

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

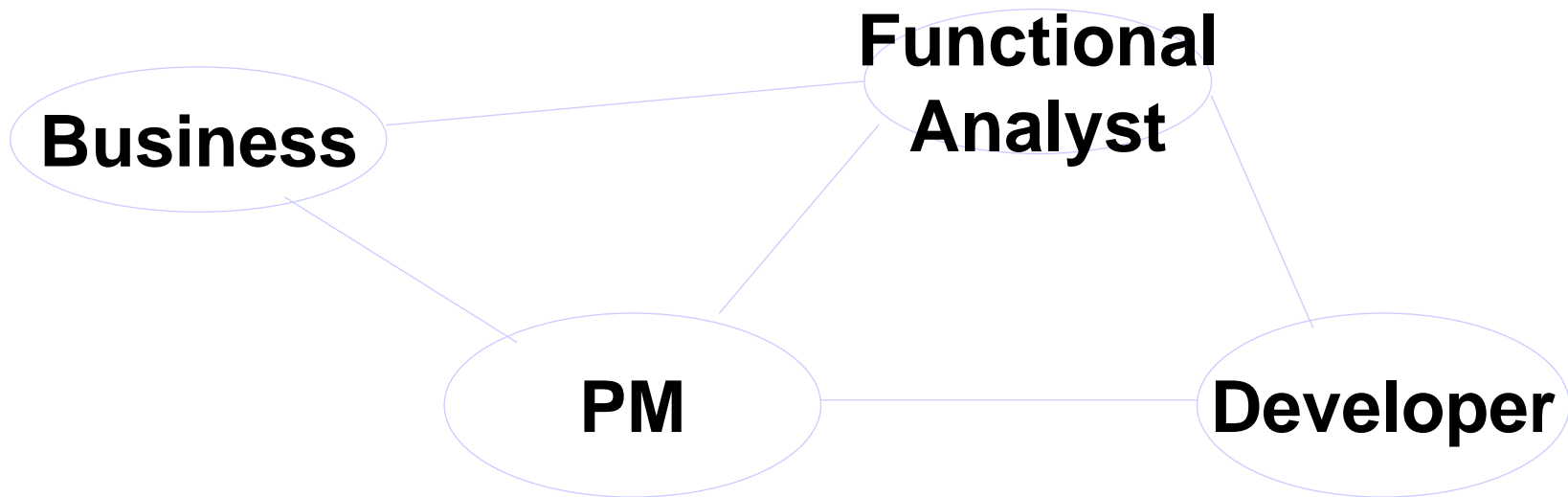
Phases stay:

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

Focus changes

- To fit the existing software (ERP) package to an organization

Typical Roles in ERP Project



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 process 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

	Re-engineering	Customizing
Re-engineering business processes	Software system best practices	Independent of tools being implemented
Organizational fit	works well with minimal changes but can disturb the organization if extensive changes are required	may disrupt organization less because the software is designed to the processes
Evolution	depends on vendor	evolution can support unique requirement but create difficulties when a vendor upgrades features you have changed

	Re-engineering	Customizing
Cost	Implementation is cost effective	may involve extensive costs of custom implementation
Requirements	boundaries set by business process models and best practices	more flexibility for custom requirements
Competitiveness	other firms have the same settings	do not have to use the software which other companies in industry adopted
Fit	Need to fit to requirements drawn by the ERP	Unique requirements has to be supported by a customization
External consulting	Needed to consult business process change	Needed to consult system implementation change

ERP Implementation Alternatives

Vanilla implementation

Single vendor with customization

In-house with supplementary ERP modules

ASP

Detailed Design

Select applicable business processes

Discard inaplicable 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

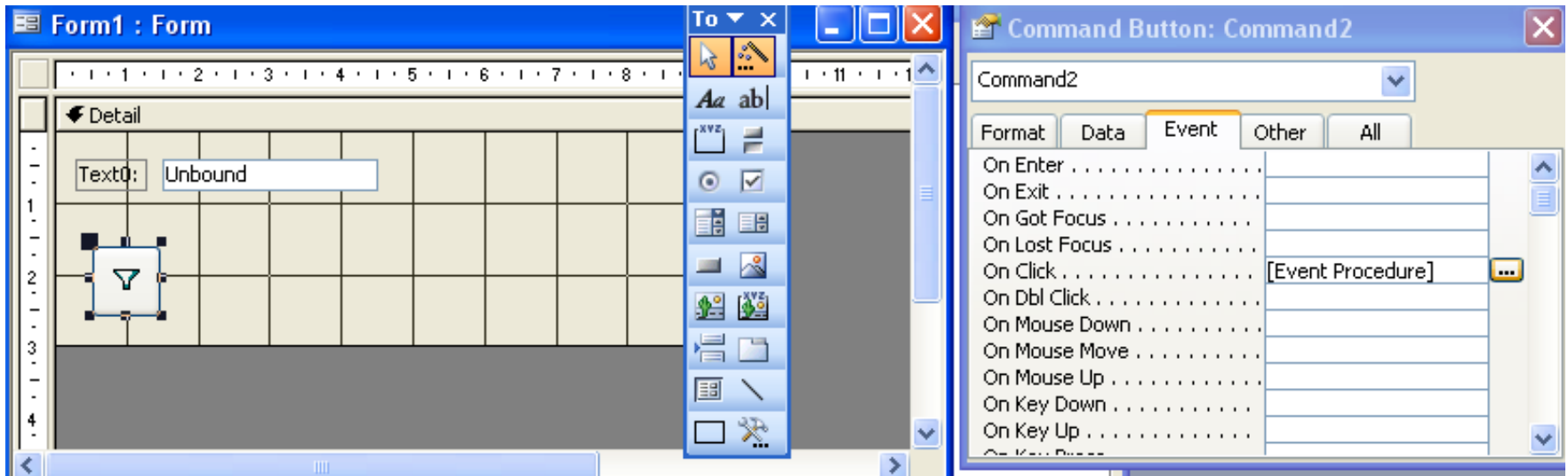
4G languages – forms

- Adding, modifying attributes, control boxes, ...
- Adding/modifying client function
- Adding/modifying connection to database
- Adding/modifying menus, control flows, ...

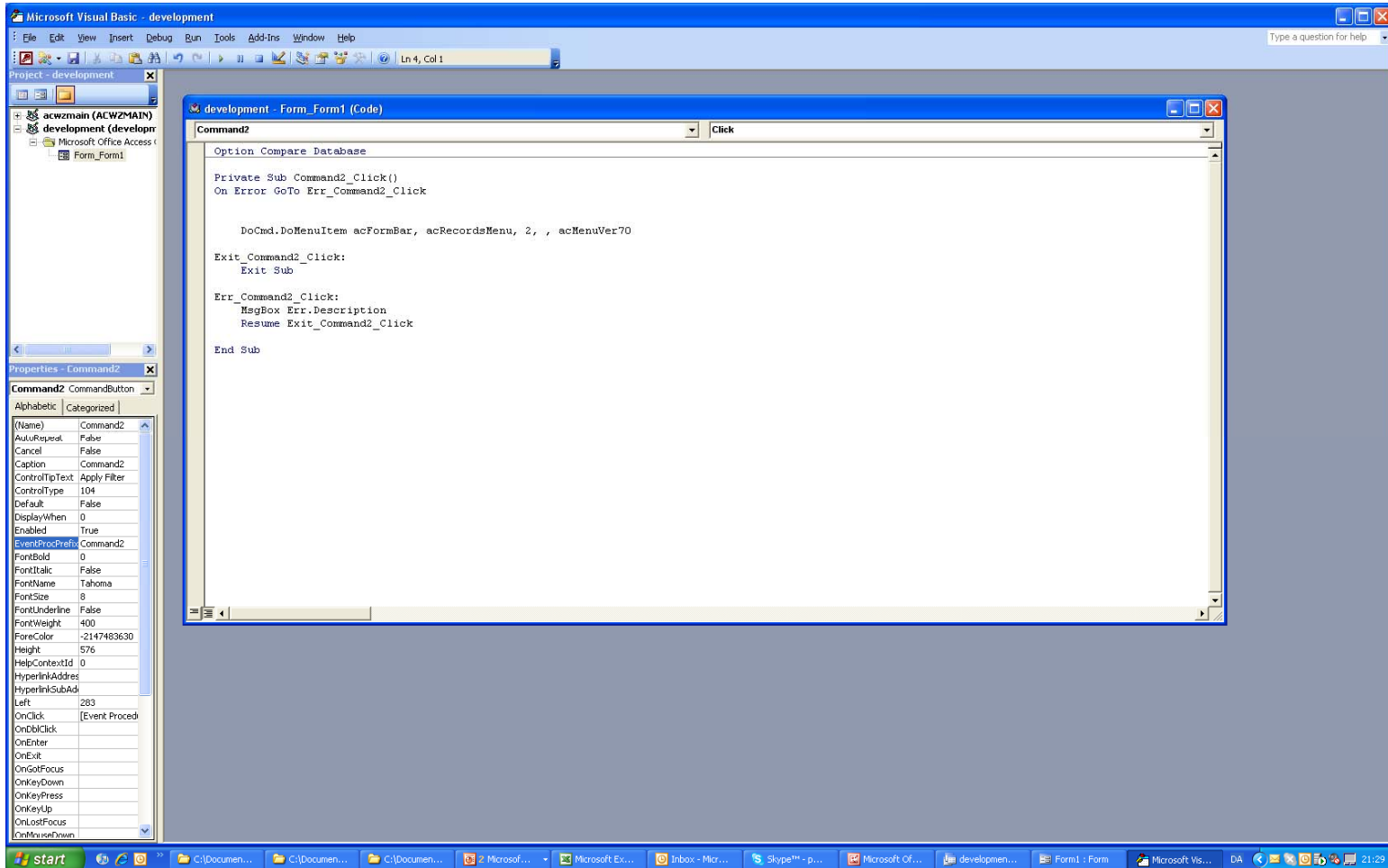
Client APIs

- 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 milion on SAP
- During worst months lost \$19mil - \$23 mil in profit

Hershey Foods Corp – SAP, impl. led by IBM

- 12% fell in sales in the first quater 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 maintenance 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, excessive 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

- Knowledgable 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