

# Modeling Theory

# What is Model?

- “A model is a pattern, plan, representation or description designed to show the main object or workings of an object, a system or a concept.” (Wikipedia)
- “A model is a simplified representation used to explain the workings of a real world system or event.” (Wiktionary)

# What is Model?

- “A model captures a view of a physical system. It is an abstraction of the physical system, with a certain purpose. This purpose determines what is to be included in the model and what is irrelevant. Thus the model completely describes those aspects of the physical system that are relevant to the purpose of the model, at the relevant level of detail. (UML 2.0 Specifications)

# Models Advantages

- A model represents something else and for being different from what they describe they are useful in several ways.

## Easier & Faster To Build

It is simpler and faster to develop a model than developing the real thing.

## Simulations Usage

We can use a model in various simulations in order to learn more about what it represents.

## Imaginary Things

Models can represent imaginary things from any discipline. Using a model we can explore, evolve and develop new ideas.

# Models Advantages

## On-Going Evolve

We can develop and evolve our model concurrently with acquiring more information and a better understanding.

## Way To Simplify

Working with a model we can choose to avoid the less important details and focus on the more important ones. This way we can simplify the decisions taking process.

# What is Modeling?

- The modeling process is the designing of the software application before its coding.

Through the modeling process we acquire more data and a better understanding of the planned system.

- The modeling process is an essential part of large software projects and might be a very helpful one when dealing with medium projects and small ones.

The model plays in software development the same role small physical models play when constructing a building.

# What is a Static Model?

- A static model describes the state of the system we are interested in.
- The main purpose of a static model is to provide us with a vocabulary we can use to describe actions.

Knowing the attributes each object has we can use them when describing the various actions in our system.

- The static model characterizes the state of an object by describing the information known about it at any point of time.  
A static model will describe the attributes an object has without describing neither their values or how do they change.

# What is a Dynamic Model?

- A dynamic model describes the behavior of the system over time.

A dynamic model can include the following UML diagrams: Activity Diagrams, State Diagrams and Sequence Diagrams.



# Implementation Diagram

- An implementation diagram is a generic term for a UML diagram we use to model the implementation of a system. Every diagram that focuses on the implementation details can be considered as an implementation diagram (e.g. detailed class diagram, deployment diagram).