



Visualizing Rationale

Tying Requirements
into the Real World

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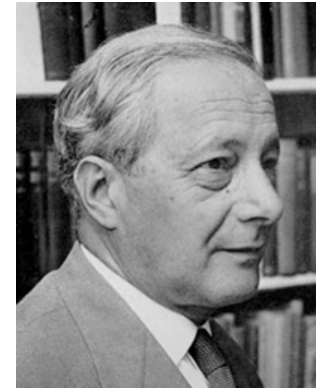
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RE'08, Barcelona, September 2008



Tacit Knowledge

- *“Users don’t know what they want until you show it to them”*
 - ‘an old saying in software’ (Kent Beck)
- *“We know more than we can tell”* (Polanyi)
 - much knowledge is only indirectly accessible
 - we can agree when shown a photofit picture, but **can’t describe without prompting**
- *“Culture is a pattern of shared basic assumptions”* (Schein)
 - so, people in other cultures have different **assumptions – which they don’t examine**



Michael Polanyi
(1891-1976)



Edgar Schein

Assumption-Based Planning



James A. Dewar
RAND

Make a robust plan by following these 5 steps

Book offers many recipes for finding assumptions that matter

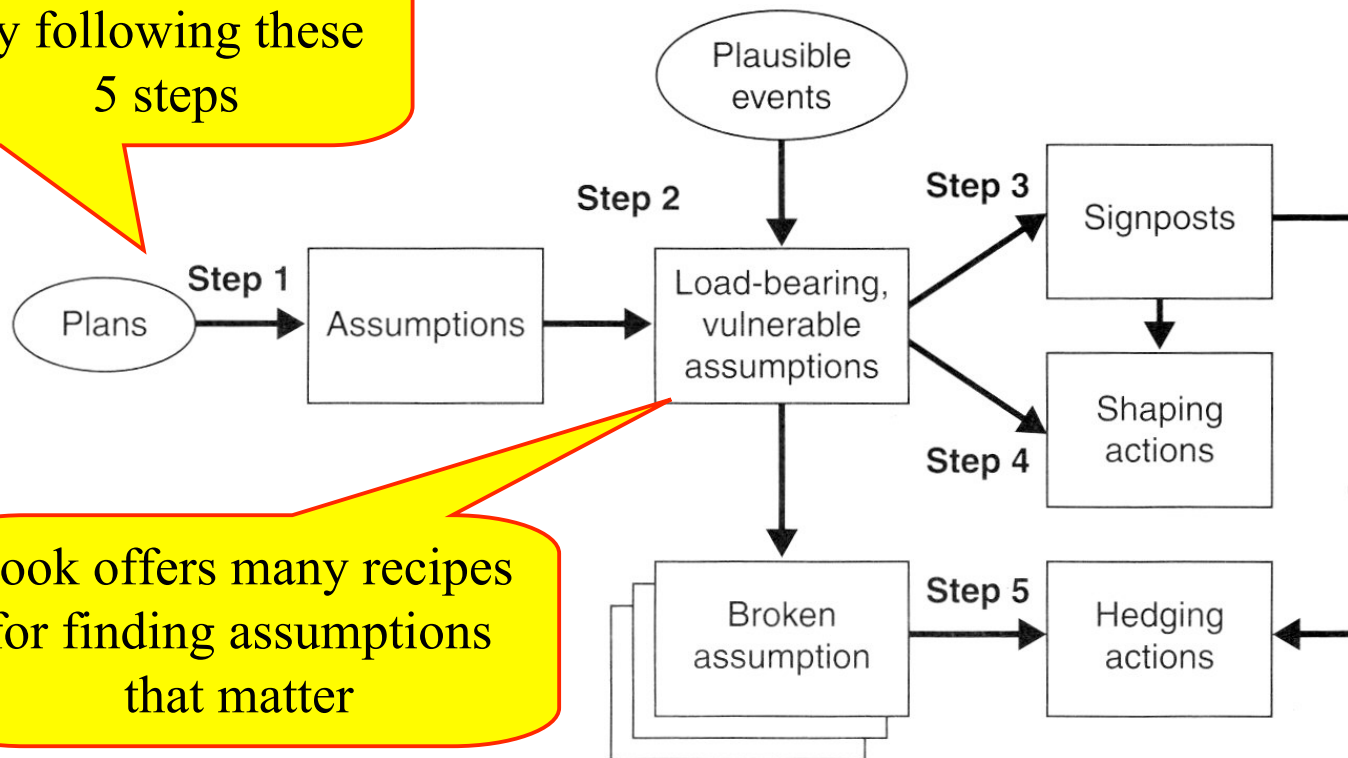
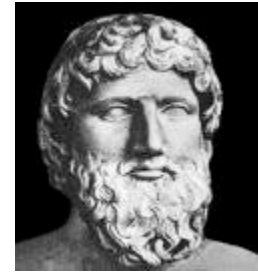


Figure 1.1. The Basic Steps and Flow of Assumption-Based Planning



Justification by Proof: Classical Reasoning



Plato
(c. 424-348 B.C.)

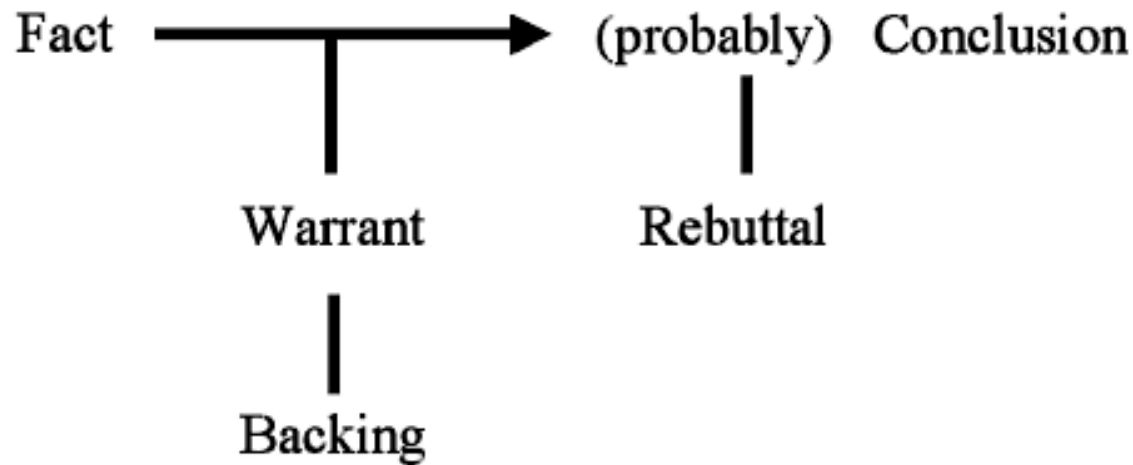
A Syllogism

- All men are mortal
- Socrates is a man
- So, Socrates is mortal

$$\forall m:\text{man}(m) \rightarrow \text{mortal}(m)$$
$$\text{man}(\text{Socrates})$$
$$\therefore \text{mortal}(\text{Socrates})$$

- Simple, convincing...
- ... and almost impossible to apply in practice.

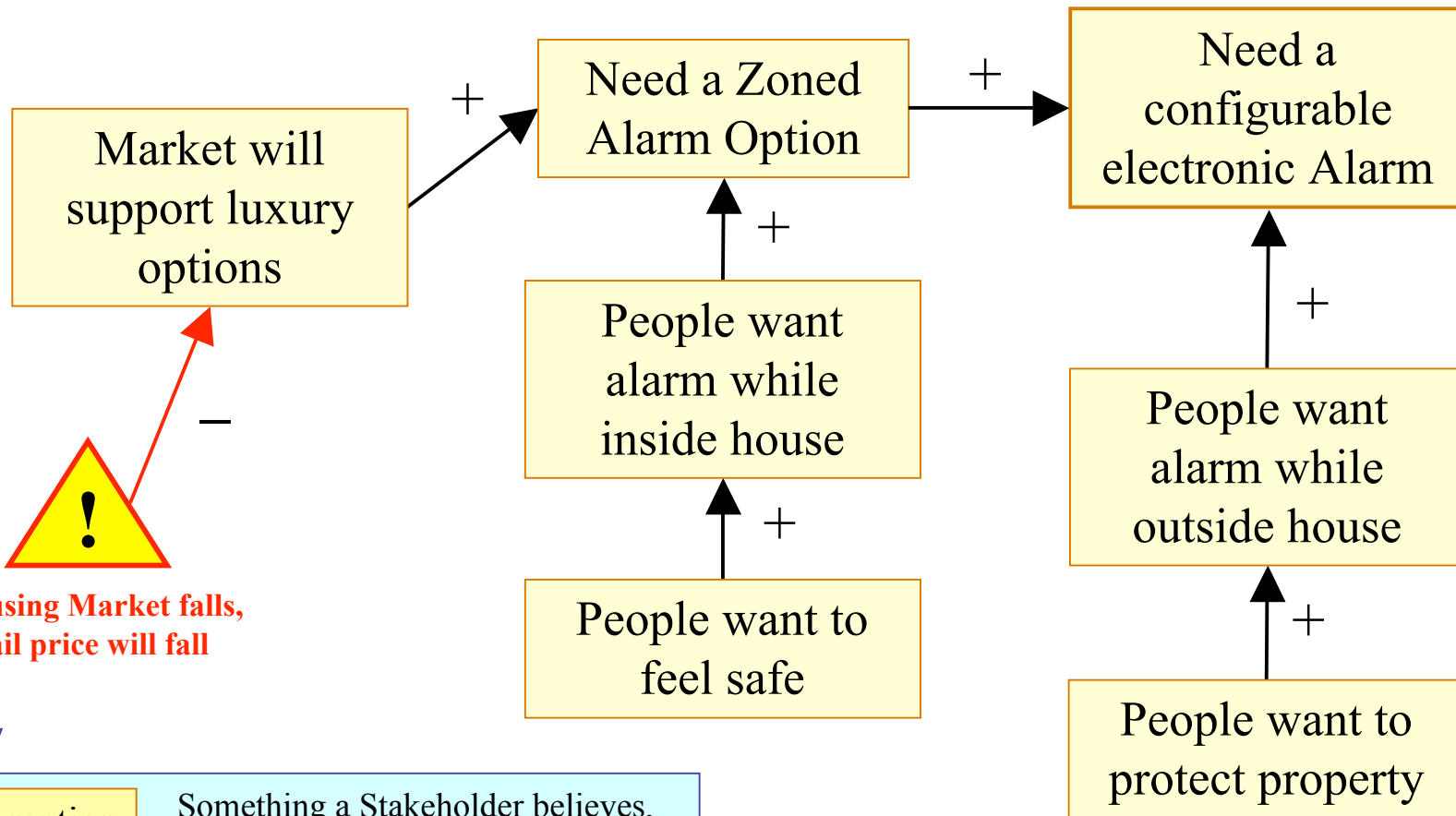
Justification by 'Substantial' Reasoning



Stephen Toulmin


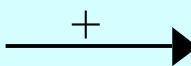
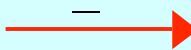
- In the real world we can hardly ever prove things mathematically (à la Plato)
- Toulmin (back in 1958, ie only 2000 years after Plato) suggested a practical or 'substantial' argument
- Not as certain as proof
- But a lot easier to use as Rationale for project decisions

Arguing from Assumptions Alone



If Housing Market falls, retail price will fall

Key

Assumption	Something a Stakeholder believes, supporting the requirements
	“Signpost”, a risk monitor that could force re-evaluation of requirements
	supports
	weakens



Rationale Notations Compared

Toulmin	Alexander	CAE	GSN
Conclusion	Assumption	Claim	Goal
Warrant, Rebuttal, Backing		Argument	Goal, Argument
Fact		Evidence	Solution, Context
—	Signpost	—	—

No agreement on names of concepts

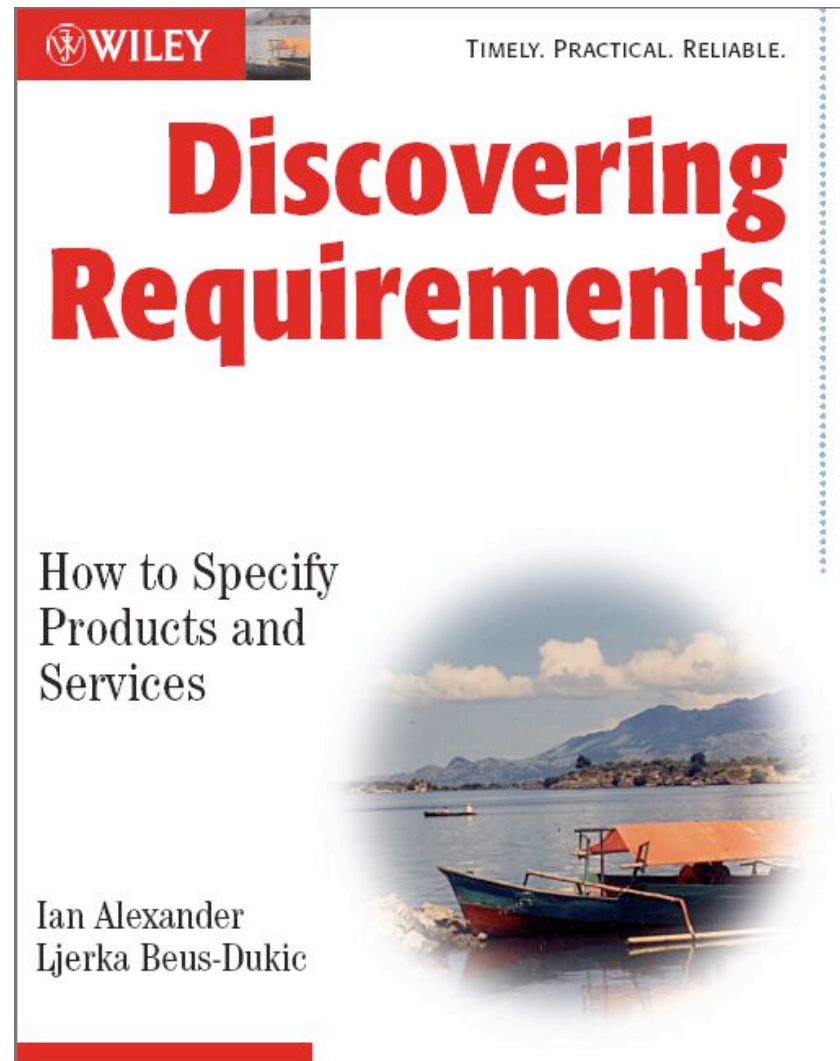
No agreement on how many concepts

not really part of rationale – indicates needed action



Forthcoming Book

with a chapter on Rationale & Assumptions



*To appear in
March 2009*