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University of Antwerp

An Overview of EMF/GMF Tool in Eclipse IDE

Presented by-

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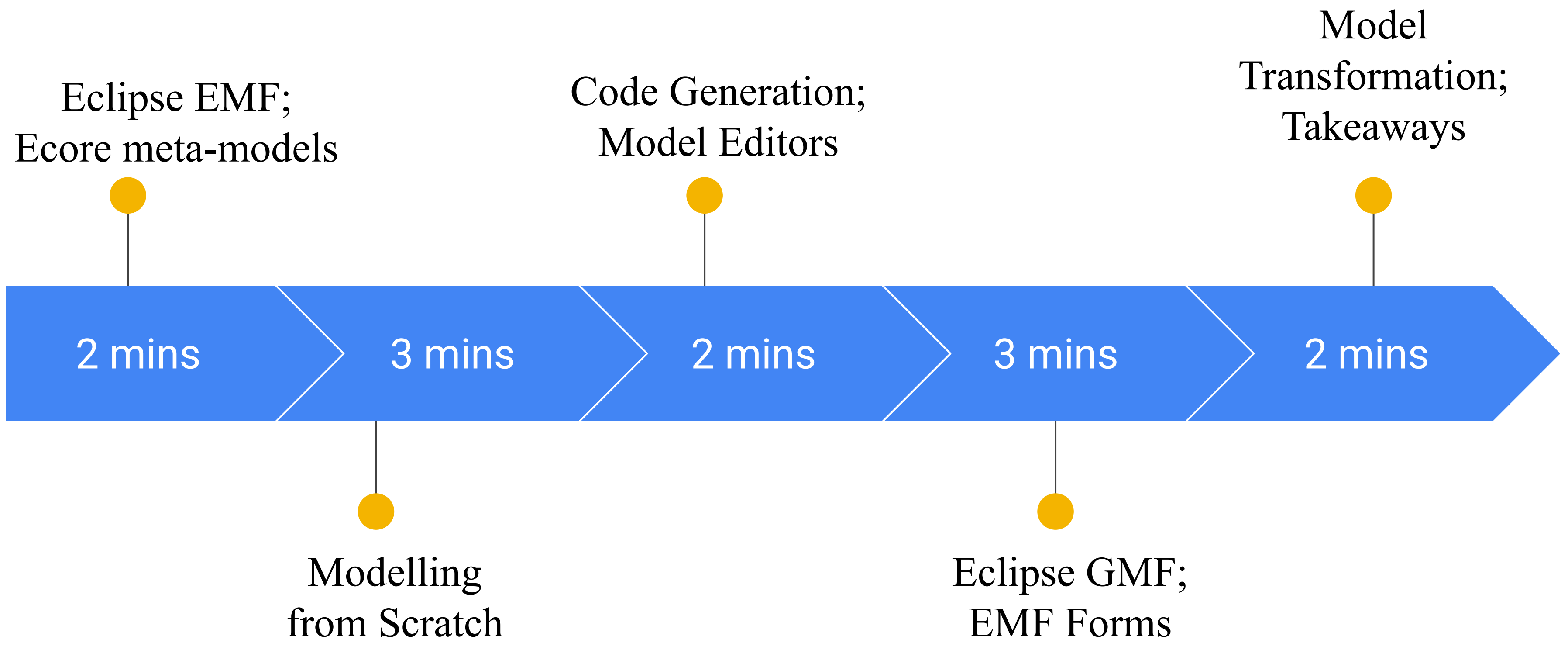
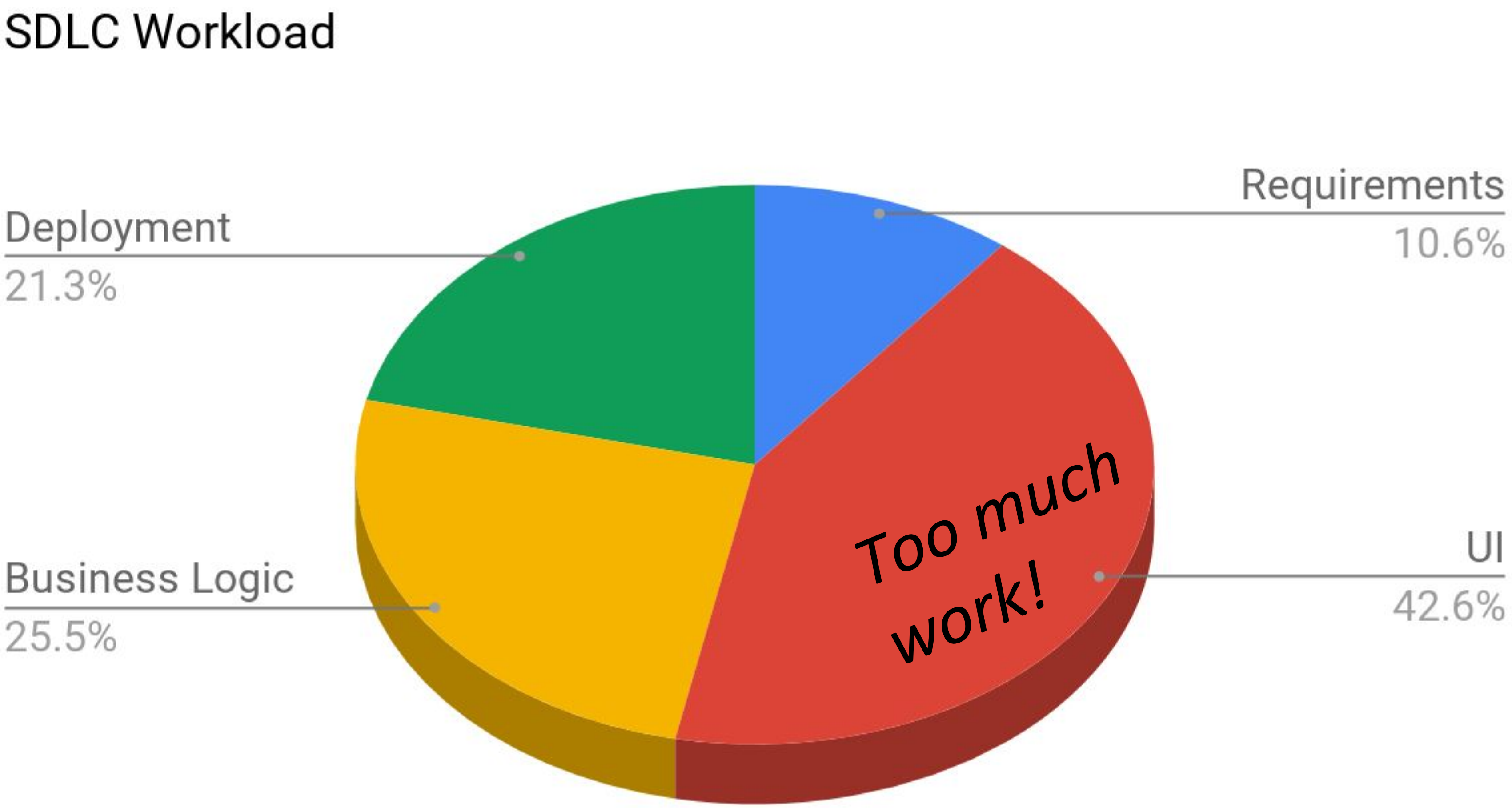
The Next 15’


Eclipse EMF;
Ecore meta-models
2 mins
3 mins
Modelling
from Scratch
Code Generation;
Model Editors
2 mins
3 mins
Eclipse GMF;
EMF Forms
Model
Transformation;
Takeaways
2 mins



"Developing business web applications with form-based UIs". Maximillian Koegel, Eclipsecon2017.

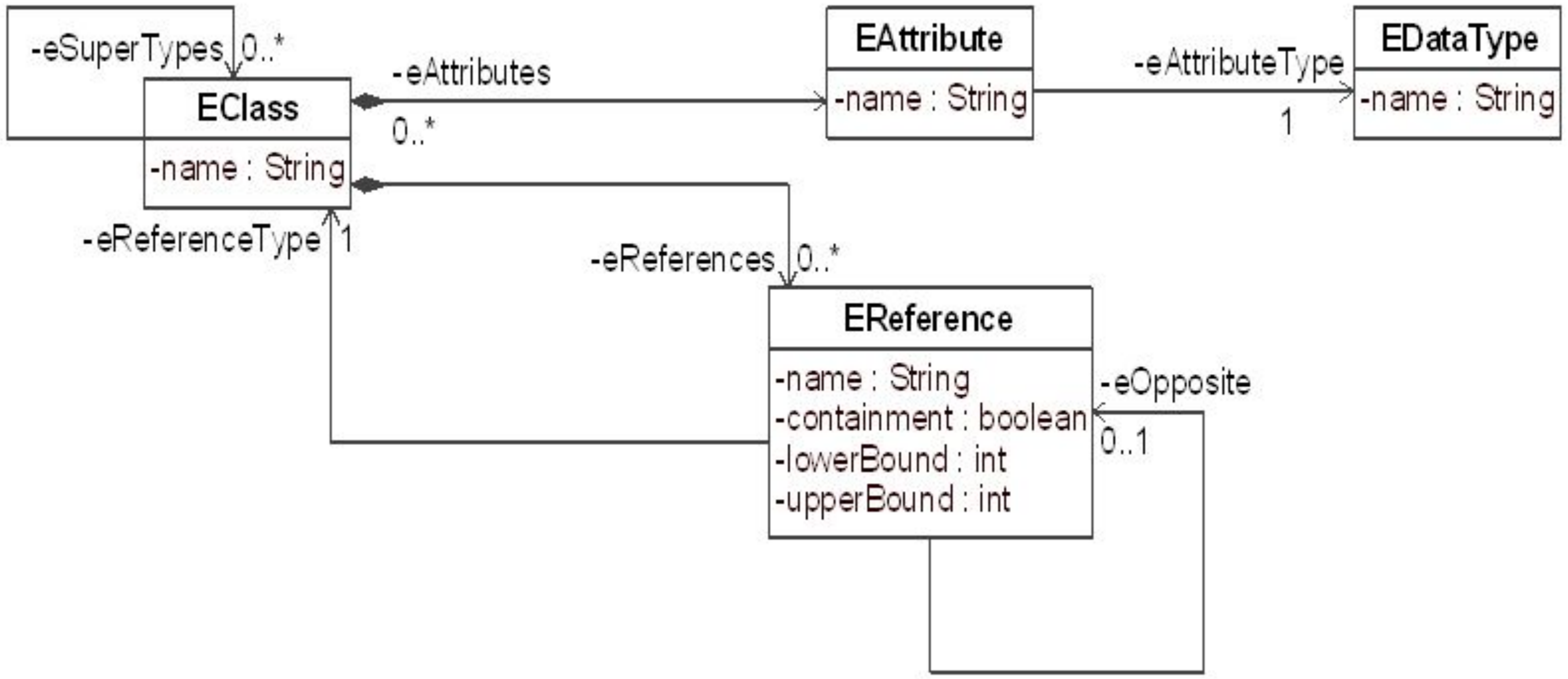
Statistics show that a lot of effort is spent in designing UI. So, can we optimize the upfront time in building UI from scratch?

What is Eclipse EMF/GMF in a nutshell

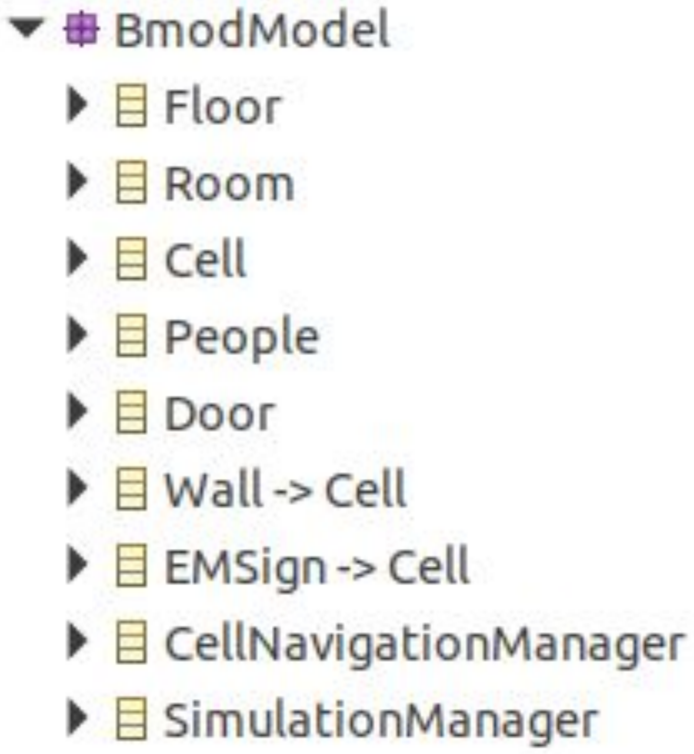
A modelling and UI integration framework.
Simple and pragmatic.

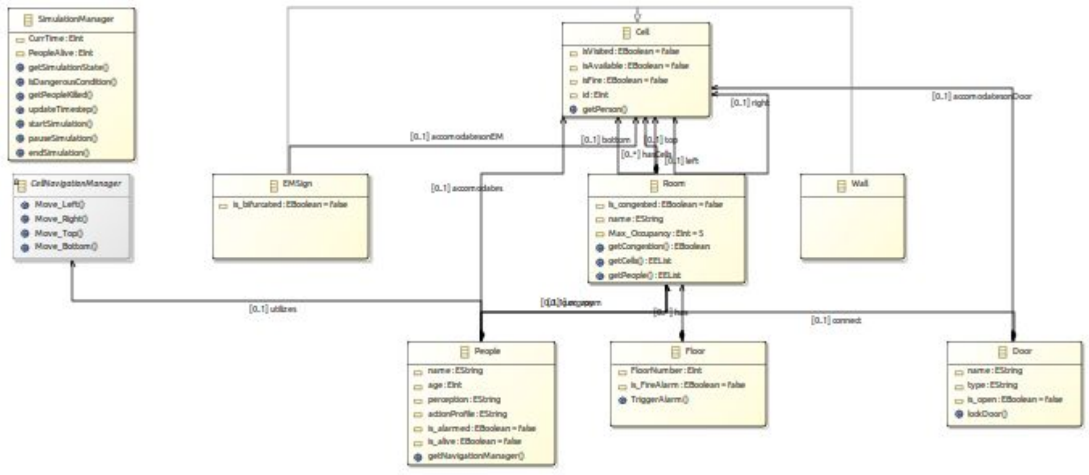
- Ecore meta-models
- Reflective APIs
- Code Generation
- Form-based UIs

The Ecore meta-modelling language



Property-driven vs Visual Editors?

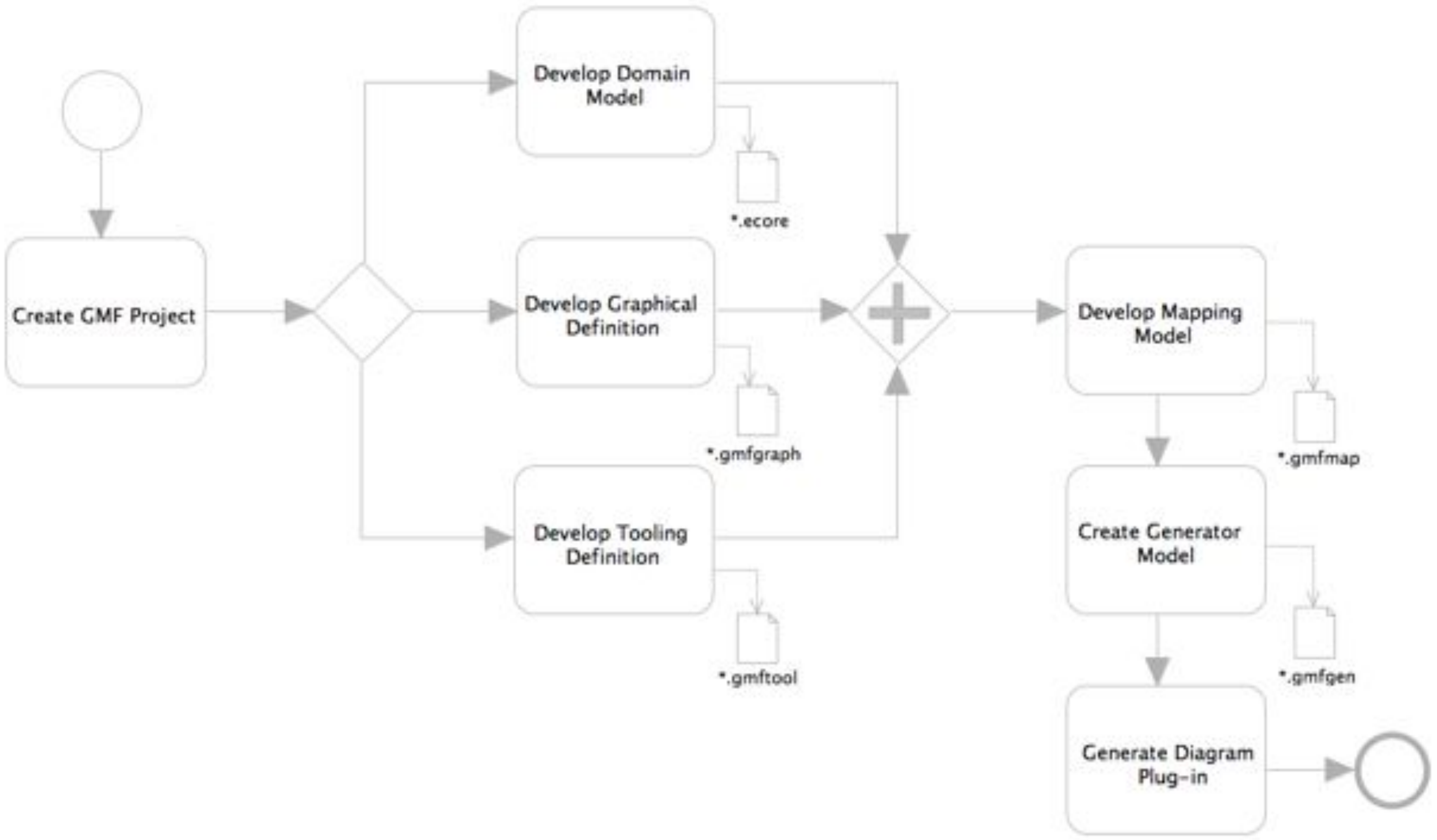

- BmodModel
  - Floor
  - Room
  - Cell
  - People
  - Door
  - Wall -> Cell
  - EMSign -> Cell
  - CellNavigationManager
  - SimulationManager



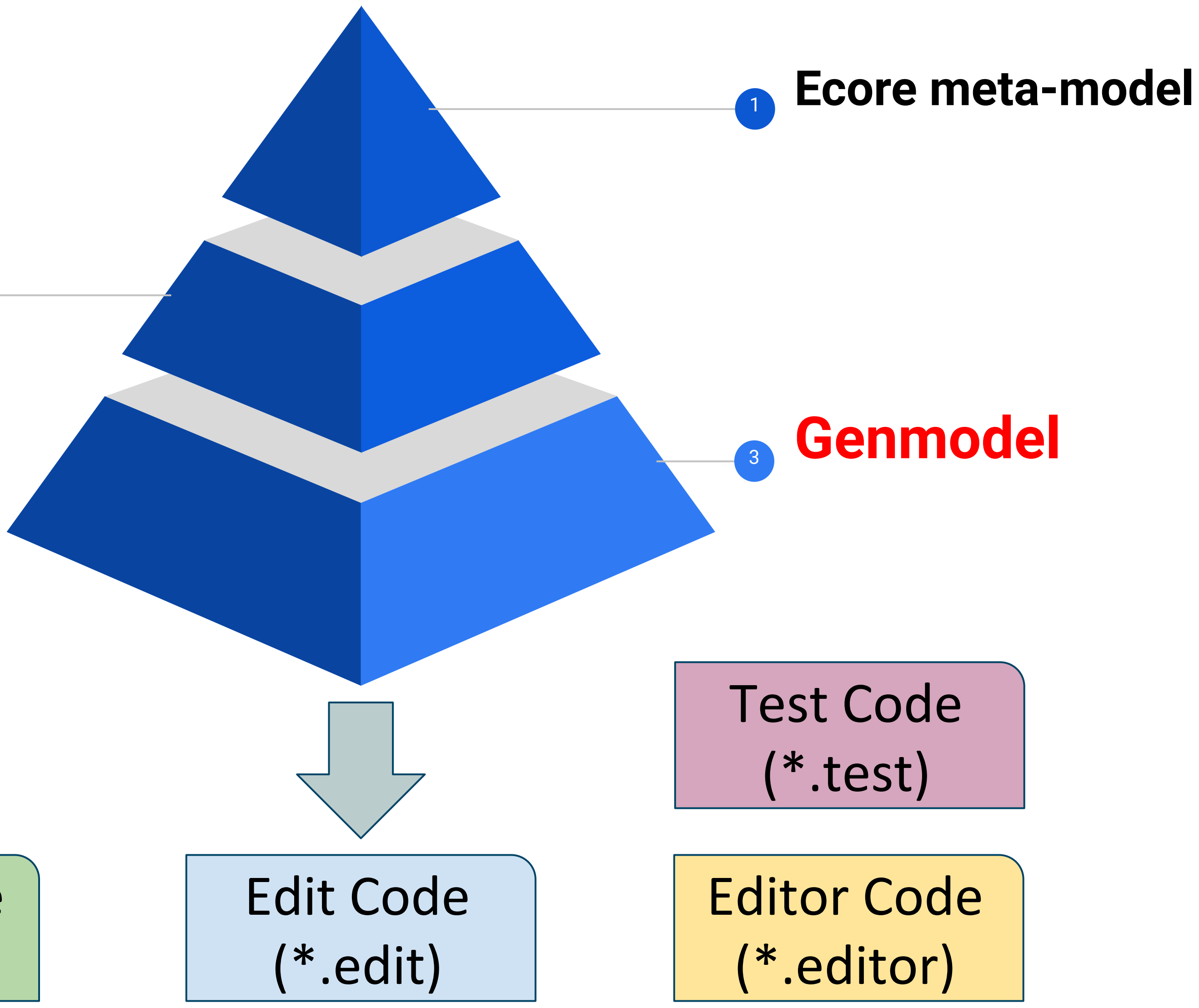
The choice is yours!

Different views, but format is persistent (XSD/XMI).
Easily exportable.

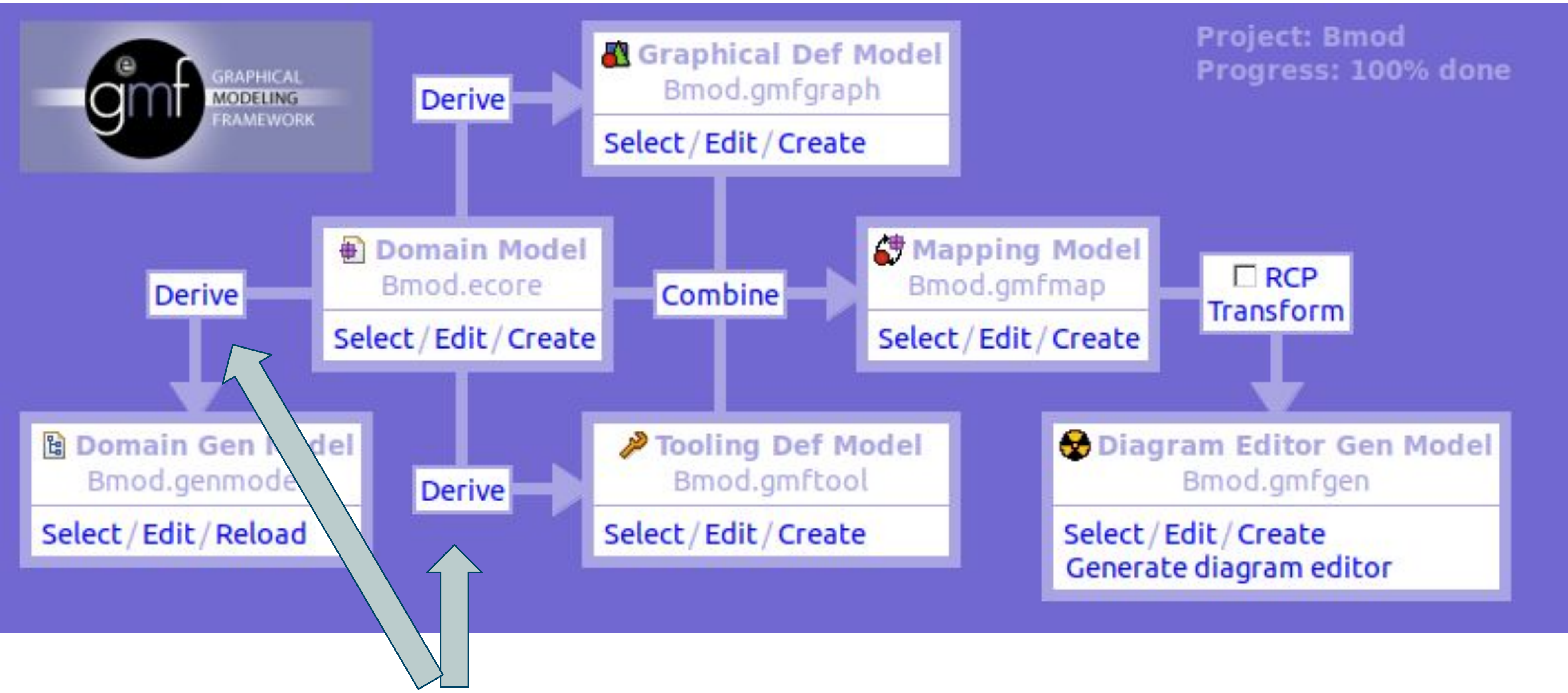
EMF/GMF Modelling Workflow



Code Generation

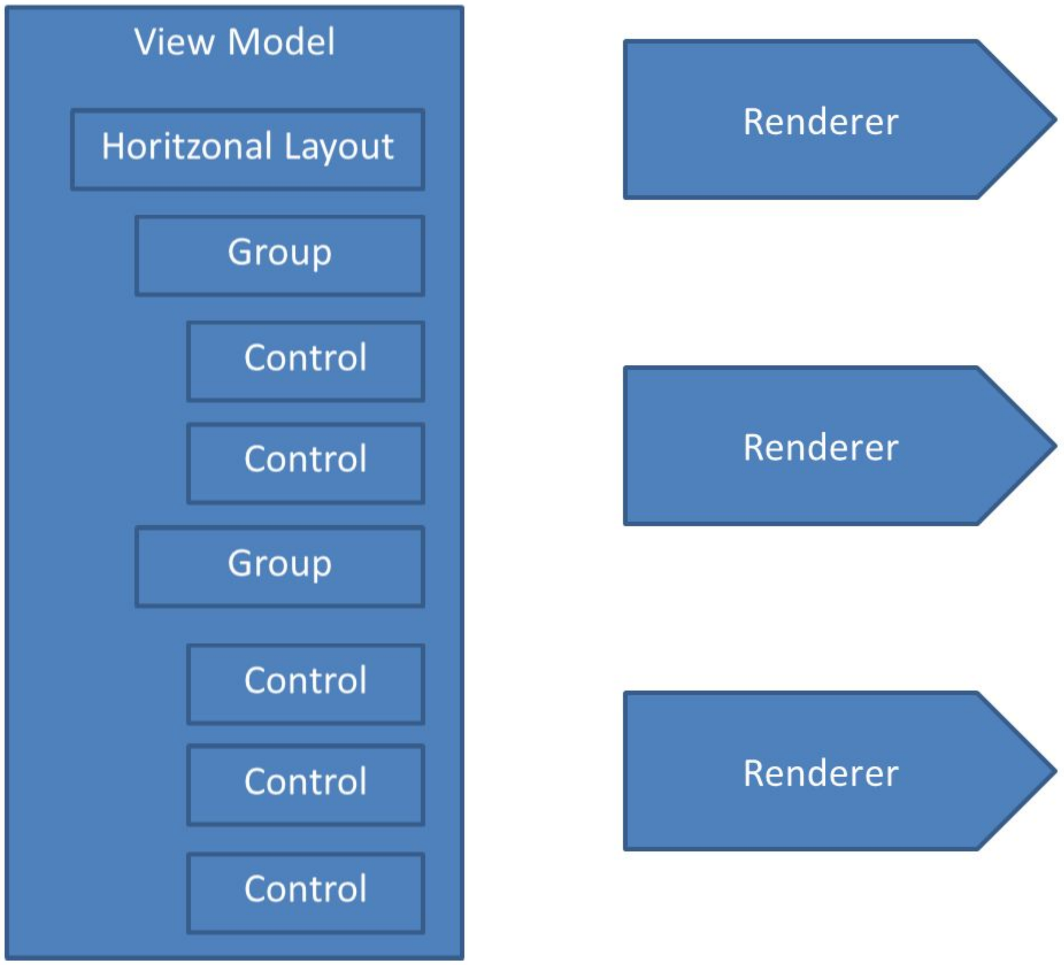


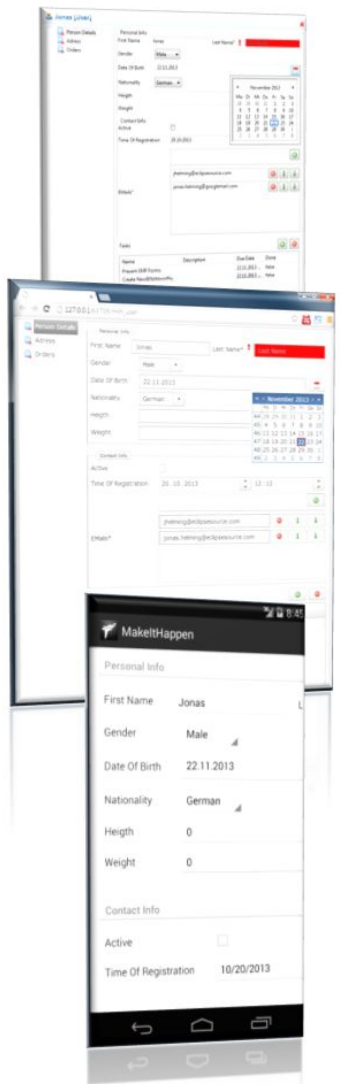
GMF Dashboard



Code generation is entirely automated.
We only need one ***Domain model*** to generate the rest.

Model-based UIs → EMF Forms





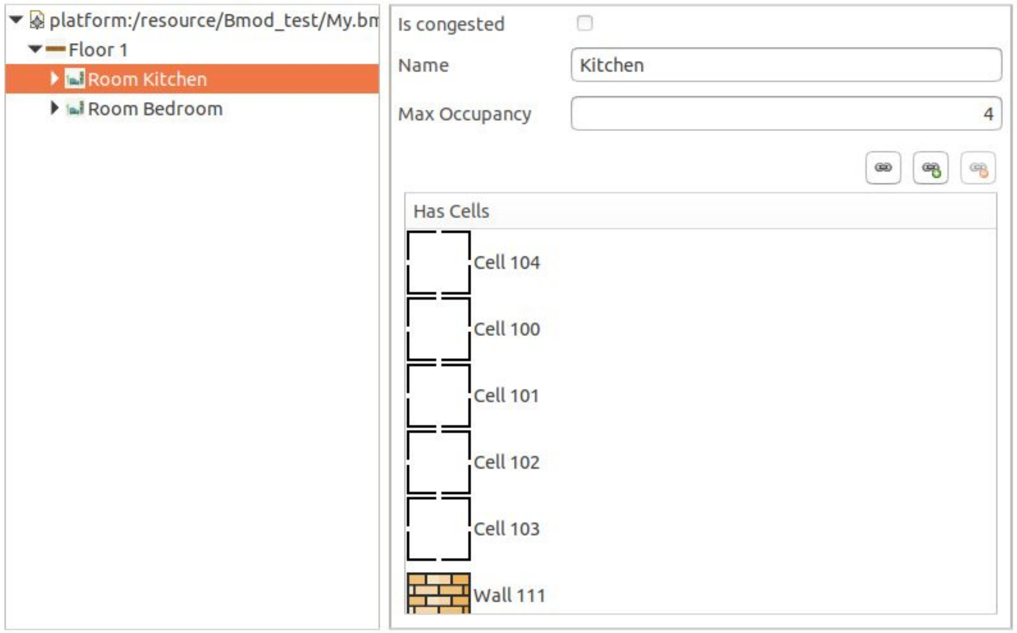
Personal Info

First Name	Jonas
Gender	Male
Date Of Birth	22.11.2013
Nationality	German
Heigth	0
Weight	0

Contact Info

Active	
Time Of Registration	10/20/2013

“Getting started with EMF forms”. Eclipse Source.

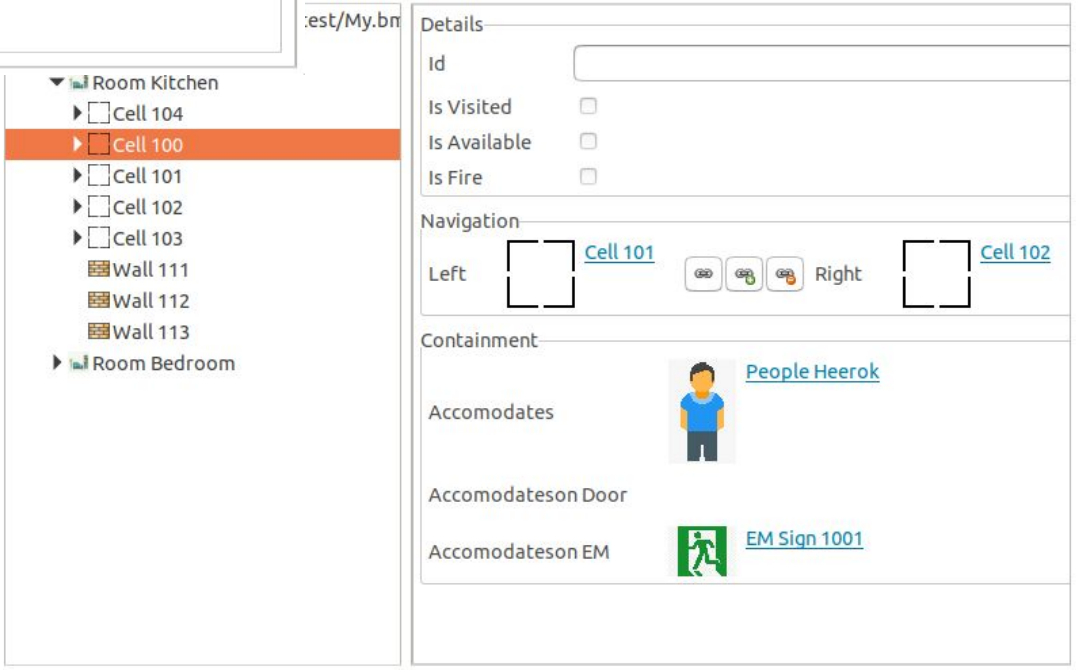

platform:/resource/Bmod_test/My.bm
Floor 1
Room Kitchen
Room Bedroom

Is congested	☐
Name	Kitchen
Max Occupancy	4

Has Cells
Cell 104
Cell 100
Cell 101
Cell 102
Cell 103
Wall 111

Examples

- Basic CRUD implementation for attributes.


est/My.bm
Room Kitchen
Cell 104
Cell 100
Cell 101
Cell 102
Cell 103
Wall 111
Wall 112
Wall 113
Room Bedroom

Details

Id	
Is Visited	☐
Is Available	☐
Is Fire	☐

Navigation
Left Cell 101 Right Cell 102

Containment

Accomodates	People Heerok
Accomodateson Door	
Accomodateson EM	EM Sign 1001

- Embedded forms to support dynamic changes.

Model Transformation

Tool/Framework	Transformation	Remarks
Eclipse EMF/ GMF	ATL MMT	declarative-imperative language
Eclipse Graphiti	-	Diagram updates from model changes
AToMPM	MoTIF	Rule-based; visual
Sirius	Acceleo/ATL	Uses underlying GMF impl.
MetaDepth	ETL	Declarative language for MMT
Xtext	ATL	by exporting to ecore models

Model Transformation (contd.)

Endogeneous transformations are not supported.
Source and Target models must be distinct.

"model-to-model Transformation with ATL". Fredric Jouault et. all, Eclipsecon 2008.

Diagram Refactoring can be employed to make minor changes in existing models.

ATL transformation for notation to notation. However, semantics is lost!

Key Takeaways

- Eclipse EMF provides tools to build domain models and DSL model editors.
- Eclipse EMF/GMF reduces upfront effort for code generation and UI implementation.
- Model transformation is tricky in graphical editors, but achievable.
- With great power, comes greater inconvenience.

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