



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
do
we do?

What are the basic steps in software development?

Tools | Customer defined
reqs

SCRUM

⇒ Iterative process

⇒ Design

⇒ Planning for sprint

⇒ Implementation

⇒ Reviewing (CR)

⇒ Testing

Developmental Activities

| Activity | Course |
|------------------------|-------------------------------|
| Planning | SE-2800 |
| Requirements | SE-3821 |
| HL Design | SE-3800 |
| HLD Review | SE-3800 |
| Detailed Design | CS-2852 SE-2030 SE-2811 |
| DLD review | SE-2800 |
| Implementation | SE-1011 SE-1021 CS-2852 |
| Code Review | SE-2800 |
| Unit Test | SE-2831 |
| Integration test | SDL |
| System/Acceptance Test | SDL |
| Postmortem | SE-2800, SE3800 |

what to do

w/Junior

Process agnostic

Why does software fail?

Inadequate Testing

Unclear reqs

Unrealistic constraints

User error

Why software fails

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

- 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 *Stakeholders*
- Use of immature technology
- Inability to handle the project's complexity
- Sloppy development practices —
- Poor project management
- Stakeholder politics
- Commercial pressures

Truth 1

- 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 2

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



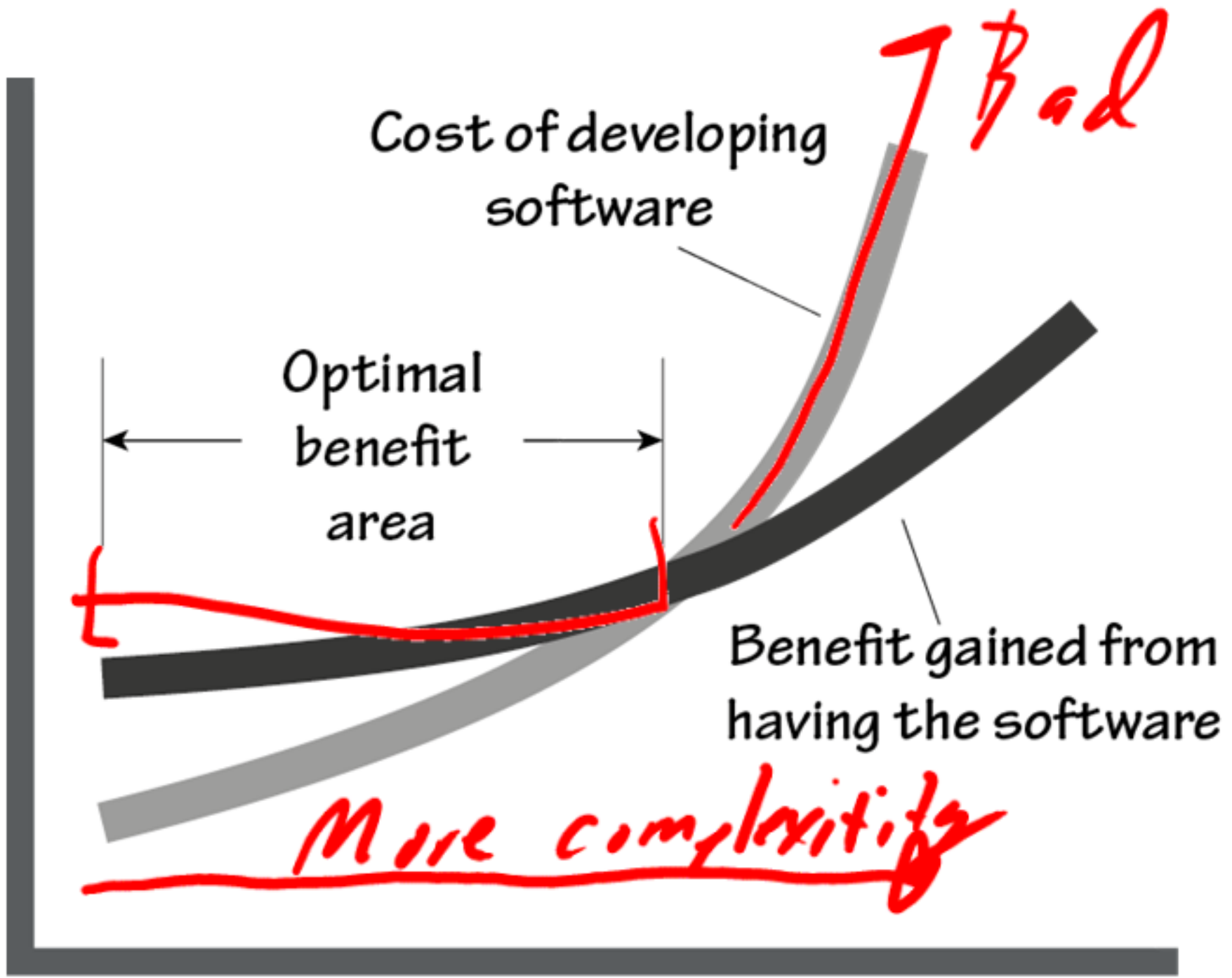
Example: MSOE Science

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 / Students / Admissions
Freshman - very useful
Not very?

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

Open Source

Open SRC projects
which are used

Sourceforge

- 324,000 hosted projects

= 3835 "Mature Projects"

"Done"

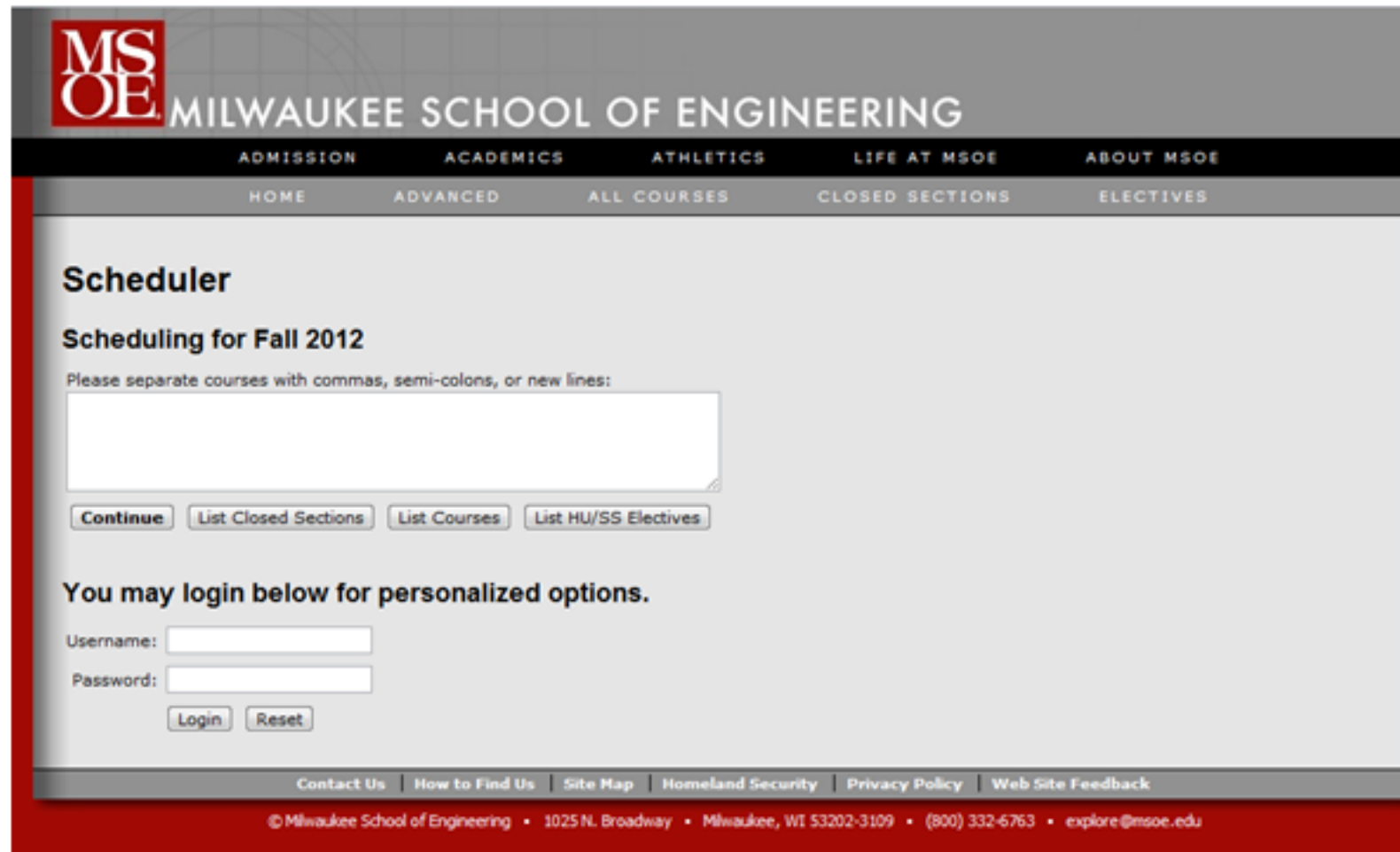
Table 6.2
***Descriptive Statistics for Dependent Variable Components:
FLOSSMole (2006) and UMass Sept-Oct 2006 Spidared Data.***

| Variable Name | Min | 1 st Quad | Median | Mean | 3 rd 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

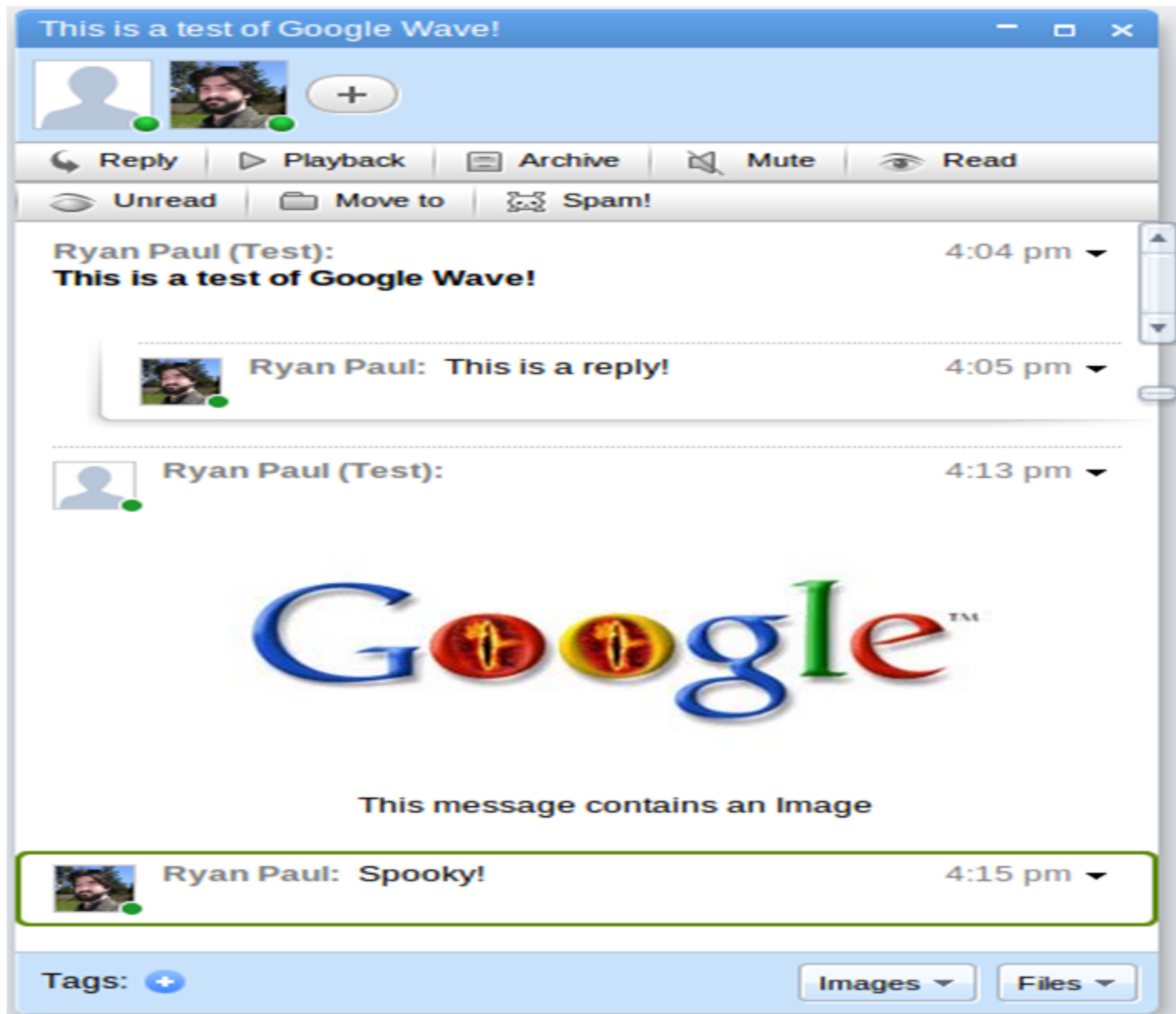
Truth 4

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



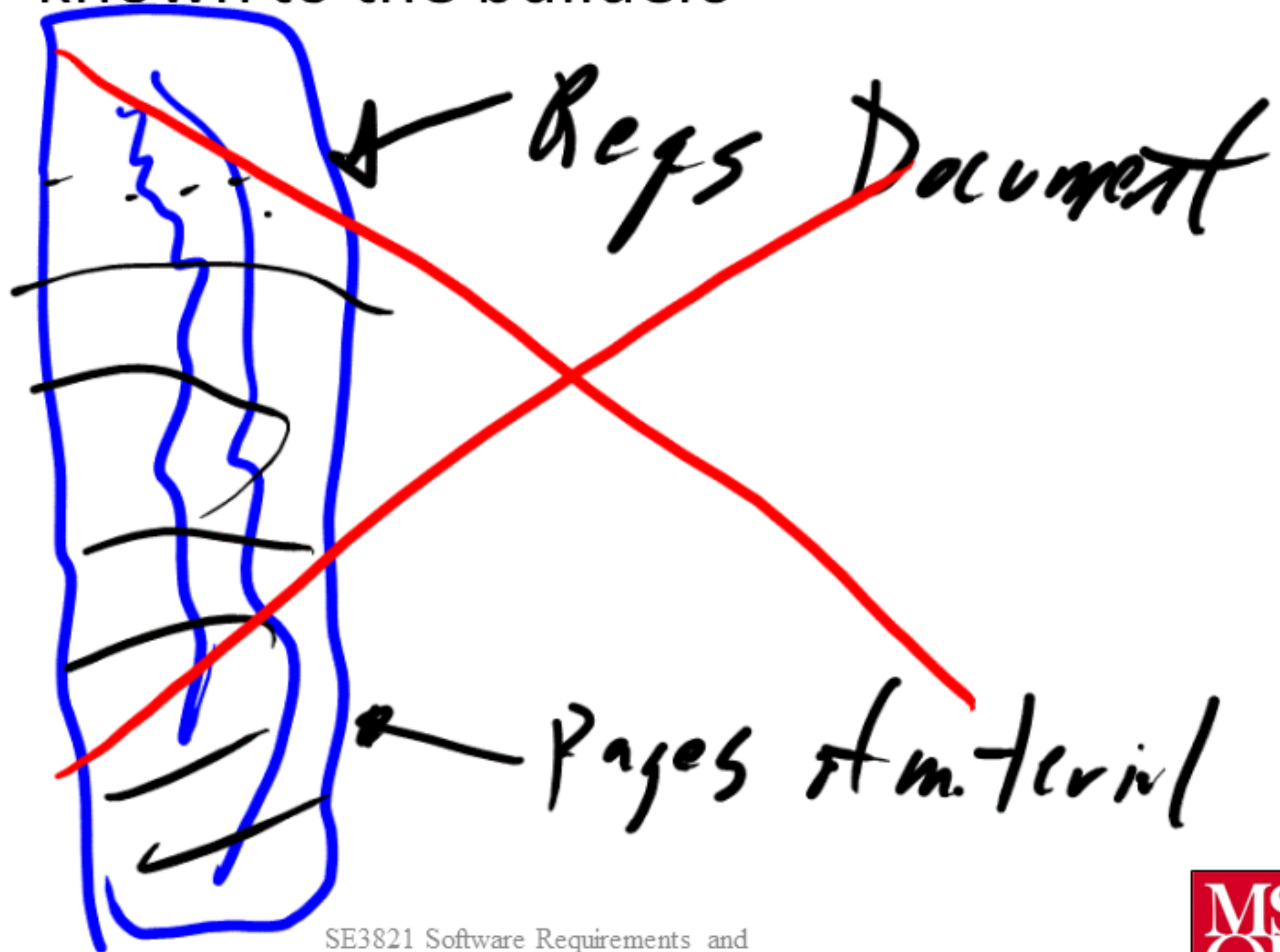
The screenshot shows the MSOE (Milwaukee School of Engineering) Scheduler website. The header includes the MSOE logo and the text "MILWAUKEE SCHOOL OF ENGINEERING". Below the header is a navigation menu with links for "ADMISSION", "ACADEMICS", "ATHLETICS", "LIFE AT MSOE", and "ABOUT MSOE". A secondary menu includes "HOME", "ADVANCED", "ALL COURSES", "CLOSED SECTIONS", and "ELECTIVES". The main content area is titled "Scheduler" and "Scheduling for Fall 2012". It contains a text input field for course selection with the instruction "Please separate courses with commas, semi-colons, or new lines:". Below the input field are buttons for "Continue", "List Closed Sections", "List Courses", and "List HU/SS Electives". A section titled "You may login below for personalized options." includes fields for "Username:" and "Password:" with "Login" and "Reset" buttons. The footer contains links for "Contact Us", "How to Find Us", "Site Map", "Homeland Security", "Privacy Policy", and "Web Site Feedback", along with contact information: "© Milwaukee School of Engineering • 1025 N. Broadway • Milwaukee, WI 53202-3109 • (800) 332-6763 • explore@msoe.edu".

Google Wave



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

Truth 5



Number one axiom of

business

- The customer is always _____

clueless

right

wrong

obnoxious

insulting

contradictory

Truth 6

- 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 7

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



Truth 8

- 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.

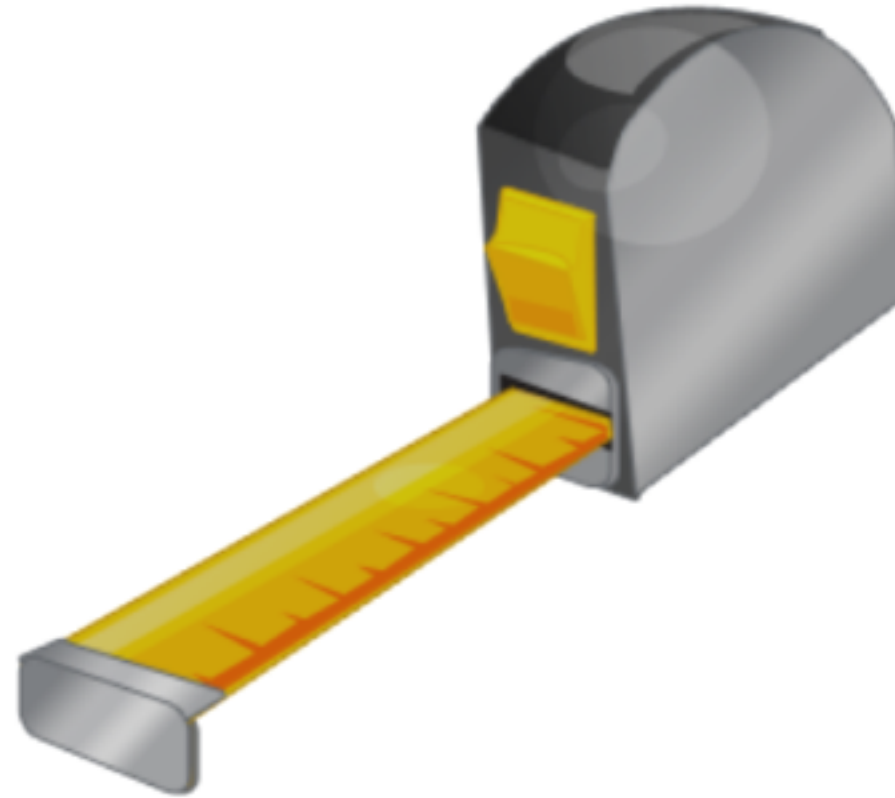
Truth 9

Requirements requires thinking.

No process will solve this problem.

Truth 10

- Requirements must be measurable and testable



Example(s)

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

What?

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

Measurable

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

Truth 11



By understanding one will improve the reqs.

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
- Governmental regulations / rules
- Necessary timeframe

