

Analysis and System Design

Reasons for New Systems

- Syarat untuk user tidak terpenuhi / Unfulfilled User Requirements
- New Technology
- Competition
- Tetapi kebanyakan Perencanaan strategik bisnis mempertimbangkan bagaimana sistem dapat membantu organisasi mencapai keuntungan yang sebanding.

The Systems Development Life Cycle

- Systems Analysis
- Systems Design – look conceptually
- Systems Development – concrete picture. Layout. On paper
- Systems Implementation – go out and program. Buys software/hardware.
- Systems Operation and Maintenance – actually begin using it.

Systems Analysis

- Requirements Analysis--Interviews, surveys, observations, examine documents and reports
- Systems Survey--Strengths and Weaknesses
- Feasibility Analysis
 - Economic
 - Technical
 - Organizational

Systems Design

- Logical Design
 - Data Model -- What data needs stored
 - Process Model -- How does the data get stored?
 - Model Integration
- Physical Design
 - Convert Logical Model to physical model (tables, forms and report **layouts**)
- Documentation
- Feasibility Analysis

Systems Development

- Creation of Data Structures
 - Tables
 - Primary Keys and Foreign Key Relationships
 - Referential Integrity, Entity Integrity, Validation Rules
- Detailed Programming
- Testing
 - Realistic data
 - Realistic data volumes
- User Training
- Feasibility Analysis

Systems Implementation

- Data Conversion
- Systems Conversion
 - Sudden Switch Conversion
 - Parallel Conversion
 - Phased-In Conversion
- Documentation -- Program and User
 - User Manuals
 - Program Documentation
 - DBMS -- Data dictionary

Data Conversion Process

- Document data in the old system
- Convert data to a form readable by the new system
- Adapt data to new codes and categories if necessary
- Input data into the new system
- Test to assure data has been converted properly

Systems Operation and Maintenance

- Operation
- Maintenance
 - Corrective Maintenance
 - Perfective Maintenance
- Post-Implementation Review
 - Of the System
 - Of the Development Process

Key Definitions

- Design phase
 - Decide *how* to build the system
 - Create *system requirements* that describe technical details for building the system
- System specification
 - Final deliverable from design phase
 - Conveys exactly what system the design team will implement during the implementation phase

Transition from Requirement to Design

- Influences on the Acquisition Strategy
- Selecting a Design Strategy
- Selecting a System Acquisition Strategy
- Developing an Alternative Matrix

Classical Design Mistakes

- Reducing design time
- Feature creep
- Silver bullet syndrome / Why Software Is Bad
- Switching tools in mid-project

Design Strategies

- Custom development (build from scratch) in-house
- Purchase software package (and customize it)
- Outsource development to third party

Custom Development

PROS	CONS
<p data-bbox="446 535 749 628">Allows flexibility and creativity</p> <p data-bbox="446 685 938 778">Consistent with existing technology and standards</p> <p data-bbox="446 835 923 978">Builds technical skills and functional knowledge in-house</p>	<p data-bbox="1107 542 1572 635">Requires significant time and effort</p> <p data-bbox="1107 692 1562 785">May exacerbate existing backlogs</p> <p data-bbox="1107 842 1591 892">May require missing skills</p> <p data-bbox="1107 949 1431 992">Often costs more</p> <p data-bbox="1107 1049 1611 1142">Often takes more calendar time</p> <p data-bbox="1107 1199 1512 1249">Risk of project failure</p>

Packaged Software

- Available for many common business needs
- Tested, proven; cost and time savings
- Rarely a perfect fit with business needs
- May allow for customization
 - Manipulation of system parameters
 - Changing way features work
 - Synchronizing with other application interfaces
- May require workarounds

Systems Integration

- Building systems by combining packages, legacy systems(old system), and custom pieces
- Integrating data is the key

Outsourcing

- Hiring an external vendor, developer, or service provider
- May reduce costs or add value
- Risks include possibly
 - Losing confidential information
 - Losing control over future development
 - Losing learning opportunities

Outsourcing Contracts

- Time and arrangements
- Fixed-price
- Value-added



Outsourcing Guidelines

- Keep the lines of communication open between you and your outsourcer.
- Define and stabilize requirements before signing a contract.
- View the outsourcing relationship as a partnership.
- Select the vendor, developer, or service provider carefully.
- Assign a person to manage the relationship.
- Don't outsource what you don't understand.
- Emphasize flexible requirements, long-term relationships, and short-term contracts.

INFLUENCES ON THE ACQUISITION STRATEGY

Selecting a Design Strategy

- Consider each of the following when deciding what strategy to use:
 - Business need
 - In-house experience
 - Project skills
 - Project management
 - Time frame

Selecting a System Acquisition Strategy



	When to Use Custom Development	When to Use a Packaged System	When to Use Outsourcing
Business need	The business need is unique	The business need is common	The business need is not core to the business
In-house experience	In-house functional and technical experience exists	In-house functional experience exists	In-house functional or technical experience does not exist
Project skills	There is a desire to build in-house skills	The skills are not strategic	The decision to outsource is a strategic decision
Project management	The project has a highly skilled project manager and a proven methodology	The project has a project manager who can coordinate vendor's efforts	The project has a highly skilled project manager at the level of the organization that matches the scope of the outsourcing deal
Time frame	The time frame is flexible	The time frame is short	The time frame is short or flexible

SELECTING AN ACQUISITION STRATEGY

Developing an Alternative Matrix

- What tools and technologies are needed for a custom development project?
- What vendors make products that address the project needs?
- What service providers would be able to build this application if outsourced?

Developing an Alternative Matrix

- Combine several feasibility analyses into one matrix
- Include technical, budget, and organizational feasibilities
- Assign weights to indicate the relative importance of the criteria
- Assign scores to indicate how well the alternative meets the criteria

Developing an Alternative Matrix

Evaluation Criteria	Relative Importance (Weight)	Alternative 1: Custom Application using VB.NET	Score (1-5)*	Weighted Score	Alternative 2: Custom Application using Java	Score (1-5)*	Weighted Score	Alternative 3: Packaged Software Product ABC	Score (1-5)*	Weighted Score
Technical Issues:		↑			↑			↑		
Criterion 1	20		5	100		3	60		3	60
Criterion 2	10		3	30		3	30		5	50
Criterion 3	10		2	20		1	10		3	30
Economic Issues:										
Criterion 4	25	Supporting	3	75	Supporting	3	75	Supporting	5	125
Criterion 5	10	Information	3	30	Information	1	10	Information	5	50
Organizational Issues		↓			↓			↓		
Criterion 6	10		5	50		5	50		3	30
Criterion 7	10		3	30		3	30		1	10
Criterion 8	5		3	15		1	5		1	5
TOTAL	100			350			270			360

Quistions ?

- If your university or office were investing in an on-line registration system, would you recommend --
 - Building it in-house?
 - Buying a package?
 - Outsourcing the project?
- What is the basis for your recommendation?