BUILDING INFORMATION SYSTEMS

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92-2

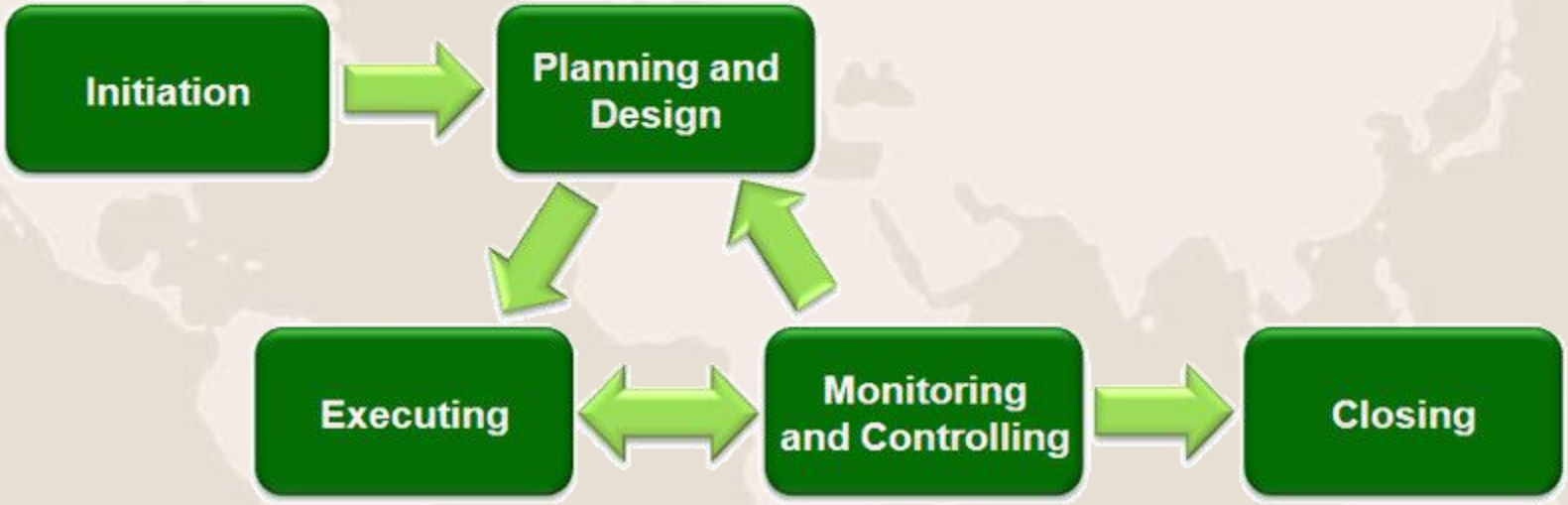
Learning Objectives

- What are the core activities in the systems development process?
- What are the principal methodologies for modeling and designing systems?

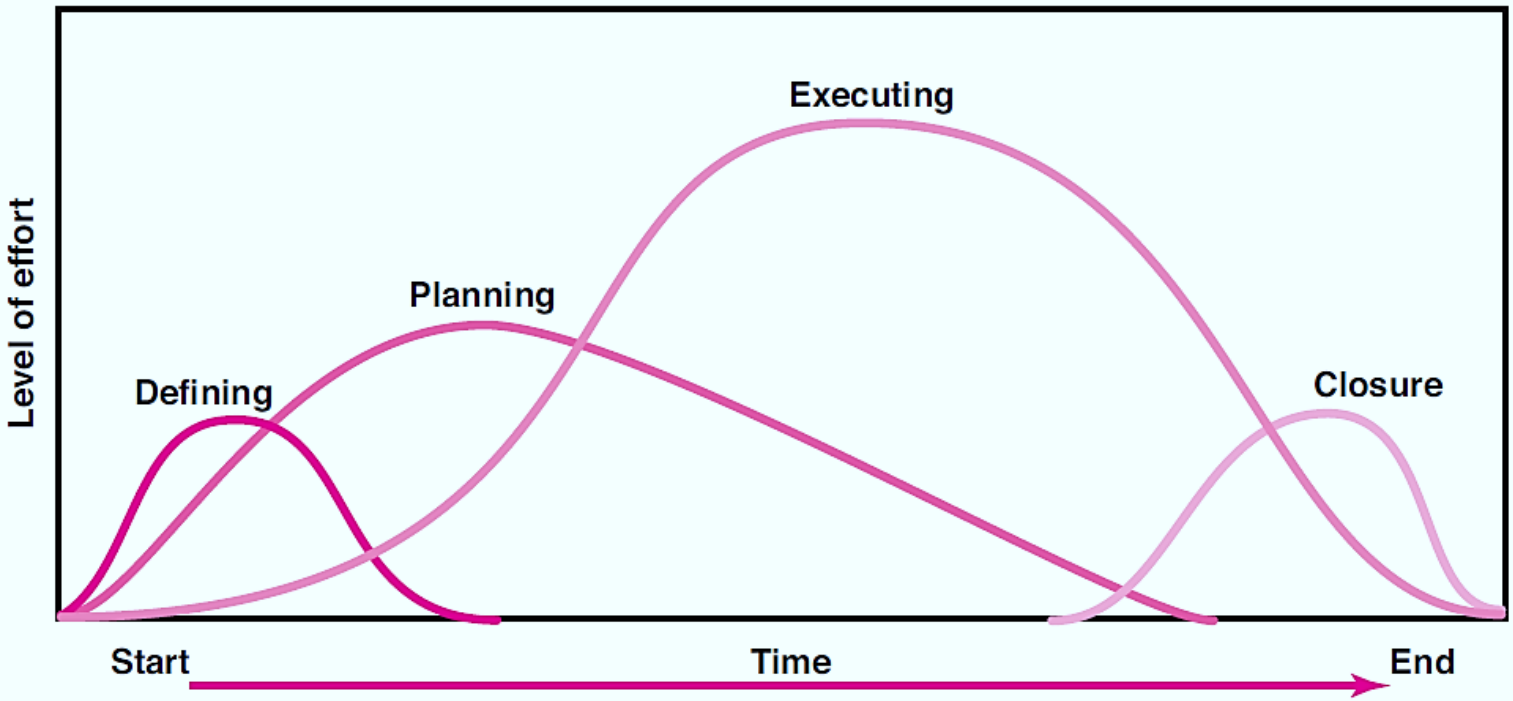
مثال

- ساخت بنا
  - بلافاصله
  - پیمانکار اجرایی
  - معمار

Typical development phases of a project



Project Life Cycle



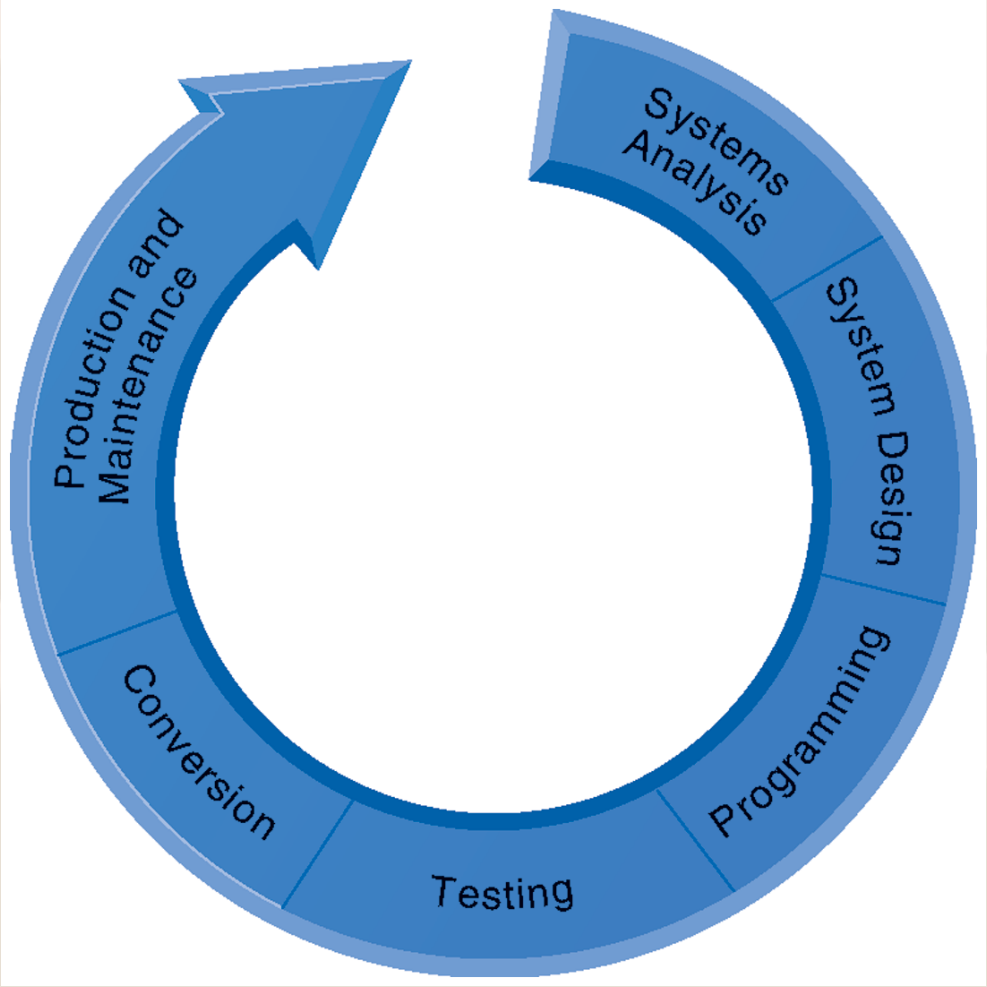
Defining	Planning	Executing	Closure
1. Goals	1. Schedules	1. Status reports	1. Train customer
2. Specifications	2. Budgets	2. Changes	2. Transfer documents
3. Tasks	3. Resources	3. Quality	3. Release resources
4. Responsibilities	4. Risks	4. Forecasts	4. Evaluation
	5. Staffing		5. Lessons learned

Overview of Systems Development

- **Systems development:**
  - **Activities that go into producing an information system solution to an organizational problem or opportunity**
  1. **Systems analysis**
  2. **Systems design**
  3. **Programming**
  4. **Testing**
  5. **Conversion**
  6. **Production and maintenance**

Overview of Systems Development

Building a system can be broken down into six core activities.



Overview of Systems Development

- **Systems analysis**
  - **Analysis of problem to be solved by new system**
    - Defining the problem and identifying causes
    - Specifying solutions/ alternative solutions
    - Identifying information requirements
      - Who needs what information, where, when, and how
      - Define objectives of new/modified system
      - Detail the functions new system must perform
  - **Includes feasibility study**
    - Is solution feasible and good investment?
    - Is required technology, skill available?

- **تحلیل گر سیستم**
  - واسط بین مشتری (کاربر نهایی) و سازنده (برنامه نویس)

Overview of Systems Development

- **Systems design**
  - **Describes system specifications that will deliver functions identified during systems analysis**
  - **Should address all managerial, organizational, and technological components of system solution**
  - **Role of end users**
    - User information requirements drive system building
    - Users must have sufficient control over design process to ensure system reflects their business priorities and information needs
    - Insufficient user involvement in design effort is major cause of system failure

Overview of Systems Development

- **Programming**
  - System specifications from design stage are translated into software program code
- **Testing**
  - Ensures system produces right results
  - Unit testing: Tests each program in system separately
  - System testing: Test functioning of system as a whole
  - Acceptance testing: Makes sure system is ready to be used in production setting
  - Test plan: All preparations for series of tests

Overview of Systems Development

- **Conversion**
  - **Process of changing from old system to new system**
  - **Four main strategies**
    1. Parallel strategy
    2. Direct cutover
    3. Pilot study
    4. Phased approach
  - **Requires end-user training**
  - **Finalization of detailed documentation showing how system works from technical and end-user standpoint**

Overview of Systems Development

- **Production and maintenance**
  - **System reviewed to determine if revisions needed**
  - **Maintenance**
    - Changes in hardware, software, documentation, or procedures to a production system to correct errors, meet new requirements, or improve processing efficiency
      - 20% debugging, emergency work
      - 20% changes to hardware, software, data, reporting
      - 60% of work: User enhancements, improving documentation, recoding for greater processing efficiency

Overview of Systems Development

SUMMARY OF SYSTEMS DEVELOPMENT ACTIVITIES	
CORE ACTIVITY	**DESCRIPTION**
Systems analysis	Identify problem(s) Specify solutions Establish information requirements
Systems design	Create design specifications
Programming	Translate design specifications into code
Testing	Unit test Systems test Acceptance test
Conversion	Plan conversion Prepare documentation Train users and technical staff
Production and maintenance	Operate the system Evaluate the system Modify the system

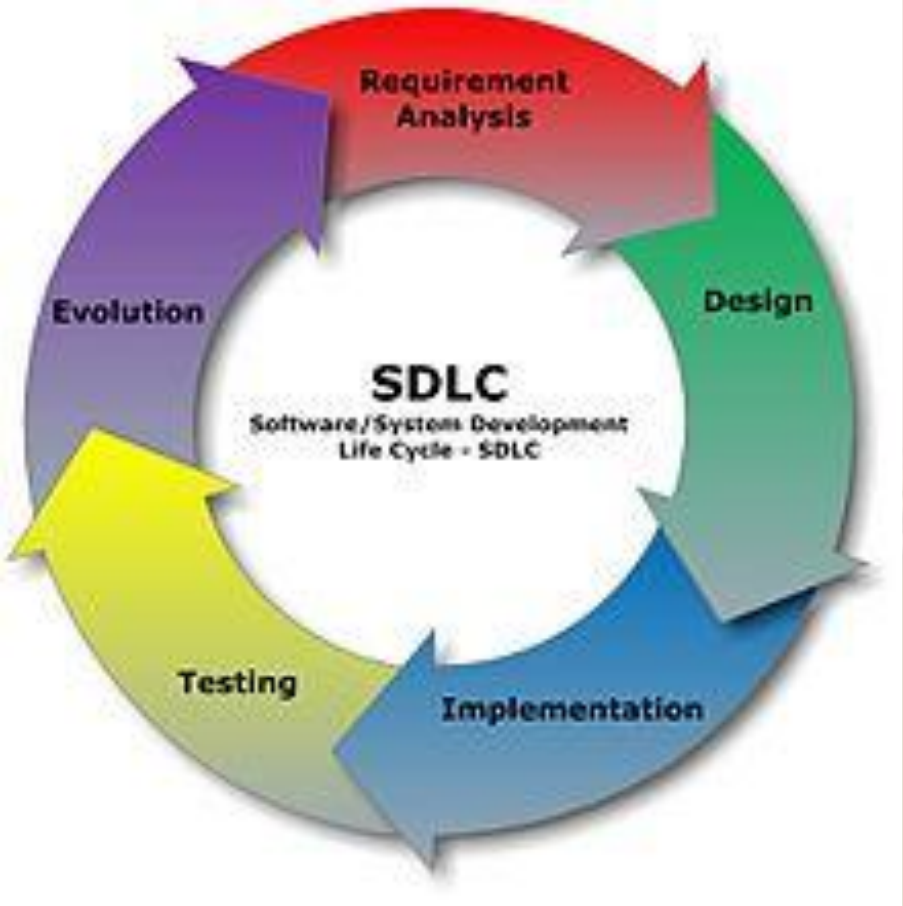
متدلوژی Methodology

- مجموعه ای از روش ها، قواعد و اصولی که دریک رشته به کار می روند.
- مجموعه ای از روش ها که بر مبنای مجموعه ای از اصول پایه به همراه قواعدی برای کاربرد آنها بنا شده اند.
- راهبردهای مشخص و مرحله به مرحله برای تکمیل یک یا چند دوره از چرخه عمر ایجاد و توسعه سیستم ها
  - توسعه دهندگان سیستم با اجرای گام به گام مراحل مشخص شده در متدلوژی ها و استفاده از ابزارها و تکنیک های هر مرحله، پروژه های توسعه IS ها را برنامه ریزی، اداره و کنترل و ارزیابی نمایند.

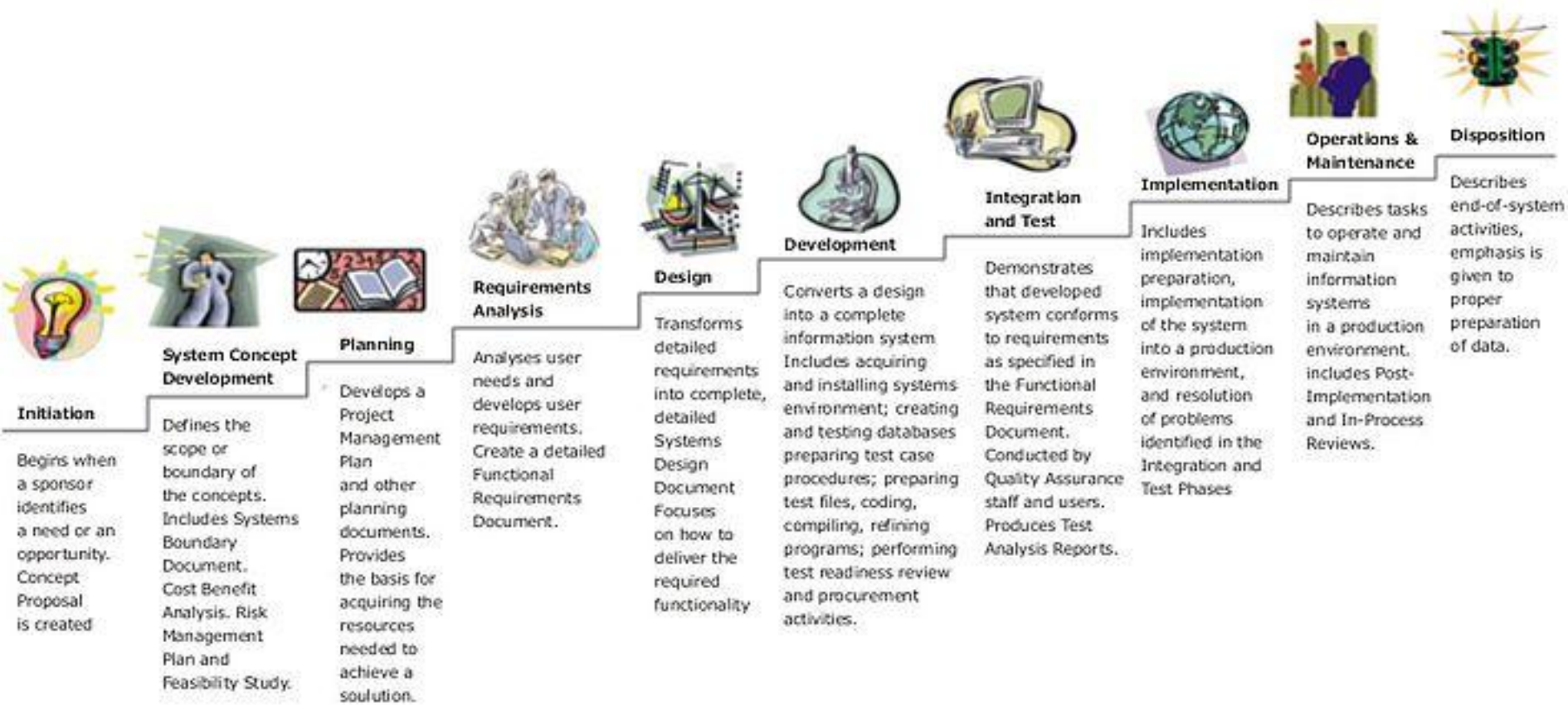
سوالاتی که یک متدلوژی باید پاسخ دهد:

- چگونه یک پروژه باید به مراحل فرعی تجزیه شود؟
- در هر مرحله
  - چه اقداماتی باید صورت گیرد؟
  - چه خروجی هایی باید تولید شود؟
  - چه محدودیت هایی باید اعمال شود؟
  - چه کسانی باید در گیر شوند؟
  - از چه ابزارهایی باید استفاده شود؟

SDLC


Requirement Analysis
Design
Implementation
Testing
Evolution
SDLC
Software/System Development Life Cycle - SDLC

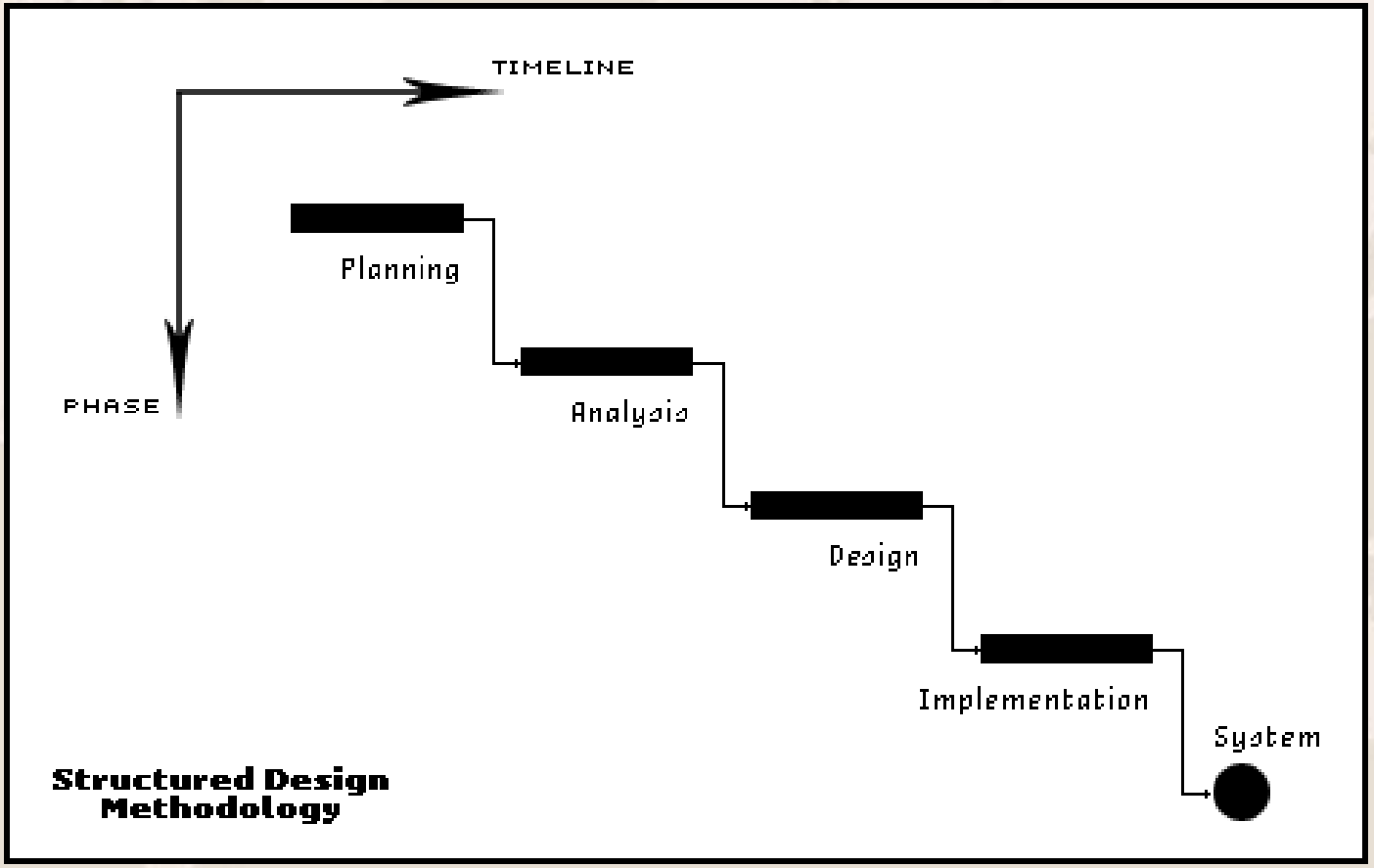
Systems Development Life Cycle (SDLC)
Life-Cycle Phases



System Development Life Cycle (SDLC) Methodologies

- Waterfall
- RAD: Rapid Application Development
- RUP: Rational Unified Process
- SSADM: Structured systems analysis and design method

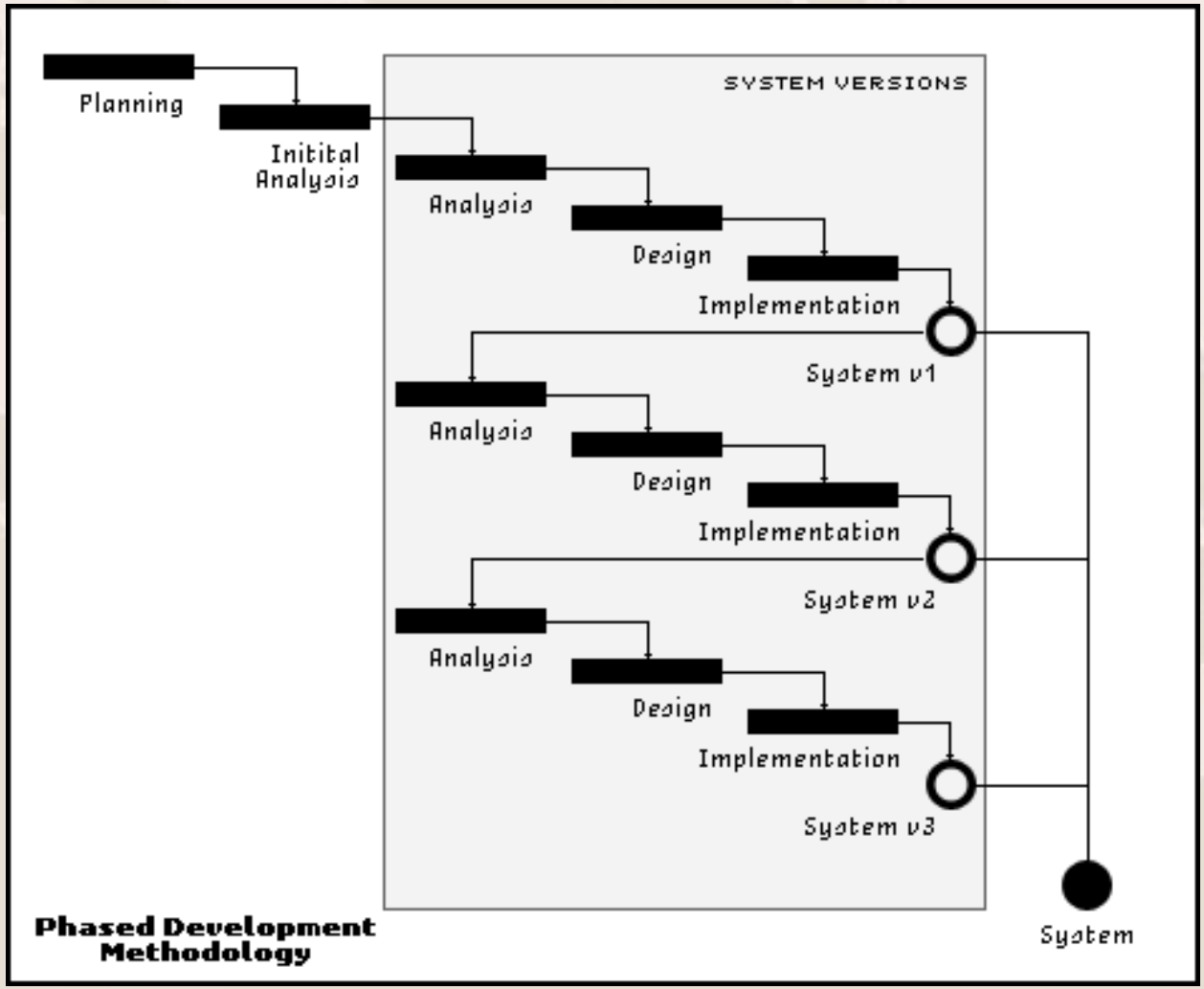
Waterfall


TIMELINE
PHASE
Planning
Analysis
Design
Implementation
System
Structured Design Methodology

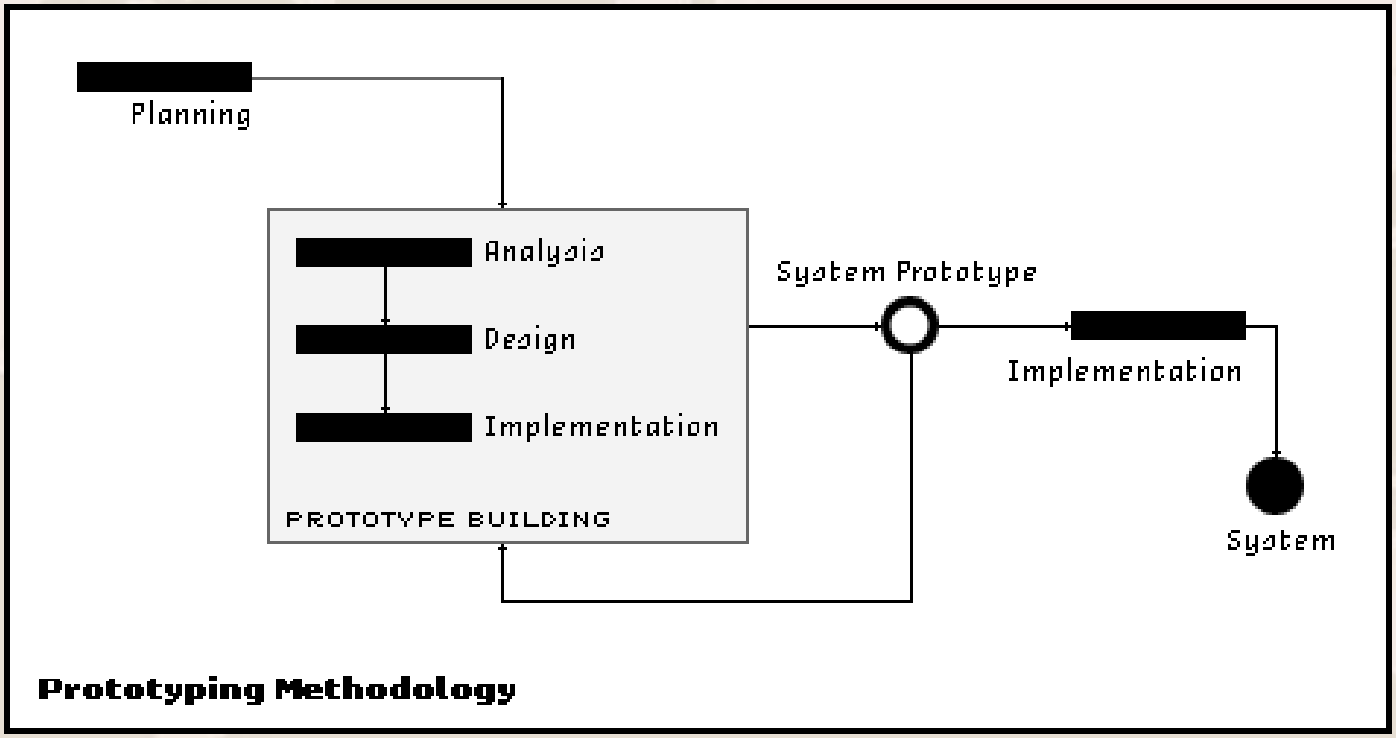
RAD (Rapid Application Development)

- There are three categories of RAD:
  - Phased Development
  - Prototyping
  - Throw-away Prototyping

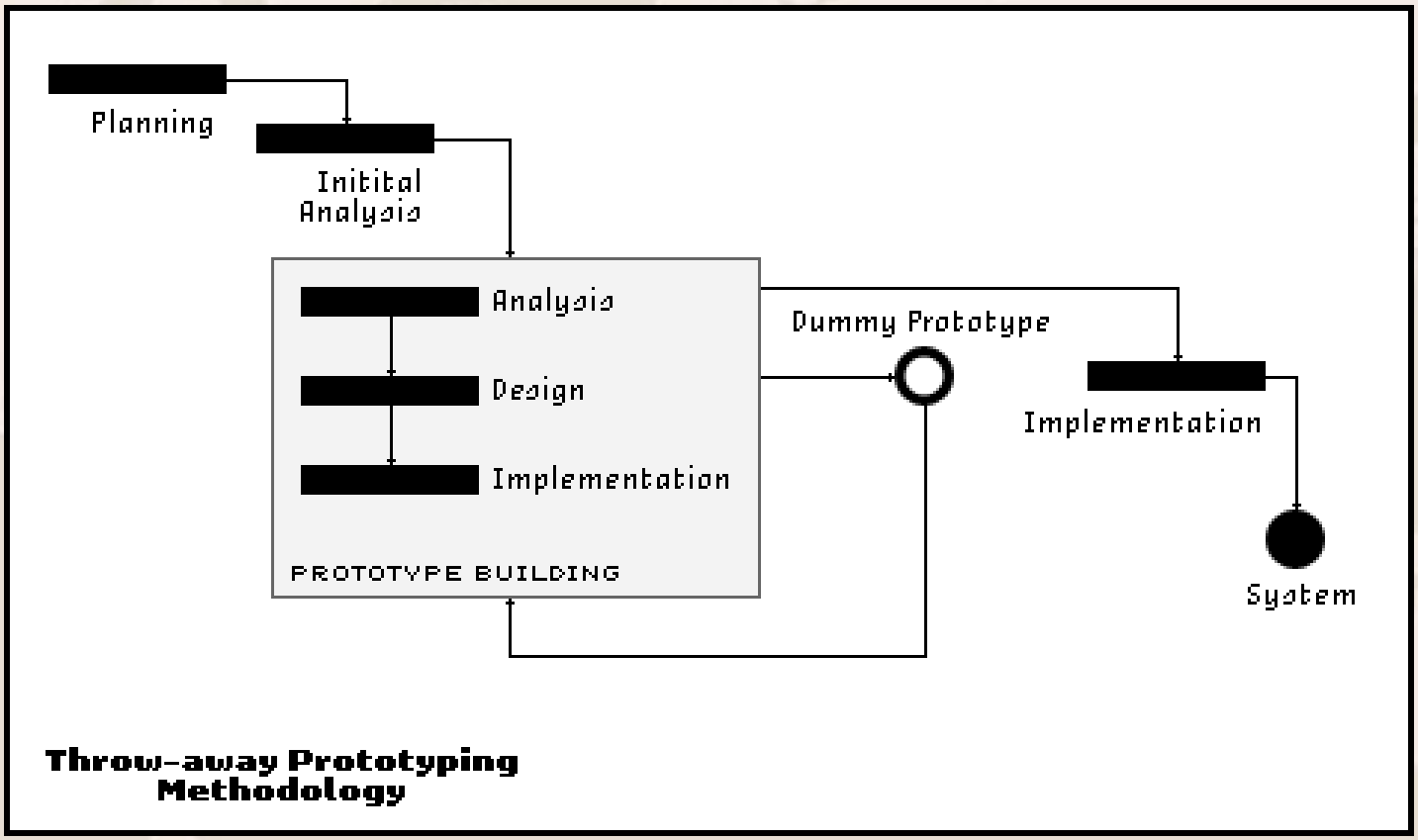
RAD (Phased Development)



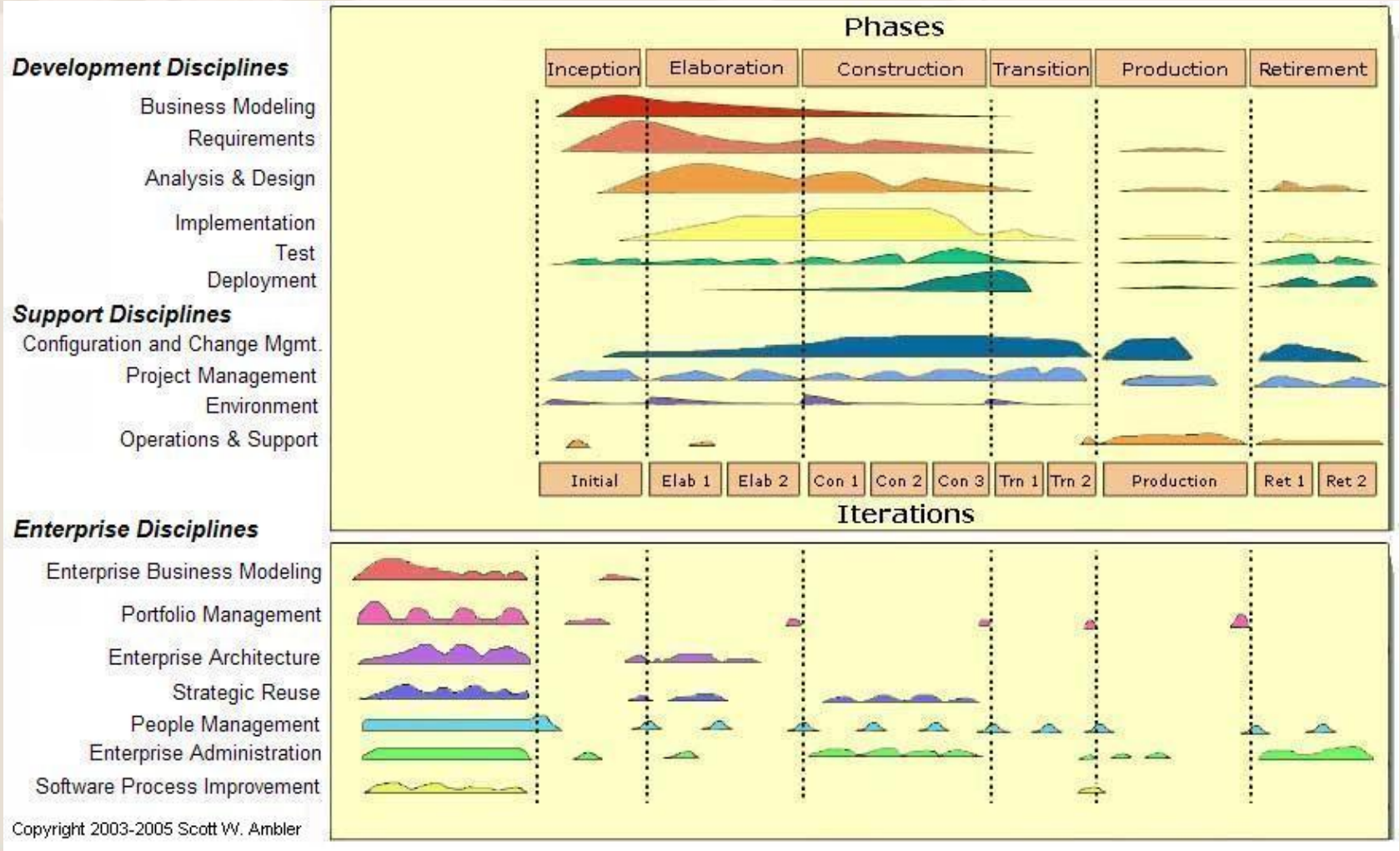
RAD (Prototyping)



RAD (Throw-away Prototyping)



RUP


Development Disciplines
Business Modeling
Requirements
Analysis & Design
Implementation
Test
Deployment
Support Disciplines
Configuration and Change Mgmt.
Project Management
Environment
Operations & Support
Enterprise Disciplines
Enterprise Business Modeling
Portfolio Management
Enterprise Architecture
Strategic Reuse
People Management
Enterprise Administration
Software Process Improvement
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Phases
Inception
Elaboration
Construction
Transition
Production
Retirement
Initial
Elab 1
Elab 2
Con 1
Con 2
Con 3
Trn 1
Trn 2
Production
Ret 1
Ret 2
Iterations

SSADM

- 1980: Central Computer and Telecommunications Agency (CCTA) evaluate analysis and design methods.
- 1981: Consultants working for Learmonth & Burchett Management Systems,
- 1983: SSADM made mandatory for all new information system developments
- 1984: Version 2 of SSADM released
- 1986: Version 3 of SSADM released, adopted by NCC
- 1988: SSADM Certificate of Proficiency launched, SSADM promoted as ‘open’ standard
- 1989: Moves towards Euromethod, launch of CASE products certification scheme
- 1990: Version 4 launched
- 1993: SSADM V4 Standard and Tools Conformance Scheme Launched
- 1995: SSADM V4+ announced, V4.2 launched
- 2000: CCTA renamed SSADM as "Business System Development". The method was repackaged into 15 modules and another 6 modules were added.

پیامبر صلی الله علیه وآله:

الضیف ینزل برزقه ویرتحل بذنوب اهل البیت

میهمان، روزی خود را می آورد و گناهان اهل خانه را می برد.

تحف العقول، ص ۳۶۱

پایان