



System Development Life Cycle (SDLC)

CS208



Six Phases of the System Development Life Cycle

- **Preliminary Investigation**
 - Assesses feasibility and practicality of system
- **System Analysis**
 - Study old system and identify new requirements
 - Defines system from user's view
- **System Design**
 - Design new/alternative system
 - Defines system from technical view

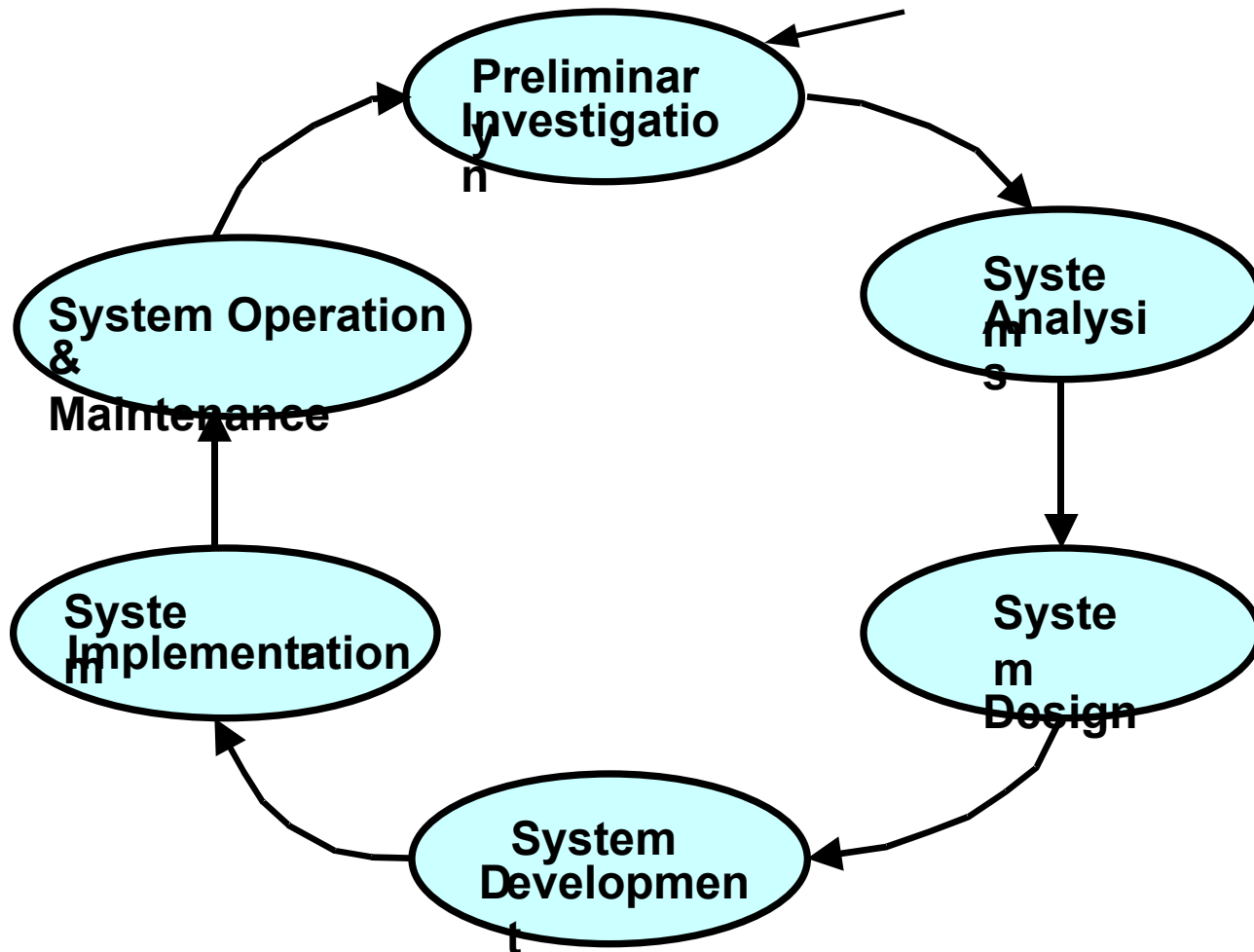


Six Phases of the System Development Life Cycle

- **System Development**
 - New hardware and software is acquired, developed, and tested
- **System Implementation**
 - System installation and training
- **System Operation & Maintenance**
 - Daily operation
 - Periodic evaluation and updating



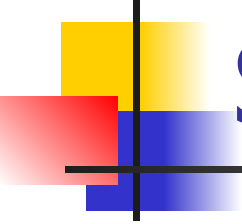
SDLC Phases





Phase 1: Preliminary Investigation

- Determine if a new system is needed
- Three primary tasks:
 - Define the problem
 - By observation and interview, determine what information is needed by whom, when, where and why
 - Suggest alternative solutions
 - Prepare a short report



Phase 2: System Analysis

- In depth study of the existing system to determine what the new system should do.
 - Expand on data gathered in Phase 1
- In addition to observation and interviews, examine:
 - Formal lines of authority (org chart)
 - Standard operating procedures
 - How information flows
 - Reasons for any inefficiencies

Phase 2: System Analysis

Tools Used

- Checklists - list of questions
- Top-down analysis - start with top level components, break down into smaller parts through each successive level
- Grid charts - to show relationship between inputs and outputs
- System flowcharts - charts flow of input data, processing, and output which show system elements and interactions



Phase 2: System Analysis

Documentation Produced

- Complete description of current system and its problems
- Requirements for for new system including:
 - Subject
 - Scope
 - Objectives
 - Benefits
- Possible development schedule



Phase 3: System Design

- Uses specifications from the systems analysis to design alternative systems
- Evaluate alternatives based upon:
 - Economic feasibility - Do benefits justify costs?
 - Technical feasibility - Is reliable technology and training available?
 - Operational feasibility - Will the managers and users support it?



Phase 3: System Design

Tools Used

- **Computer-Aided Software Engineering (CASE)** tools are software-based products designed to help automate the production of information systems.
- Examples:
 - Diagramming Tools
 - Data Repositories
 - Prototyping Tools
 - Test Data Generators
 - Documentation Tools
 - Project Management Tools



Phase 3: System Design Documentation Produced

- System Design Report
 - Describe Alternatives including:
 - Inputs/Outputs
 - Processing
 - Storage and Backup
 - Recommend Top Alternative based upon:
 - System Fit into the Organization
 - Flexibility for the future
 - Costs vs. benefits

Phase 4:

System Development

- Build the system to the design specifications
 - Develop the software
 - Purchase off-the-shelf software OR
 - Write custom software
 - Acquire the hardware
 - Test the new system
 - Module (unit) test - tests each part of system
 - Integration testing - tests system as one unit
 - Create manuals for users and operators

Phase 5:

System Implementation

- Convert from old system to new system
- Train users
- Compile final documentation
- Evaluate the new system



Phase 5: System Implementation

Types of Conversion

- **Direct/plunge/crash** approach – entire new system completely replaces entire old system, in one step
- **Parallel** approach - both systems are operated side by side until the new system proves itself
- **Pilot** approach - launched new system for only one group within the business -- once new system is operating smoothly, implementation goes company-wide
- **Phased/incremental** approach - individual parts of new system are gradually phased-in over time, using either crash or parallel for each piece.



Phase 5: System Implementation

- User Training
 - Ease into system, make them comfortable, and gain their support
 - Most commonly overlooked
 - Can be commenced before equipment delivery
 - Outside trainers sometimes used



Phase 6: Operations & Maintenance

- Types of changes:
 - Physical repair of the system
 - Correction of new bugs found (corrective)
 - System adjustments to environmental changes
 - Adjustments for users' changing needs (adaptive)
 - Changes to user better techniques when they become available (perfective)



Phase 6: Operations & Maintenance

- Evaluation Methods
 - Systems audit - performance compared to original specifications
 - Periodic evaluation - “checkups” from time to time, modifications if necessary

Deliverables of the SDLC

