

Comparando Feature Model Notations

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Roteiro

- Comparação geral
- Novos Termos
 - Versions
 - Layers
 - Mapeamento de Recursos
 - Expressiveness
- Feature Modeling Family

Características das notações

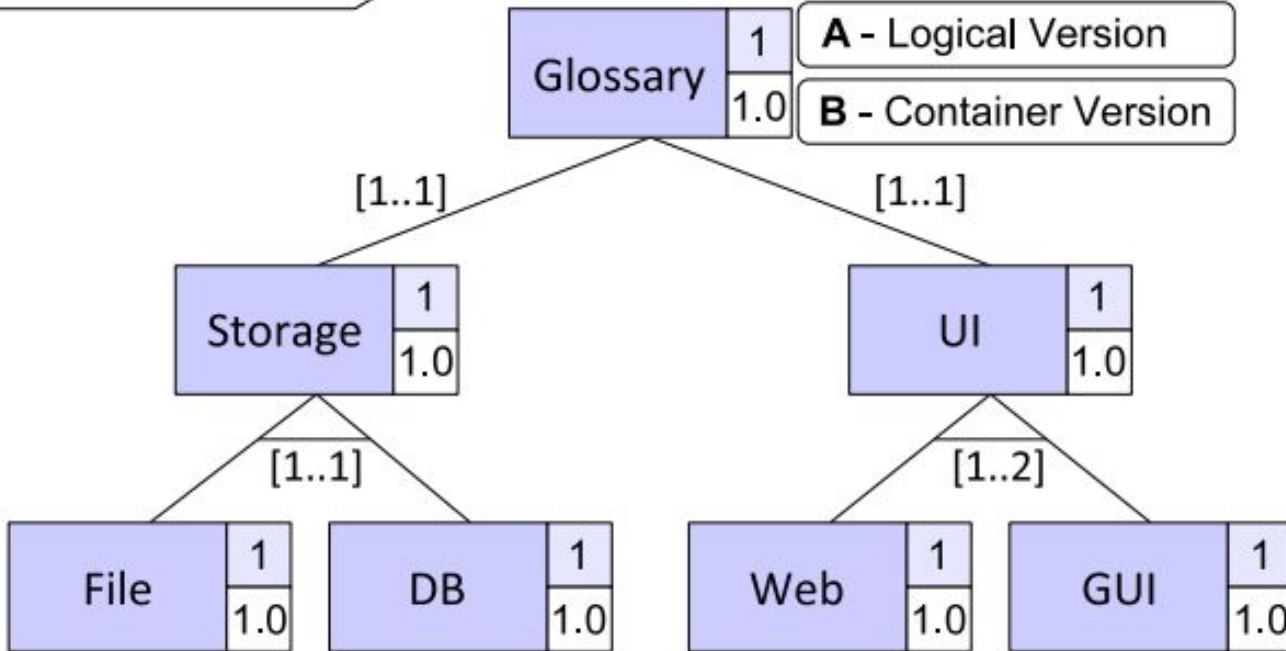
		Kang et al. 1990 [KCH+90]	Kang et al. 1998 [KKL+98]	Griss et al. 1998 [GFA98]	Hein et al. 2000 [HSVM00]	Czarnecki et al. 2000 [CE00]	Van Gurp et al. 2001 [VGBS01]	Riebisch et al. 2002 [RBSF02]	Czarnecki et al. 2002 [CBUE02]	Czarnecki et al. 2004 [CHE04]	Batory 2005 [Bat05]	Eriksson et al. 2005 [EBB05]	Benavides et al. 2005 [BTRC05]	Schobben et al. 2007 [SHTB07]	Mitschke et al. 2008 [ME08]	Bak et al. 2011 [BCW11]	Abele et al. 2010 [APS+10]	Classen et al. 2011 [CBH11]	Thüm et al. 2011 [TKES11]	Rosenmüller et al. 2011 [RSTS11]	Schroeter et al. 2012 [SLW12]	Kowal et al. 2013 [KSS13]	Acher et al. 2013 [ACLF13]	Seidl et al. 2014 [SSA14a]
Feature Modeling Notation	Mandatory Features	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Optional Features	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Feature Cardinality	-	-	-	-	-	-	0	+	+	-	-	-	+	0	+	+	+	-	-	0	-	-	0
	Attributes	-	-	+	-	-	-	0	+	+	-	-	+	-	-	+	+	+	-	-	-	-	-	-
	Feature Versions	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	+
	Layers	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-	-	+	-
	External Features	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	-	+	-	-	+	(+)
	Binding Times	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Resource Mapping	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-
	Alternative-Groups	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Or-Groups	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Group Cardinality	-	-	-	-	-	-	+	-	+	-	-	-	+	+	+	+	+	-	-	+	-	-	+
	Multiple Groups	(-)	(-)	(-)	(-)	+	+	+	+	+	-	(+)	+	(-)	(-)	+	+	(-)	-	+	(-)	(-)	(-)	+
Constraint Language	Expressiveness	R	R	R	R	O	R	O	O	-	P	R	-	P	R	P+	P	P+	P	P	R	P	P	P+
	Representation	T	T	G	G	T	G	G,T	T	-	T	G	-	T	T	T	G,T	T	T	T	G	T	T	T

R: Requires/Excludes, O: OCL, P: Propositional Logic, T: Textual, G: Graphical

Feature Versions

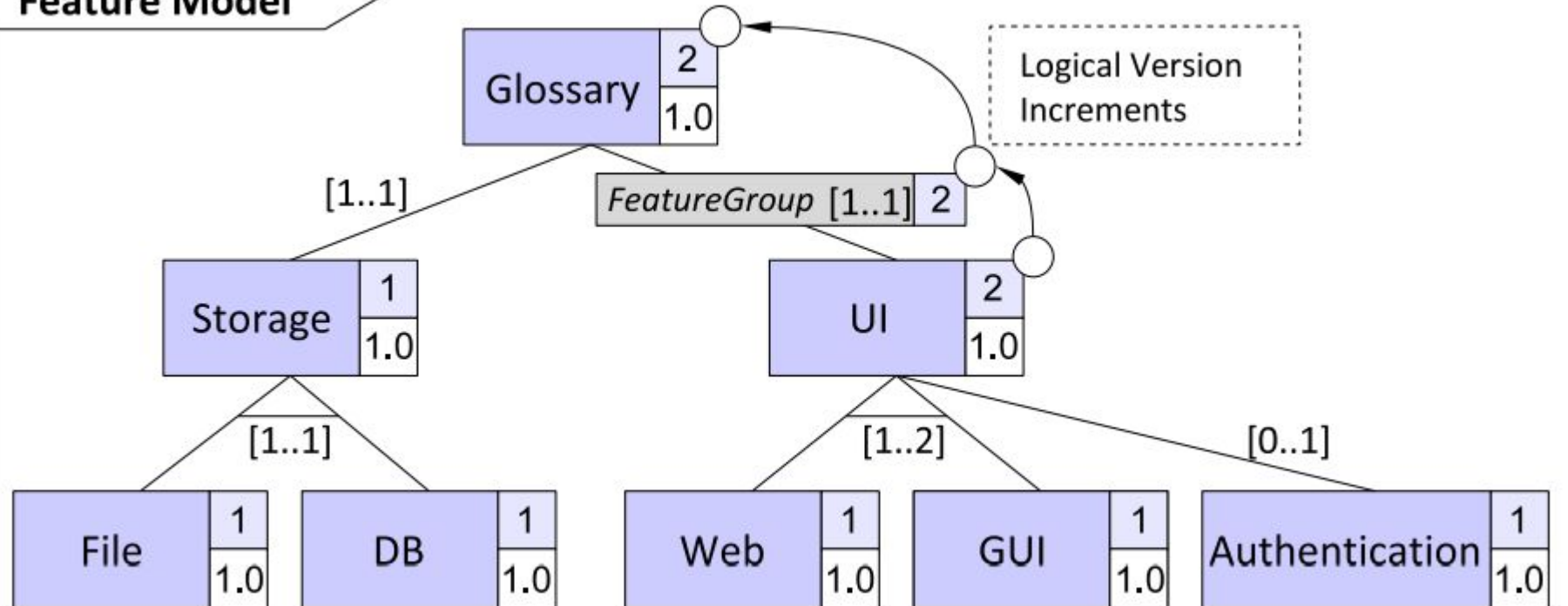
- Incluem variabilidade de tempo ;
- [Mitschke et al. 2008] suporta duas versões por *feature*, representando o estado da estrutura do *feature model* e sua implementação associada.
 - Faz com que a versão de uma *feature* mude logicamente, se uma *feature* filha for adicionada, removida ou mudada.
- [Seidl et al. 2014] permite especificação de multiplas *feature versions* com interdependencias.

Feature Model

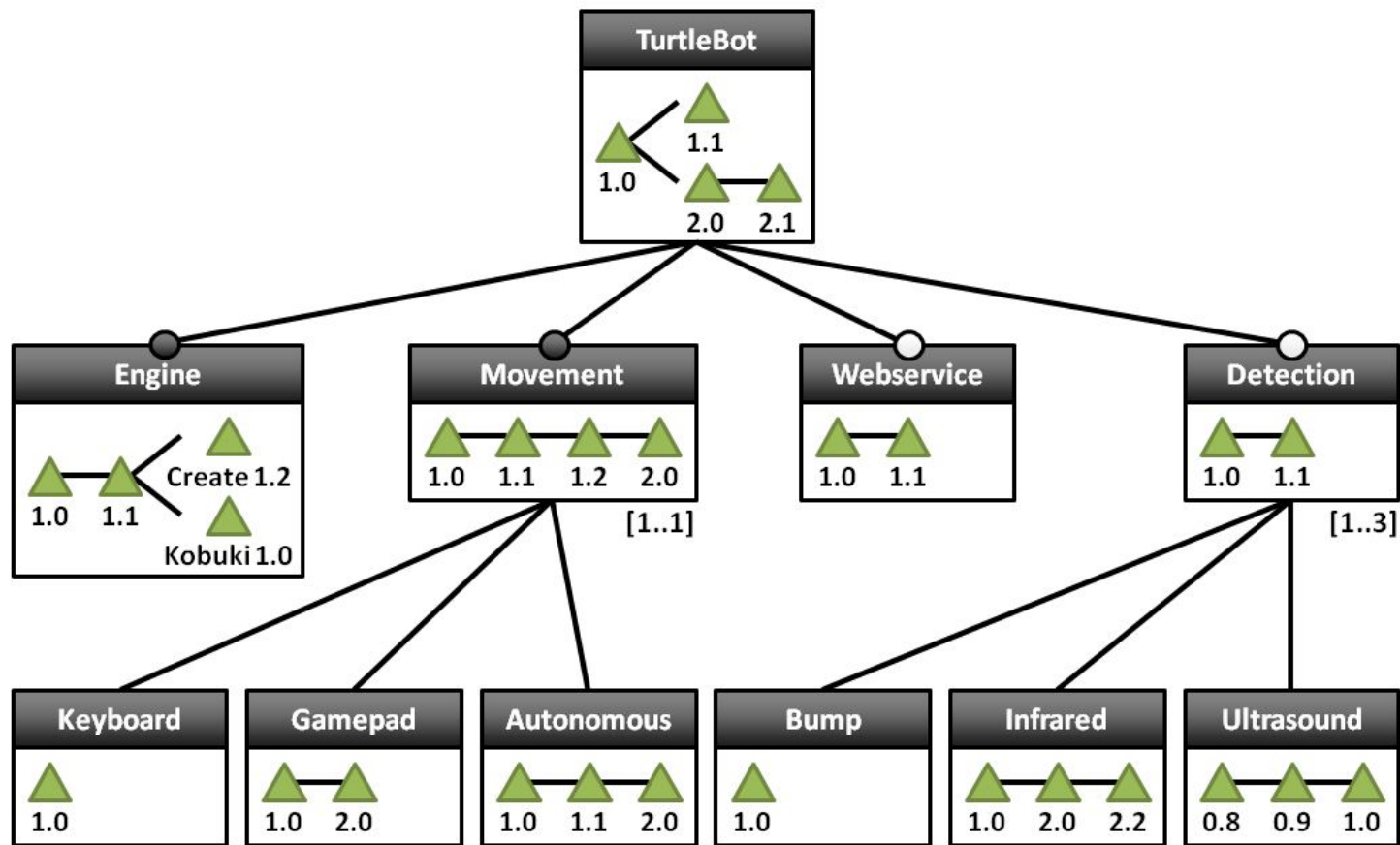


Feature Versions[Mitschke et al. 2008]

Feature Model



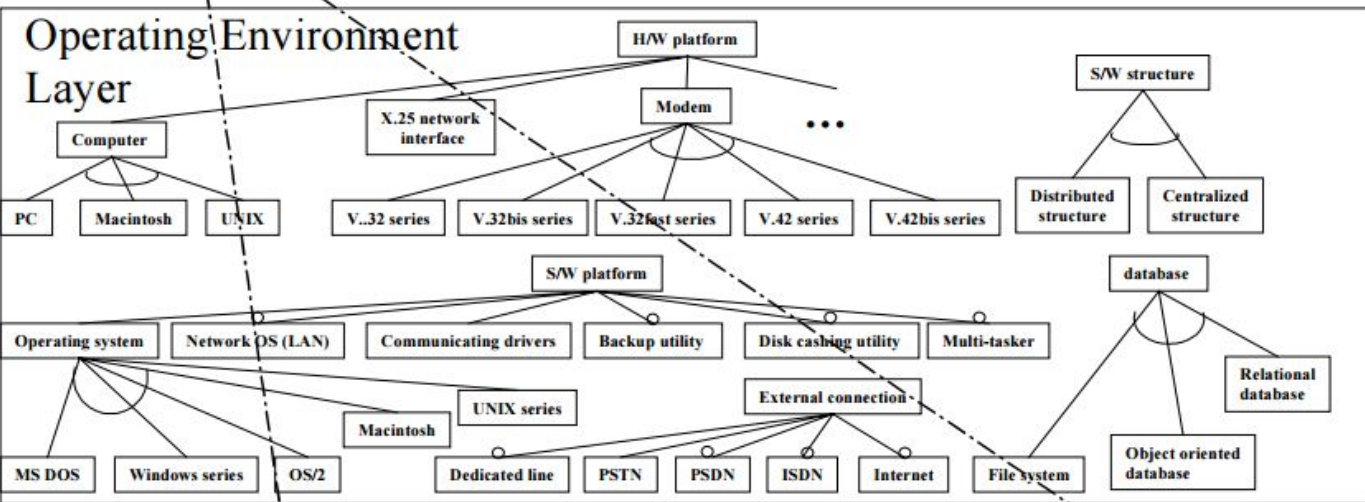
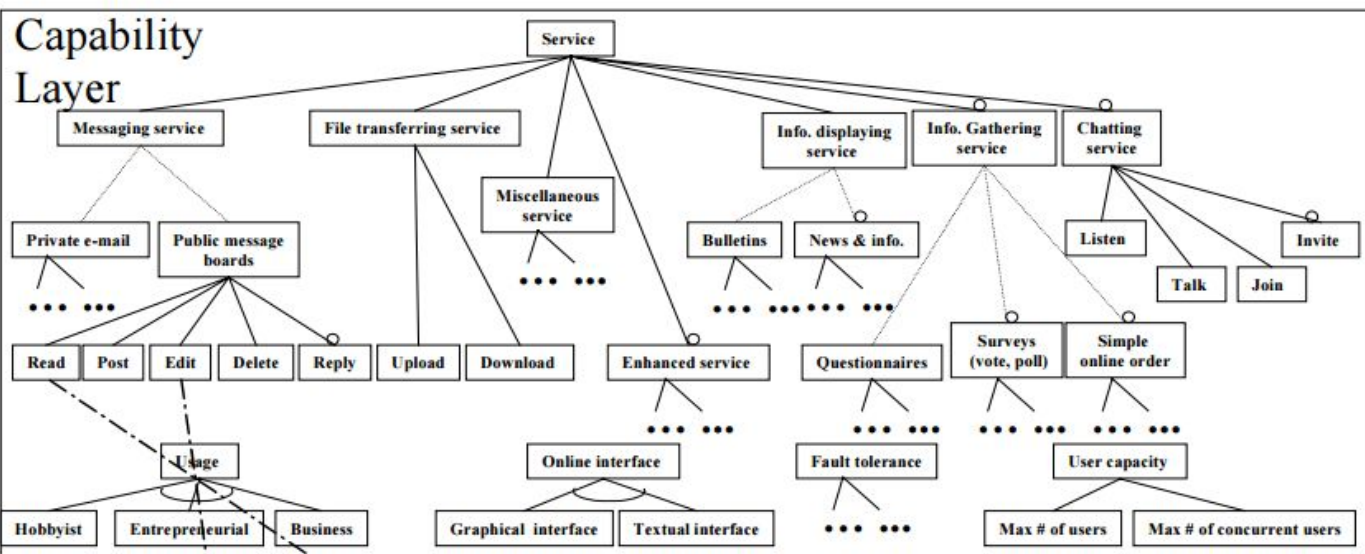
Feature Versions[Mitschke et al. 2008]



[Seidl et al. 2014]

Layers (Camadas)

- Fornece uma separação de interesses para diferentes fontes de variabilidade.
- [Kang et al. 1998] utiliza layers para: *Capability, Operating Environment, Domain Technology and Implementation Technique*.
- Cada layer pode conter um conjunto de *feature models* separados com relações com *feature models* de outras layers.
- Isso aumenta o reuso de um *feature model* e da suporte a escalabilidade.



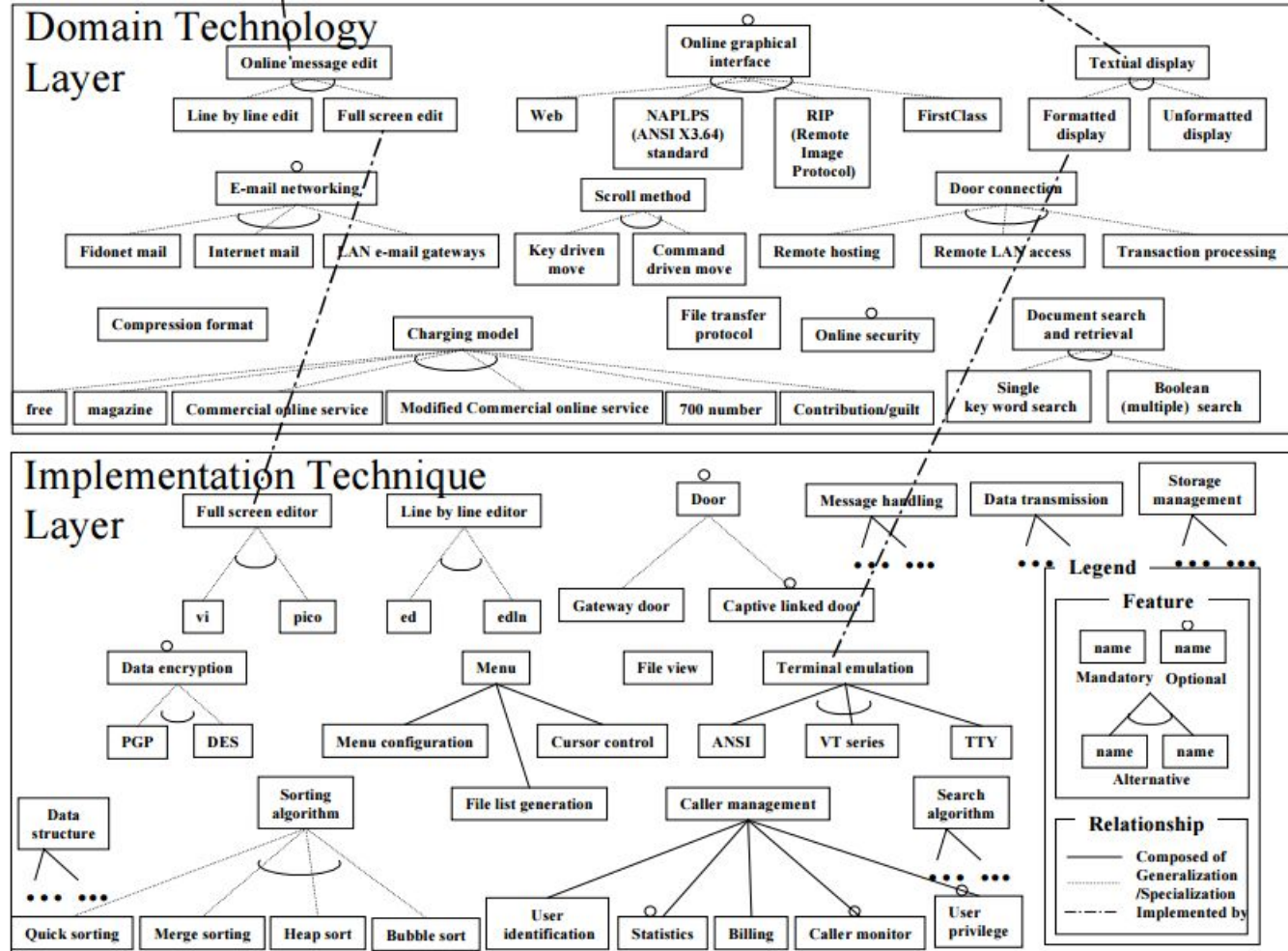


Figure 3-2: The Feature Model of EBBS Domain.

Mapeamento de recursos

- Permite associação de vários recursos com *features*;
- [Schroeter et al. 2012] fornece um mapeamento de *features* para *views*, que exhibe apenas as partes desejadas de um *feature model*.
- [Kowal et al. 2013] mapeia as prioridades para a configuração e especificação de hardware.

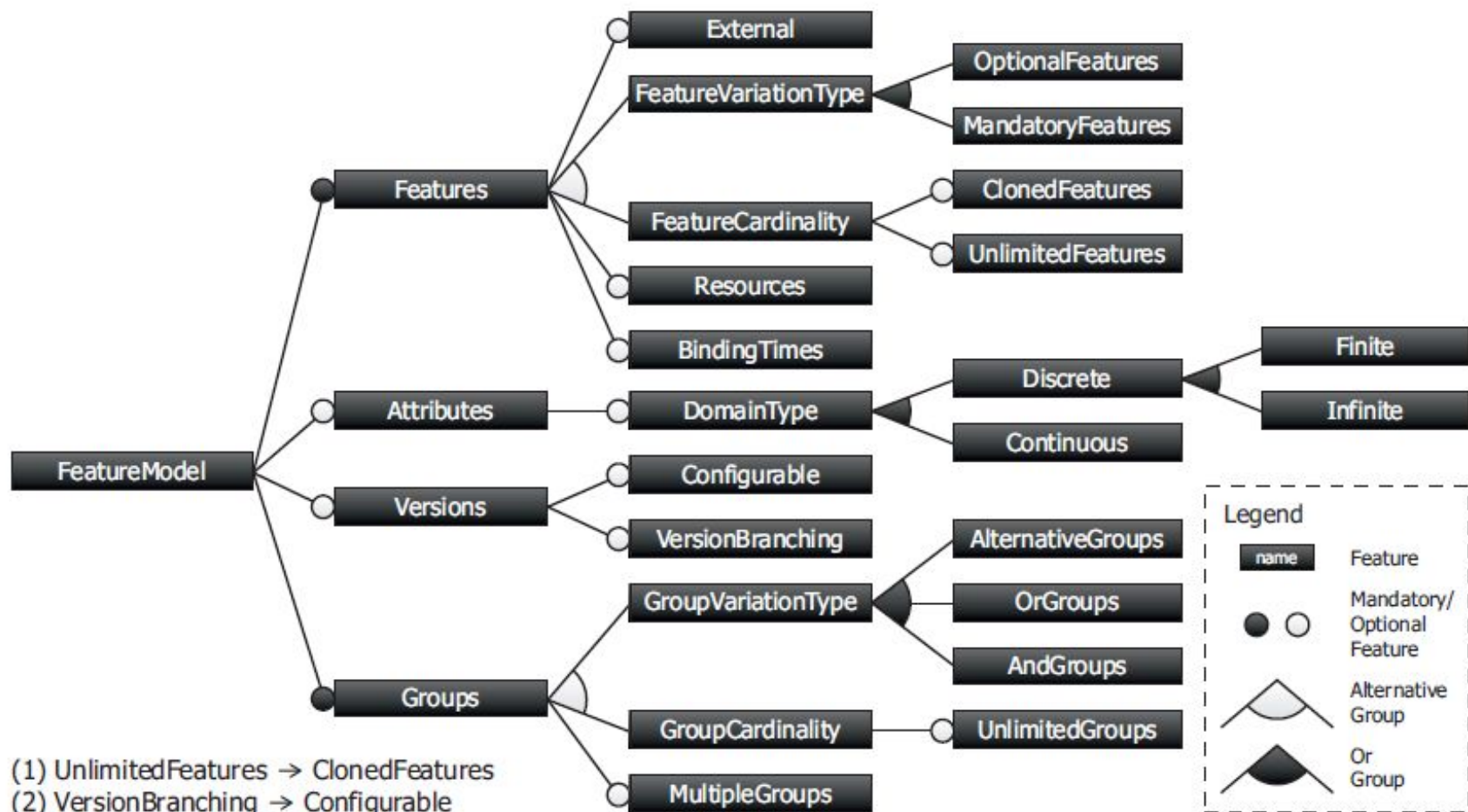
Expressiveness (Expressividade)

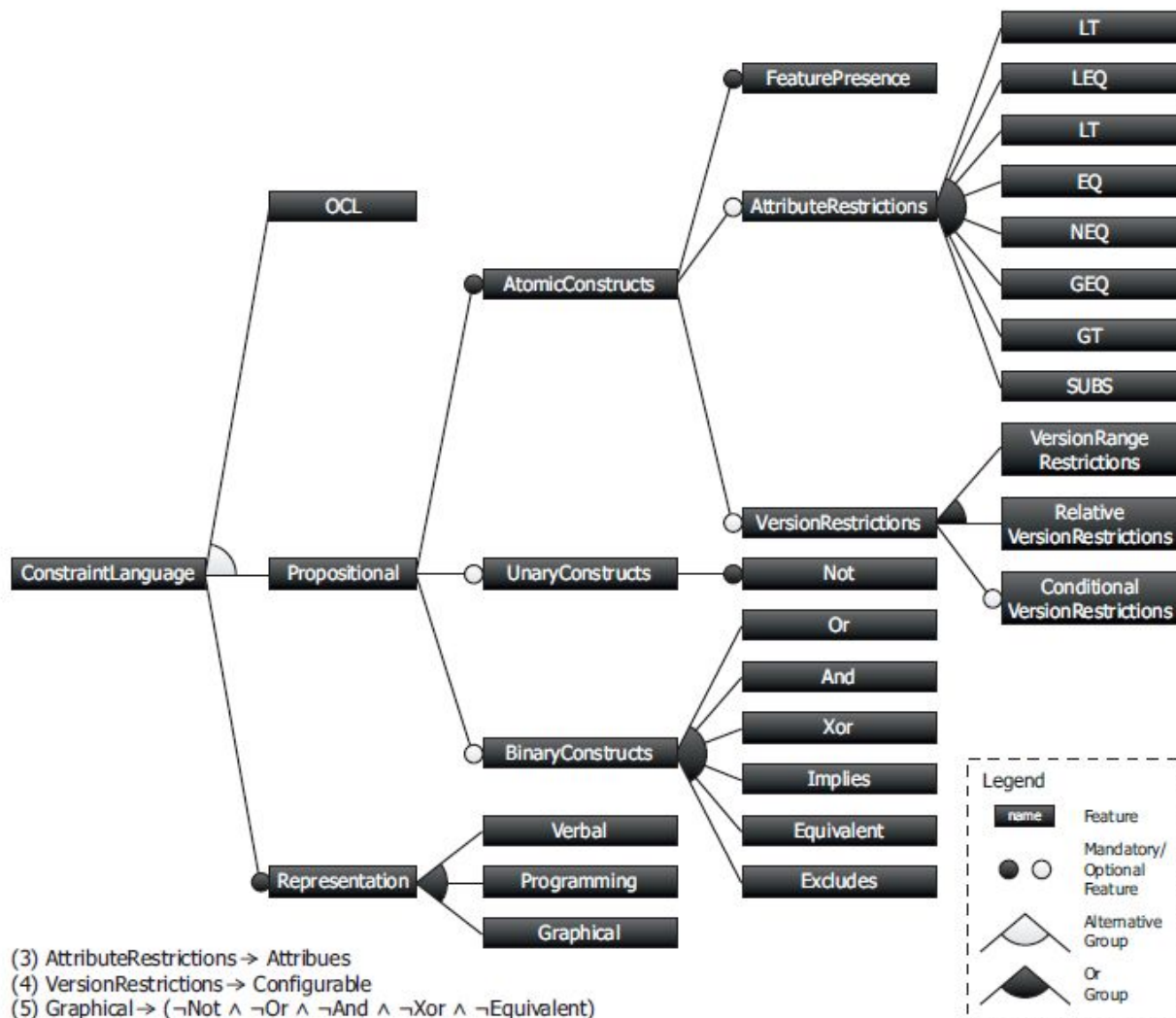
- Determina o formalismo aplicado a cada notação.
 - R - usa *requires* e *excludes*; - [**Kang et al. 1990**, Griss et al. 1998, Hein et al. 2000, **van Gurp et al. 2001**, Eriksson et al. 2005, Schroeter et al. 2012].
 - O - Linguagem para especificação de restrições (OCL) - [**Czarnecki e Eisenecker 2000**, **Czarnecki et al. 2002**].
 - P - Lógica Proposicional - [Kowal et al. 2013 , Seidl et al. 2014].
 - P+ - Outras linguagens de construção especiais. - [Karatas et al. 2010]

Representação

- Gráfica ou textual
- Representação gráfica pode usar bordas adicionais entre as features para expressar *requires* ou *exclude*.
- Representações textuais geralmente são mais formais.

Feature Modeling Family





- (3) AttributeRestrictions → Attributes
 (4) VersionRestrictions → Configurable
 (5) Graphical → $(\neg \text{Not} \wedge \neg \text{Or} \wedge \neg \text{And} \wedge \neg \text{Xor} \wedge \neg \text{Equivalent})$

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