Goal Modelling
in
DOORS

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http://www.scenarioplus.org.uk

What is a Goal (in different areas of life)?

Where do Requirements come from?

- People
- All different
- What do they want?
- How do we find out?

GOALS

Does Industry Model Goals?

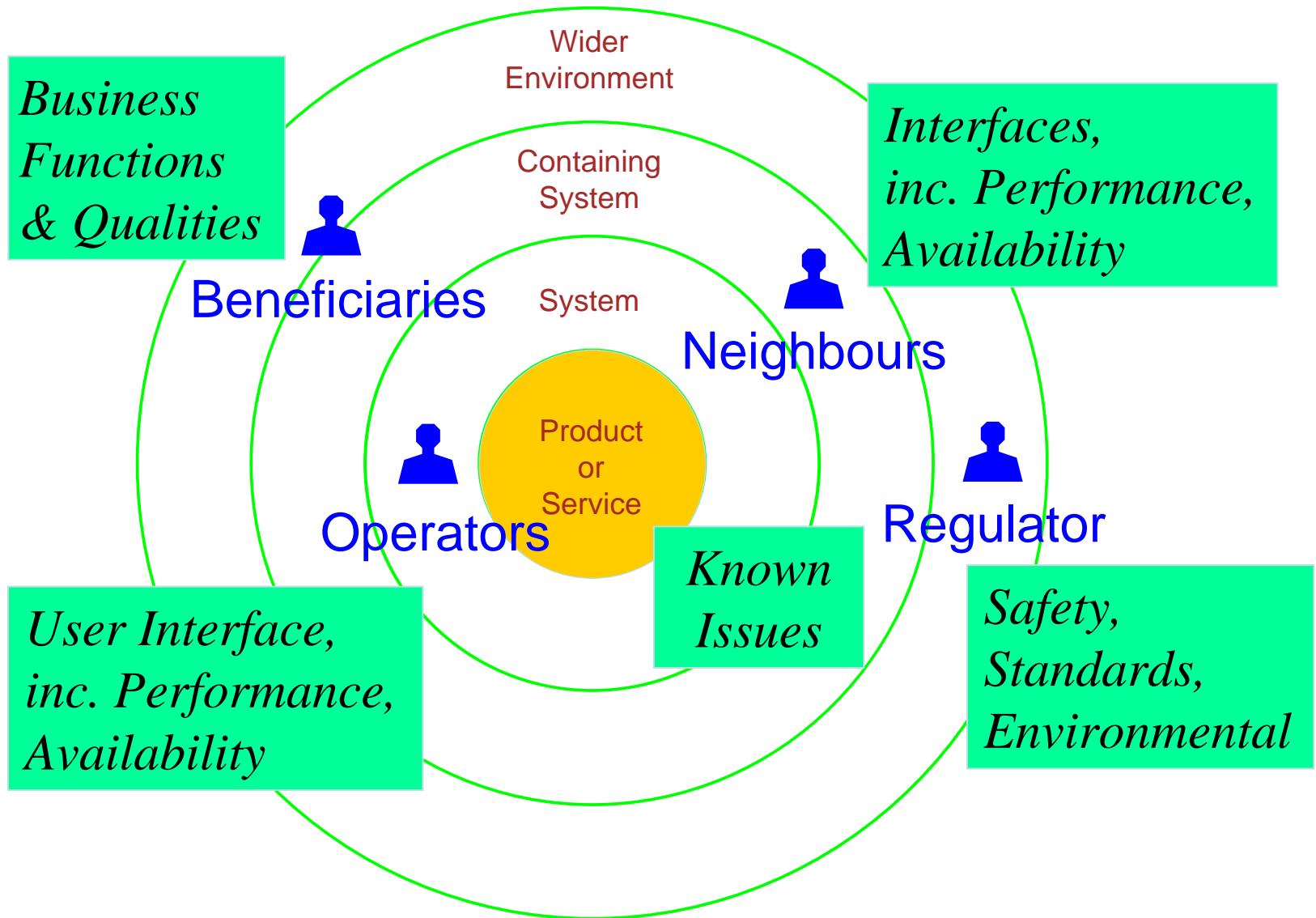**Most widely used** RE notations *

– Data Flow Diagrams

– Entity Relationship Diagrams

Not even mentioned

– Goal Models

* Davies, I., P. Green, M. Rosemann, M. Indulska, and S. Gallo,
How Do Practitioners Use Conceptual Modelling in Practice?
Data and Knowledge Engineering, 2006. **58**: p. 358-380.

Goals from Roles

Wider Environment

Containing System

System

Product or Service

Business Functions & Qualities

Beneficiaries

Interfaces, inc. Performance, Availability

Neighbours

Operators

Known Issues

Regulator

User Interface, inc. Performance, Availability

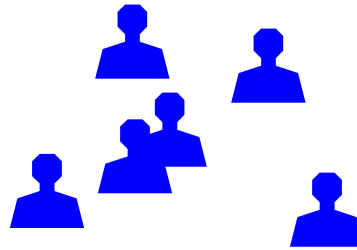**Safety, Standards, Environmental**

Do Interviewees State Fully-Formed Requirements?

What priority?

Is interviewee right?

Actually needed?

What is left unstated?

How could you test it?

Would other people agree?

Useful Goals
*can be **Unattainable***

on Burglar Alarm:

Householder

(Beneficiary) – I want to **feel safe in my house**

(Beneficiary) – I want **not to have valuables stolen**

These Goals are **key**
to purpose of product:
but can't be guaranteed

Useful Goals *can **Conflict*** … creating Trade-Offs

Low retail price to achieve sales growth	**vs**	Functionality of household alarm
Simplicity for householder	**vs**	Threat of tampering & impersonation by intruders
Cost of 'smart' self-contained household alarm	**vs**	Communication delay & workload at control centre

These Goal Trade-Offs
Drive the Design

Goals are not Requirements

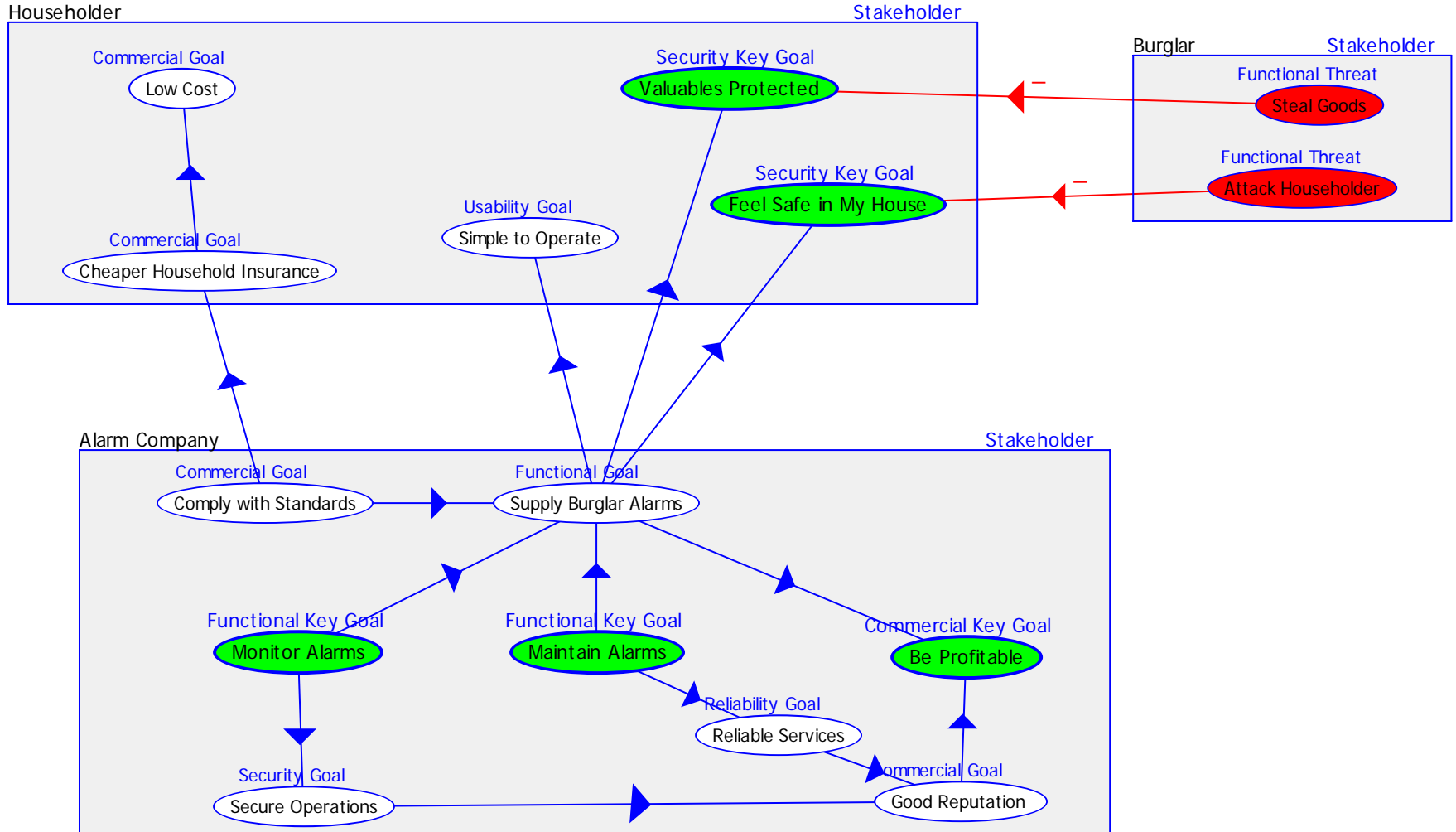| Goals	Requirements
belong to different stakeholders	*must be shared*
may conflict, indicating trade-offs; these often drive 1) design 2) choice of life-cycle	*must not conflict*, so design envelope must be known sufficiently
may be ideal, unattainable, indicating what is hoped for	*must be realisable* within limits of budget, timescale, technology, and skill available

"A perfectly secure system"
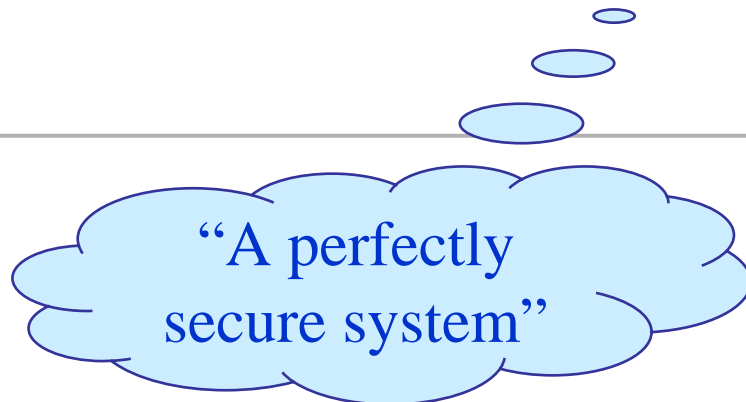
How can we Model Goals?

- they belong to stakeholders
  - why not ***contain them in named boxes?***

- Use Cases are functional goals
  - why not ***draw goals as named bubbles?***

- they help each other, or conflict
  - why not ***draw + or − arrows?***

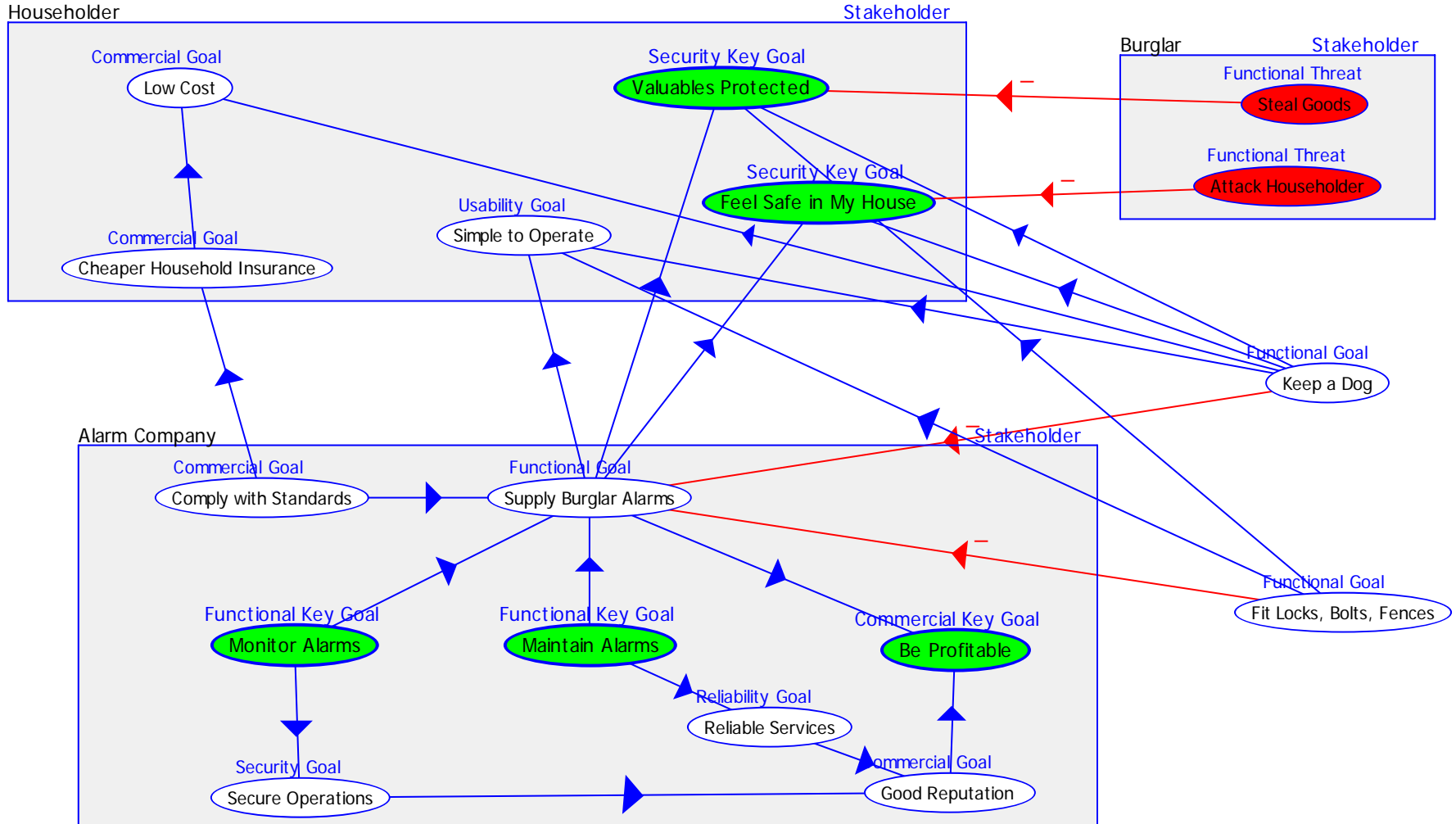　　　http://www.scenarioplus.org.uk

Goal Model – problem statement
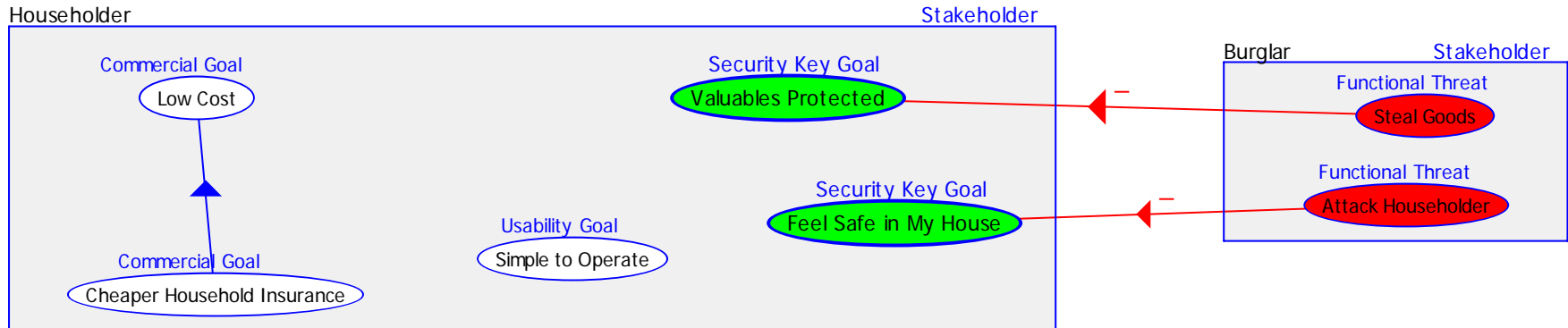
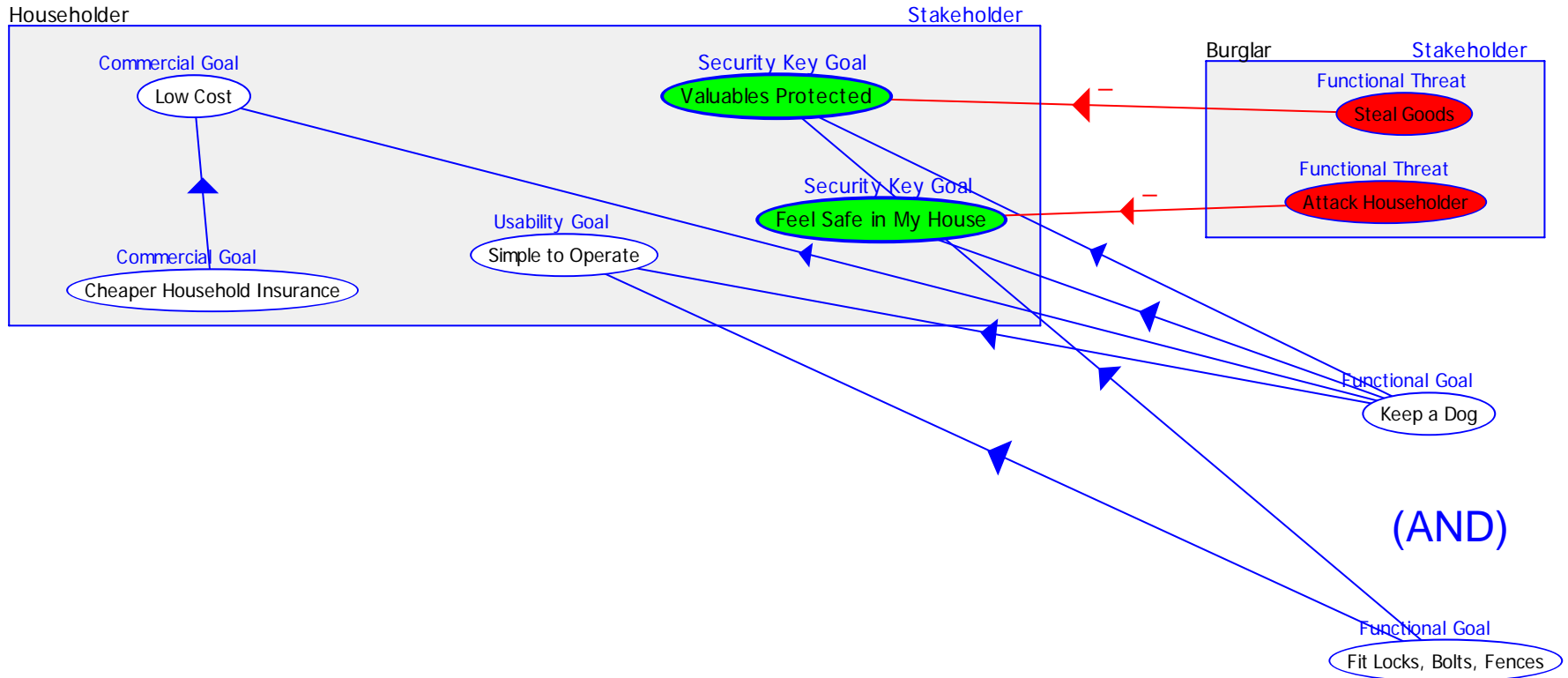# Goal Model – company solution

Goal Model – other options?

Cluttered!

Goal Model –
filtered – one solution

Householder   Stakeholder

Commercial Goal   Security Key Goal
Low Cost   Valuables Protected

                                             Security Key Goal
Commercial Goal   Usability Goal   Feel Safe in My House
Cheaper Household Insurance   Simple to Operate

Burglar   Stakeholder
Functional Threat
Steal Goods

Functional Threat
Attack Householder

Functional Goal
Keep a Dog

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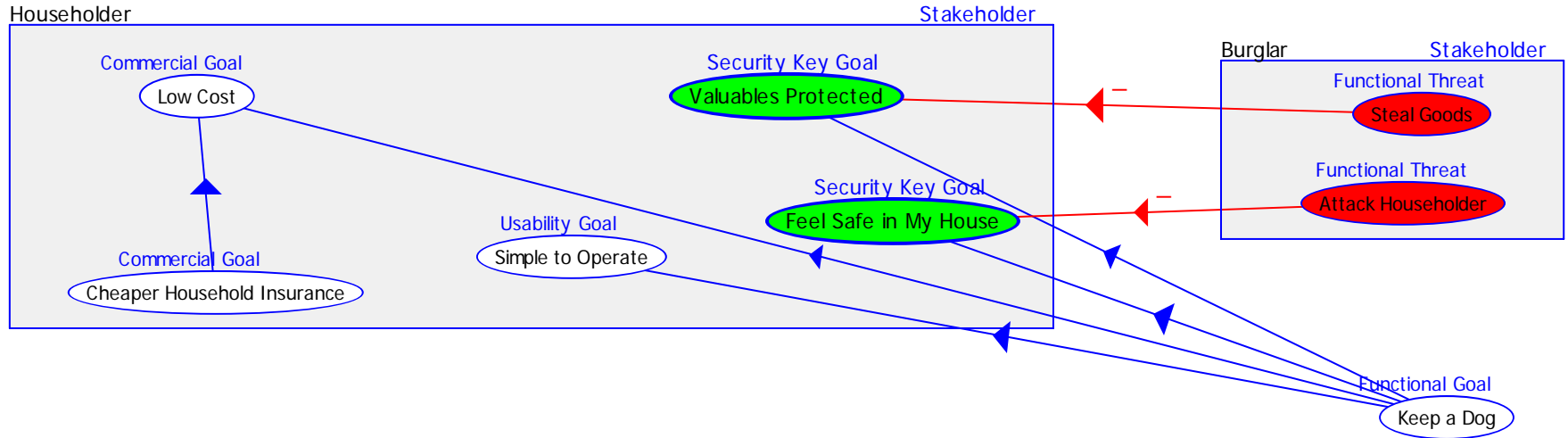
Goal Model –
filtered - another solution

Householder

Stakeholder

Commercial Goal
Low Cost

Commercial Goal
Cheaper Household Insurance

Security Key Goal
Valuables Protected

Usability Goal
Simple to Operate

Security Key Goal
Feel Safe in My House

Burglar   Stakeholder

Functional Threat
Steal Goods

Functional Threat
Attack Householder

Functional Goal
Fit Locks, Bolts, Fences

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Goal Model –
solution combining 2 options

Householder   Stakeholder

Commercial Goal
- Low Cost

Commercial Goal
- Cheaper Household Insurance

Usability Goal
- Simple to Operate

Security Key Goal
- Valuables Protected

Security Key Goal
- Feel Safe in My House

Burglar   Stakeholder

Functional Threat
- Steal Goods

Functional Threat
- Attack Householder

Functional Goal
- Keep a Dog

(AND)

Functional Goal
- Fit Locks, Bolts, Fences

Goal Model Editor

Arrow Editor

- Arrow means
  - (+) "this goal supports that goal"
    - "this goal weakens/conflicts with that goal"
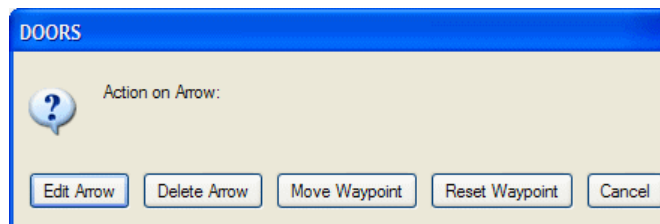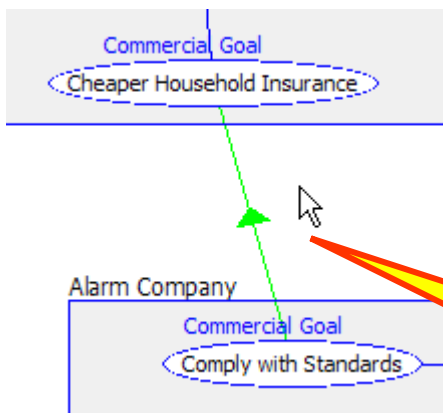
Right-click on arrow to pop up Arrow menu

Arrow editor just sets sign + (blue) or – (red)
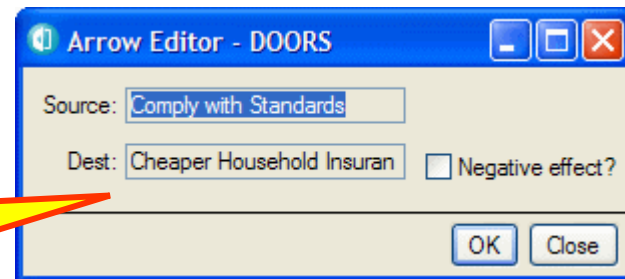
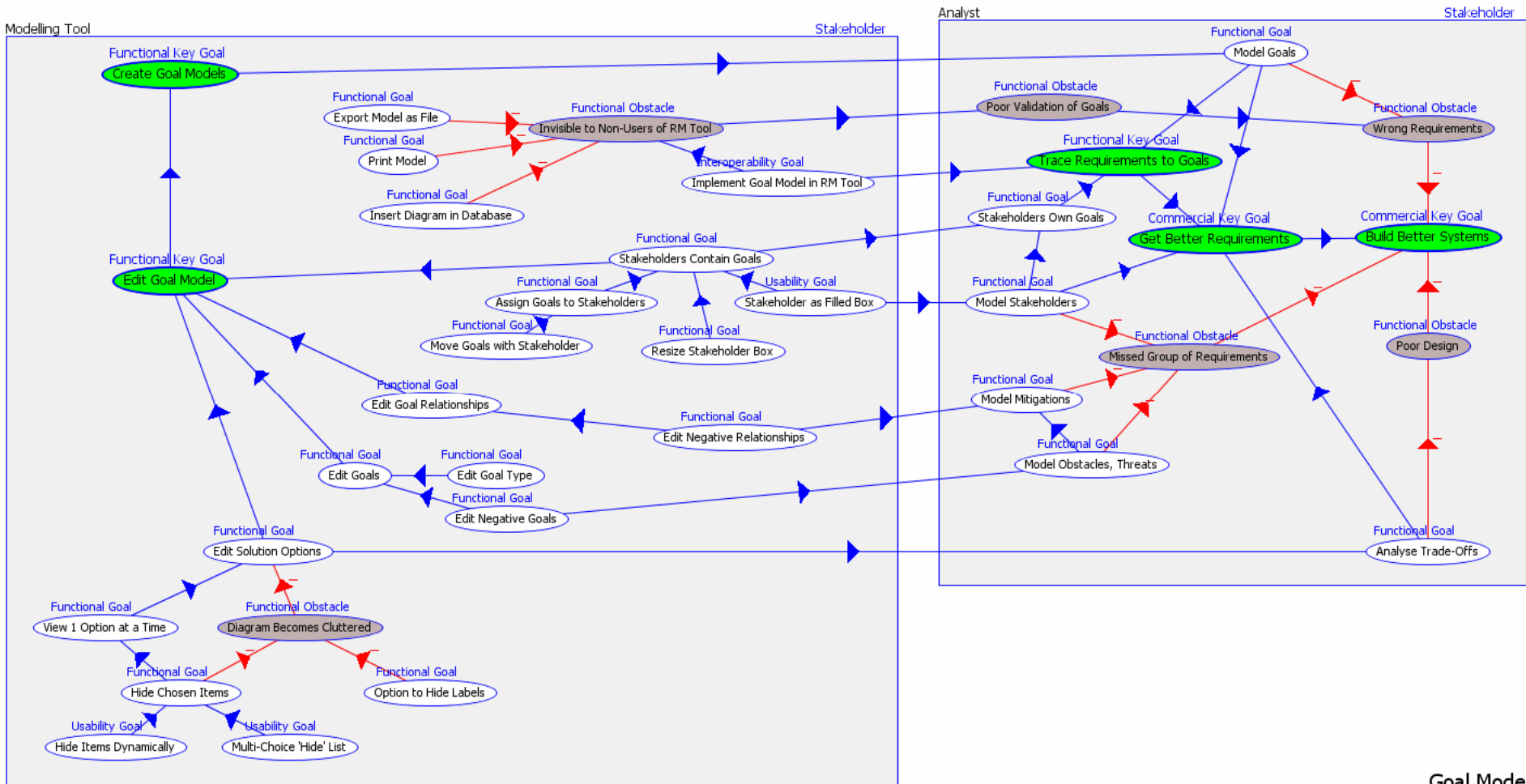# Editor - Viewing a Goal Model
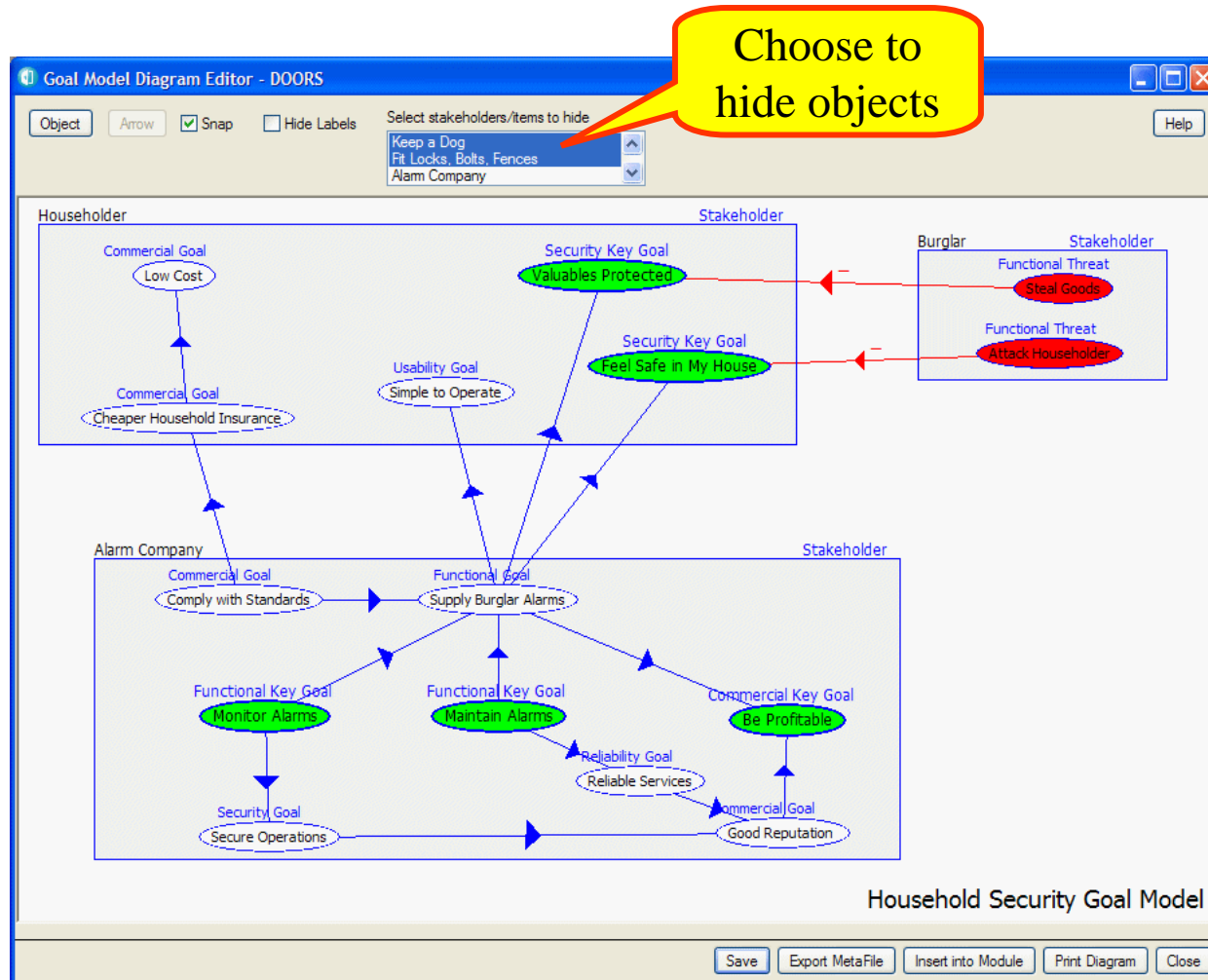
Tool Capabilities

Household Security Goal Model
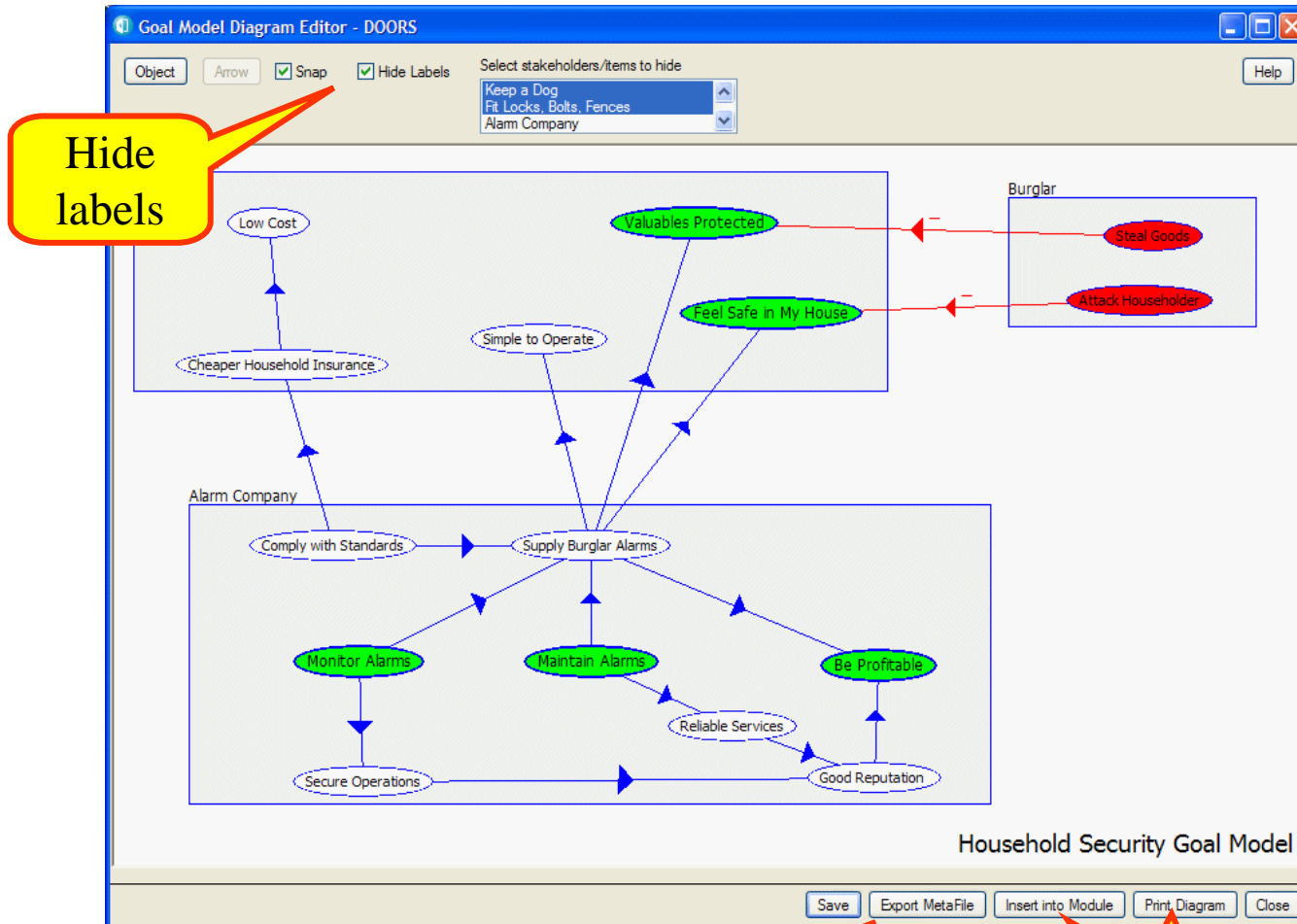
Hide labels

Export diagrams for use in documents, presentations

Easy printing

A Larger Example

Representing a Goal Model in DOORS
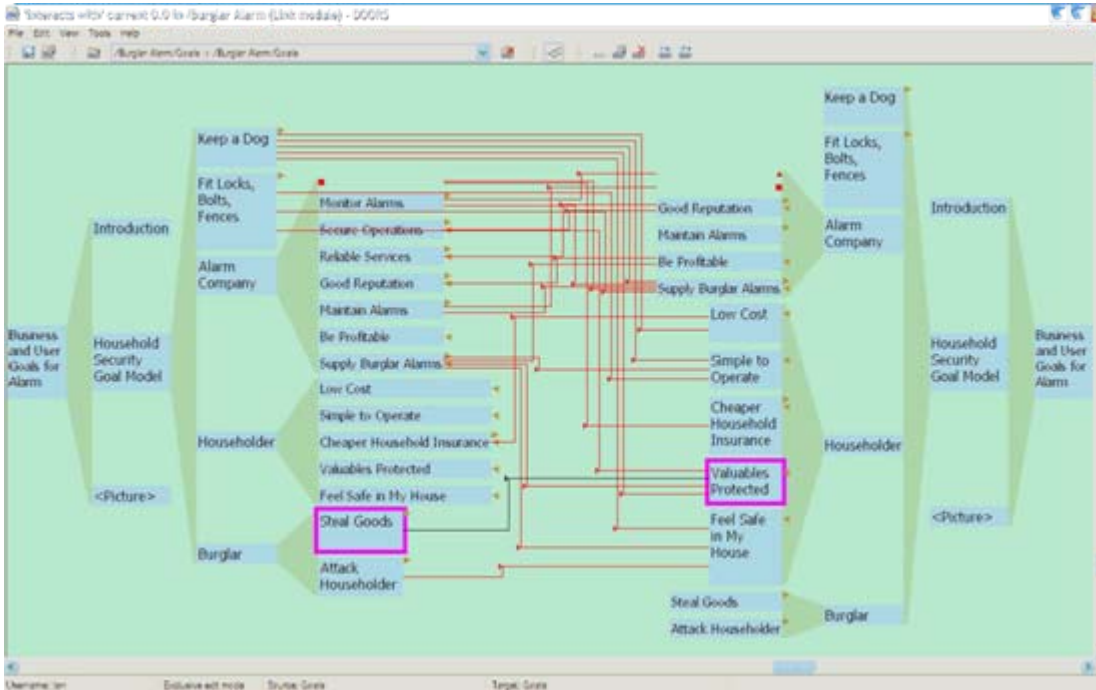
Hidden Requirements

- Drop Goal into Stakeholder box

  = "move goal to be child of stakeholder"

- Resize Stakeholder box

  = "find out which goals now belong to this stakeholder, and make them children"

- Move Goal out of Stakeholder box

  = "promote to top-level (unowned) object"

Behind the Scenes:
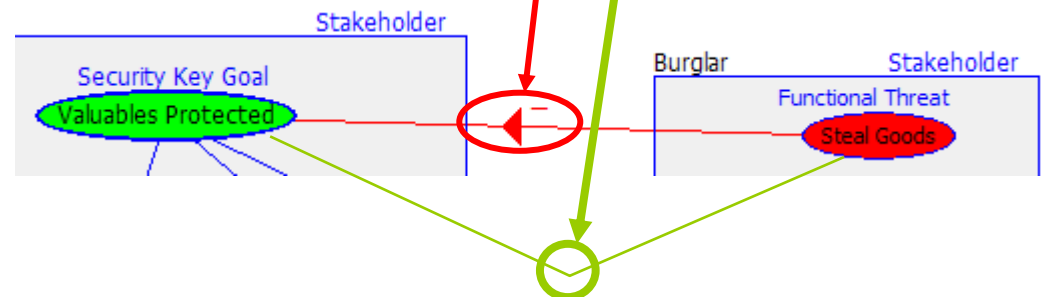# Link Attributes for Goal Relationships

Links *edited automatically*
(*user never sees* Link Attributes)

User can add a Waypoint
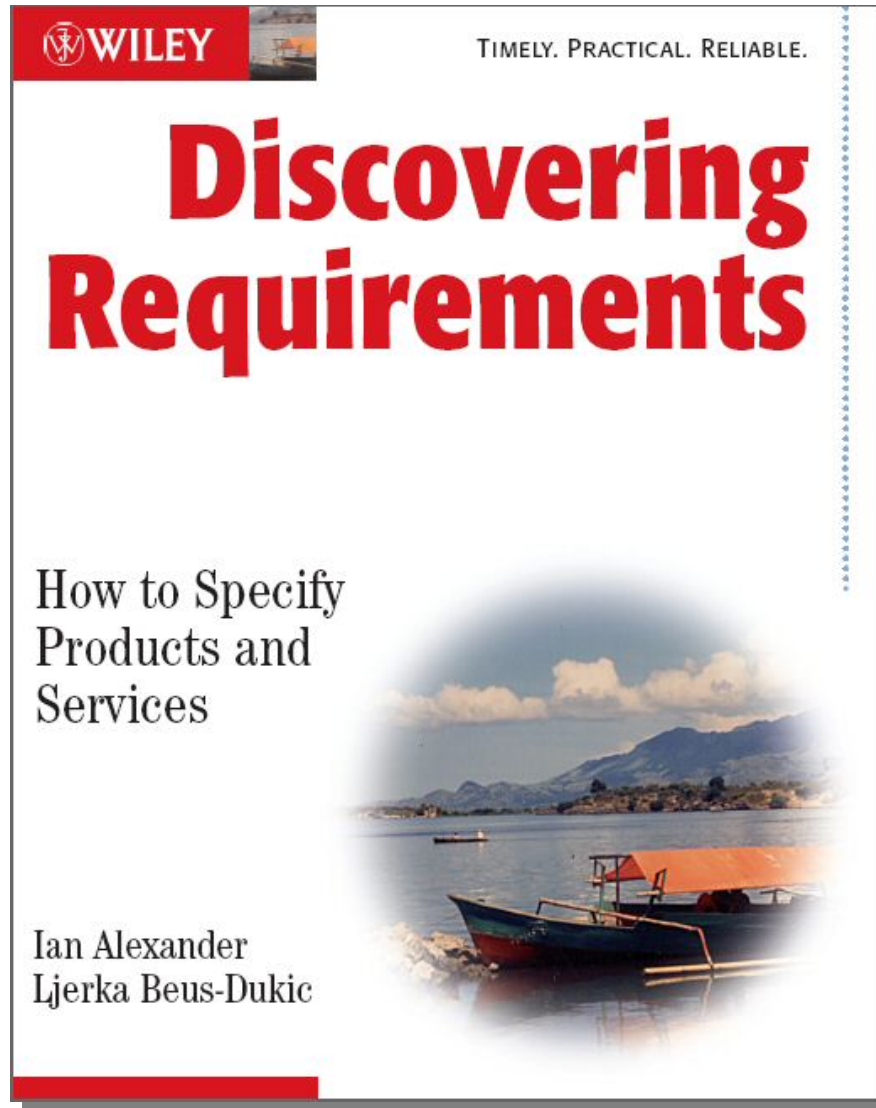to help reduce line crossings

Summary

- *Why Goals?*
  - discover real stakeholder needs
  - identify & resolve conflicts
  - identify and handle trade-offs

- *Why in DOORS?*
  - full traceability from requirements to goals
  - each stakeholder, goal a full object in database
  - goal models included in project baselines

Discovering Requirements

Requirement Elements

- Stakeholders
- Goals
- Context
- Scenarios
- Qualities
- Rationale
- Definitions
- Measurements
- Priorities

Discovery Contexts

- From Individuals
- From Groups
- From Things
- Trade-Offs

WILEY

TIMELY. PRACTICAL. RELIABLE.

Discovering Requirements

How to Specify Products and Services

Ian Alexander
Ljerka Beus-Dukic