What are Requirements?

Lecture Objectives:

1) Understand the relationship between MSOE courses and development activities
2) List reasons why software fails to be successful.
3) Explain the key purpose for the requirements activity.
4) Compare and contrast constraints with requirements.
5) List common sources for constraints.

What are the basic steps in software development?

1. Requirements Analysis
2. Design ← ~~Arch~~ Architectural Design
   Detailed Design
   Component
3. Implement
4. Test
5. Release...

Developmental Activities

Activity	Course
Planning	SE-280
Requirements	SE-3821
HL Design	SE-380
HLD Review	SE-380
Detailed Design	CS-2852 SE-2030 SE-2811
DLD review	SE-280
Implementation	SE-1011 SE-1021 CS-2852
Code Review	SE-280
Unit Test	SE-2831
Integration test	SDL
System/Acceptance Test	SDL
Postmortem	SE-280, SE-4831

Process Agnostic.
- Doesn't require a specific process.

SCRUM, Waterfall, Agile, RUP

Why does software fail?

- Scope creep.
  - => Getting too big
- Poor Testing
- Misunderstanding REQS.
  - Incomplete REQS

Why software fails

- Unrealistic or unarticulated project goals
- Inaccurate estimates of needed resources
- Badly defined system requirements
- Poor reporting of the project's status
- Unmanaged risks
- Poor communication among customers, developers, and users
- Use of immature technology
- Inability to handle the project's complexity
- Sloppy development practices
- Poor project management
- Stakeholder politics
- Commercial pressures

Charette, R.N.; , "Why software fails [software failure]," *Spectrum, IEEE*, vol.42, no.9, pp. 42- 49, Sept. 2005

SE3821 Software Requirements and Specification

- Requirements are not really about requirements

Focus of the requirements activity is about understanding the business problem.
- Software exists to solve a business problem.

Truth 1

Truth 2

- If we must build software, then it must be optimally valuable for its owner.
  - useful
  - Owner
    - The person or organization who pays for the software
    - The person who receives benefit from the software

Example: MSOE Science Building navigation system

- A system is to be built which will allow one to find any classroom in the science building as well as calculate the fastest and shortest route to any other room in the science building.
  - With your next door neighbor
    - Who is the owner of this system?
    - How useful will this application be?
    - How expensive will it be to construct?

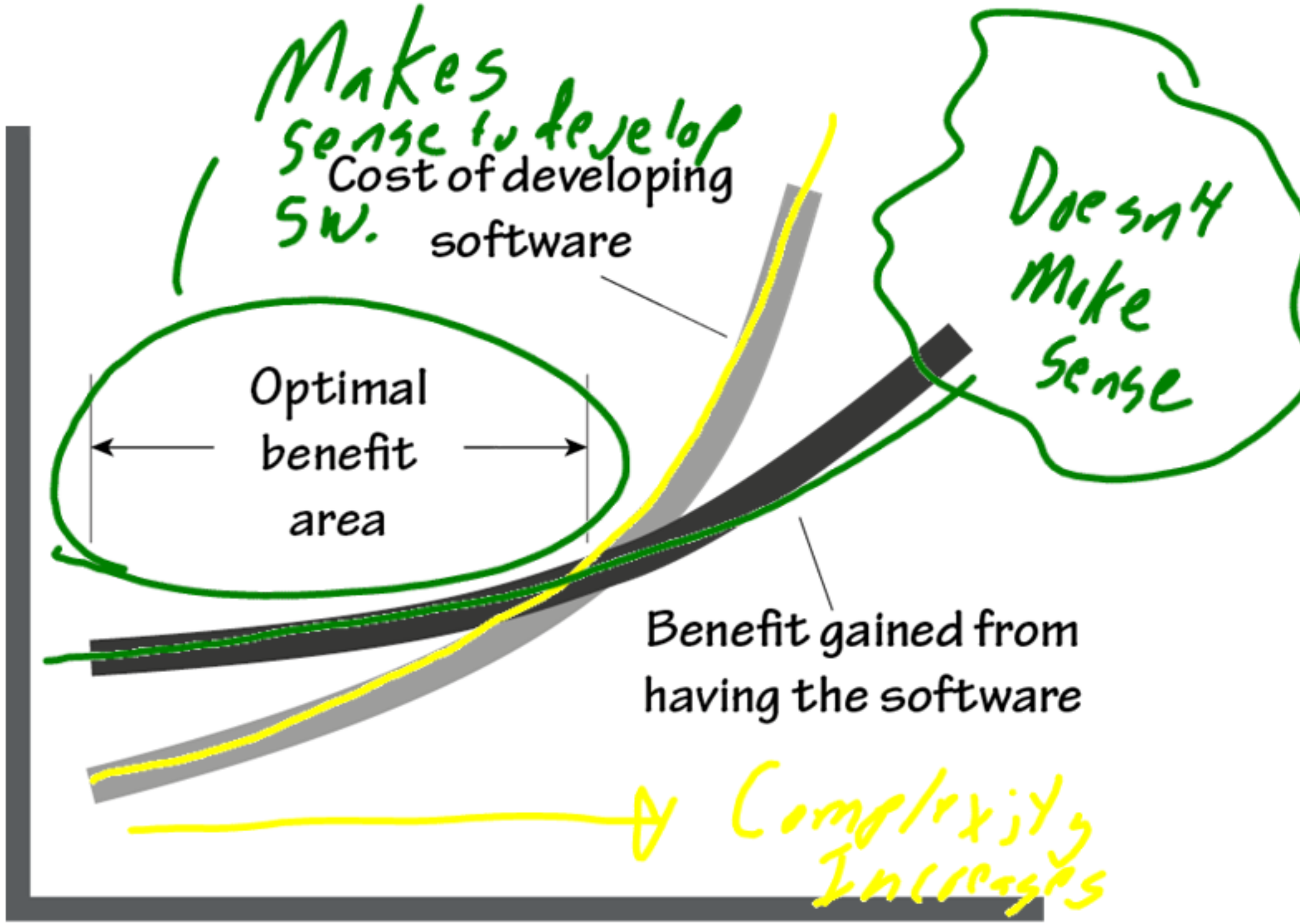
MSOE Student

Freshman → Great

Seniors? Not So.

Somewhat expensive

Relationship between cost and benefit



- If your software does not have to satisfy a need, then you can build anything. However, if it is meant to satisfy a need, then you have to know what that need is to build the right software.

Truth 3

- 324,000 hosted projects — open source
  - 3835 "Mature Projects"

↳ People are using them.

Sourceforge

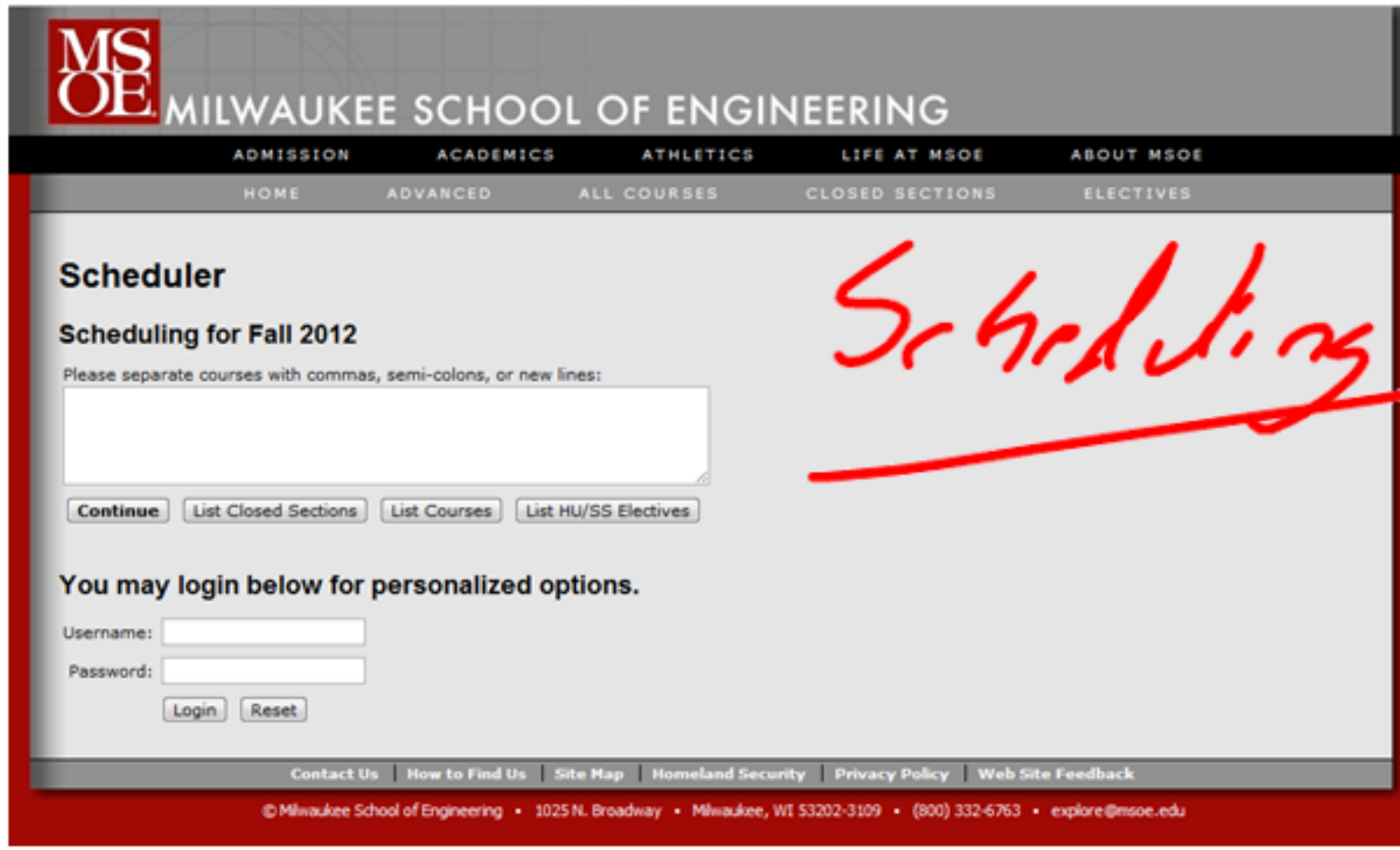
Sourceforge

Table 6.2 Descriptive Statistics for Dependent Variable Components: FLOSSMole (2006) and UMass Sept-Oct 2006 Spidered Data.						
Variable Name	**Min**	**1st Quad**	**Median**	**Mean**	**3rd Quad**	**Max**
Project Lifespan (yrs)	0.003	1.08	2.39	2.54	3.70	6.74
Number of Releases	0	0	1.00	2.77	2.00	537
Downloads	0	0	23	12,835	494	228,643,712

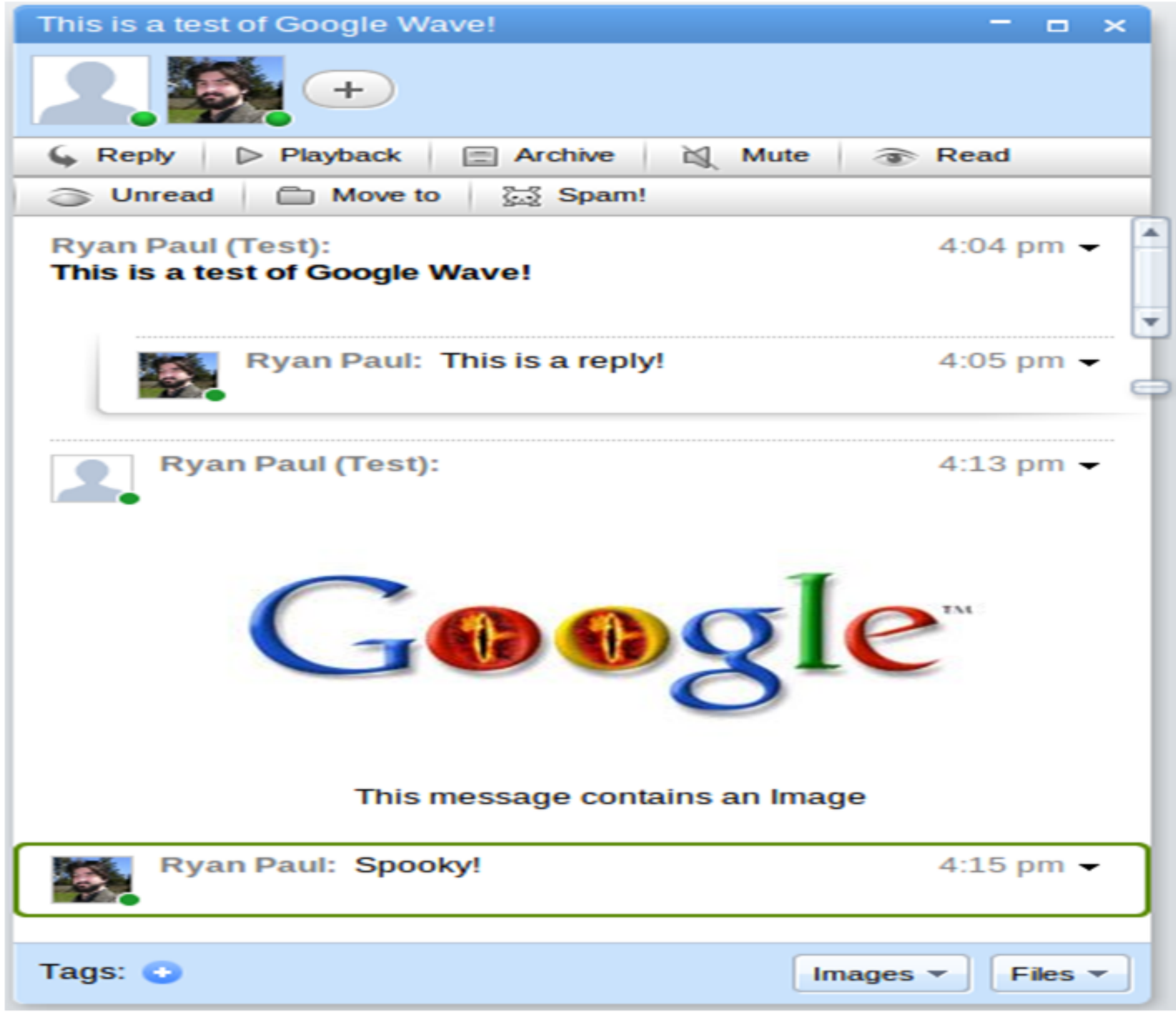
- The Dependent Variable: Defining Open Source "Success" and "Abandonment" Using Sourceforge.Net Data Charles M. Schweik

Truth 4

- There is an important difference between building a piece of software and solving a business problem. The former does not necessarily accomplish the latter.



Google Wave


This is a test of Google Wave!
Reply
Playback
Archive
Mute
Read
Unread
Move to
Spam!
Ryan Paul (Test):
4:04 pm
This is a test of Google Wave!
Ryan Paul: This is a reply!
4:05 pm
Ryan Paul (Test):
4:13 pm
Google
This message contains an Image
Ryan Paul: Spooky!
4:15 pm
Tags:
Images
Files

- The requirements do not have to be written, but they have to become known to the builders

You must know what you are doing before you do it.

Truth 5

Number one axion of business

- The customer is always _____

Right

Stupid

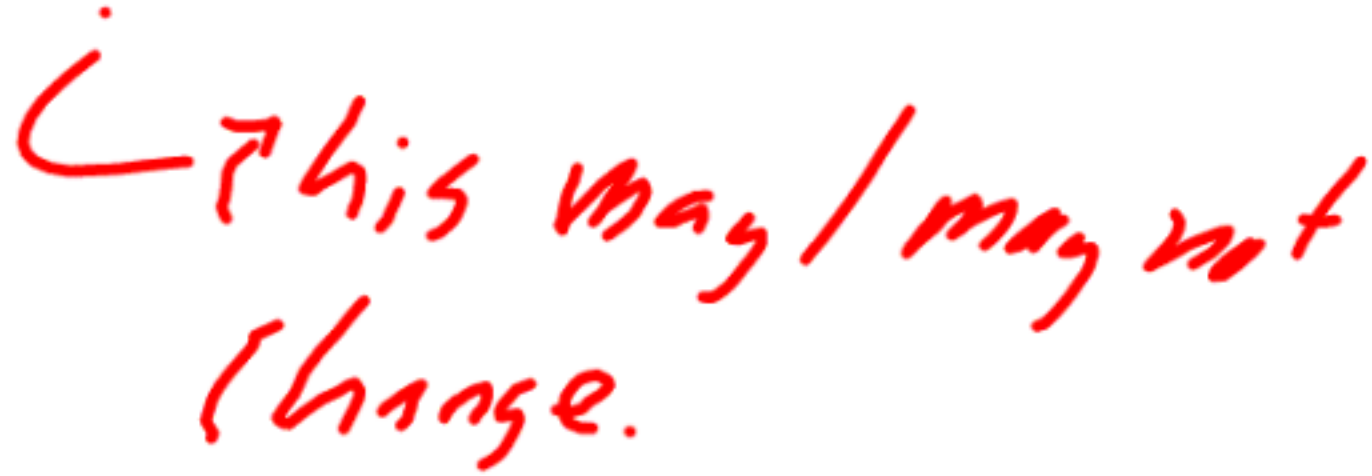
- Your customer won't always give you the right answer. Sometimes it is impossible for the customer to know what is right, and sometimes he just doesn't know what he needs.

Truth 6

Truth 7

- Requirements do not come by chance. There needs to be some kind of orderly process for developing them.

- You can be as iterative as you want, but you still need to understand what the business needs.



- There is no silver bullet. All our methods and tools will not compensate for poor thought and poor workmanship.

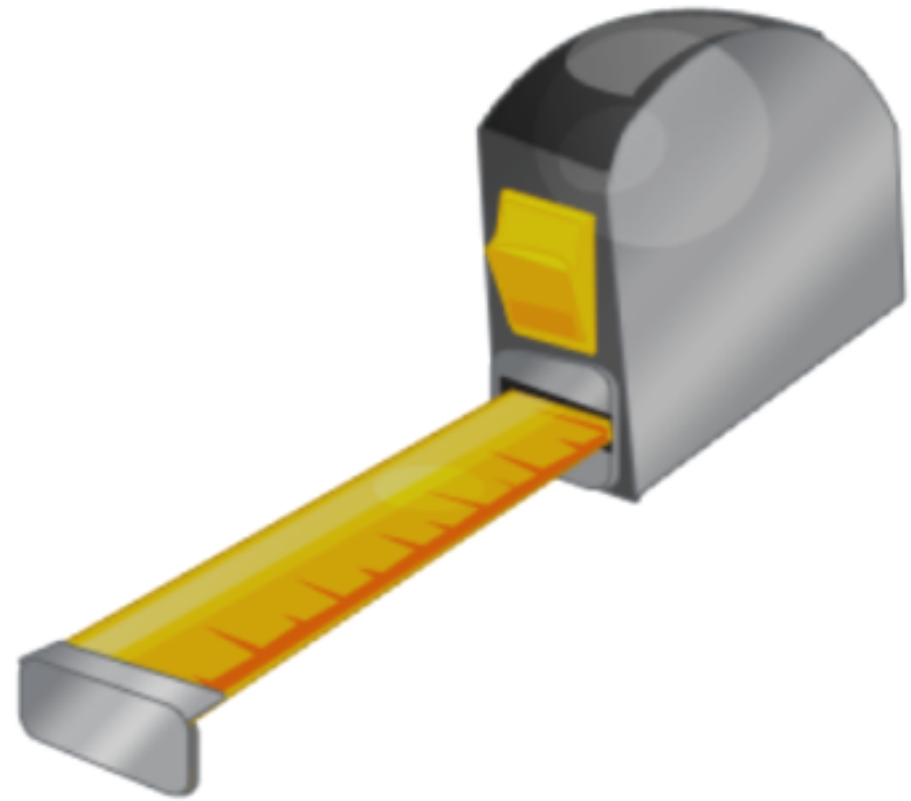
Truth 9

Requirement requires thinking.

We get following blindly of + practice

MSOE

- Requirements must be measurable and testable



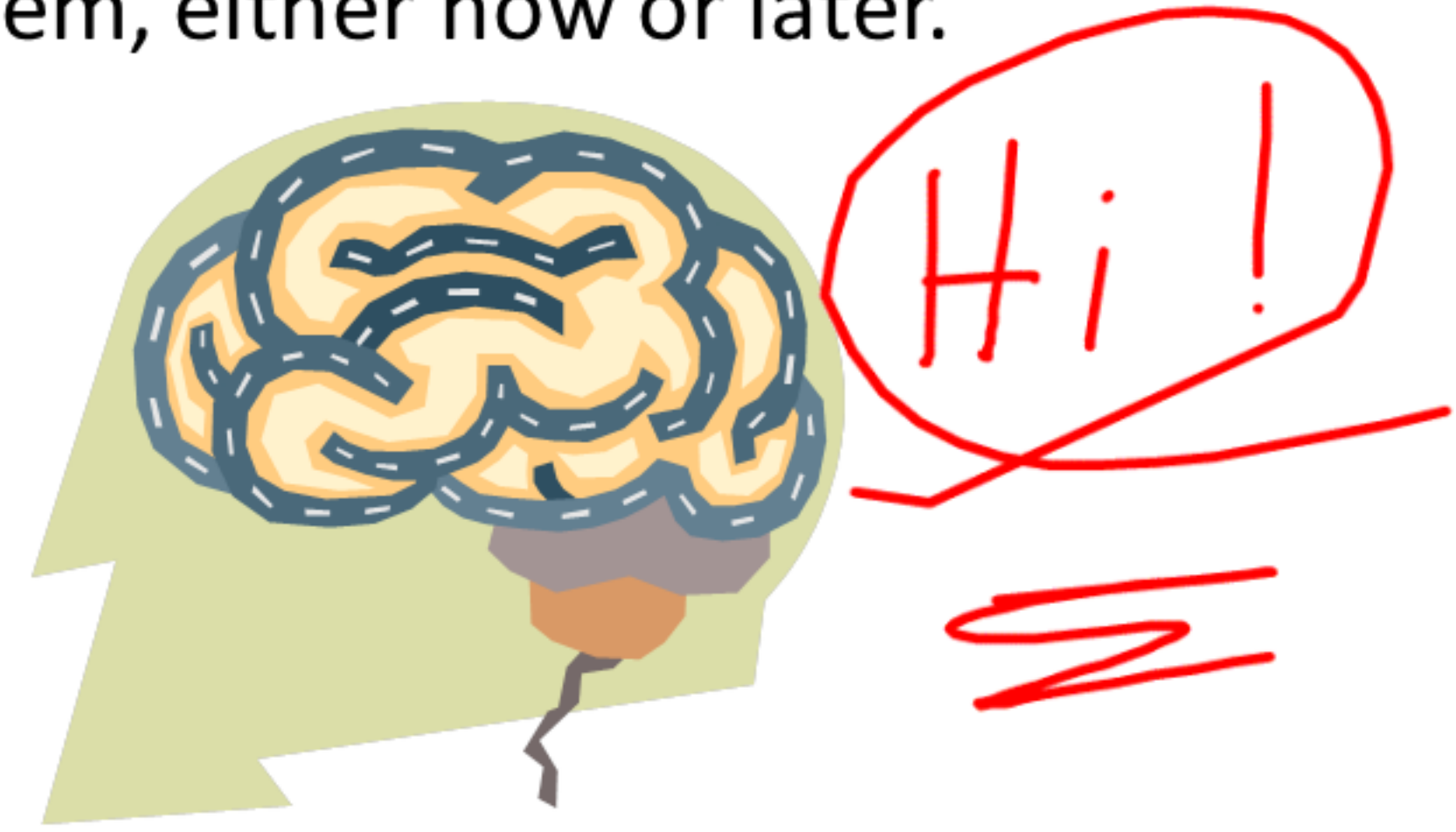
Truth 10

- It shall be easy to address an email to a system user.

Example(s)

- A user shall be capable of addressing an e-mail to a user within 3 mouse clicks.

- You, the business analyst, will change the way the user thinks about his problem, either now or later.



Definitions

- Functional Requirements
  - Describes an action that the product must take if it is to be useful to its operator
- Non-functional requirement
  - Properties that a product must have to be acceptable to its owner and operator
- Constraints
  - Limitations placed upon the design or implementation of the product.
  - "Box in" the ultimate solution.

Where do constraints come from?

- Existing systems

⇒ Legacy

- Governmental regulations / rules

Medical SW

- Necessary timeframe

Banking

When the customer needs the SW.

Less Constraints: better.