

Chapter 9 – Developing IT systems

No matter what system your organization chooses to develop, when it comes to developing those systems, who will develop those systems or how your organization will develop those systems, your participation is important because you are a:

Business process expert – who possesses knowledge concerning how business processes work and how they need to change

A Liaison to the customer – understand how customers interact with the organization and what information they need

Quality control analyst – you are responsible for ensuring that the final system meets your logical requirements

Manager of other people – you are responsible for the work and productivity of your employees.

Answering the who questions of systems development

IT specialist (insource), knowledge workers (self sourcing) and other organizations (outsourcing)

Answering the How questions of system development

1. Traditional systems development life cycle – knowledge worker tells the IT specialist what you want
2. Prototyping – Building models of systems to determine requirements and express functionality
3. Application software packages – Prewritten software packages that automate common business functions.
4. Computer-aided software engineering – Software tool that automates some or all steps in the traditional system development life cycle
5. Joint Application development – Workshops that unite knowledge workers and IT specialists to increase the effectiveness of communicating requirements and solutions.

Traditional System development life cycle – is a structured step-by-step approach to developing systems that creates a separation of duties among IT specialists and knowledge workers

1. **Planning** – Establish an IT plan to meet the strategic plans of the organization. Determine if the development of the system should be outsourced, insourced or selfsourced.
2. **Scoping** – Define the scope of the proposed system (lay the foundation of the system) Key tasks include:
 - a. Which business units the new system will affect
 - b. Gather the project team
 - c. Review existing applications to which and interface will be required
 - d. Perform feasibility review
 - e. Develop a plan for proceeding

Your role during Scoping:

- ⇒ Define the exact problem or opportunity
- ⇒ Participate in developing a plan for proceeding

3. **Analysis** – Determine the logical requirements for the proposed system. A completed logical model of the proposed system must include a step-by-step description of processes as well as thorough documentation of all the information the proposed system will work with. Key tasks include:
 - a. Model, study, and analyze current system and business processes
 - b. Define new information and processing requirements
 - c. Model the new system
 - d. Update the project plan and scope.

Your role during Analysis:

- ⇒ Provide information on how the system currently works
- ⇒ Provide information concerning new information and processing requirements
- ⇒ Monitor and justify new feasibility review – justify expenditure

4. **Design** – Convert the logical requirements into a technical system design. To build a technical blueprint of how the proposed system would work. Mostly IT specialists but your role becomes that of quality assurance. Key tasks include:
 - a. Identify alternative technical solutions
 - b. Analyze the alternative solutions and choose the best
 - c. Update the project plan and scope

Your role during design:

- ⇒ Ensure that the recommended technical solution meets the logical requirements
- ⇒ Monitor and justify the project plan

5. **Implementation** – Create the new system. Bring the proposed system to life and place it in the organization. Key tasks include:
 - a. Programming – writing any necessary software
 - b. Hardware acquisition and installation – IT specialists
 - c. Testing

- d. Training – required for people using the new system
- e. Conversion – moving from old to new
 - ⇒ Parallel conversion – both old and new until new system performs correctly
 - ⇒ Plunge conversion – Discard old and immediately use new
 - ⇒ Pilot conversion – small group uses the new system
 - ⇒ Piecemeal conversion – use portion of new system until you’re sure it works correctly.

Your role during Implementation:

- ⇒ Determine the best training method
- ⇒ Determine the best method of conversion
- ⇒ Provide complete testing of new system
- ⇒ Monitor budget and schedule and look for “run away” projects

- 6. **Support** – Provide ongoing support. Ensure system continues to meet stated goals. Key tasks include:
 - a. React to change in information and processing needs
 - b. Assess worth of system in terms of strategic plan of the organization

Your role during support:

- ⇒ Provide mechanism for people to request changes
- ⇒ Assess worth of proposed changes before passing them on to the IT specialist

Self-sourcing and Prototyping

Selfsourcing (knowledge worker development) – Is the development and support of IT systems by knowledge workers with little or no help from IT specialists

Prototyping – Is the process of building a model that demonstrates the features of a proposed service or system. A prototype is a model of a proposed product, service or system

The Prototyping Process

Step 1: Identify Basic requirements – input and output information

Step 2: Develop Initial prototype – user interface, data entry screens and reports

Step 3: Knowledge worker Reviewing – interactive process – evaluate prototype

Step 4: Revise and Enhance Prototype

Advantages of Prototyping

1. Helps resolve discrepancies among knowledge workers
2. Gives knowledge workers a feel for the final system
3. Helps determine technical feasibility
4. Helps sell the idea of a proposed system

Disadvantages of Prototyping

1. Leads people to believe the final system will follow shortly
2. Gives no indication of performance under operational conditions
3. Leads the project team to forgo proper testing and documentation

Key tasks in SelfSourcing

1. Scoping
 - a. Define goals of new system

- b. Create project plan
 - c. Identify any systems that require an interface
 - d. Determine what type of external support you will require
2. Analysis
 - a. Study and model the current system
 - b. Understand the interface in detail
 - c. Define and prioritize your requirements
3. Design
 - a. Select a design target (hardware and software)
 - b. Acquire the necessary hardware and software
 - c. Develop an initial prototype
4. Implementation
 - a. Fully develop the prototype into a complete system
 - b. Test the new system
 - c. Train
 - d. Convert the new system
 - e. Completely document the system
5. Support
 - a. Provide ongoing maintenance

Advantage of selfsourcing

1. Improves requirement determination
2. Increases knowledge worker participation and sense of ownership
3. Increases speed of system development

Disadvantages of selfsourcing

1. Inadequate knowledge worker expertise leads to inadequately developed system
2. Lack of organizational force creates “privatized” IT system
3. Insufficient analysis of design alternatives leads to subpar IT systems
4. Lack of documentation and external support leads to short-lived systems

Outsourcing

Outsourcing is the delegation of specific work to a third party for a specified length of time, at a specific cost, and at a specified level of service

Outsourcing may take on 3 forms:

1. Purchase an existing application software package
2. Purchase an existing application software package and request modifications
3. Outsource the development of an entirely new system for which no application software package exists.

Outsourcing steps:

1. Planning – identify what system needs to be developed

2. Scoping – Select a target system. Lay the groundwork for the development of a proposed system
3. Analysis – Establish logical requirements
4. Develop a request for proposal – A formal document that outlines your logical requirements for the proposed system and invites outsourcing organizations to submit bids for its development.
 - ⇒ Problem statement
 - ⇒ Description of current system
 - ⇒ Description of proposed system
 - ⇒ Request for support plan
 - ⇒ Request for development time frame
 - ⇒ Request for statement of outsourcing costs
 - ⇒ How RFP return will be scored
 - ⇒ Deadline for RFP return
5. Evaluate request for proposal returns and choose a vendor
6. Test and accept Solution
7. Monitor and re-evaluate

Advantages of outsourcing

1. Allows company to focus on unique core competencies
2. Exploit the intellect of another organization
3. Better predict future costs
4. Acquire leading-edge technology
5. Reduce costs
6. Improve Performance Accountability

Disadvantages of outsourcing include:

1. Reduces technical know-how for future innovation
2. Reduces degree of control
3. Increases vulnerability of strategic information
4. Increases dependency on other organizations

Computer Aided Software engineering

CASE's support your systems development efforts in two ways:

1. Helps you model and store information pertinent to a specific system
2. Helps you perform the system development tasks of converting information to a new form

Tools that automate some or all steps in the SDLC. Integrated CASE tools automate the entire SDLC. Upper CASE tools automate the planning, scoping, analysis, and design steps; lower CASE tools automate the design, implementation and support steps.

Project repository – Is a database that contains information pertaining to all the systems development projects that your organization has undertaken using the CASE tools

CASE Tools support for the system Development Life cycle

1. Planning
 - a. Goals and objectives of your organization
 - b. Current IT infrastructure
 - c. IT systems plan
 - d. Organizational structure
 - e. Current information and processes
2. Scoping
 - a. Problem statement
 - b. Goals of the new system
 - c. Interface requirements
 - d. Feasibility review
 - e. Project team
 - f. Project plan
3. Analysis
 - a. Model of current system, processes, and information
 - b. New information and processes
 - c. Model of new system, processes and information
4. Design
 - a. Technical alternatives of the system
 - b. Detailed specifications of how the software should work
 - c. Screen and report design
 - d. Database and file layouts
5. Implementation
 - a. Generate software automatically from detailed design
 - b. Generate test data
 - c. Debug a system and find mistakes
6. Support
 - a. Regenerate software after changing design specifications
 - b. Reverse-engineer old systems to support changes

Advantages of CASE tools

1. Increased speed and efficiency of SDLC
2. Repository of project information
3. Valuable control checking
4. Deployment of systems across multiple platforms

Disadvantages of CASE tools

1. You must still have a solid background in analysis and design
2. CASE tools are not for knowledge workers – they're for IT specialists
3. Integrated CASE tools require a detailed organizational understanding

Joint Application Development

JAD is a workshop that united management, IT specialists, and knowledge workers to define and specify the logical requirements and technical alternatives for a proposed system. (1) it breaks down their communication differences (2) work as a team to define logical requirements (3) explore several technical alternatives for the new system

Role of the JAD facilitator – run the workshop, keep participants moving forward through the agenda, and they resolve conflicts between participants. He or she is responsible for seeing that the group meets its ultimate goal – defining the logical requirements for the proposed system and exploring several technical alternatives.

JAD Process

1. Establish the JAD Project – scoping the proposed system and formulating the guidelines for the JAD workshop.
2. Introduce Participants to the Project and JAD workshop
3. Prepare JAD workshop materials
4. Perform the JAD workshop

The advantages of JAD

1. Improved systems design that better meets the needs of knowledge workers because JAD breaks down communication barriers, knowledge workers are better able to express their requirements and IT is better able to understand those requirements.
2. Reduce Delivery time for the new system – faster at gathering requirements
3. Improved relations among management, IT specialists, and knowledge workers