



## Modelling Architecture Design Patterns

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### Subject Area

- Design Patterns,
- Model Based Software Engineering.

### Background

A *design pattern (DP)* is a general, repeatable solution to a commonly occurring problem in software design [1].

*Model Based Software Engineering (MBSE)* is an approach in which a system is modelled in terms of abstract models. The models are then used for analysis purpose as well as code-generation.

### Objectives

The main objective of this project is to implement and evaluate a modelling language for architecture design patterns in the Eclipse Modelling Framework or related approaches.

Therefore, the following tasks have to be performed:

- 1) A language for the modelling of Software Architectures has to be studied and implemented using EMF [2] or related approaches.
- 2) Optionally, code should be generated for external tools in order to analyse the architecture.

The challenge of the project lies in the conceptualization of a suitable architecture with well-defined interfaces to allow for the generation of code for different tools.

### Additional Information

- If desired, the student has the possibility to participate in a follow-up publication at a scientific venue.

### Prerequisites

- Knowledge in modelling of distributed systems.
- Basic experience of a programming language such as Java or C#.
- Interest in Software Architectures and Model Based Software Engineering.

### Further References

- [1] Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides. 1995. *Design Patterns: Elements of Reusable Object-Oriented Software*. Addison-Wesley Longman Publishing Co., Inc., Boston, MA, USA.
- [2] Eclipse Modelling Framework: <http://www.eclipse.org/modeling/emf/>

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