Object-Oriented Analysis and Modeling

Introduction

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The value of software

- A crucial part of many industries.

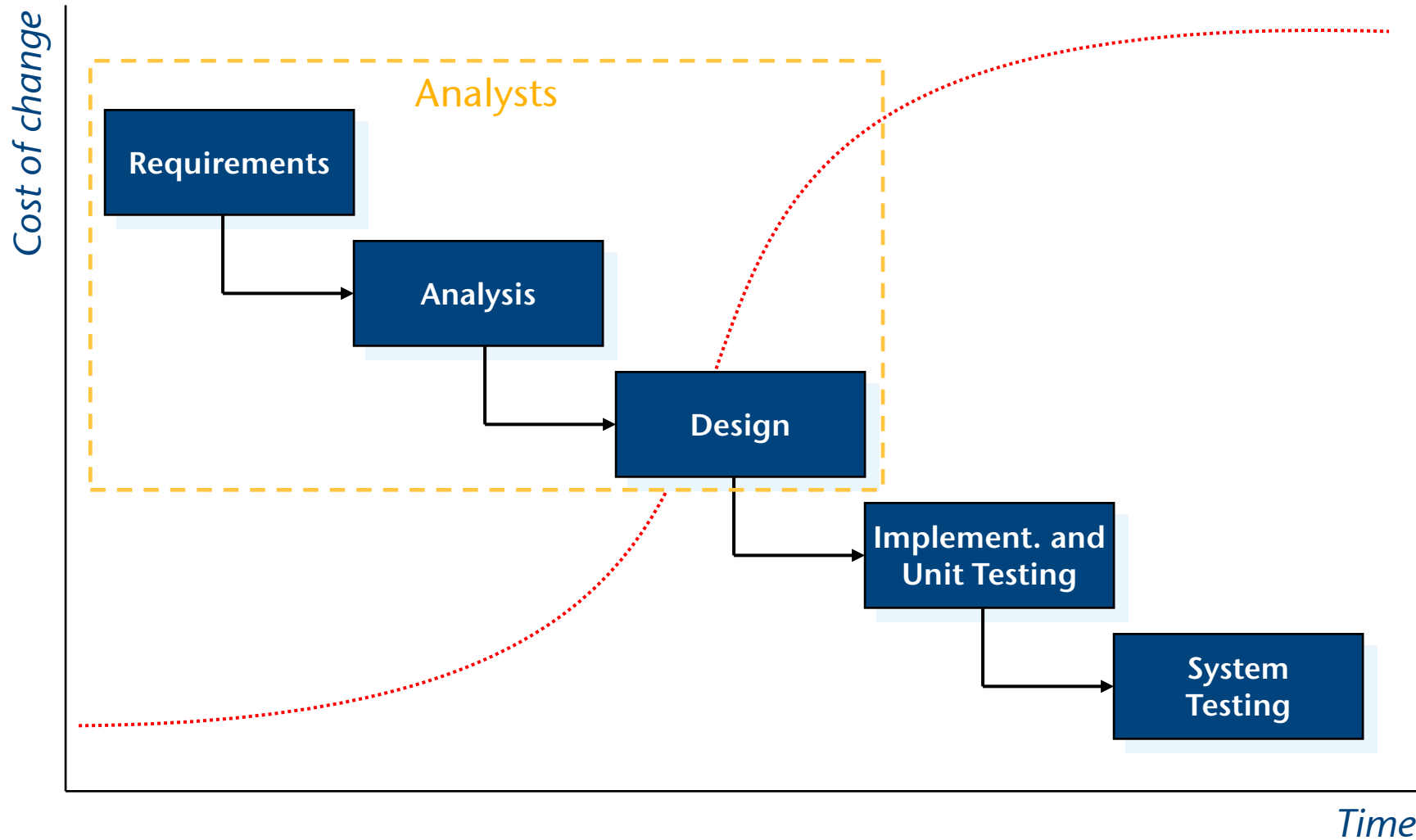- Expanding of size, complexity, distribution and importance.

Development limits of software industry

- It is very difficult to repeatable build and maintain large, complex, distributed and critical software systems with a good quality.

- Still quite a young industry.

- Software engineering is not developed as much as other engineering areas.

Symptoms of Software Development Failures

- Inaccurate understanding of end-users needs.

- Inability to deal with changing requirements.

- Modules that don't fit together.

- Software that's hard to maintain or extend.

- Late discovery of serious project flaws.

- Poor software quality.

- Unacceptable software's performance.

- Team members in each other's way, making it impossible to reconstruct who changed what, when, and why.

- An untrustworthy build-and-release process.

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Waterfall Software Life Cycle
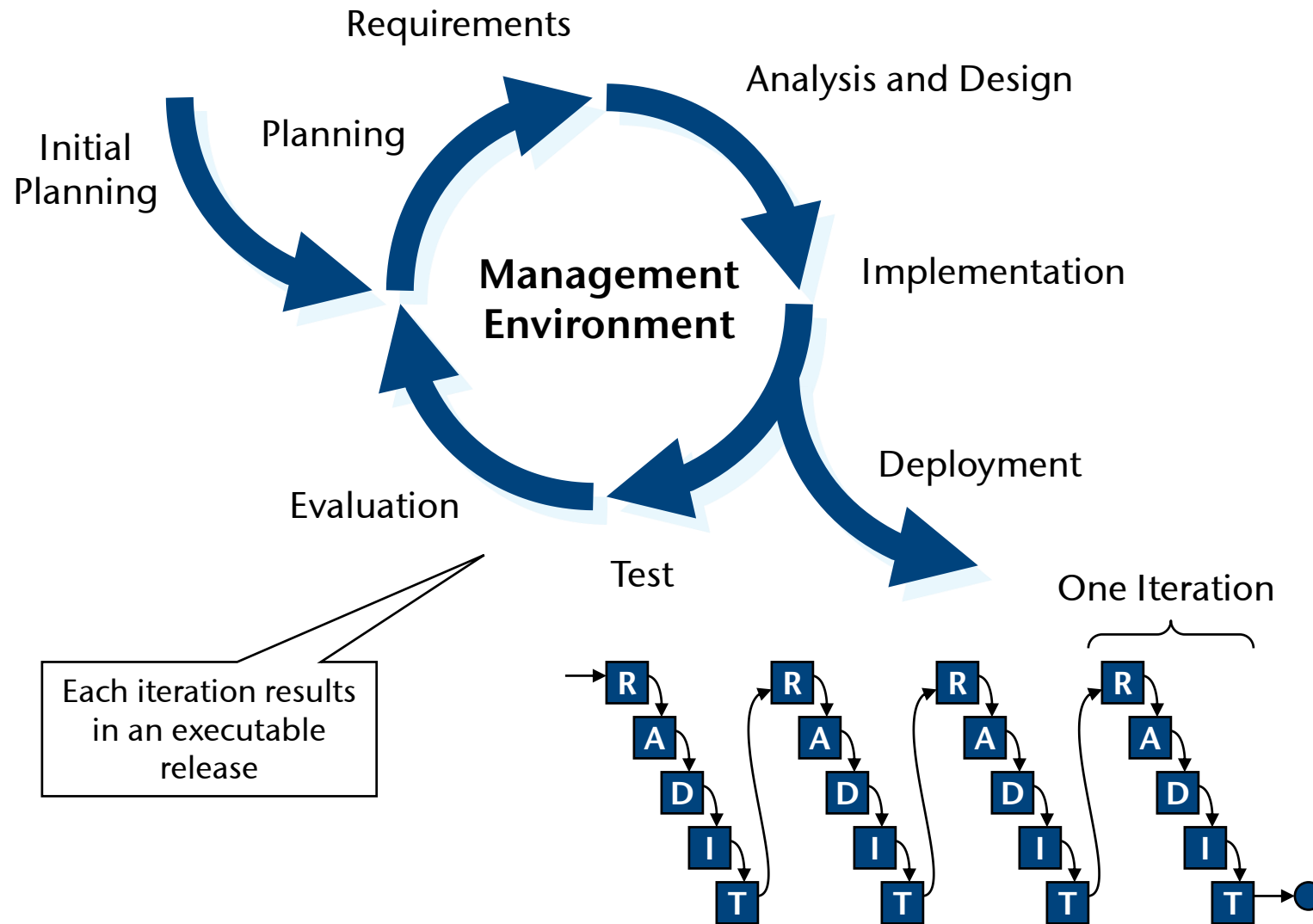
Role of Software Analysis

- Requirements:
    - Understand the domain.
    - Gather requirements.
    - Document requirements.
    - Distribute requirements.

- Analysis and design:
    - Create and document software architecture.
    - Analyze/design requirements.
    - Provide specifications to programmers, testers, management, …

- Testing (optional):
    - Design test cases and testing scenarios.
    - Implement tests.
    - Help to execute tests.

Visual Modeling

"One picture is better than a thousand words."

- Abstraction and simplification of reality.

- Different perspectives.

- Dealing with complexity (software is inherently complex).

- Better structuring of software architecture.

- Easy to understand, communicate and modify.

CASE Tools

Computer-Aided Software Engineering

- Tools supporting activities of the SW lifecycle:
    - requirements management,
    - analysis,
    - design,
    - code generation,
    - reverse and round-trip engineering,
    - documentation,
    - configuration management,
    - …
- Usage of visual modeling.
→ **Shorter application development time with increased quality.**