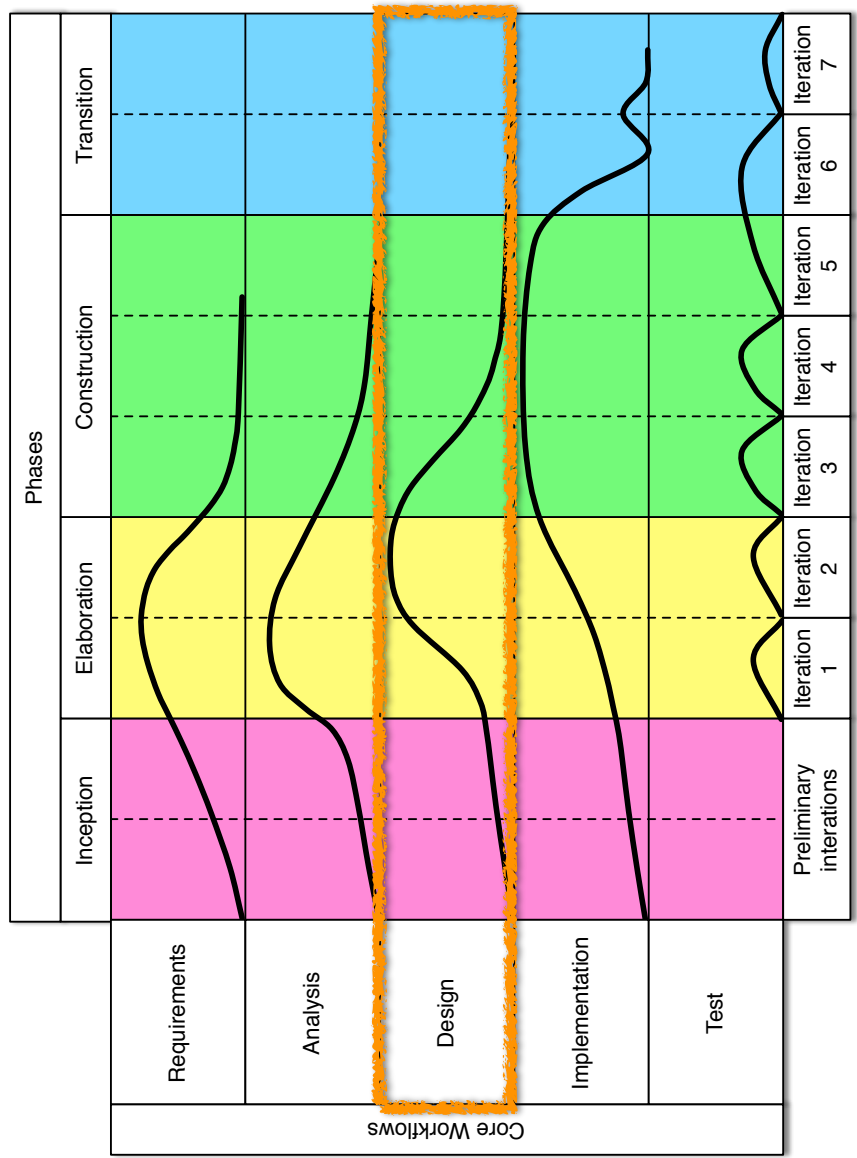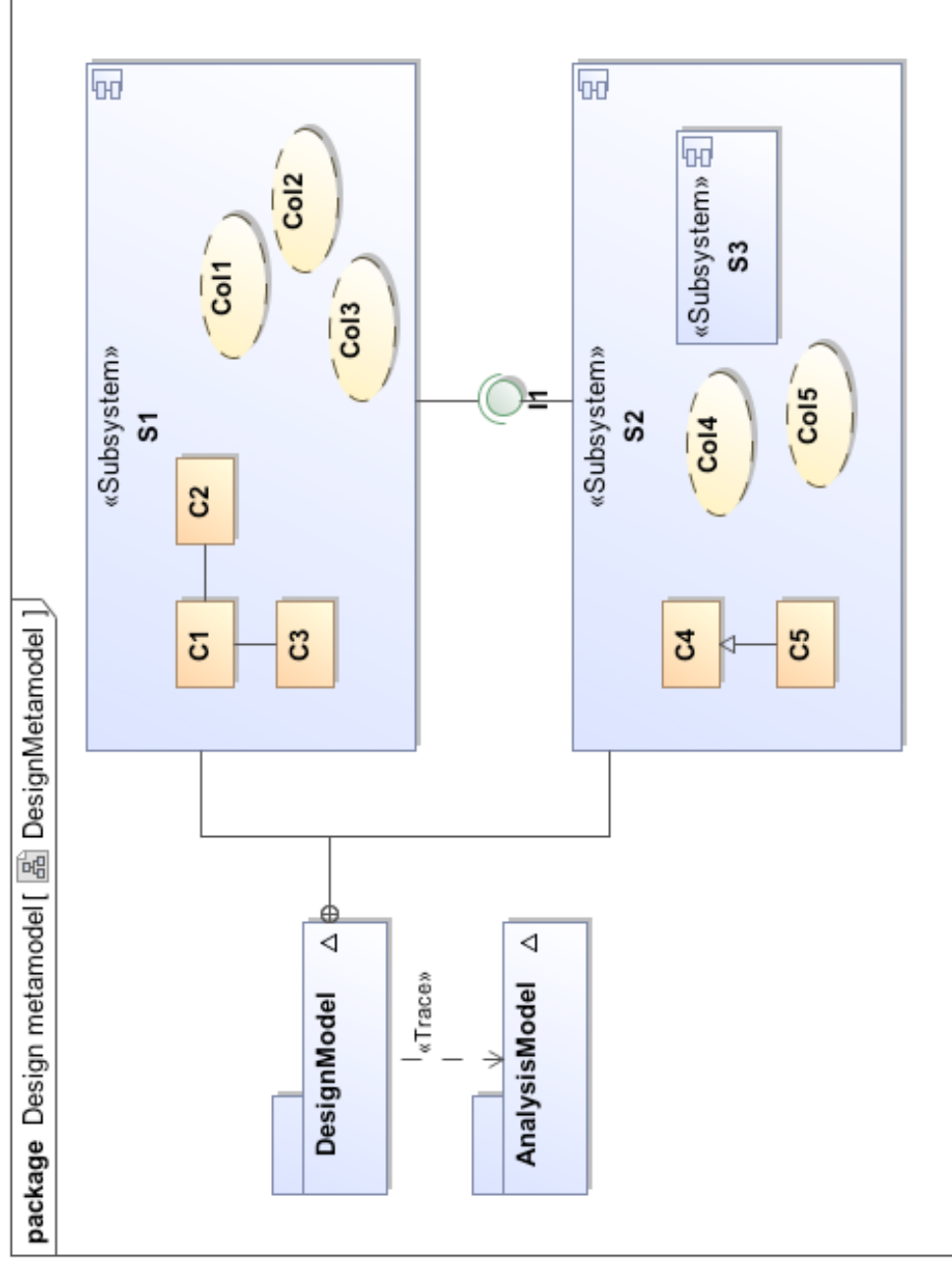# Design – purpose

- Decide how the system's functions are to be implemented

- Decide on strategic design issues such as persistence, distribution, etc.
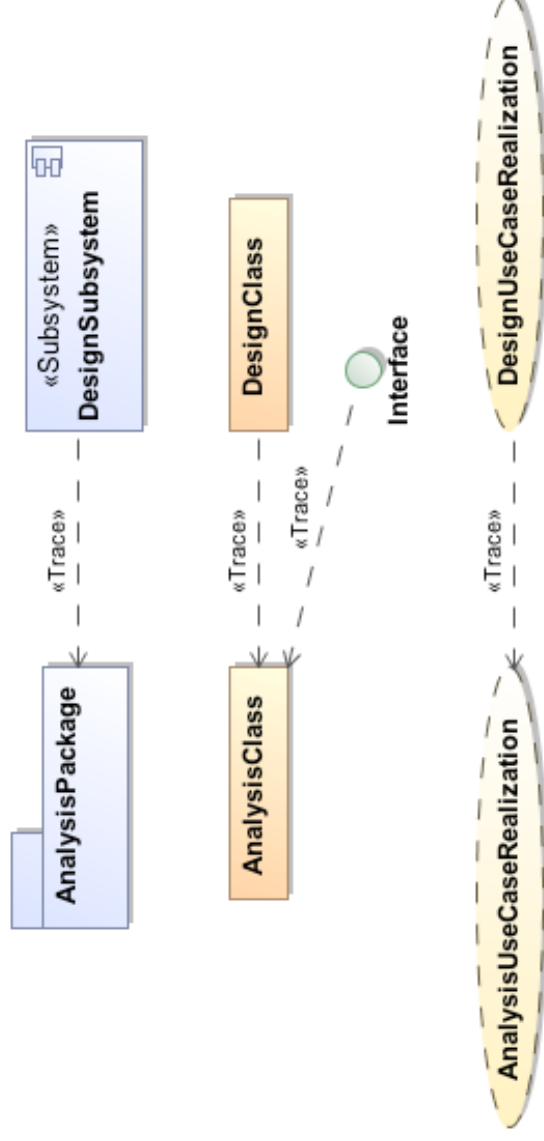
- Create policies to deal with tactical design issues

Design artifacts – metamodel

- Subsystems are components that contain UML elements

- We create the design model from the analysis model by adding implementation details, so there is a historical «trace» relationship between the two models

package Design metamodel [🔲 DesignMetamodel]

«Subsystem»
S1

C2

C1

C3

Col1

Col2

Col3

I1

«Subsystem»
S2

C4

C5

Col4

Col5

«Subsystem»
S3

DesignModel

«Trace»

AnalysisModel

Artifact «trace» relationships

- Relationships between analysis and design artifacts are typically one to many

- There are some new types of artifact in the design model - interfaces, subsystems and new types of relationship

- There is also the deployment model (not shown) which is a subset of the design model
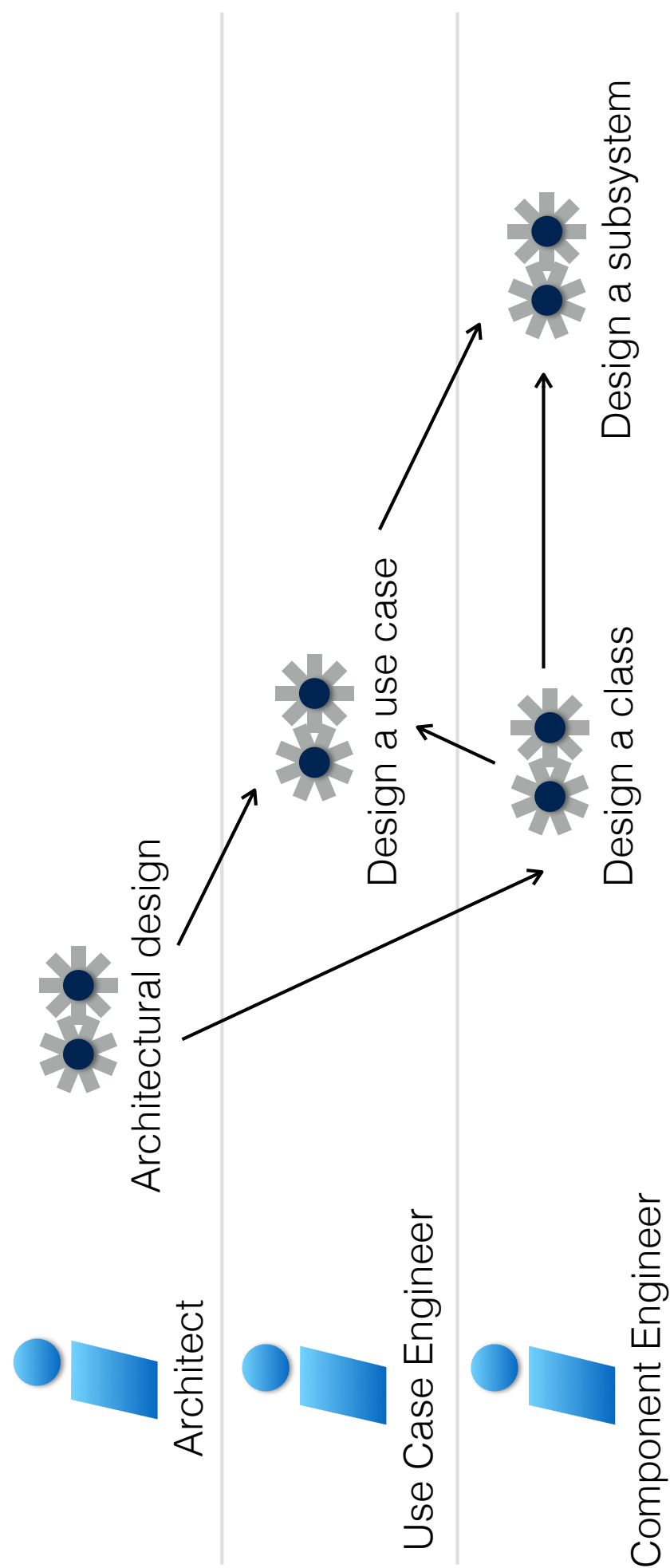
Should you maintain two models?

- A design model may contain 10 to 100 times as many classes as the analysis model. The analysis model helps us to see the big picture without getting lost in implementation details

- We need to maintain both models if:

  - It is a big system (>200 design classes)

  - It has a long expected lifespan

  - It is a strategic system

  - We are outsourcing construction of the system

- We can make do with only a design model if:

  - It is a small system

  - It has a short lifespan

  - It is not a strategic system

Often the analysis model is the strategic model and the design model is only tactical!

Design workflow

Architect

Use Case Engineer

Component Engineer

Architectural design

Design a use case

Design a class

Design a subsystem

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Summary

- Design is the primary focus in the last part of the elaboration phase and the first half of the construction phase

- Purpose – to decide how the system's functions are to be implemented

- Artifacts:

  - Design classes

  - Interfaces

  - Design subsystems

  - Use case realizations – design

  - Deployment model