ERP Course: Planning, Design, and Implementation of ERP
Readings: Chapter 3 and 8 Mary Sumner, Paper on Agile Development for ERP as a case

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ERP Implementation

Phases stay:

- Planning
- Requirements analysis
- Design
- Detailed design
- Implementation
- Maintainance

Focus changes

- To fit the existing software (ERP) package to an organization
Typical Roles in ERP Project

- Business
- Functional Analyst
- PM
- Developer
Planning (Business justification)

Inventory cost reductions
- Ability to use timely operational data

IT cost reductions
- Ability to integrate systems instead of maintaining many separate

Personnel cost reductions
- Ability to enhance systems without incurring the time and cost of custom development and modifications

Increased profitability
- Ability to introduce new features

Productivity improvement
- Access online to real time data

Better cash management
- Reduction in cost and time of systems development and maintenance
Requirements Analysis

Analyzing business process (how company works)
Analyzing how those processes are already supported
Specifying the processes to be supported in addition or change of the current support
Should fit with organization’s goals and competitive strategy
Analysis of technical infrastructure
Specification of technical infrastructure which should enable the change
Selecting an ERP System

Create a vision
Create a feature list
Create a software candidate list
Narrow the field to 4 - 6 candidates
Create RFP
Select 2 - 3 finalists
Select a winner
Justify the investment
Negotiate the contract
Run a pre-implementation pilot
Validate justification
Technology Factors

Cost of technology (start-up and recurring)
Installation (support, time, and cost)
User interfaces
Upgradability
Computing environment
Personnel requirements (to use and to design)
Design

Re-engineering vs. Customization

Re-engineering

• Analyse possibilities to change processes and organizational structures
• Design changes to fit ERP best practices

Customization

• Analyse current processes
• Suggest an ERP system change to fit it to existing processes
Re-Engineering vs. Customizing

Customizing
+ Supports unique business processes
+ Strategic processes are maintained
- Difficulty to introduce some changes
- Difficulty with upgrades

Re-Engineering
+ Features and processes supported by ERP
+ Based on best practices
- Does not support strategic or unique business processes
- Resistance to organizational change
# Re-engineering and customization factors

<table>
<thead>
<tr>
<th></th>
<th>Re-engineering</th>
<th>Customizing</th>
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<tbody>
<tr>
<td>Re-engineering</td>
<td>Software system best practices</td>
<td>Independent of tools being implemented</td>
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<tr>
<td>business processes</td>
<td>works well with minimal changes but can disturb the organization if extensive changes are required</td>
<td>may disrupt organization less because the software is designed to the processes</td>
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<tr>
<td>Organizational fit</td>
<td></td>
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<tr>
<td>Evolution</td>
<td>depends on vendor</td>
<td>evolution can support unique requirement but create difficulties when a vendor upgrades features you have changed</td>
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<tr>
<td></td>
<td>Re-engineering</td>
<td>Customizing</td>
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<tr>
<td><strong>Cost</strong></td>
<td>Implementation is cost effective</td>
<td>may involve extensive costs of custom implementation</td>
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<tr>
<td><strong>Requirements</strong></td>
<td>boundaries set by business process models and best practices</td>
<td>more flexibility for custom requirements</td>
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<tr>
<td><strong>Competitiveness</strong></td>
<td>other firms have the same settings</td>
<td>do not have to use the software which other companies in industry adopted</td>
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<td><strong>Fit</strong></td>
<td>Need to fit to requirements drawn by the ERP</td>
<td>Unique requirements has to be supported by a customization</td>
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<tr>
<td><strong>External consulting</strong></td>
<td>Needed to consult business process change</td>
<td>Needed to consult system implementation change</td>
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ERP Implementation Alternatives

Vanilla implementation
Single vendor with customization
In-house with supplementary ERP modules
ASP
Detailed Design

Select applicable business processes
Discard inapplicable business processes
Reorganize and document new processes
Identify areas not covered by the best practices which require customization and development
Models Used

Component model – show major functions
Organization model – breakdown of organization structure
Data model – information needed by a company
Interaction model – information flow between organizational units
Implementation

Dialog customization
Dialog connection customization
Processing functions customization
Data model customization
Reports customization
Integration with the office systems
Client Customization

4G languages – forms
  • Adding, modifying attributes, control boxes, …
  • Adding/modifying client function
  • Adding/modifying connection to database
  • Adding/modifying menus, control flows, …

Client APIs
  • Externilize dialogs to functions
  • Allow to instantiate and embed client dialogs and functions in external programs
Forms Development
Visual Basic for Applications
Business And Database Tier Customizations

Set of business functions and rules
Language to create them, e.g. Enterprise Java Beans, Oracle Application Server procedures, Oracle stored procedures
APIs/SDKs to access database and business functions on the server
Automation technology to embed and use it in external programming environments and applications
Adding attributes/tables/triggers
Development and Deployment

The product works this way vs. Whatever customer wants
User Exits
Configuration of units
Data Driven
Code is posted into a repository and immediately available to users
  • Story and test driven development is a challenge
  • Difficult to convince about cloning the servers (4 instances for update-write test-write code-check in)
QA processes in integrated system
  • Multiple projects running on the same erp tests
  • Access just to those parts which are under your functional area/module
  • Estimated 3M delay between fully tested component and deployment to the production
ERP Projects

They often represent the single largest investment
Complexity in functions
Complexity in projects
Complexity in technology

Need for management
Some Cases 😞

FoxMeyer Corporation – SAP
  • Helped drive it into bankruptcy
W.W Grainer Inc. – SAP
  • Spent $9 million on SAP
  • During worst months lost $19 million - $23 million in profit
Hershey Foods Corp – SAP, impl. led by IBM
  • 12% fell in sales in the first quarter after system was alive
Statistics on ERP Vendors Implementation

SAP/R3 65.3%
J.D. Edwards 12.9%
Oracle 8.9%

Firms felt that they achieved 65% of the business case targets
70% of firms felt that implementation was successful
55.5% pointed that the actual costs exceeded budget by an average of 60.6% (actually the range was -10% to 200%)
Additional findings

Under- or on-budget projects made fewer modifications. Modifications contribute to a 50% increase in project duration. Under- or on-budget projects established greater authority of implementation. Under- or on-budget projects established more effective communications. Under- or on-budget firms manage their business better and managed their ERP implementation better.
Some questions

What technology challenges are encountered in implementing enterprise-wide information management system?
What organizational challenges are addressed?
What people challenges are encountered?
What challenges are associated with size and project scope?
What are the strategies for minimizing the risks associated with the technology, organization, people, size/scope?
Causes of Project Failures

Resource failures
- Conflicts of people, time and project scope due to insufficient personnel
- Incorrect systems with poor reliability, difficult to maintain, dissatisfied users

Requirement failures
- Poor specification of requirements
- Developing the wrong system with many changes

Goal failures
- Inadequate statement of goal from management
- Developing wrong system, leads to requirements failures
Causes of Project Failures

Technique failures

• Wrong software development approaches
• Inadequate req. spec., poor reliability, high maintainance costs, scheduling and budget problems

User contact failures

• Inability to communicate with the system users
• Inadequate req., poor preparation for accepting and using

Organizational failures

• Poor org. structure, lack of leadership, accessible span of control
• Poor coordination of tasks, schedule delays, inconsistent quality
Causes of Project Failures

People management failures
  • Lack of effort, antagonistic behaviour, stifled creativity
  • Time delays, budget overruns, poor specs., maintenance problems

Methodology failures
  • Unnecessary activities performed while the necessary ones are omitted
  • …
Causes of Project Failures

Technology failures

• Hardware/Software does not meet spec., failure of the vendor to deliver on time, unreliable products

• Schedule delays, poor reliability, maintenance problems, dissatisfied users

Size failures

• Too large project, capabilities pushed beyond the level

• Insufficient resources, inadequate requirements, simplistic project control, poor use of methodology
Causes of Project Failures

Planning and control failures
  • Vague assignments, inadequate tools for PM and tracking
  • Work assignments overlap or missing, deliverables poorly defined, poor communication

Personality failures
  • People clashes
  • Passive cooperation and covert resistance, vengeance
Key Factors to Have in Mind

To deliver:
- On time
- Within budget
- Reliable System
- Maintainable System
- Meet goals
- Meet Requirements
To evaluate

Rules
Players
Goals
Constraints
Risks Categories

Technology risks
Organizational risks
Risks in people
Risks in project size
Technology risks

Technology fit

- system consistent with current technology infrastructure poses lower risk
- System which require major changes in technology infrastructure means higher risk

Fit with technological expertise

- Tech. Requirements are consistent with technical expertise – lower risk
- Not consistent with tech. Expertise – bigger risk
Organizational risks

Business process re-design

• Extensive re-design of business process – in the book it says lower risk, but it depends where you book the costs on the re-design ;)

• Major changes and customization – higher risk

Scope of business processes

• Scope of project affects 0-25% of business processes – lower risk

• Scope of project affects 50-100% of business processes – higher risk
Risk in people

Knowledge of IT staff
- Knowledgeable in app. Specific modules – lower risk
- Limited knowledge – higher risk

Knowledge of User staff
- Fully involved in the project – lower risk
- Limited involvement in the project – higher risk
Risk Categories and Factors

Organizational fit
- Failure to redesign business processes
- Failure to follow an enterprise-wide design with data integration

Skill set
- Insufficient training and re-skilling
- Insufficient internal expertise
- Lack of business analyst with business and technology knowledge
- Failure to mix internal and external expertise
- Failure to retain or recruit qualified ERP systems developers
Risk Categories and Factors

Management Strategy
- Lack of senior management support
- Lack of proper management control structure
- Lack of champion
- Ineffective communication

Software design
- Failure to adhere to standard specifications which the software supports
- Lack of integration
Risk Categories and Factors

User involvement and training
- Insufficient training of end-users
- Ineffective communication
- Lack of full time commitment to project
- Failure to emphasize reporting

Technology planning/integration
- Inability to avoid technological bottleneck
- Attempting to build bridges to legacy applications
Risk Categories and Factors

Organizational fit

• Commitment to redesign business processes
• Top management commitment to restructure and follow an enterprise-wide design with data integration

Skill mix

• Effective recruiting and retaining specialized technical personnel
• Effective reskilling of existing IT workforce
• Obtaining business analyst with knowledge about application specific modules
• Effective use of external consultants on project teams
Risk Categories and Factors

Management Structure and Strategy
• Obtaining top management support
• Establishing a centralized project management structure
• Assigning a champion

Software design
• Commitment to using project management methodology and best practices specified by vendor
• Adherence with software specification
Risk Categories and Factors

User involvement and training
- Effective user training
- Full time commitment of users to project
- Effective communication

Technology planning/integration
- Acquiring technical expertise
- Acquiring vendor support for capacity planning and upgrading
- Proper planning for an architecture which was decided