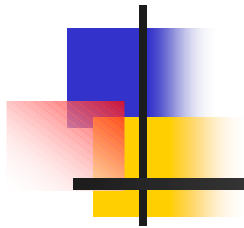


Modeling Web Services Variability with Feature Diagrams



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Modeling Web Services Variability with Feature Diagrams

- ✍ Web Services (WS) vs. components
- ✍ Why feature diagrams for WS?
- ✍ Feature models:
 - ✍ Feature notion, feature diagram, used notation
- ✍ Examples:
 - ✍ WS communication technologies
 - ✍ WS models: interface, presentation, security
 - ✍ WS consumer: presentation model
- ✍ Conclusion and future work



WS vs. Components






Component

-  Provides functionality through well defined standards
-  Contains a full declaration of its static dependencies
-  Is equipped with explicit configuration mechanisms (required interfaces as opposed to the more traditional provided interfaces)
-  Is equipped with version identification



WS vs. Components

WS

-  Larger level of granularity
-  Existence of appropriate services allowing finding and discovering WSs
-  Service-oriented architecture containing 3 roles: producer, consumer, provider
-  Dynamic nature (parts evolve separately)
-  Run-time environment based on high performance application server or message broker







Why Feature Diagrams for Web Services?


- Generic description of a range of diverse systems
 - Feature diagram and its instances
 - Commonality and variability of some WS aspects
 - Description transparency



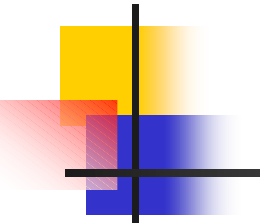
Feature Model

FODA- feature model:

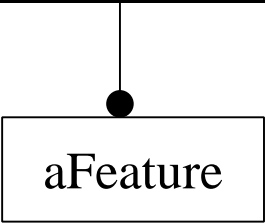
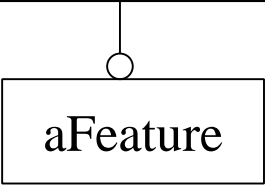
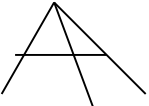

-  Feature diagram
-  Composition rules
-  Issues and decisions
-  System feature catalog.

 Feature notion: *A feature* is a visible characteristic of concept (e.g. system, component, etc.), which is used to describe and distinguish different instances of the concept

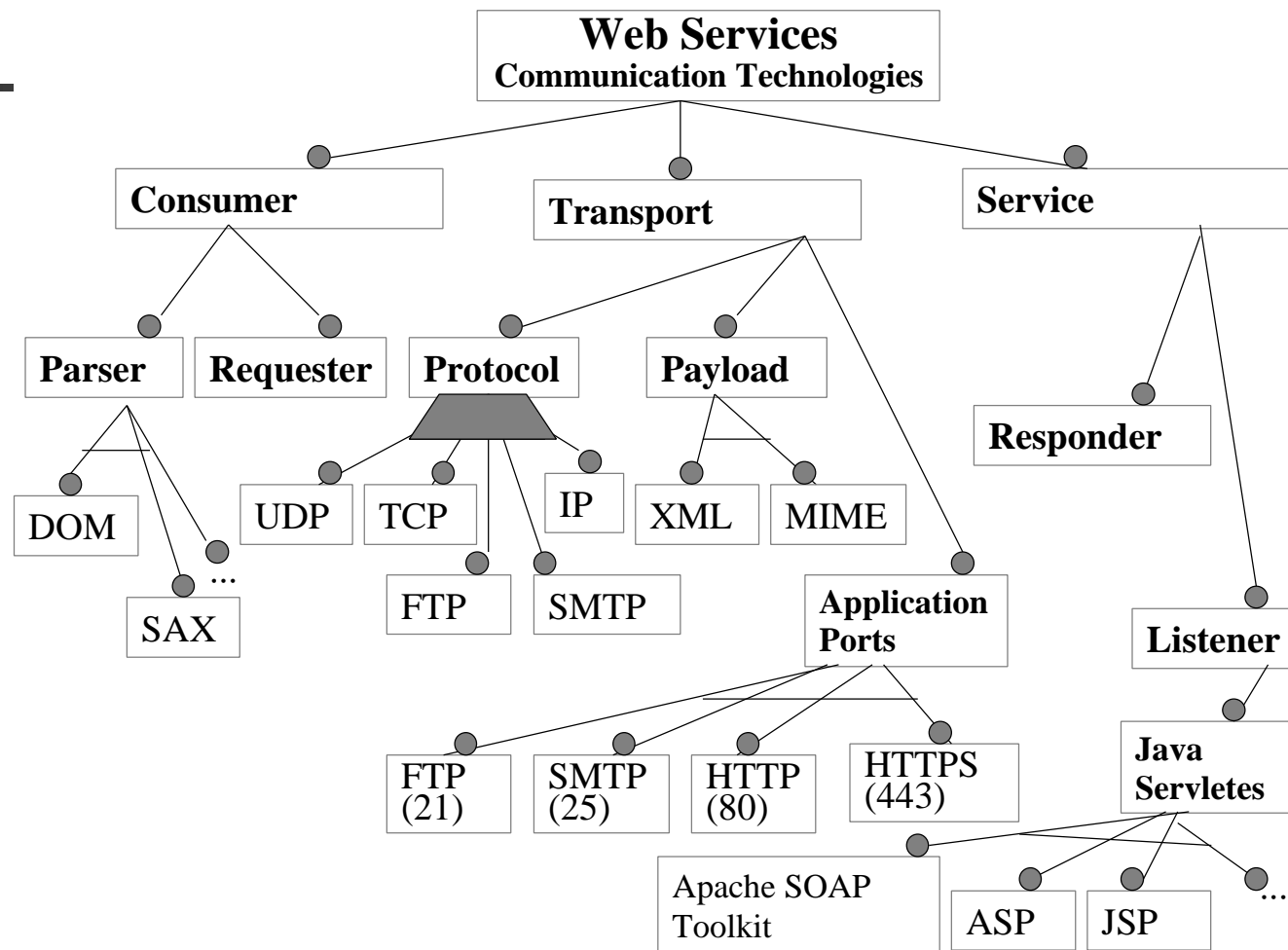
Feature Diagram

- 
- ✍ Feature diagram forms a tree (graphical AND/OR hierarchy of features) and captures the relationships among the features
 - ✍ Concept node (root), features, sub-features
 - ✍ Feature types: mandatory, optional; alternative, or-features

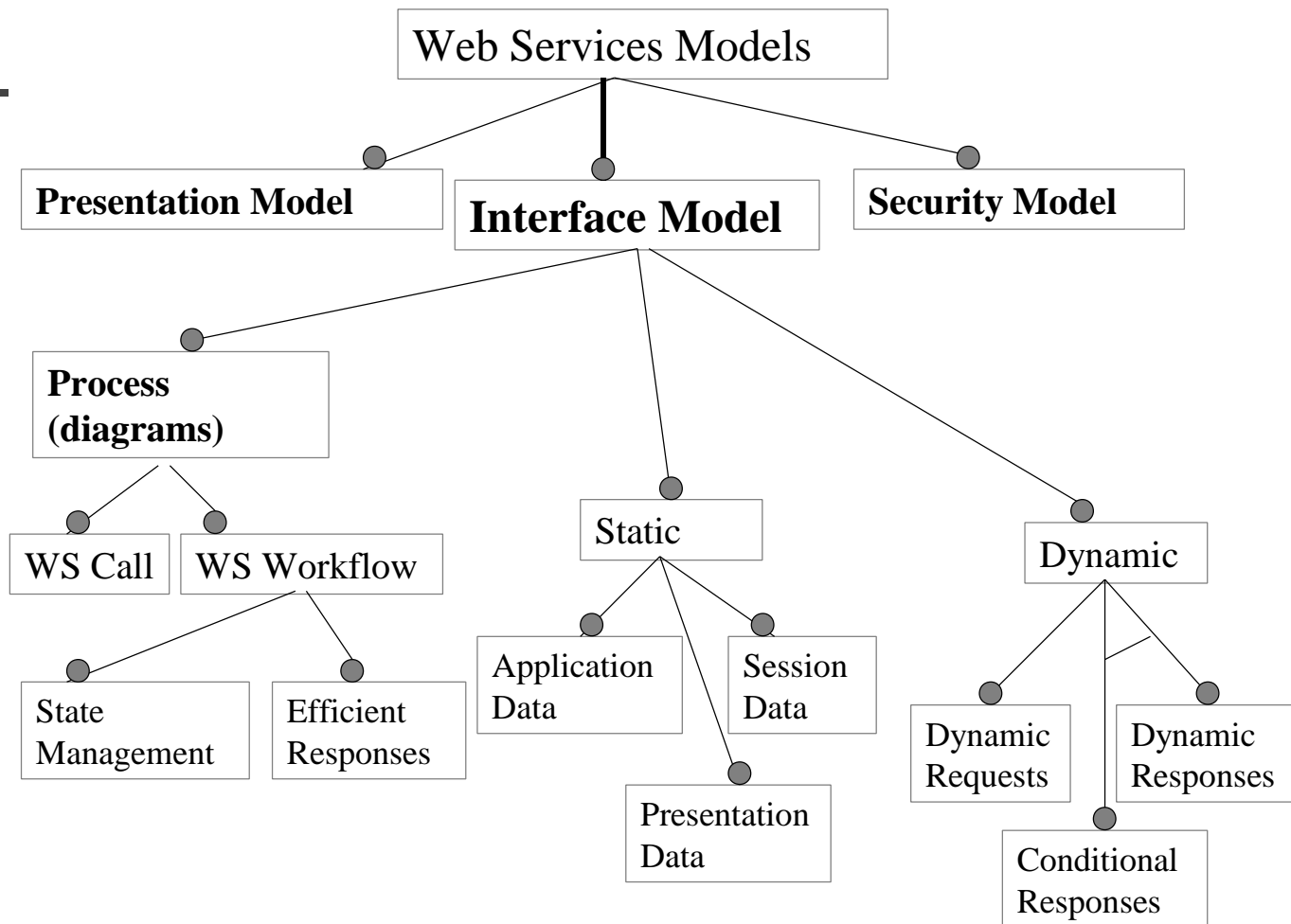
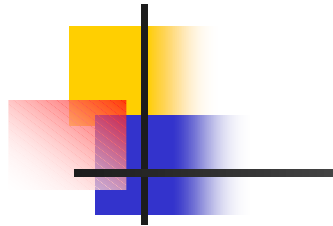
Feature Diagram Notation in Generative Programming [CE00]

Symbol	Feature Type	Meaning
	mandatory	All included
	optional	Option (may be included or not)
	alternative	XOR-specialization
	Or-feature	OR-specialization

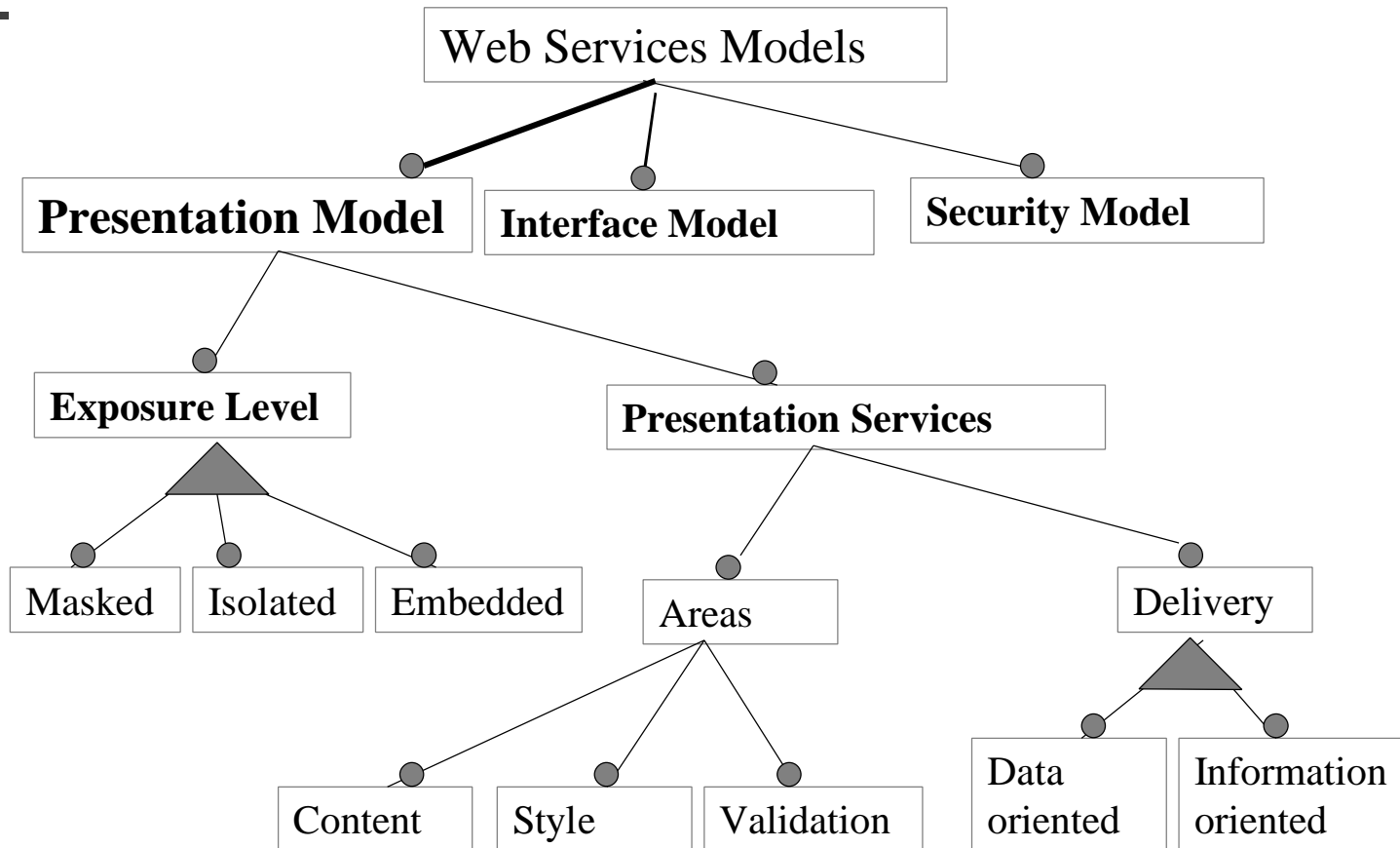
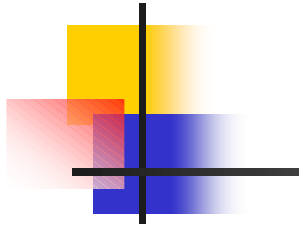
WS Communication Technologies



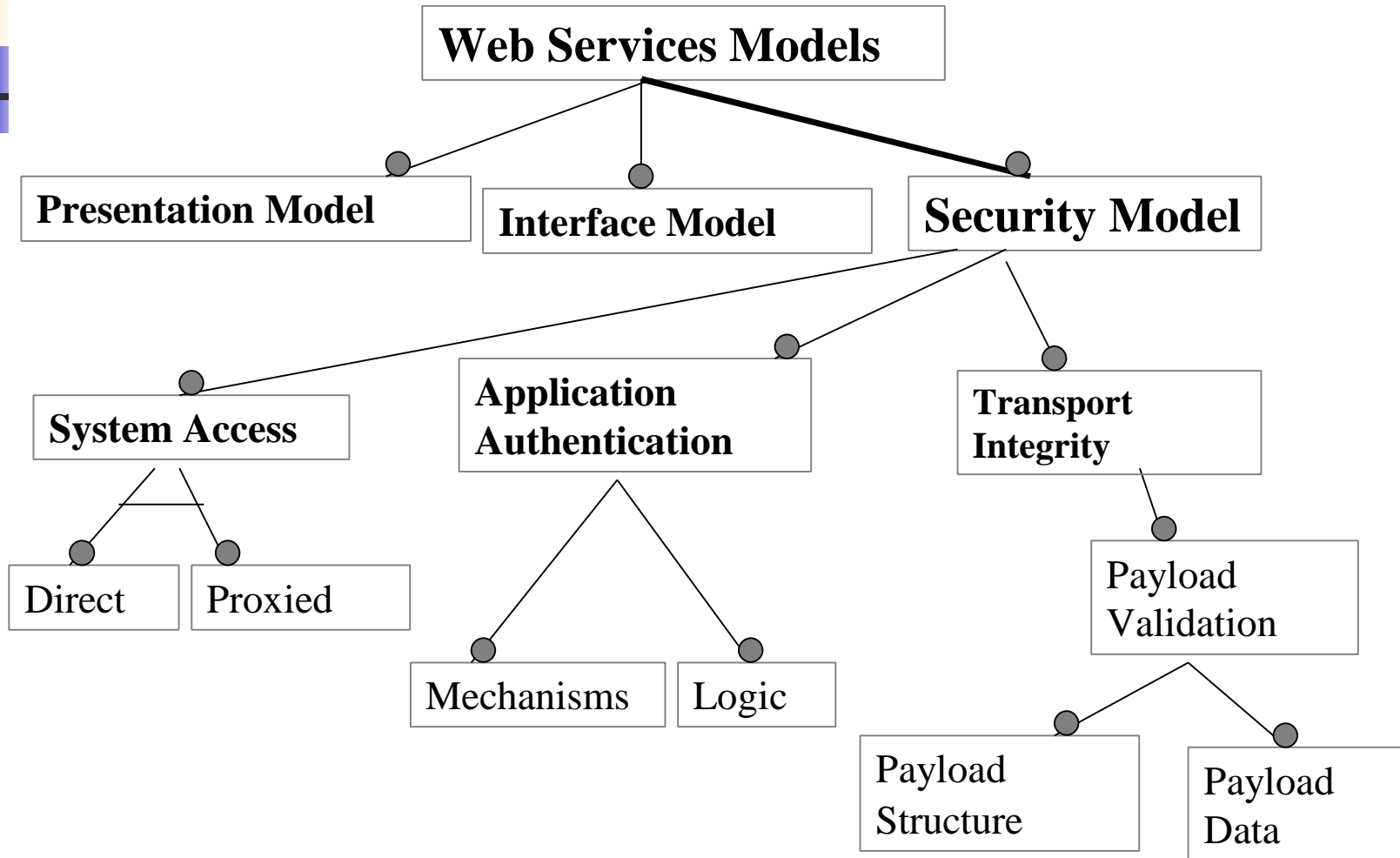
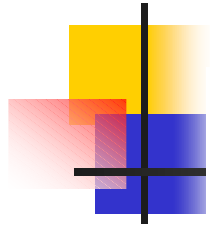
WS Models – Interface Model



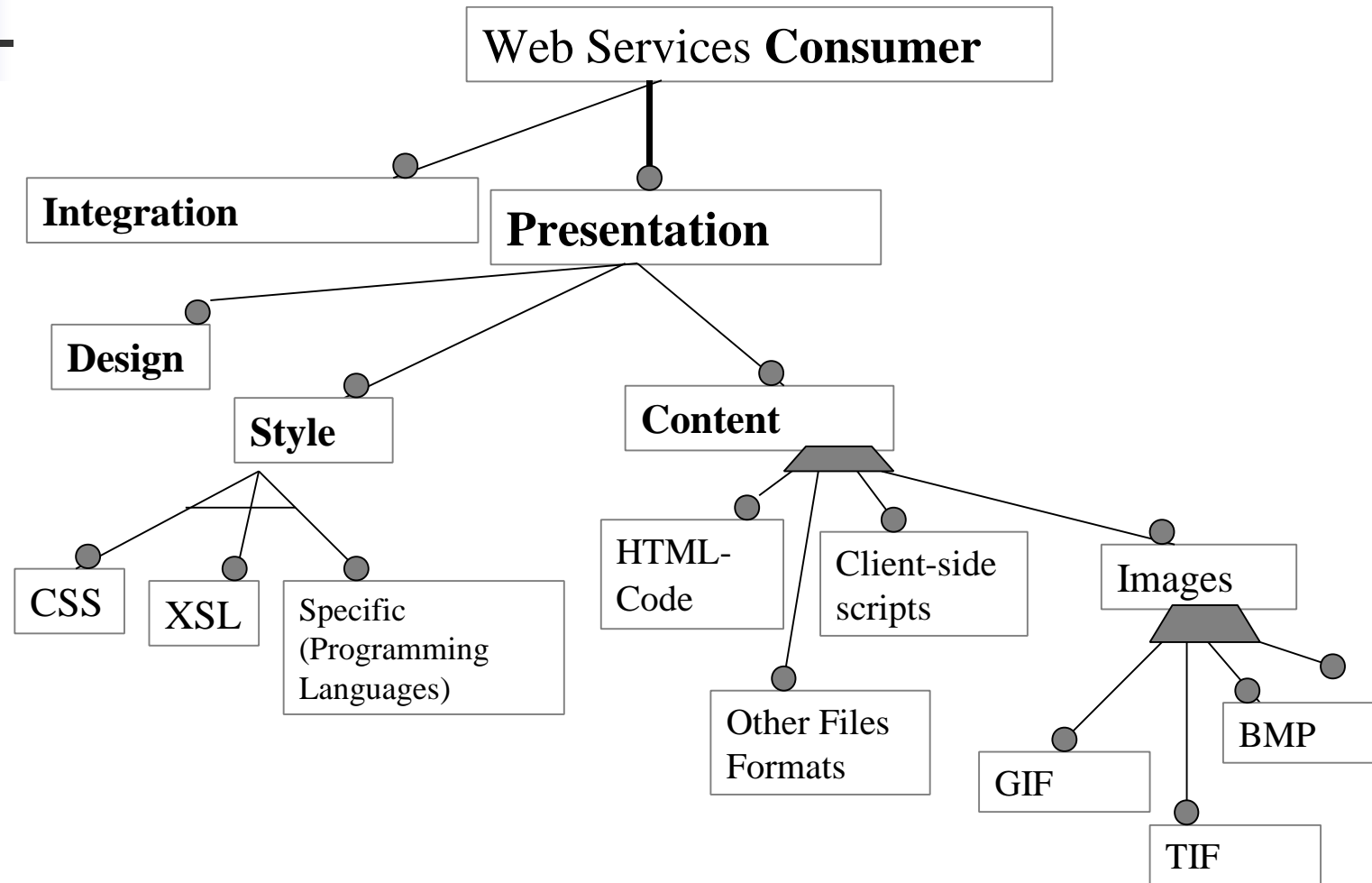
WS Models – Presentation Model



WS Models – Security Model



WS Consumer – Presentation Model





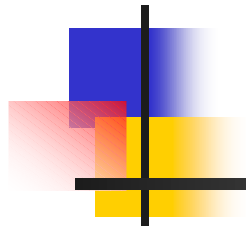
Conclusion

- WS are software components on Web-level
 - Services for Web, as also components in complex workflows
- Feature diagrams may be used for description of WS variability and dynamically instantiated for individual consumers profiles

Future work

- Feature interactions problems (dependencies and traceability) as orthogonal problems to WS

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Thank you!