

Goal Modelling *in* **DOORS**

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DOORS User Group
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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 *

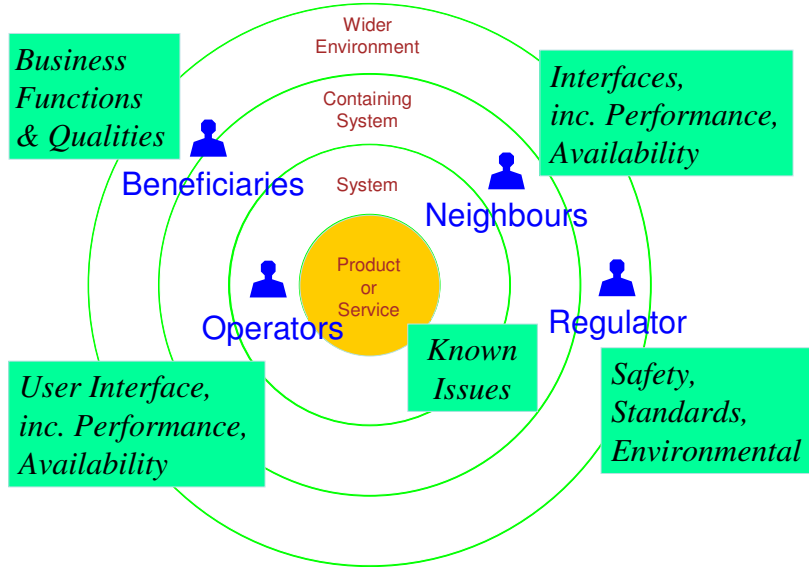
- Data Flow Diagrams
- Entity Relationship Diagrams

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



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Do Interviewees State Fully-Formed Requirements?



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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

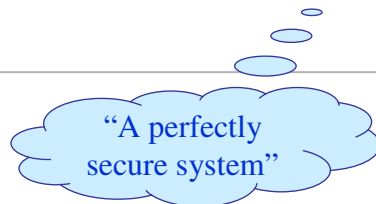
Useful Goals *can Conflict* ... creating Trade-Offs

| | | |
|--|----|--|
| 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 |



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How can we Model Goals?

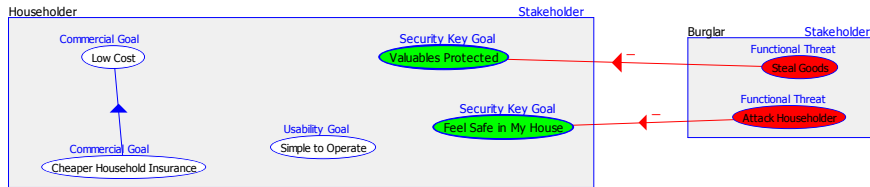
- they belong to stakeholders
 - why not ***contain them in named boxes?***
- Use Cases are functional goals
 - why not ***draw goals as named bubbles?***
- they help each other, or conflict
 - why not ***draw + or - arrows?***

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Goal Model – problem statement

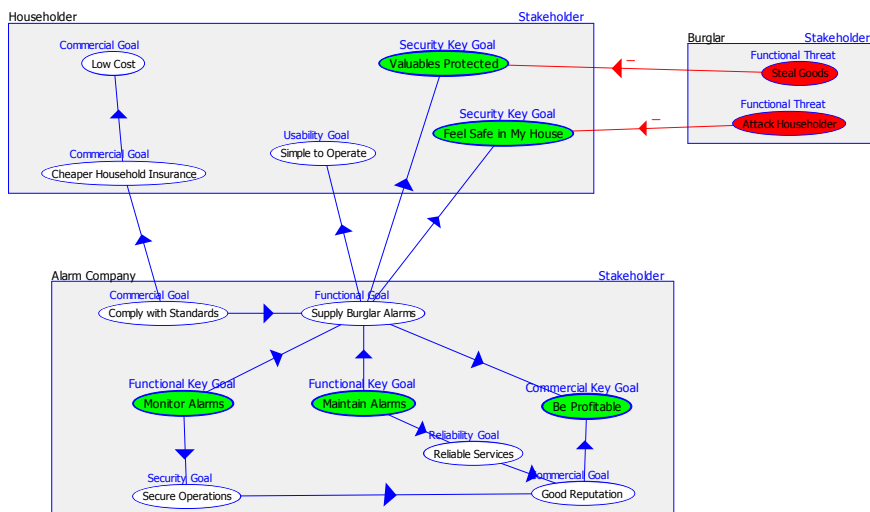


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Goal Model – company solution

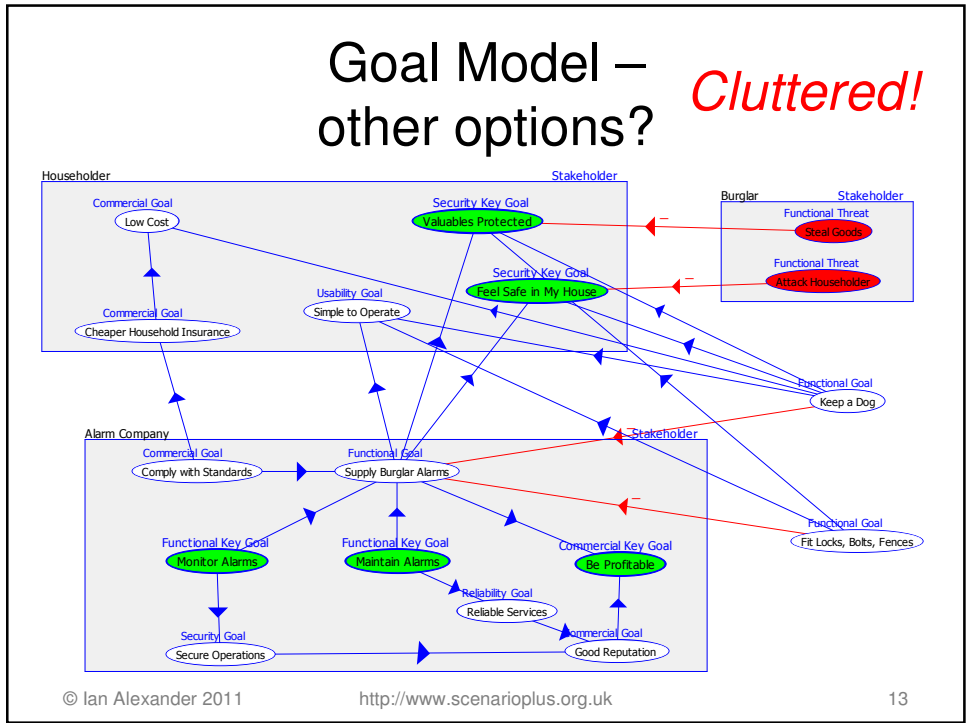


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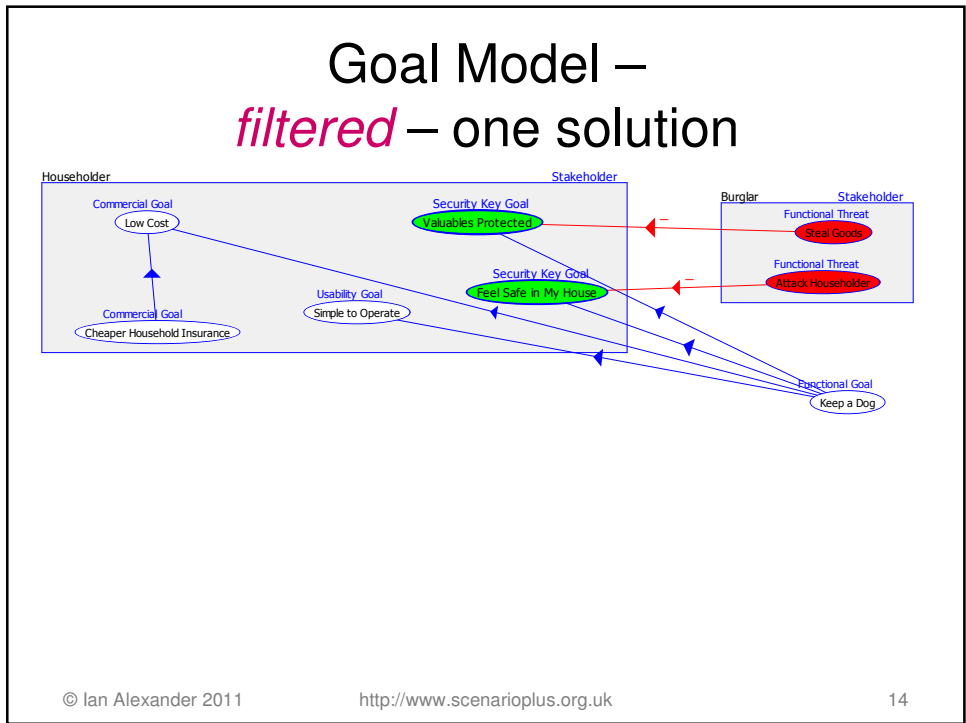
<http://www.scenarioplus.org.uk>

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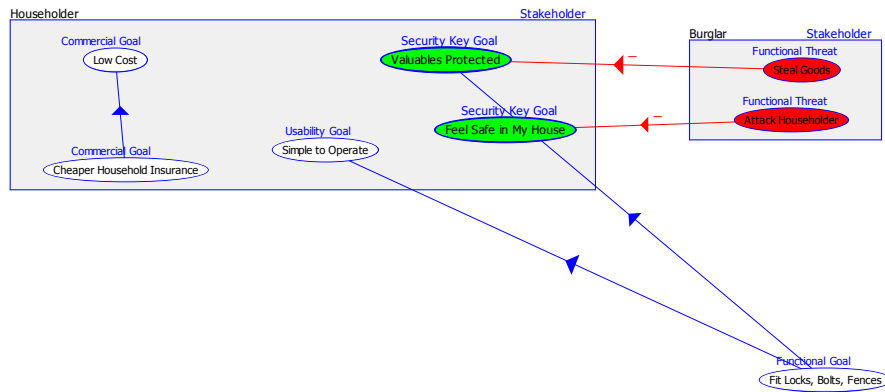
Goal Model – *Cluttered!*



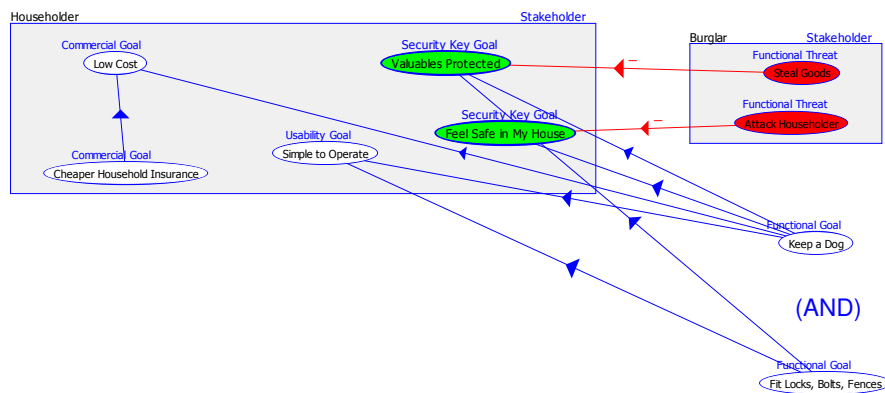
Goal Model – *filtered* – one solution



Goal Model – *filtered* - another solution



Goal Model – solution combining 2 options



Goal Model Editor

The screenshot shows the 'Goal Model Diagram Editor - DOORS' window. It features a toolbar with 'Object', 'Arrow', 'Snap', and 'Hide Labels' options. A 'Select stakeholders/items to hide' dropdown is set to 'New Stakeholder'. The main diagram area contains a 'New Stakeholder' box, a 'Stakeholder' box, and a 'Functional Goal' box labeled 'New Goal'. A context menu is open over the 'New Goal' box, showing options: 'Edit', 'Move', 'Delete', 'Arrow', and 'Cancel'. An 'Object Editor - DOORS' dialog is also open, showing 'Goal Type' options: Functional, Safety, Security, Reliability, Usability, Commercial, Legal, Interoperability, and others. A 'DOORS' dialog titled 'Action on Goal 'New Goal'' is also visible with 'Edit', 'Move', 'Delete', 'Arrow', and 'Cancel' buttons. A 'Goal Model' window is at the bottom with 'Save', 'Export MetaFile', 'Insert into Module', 'Print Diagram', and 'Close' buttons.

Callouts in yellow speech bubbles provide the following information:

- Create more objects (or Right-click in diagram)**: Points to the 'Object' button in the toolbar.
- Initial stakeholder, goal created automatically**: Points to the 'New Stakeholder' and 'New Goal' boxes in the diagram.
- Right-click to pop up item-specific menu**: Points to the context menu over the 'New Goal' box.
- Specify type of object, eg Functional Goal**: Points to the 'Object Editor' dialog.

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Arrow Editor

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

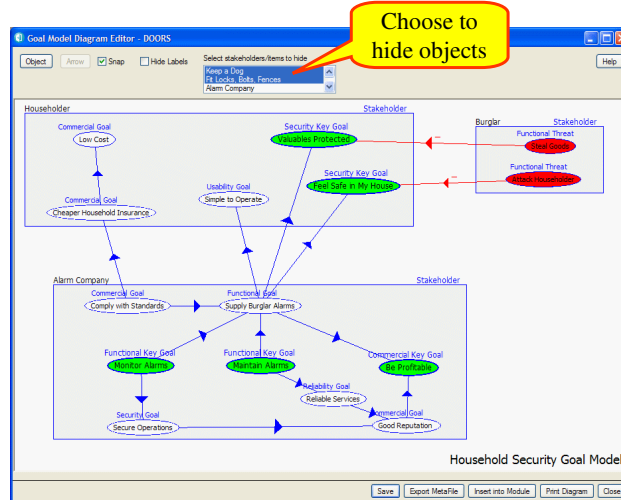
The screenshot shows a diagram with two goals: 'Cheaper Household Insurance' (Commercial Goal) and 'Comply with Standards' (Commercial Goal). An arrow points from 'Comply with Standards' to 'Cheaper Household Insurance'. A 'DOORS' dialog titled 'Action on Arrow' is open with buttons: 'Edit Arrow', 'Delete Arrow', 'Move Waypoint', 'Reset Waypoint', and 'Cancel'. An 'Arrow Editor - DOORS' dialog is also open, showing 'Source: Comply with Standards' and 'Dest: Cheaper Household Insuran' with a 'Negative effect?' checkbox. A callout explains that the arrow editor sets the sign (+ or -).

Callouts in yellow speech bubbles provide the following information:

- Right-click on arrow to pop up Arrow menu**: Points to the arrow between the two goals.
- Arrow editor just sets sign + (blue) or - (red)**: Points to the 'Arrow Editor' dialog.

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Editor - Viewing a Goal Model

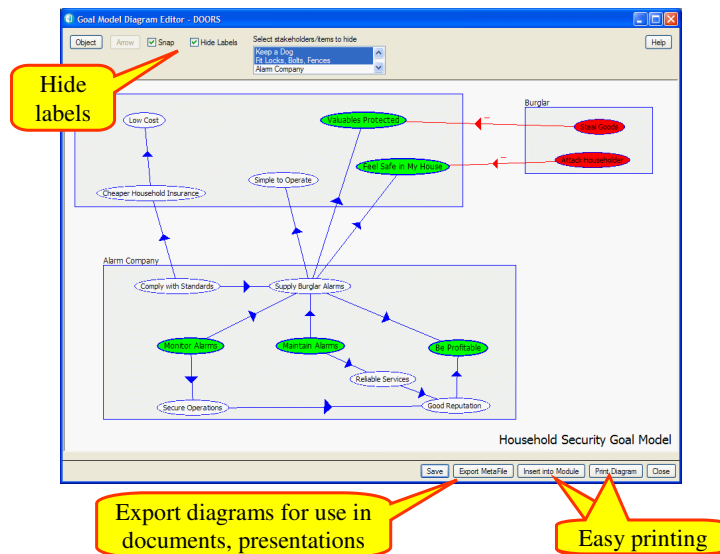


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Tool Capabilities

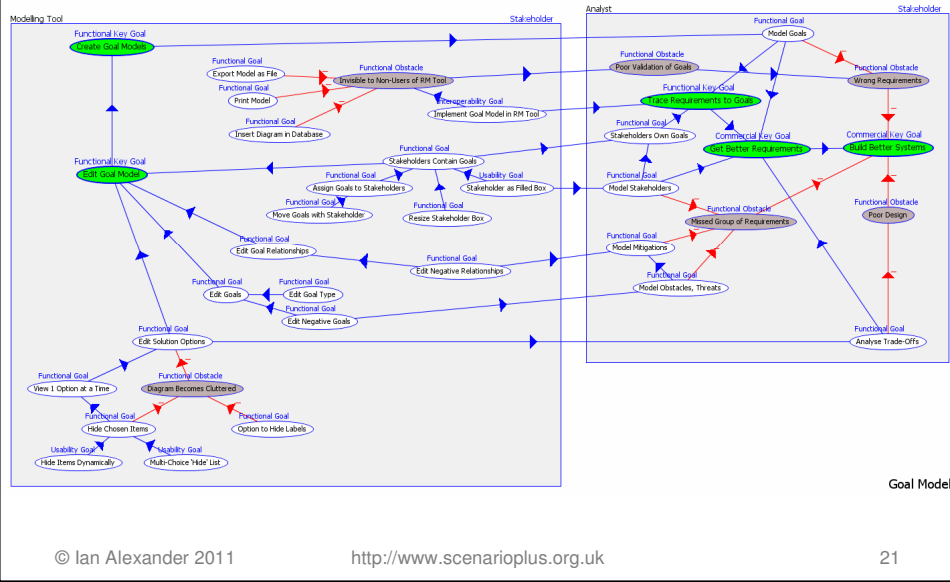


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A Larger Example



Representing a Goal Model in DOORS

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

| ID | Business and User Goals for Alarm | Goal Obstacle Type | Goal Type | Xpos | Ypos | Xaize | Yaize |
|------|---|--------------------|-------------|------|------|-------|-------|
| G-2 | 2 Household Security Goal Model | | | | | 934 | 568 |
| | Use Goal Model Editor to create diagrams. | | | | | | |
| 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 | | | | | |

Goals grouped automatically by Stakeholder

Attributes used to characterise goals

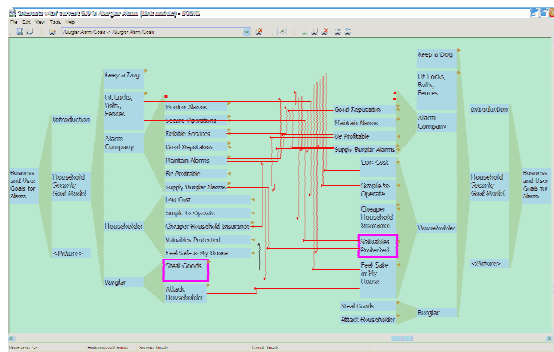
Links record goal relationships, directions

Username: ian 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”

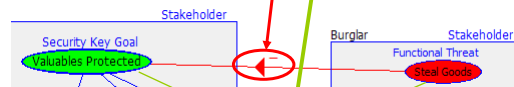
Behind the Scenes: Link Attributes for Goal Relationships



| 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? | <input checked="" type="checkbox"/> True |
| Waypoint | <input checked="" type="checkbox"/> True |
| Away | 325 |
| Way | 200 |



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

User can add a Waypoint
to help reduce line crossings

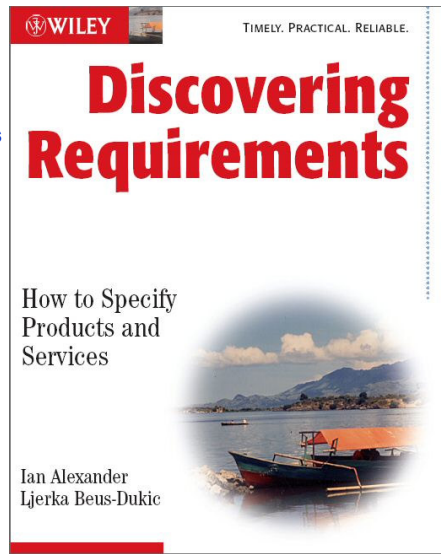
Summary

- *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