

# Exploring Views for Goal-oriented Requirements Comprehension

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## But what is the problem?

Requirements artifacts are often too **large** or too **complex** to be quickly understood or queried by different stakeholders

Multiple views are broadly employed in requirements modeling for very specific purposes

These views do not offer interactive features to allow stakeholders browsing the information according to their needs

Views of the requirements should be configured to their particular needs

# Requirements exploration

It is a process to navigate through requirements artifacts, aiming at comprehending their structure and content

## **Reasons to provide mechanisms for requirements exploration:**

- 1) Requirements artifacts are often used by people who have not created them
- 2) Stakeholders need to search information on these artifacts
- 3) Exploration mechanisms can help navigating through the entire documentation to find the elements associated with a specific point of interest



# Viewpoint, point-of-view, view and visualization

## **Viewpoint and point-of-view**

opinion that a person has about a given subject

## **View**

includes a representation language

## **Visualization**

includes a representation mechanism such as zoom, filter, details on demand, history log, overview, ...



# Proposing 3 views for requirements exploration

1

## Big Picture view

Generates an overview for a source model

Offers the ability to expand and reduce the details on demand

Organizes the model information on levels of importance or by aggregation



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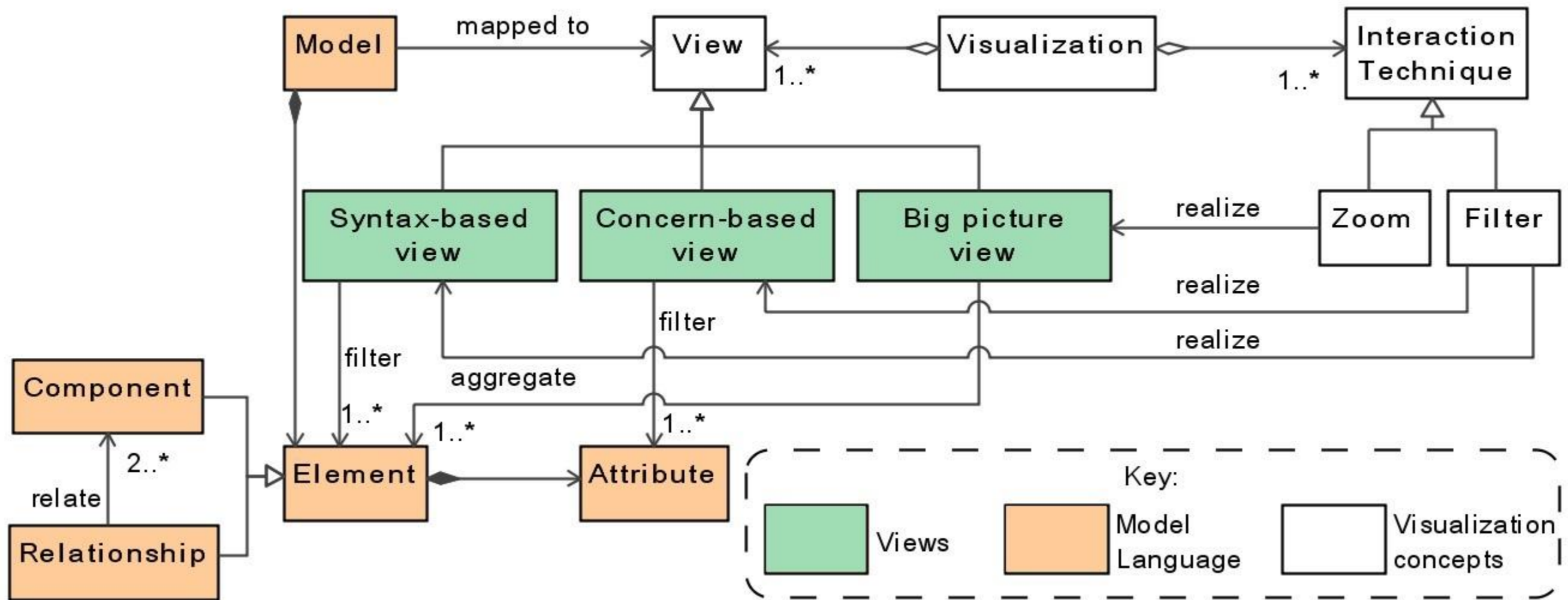
3

## Concern-based view

Filters concerns through meta-data, system lexicon (key words) or semantic similarity



# Conceptual model: exploratory views of requirements



# Demonstration: Health Care System



**Insurance Claim**

An insurance claim is a formal request to an insurance company for payment based on the terms of a policy. Insurance claims are reviewed by the insurer and, if approved, payment is made to the insured or the beneficiary.

# Demonstration: *i\** model for Health Care

## Numbers for Health Care System (HCS):

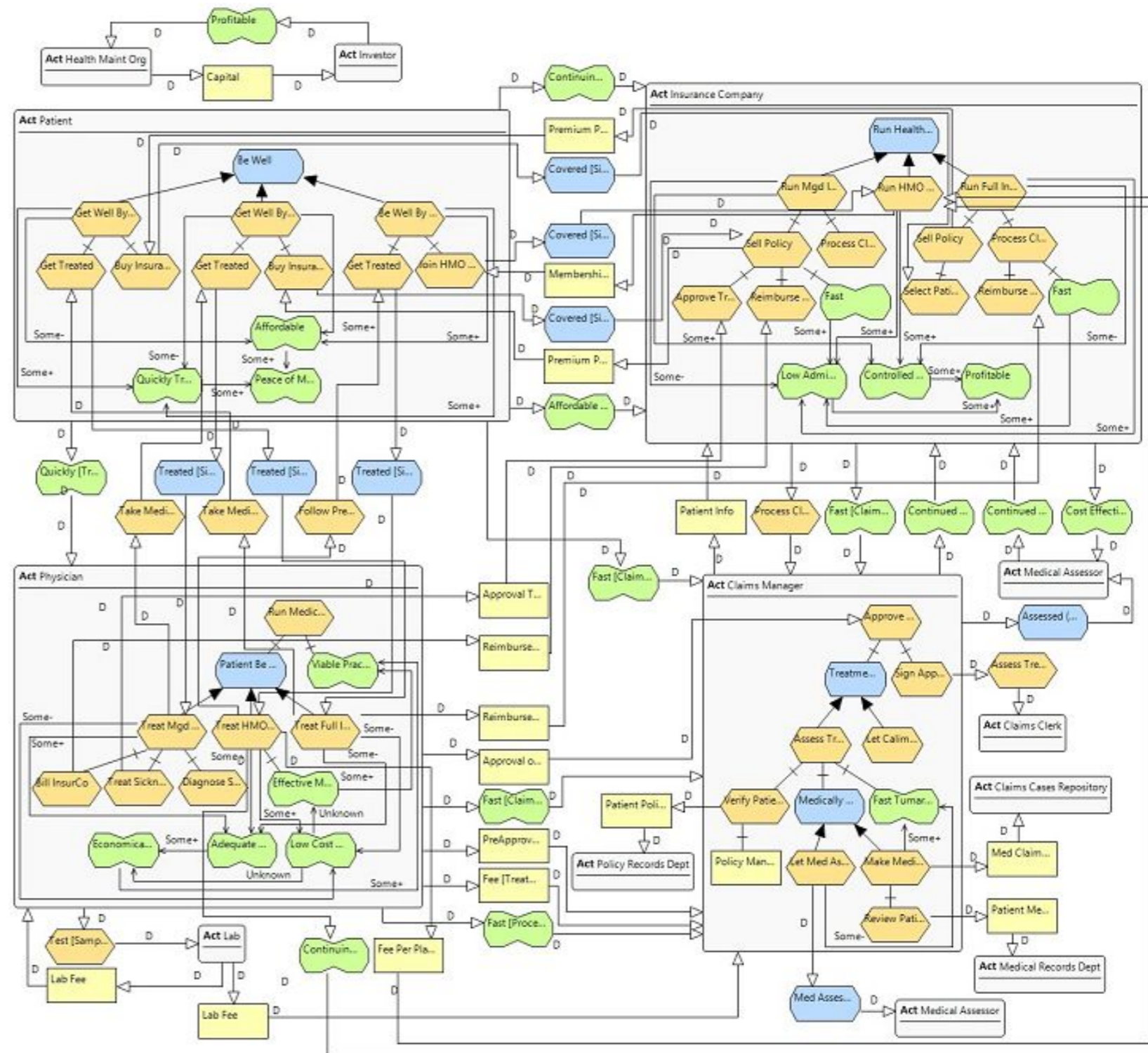
13 actors

13 goals

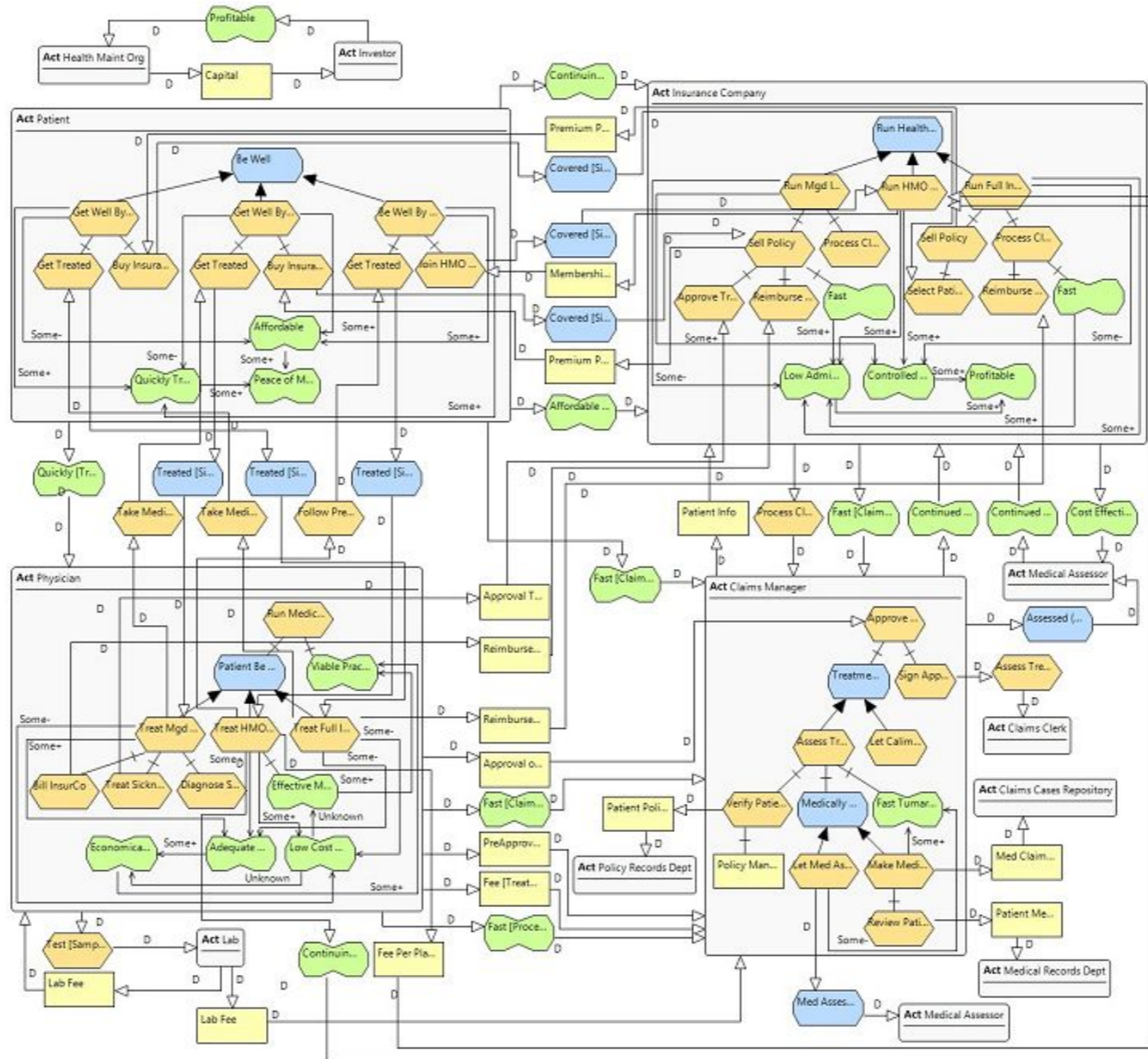
41 tasks

26 softgoals

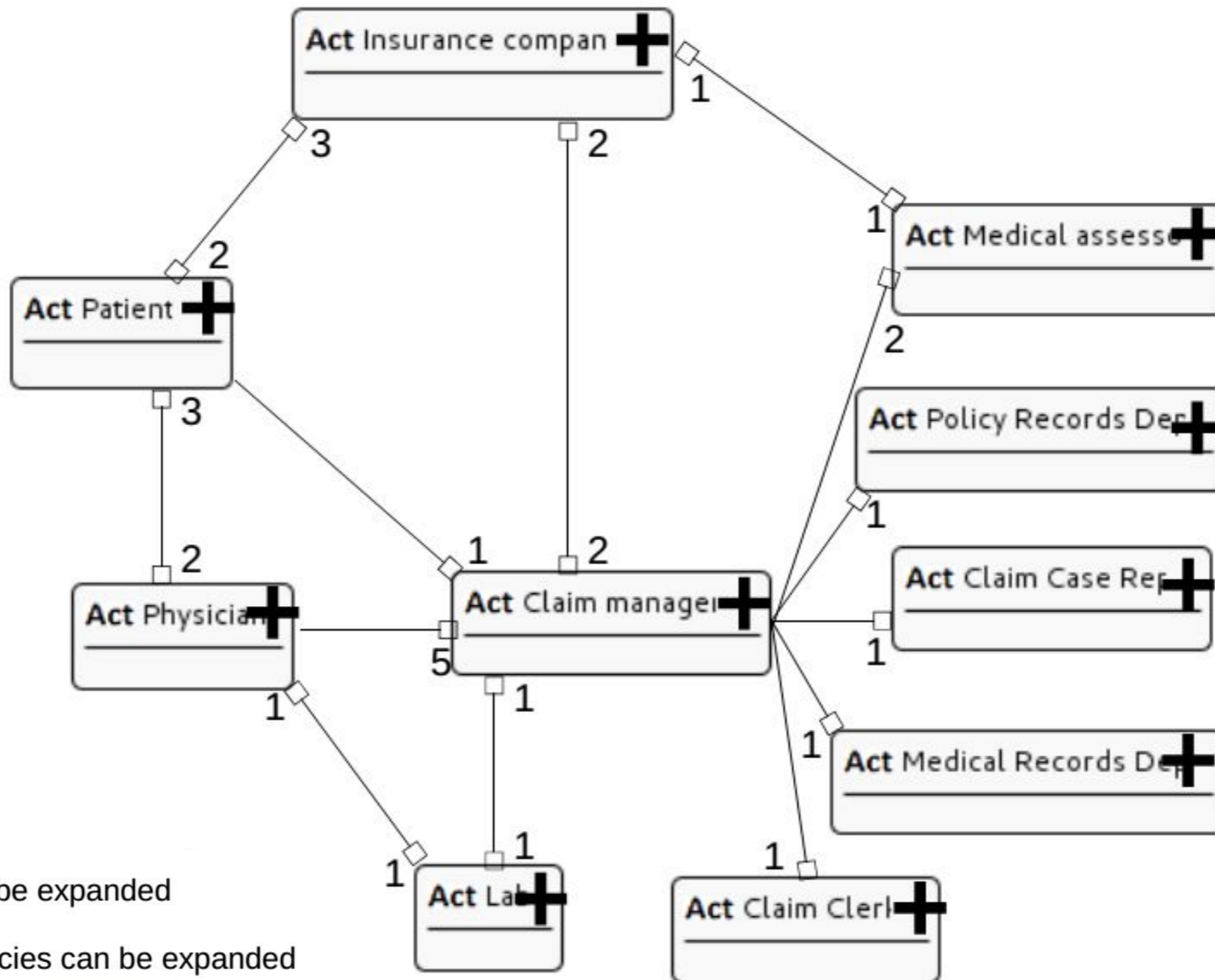
165 links



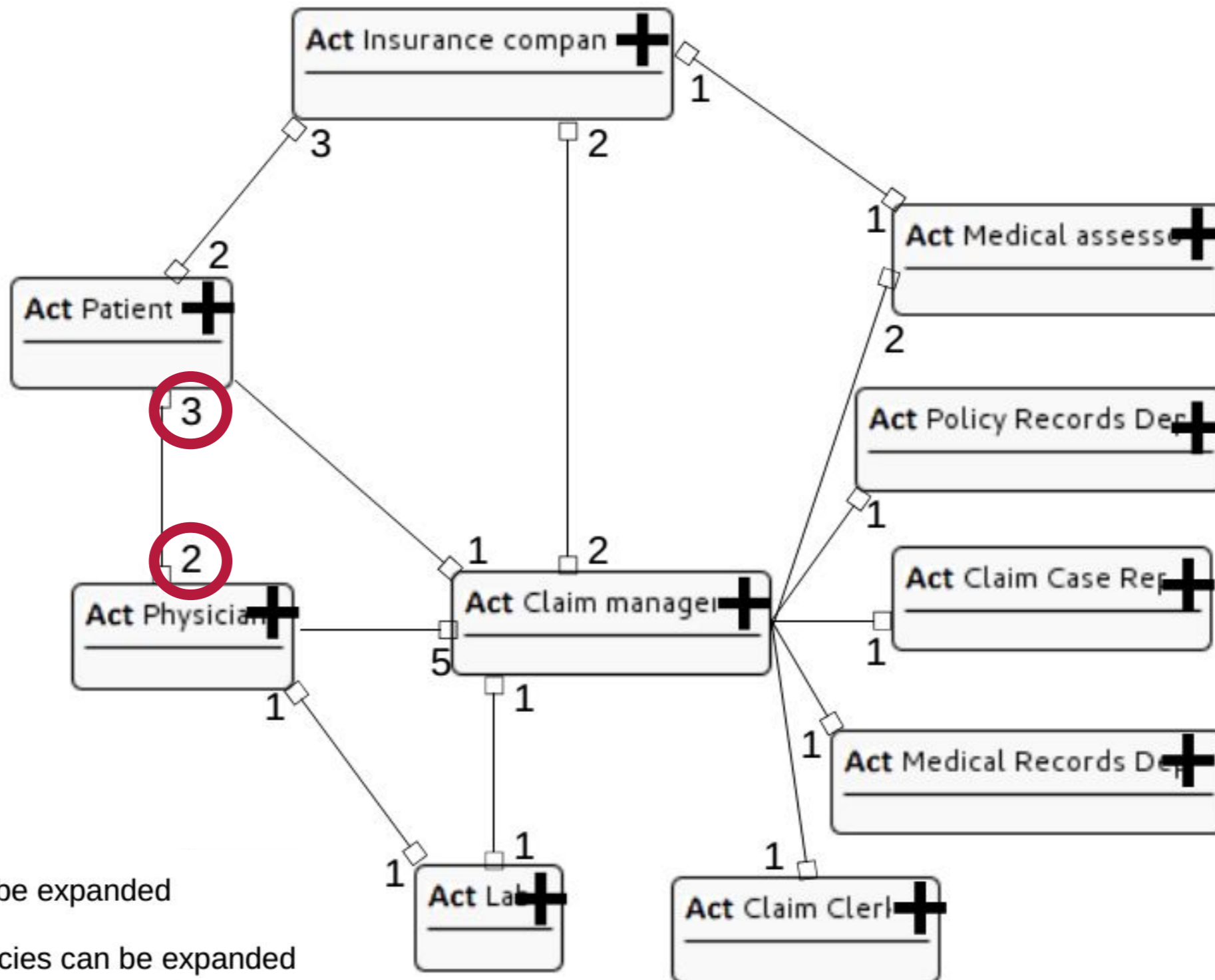
# Big Picture view expanded



# Big Picture view with both actors and dependencies collapsed

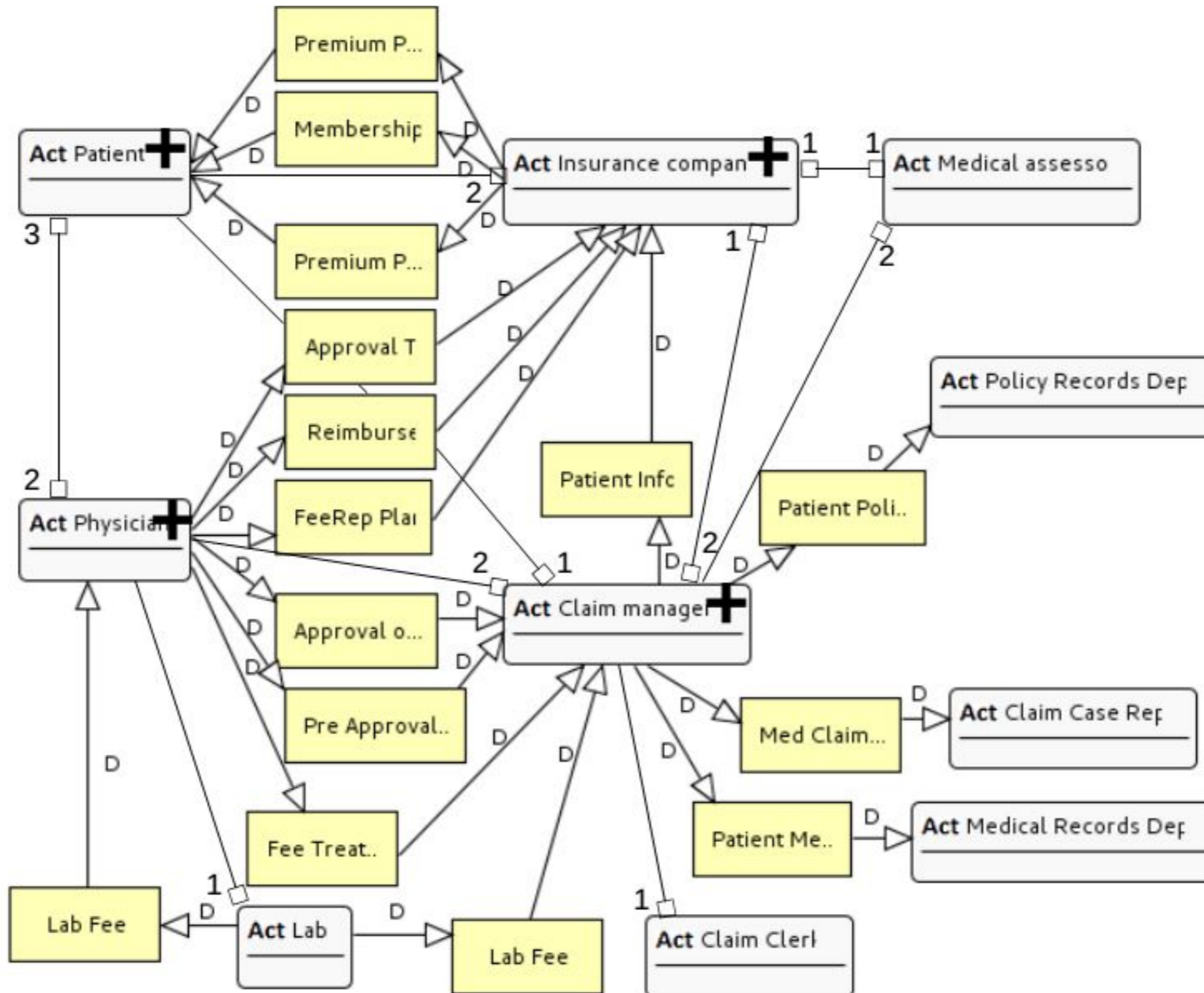


# Big Picture view with both actors and dependencies collapsed



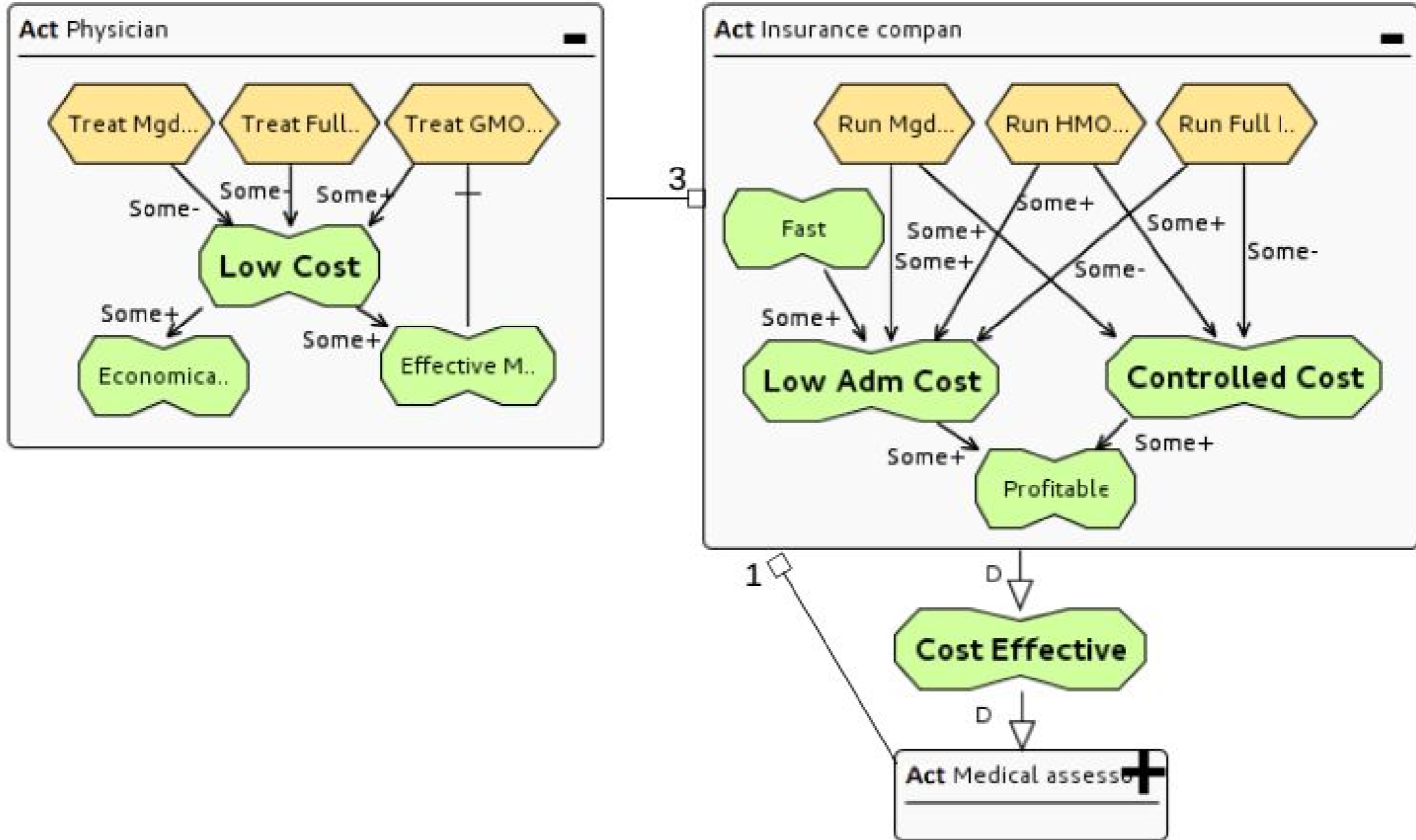


# Syntax-based view: filtering resource dependencies

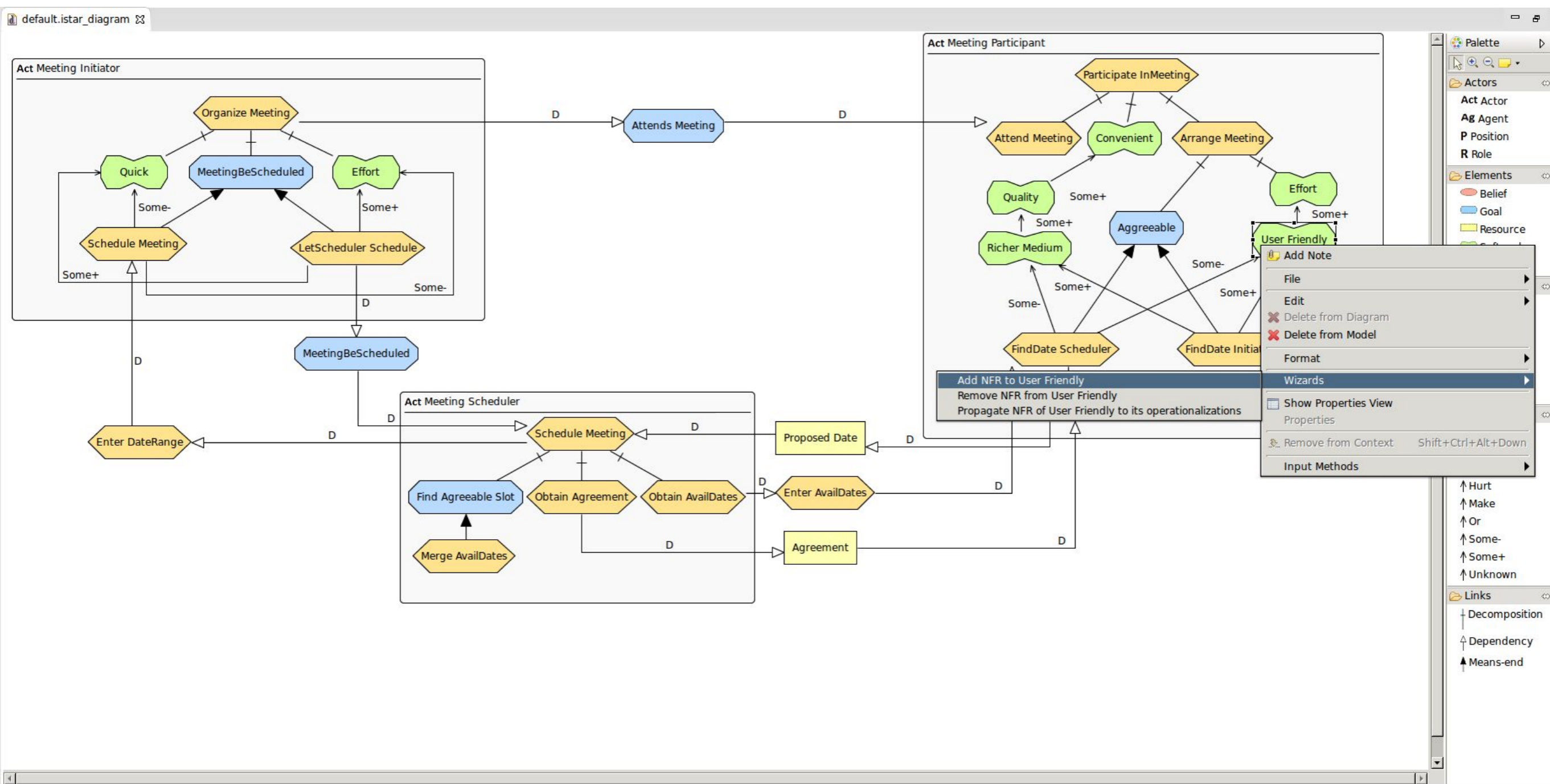




# Concern-based view: filtering the string *Cost*, considering a distance of one



# Tool support for the syntax-based view



# Discussion and current challenges for using multiple view for requirements exploration

In the requirements engineering process, many models are generated. It is necessary to provide **exploration mechanisms** to navigate **through them**, instead of only navigating an isolated model

The tools implementing this **complementary views** should provide mechanisms to allow users to interact directly with the visual elements

Users may interact with the source model as well as with the views. It is necessary to generate a view about **the path followed** to the achieved result

Interaction mechanisms include aspects from human-computer interaction have not been taken into consideration yet

# Summary and conclusions

We proposed 3 views for requirements exploration:  
big picture, syntax-based and concern-based

They are based on the interaction tasks zoom and filter

They capture 3 manners of abstracting a model, by:

- 1) decreasing it's amount of elements
- 2) allowing stakeholders to search
- 3) focusing on information of interest

Can be applied to other kinds of models: we have done it for use cases

Our views deal with the complexity of requirements models

Without this kind of mechanisms, more stakeholders effort is demanded to find and analyse relevant information in the system model



## Future work

Investigate how tools can be prepared for supporting our views

Define a process to instantiate our views to other requirement models

Conduct experimental evaluations of the impact of introducing the proposed views in requirements tools

Evaluate how the proposed views impact on the efficiency and effectiveness of different stakeholders while performing requirements exploration

**Thank you**  
Questions?



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