

Modellistica Medica

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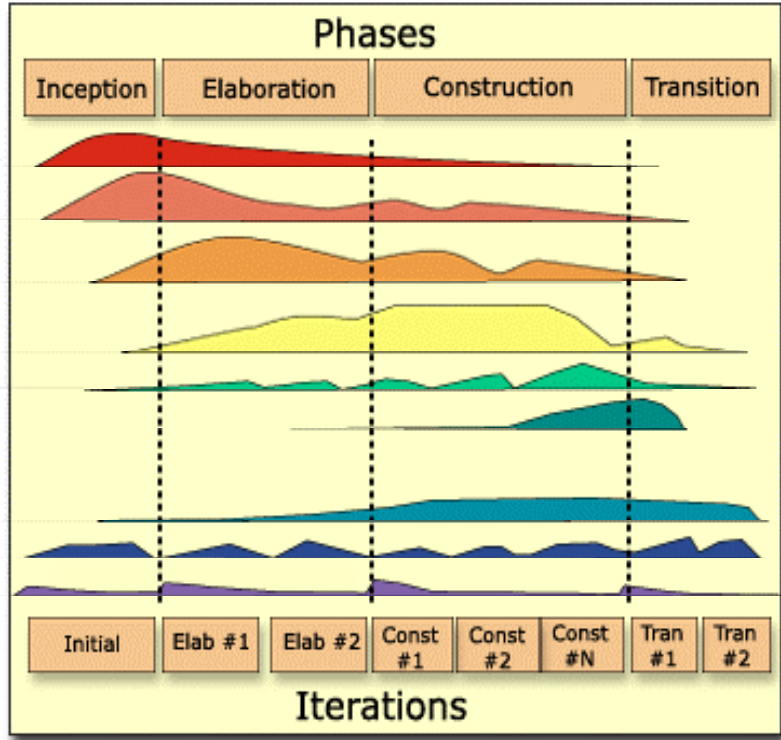
Lezione 20-21

The Unified Process Dynamic dimension

Two dimensions

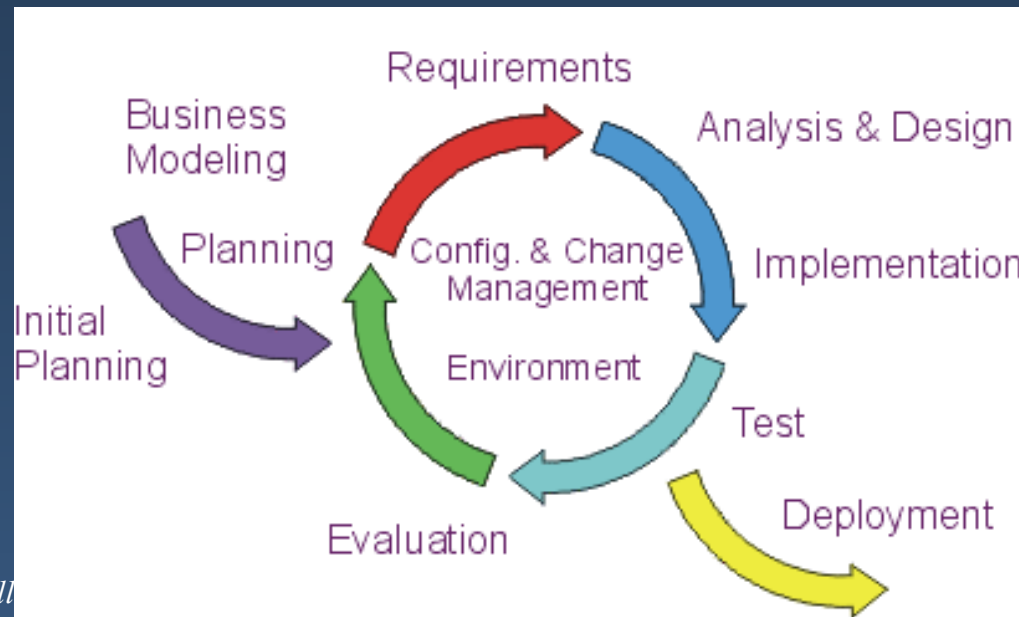
Content

- **Static** aspect of the process
- Described in terms of
 - disciplines
 - activities
 - artifacts
 - workers



Time

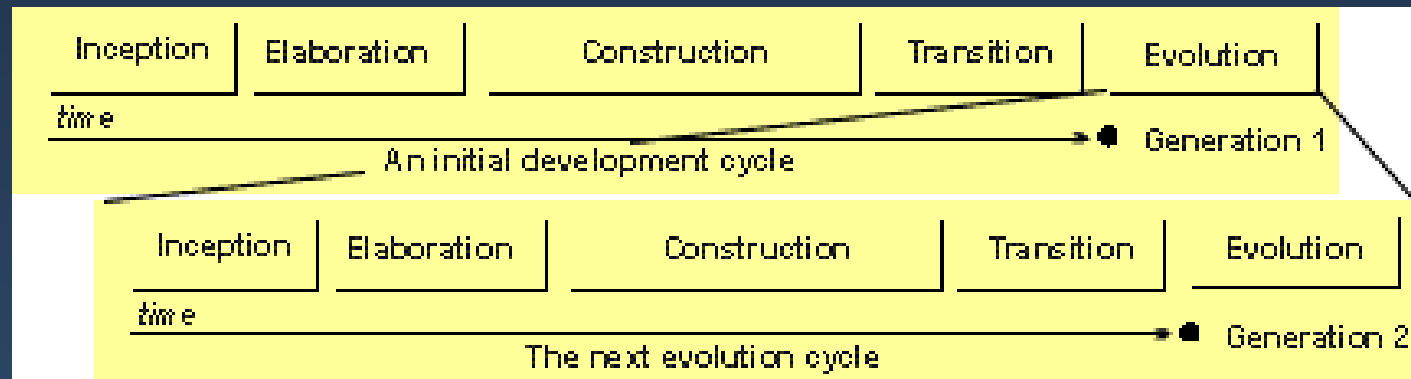
- **Dynamic** aspect of the process
- Expressed in terms of
 - cycles
 - phases
 - iterations
 - milestones



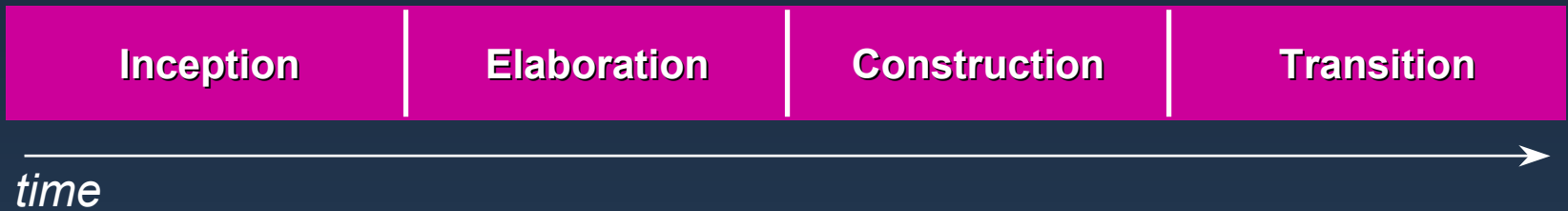
The dynamic structure

- The software life-cycle is broken into **cycles**
 - each cycle working on a new generation of the product
- A cycle encompasses 4 consecutive **phases**

- Inception
- Elaboration
- Construction
- Transition



Process Architecture - Lifecycle Phases



- **Inception**
 - Define the scope of project
- **Elaboration**
 - Plan project, specify features, baseline architecture
- **Construction**
 - Build the product via several iterations; up to beta release
- **Transition**
 - Transition the product into end user community
- **Each phase is concluded with a well defined milestone**
 - a point in time where key goals must have been achieved

Iterations

- Phases may include **iterations**
 - an iteration is a development loop resulting in the (internal or external) release of a product
 - the product grows incrementally from iteration to iteration to become the final system
- Amount of time spent in each varies
 - sometimes 3-5 iterations in elaboration;
 - simple project – one iteration in elaboration
 - can be very complex

Inception phase

- Establish the business case for the system
 - Success criteria
 - Risk assessment
 - Resource estimate
 - Phase plan with major milestones
- Delimit the project scope
- Identify the most important functional requirements
 - *use case driven*
- Identify the most important non-functional requirements
- Milestone: Life cycle objectives
- Evaluation criteria

Elaboration phase

- Purpose

- analyse the problem domain
- establish a sound architectural foundation
- develop the project plan
- eliminate/mitigate the highest risk elements

Mile-wide and inch-deep view of the system

- Outcome:

- Use case model (~80% complete) + supplementary requirements
- Software architecture description
- Architectural prototype
- Revised risk list and business case
- Coarse-grained plan, with iterations and corresponding evaluations
- Development case specifying the process

- Milestone: life-cycle architecture

- Evaluation criteria

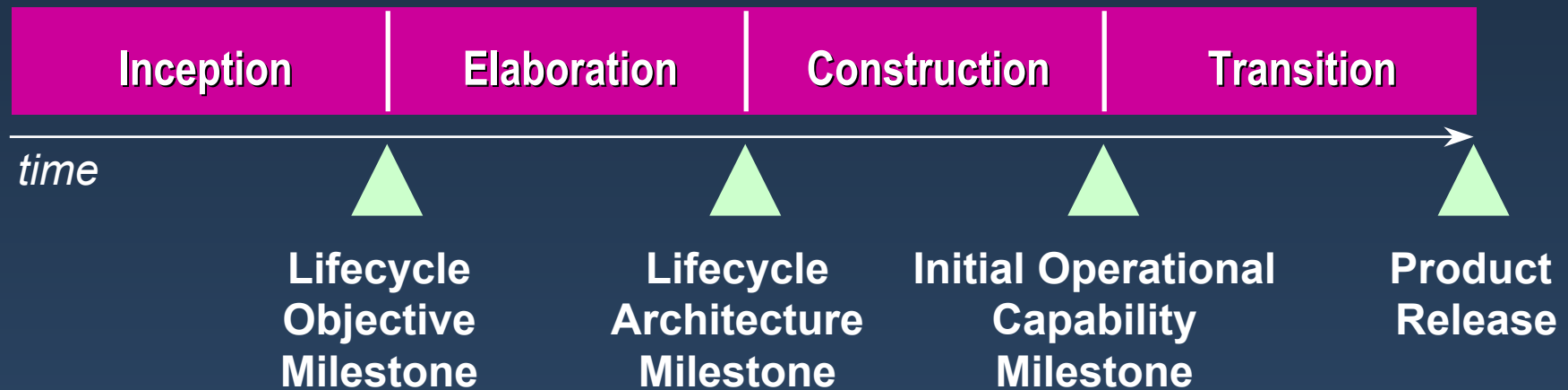
Construction phase

- Development and testing
- Outcome: a β release
 - Software product integrated on the adequate platforms
 - User manuals
 - Description of the current release
- Milestone: initial operational capability
- Evaluation criteria

Transition phase

- Transition the software product to the user community
- Includes:
 - β -testing
 - parallel operation with legacy system
 - training of users and maintainers
- Milestone: Product release
- May coincide with the inception phase for the next cycle

Phase Boundaries Mark Major Milestones

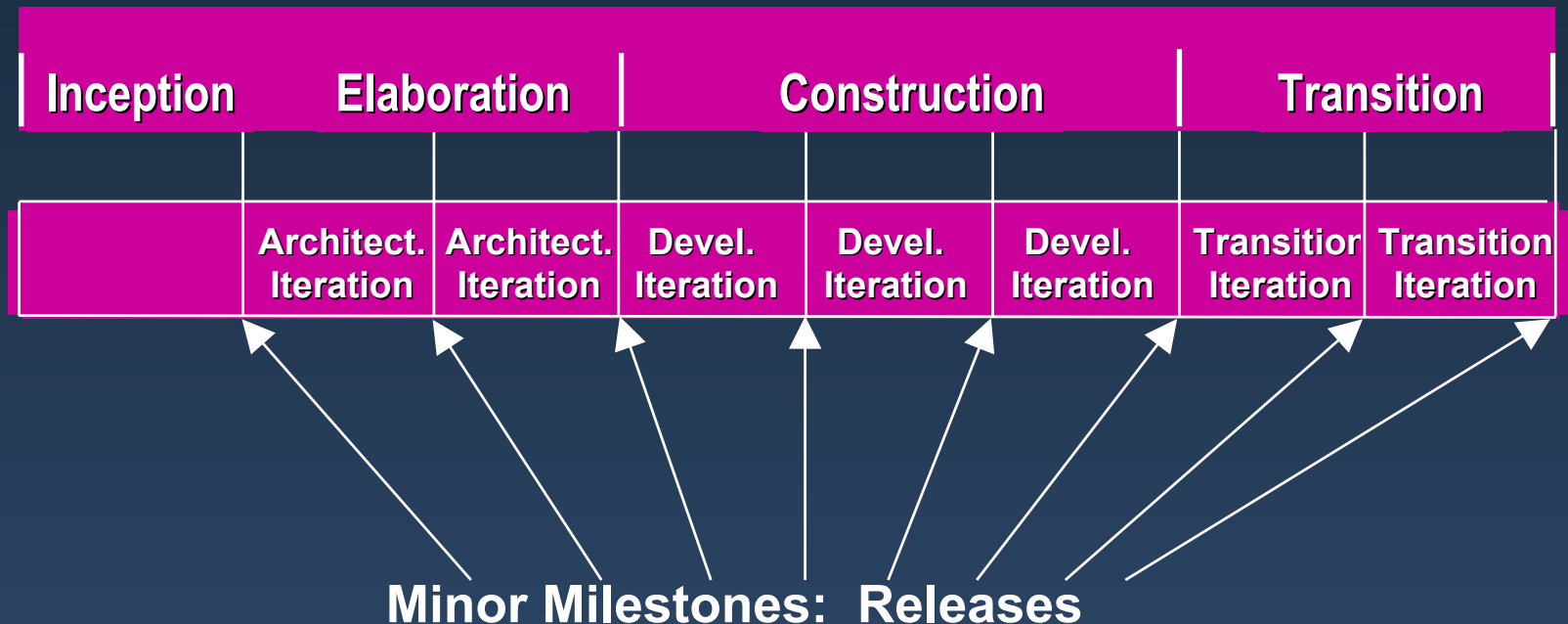


At each of the major milestones, the project is reviewed and a decision made as to whether to proceed with the project as planned, to abort the project, or to revise it.

The criteria used to make this decision vary by phase.

Lots of evaluation criteria as we move from phase to phase...

Iterations and Phases



- An iteration is a distinct sequence of activities
 - with an established plan and evaluation criteria
 - resulting in an executable release (internal or external)
- Number of iterations per phase is variable
- Each iteration can result in an executable release where the system evolves into a large system

Evaluation criteria for Inception

- The evaluation criteria for the inception phase (LCO – Life Cycle Objective Milestone) include:
 - stakeholder concurrence on scope definition and cost/schedule estimates
 - requirements understanding as evidenced by the fidelity of the primary Use-Cases
 - credibility of cost/schedule estimates, priorities, risks, and development process
 - depth and breadth of any architectural prototype
 - actual expenditures versus planned expenditures

Evaluation criteria for Elaboration

- The evaluation criteria for the elaboration phase (Architecture Milestone) include:
 - stability of the product vision and architecture
 - resolution of major risk elements
 - adequate planning and reasonable estimates for project completion
 - stakeholder acceptance of the product vision and project plan
 - acceptable expenditure level

Evaluation criteria for Construction

- The evaluation criteria for the construction phase (IOC – Initial Operational Capability Milestone) include:
 - stability and maturity of the product release
 - i.e., is it ready to be deployed?
 - readiness of the stakeholders for the transition
 - acceptable expenditure level

Evaluation criteria for Transition

- At the end of the transition phase, a decision is made whether to release the product
- This will be based primarily on the level of user satisfaction achieved during the transition phase
 - Often this milestone coincides with the initiation of another development cycle to improve or enhance the product
 - In many cases, this new development cycle may already be underway

Releases - Internal and External

- An internal release is kept within the development environment and (optionally) demonstrated to the stakeholder community
- An external release is provided to stakeholders (usually users) for installation in their own environment
- External releases are much more expensive (they require user documentation and technical support) and normally occur only during the transition phase
- The end of an iteration marks a minor milestone

Major Workflows Produce Models

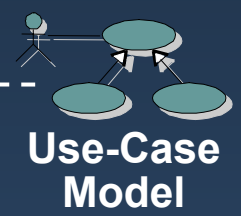
Business Modeling



The business itself; generally larger than the application domain of project...

automated by

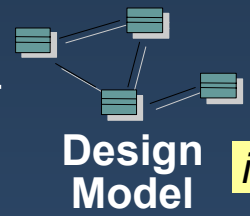
Requirements



realized by

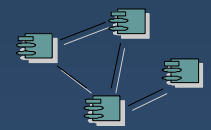
The RUP is a model-driven approach
Several models are needed to fully describe the system

Analysis & Design



implemented by

Implementation



verified by

Test



Test Model

Major Models

- The Business Model is a model of what the business processes are and the business environment
 - It can be used to generate requirements on supporting information systems
- The Use-Case Model is model of what the system is supposed to do and the system environment
 - Create Use Case diagrams and supporting documentation

Major models

- The Analysis and Design Model is an object model describing the realization of Use-Cases
- It serves as an abstraction of the implementation model and its source code
 - Create analysis classes, interaction diagrams...architecture resolved
- The Implementation Model is a collection of components, and the implementation subsystems that contain them
 - Primarily programming – realizing the design model
- The Test Model encompasses all of the test cases and procedures required to test the system
 - Development team verification; user validation

Bringing It All Together: The Iterative Model

Process Workflows

Business Modeling

Requirements

Analysis & Design

Implementation

Test

Deployment

Management
Briefings;
Status...

Supporting Workflows

Configuration & Change Mgmt

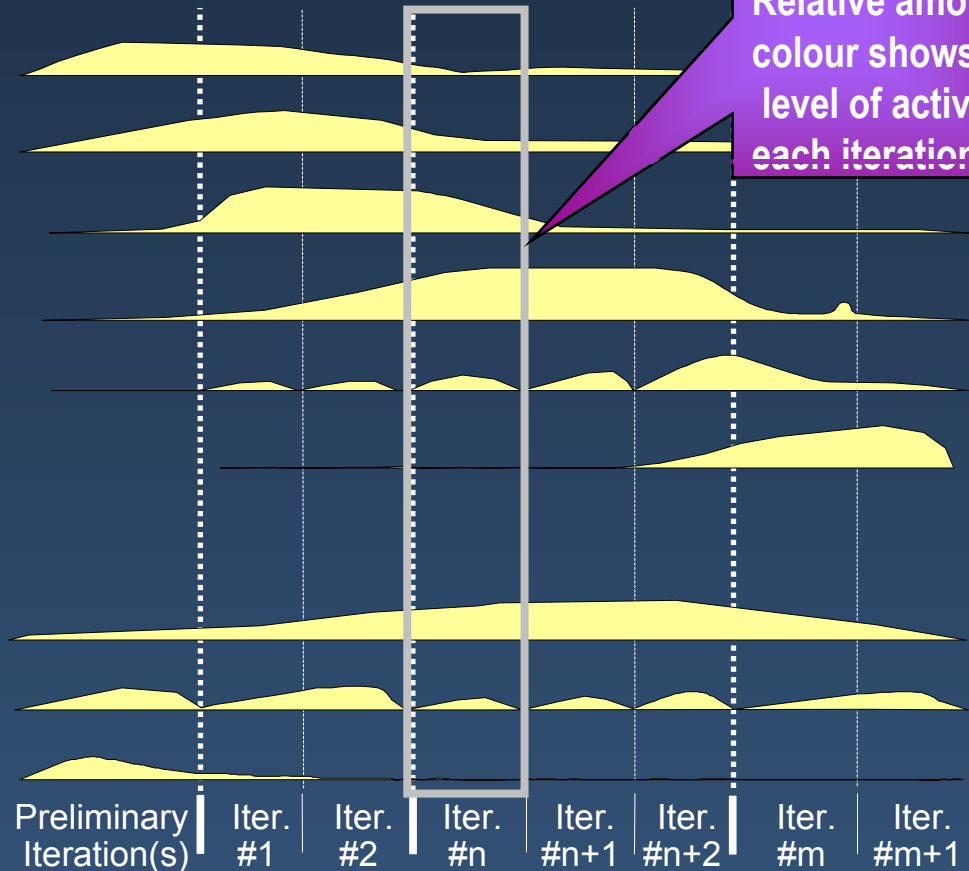
Project Management

Environment

Workflows
group activities
logically

Development Team Focus Phases

Inception Elaboration Construction



In an iteration, you walk through all workflows. Relative amount of colour shows level of activity in each iteration.

Iterations