

EXTENSION SPECIFICATION

On Temporally Annotating Goal Models (Recreated)

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PRESENTATION OF THE ISTAR EXTENSION: On Temporally Annotating Goal Models (Recreated)

This document specifies the following iStar extension: On Temporally Annotating Goal Models (Recreated). The list of constructs included, their descriptions and representations are presented following. The metamodel is also presented.

A general description should be introduced here to present an overview of the iStar extension proposed. The iStar extension metamodel should be presented and described here.

We selected the iStar extension Liaskos, S., Mylopoulos, J. On Temporally Annotating Goal Models, International i* workshop, 2010. It was choice because it has incompleteness (Absence of a metamodel).

The number of problems in original and recreated versions is presented in the table following.

Evaluation criteria	Original	Recreated
PIM1	0	0
PIM2	1	0
PIN1	0	0
PIN2	0	0
PCO1	0	0
PCO2	0	0
PCO3	0	0
PCO4	0	0
PCO5	0	0

- PIM1: Non-definition of the meaning of the constructors introduced;
- PIM2: Non-representation of the extension in the abstract syntax;
- PIN1: Inconsistencies with iStar default syntax due absence of nodes and links;
- PIN2: Inconsistencies between the abstract syntax and concrete syntax;
- PCO1: One concept with two or more representations in concrete syntax;
- PCO2: Two or more concepts with only one construct in concrete syntax;
- PCO3: New Constructs in conflict with the iStar default syntax;
- PCO4: Wrong representation of iStar default syntax construct;
- PCO5: Representation of constructs that are not part of the extension.

1 Analyse The Need For Extension Proposal

1.1 Study a domain/application area

It was not necessary contact experts in domain/application area in this task. We just did a survey of the article references, which are probably what the author used to extract the concepts added by the extension. However, we identified that this extension is related to practical aspects of the usage of iStar and it was not based on a set of concepts defined in references.

1.2 Identify the concepts to be introduced by the extension

We identified 6 concepts to be introduced by the extension, being 3 nodes and 3 links.

ID_concept	Name of the Concept	Reference
<i>Nodes</i>		
CON_TEMP_01	Domain variables	-
<i>Links</i>		
CON_TEMP_02	Precedence	-
CON_TEMP_03	Effect	-

1.3 Contact experts and Model an example with the identified concepts using iStar

We did not have any doubts about the domain/application area, so we did not contact these experts. We also did not have any doubts about the domain concepts which is possible to represent with iStar without creating new representations and what is not possible to identify with iStar.

1.4 Search if there is an extensions related to the new proposal in iStar extensions catalogue

It was searched in the repository using temporal term. Only the paper of this extension was identified. Thus, we can conclude that, excluding this recreated paper, there is no extension proposed for this purpose.

For the next process gateways the flow is: To Is there an extension suitable for your need? - Is not the extension related to a domain / application area? - Y. Thus, activity 1.2. Study a domain / application area is started.

2 Conceptualise the iStar extension

2.1 Search and select constructs to be reused.

We did not found any construct to be reused.

2.2 Define extension's concepts

The definition of the extension's concepts is presented in following table.

ID_concept	Name of the Concept	Definition	Reference
<i>Nodes</i>			
CON_TEMP_01	Domain variables	Predicates used to represent the state of the environment in which tasks should be performed or the result of execution of a task.	The own recreated paper.
<i>Links</i>			
CON_TEMP_02	Precedence	Indicates that it is required to achieve an goal or a domain variable to perform a task or to	The own recreated paper.

		reach another goal.	
CON_TEMP_03	Effect	Indicates the consequence of the result of the execution of a task.	The own recreated paper.

2.3 Analyse how the extension constructs can be integrated with the iStar constructs

We tried to relate the concepts to be introduced with the iStar standard concepts. So, we concluded that precedence and effect can be used to connect intentional elements.

ID_concept	Name of the Concept	Relation with iStar constructs
Nodes		
CON_TEMP_02	Precedence	<i>It can connect intentional elements.</i>
CON_TEMP_03	Effect	<i>It can connect intentional elements.</i>

3 DEVELOP ISTAR EXTENSION

3.1 Define metamodel of extension

We included the concepts identified in the List of concepts to be introduced in the iStar metamodel. We considered the relationship of extension's constructs and iStar constructs in this step. The result is presented in the figure below.

The new metaclasses Temporal Link and DomainVariables were created. Additionally, precedence and effect were defined as properties of the temporallylinks. It was not necessary to add validation rules in this extension (task 3.2).

CON_TEMP_03	Effect		It is an arrow with open head and a textual eff.	No
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3.4 Check completeness, consistency and conflicts

Completeness

Which level the iStar extension was applied

[X] Concepts definition [X] Metamodel ☐ Well-formedness rules (optional) [X] Concrete syntax

Consistency

List following the concepts in each level

Concept	Concept's definition	Metamodel	Concrete syntax
Domain variables	[X]	[X]	[X]
Precedence	[X]	[X]	[X]
Effect	[X]	[X]	[X]

Presence of nodes and links of iStar default syntax

Construct		Metamodel	Concrete syntax
Goal		[X]	[X]
Quality		[X]	[X]
Resource		[X]	[X]
Task		[X]	[X]
Actor		[X]	[X]
Agent		[X]	[X]
Role		[X]	[X]
Refinement		[X]	[X]
Qualification		[X]	[X]
Contribution (make, help, break, hurt)		[X]	[X]
NeededBy		[X]	[X]
Dependency		[X]	[X]
Association links	is-a	[X]	[X]
	Participates-in	[X]	[X]

Conflicts

List the concepts and verify the occurrence of conflicts between the constructs of the extension and the existing extensions.

Concept	Conflicts			
	One construct with two or more	Two of more constructs with	Wrong representation of	Construct which is not

	Symbols	only one Symbol	iStar constructs	part of the extension
Domain variables	[0]	[0]	[0]	[0]
Precedence	[0]	[0]	[0]	[0]
Effect	[0]	[0]	[0]	[0]
Details about the problem(s): Problems were not identified.				

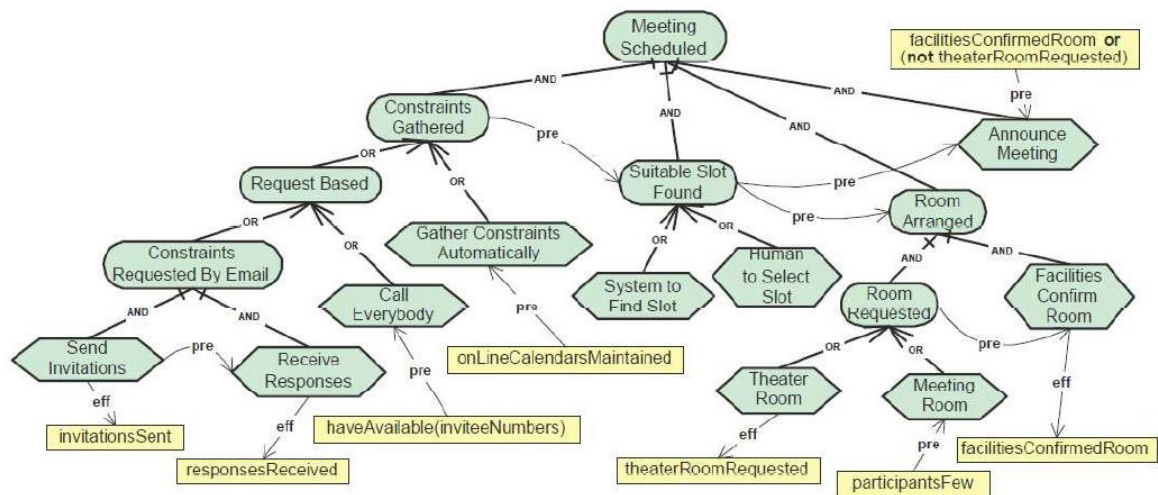
3.5 Apply the extension to a modelling tool

We did not propose a modelling tool. So, the flow goes to 4. Evaluate and validate iStar extension.

4 Evaluate and validate iStar extension

4.1 Use the iStar extension proposed to model a system

There was not any change in the graphical representation of this extension. So, the example is the same of the presented in the original paper.



4.2 Evaluate the iStar extension

We did not perform the evaluation of the iStar extension because we are only revisiting one existing iStar extension. We will propose a new extension using all tasks of the PRISE.