INTEGRATION AND DEPLOYMENT

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TOPICS:

- Components, interfaces and integration
- Infrastructure, Middleware and Platforms
- Techniques – Data warehouses, extending frameworks, wrappers, glue, facades
- Testing/evaluation/benchmarking
- System release: pilot and acceptance testing and defect repair
- System support strategies and user support plans

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SYSTEM INTEGRATION (SI)

- SI is essential to the development of large, complex engineered systems.
- It is used for melding existing systems and new technologies to form more capable systems that are intended to take on additional tasks, exhibit improved performance, and/or enhance existing systems.
- SI requires the coordination of preexisting and coexisting system components with newly developed ones

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- SI ensures that specific hardware/software components fit together smoothly in a stated configuration

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DEFINITION

- SI is a logical, objective procedure for applying new and/or expanded performance requirements in an efficient, timely manner to the design, procurement, installation, and operation of an operational configuration consisting of distinct modules (or subsystems), each of which may embody inherent constraints or limitations.

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KEY TERMS

- ***Logical, Objective Procedure***. *The SI process is clear to external observers and all* steps have a built-in audit trail.
- ***Efficient and Timely***. *The SI process will not be unduly burdened with delays and* bureaucratic procedures that increase cost to the client and delay deployment of the system.
- ***Design, Procurement, Installation, and Operation***. *The SI process will be employed* throughout the entire process.

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KEY TERMS…CONT…

- ***Distinct Modules with Inherent Limits or Constraints***. *The concept of distinct modules* with inherent limits or constraints is central to the concept of SI.
- SI is necessary when the configuration to be deployed includes devices with intimate connections to other devices previously deployed or to be deployed under a later procurement, particularly if these devices were designed and constructed *de novo by subcontractors* with only partial design responsibility for the overall system.

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OBJECTIVES OF SYSTEMS INTEGRATION METHODOLOGY

- The objectives for a systems integration engineering methodology can be stated as follows:

1. To support problem understanding and communication between all parties at all stages of development.
2. Enable capture of design and implementation needs early, especially interface and interactive needs associated with bringing together new and existing equipment and software.
3. To support both a top-down and a bottom-up design philosophy.

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OBJECTIVES OF SYSTEMS INTEGRATION METHODOLOGY -2

4. To support full compliance with audit trail needs, system-level quality assurance, and risk assessment and evaluation.
5. To support definition and documentation of all aspects of the program.
6. To provide a framework for appropriate systems management application to all aspects of the program.

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SI PERSONNEL NEEDS AND TECHNICAL AREAS

- The client must define the SI requirements, specifications, constraints, and variables in a manner so as to provide the means for a SI organization to deliver the necessary systems and services required to fulfill the client mission under the specific contract
- SI requires personnel who possess sound technical and management skills that combine to provide the ability to integrate technology and operations with technical and managerial direction.

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ROLE OF SYSTEMS INTEGRATION IN LARGE, COMPLEX ENGINEERED SYSTEMS

- Development and utilization of a strategic plan for management and technical aspects of the program;
- Establishment of a complete audit trail;
- Assistance in meeting initially unrecognized needs (including changes in system requirements);
- Avoidance of under- and over-procurement; and utilization of risk management plans;
- Management of subcontractors to the same specifications as employed on the prime contract; and
- Provisions for future modification and expansion.

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SYSTEMS INTEGRATION LIFE CYCLE

- Requirements definition and specification
- Feasibility analysis
- System architecture development
- Management plan: program and project plan
- Systems design: logical and physical design
- Implementation: design implementation, system tests, and operational deployment
- Evaluation: system review and plan for replacement/retirement

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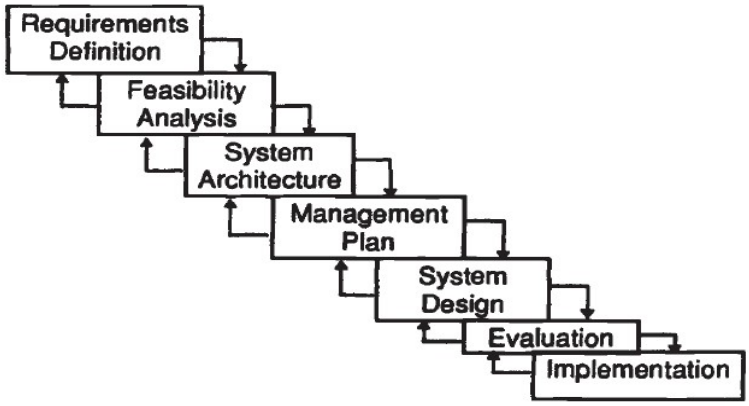

Figure 14.1 Systems integration life cycle.

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REQUIREMENTS DEFINITION AND SPECIFICATIONS

- Definition of requirements by use
- Review of requirements for ambiguity, conflict, and other issues
- Development of systems specifications

The goal for requirements definition and specification is to completely define and correctly interpret the client's real needs.

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FEASIBILITY ANALYSIS

- Determine the likelihood of successful system development and deployment
- Examine new technologies
- Assess risk and develop risk strategies

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SYSTEM ARCHITECTURE DEVELOPMENT

- Describe functional system architecture
- Specify required technical capabilities

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MANAGEMENT PLAN: PROGRAM AND PROJECT PLAN

- Identify technical architecture alternatives
- Specify required configuration categories
- Prepare program and project plans (e.g., work breakdown structure)
- Prepare subcontractor management plan
- Prepare risk management plan

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SYSTEMS DESIGN

Logical and Physical Design

- Design approaches (e.g., top-down, bottom-up, etc.)
- Use of CASE tools and other automated aids

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IMPLEMENTATION

Design Implementation, System Tests, and Operational Deployment

- Identify technical configuration
- Specify required configuration component items
- Procurement from subcontractors
- Perform system tests
- System deployment

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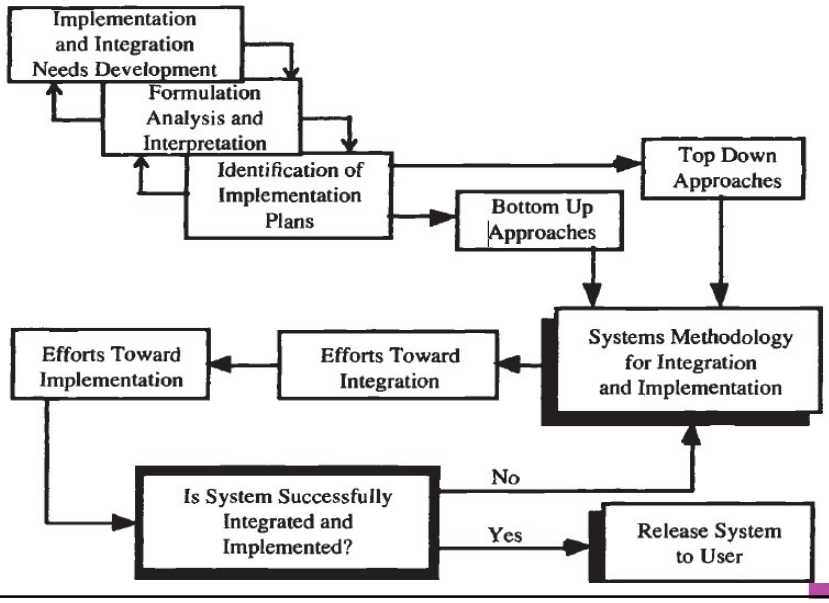
SI IMPLEMENTATION



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EVALUATION

System Review and Plans for Replacement~retirement

- Review and evaluate system functioning
- Obtain, install, test, and accept modified components
- Maintain, modify, augment, and enhance systems
- Plan for system retirement/replacement.

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FUNCTIONAL ACTIVITIES OF SYSTEMS INTEGRATORS

- Conduct general studies of needs to realize improved system performance.
- Develop detailed specifications and designs.
- Conduct risk studies and implement risk minimization strategies.
- Perform system analysis and design.
- Develop hardware and software design.
- Employ project planning and control.
- Perform business management and accounting.

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FUNCTIONAL ACTIVITIES OF SYSTEMS INTEGRATORS

- Develop and nurture relationships with customers and subcontractors.
- Develop hardware design and specification.
- Carry out configuration management.
- Accomplish testing.
- Implement technology based solutions to business needs.
- Train users of new systems.

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SYSTEMS INTEGRATION STRATEGIES FOR SUCCESS

- For SI management, some of the strategies that will be necessary to compete in the SI world of the future include:
  - Strict control of overhead
  - Increased knowledge of client businesses
  - Proactive management to control costs and increase market share

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MIDDLEWARE

- Is a special software
- Connect between software or applications
- Support for distributed applications
- May be is Transaction process system

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ADVANTAGES OF USING MIDDLEWARE

- Speedup
- **Increased Efficiency**
- Security
- Middleware technologies can help by providing a flexible layer between applications and technologies.

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DISADVANTAGES OF USING MIDDLEWARE

- Prohibitively high development costs
- There are few people with experience in the market place
- The tools are not good enough
- Middleware products are not very mature

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CONSIDERATIONS FOR ENTERPRISE INTEGRATION PLATFORM SELECTION

- Windows
- Unix/Linux
- Novell netware
- Database flatform

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