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Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models
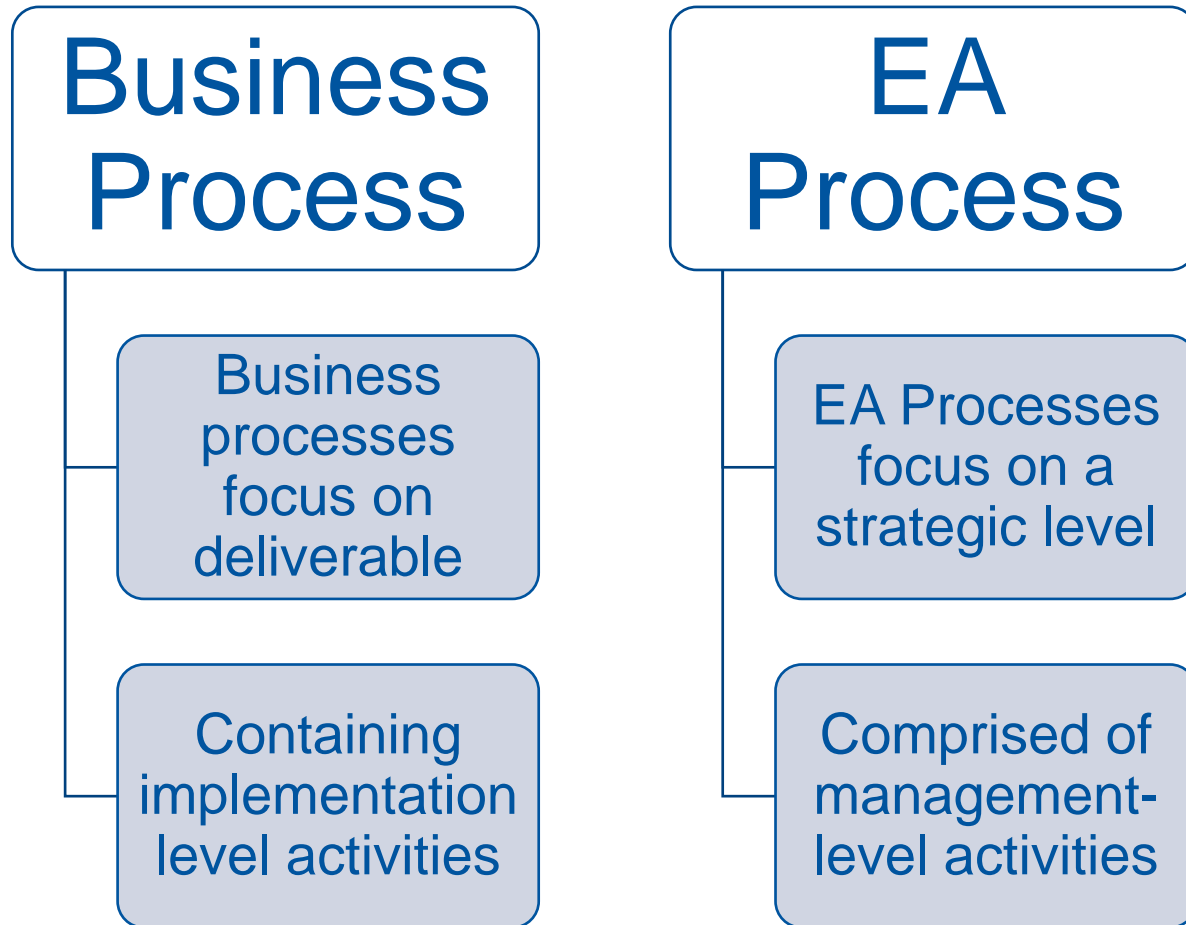
QuASoQ 2020

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Agenda

Background

Methods

Results & discussion

Conclusion & Future work

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

Background - Business Processes vs EA Processes

Business Process

- Business processes focus on deliverable

- Containing implementation level activities

EA Process

- EA Processes focus on a strategic level

- Comprised of management-level activities

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models
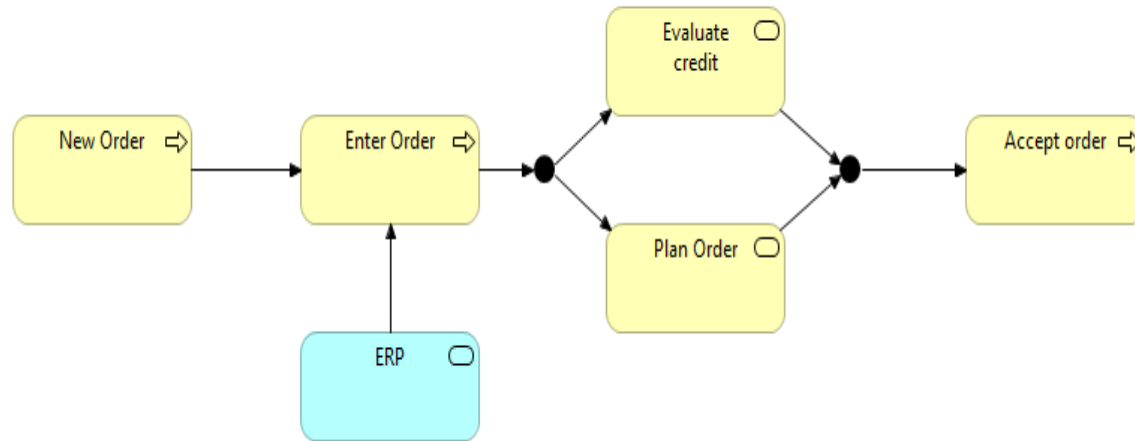
Background - EA Process vs Business Process

Fig2: Model describing a high-level process
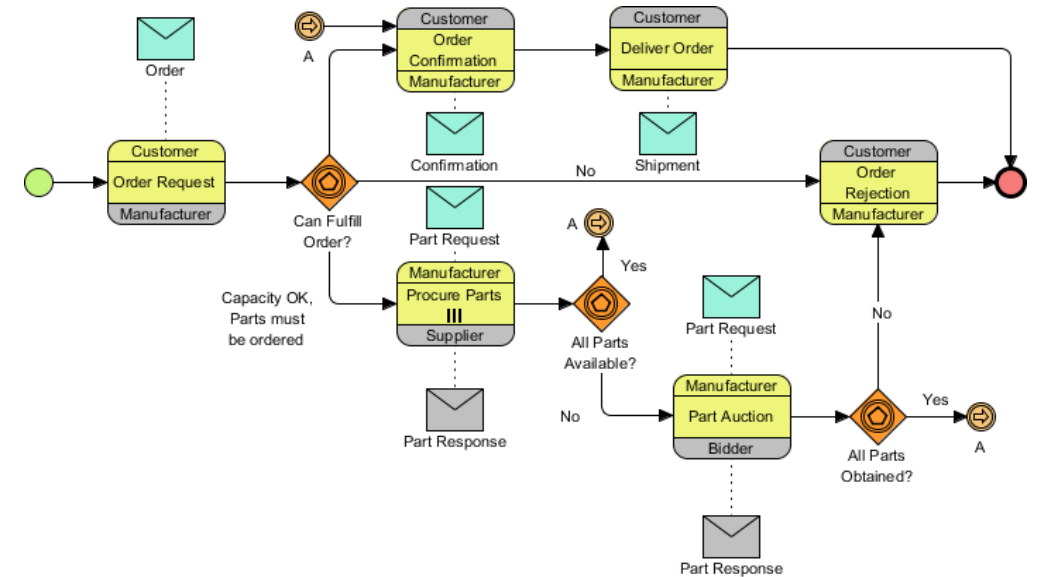
Fig3: Model describing a low-level process

Example EA Model in ArchiMate taken from https://github.com/archimatetool/ArchiModels | process model taken from: https://www.visual-paradigm.com/tutorials/businessprocessmodeling.jsp

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

- Process model degenerate over time (time pressure, evolution)

- Model pose the risk to become unusable

- May hamper the sustainability of EA practices

State of the art

Process anti-pattern are useful to avoid the degeneration

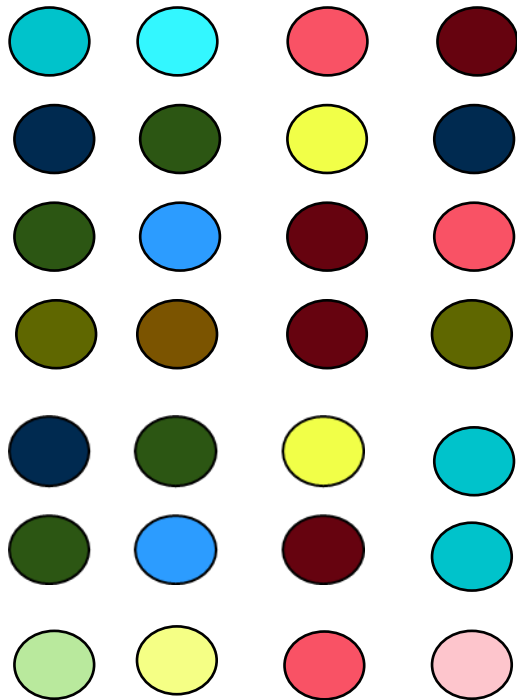Current process anti-pattern research focus on BPM
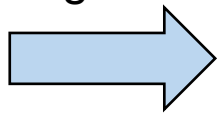
Leaving out the Enterprise context

EA processes lack the methods to address such degeneration

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

What process anti-patterns can be defined to support EA modeling activities through the analysis of published process anti-patterns?

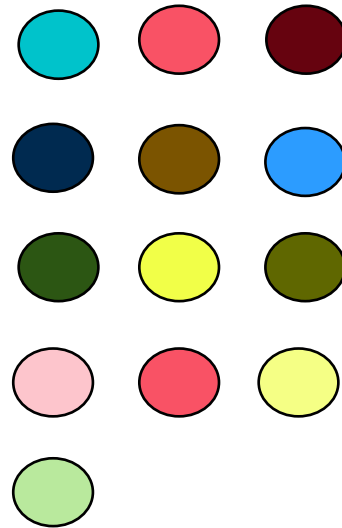Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

336 Anti-Pattern

200 Anti-Pattern

78 Anti-Pattern

Merging similar together

Mapping
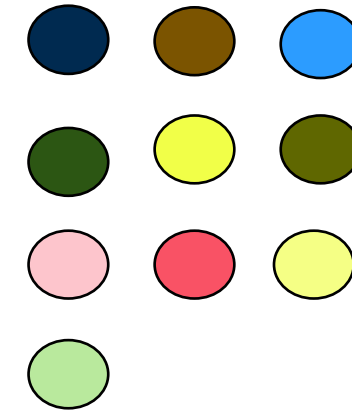
Transformation

18 EA Process Anti-pattern

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

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Methods

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models
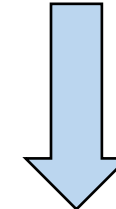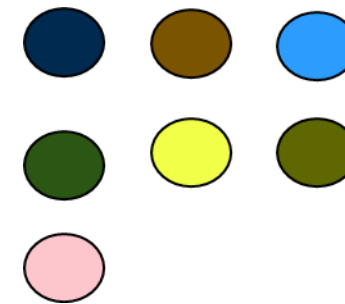
- Merging anti-patterns to together that are similar

- For example, many variants of deadlock, language fault

- We pruned out the details, so it fits into the EA level

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

Methods - Notation Mapping

Table1: Describing the mapping between ArchiMate and BPMN

ArchiMate	BPMN
Process	Business Process Diagram, Pool, Lanes
Function	Task, Sub-Processes, Activities
Interaction	Collaboration Diagram
Object	Data Object
Business Role, Business Actor, Application Component	Lane
Triggering, Flow	Sequence flow
Access	Data association
And-Junction	Inclusive and parallel gateways
Or-Junction	Exclusive and event-based gateways

[1]: Penicina, Ludmila. "Linking BPMN, ArchiMate, and BWW: Perfect match for complete and lawful business process models?." *PoEM (Short Papers)*. 2013.
[2]: Combining ArchiMateR©3.0 with Other Standards – BPMN. https://bizzdesign.com/blog/combining-archimate-3-0-with-other-standards-bpmn/ Accessed: 10.03.202
[3]: ArchiMateR©3.1 Specification. https://pubs.opengroup.org/architecture/archimate3-doc/toc.html . Accessed: 28.02.202

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

- Pruned out anti-patterns that are not relevant for EA after mapping

- For example syntax errors

- for example sequence flow crosses process boundary
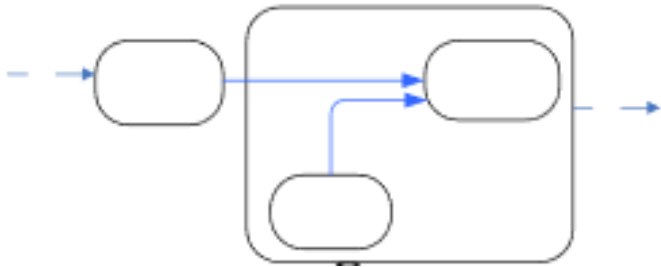
- Not forbidden to do in ArchiMate

Methods - Anti-pattern typ

Directly applicable after mapping

- Deadlock

Broad modification needed

- Useless Test

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

Results and discussion

Towards the Identification of Process Anti-Patterns in Enterprise
Architecture Models
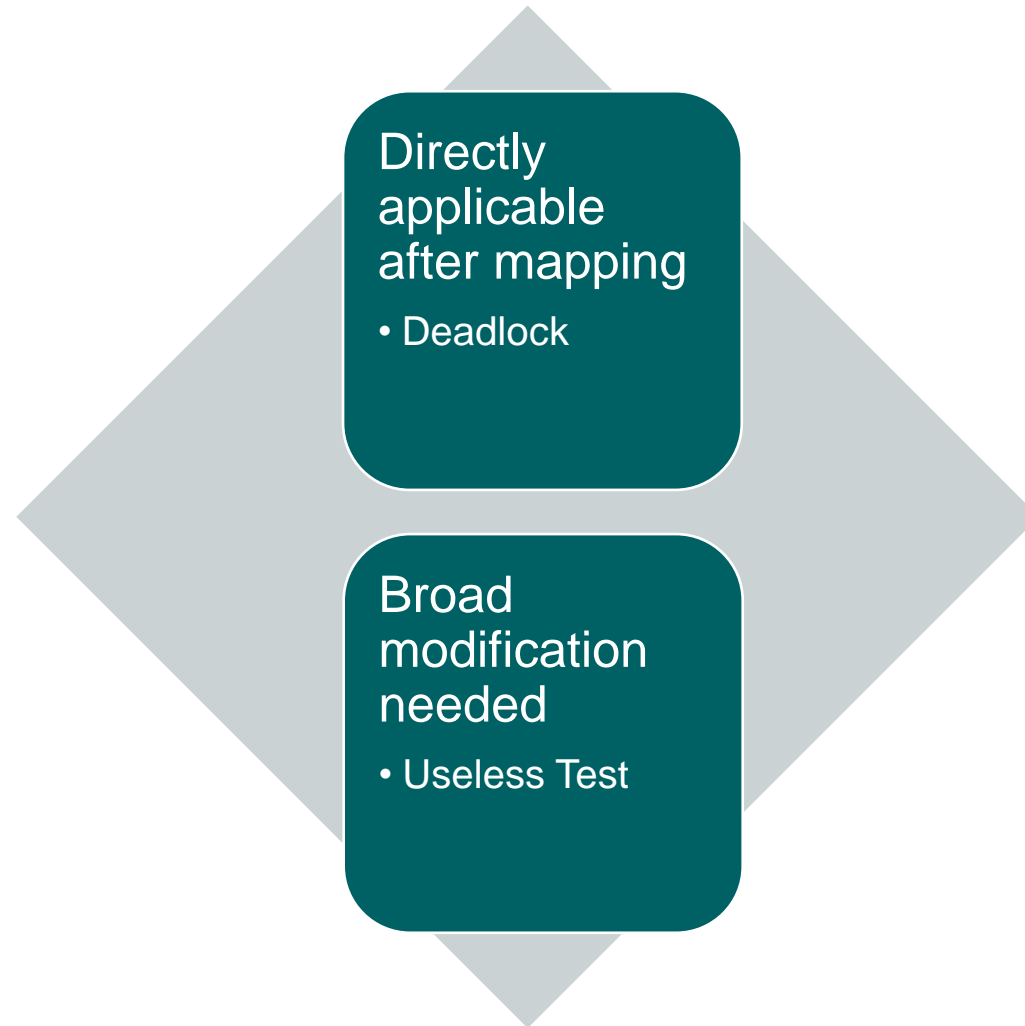
We derived 18 EA process anti-pattern from literature

Semantic(2), Control-flow Problems(5), Understandability(7), Data-flow related(3), Rule-related(1)

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

Results – Anti-pattern Transformation Template

Attribute	Meaning
Name	Gives the anti-pattern a meaningful designator
Problem	Describes why the anti-pattern leads to problems
Consequences	Describes what the consequences of the anti-pattern are
Solution	Describes a solution to the anti-pattern
Graphical Definition	Shows a graphical representation of the anti-pattern to reduce misinterpretations

[1] : Koschmider, Agnes & Laue, Ralf & Fellmann, Michael. (2019). BUSINESS PROCESS MODEL ANTI-PATTERNS: A BIBLIOGRAPHY AND TAXONOMY OF PUBLISHED WORK.

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

Discussion – Example Model

https://ea-anti-pattern.pages.rwth-aachen.de/process-anti-patterns/

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models
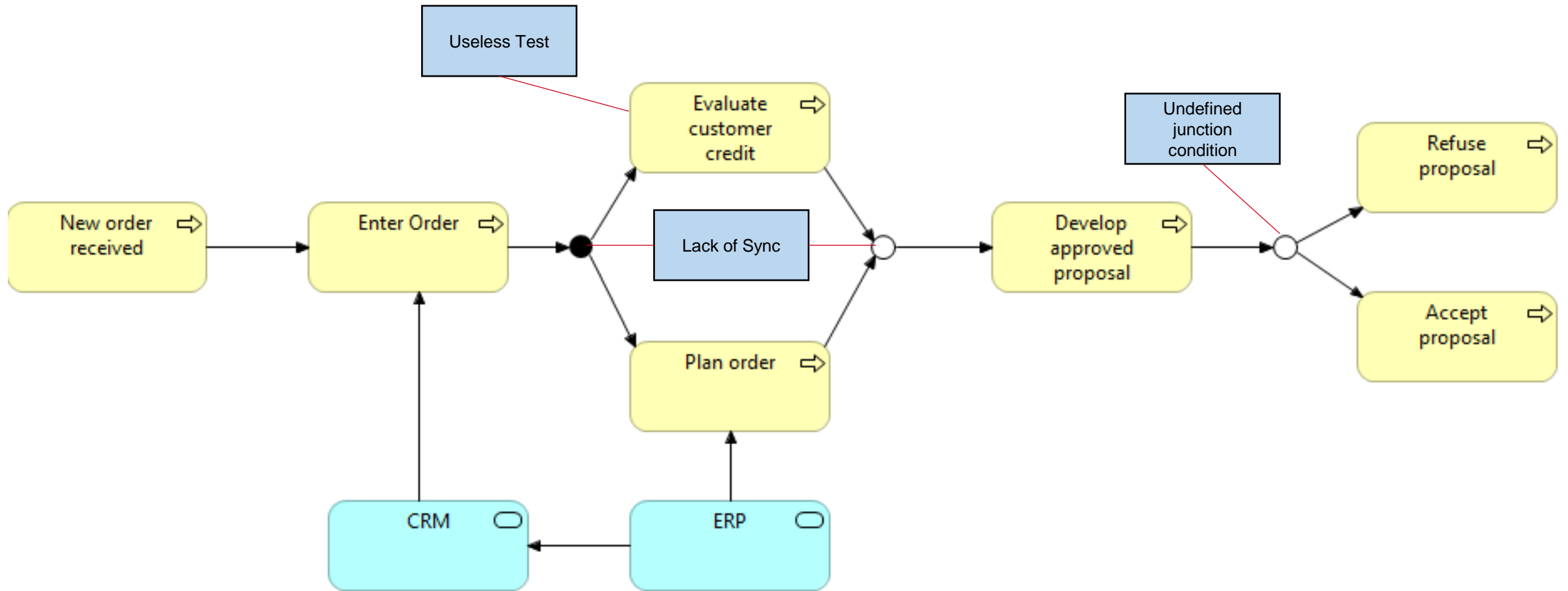
Threats to Validity

Lack of previous Research

Bias during the anti-pattern transformation

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

Conclusion & Future Works

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

Perform empirical studies for concept and practical

Develop tools for automatic detection

Pursue different methods for defining EA Anti-patterns

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models

EA Anti-pattern contribute to a high-quality EA Model

Towards the Identification of Process Anti-Patterns in Enterprise Architecture Models