Requirements and Specifications

Pragmatic Programmer Tip: Don't Gather Requirements – Dig for them

Requirements rarely lie on the surface. They're buried deep beneath layers of assumptions, misconceptions, and politics

Resources

- *"Rapid Development"*, Steve McConnell
  - Chapters 10, 14 (required)
- "*Pragmatic Programmer*", Hunt, Thomas
  - Chapter 7 (recommended)
- "*Software Project Survival Guide*", Steve McConnell
  - Chapter 8 (optional)
- *Software Requirements Specification Template*, *Use case papers*, (on class web, Resources link)

Outline

- What are requirements?
- Some interesting requirements facts
- How can we gather requirements?
- How can we specify requirements?
- Beware of scope creep

What are requirements?

- % def requirement

  n, something wanted or needed: necessity

- Requirements are *features* necessary to deliver with the product
- Requirements are necessary *attributes* of the product

Brainstorm!

What types of software project requirements can you think of? General categories …

Examples requirements types:

- Feature set
- GUI
- Performance
- Reliability
- Expansibility (ie. support plug ins)
- Environment operates in (ie. HW, OS, browsers)
- Schedule

How do we gather requirements?

Let's start with two facts:

- Standish group survey of over 8000 projects, the number one reason that projects succeed is user involvement
- Easy access to end users is one of three critical success factors in rapid-development projects (McConnell)

How do we gather requirements?

Is the answer obvious?

Why work with customers?

- Good relations improve development speed Why?
- Improves perceived development speed Why?
- They don't always know what they want Why?
- They do know what they want, and it changes over time

Words of Wisdom 1

The most difficult part of requirements gathering is not the act of recording what the users want; it is the exploratory, development activity of helping users figure out what they want.

McConnell, SG

Words of Wisdom 2

Work with a User to Think Like a User – it's the best way to get insight on how the system is easily used

Pragmatic Programmer Tip

How can we work with our customers?

What can we do during the lifecycle stages of:

- Planning
  - select lifecycle
  - identify real customer
  - establish interaction method
- Requirements Analysis
  - help customer determine what they want (ie.prototypes)
  - videotape customers operating
  - surveys, meetings, focus groups, discussions
- Design
  - design for change
- Construction
  - implement to allow change
  - show customer tangible signs of progress, phased delivery allowing feedback

And the results we expect?

- Improved efficiency Why?
- Less Rework Why?
- Reduced Risk Why?
- Lack of friction Why?

Words of Wisdom 3

Throughout your travels with the customer, be sure to set reasonable customer expectations

Why is this important?

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How can we specify requirements?

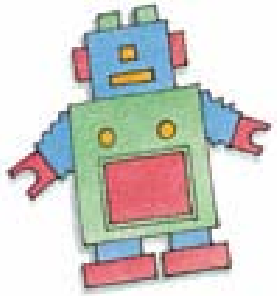
So… we've worked with the customer to understand their needs, how do we capture these requirements?

Ideas?

Possibilities include:

- Prototype
- Requirements Specification Document
  - Use Cases
  - Feature List

Prototype

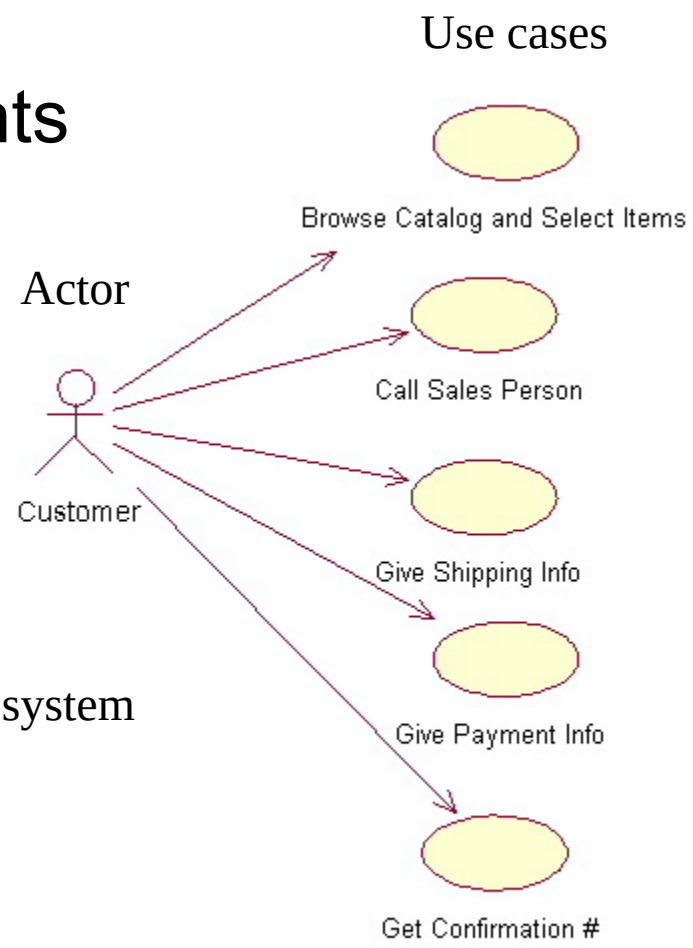


- Build a prototype to capture requirements
- Extend until it demonstrates all the functional areas of the system. Broad but shallow.
- Develop a style guide that codifies the proto's look and feel
- Proto is a baseline spec OR

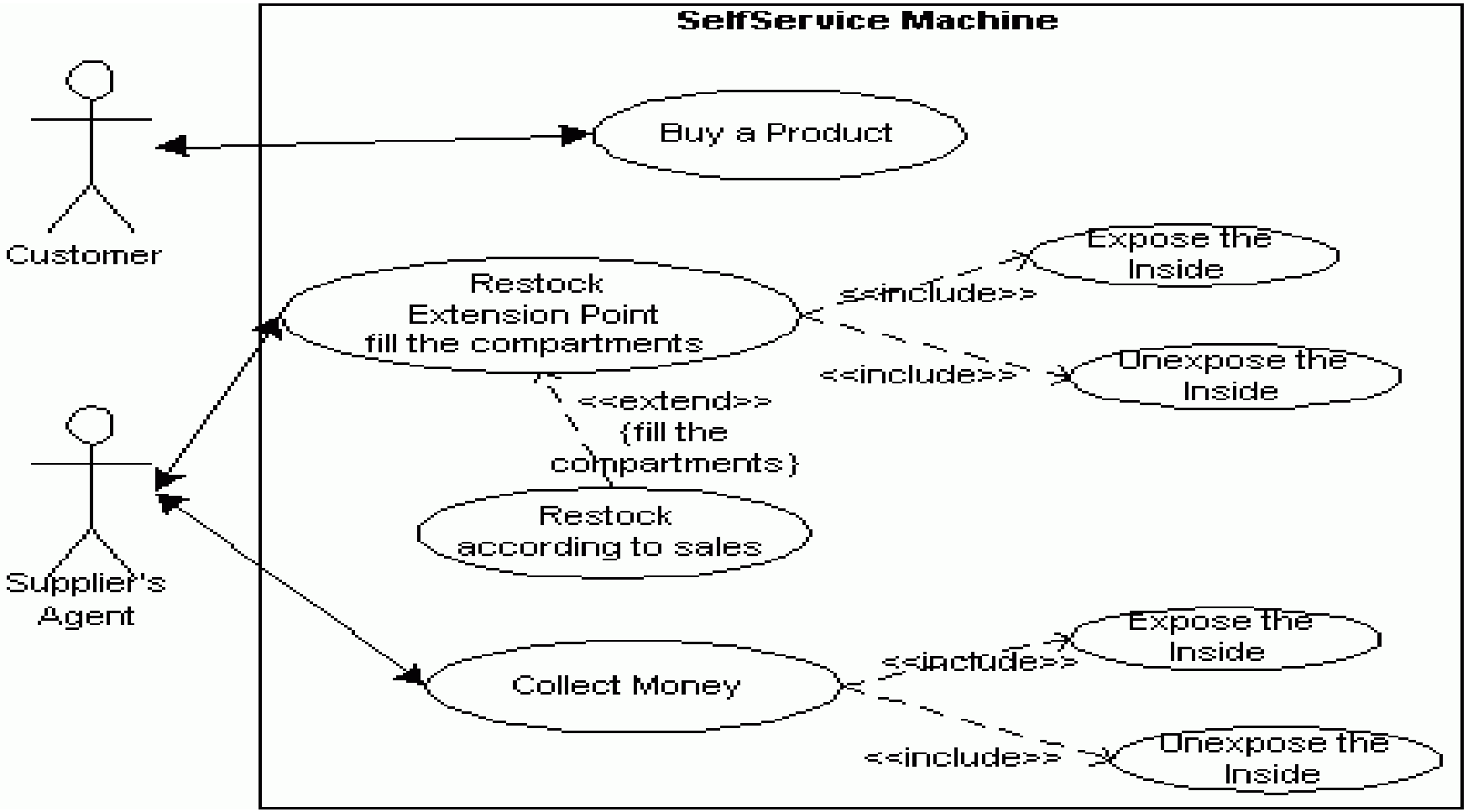
  Can write detailed end-user doc based on proto, which becomes software spec

Use Cases

- Capture a particular use of the system
- Describe how external agents (actors) interact with the system (use case)
- Diagrams or textual description



Another use-case example



•http://odl-skopje.etf.ukim.edu.mk/uml-help/html/02day12.html#ovde

Cockburn's use case template

Figure 7.1. Cockburn's use case template

A. CHARACTERISTIC INFORMATION
- Goal in context
- Scope
- Level
- Preconditions
- Success end condition
- Failed end condition
- Primary actor
- Trigger

B. MAIN SUCCESS SCENARIO
C. EXTENSIONS
D. VARIATIONS
E. RELATED INFORMATION
- Priority
- Performance target
- Frequency
- Superordinate use case
- Subordinate use cases
- Channel to primary actor
- Secondary actors
- Channel to secondary actors

F. SCHEDULE
G. OPEN ISSUES

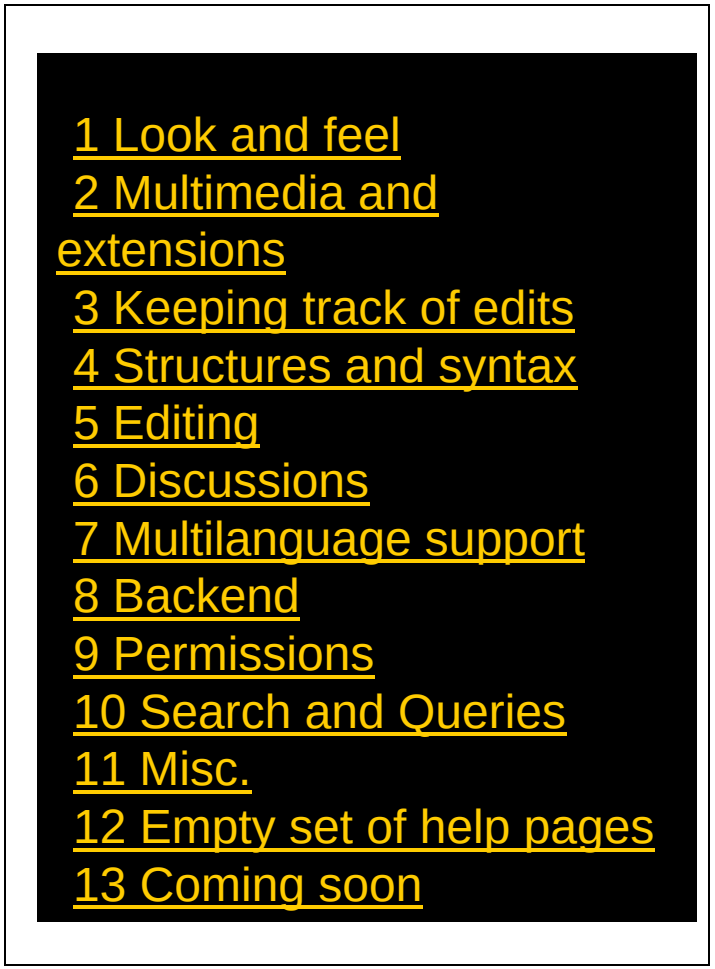
Example buy goods use case

Characteristic Info	
- Goal	Buyer issues request to buy product, expects delivery
- Preconditions	We know buyer address
- Success end condition	Buyer has goods, we have $
- Failed end condition	No goods to buyer, no $ to us
- Primary actor	Buyer
- Trigger	Purchase request comes in
Main success scenario	…

Feature List

List of features together with a brief description of their function

WikiMedia Index to Feature List



Pulling it all together

How much is enough?

What are problems with over specifying?

What are problems with underspecifying?

You have to find a balance

- comprehensible vs. detailed correctness
- graphics vs. explicit wording and tables
- short and timely vs. complete and late

Words of Wisdom 4

Organize your specification by viewpoint or category of requirements

Example:

- Administrative functions
  - New account
  - Change password
- Customer functions
  - Retrieve data
  - Edit data
  - Publish
  - Collaborative
- Performance
- Reliability

Words of Wisdom 5

After you create a specification, go over it to:

- Eliminate all requirements not absolutely necessary
- Simplify those that are more complicated than necessary
- Substitute cheaper options when available
- Move non essentials to future releases

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Scope Creep

"The software was late and far over budget; in fact, it almost didn't make it out the door. And it bore little resemblance to their original plans… Most software-development stinks"

Wall Street Journal

Our analysis found that the average requirements overrun on our projects is about 40%

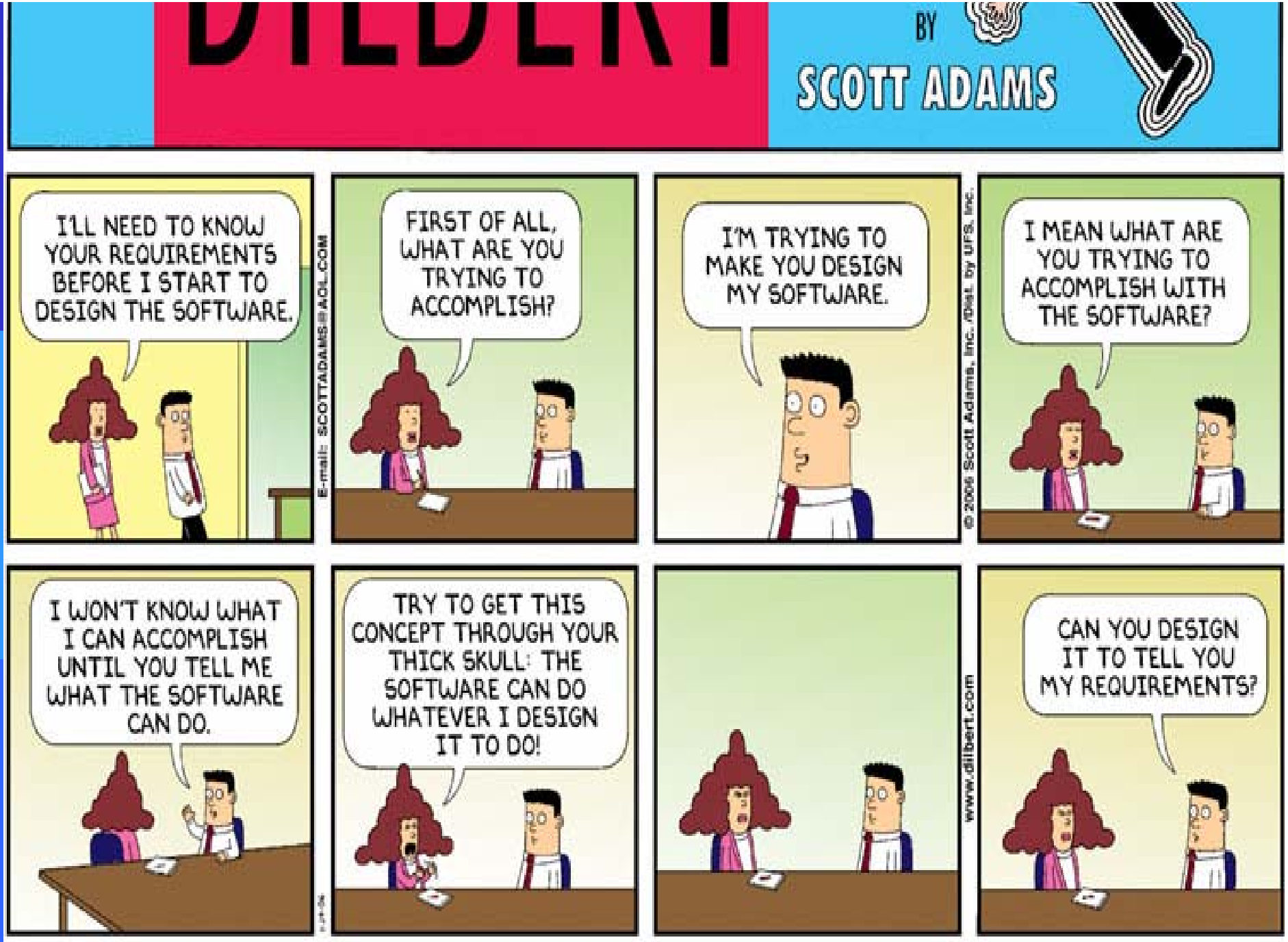
Construx

How can you manage this?

Your thoughts?

Two strategies:

- Scope change document (nothing is free)
  - Analyze cost, impact, make tradeoffs
- Change control board



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