DES
Departamento de Eletrônica e Sistemas

Centro de Informática U·F·P·E

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Improving the Modularity of i* Models

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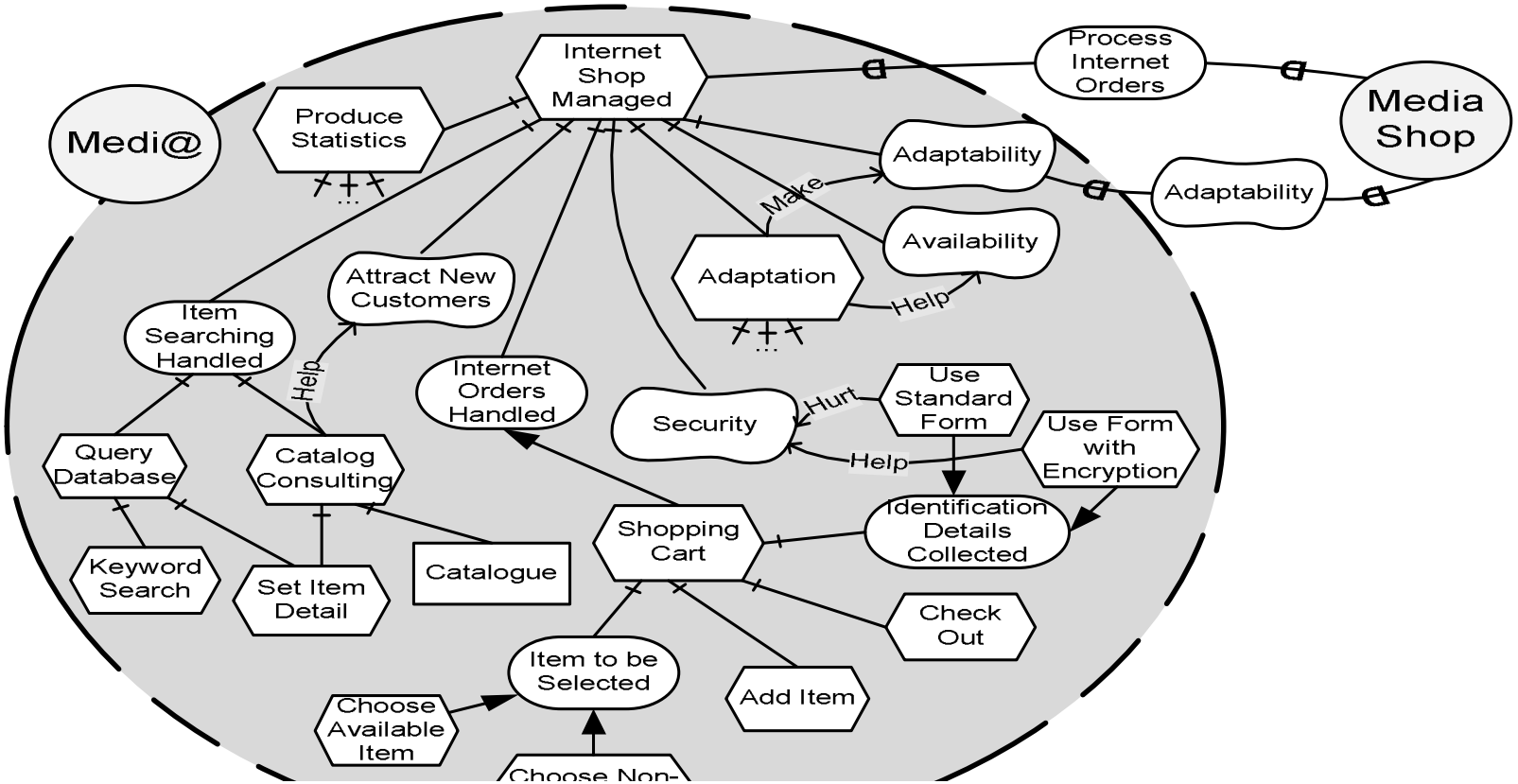
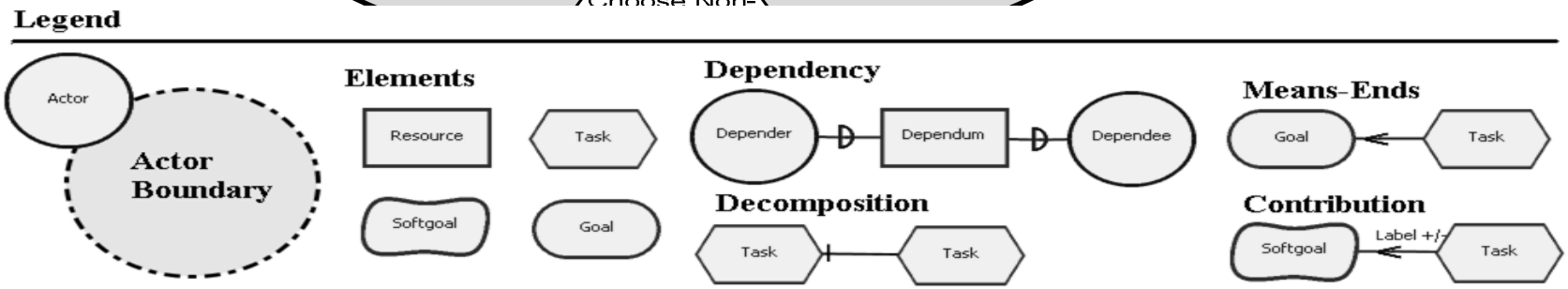
1 Modularizing i* with Aspects

- **The modularity of i* models can be improved by removing tangled and scattered information into aspectual actors together with some weaving mechanisms [1].**

1 Modularizing i* with Aspects

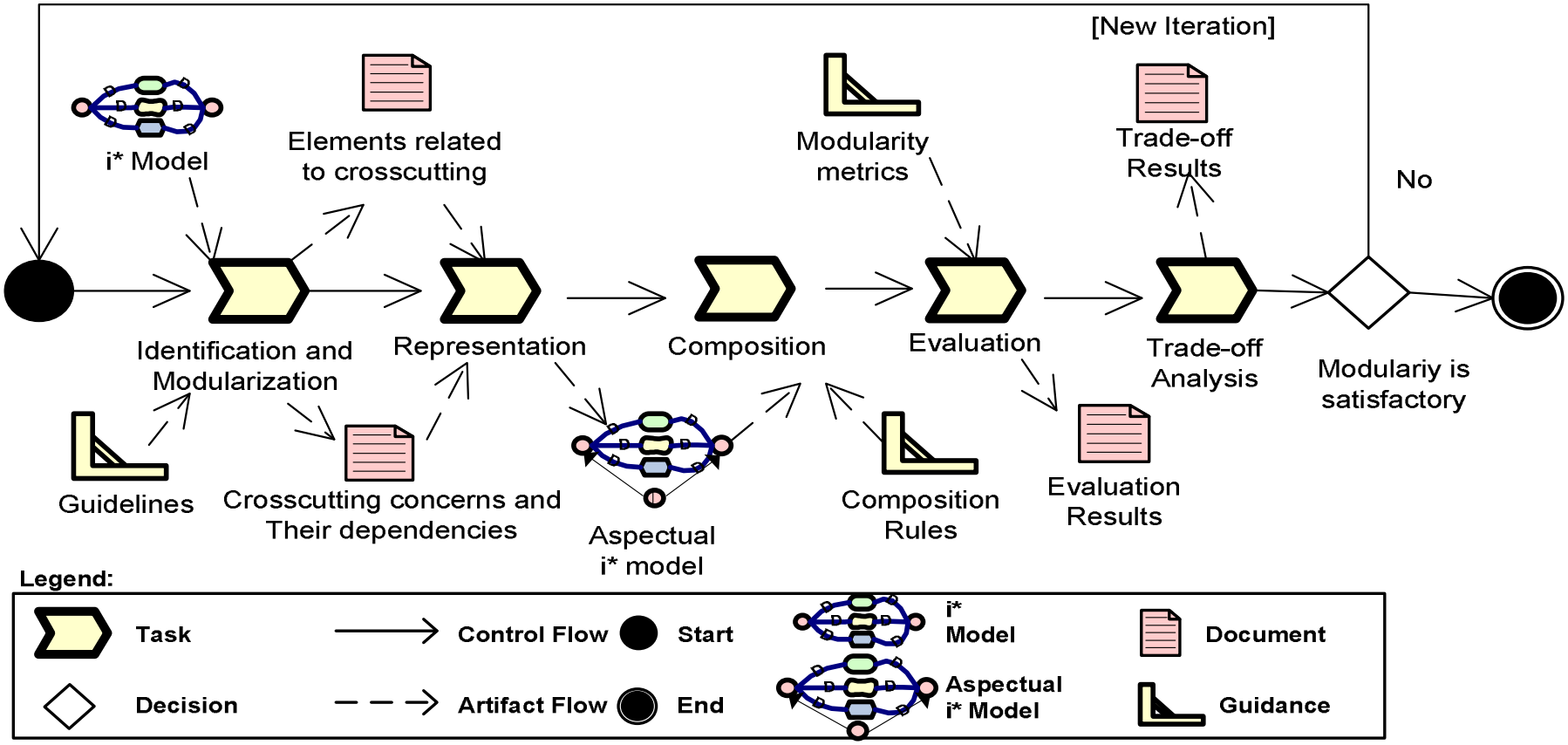




2 Modularizing i* with Aspects

- **Our aspectual approach consists of**
  - **(i) a set of guidelines to identify crosscutting concerns in i* models; and**
  - **(ii) an extension of the i* modeling language [11] by adding aspectual constructors to modularize crosscutting concerns and to allow its graphical composition with other system modules (Fig 1).**

2 Modularizing i* with Aspects



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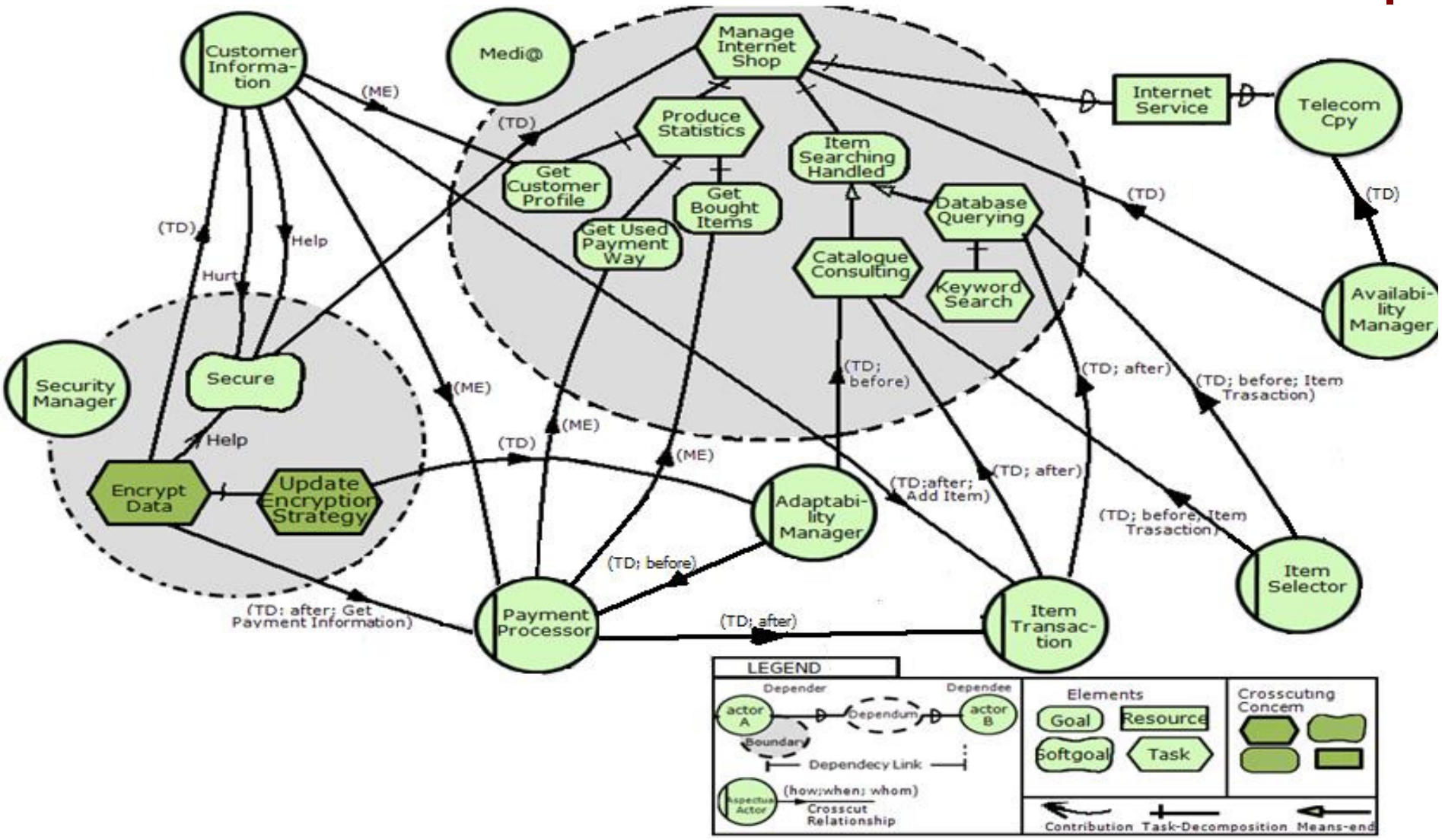


3 Modularizing i* by means of Model Transformations

- **An approach to improve the modularity of i* models is to restructure the models in order to extract the information that are not fully related to the application domain.**

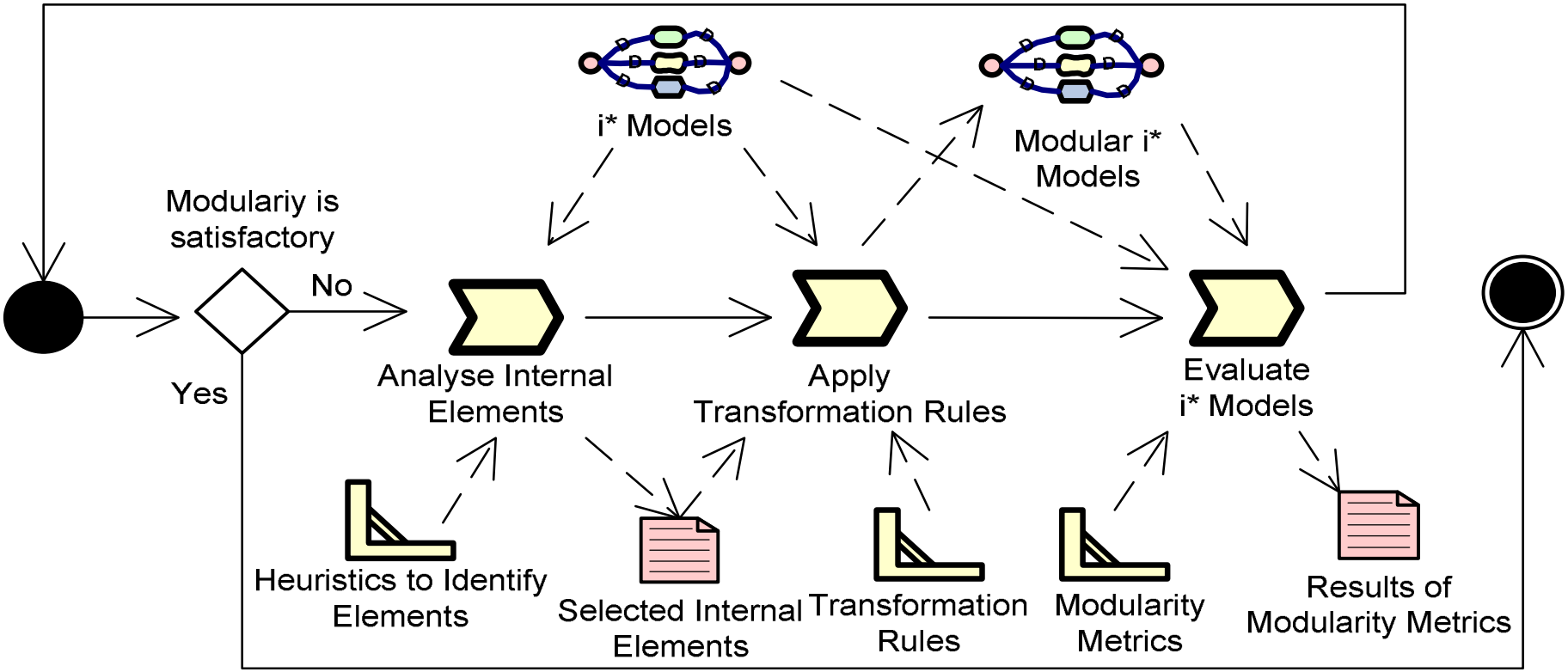
- **The model transformation approach consists of three activities (Fig 2):**

  (i) Analyze internal elements, whereby internal elements can be factored out from software actor are identified;

  (ii) Apply Transformation rules, which relies on model transformation rules to systematically move (delegate) the identified internal elements from software actor to new actors;

  (iii) Evaluate i* models, used at the beginning and the end of the process in order to evaluate the modularization of the models.

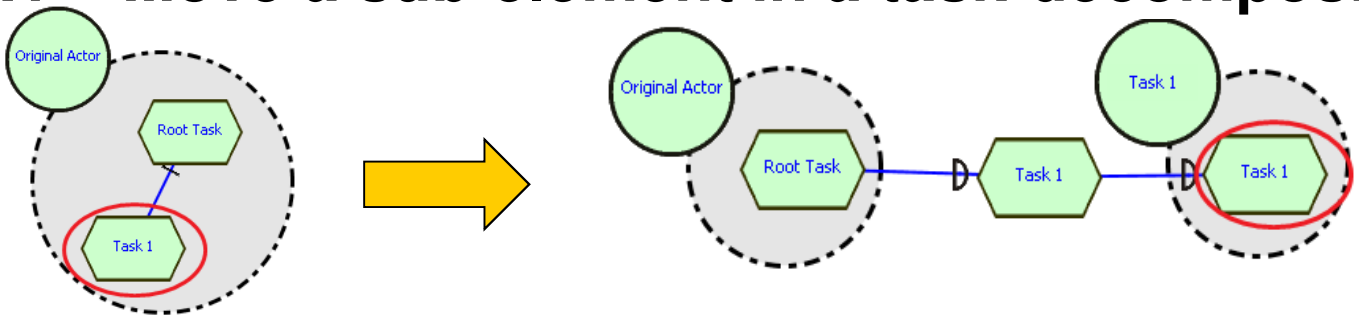
3 Modularizing i* by means of Model Transformations



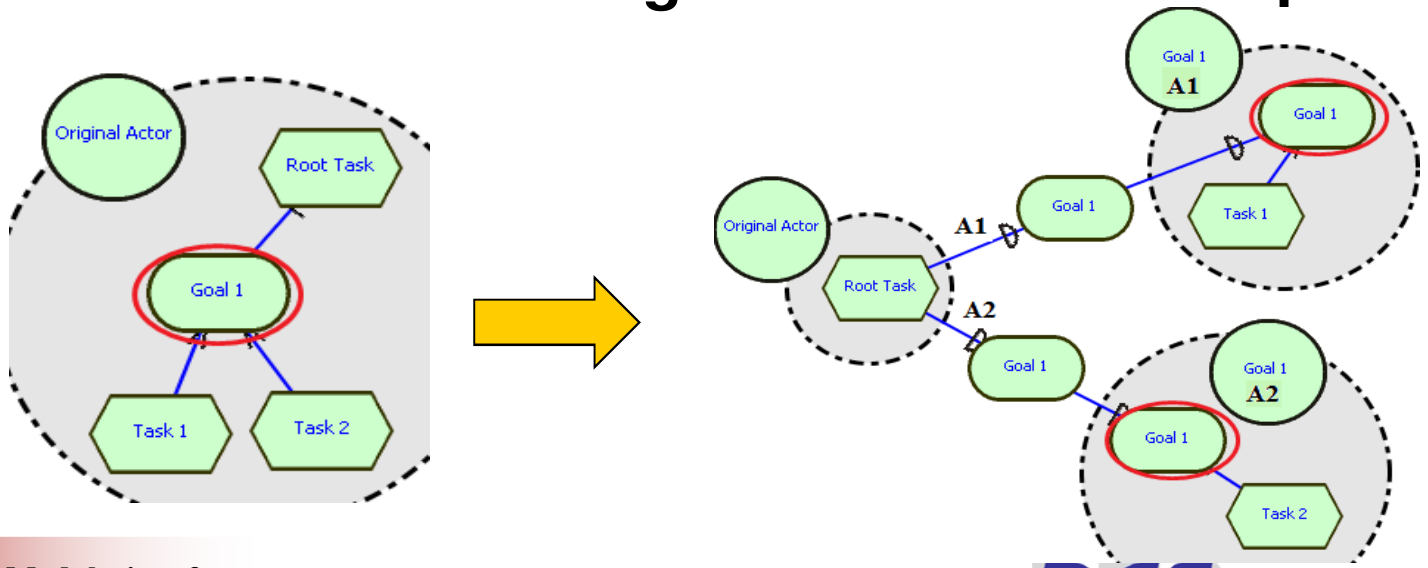
3 Modularizing i* by means of Model Transformations

Apply Horizontal Transformation Rules

- TR1 – Move a sub-element in a task-decomposition



- TR1v1 – Move a sub-goal in a task-decomposition



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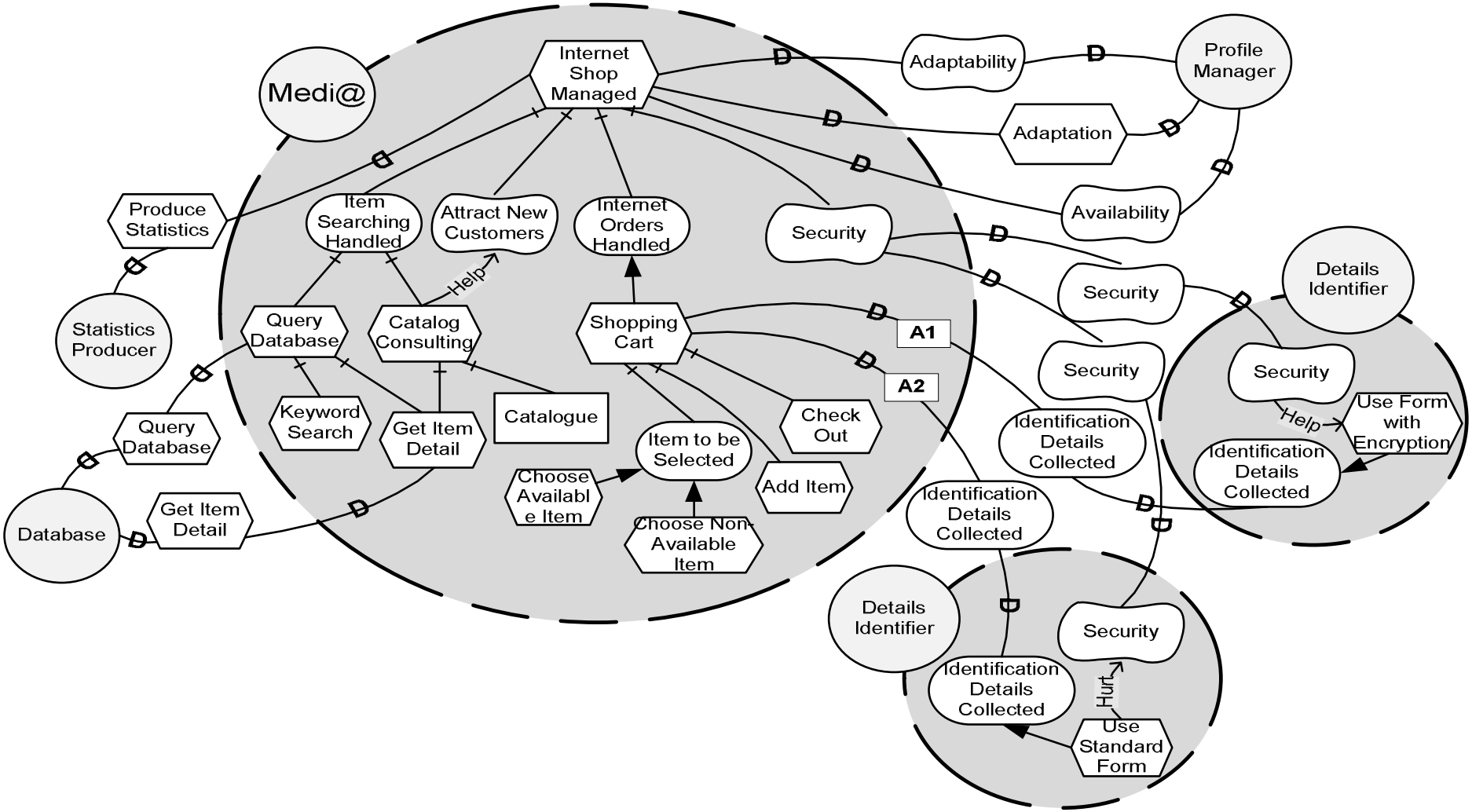

4 Ongoing and Future Work

- Evolution of the Istar Tool to support our modularity approaches.
- The unification of our approaches to decrease complexity, and to increase modularity and separation of concerns in i* models.
- The identification of suitable metrics for goal modeling is also advancing.
- Investigation of the usability of the models.
- Other case studies are performed in an experimental setting. We also need to validate the metrics.
- Definition of a trade-off analysis method to complement the aspectual i* process and to investigate the use of modularized i* models to support early architectural design.
- The extension of the AIRDoc approach in order to establish specific metrics to deal with i* models.

5 Publications

- **ACM SAC 2010**
- **4th International i* Workshop 2010**
- **Special Issue at Journal of Systems and Software**

6 Research

- **Dissertações**
  - **Extender Airdoc métricas em i***
  - **Comparação entre abordagens**
    - **i* aspectual**
    - **i* modular**
    - **i* Service**