>Design of specifications for the proposed system</td>
<td>Program design specifications output design; input design Database design; input design</td>
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<tr>
<td>Implementation</td>
<td>Software implementation; training end-users; development of reporting systems; design of controls and security</td>
<td>Coding; testing; documentation</td>
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<tr>
<td>Maintenance</td>
<td>Ongoing technical support; ongoing upgrades and enhancements</td>
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Traditional Systems Development Life Cycle

- Automating current system is counter-productive
  - Inherit old problems and flaws
- Provides opportunity to re-engineer current system
- Create logical database design before details are refined
- Takes too much time
- Uses a great deal of resources
- Expensive
ERP Systems Design Process

- **Phases**
  - Planning
  - Requirements analysis
  - Design
  - Detailed design
  - Implementation
  - Maintenance
Planning and Requirements Phases

- Planning
  - Needs assessment
  - Business justification
    - Tangible and intangible benefits
- Requirements analysis
  - Identify business processes to be supported
  - “Best practices” offered by vendors
    - Models of supported functions
  - Checklist of activities and factors
Design Phase

- Re-engineering business processes to fit software
  - Traditional SDLC defines new business requirements and implements conforming software
- Re-engineering versus customization
  - Re-engineering can disrupt organization
    - Changes in workflow, procedures
  - Customizing
    - Upgrading can be difficult
Alternative Designs

- “Vanilla”
  - Easy to implement
    - Follow vendor prescribed methodology
    - Employ consultants with specialized vendor expertise
  - Usually on time and on budget implementations
- Customized
  - Time and costs increase
  - Not easily integrated into new version
Alternative Designs cont.

- Maintain legacy systems and add ERP modules
  - Support specific functions
  - Cost-effective
  - Organization doesn’t get full benefit of ERP
  - Less disruptive
  - Lacks integration

- Outsourcing
  - External vendor operates
    - ASPs (Application Service Providers) provide on time-sharing basis
    - Depends on reliability and stability of vendor
<table>
<thead>
<tr>
<th>Option</th>
<th>Time</th>
<th>Cost</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanilla implementation of a single vendor ERP</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Easiest to implement</td>
<td>May forfeit internal systems which provide a strategic advantage</td>
</tr>
<tr>
<td>Single-vendor ERP with customization</td>
<td>High</td>
<td>High</td>
<td>Maintains strategic processes</td>
<td>Poses greater risk and higher cost because vendor modifications cannot be easily adopted</td>
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<tr>
<td>In-house with supplementary ERP modules</td>
<td>Moderate</td>
<td>High</td>
<td>Minimizes the extent of change that users have to accept</td>
<td>Higher cost because of maintaining legacy systems and new ERP modules; limited benefits because of lack of integration</td>
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<tr>
<td>ASP</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Provides vendor support and expertise at lower cost</td>
<td>Creates dependence on the provider</td>
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Detailed Design Phase

- Team selects the models, processes, and information to be supported
  - “Best practices” methodology provides models
    - Select applicable business processes
    - Discard inapplicable processes
    - Those processes that do not match the system will serve as foundation for re-engineering
    - Identify any areas not covered as candidates for customization
- Interactive prototyping
- Extensive user involvement
Implementation Phase

- **Implementation**
  - Address configuration issues
    - Data ownership and management
    - Security issues
  - Migrate data
    - Ensure accuracy
  - Build interfaces
  - Documentation review
  - User training
  - Reporting
  - Testing
Implementation Strategies

- Big Bang
  - Cutover approach
    - Rapid
    - Requires many resources
    - Small firms can employ
- Mini Big Bang
  - Partial vendor implementation
- Phased by Module
  - Module-by-module
  - Good for large projects
- Phased by Site
  - Location-based implementation
Case: Response to Request for Proposal for an ERP System

- Wingate Electric
  - Mid-sized manufacturer of electric motors
  - Owned by Dick, CEO, and Steve, COO
- MIS system
  - Supports major accounting and financial functions
    - Sales order processing, inventory control, accounts payable, accounts receivable, general ledger
- Multiple legacy systems
  - Redundant data
  - Inconsistent data
  - Queries difficult
Case: Response to Request for Proposal for an ERP System, continued

- Competitors adopting ERP systems
  - Integrating financial and manufacturing
  - Web-based front ends
    - Order processing, tracking, follow-up

- RFP for ERP system
  - Initially to support accounting, financials
  - Additional support for production, manufacturing
  - Eventual support for sales and marketing, HR, CRM, eBusiness
  - $1,000,000 budget for system
  - Determination made by five executives, representing different user groups
    - 10 scored criteria
    - Vendor presentations, supplemental materials
Summary

- Traditional SDLC has been modified by the use of prototyping, end-user developments, and software packages.
- ERP systems design process consists of six phases: planning, requirements analysis, design, detailed design, implementation, and maintenance.
- The design phase considers the use of traditional methods, re-engineering, and customization, as well as outsourcing.
THANK YOU