

EXTENSION SPECIFICATION

A Holonic Extension of the i^ Framework (RECREATED)*

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PRESENTATION OF THE ISTAR EXTENSION: A Holonic Extension of the i* Framework (RECREATED)

This document specifies the following iStar extension: A Holonic Extension of the i* Framework (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 Louaquad, W. El Mohajir, M. A holonic extension of the i* framework. Third IEEE International Colloquium in Information Science and Technology (CIST), 2014. It was choice because it has incompleteness (Absence of a metamodel) and there is a wrong graphical representation an iStar default syntax construct.

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	1	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. The following list of references follows:

ID_reference	Reference
REF_SPC1	S. Rodriguez, N. Gaud, V. Hilaire, A. Koukam, Modeling Honolic Systems with an Organizational Approach, European Conference on Multi-Agent Systems, 2006
REF_SPCP2	MELLA, Piero. The Holonic Revolution. Holons, Holarchies and Holonic; Pavia

	University Press: Pavia, Italy, 2009
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1.2 Identify the concepts to be introduced by the extension

We identified 6 nodes to be introduced by the extension. Additionally, the iStar models were specialised in Strategic business dependency model/ Strategic business rational model and Strategic process dependency model/Strategic process rational model.

ID_concept	Name of the Concept	Reference
<i>Nodes</i>		
CON_HOL_01	Business unit	REF_SPCP2
CON_HOL_02	Business goal	REF_SPCP2
CON_HOL_03	Business service	REF_SPCP2
CON_HOL_04	Process Unit	REF_SPCP2
CON_HOL_05	Process goal	REF_SPCP2
CON_HOL_06	Business Process	REF_SPCP2
<i>Models</i>		
CON_HOL_07	Strategic Business Dependency Model	-
CON_HOL_08	Strategic Business Rational Model	-
CON_HOL_09	Strategic Process Dependency Model	-
CON_HOL_10	Strategic Process Rational Model	-

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 holonic term. We did not find another extension. There is no another 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 find any construct to be reused from previous extensions.

2.2 Define extension's concepts

The definition of the extension's concepts is presented in following table. Additionally, the iStar models were specialised in Strategic business dependency model/ Strategic business rational model and Strategic process dependency model/Strategic process rational model.

ID_concept	Name of the Concept	Definition	Reference
<i>Nodes</i>			
CON_HOL_01	Business unit	an intentional and social entity responsible for the performance of a business service	REF_SPCP2
CON_HOL_02	Business goal	represents the goal of business unit	REF_SPCP2
CON_HOL_03	Business service	represents a functionality offered by an organization. A business service can be decomposed into sub business services	REF_SPCP2
CON_HOL_04	Process Unit	an intentional and social entity responsible for the performance of a business process	REF_SPCP2
CON_HOL_05	Process goal	represents the goal of a process unit	REF_SPCP2
CON_HOL_06	Business Process	the business service is refined into a set of business processes that perform it	REF_SPCP2
<i>Models</i>			
CON_HOL_07	Strategic Business Dependency Model	It is the version of SD model with Business nodes	-
CON_HOL_08	Strategic Business Rational Model	It is the version of SR model with Business nodes	-
CON_HOL_09	Strategic Process Dependency Model	It is the version of SD model with Process nodes	-
CON_HOL_10	Strategic Process Rational Model	It is the version of SR model with Process nodes	-

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

All constructs introduced by this extension specialises the iStar constructs.

ID_concept	Name of the Concept	Relation with iStar constructs
Nodes		
CON_HOL_01	Business unit	<i>Specializes Actor</i>
CON_HOL_02	Business goal	<i>Specializes goal</i>
CON_HOL_03	Business service	<i>Specializes resource</i>
CON_HOL_04	Process Unit	<i>Specializes Actor</i>
CON_HOL_05	Process goal	<i>Specializes goal</i>
CON_HOL_06	Business Process	<i>Specializes task</i>
Models		
CON_HOL_07	Strategic business dependency model	<i>Specializes SD iStar model</i>
CON_HOL_08	Strategic business rational model	<i>Specializes SR iStar model</i>
CON_HOL_09	Strategic process dependency model	<i>Specializes SD iStar model</i>
CON_HOL_10	Strategic process rational model	<i>Specializes SR iStar model</i>

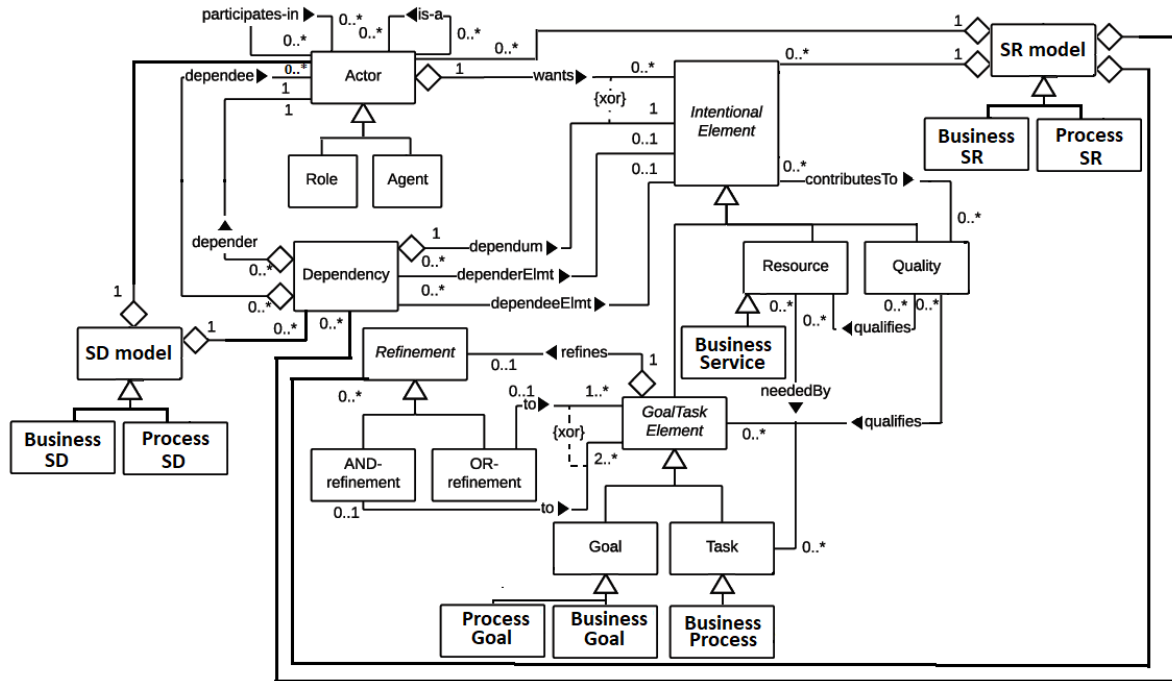
3 DEVELOP ISTAR EXTENSION

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 Business unit, Business goal, Business service, Process Unit, Process goal, Business Process, sdbusiness, srbusiness, sdprocess and srprocess were created by specialising the existing iStar constructs.

It was not necessary to add validation rules in this extension (task 3.2).



3.2 Define validation rules of extension

It was not necessary.

3.3 Define concrete syntax of extension

The representations of extension's constructs are presented in next table. We used the iStar extensions catalogue to identify the representation of reused constructs. We used the new graphical representations to Contextual resource, contextual goal and context-means introduced by the Murukannaiah, P., Singh, M. Xipho: Extending Tropos to Engineer Context-aware Personal Agents, International Conference on Autonomous Agents and Multi-Agent Systems, 2014. The results are presented in table following. The representation to business process should be represented such as an specialization of task once it is a kind of task.

ID_concept	Name of the Concept	Representation	Explanation about the graphical representation	Reused?
<i>Nodes</i>				
CON_HOL_01	Business unit		It is an specialization of Actor. Thus, its representation is similar to actor but it uses dotted edges.	No
CON_HOL_02	Business goal		It is an specialization of goal. Thus, its representation is similar to goal but it uses dotted	No

			edges.	
CON_HOL_03	Business service		It is an specialization of resource. Thus, its representation is similar to resource but it uses dotted edges.	No
CON_HOL_04	Process Unit		It is an specialization of Actor. Thus, its representation is similar to actor but it uses large dotted edges.	No
CON_HOL_05	Process goal		It is an specialization of goal. Thus, its representation is similar to goal but it uses large dotted edges.	No
CON_HOL_06	Business Process		It is an specialization of task. Thus, its representation is similar to task but it uses dotted edges.	No
CON_HOL_07	Strategic business dependency model	There is no a specific graphical representation	There is no a specific graphical representation	No
CON_HOL_08	Strategic business rational model	There is no a specific graphical representation	There is no a specific graphical representation	No
CON_HOL_09	Strategic process dependency model	There is no a specific graphical representation	There is no a specific graphical representation	No
CON_HOL_10	Strategic process rational model	There is no a specific graphical representation	There is no a specific graphical representation	No

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
Business unit	[X]	[X]	[X]
Business goal	[X]	[X]	[X]
Business service	[X]	[X]	[X]
Process Unit	[X]	[X]	[X]
Process goal	[X]	[X]	[X]
Business Process	[X]	[X]	[X]
Strategic business dependency model	[X]	[X]	[X]
Strategic business rational model	[X]	[X]	[X]
Strategic process dependency model	[X]	[X]	[X]
Strategic process rational model	[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
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	One construct with two or more Symbols	Two of more constructs with only one Symbol	Wrong representation of iStar constructs	Construct which is not part of the extension
Business unit	[0]	[0]	[0]	[0]
Business goal	[0]	[0]	[0]	[0]
Business service	[0]	[0]	[0]	[0]
Process Unit	[0]	[0]	[0]	[0]
Process goal	[0]	[0]	[0]	[0]
Business Process	[0]	[0]	[0]	[0]
Strategic business dependency model	[0]	[0]	[0]	[0]
Strategic business rational model	[0]	[0]	[0]	[0]
Strategic process dependency model	[0]	[0]	[0]	[0]
Strategic process rational model	[0]	[0]	[0]	[0]
Details about the problem(s): Problems were not identified.				

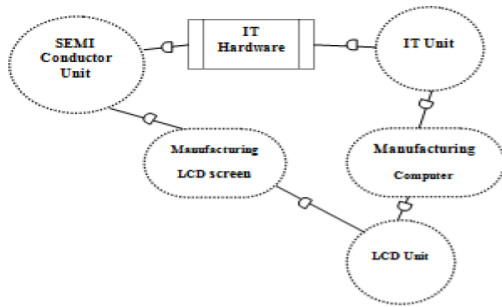
3.5 Apply the extension to a modelling tool

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

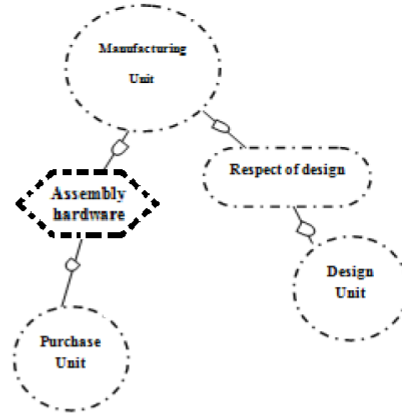
4 Evaluate and validate iStar extension

4.1 Use the iStar extension proposed to model a system

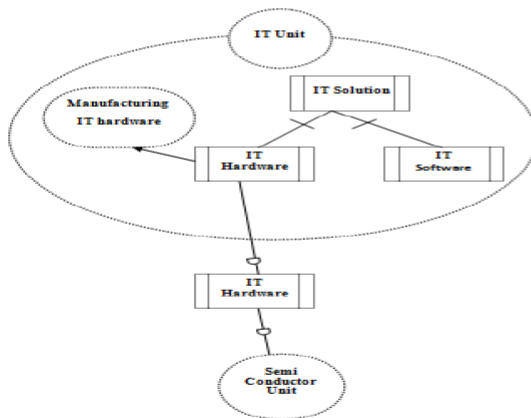
There was not any change to the concrete syntax of this extension. Thus, the illustration is the same of the represented in the paper Louaqad, W. El Mohajir, M. A holonic extension of the i* framework. Third IEEE International Colloquium in Information Science and Technology (CIST), 2014. It is necessary to do the SD and SR iStar business models with the Business units, Business goals and business services. Following it the Processes units, Processes goals and Business processes should be represented by the SD and SR iStar process models. Finally, the iStar models should be created from these models.



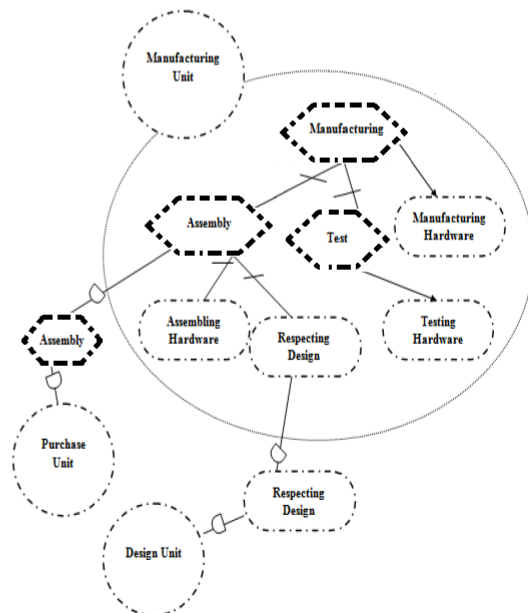
Strategic Business Dependency Model



Strategic Process Dependency Model



Strategic Business Rational Model



Strategic Process Rational Model

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.