

A scenic view of a lake with mountains in the background and a boat in the foreground. The boat is green with a red bottom and a blue canopy. The water is calm, and the sky is blue with white clouds. The mountains are in the distance, and there are some trees on the shore.

Goal Modelling *in* **DOORS**

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DOORS User Group

IBM Hursley, 16 February 2011

<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 *

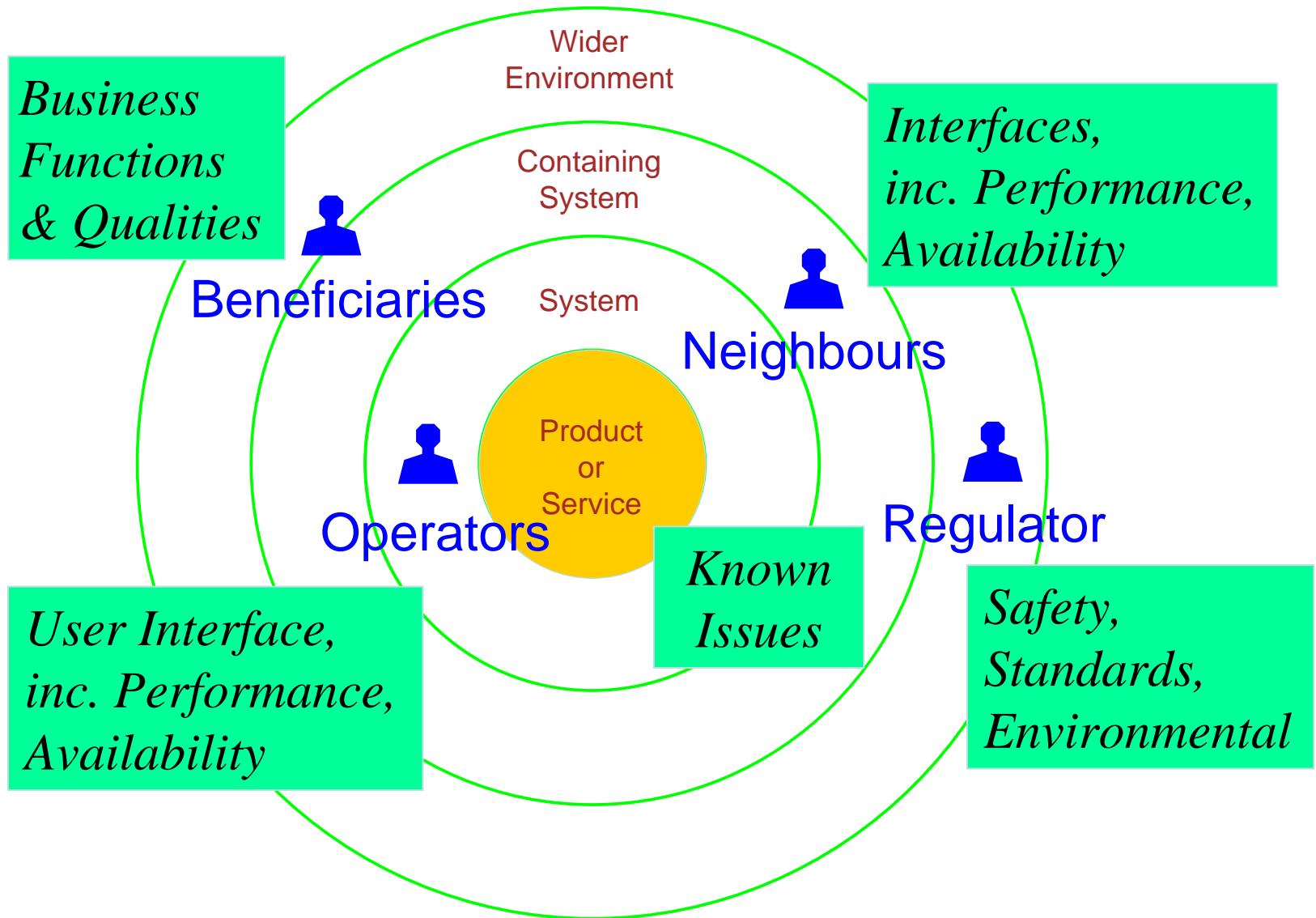
- Data Flow Diagrams
- Entity Relationship Diagrams

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

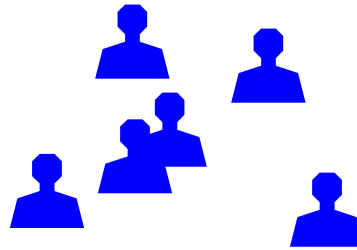


Do Interviewees State Fully-Formed Requirements?

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

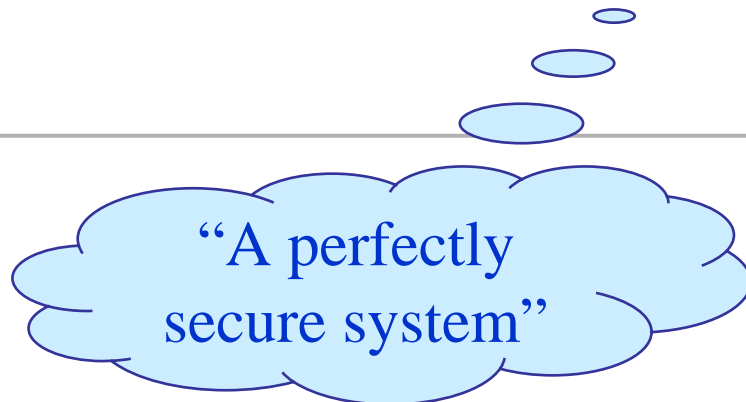
Useful Goals *can Conflict* ... creating Trade-Offs

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

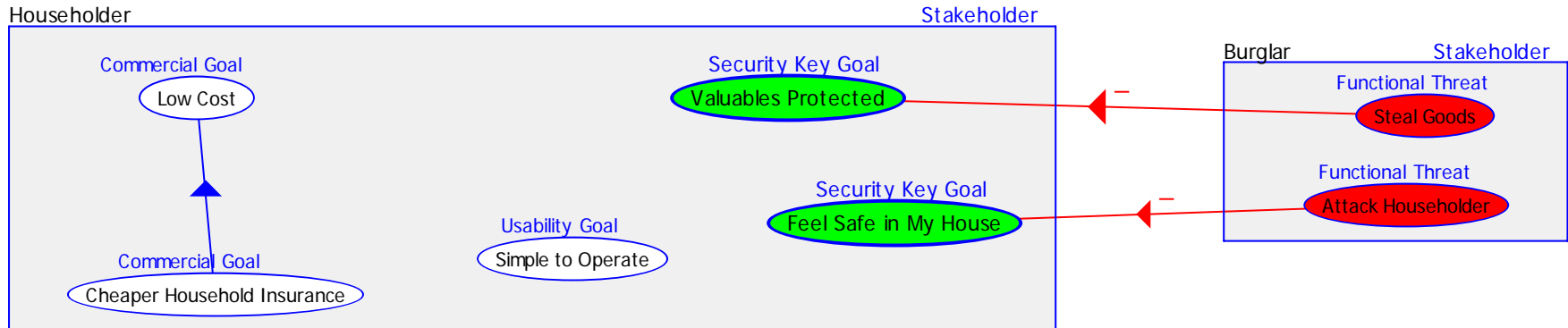
Goals	Requirements
belong to different stakeholders	<i>must be shared</i>
may conflict , indicating trade-offs; these often drive 1) design 2) choice of life-cycle	<i>must not conflict</i> , so design envelope must be known sufficiently
may be ideal, unattainable , indicating what is hoped for	<i>must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



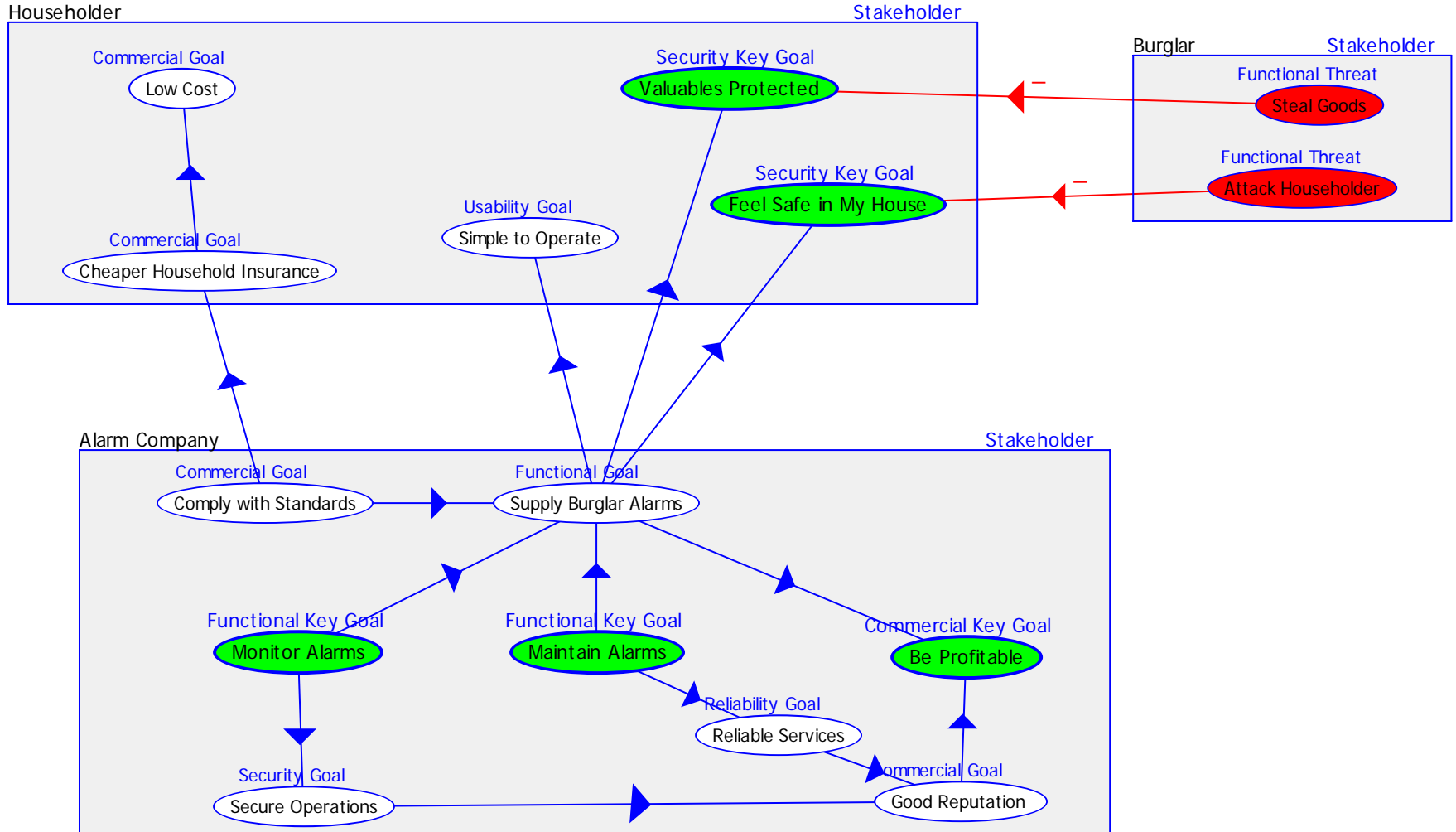
How can we Model Goals?

- 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?***

Goal Model – problem statement

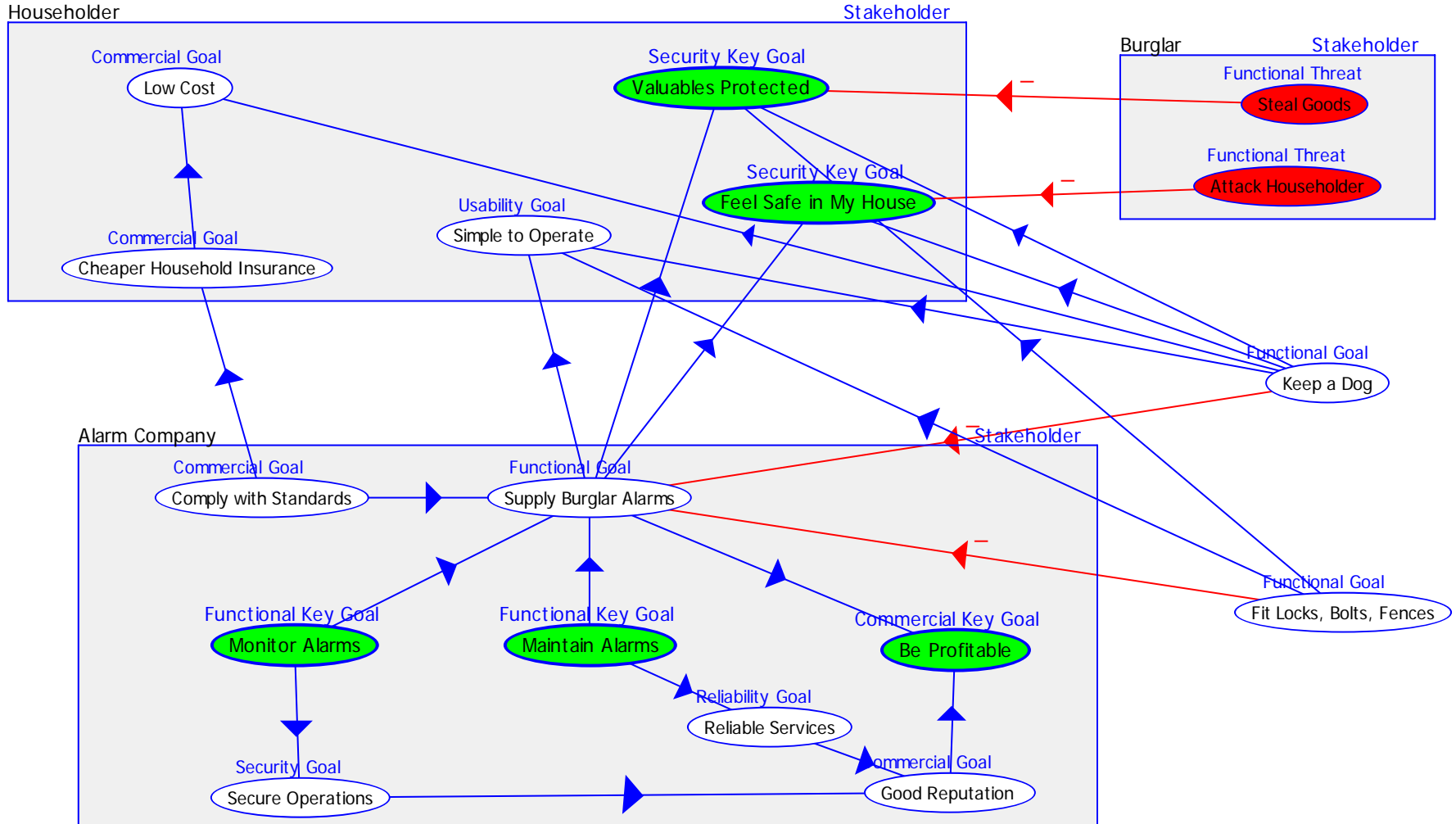


Goal Model – company solution

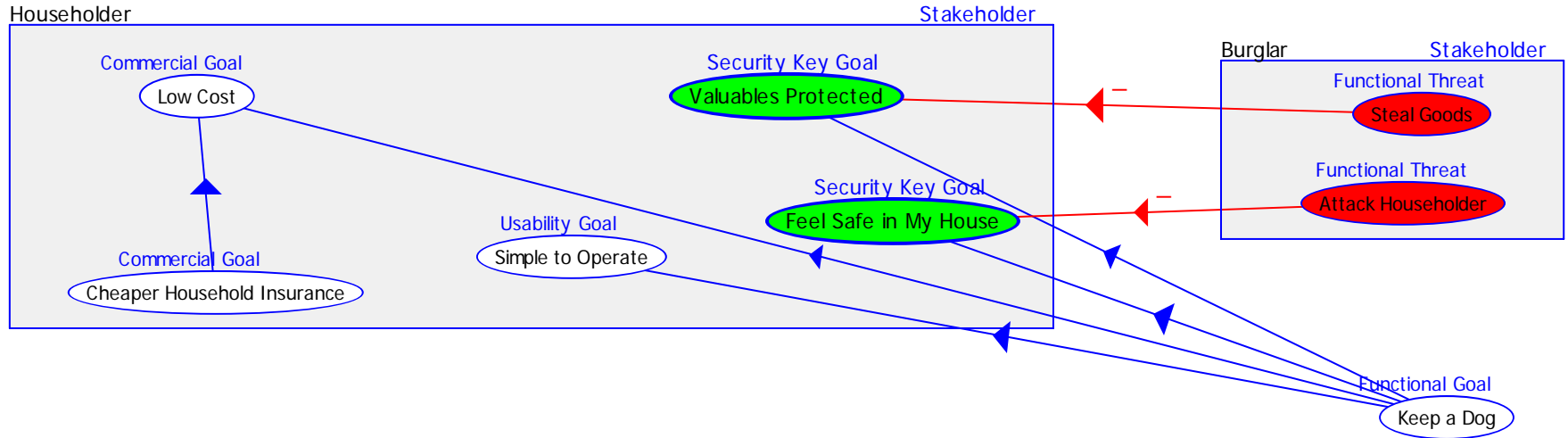


Goal Model – other options?

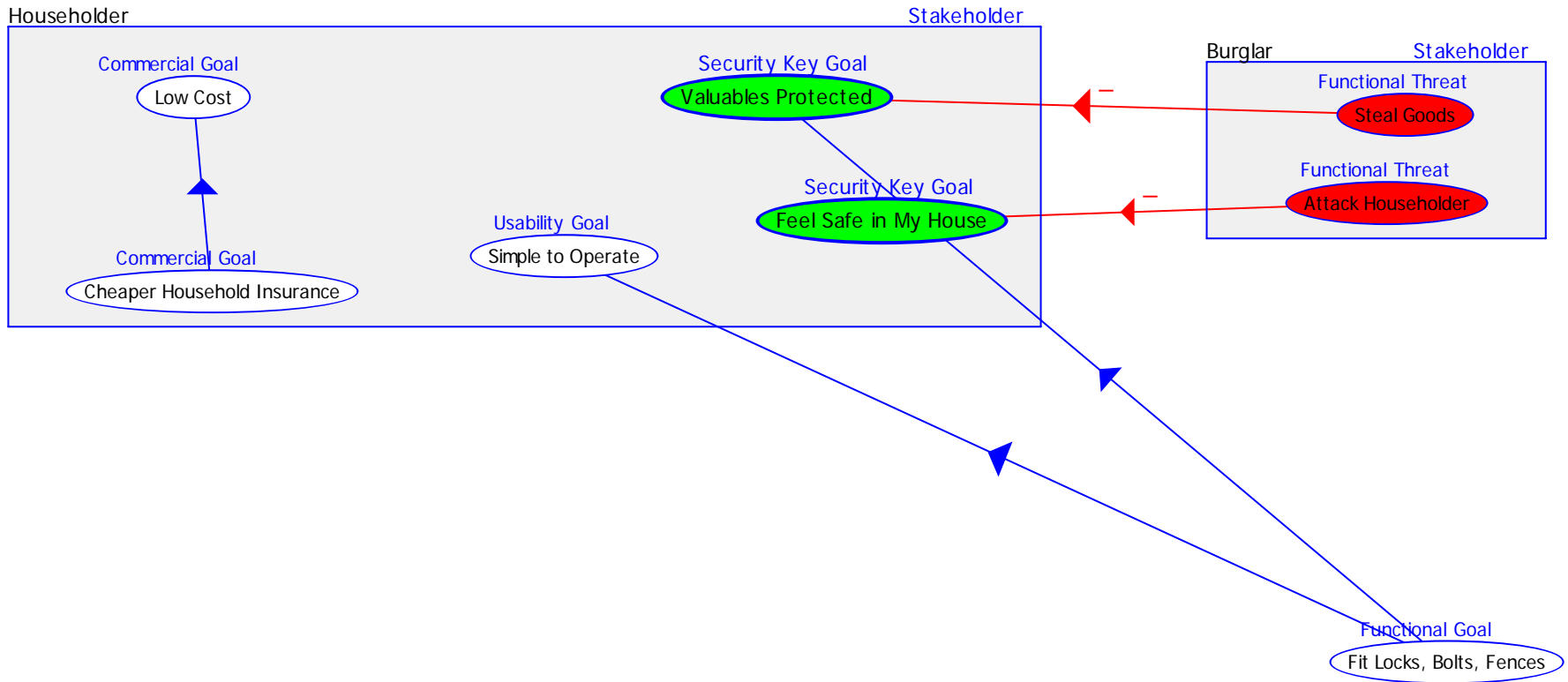
Cluttered!



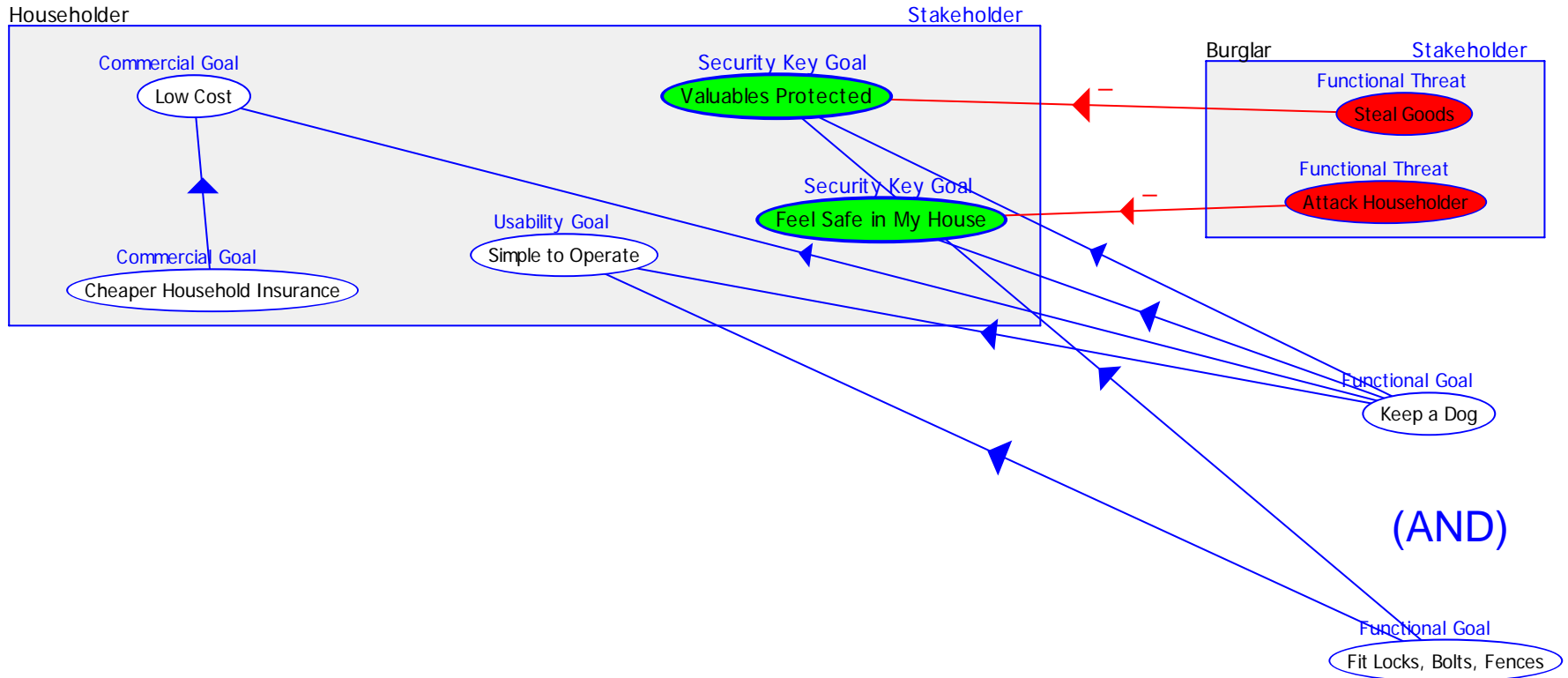
Goal Model – *filtered* – one solution



Goal Model – *filtered* - another solution



Goal Model – solution combining 2 options



Goal Model Editor

The screenshot shows the 'Goal Model Diagram Editor - DOORS' window. The main workspace contains a diagram with a 'New Stakeholder' box, a 'Stakeholder' box, and a 'Functional Goal' box containing a 'New Goal' oval. A context menu is open over the 'New Goal', and the 'Object Editor - DOORS' dialog is also open, showing configuration options for the selected object.

Create more objects (or Right-click in diagram)

Initial stakeholder, goal created automatically

Right-click to pop up item-specific menu

Specify type of object, eg Functional Goal

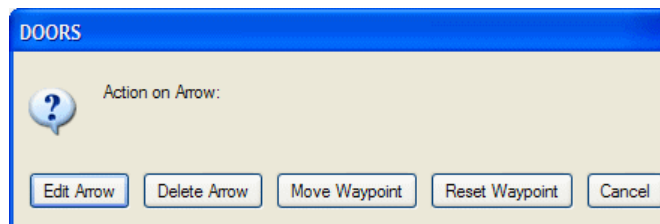
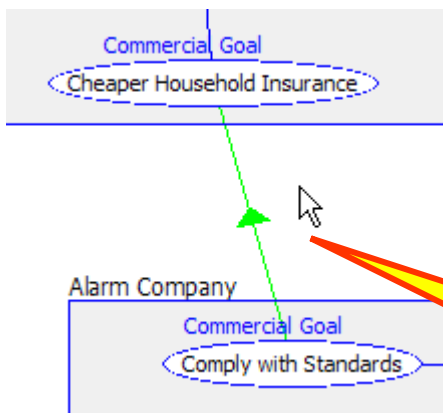
The 'Object Editor - DOORS' dialog shows the following configuration:

- Object: New Goal
- Owner: New Stakeholder
- Goal Type: Functional, Safety, Security, Reliability, Usability, Commercial, Legal, Interoperability,
- Object Type: Goal, Obstacle, Threat, Key Goal, Stakeholder

Buttons at the bottom of the main window include: Save, Export MetaFile, Insert into Module, Print Diagram, Close.

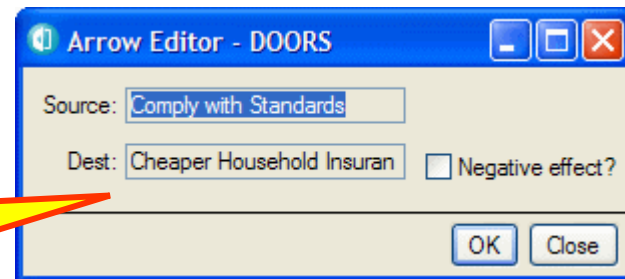
Arrow Editor

- Arrow means
 - (+) “this goal supports that goal”
 - “this goal weakens/conflicts with that goal”

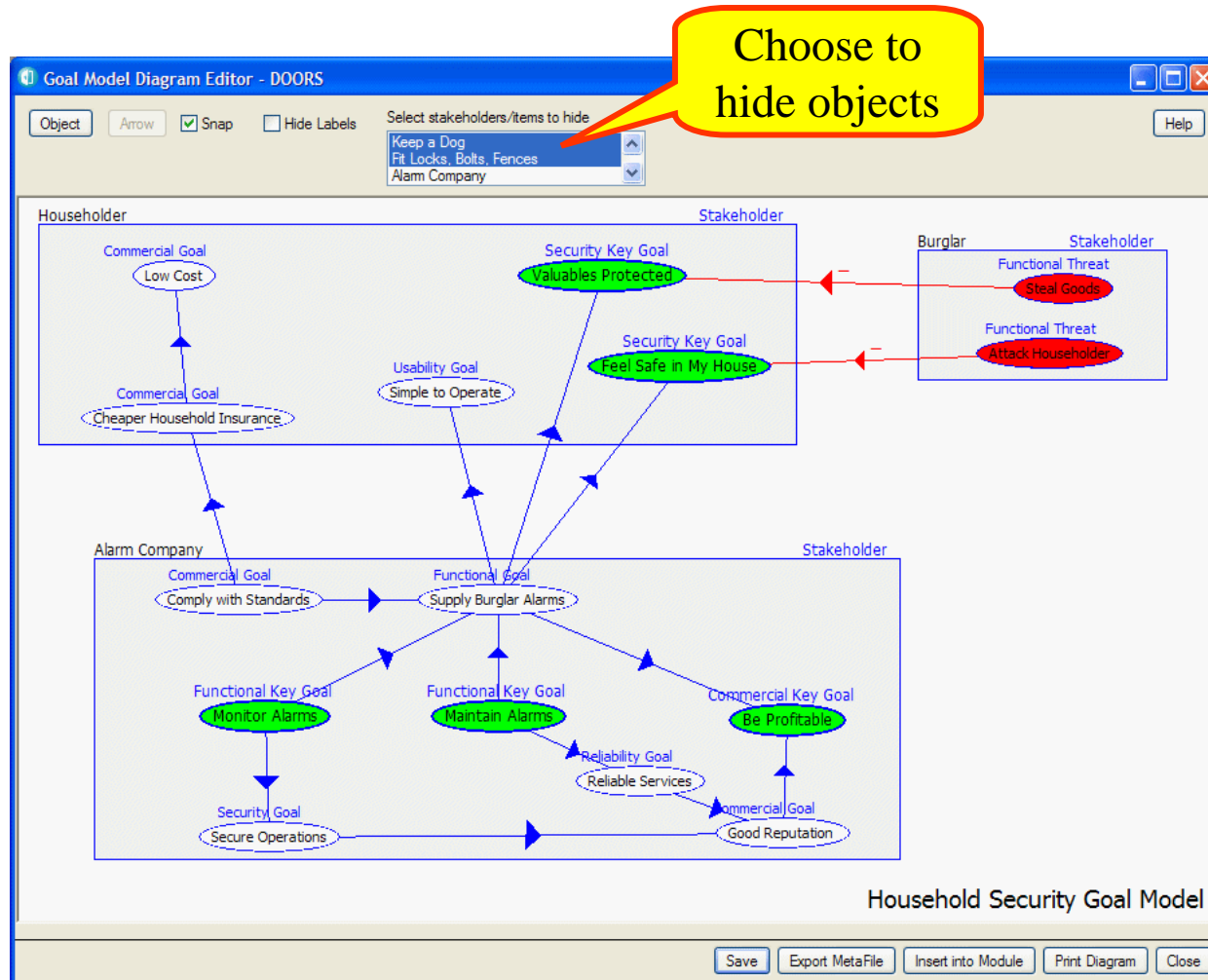


Right-click on arrow
to pop up Arrow menu

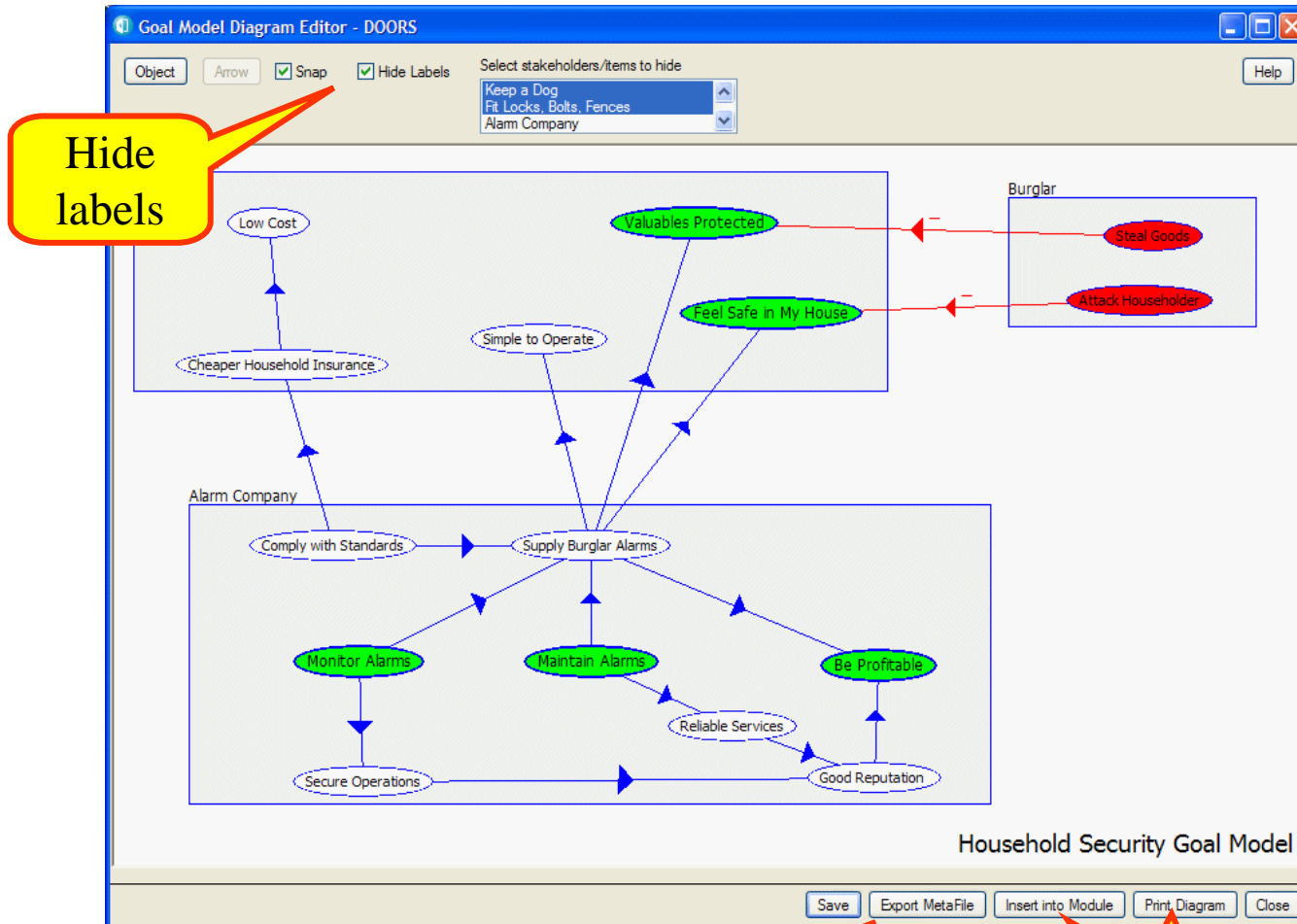
Arrow editor just sets
sign + (blue) or – (red)



Editor - Viewing a Goal Model



Tool Capabilities

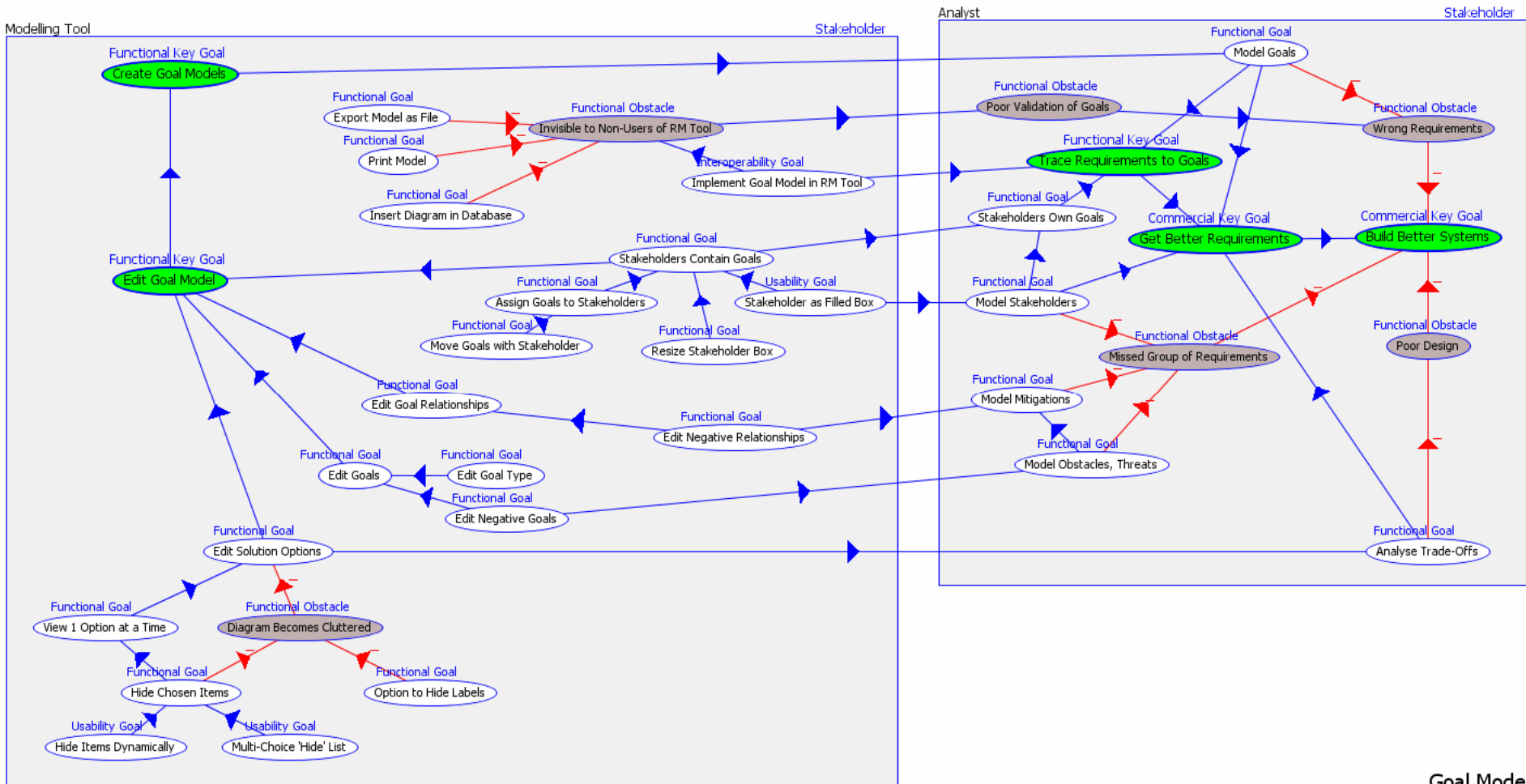


Hide labels

Export diagrams for use in documents, presentations

Easy printing

A Larger Example



Goal Model

Representing a Goal Model in DOORS

'Goals' current 0.0 in /Burglar Alarm (Formal module) - DOORS

File Edit View Insert Link Analysis Table Tools Discussions User Diagrams DXLcourse Exercises Extensions PSToolbox Publish Help

View Goal Model Spreadsheet All levels

ID	Business and User Goals for Alarm	Goal Obstacle Type	Goal Type	Xpos	Ypos	Xsize	Ysize
G-2	2 Household Security Goal Model Use Goal Model Editor to create diagrams.					934	568
G-12	2.1 Keep a Dog			820	240		
G-11	2.2 Fit Locks, Bolts, Fences			830	380		
G-23	2.3 Alarm Company			369	394	622	232
G-24	2.3.1 Comply with Standards		Commercial	170	310		
G-17	2.3.2 Monitor Alarms	Key Goal	Functional	190	400		
G-15	2.3.3 Secure Operations	Goal	Security	193	403		
G-16	2.3.4 Reliable Services	Goal	Reliability				
G-14	2.3.5 Good Reputation	Goal	Commercial	590			
G-18	2.3.6 Maintain Alarms	Key Goal	Functional	370			
G-6	2.3.7 Be Profitable	Key Goal	Commercial	593	403		
G-7	2.3.8 Supply Burglar Alarms	Goal	Functional	370	310		
G-22	2.4 Householder	Stakeholder	-----	307	105	585	170
G-27	2.4.1 Low Cost	Goal	Commercial	120	60		
G-25	2.4.2 Simple to Operate	Goal	Usability				
G-5	2.4.3 Cheaper Household Insurance	Goal	Commercial				

Goals grouped automatically by Stakeholder

Attributes used to characterise goals

Links record goal relationships, directions

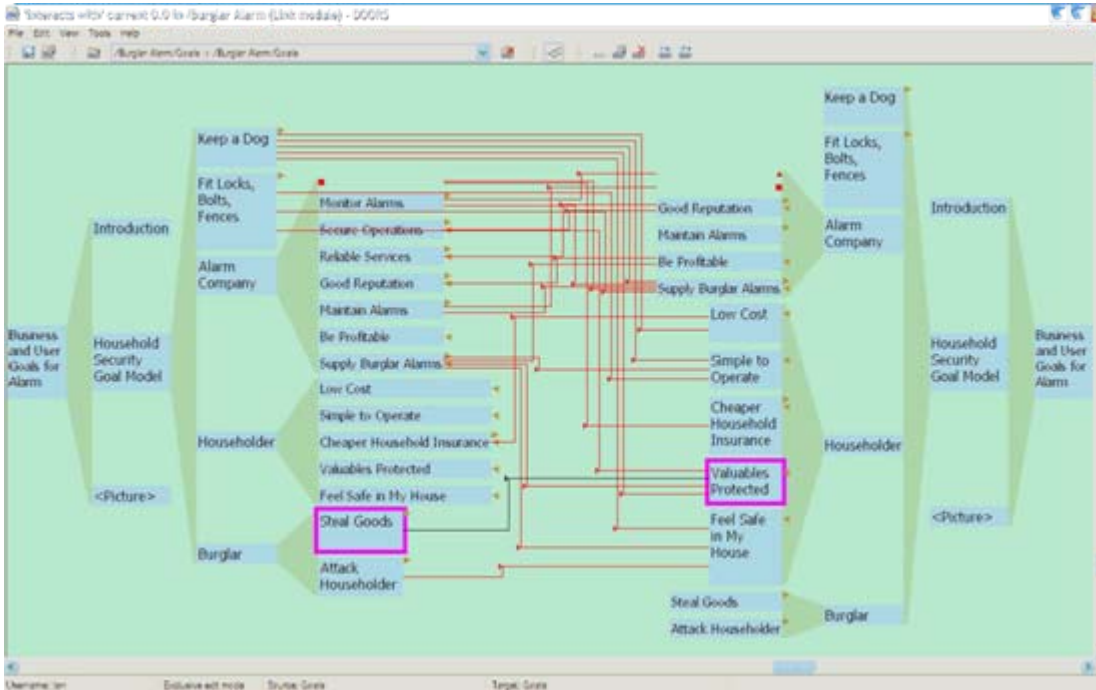
Username: lan Exclusive edit mode

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



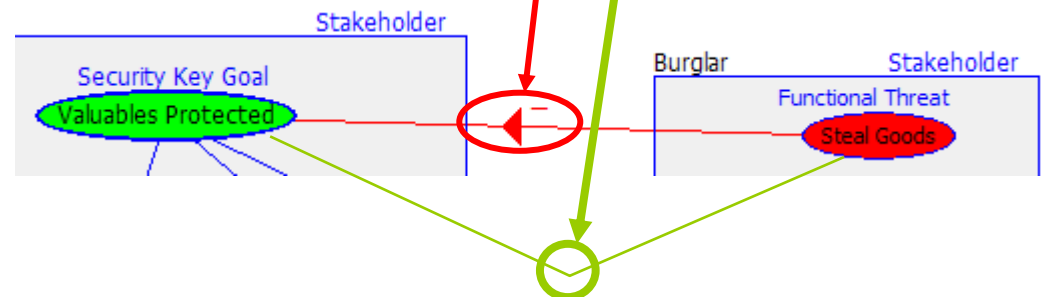
Edit Link Object - DOORS

Source	Target
Module: Goals	Goals
Object: Steal Goods	Valuables Protected
Absolute number: 8	4

Link attributes:

Last Modified By	Ian
Last Modified On	Monday, 22 November 2010
Negative?	True
Selected	False
Xway	325
Yway	200

Close



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

User can add a Waypoint
to help reduce line crossings

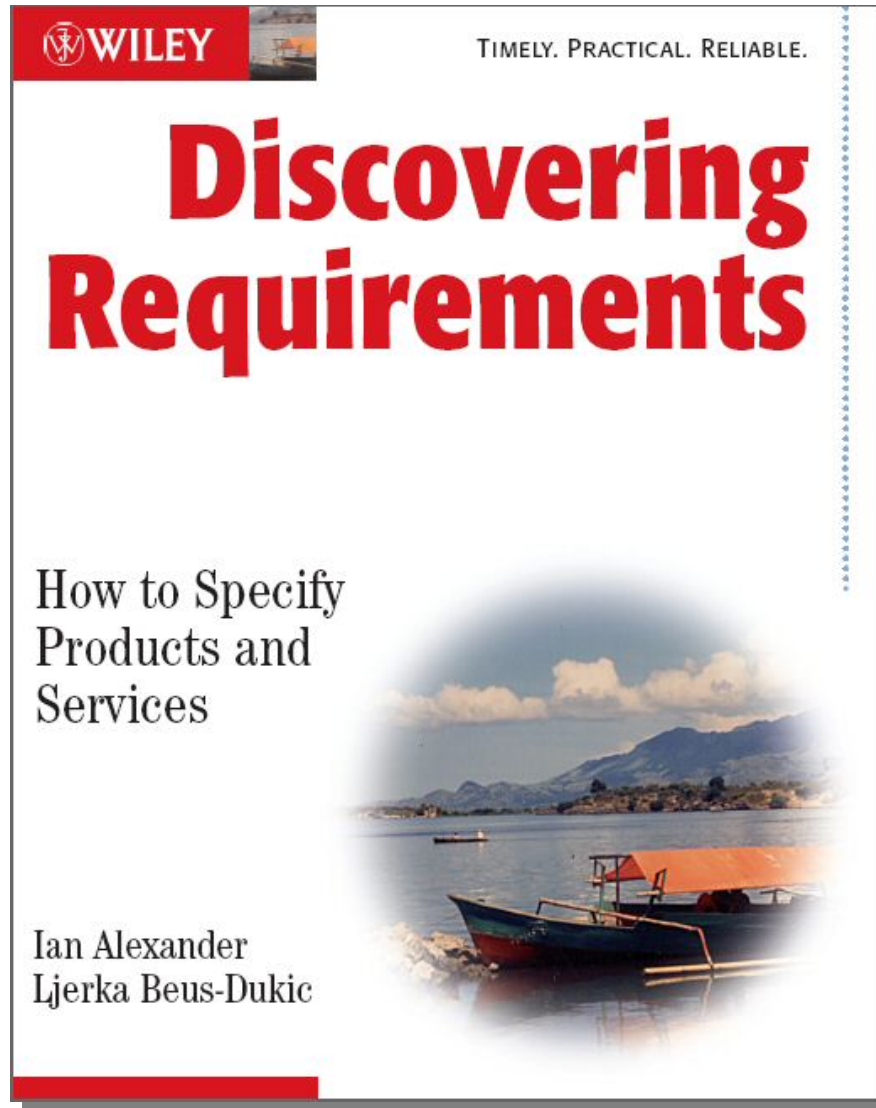
Summary

- *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