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# A Catalogue of iStar Extensions

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# Summary

- Introduction
- Background about iStar extensions
- Related work
- Methodology
- Previous Results
- CATIE: A Catalogue of iStar Extensions
- Conclusions and Future work

# Introduction

- Since its proposal by Yu (1995), iStar is often extended to incorporate new constructs
  - Due to the proposal for a new version of iStar (Yu,1995), we believe this is the suitable moment to discuss how iStar extensions could be systematized
- We performed a set of previous works to identify the existing iStar extensions, to identify the opinion of experts and to mitigate existing conflicts
  - These results pointed the need to propose a catalogue
- This paper aims to present a catalogue of iStar extensions, including its constructs and analysis about both.
  - This catalogue is useful to facilitate the identification of the existing extensions and constructs previously proposed

# Background about iStar Extensions

- iStar (YU, 1995) Extensions have been proposed in different ways:
  - Describe in detail the new constructs
  - The extension is presented along with a method
  - Presenting a case study or modelling tool

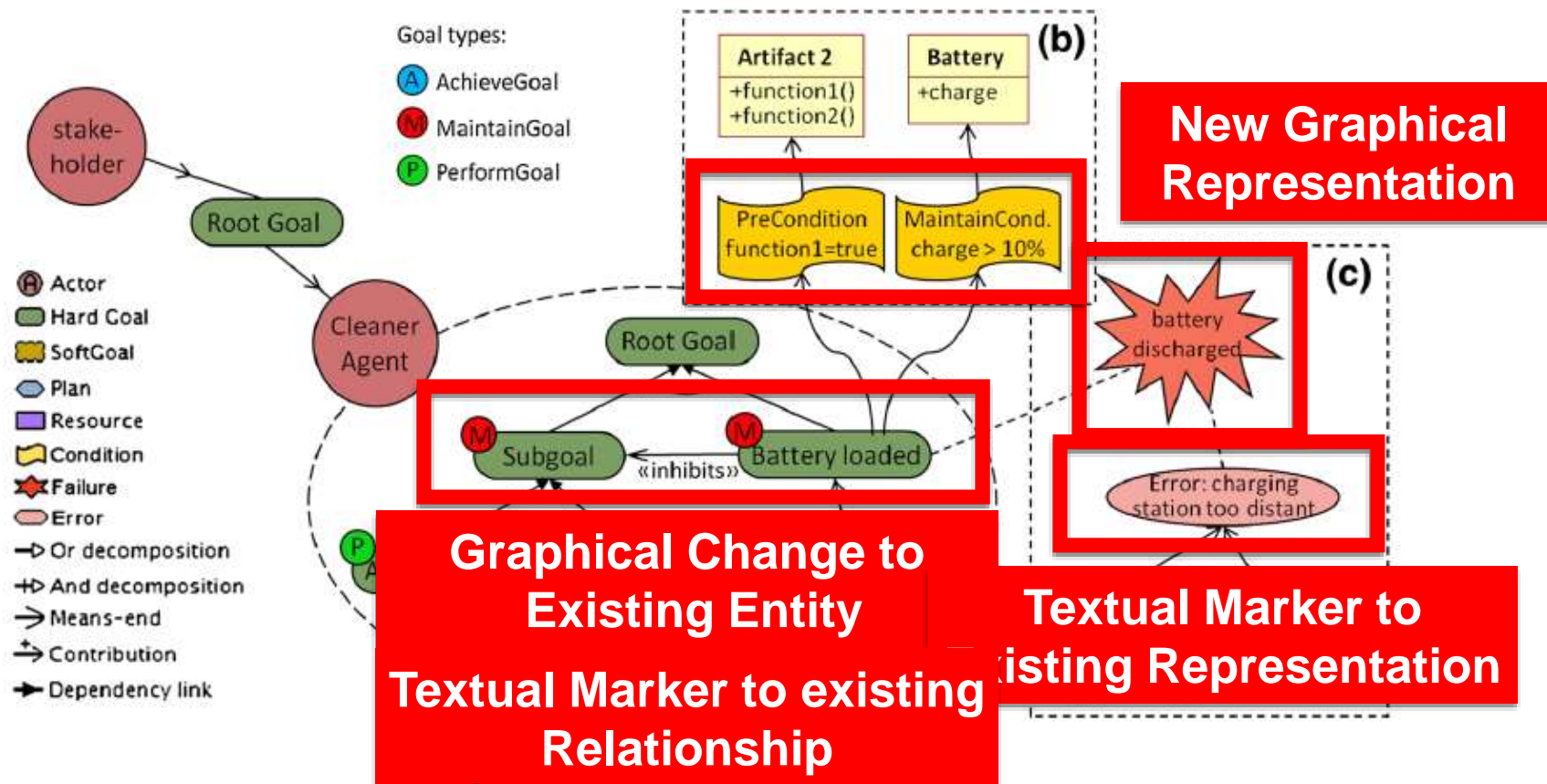


Fig. 1: Example of iStar extension. Source: (Morandini et al., 2015)

# Related Work

- **We did not find a catalogue of iStar extensions**
  - However, catalogues have been proposed to contribute to join the knowledge of other aspects of the requirements engineering area.
- **Examples of catalogues in requirements engineering:**
  - A gamification requirements catalogue for educational software (Peixoto and Silva, 2017)
  - A catalogue of Functional Software Requirement Patterns (Palomares et al., 2013)
  - A reusable catalogue of legal requirements derived from specific legal texts regarding security and personal data protection (Toval et al., 2002)

# Methodology Overview

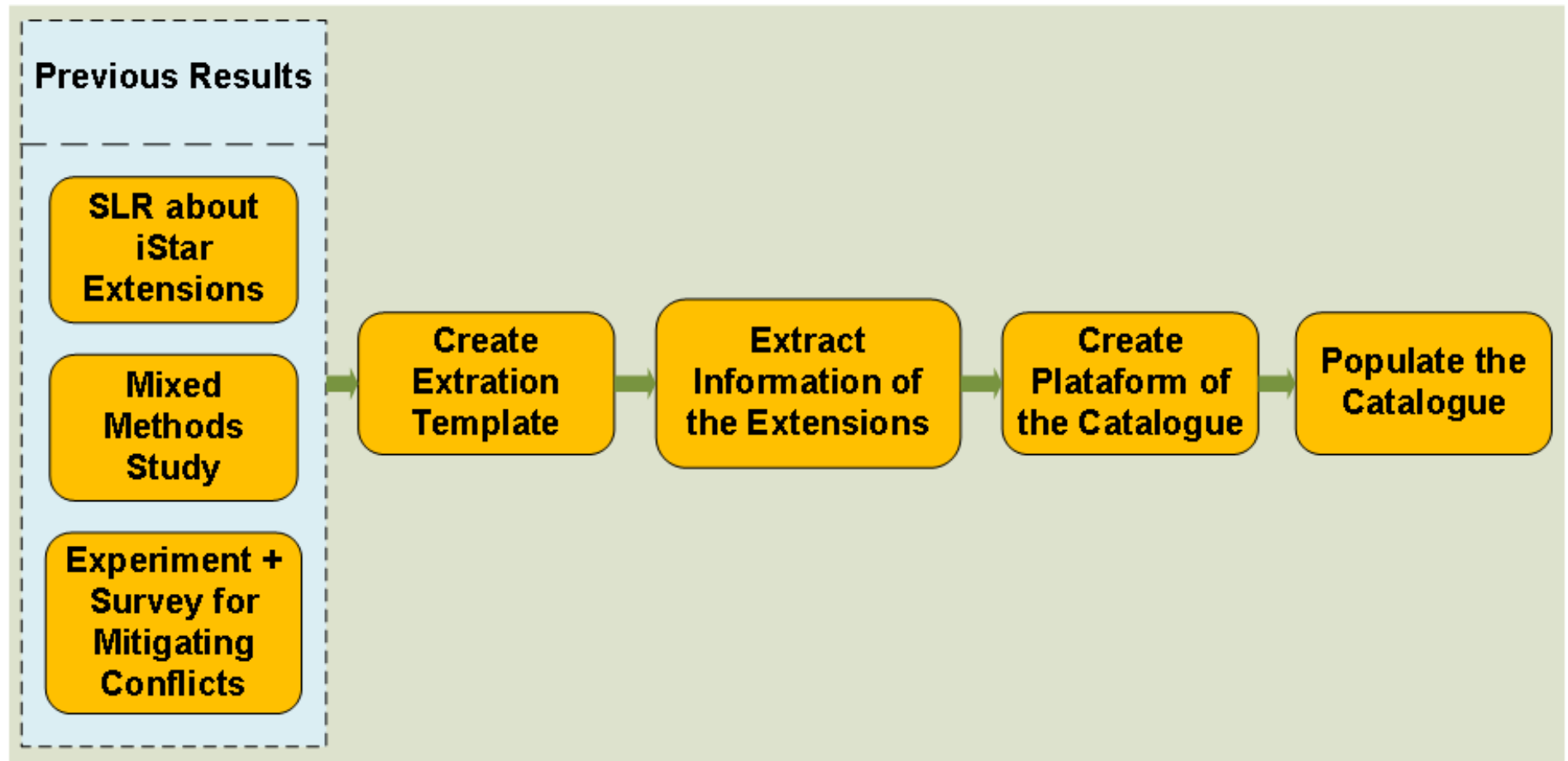


Fig. 2. The method used to create the catalogue of iStar extensions.

# Previous Results

- SLR about iStar Extension (Gonçalves et al., 2018a)
  - Identified the papers which propose iStar Extension
  - Search in the principal research databases
  - Until 2016

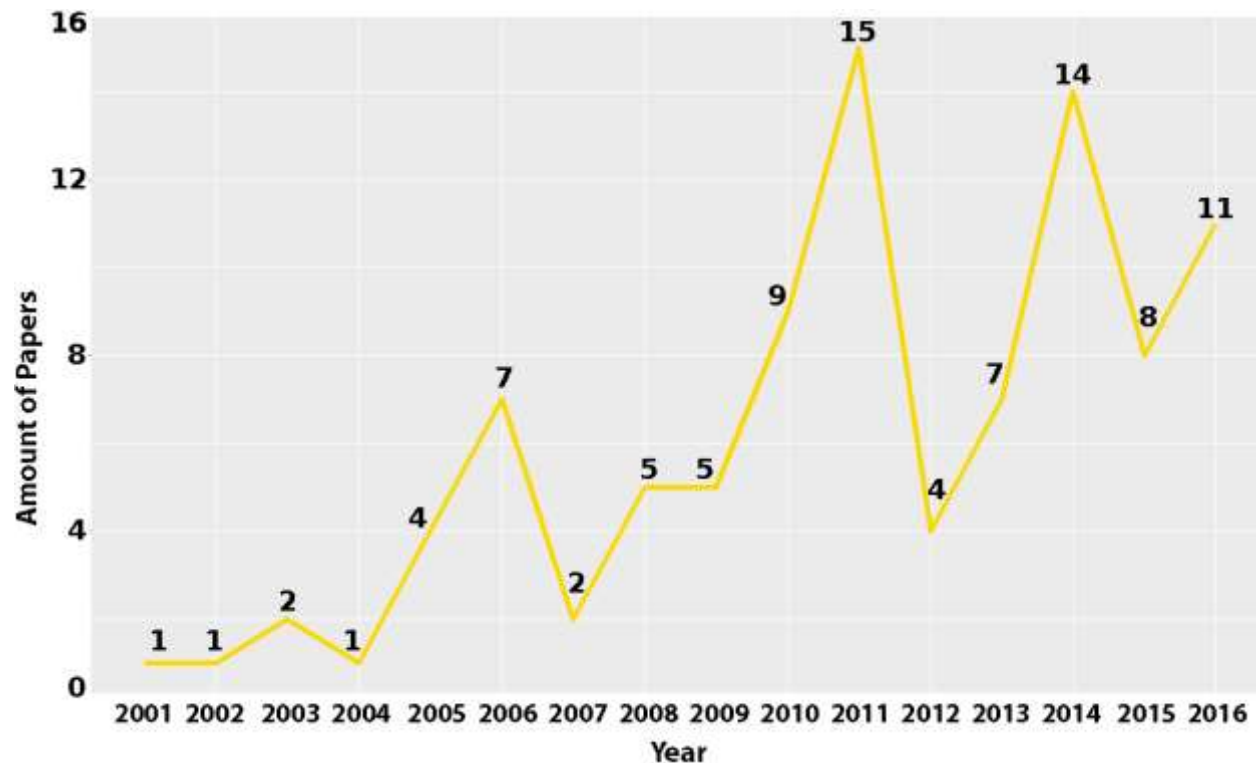


Fig. 3. Distribution of selected papers per year.

# Previous Results

- Mixed methods study with extenders (GONÇALVES et al., 2018b)
  - Interviews with 20 participants ~> Categories and statements
  - Survey with 30 participants ~> Guidelines

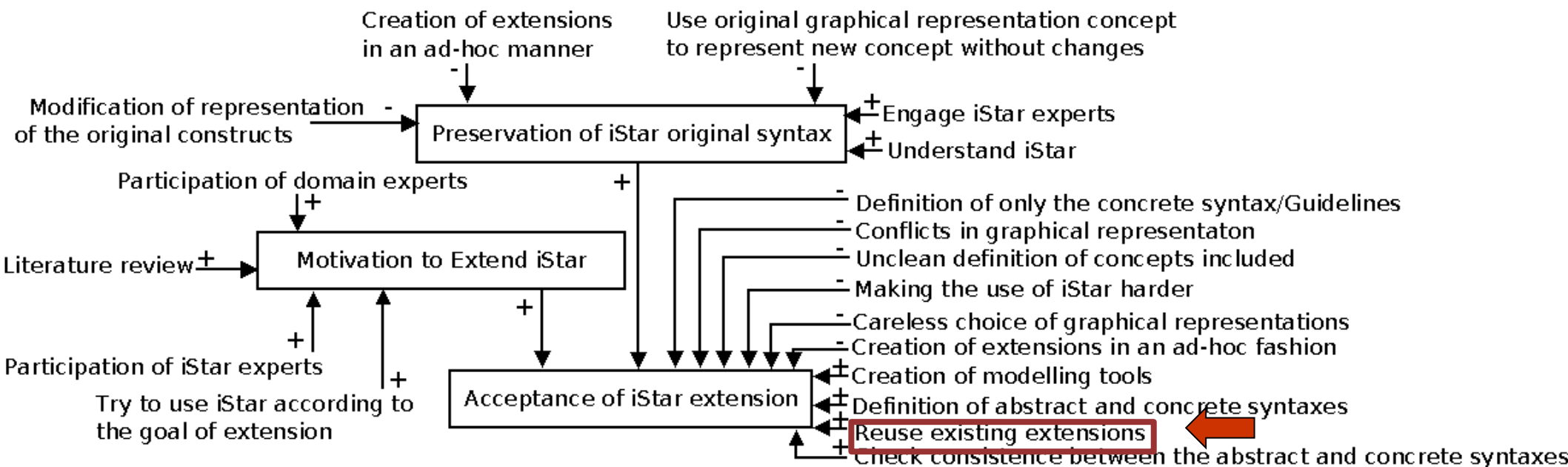


Fig. 4: Categories and Their Relationships.

# Previous Results

- Mitigating conflicts in the graphical representations (Gonçalves et al., 2018c)
  - Experiments (new representations) and survey (prioritization)

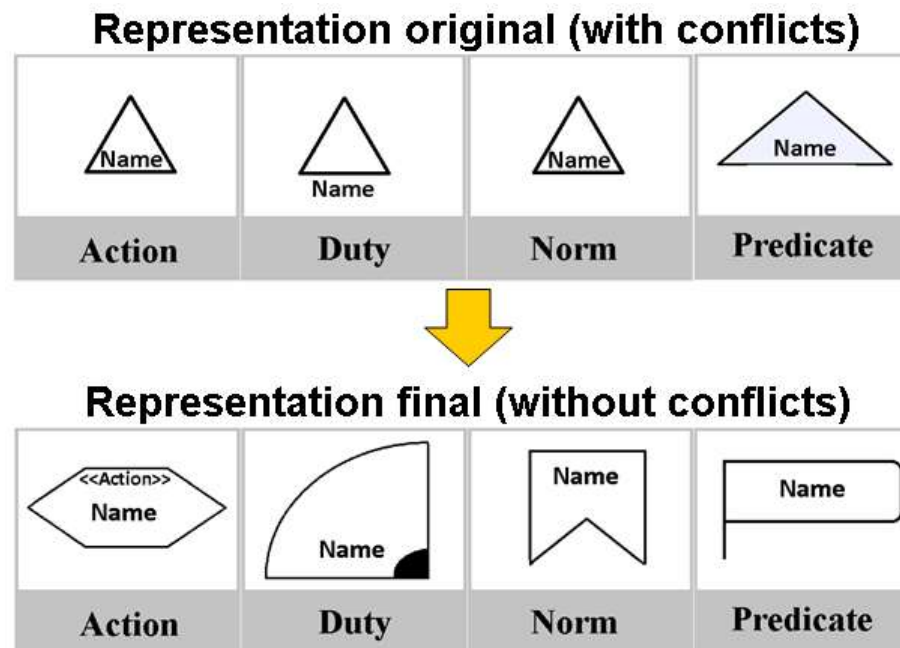


Fig. 5: An example of mitigated conflict.

- The new representations and prioritization were included in catalogue

# **CATIE: A Catalogue of iStar extensions**

- Catalogued the extensions identified in SLR (Gonçalves et al, 2018a)
- Used a extraction template with predefined fields to extensions and constructs
- [\*\*istarextensions.cin.ufpe.br/catalogue/\*\*](http://istarextensions.cin.ufpe.br/catalogue/)

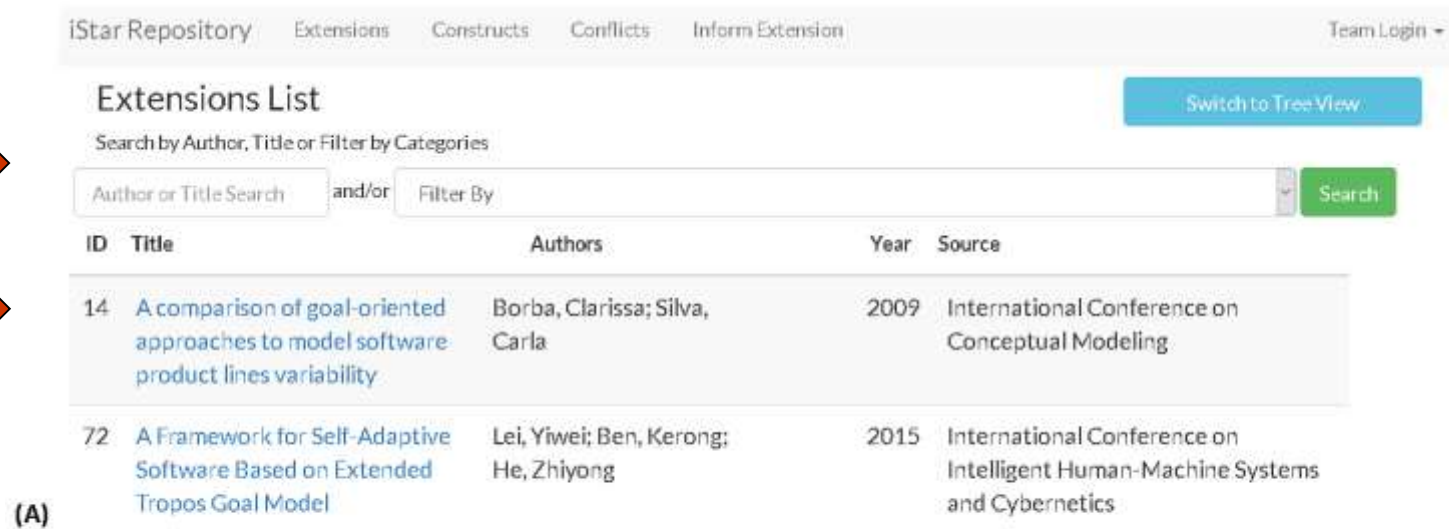
# Extension List

- Two views are available: List (a) and Tree View (b)

Search →

Detail →

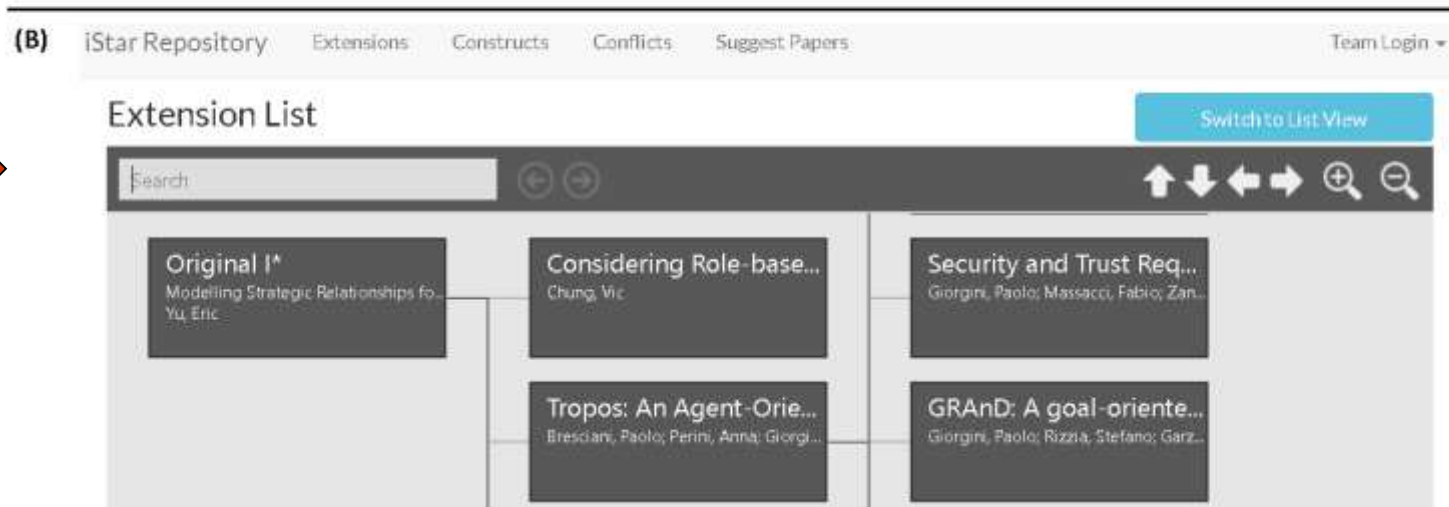
(A)



ID	Title	Authors	Year	Source
14	A comparison of goal-oriented approaches to model software product lines variability	Borba, Clarissa; Silva, Carla	2009	International Conference on Conceptual Modeling
72	A Framework for Self-Adaptive Software Based on Extended Tropos Goal Model	Lei, Yiwei; Ben, Kerong; He, Zhiyong	2015	International Conference on Intelligent Human-Machine Systems and Cybernetics

Search →

(B)




Original I*	Considering Role-base...	Security and Trust Req...
Modeling Strategic Relationships fo... Yu, Eric	Chung, Vic	Giorgini, Paolo; Massacci, Fabio; Zan...
Tropos: An Agent-Orie...	GRAnD: A goal-oriente...	
Bresciani, Paolo; Perini, Anna; Giorgi...	Giorgini, Paolo; Rizza, Stefano; Garz...	

Fig. 6: Extensions list

# Detail extension

- Show the information of the extraction fields to the selected extension

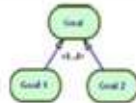
A goal oriented approach to identify and configure feature models for software product lines 

Author: Silva, Carla; Borba, Clarissa; Castro, Jaelson  
 Journal/Conference/Book: Workshop on Requirements Engineering  
 Type: conference  
 Year: 2011  
 Description:  
 Extensions Base:

- Original I\* Modelling Strategic Relationships for Process Reengineering

Application Area <a href="#">Software Product Lines</a>	Compatibility between metamodel and concrete syntax of extensions <a href="#">Compatible</a>	Concepts Definition <a href="#">Present Definition Partially</a>	Is there tool support <a href="#">Yes</a>
Level of Extension <a href="#">Both</a>	Metamodel Completeness <a href="#">Absence of Links</a>	Kind of Construction Proposed <a href="#">Nodes and Links</a>	Kind of Validation ... // ...
		Reasoning Approach ... // ...	Static Semantic ... // ...

**Constructs**

ID	Concept	Type	Image	Option
257	cardinality	relationship		<a href="#">Detail</a>

**Metamodel Image**

Title	Description	Option
Metamodel	metamodel	<a href="#">Show</a>




Fig. 7: Extensions details



# Show construct list for extension

- Show the list of the constructs (a)

**Search** →

**Detail** →

**(A)**

Application Area	Concept	Form	Type	Image	Priorization
System	<a href="#">Domain values</a>	oval	entity		0
Adaptative System	<a href="#">Context</a>	link	relationship		0

**(B)**

**Construct: 17 - Domain values**

**Related Extension:** - [A Framework for Self-Adaptive Software Based on Extended Tropos Goal Model](#) (Lei, Yiwei; Ben, Kerong; He, Zhiyong)

Priorization: 0

**Description**

A set of new metaclasses created in the metamodel and republished as adornment in the goal entity


**Form**

oval

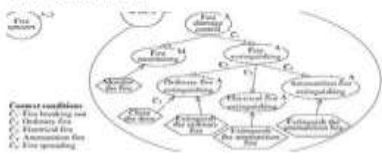
**Classification**

None

**Notation:**




**Example:**



**Conflicts**

Conflicts of one concept with two or more representations - Goal indicator



Domain values

Achieve goal, Maintain goal, Perform

goal

Fig. 8: Constructs list and details

# Show conflicts list for extension

## Conflicts List

**Search** → -- Filter By Type -- Search

Description	Constructs Involved
<a href="#">Conflict of new constructs in conflict with the iStar default syntax</a>	8
<a href="#">Conflict of one concept with two or more representations - Conflicts of Nodes Identifier in Nòmos</a>	4

(A)

---

**Detail** →

(B)

Conflict: 1 - Conflict of one concept with two or more representations - Plan

Type: One concept with two or more representations in concrete syntax




Constructs	Concept	Form	Description	Priority	Image
<a href="#">Plan</a>	Plan	Parallelogram as a arrow	A new representation of this construct based on the results of an experiment.	1	
<a href="#">Plans</a>	Plans	octagon	Octagon represents Plans, in the original Tropos is a hexagon	2	
<a href="#">Plans</a>	Plans	hexagon	Plans are represented as tasks	3	

Fig. 9: Conflict list and details

# Submitting a new extension


- Based on two steps: Inform Extension (a) and accept extension (b and c)

(A) iStar Repository Extensions Constructs Conflicts Inform Extension Team Login

Title of the Extension  
Test

Link to Access the Extension  
www.dropbox.com/s/sm8catsrxsxpth/Extension%20Specification%20%20cloud%20provid%5BFinal%5D.pdf?dl=




Your E-mail  
ejtg@cin.ufpe.br

☒ I'm not a robot  reCAPTCHA Privacy - Terms

(B) iStar Repository Extensions Constructs Conflicts Inform Extension Paper Submit Team Dashboard Enyo, José

Show: Waiting Review

Title	Year	Author	Journal
Test			

(C) Test   

Author:  
Journal/Conference/Book:  
Type:  
Year:  
Description:

Status: In review

Fig. 10: Submission and acceptance of a new iStar extension

# Conclusions

- Many extension have been proposed since 90's
- Find a specified iStar extension based require extra time
- It is relevant to analyse these extensions and extract information to easier the identification
- CATIE Catalogue facilitates the identification of existing extensions and their constructs by extenders or users

# Future works

- We are working in the definition of a process to conduct iStar extensions
- This process uses the CATIE
- The set of all constructs of iStar extensions of CATIE can be formalised by a conceptual model, metamodel or ontology

# References

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