A Comparison of Ecore and GOPPRR through an Information System Meta Modeling Approach

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First Workshop on Graphical Modeling Language Development

ECMFA
European Conference on Modelling Foundations and Applications

Agenda

- **Motives and Goals**
- **Modeling concepts comparison**
- **Ease of use**
- **Further research**
- **Conclusion**

Motives and Goals

- *Integrated Information Systems CASE Tool* (**IIS*Case**)
  - Model driven software tool that provides generation of executable application prototypes
  - Provides the generation of database schemas and fully operational application prototypes
  - We have created a number of modeling, meta-level concepts and formal rules that are used in the design process
    - in order to provide design of various platform independent models (PIM) by IIS*Case

Motives and Goals

- **Current research**
  - IIS*CDesLang
    - textual DSL
    - developed using attribute grammars
    - formalization of PIM concepts
      - modeling in a formal way
    - formal correctness and semantical analysis of models

Motives and Goals

- **Current research**
  - MOF approach
    - Ecore
      - Eclipse's implementation of MOF
    - specification of PIM concepts
    - developing textual DSL
  - MetaEdit+ approach
    - GOPPRR
    - specification of PIM concepts
    - developing graphical DSL

Motives and Goals

- **Main research goals**
  - Comparison of Ecore and GOPPRR
    - concepts used
    - ease of use
  - Basis for the better understanding of the meta-languages
    - further development of textual and graphical DSLs

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Modeling concepts comparison

Concept		Ecore	GOPPRR
Main concepts	**Class**	*EClass*	*Object*
	Relationship	*EReference*	Relationship
	Role	-	*Role*
	Port	-	*Port*
	Grouping	*EPackage*	*Graph*
	Atrribute	*EAttribute*	*Property*

Modeling concepts comparison

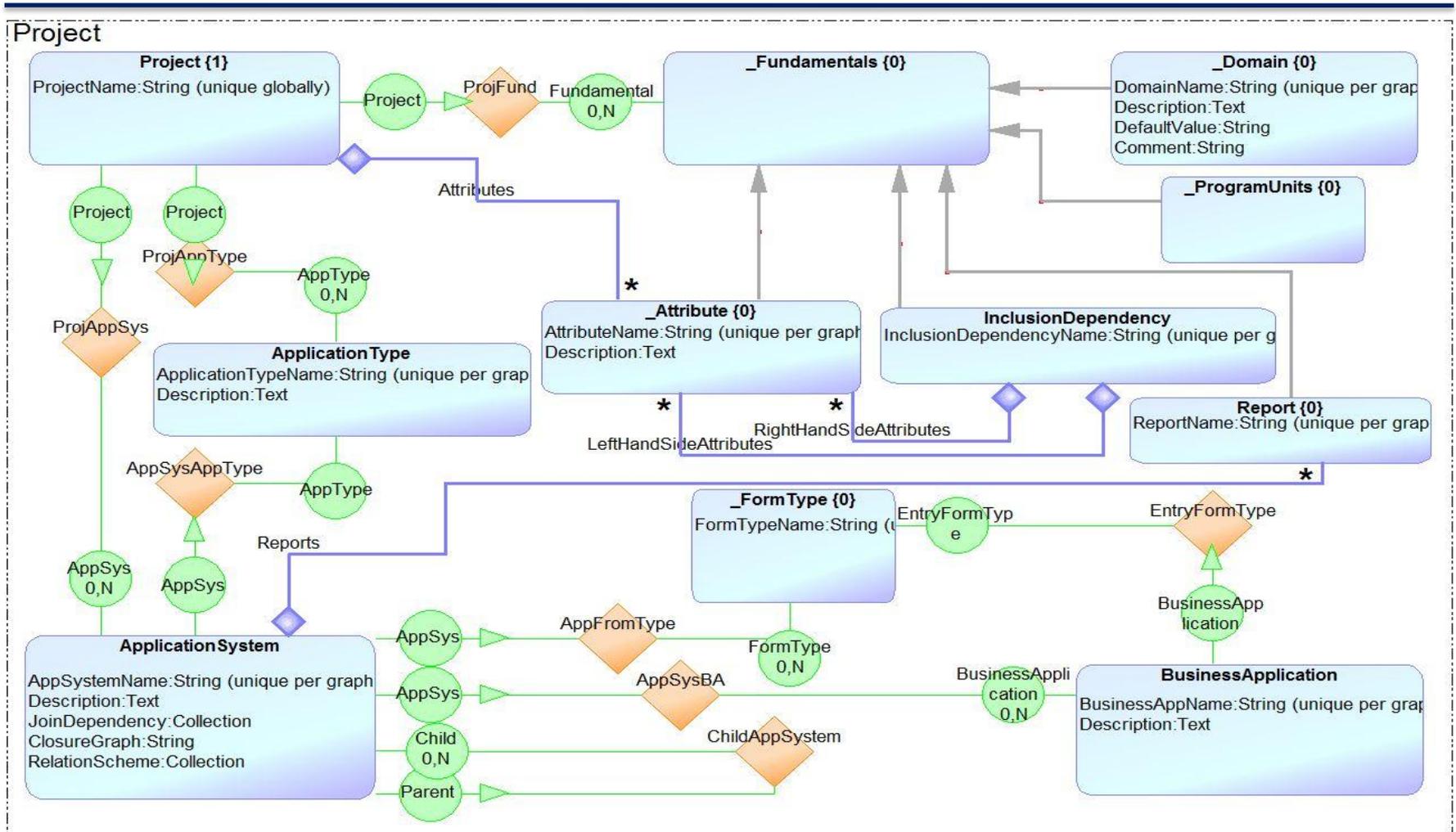|	Concept	Ecore	GOPPRR
Relationship concepts	**Arity**	*binary*	*n-ary*
	Cardinality	*(lower, upper)*	*-* *(may be specified in a role)*
	Dependency	*EClass*	*Project*
	Attributes	*no*	*yes*
	Inheritance	*multiple*	*single*
	Inheritable	*EClass*	*Object, Relationship, Role, Port, Graph*

Modeling concepts comparison

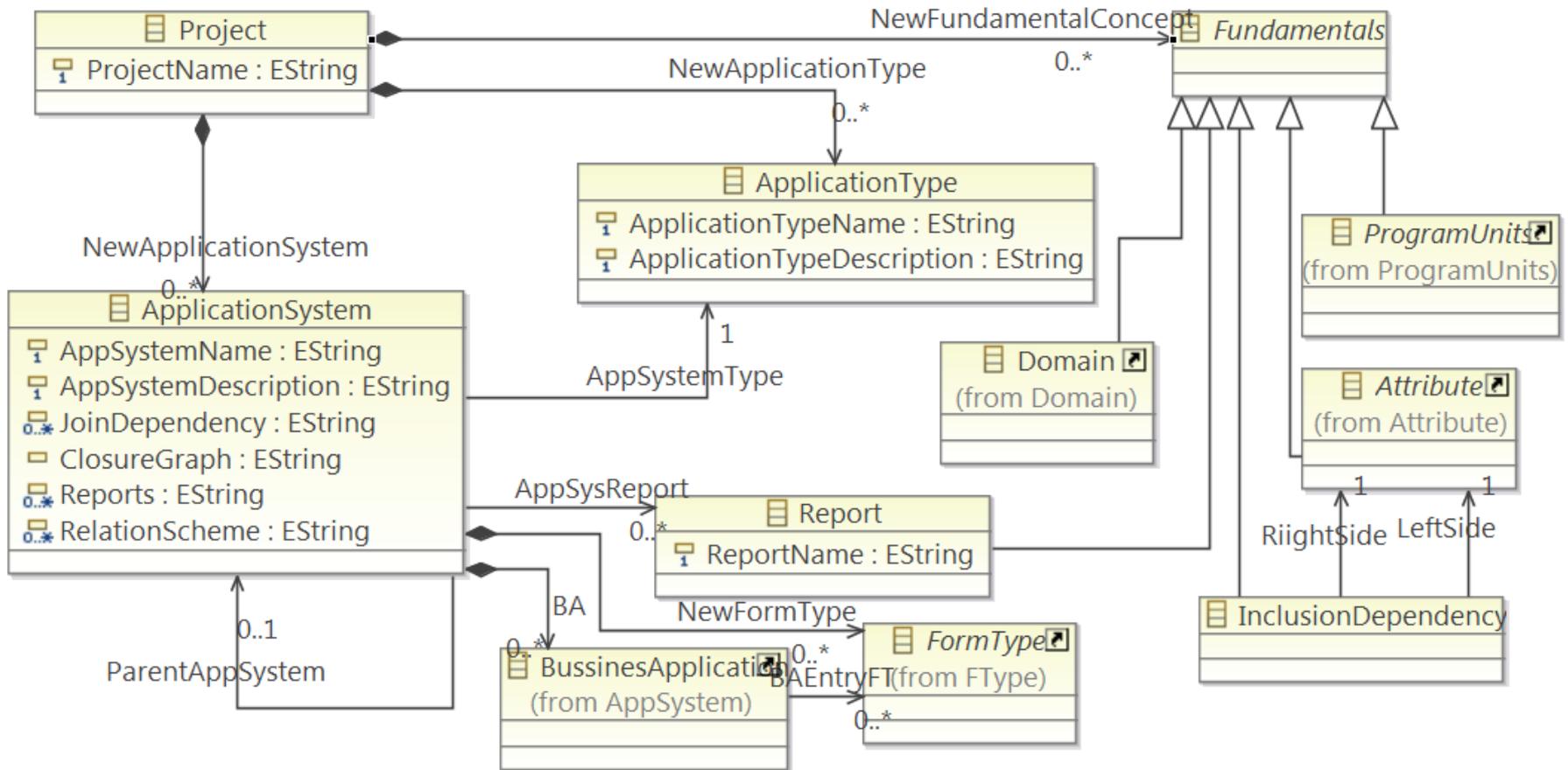|	Concept	Ecore	GOPPRR
Attribute concepts	**Concept as an attribute**	*EClass*	*Object, Relationship, Role, Port, Graph*
	Cardinality	*(lower, upper)*	-
	Value pattern	*no*	*yes*
	Dependency	*EClass*	*Project*

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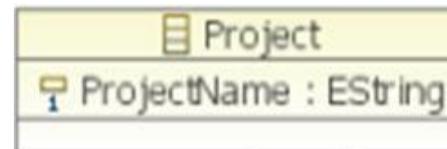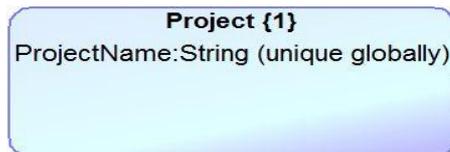- **Further research**
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Ease of use

Ease of use

Ease of use

- Restricting meta-concept's **number of instances** in a model
  - GOPPRR allows the definition of object's possible instances number
    - *{0}, {1}* and *{N}*
  - Ecore does not have this option
    - possible solution – use of OCL

Project {1}
ProjectName:String (unique globally)

Project
ProjectName : EString
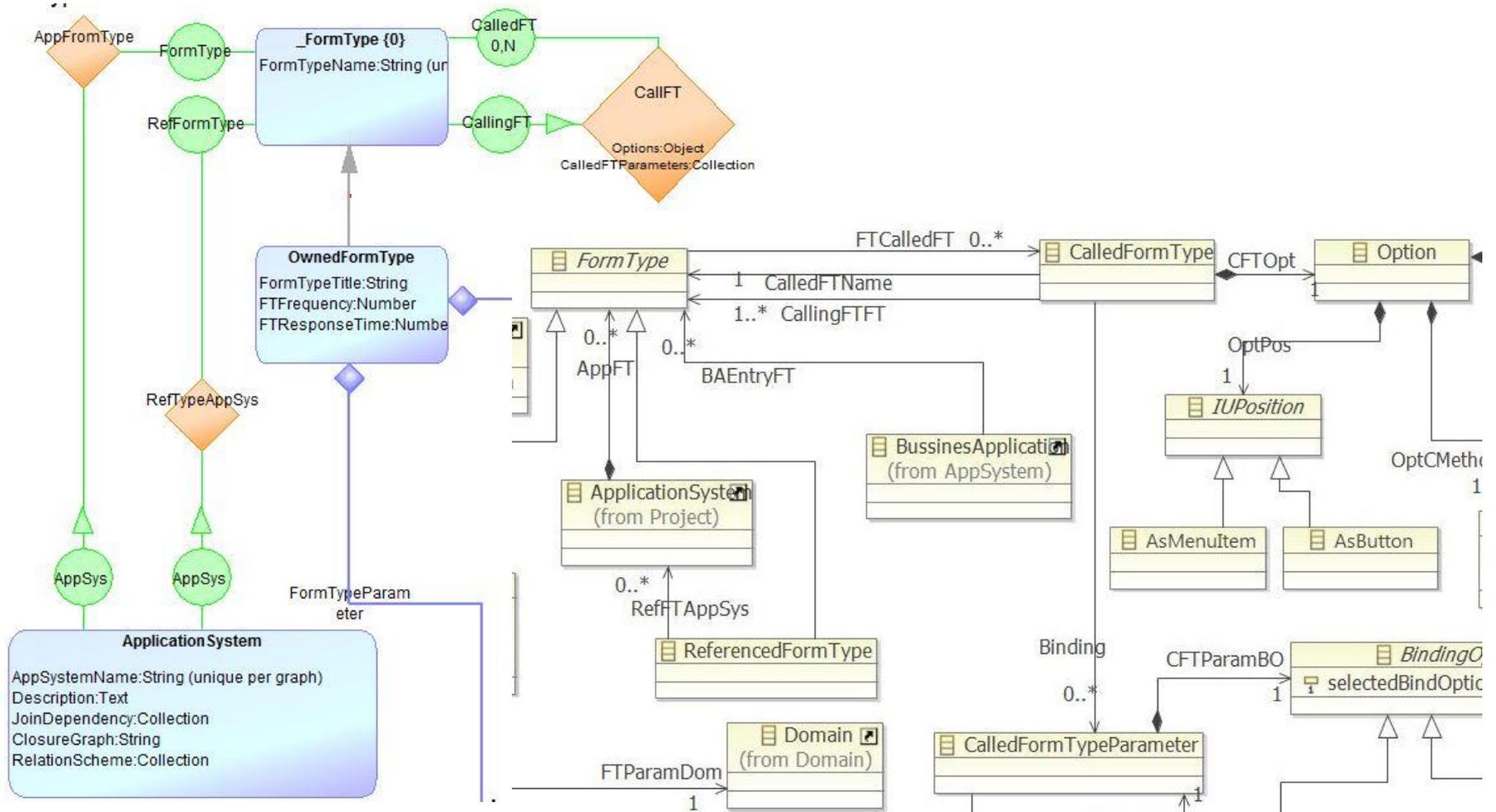
Ease of use

- **Mandatory properties**
  - GOPPRR has regular expressions
    - powerful mechanism
      - value patterns
    - experienced users
    - „.+" for mandatory property
  - Ecore has cardinalities
    - easy specification of mandatory properties
    - has an upper bound

Ease of use

- **Relationship attributes**
  - One of the main advantages of GOPPRR
  - *Referenced form type* modeled in both meta-languages
    - *CallFT* vs several EClasses

Ease of use

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Further research

- **Some ideas/goals**
  - Code generator
    - import the code into IIS*Case
  - Mapping between the meta-models using GOPPRR and Ecore specification
    - development of our own bridge
    - using *EMF-MetaEdit+-Bridge*
    - transformations between models in EMF
      - *Epsilon* or *Xpand*
  - Textual and visual editors
    - over the same IIS*Case repository

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Conclusion

- **Ecore**
  - EMF only for abstract syntax development
  - De facto standard
  - XMI
- **GOPPRR**
  - MetaEdit+ environment for graphical DSL creation
  - More expressive power
  - Easily extensible graphical representation

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End of presentation

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