

“Advancing Traffic Efficiency and Safety
through Software Technology phase 2 (ATESST2)”

EAST-ADL2 Vehicle Level

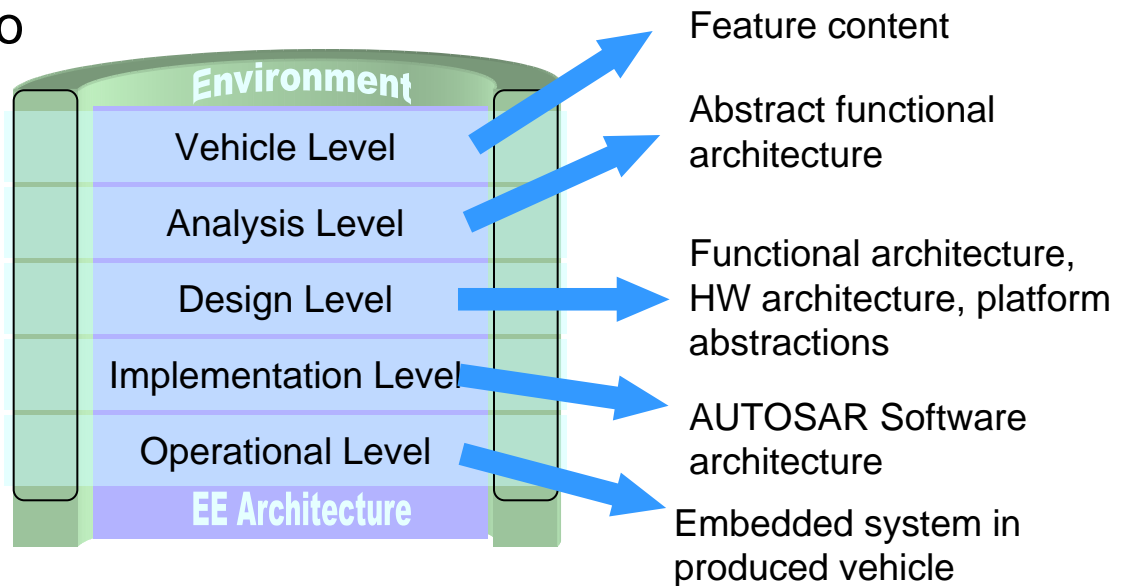
ATESST2 Concept presentation 2010 Q2



EAST-ADL2

A System Modeling Approach that

- Is a template for how engineering information is organized and represented
- Provides separation of concerns
- Embrace the de-facto representation of automotive software – AUTOSAR



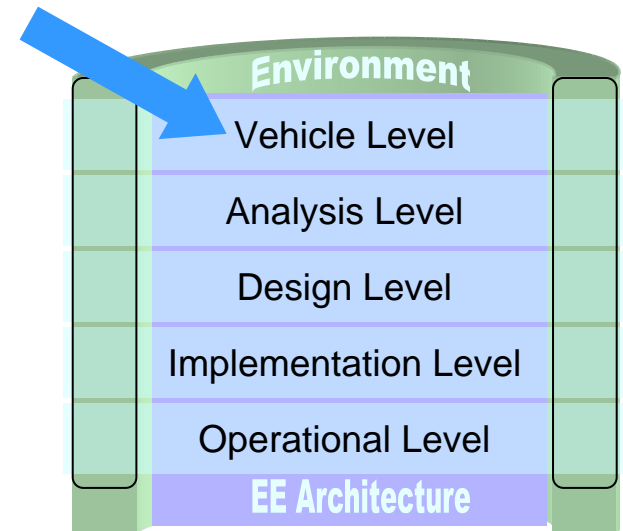
Product Planners decide what to put in the next product

Features represent the
properties/functionality/traits
(*Brake, Wiper, CollisionWarning,...*)

Vehicle Feature Model organize Features of
the vehicle

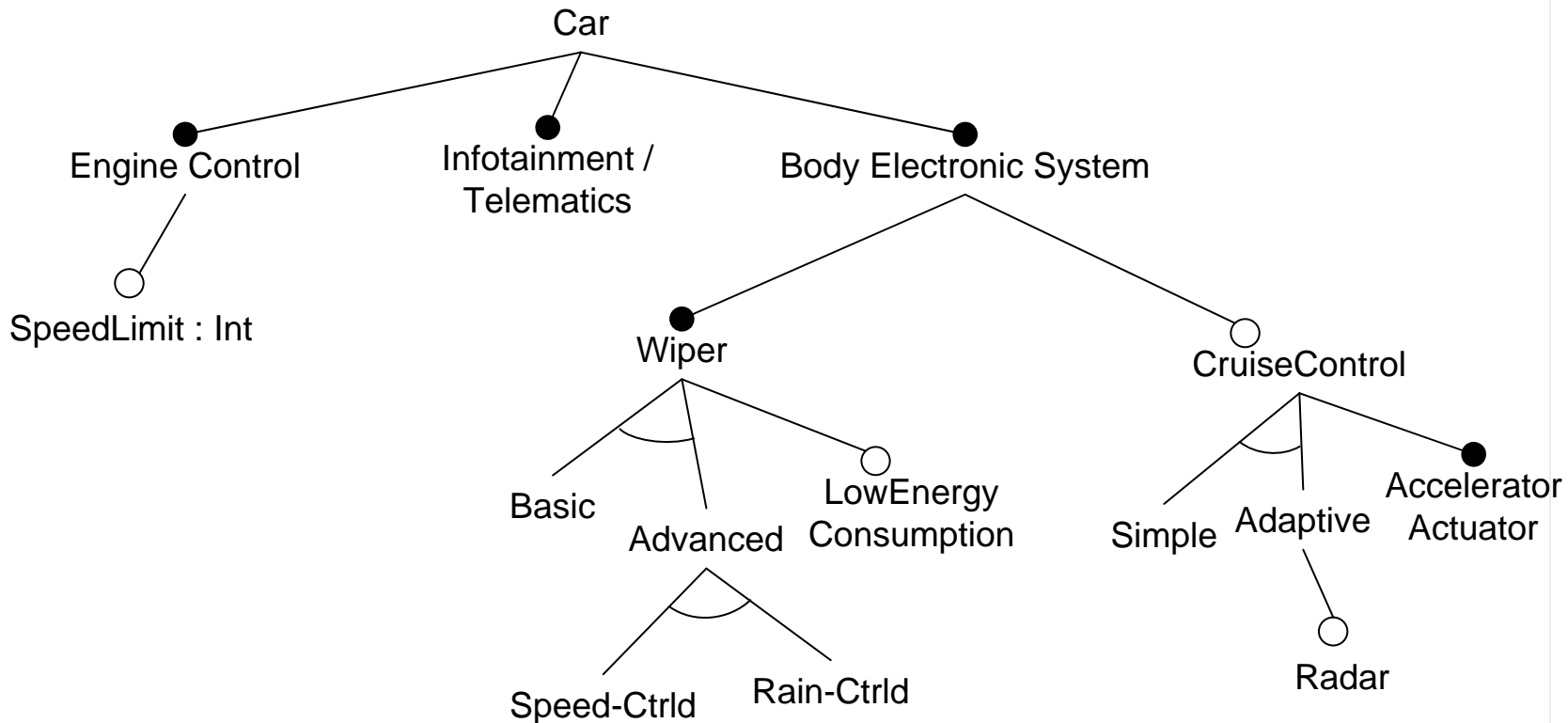
Requirements are included and refer to
external and top level aspects as opposed
to realization details

Variability mechanism supports the definition
of rules for inclusion in different vehicles –
Product Line Architecture



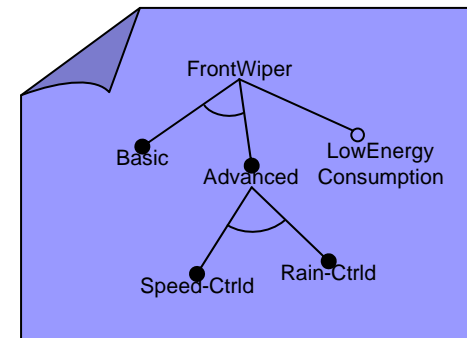
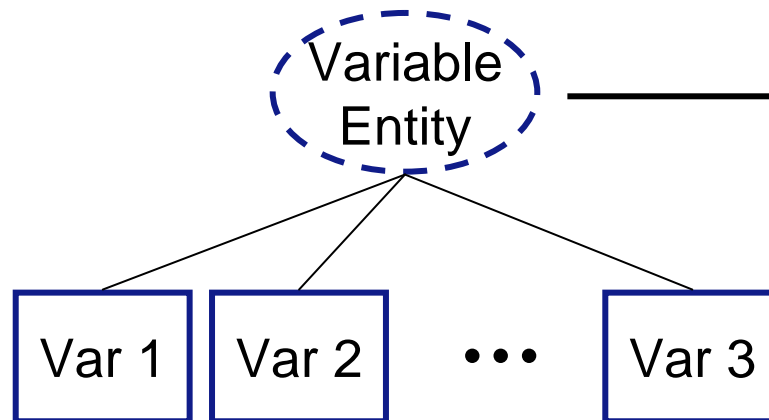
Basic Concepts – Feature Modeling

as introduced by Kang et al. in 1990



What is a Feature ?

A Feature is a characteristic or trait that the variants of a variable entity may or may not have.



What is a Feature ?

A Vehicle is given by a set of Features

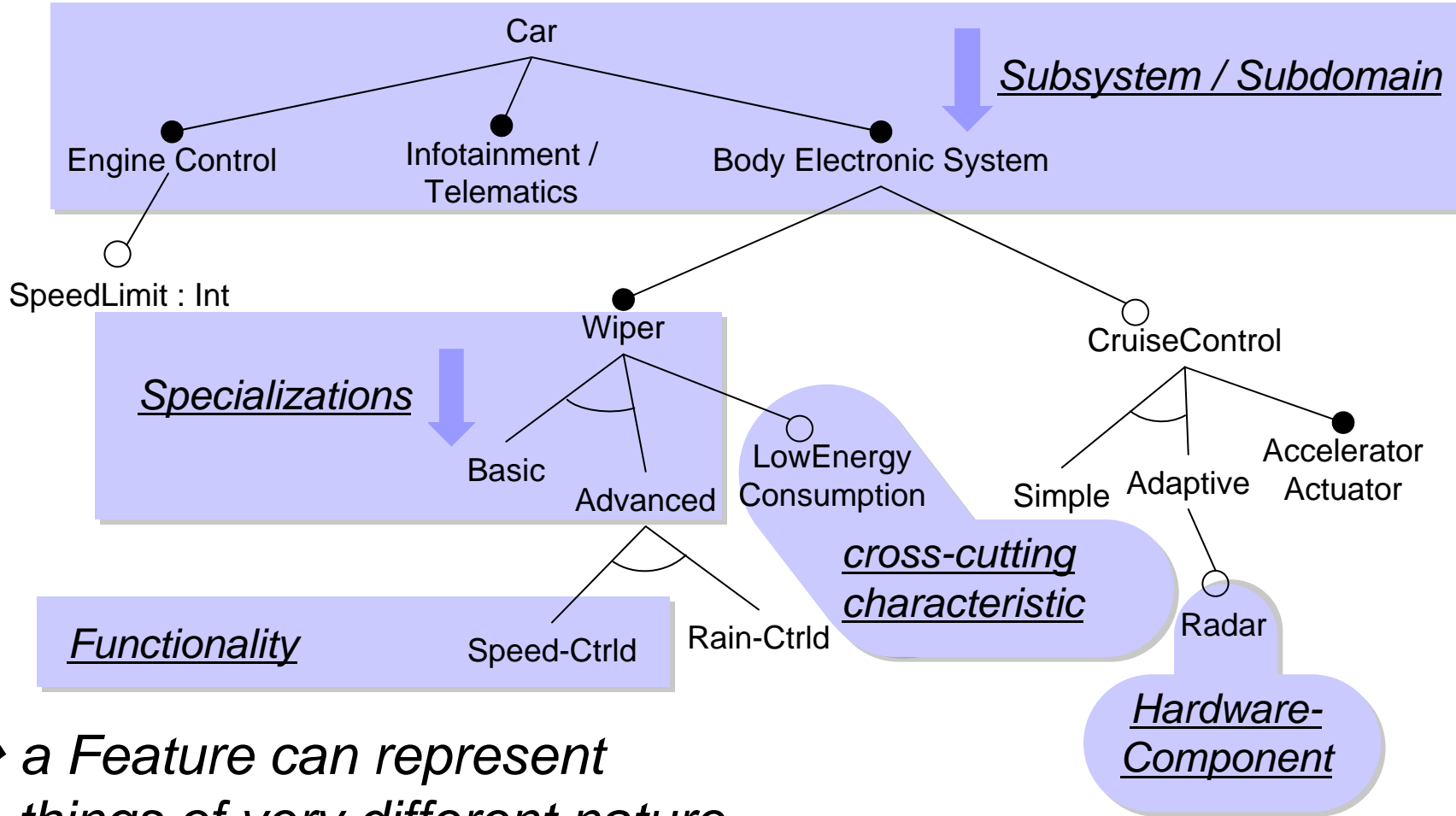
Features are *stakeholder* requested functional or non-functional characteristics of a vehicle

A Feature describes the "what", but shall not fix the "how"

A Feature might be refined by further requirements

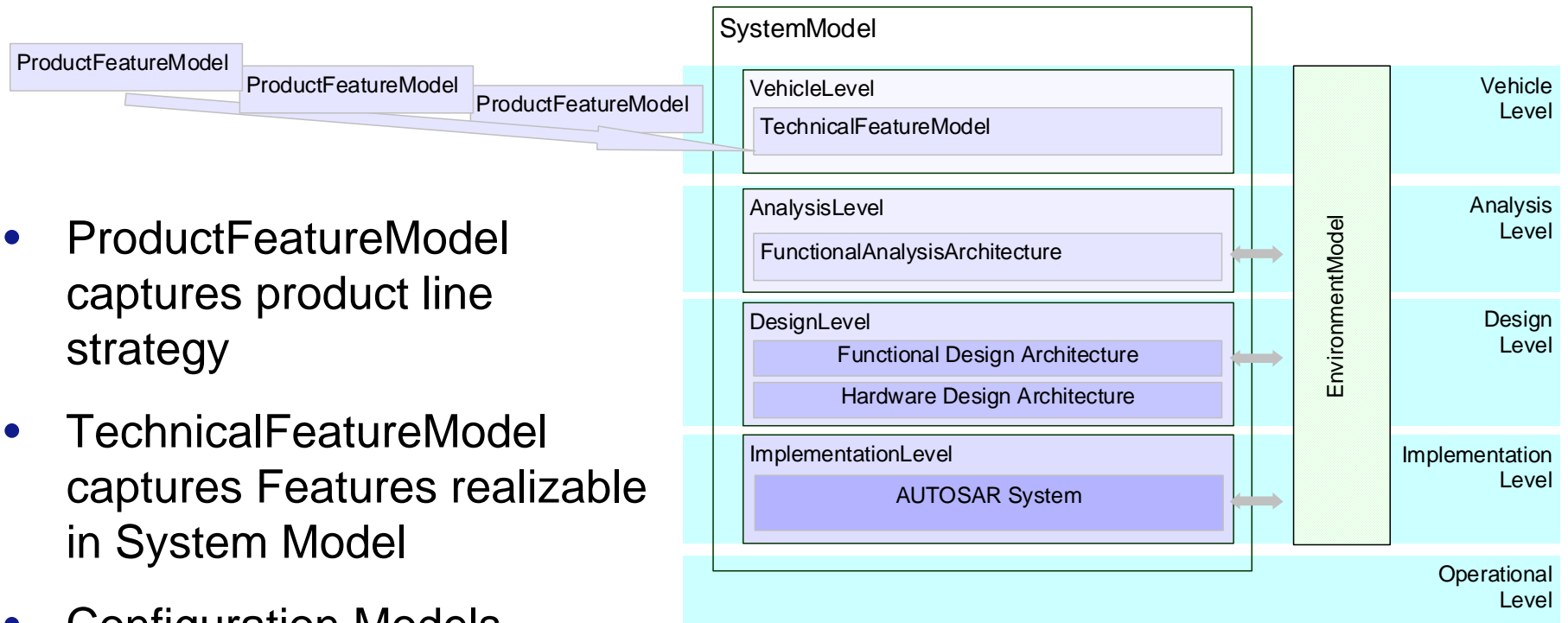
From a top-down architecture approach the features are the configuration points to create a vehicle variant

What is a Feature ?



→ a Feature can represent things of very different nature

EAST-ADL Feature Modelling



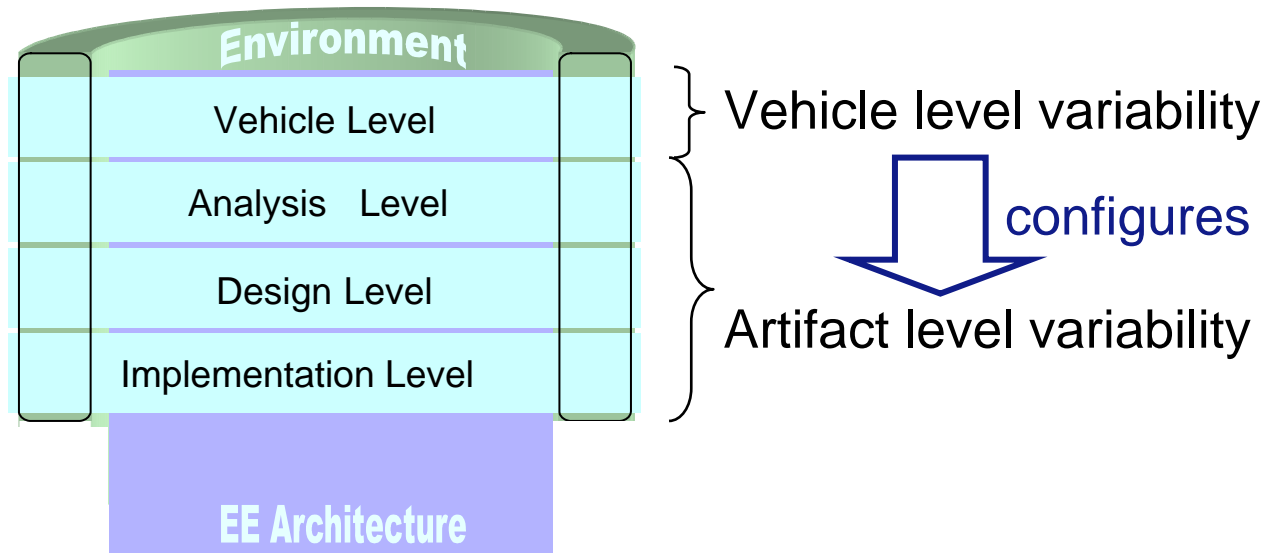
- ProductFeatureModel captures product line strategy
- TechnicalFeatureModel captures Features realizable in System Model
- Configuration Models configure feature models and artifacts

Variability – Overview

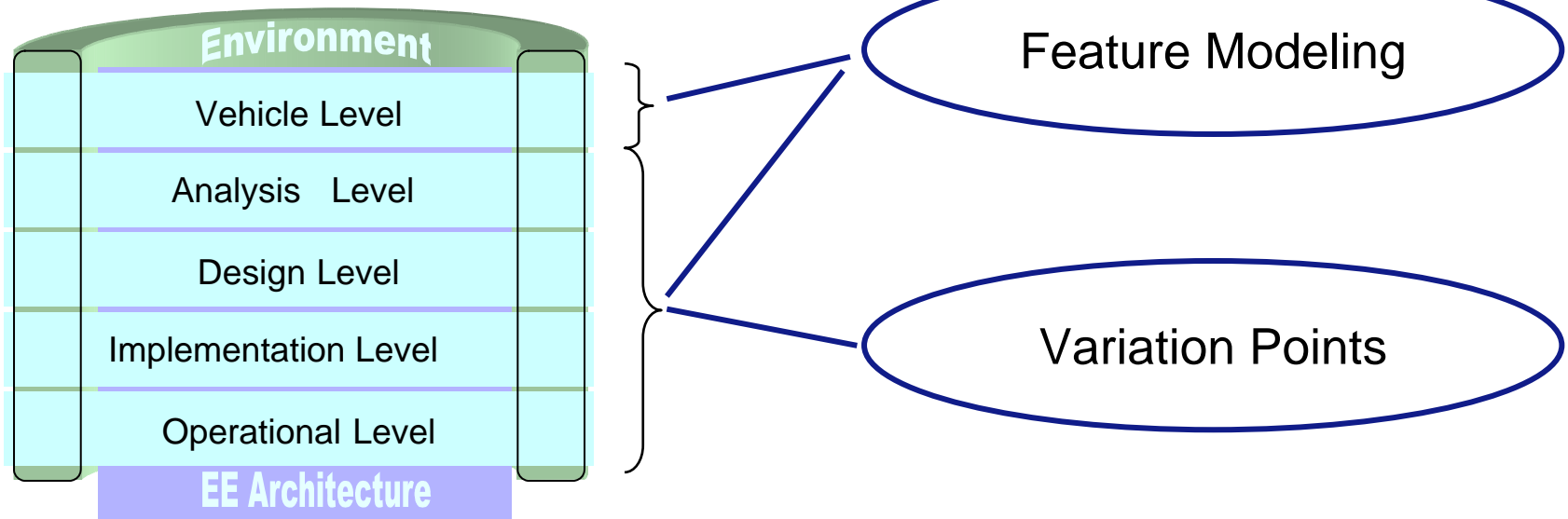
Variability is modeled essentially on two different abstraction layers:

Vehicle level variability (being the primary source for variant/product configuration)

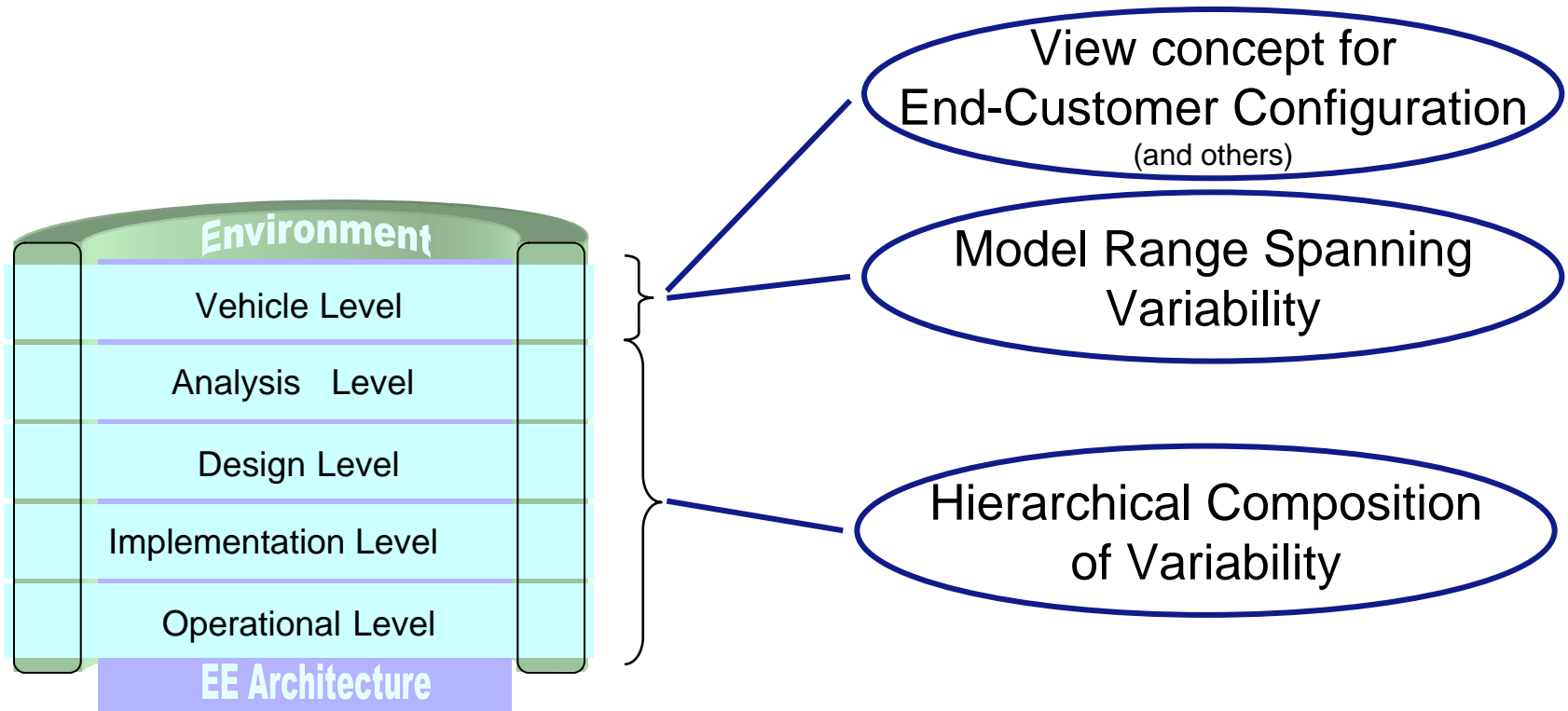
Artifact level variability (comprising all artifact elements, e.g. requirements, FAA, FDA...)



Basic Concepts



Advanced Concepts



End-Customer Configuration

vehicle level contains the core feature model

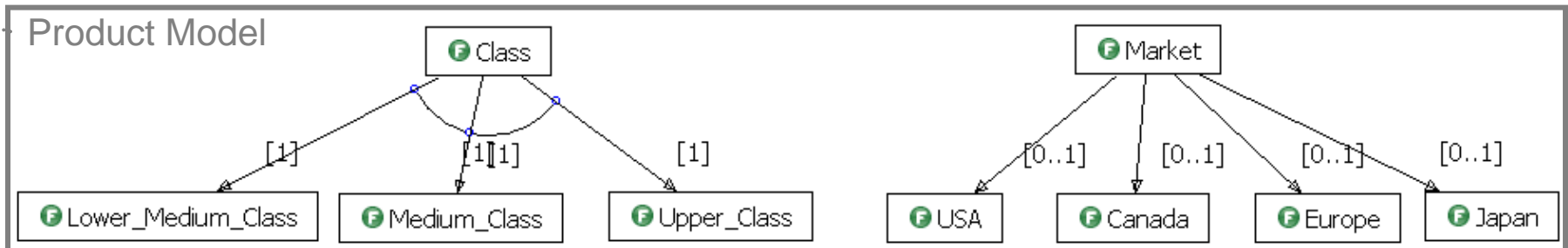
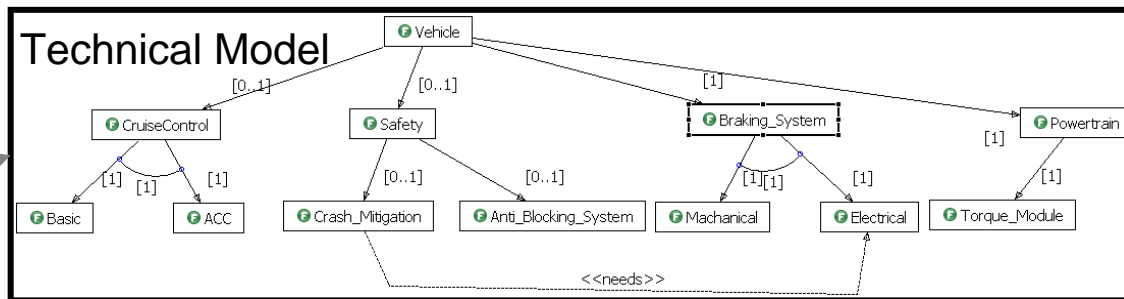
- showing variability of the complete system
- high complexity
- technical viewpoint
(terminology, customer-invisible variability, diverse life-cycle)
- not appropriate for end-customer configuration

vehicle level supports to define end-customer configuration

- provides „view“ on core feature model
- allows for orthogonal „packaging“ of variability
- supports orthogonal configuration considerations
- can be used for separation of other concerns

Vehicle Feature Model and Product Model

A set of product decisions specifies how the Basic Model is configured depending on the configuration of the Product Model:



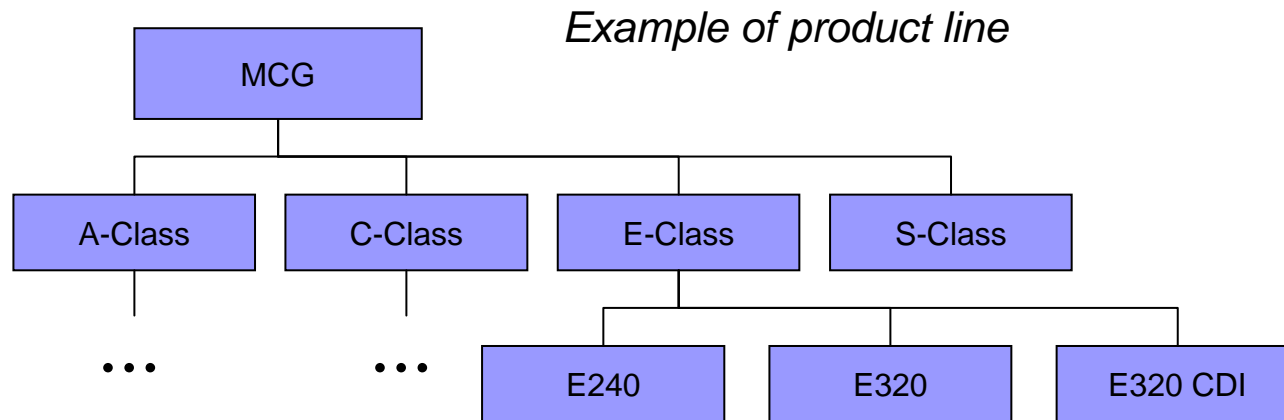
Example for a product decision: “*All Canadian cars have ACC*”. I.e. if the market “Canada” is selected, in the Basic Model the feature “ACC” is selected.

Model Range Spanning Variability

two kinds of variability:

model range specific variability

model range spanning variability

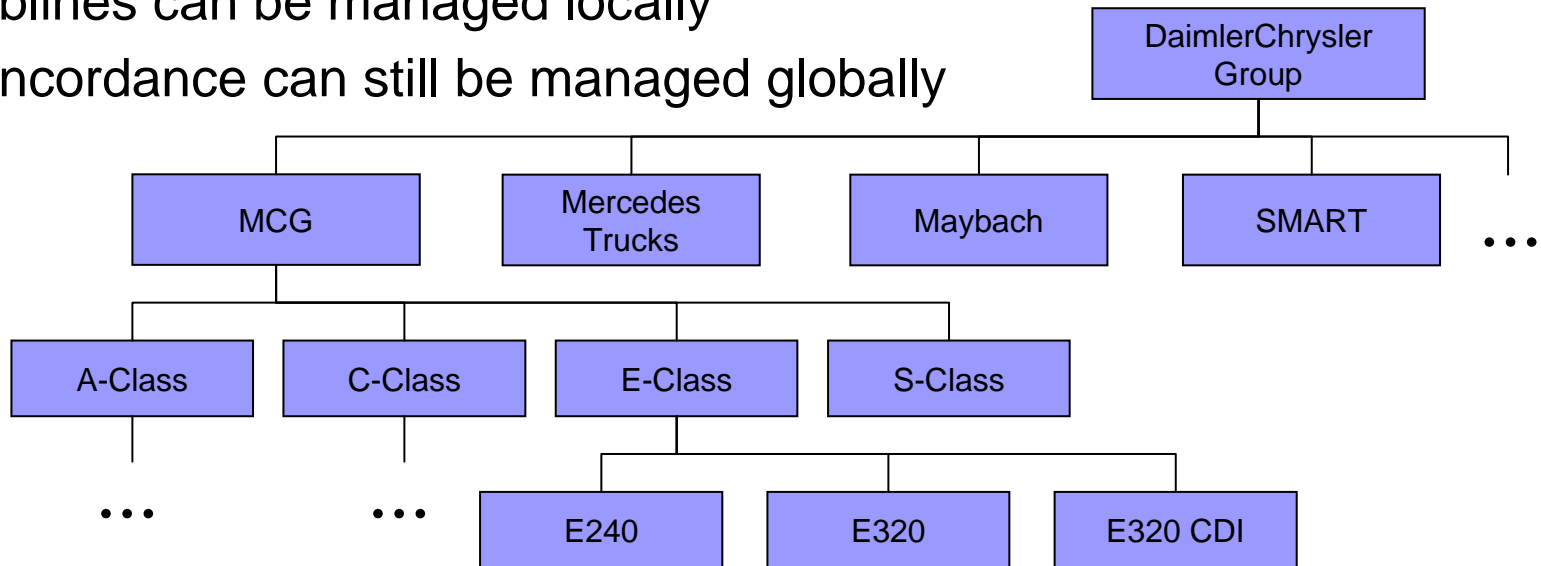


Model Range Spanning Variability

traditional solution: either one large software product line or several independent ones

multi-level concept: compromise between the two

- sublimes can be managed locally
- concordance can still be managed globally



Multi-Level Feature Model – Example

