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Unified Process

MDA402 Project Management

Josef Spurný
jspurny@mail.muni.cz

Faculty of Informatics, Masaryk University

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Lecture Overview

Predictive Project Methodology

Definition 4.1

Predictive approach refers to the requirement of **predictability** from the project:

- satisfying management need to **control** the project [1]
- high level of **certainty** regarding what project should deliver
- most of the planning is done **upfront**
- product requirements are defined, collected and analyzed **at the start** of the project [3]
- final solution is **complex** and its features are **interdependent** so the system has to be delivered as a whole

One of the most used predictive approach is: **UNIFIED PROCESS**

Unified process

Definition

Definition 4.2

Unified Process (UP) is an **incremental** and **iterative** predictive software development approach. [4]

UP axioms:

- requirements-driven
- risk-driven
- architecture-centric [2]

Unified Process

Phases

Iterations are spread over **four phases**:

INCEPTION **ELABORATION**

CONSTRUCTION **TRANSITION**

$\rightarrow$ each phase consists of one or more iterations

Unified Process

Phases

Inception

- **first** and **shortest** phase of the project
- should create **basis** of the project:
  - formulation of **business case**
  - establishment of **project scope**
  - outlining of **key requirements**
  - identification of **risks**
  - development of **initial project plan**
- must haves for this phase $\rightarrow$ clear project **vision** and **goals**

Unified Process

Phases

Elaboration

- capture majority of **system requirements** in the form of **use cases**
- perform identified risks **analysis** from Inception phase
- make a plan of **risk management** $\rightarrow$ reduce or eliminate the impact on final product
- establish **design** and **architecture** (using diagrams) for next phase

Unified Process

Phases

Construction

- the **longest** and **largest** phase
- design is **finalized** and **refined**
- product is built on the basis created in Elaboration phase

Transition

- the **final** phase that delivers product to end-users
- consists also of **defect fixing**
- includes **data migration** and **user training**

Unified Process

Iterations

- large software development project is broken down into **small pieces** = **iterations**
- each iteration generates **baseline** $\rightarrow$ **partially complete working** version of final product
- each iteration is defined and specified by **six workflows**:
  1. **Business Modeling**
  2. **Requirements**
  3. **Analysis & Design**
  4. **Implementation**
  5. **Test**
  6. **Deployment**

Unified Process

Lifecycle

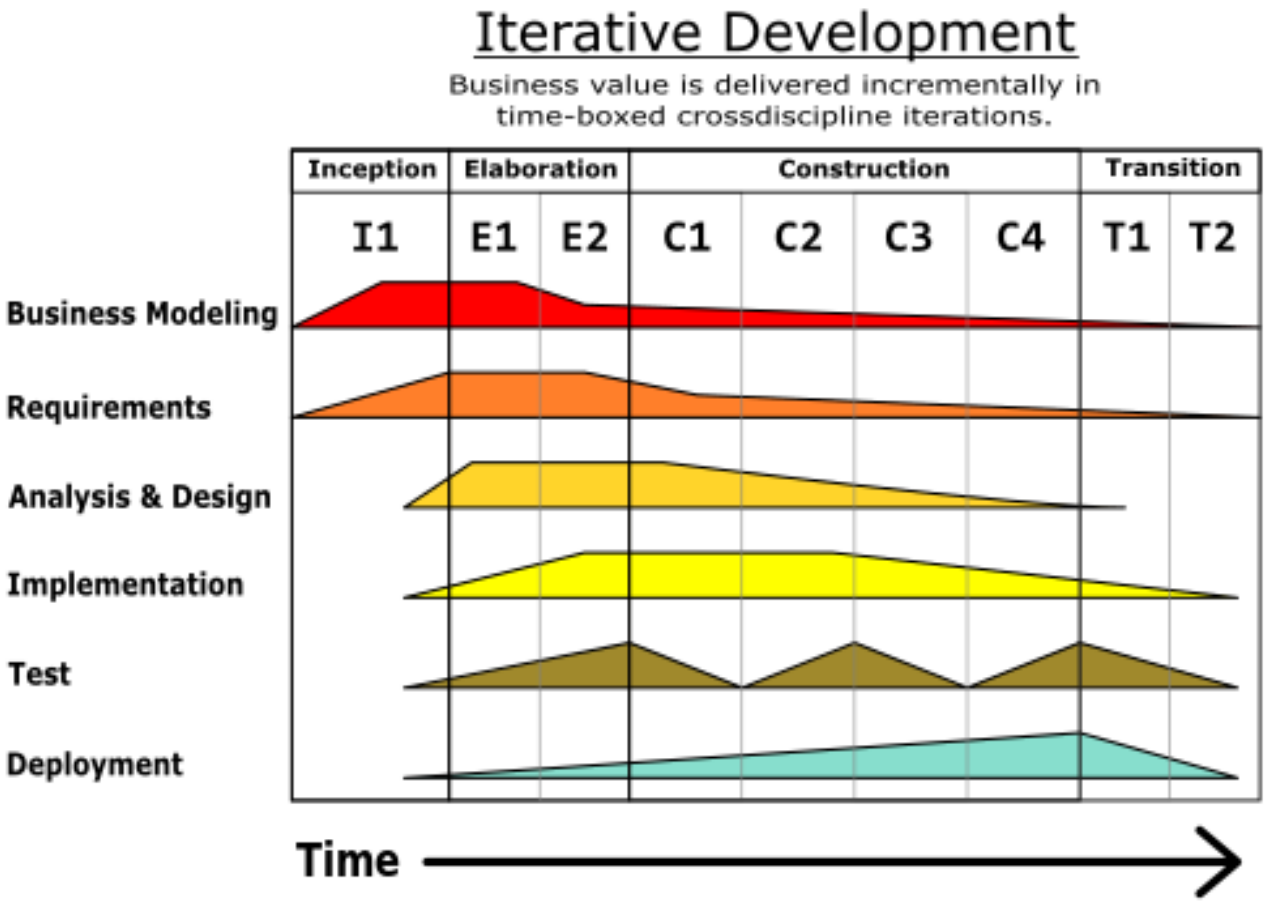

Figure: UP Lifecycle [4]

Unified Process

Diagrams

Definition 4.3

Unified Modeling Language (UML) is general-purpose modeling language for systems. It provides visual syntax $\rightarrow$ **diagrams** that are used to construct models. [2]

- core part of the UP are **UML diagrams**
- multiple types of UML diagrams are used throughout the **whole UP lifecycle**

Unified Process

Diagrams

1. **Use case diagram** $\rightarrow$ describing use case
2. **Sequence diagram** $\rightarrow$ describing main success scenario for use case
3. **Class diagram** $\rightarrow$ representing system design model
4. **State diagram** $\rightarrow$ showing system events in use case
5. **Communication diagram** $\rightarrow$ illustrating classes relations

Unified Process

Diagrams

6. **Activity diagram** → visualizing business workflows and processes
7. **Interaction overview diagram** → visualizing use cases
8. **Package** → grouping a set of consistent responsibilities
9. **Component** → representing deployable and replaceable parts of system
10. **Deployment** → showing how instances of system are deployed

Unified Process

Diagrams

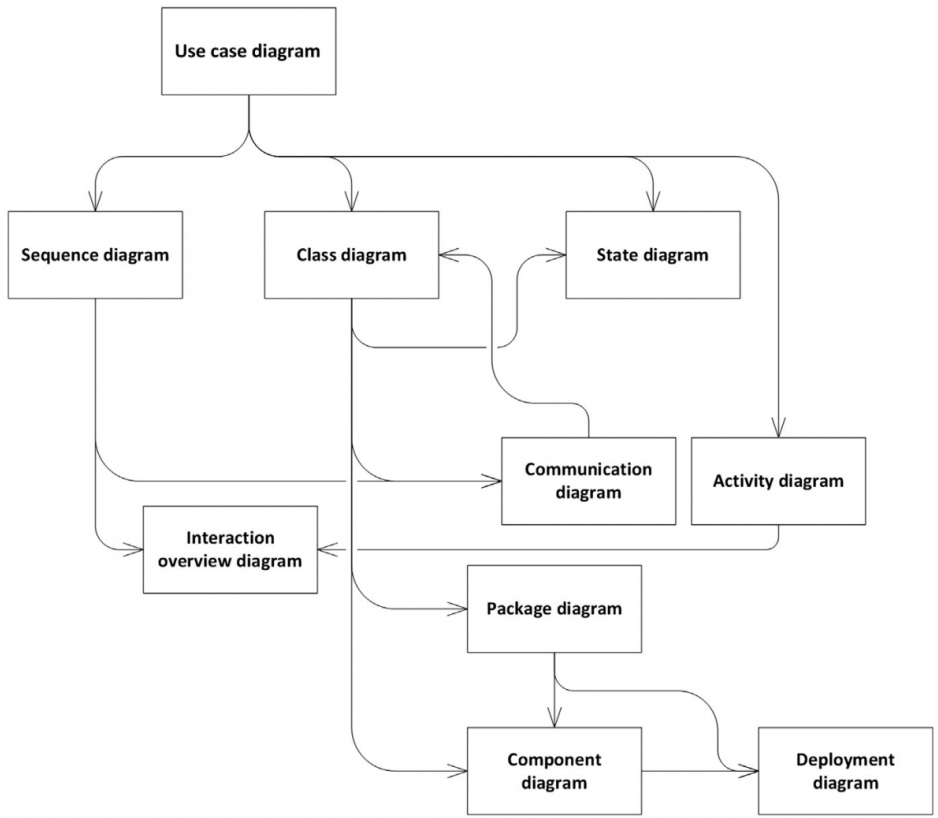

Figure: UP development sequence by UML diagrams [4]

Unified Process

Application

Unified Process is best to apply and use on your project when:

- majority of planning and requirements needs to be done **upfront**
- project requires **predictability**, **stability** and **control**
- **consistent** and **thorough** documentation is required

Bibliography I

[1] "One size does not fit all: Choosing the right project approach", 2014. [Online]. Available: https://www.pmi.org/learning/library/choosing-right-project-approach-9346. [Accessed: 26-Sep-2024].

[2] Jim Arlow and Ila Neustadt. *UML2 and the Unified Process*. 2nd ed. Addison-Wesley, 2005.

[3] Project Management Institute. *A Guide to the Project Management Body of Knowledge PMBOK Guide*. 7th ed. Project Management Institute, 2021.

[4] Janis Oasis and Uldis Donins. *Topological UML Modeling: An Improved Approach for Domain Modeling and Software Development*. Elsevier, 2017.

Thank You for Your Attention!