Object Oriented Development with Java

(CT038-3-2 and Version VC1)

Introduction to UML

System Modeling

Topic & Structure of The Lesson

- Usecase diagram
- Class diagram
- Activity diagram

Learning outcome

- At the end of this lesson, you will be able to
  - Explain what is Unified Modeling Language (UML)
  - Define the types of processes that best relate to the UML
  - Types of UML diagrams

Key terms you must be able to use

If you have mastered this topic, you should be able to use the following terms correctly in your assessments:

--Usecase –actors,usecase,extend,include

-class- association,aggregation,composition

-activity

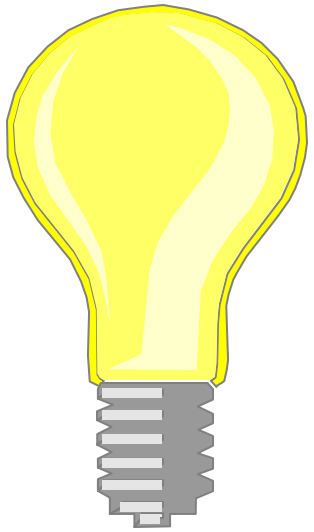
What Is the UML?

- The UML is a language for
  - Visualizing
  - Specifying
  - Constructing
  - Documenting

  the artifacts of a software-intensive system.

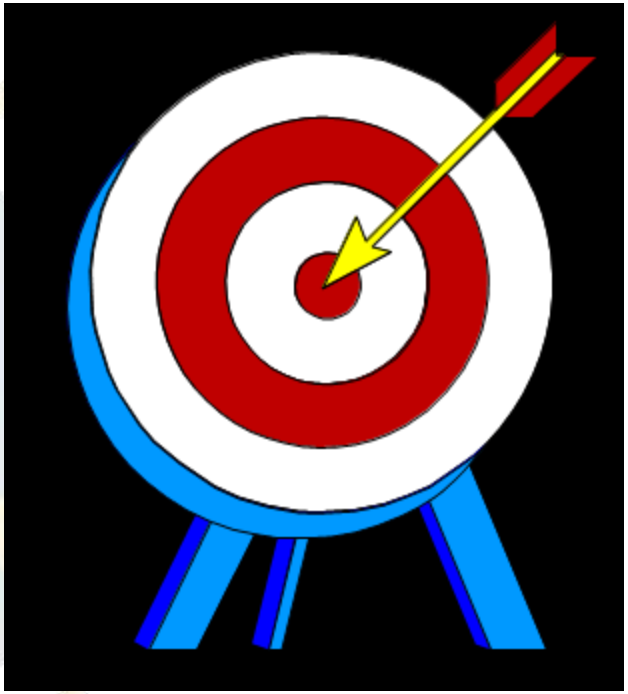
The UML Is a Language for Visualizing

- Communicating conceptual models to others is prone to error unless everyone involved speaks the same language.
- There are things about a software system you can't understand unless you build models.
- An explicit model facilitates communication.



The UML Is a Language for Specifying

- The UML builds models that are precise, unambiguous, and complete.



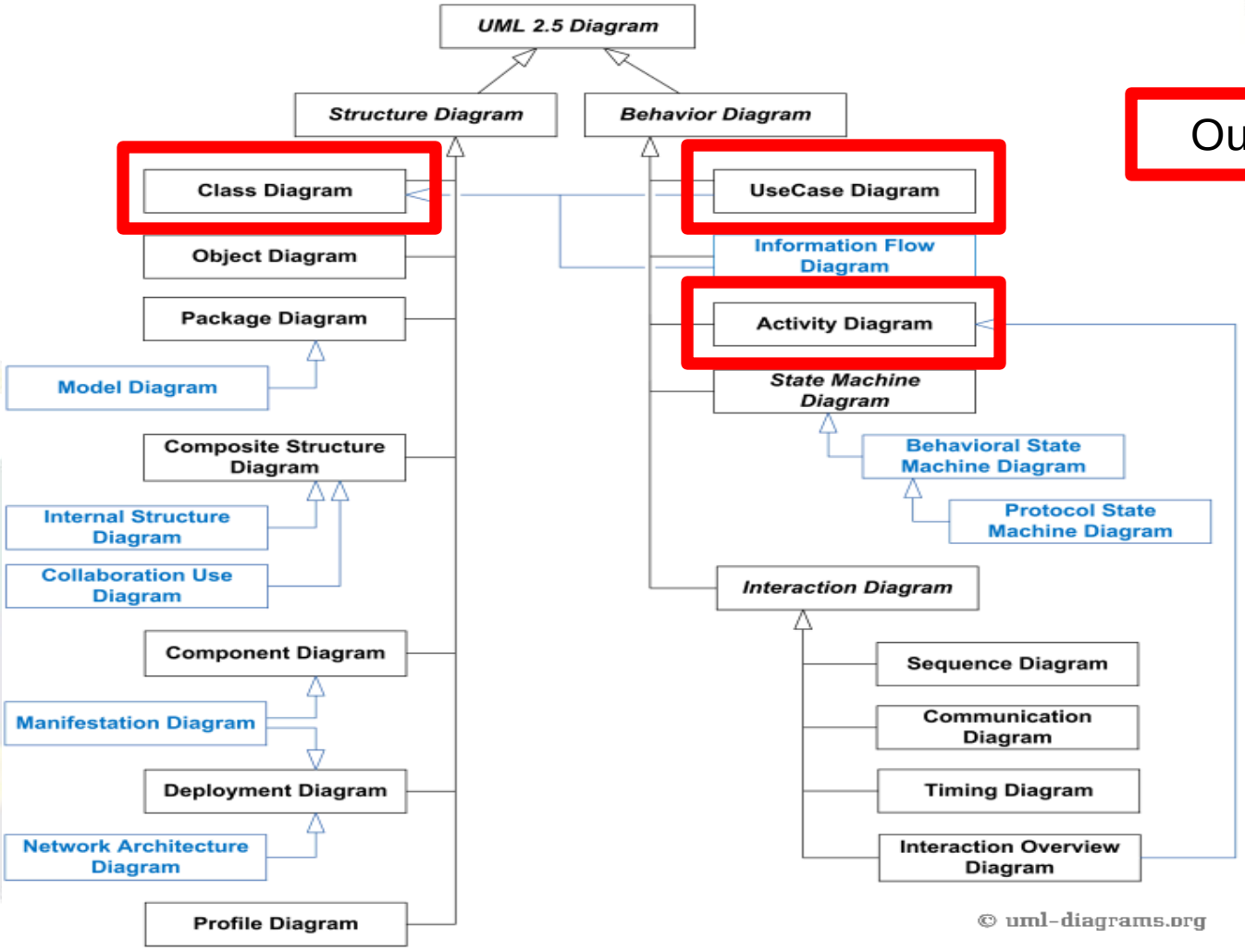
The UML Is a Language for Constructing

- UML models can be directly connected to a variety of programming languages.
  - Maps to Java, C++, Visual Basic, and so on
  - Tables in a RDBMS or persistent store in an OODBMS
  - Permits forward engineering
  - Permits reverse engineering

The UML Is a Language for Documenting

- The UML addresses documentation of system architecture, requirements, tests, project planning, and release management.

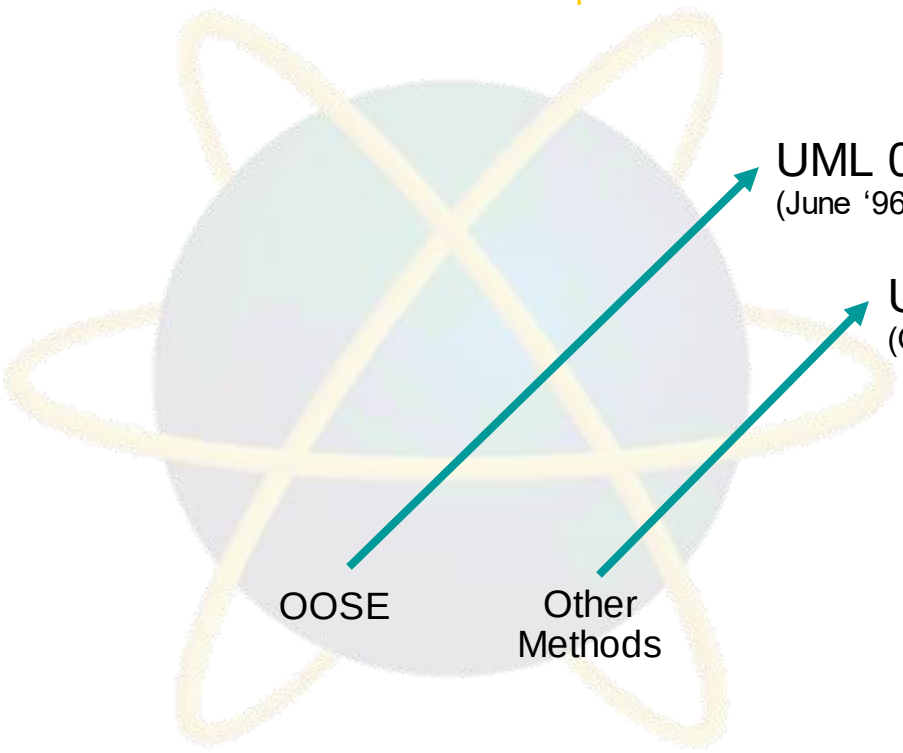
Types of UML diagrams



Our focus

Source: http://www.uml-diagrams.org/uml-25-diagrams.html

History of the UML



UML 2.5
(2015)

UML 2.0
(2004)

UML 1.5
(March, '03)

UML
Partners'
Expertise

UML 1.1
(Sept. '97)

UML 1.0
(Jan. '97)

UML 0.9 and UML 0.91
(June '96) (Oct. '96)

Unified Method 0.8
(OOPSLA '95)

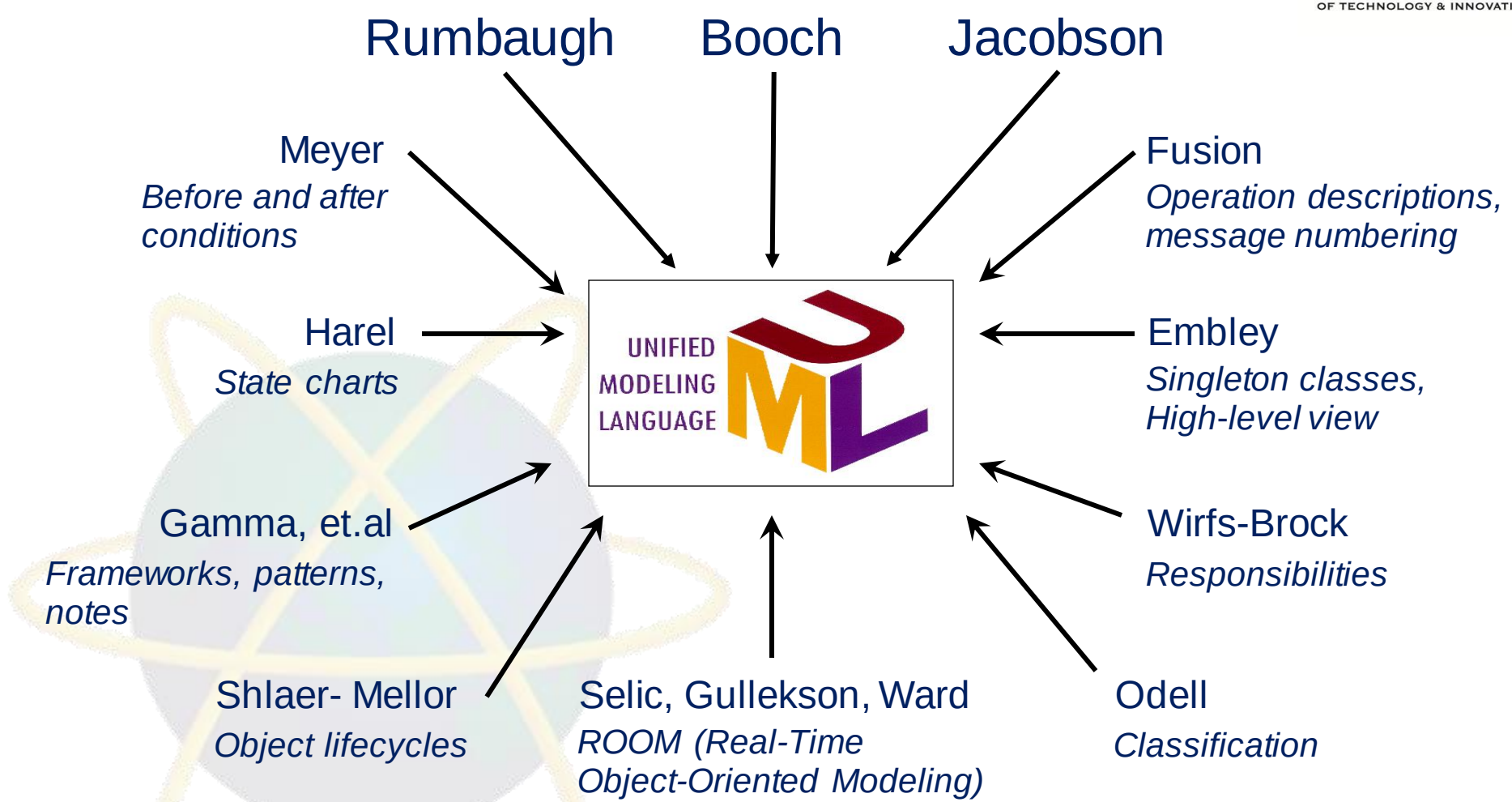
Booch '93 OMT - 2

Booch '91 OMT - 1

OOSE Other Methods

Public
Feedback

Inputs to the UML

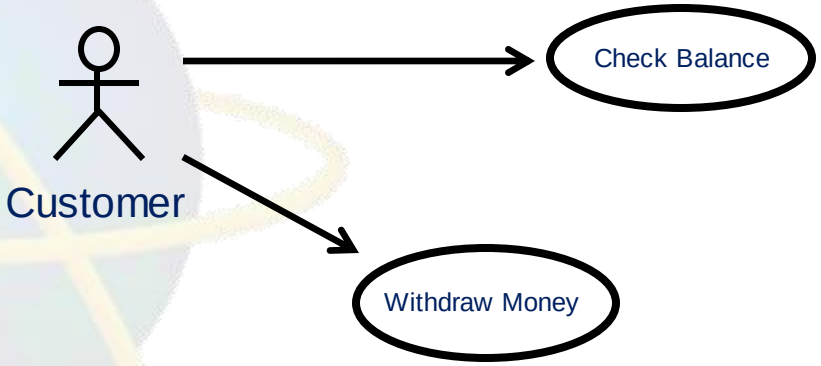


What Type of Process Most Benefits the UML?

- The UML is largely process independent. A process fully benefits from the UML when the process is:
  - Use-case driven
  - Architecture centric
  - Iterative and incremental

A Use-Case Driven Process

- Use cases defined for a system are the basis for the entire development process.
- Benefits of use cases:
  - Concise, simple, and understandable by a wide range of stakeholders.
  - Help synchronize the content of different models.



An Architecture-Centric Process

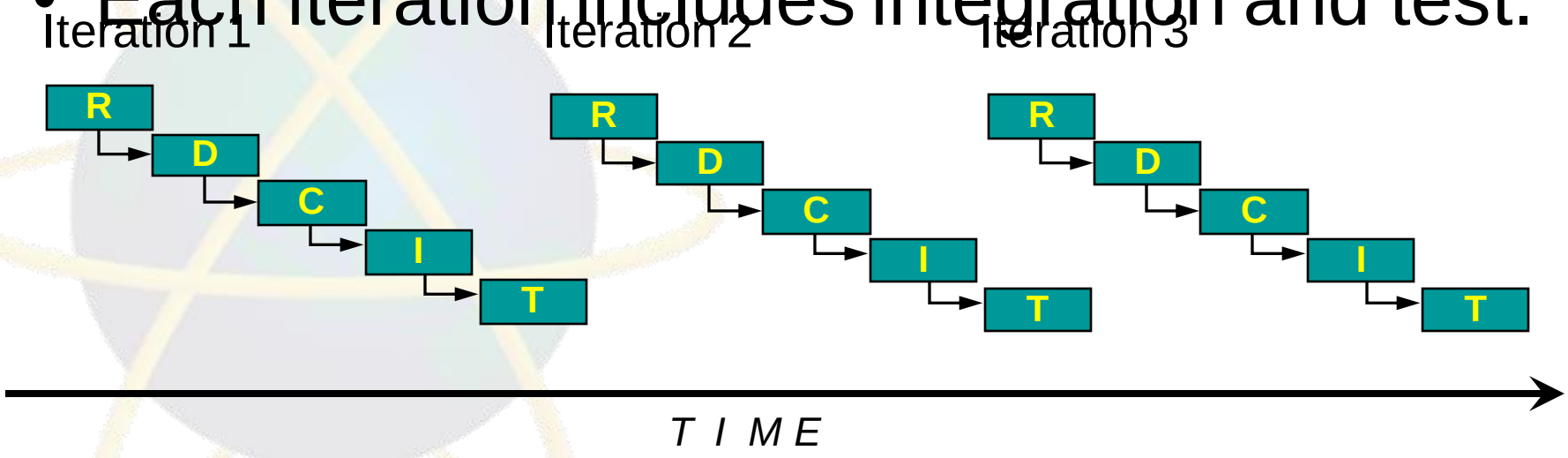
- A system's architecture is used as a primary artifact for conceptualizing, constructing, managing, and evolving the system under development.
- Benefits:
  - Intellectual control over a project to manage its complexity and to maintain system integrity.
  - Effective basis for large-scale reuse.
  - A basis for project management.
  - Assistance in component-based development.

An Iterative and Incremental Process

- Critical risks are resolved before making large investments.
- Initial iterations enable early user feedback.
- Testing and integration are continuous.
- Objective milestones focus on the short term.
- Progress is measured by assessing implementations.
- Partial implementations can be deployed.

Iterative Development

- Earliest iterations address greatest risks.
- Each iteration produces an executable release, an additional increment of the system.
- Each iteration includes integration and test.

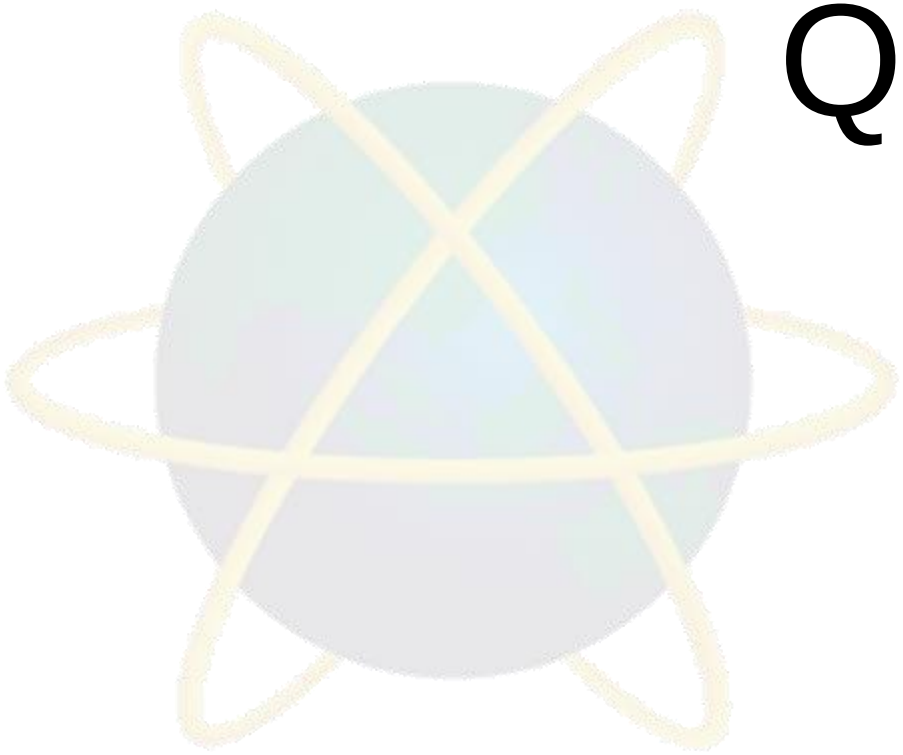


Quick Review Questions

- What is the UML? Describe each of its four benefits.
- What process characteristics best fit the UML? Describe each characteristic.
- What is an iteration?

Summary of Main Teaching Points

-UML
-Types of UML diagram
-History of UML diagram



Q & A

Next Session

-Usecase diagram