# 605.601 Foundations of Software Engineering
## Fall 2020

## Module 01A: Evolution of Software Development

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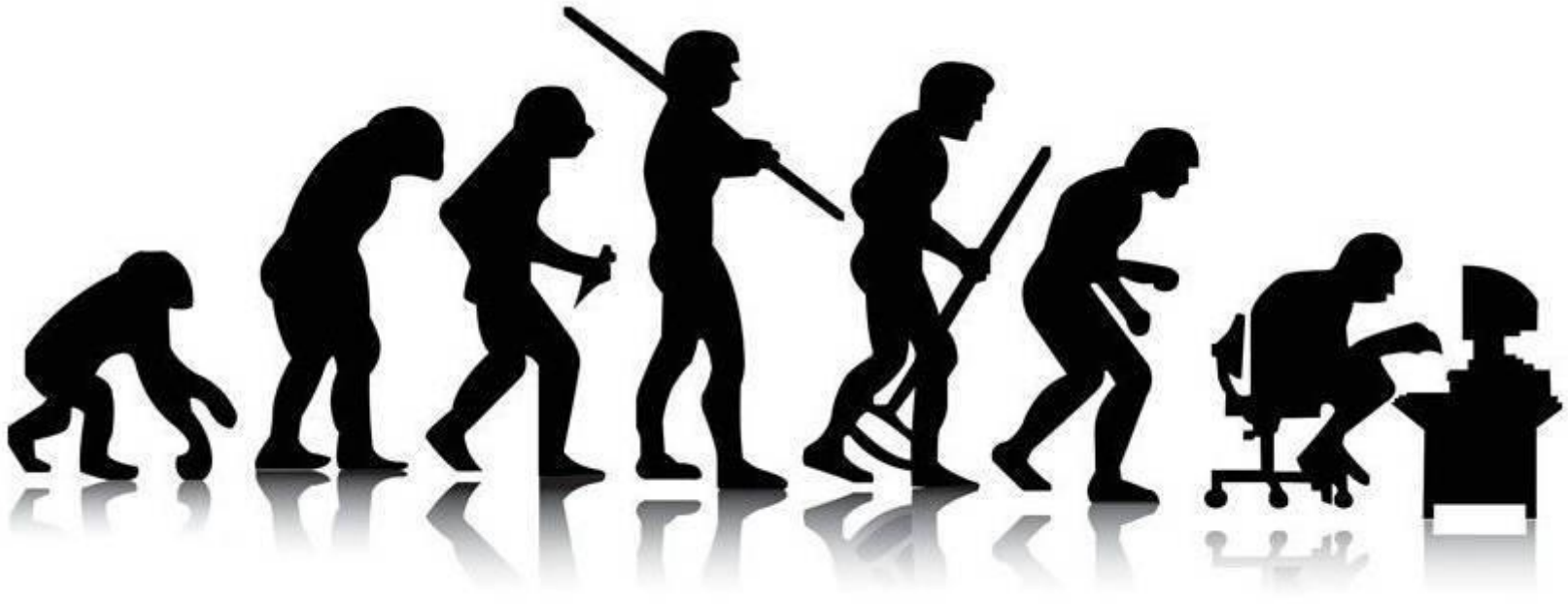
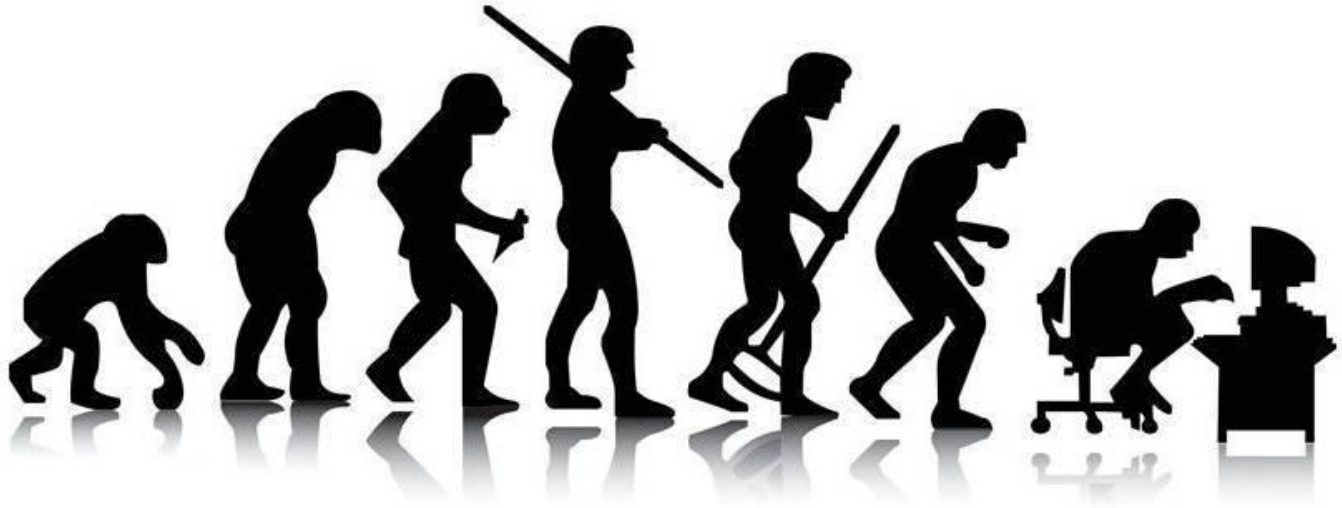
# 605.601 Foundations of Software Engineering
# Course Module 01A: Evolution of Software Development



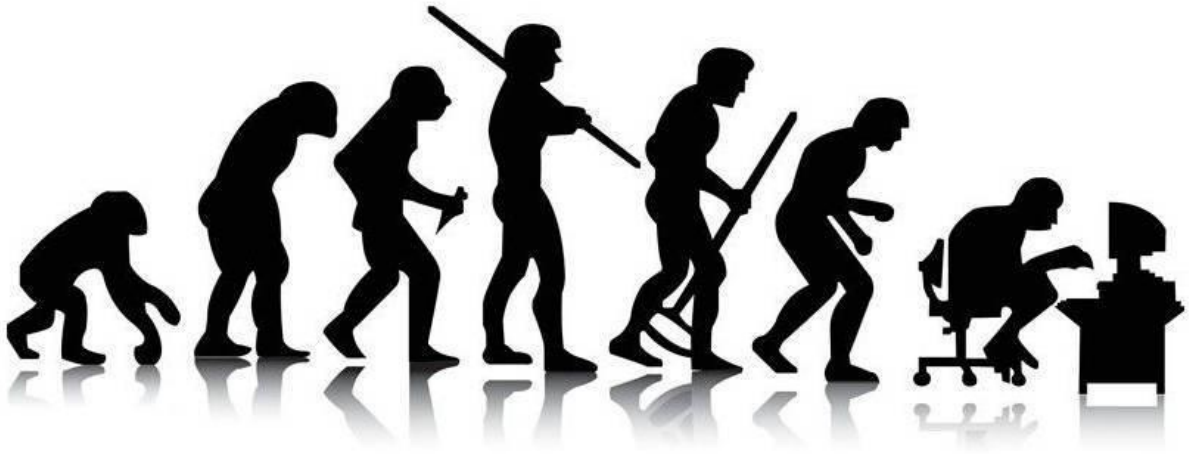
# 605.601 Foundations of Software Engineering
# Course Module 01A: Evolution of Software Development

- The Evolution - History
  - Early days – 1970s to '90s
    - Complexity
    - Planning
    - Cost and Time
    - Resources
    - Uncertainty
  - 1990'S – Lifecycle (SDLC)
    - Organized Approach
    - Methodology
    - Process
    - Model
  - 2000 – Beyond – Lifecycle Management



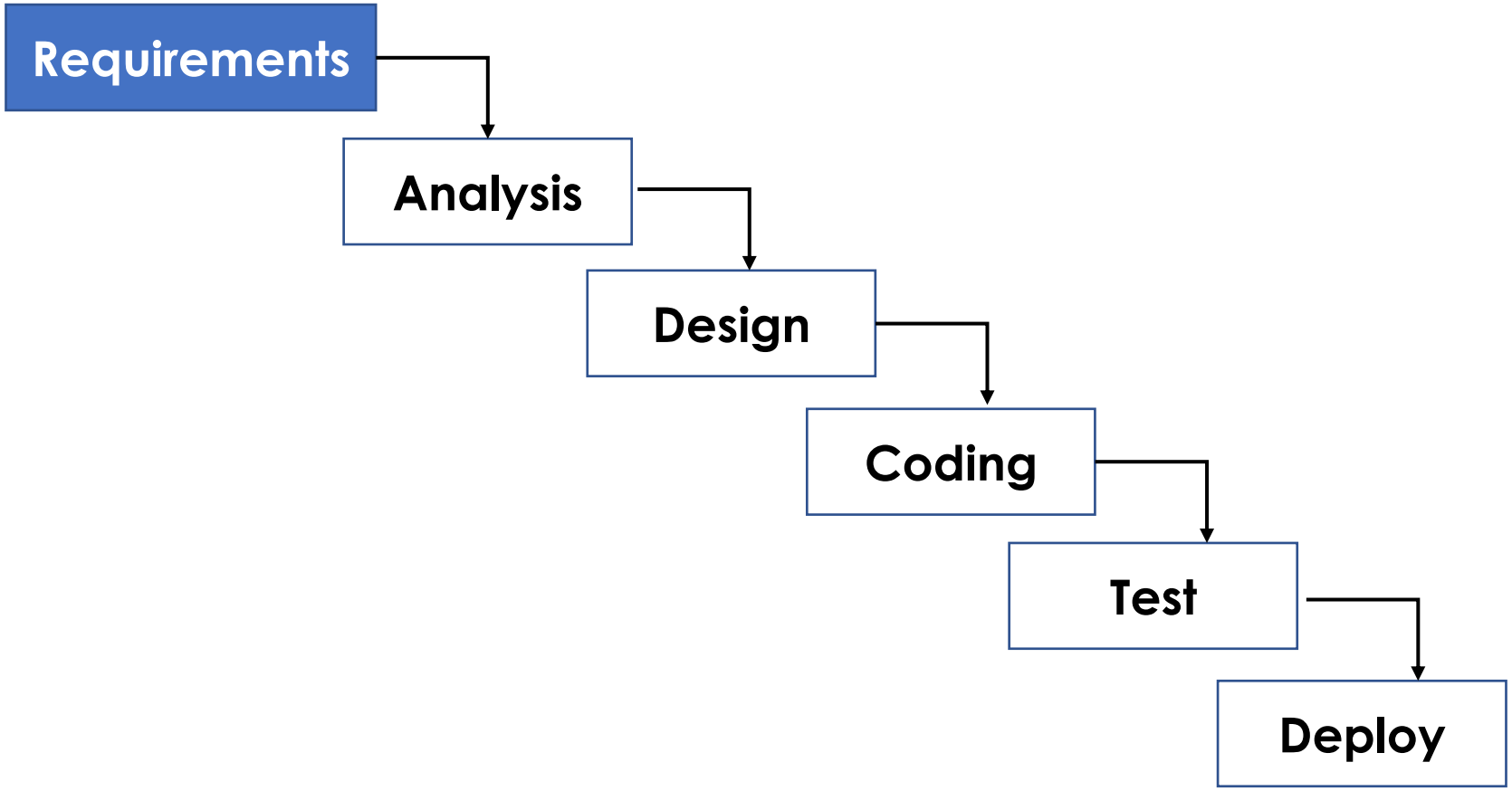
# 605.601 Foundations of Software Engineering
# Course Module 01A: Evolution of Software Development

- The Evolution
  - Classical Model - Waterfall
  - Incremental
  - Spiral
  - Iterative and Incremental
  - Agile
  - DevOps



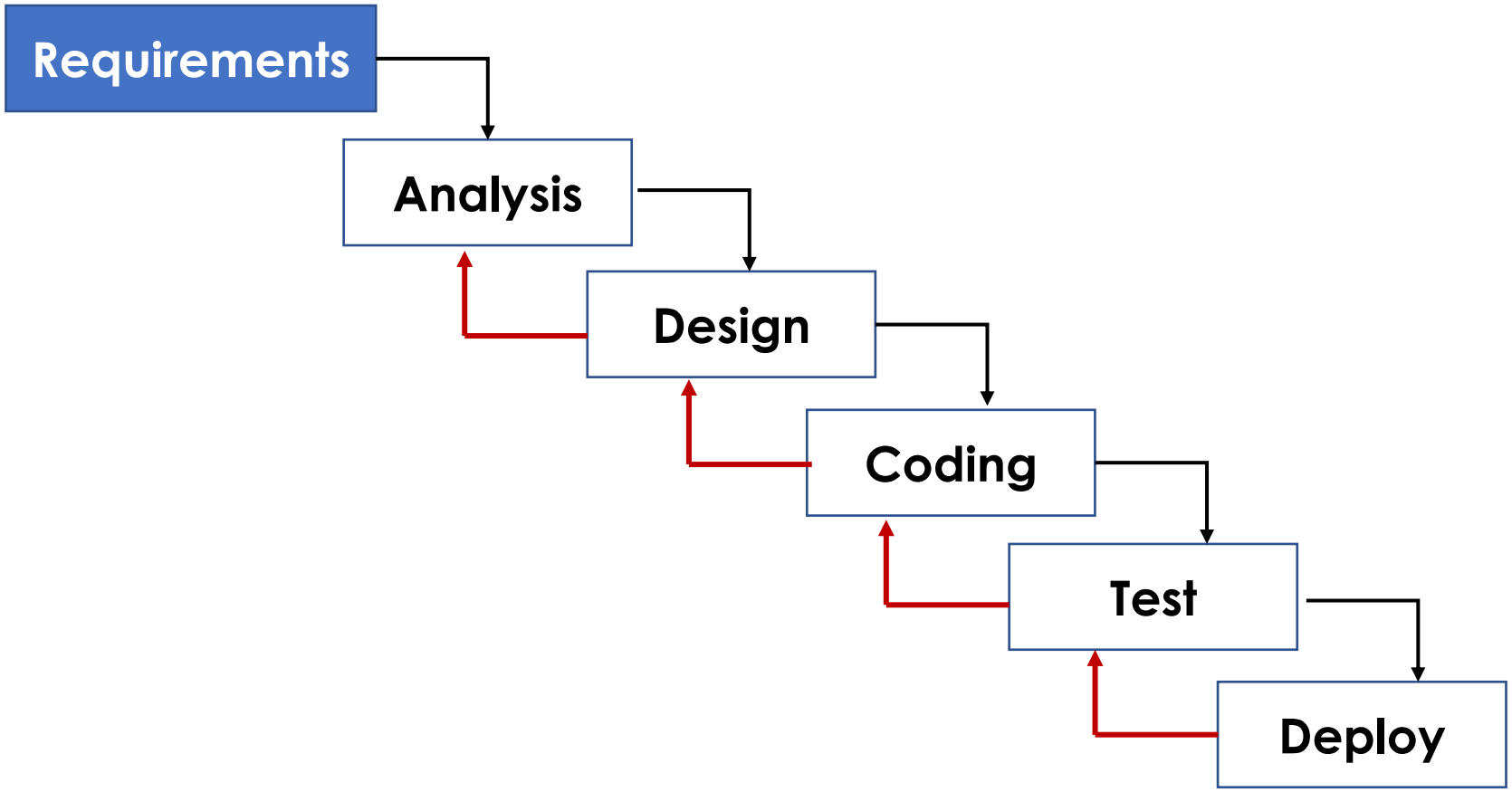
# 605.601 Foundations of Software Engineering
# Evolution of Software Development

- Classical Model - Waterfall



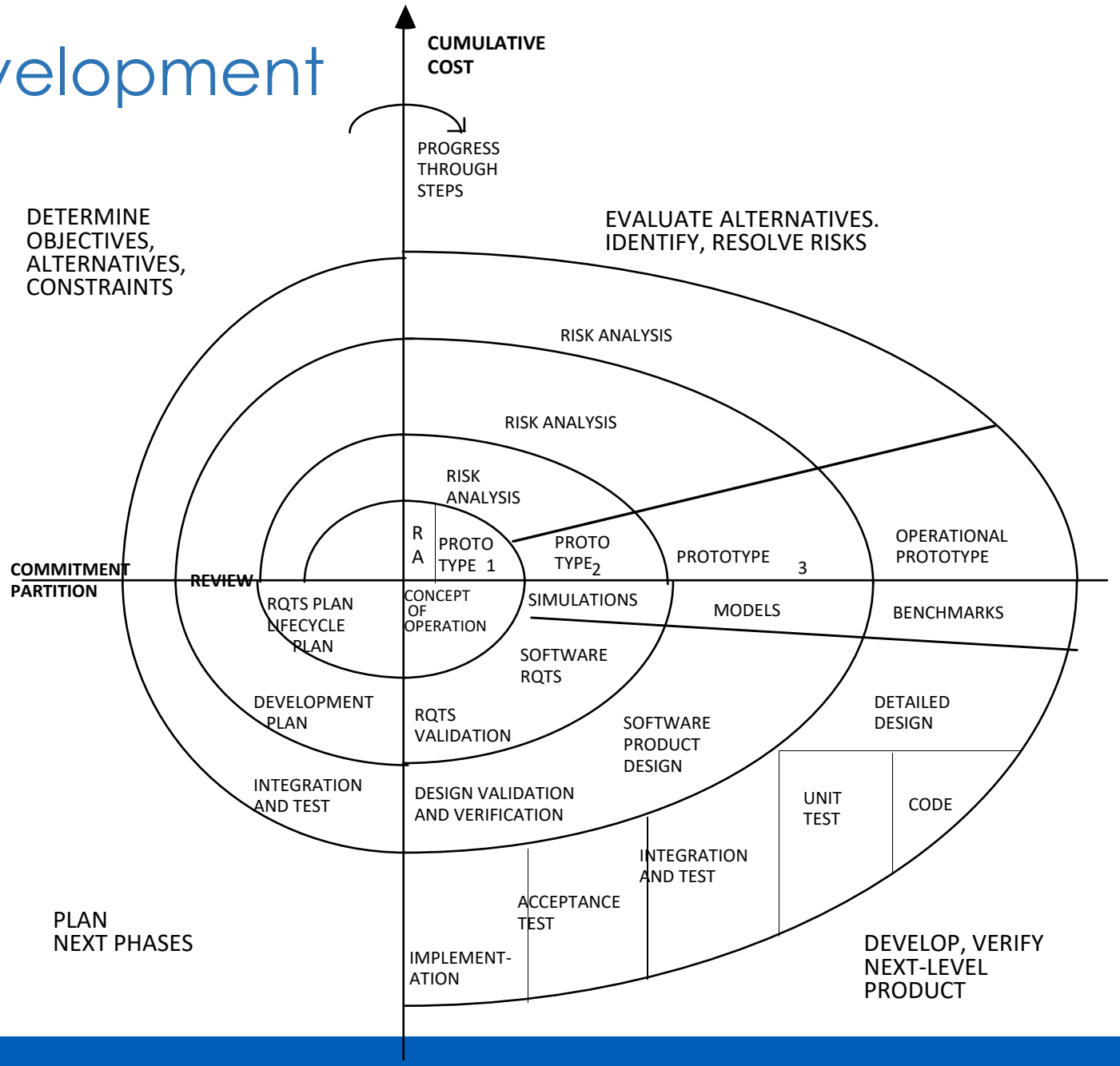
# 605.601 Foundations of Software Engineering
# Evolution of Software Development

- Incremental



# Evolution of Software Development

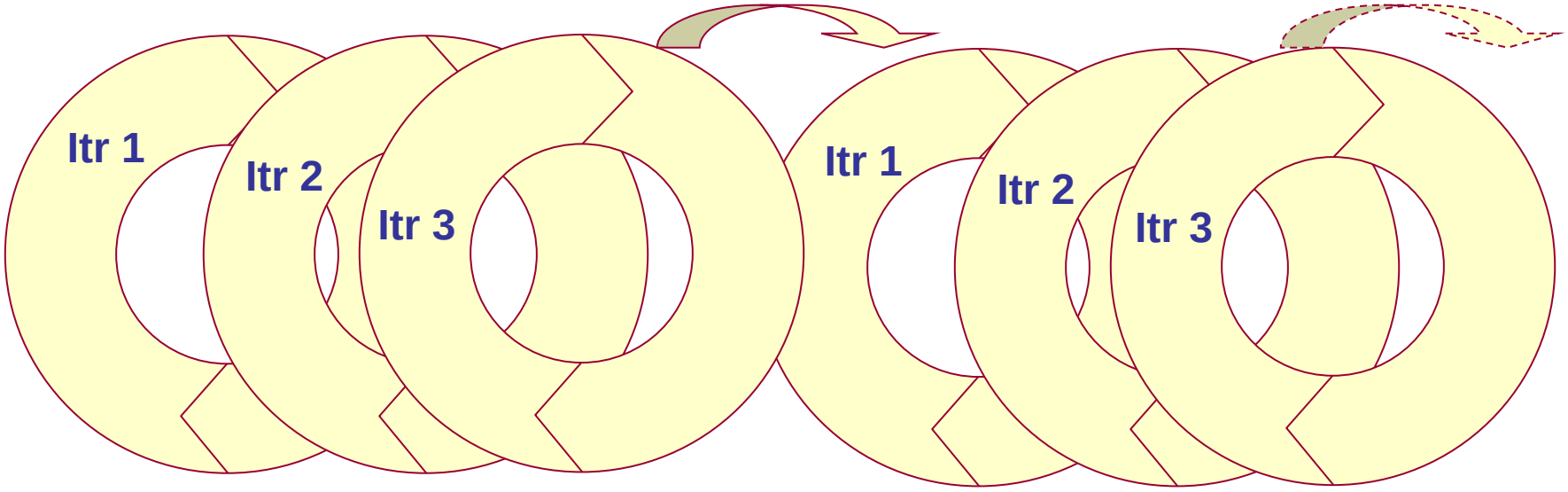
- Spiral
  - Large Scale Development
  - Two Key Elements
    - Prototype
    - Integration




(after Boehm, 1986, 1988; Boehm and Belz, 1988)

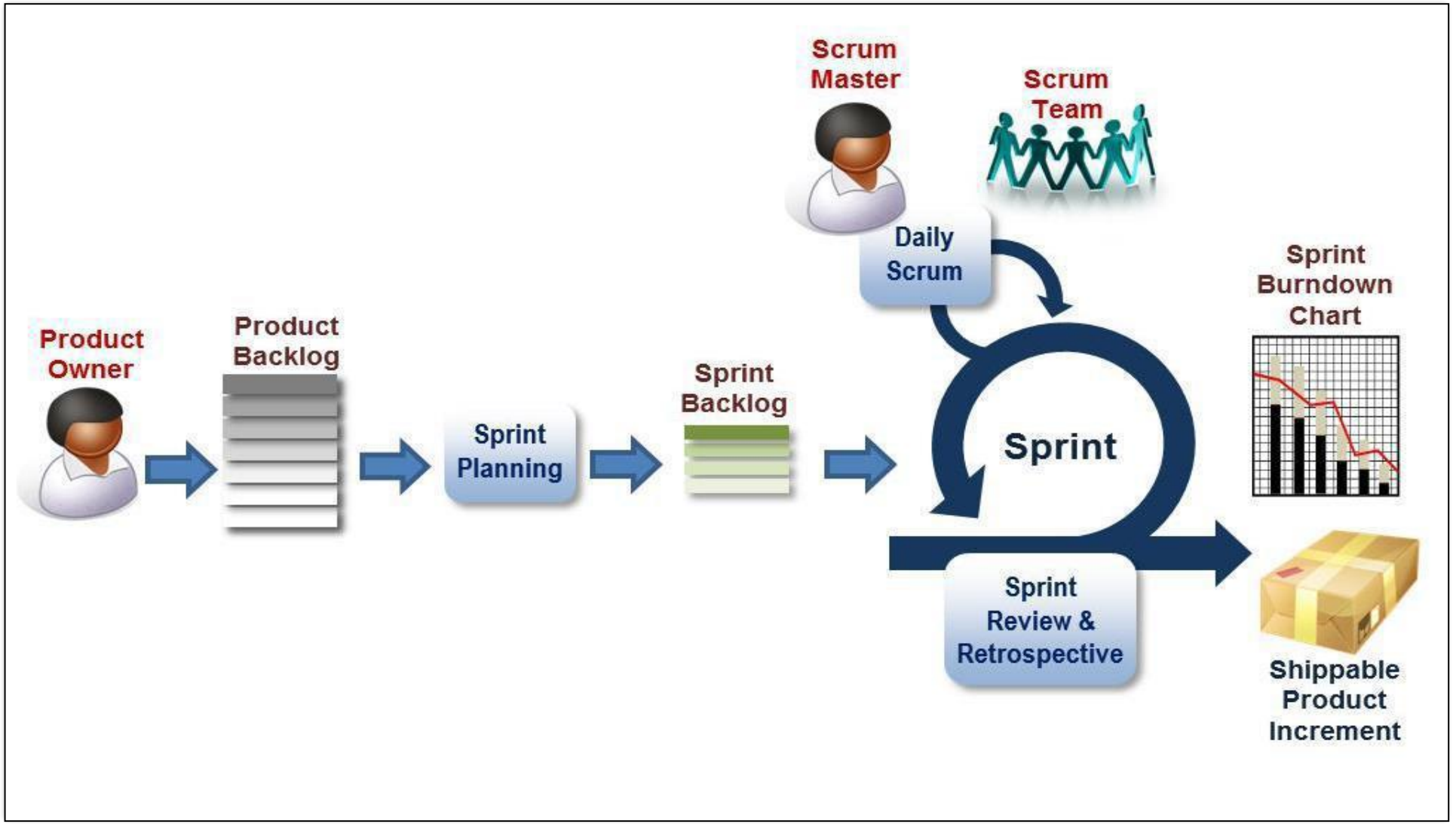
# Evolution of Software Development

- Iterative and Incremental



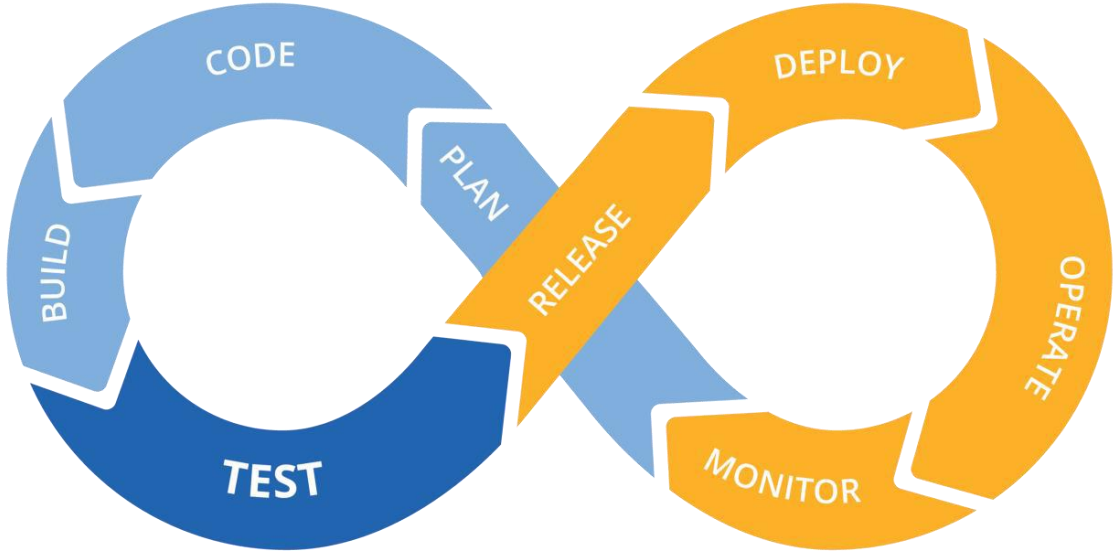
# Evolution of Software Development

- Agile



# Evolution of Software Development

- DevOps



# Software Development Life Cycle

- Process
  - Improve the development and management over a set of phases or stages
  - Adopt practical and consistent approach
    - Early days: Monolithic – sequential - structured
    - Parallel and Concurrent
    - Object-oriented
    - Component-based
    - Model Driven
    - Service-oriented

# Software Development Life Cycle

- Process – Common six (6) phases or stages are:
  - Requirement gathering and analysis.
  - Design.
  - Implementation or coding.
  - Testing.
  - Deployment.
  - Maintenance

# Software Development Life Cycle

- Methodology
  - Two components
    - Model
    - Framework
  - Goal is to reduce complexity with consistent model(s)
    - Problem decomposition
    - Standard modeling notation
      - Unified Modeling Language (UML)
  - Objective is to provide better communication
    - Interaction with all members of the team = business and technology
    - Identify errors or defects early
    - Set the expectation right with right expectations

# Application Life Cycle Management

- Continuous Integration
  - Integration is the integral part of modern application development
- Application Life Cycle Management
  - Includes development, operations, support and maintenance