# What are Requirements?

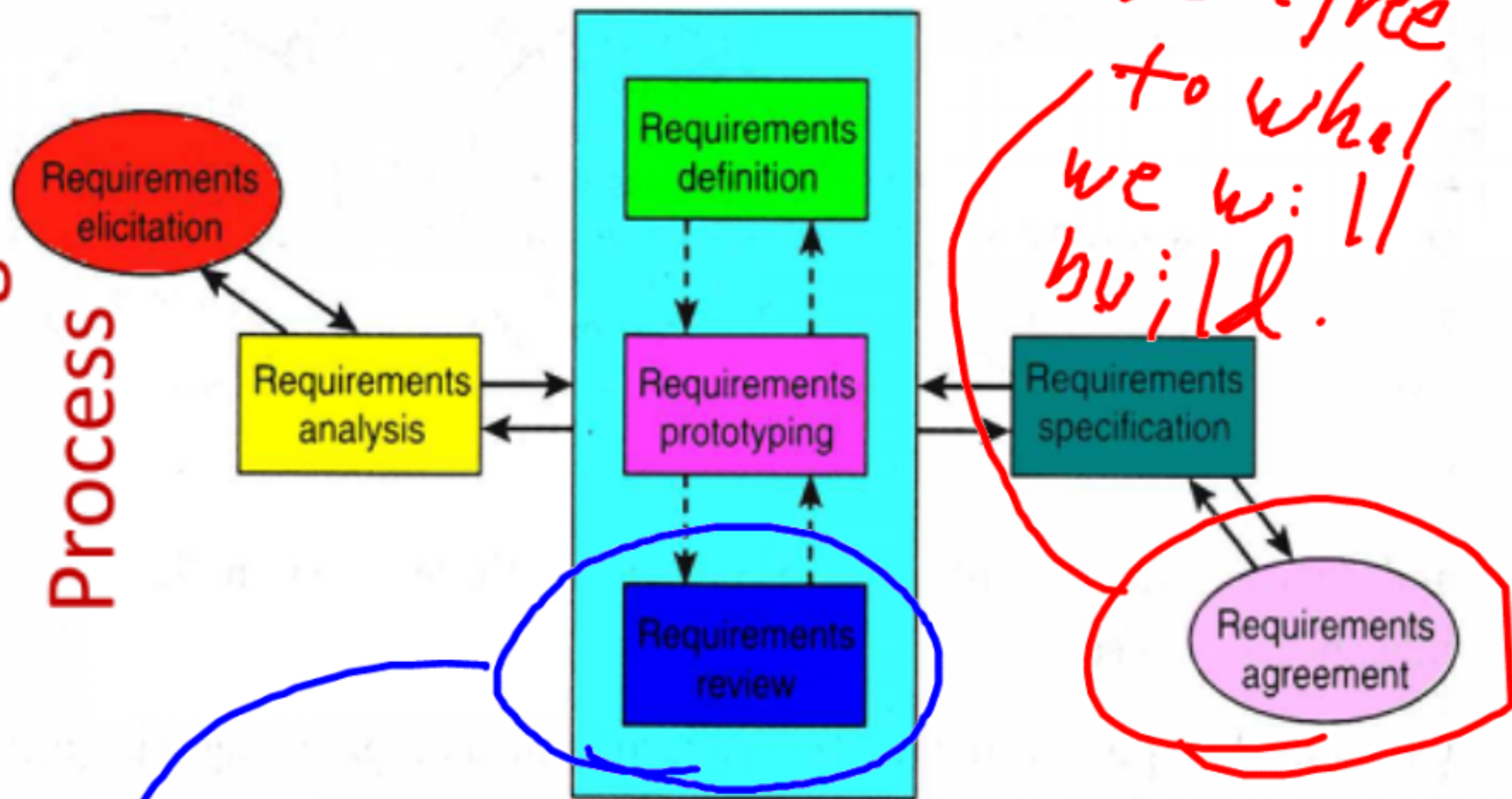## Lecture Objectives:

1) Explain the steps of the Volere Requirements Process
2) Explain what happens during Project Blastoff
3) Explain the rabbit, horse, and elephant analogy to software development
4) Explain the concept of a context diagram
5) Define the trinity of scope, stakeholders, and goals
6) Define stakeholders
7) Identify different sponsors for a project

Requirements Engineering Process

Requirements elicitation

Requirements analysis

Requirements definition

Requirements prototyping

Requirements review

Requirements specification

Requirements agreement

We agree to what we will build.

Check to make certain REQS are correct.

SE2890 - Software Requirements Part 1
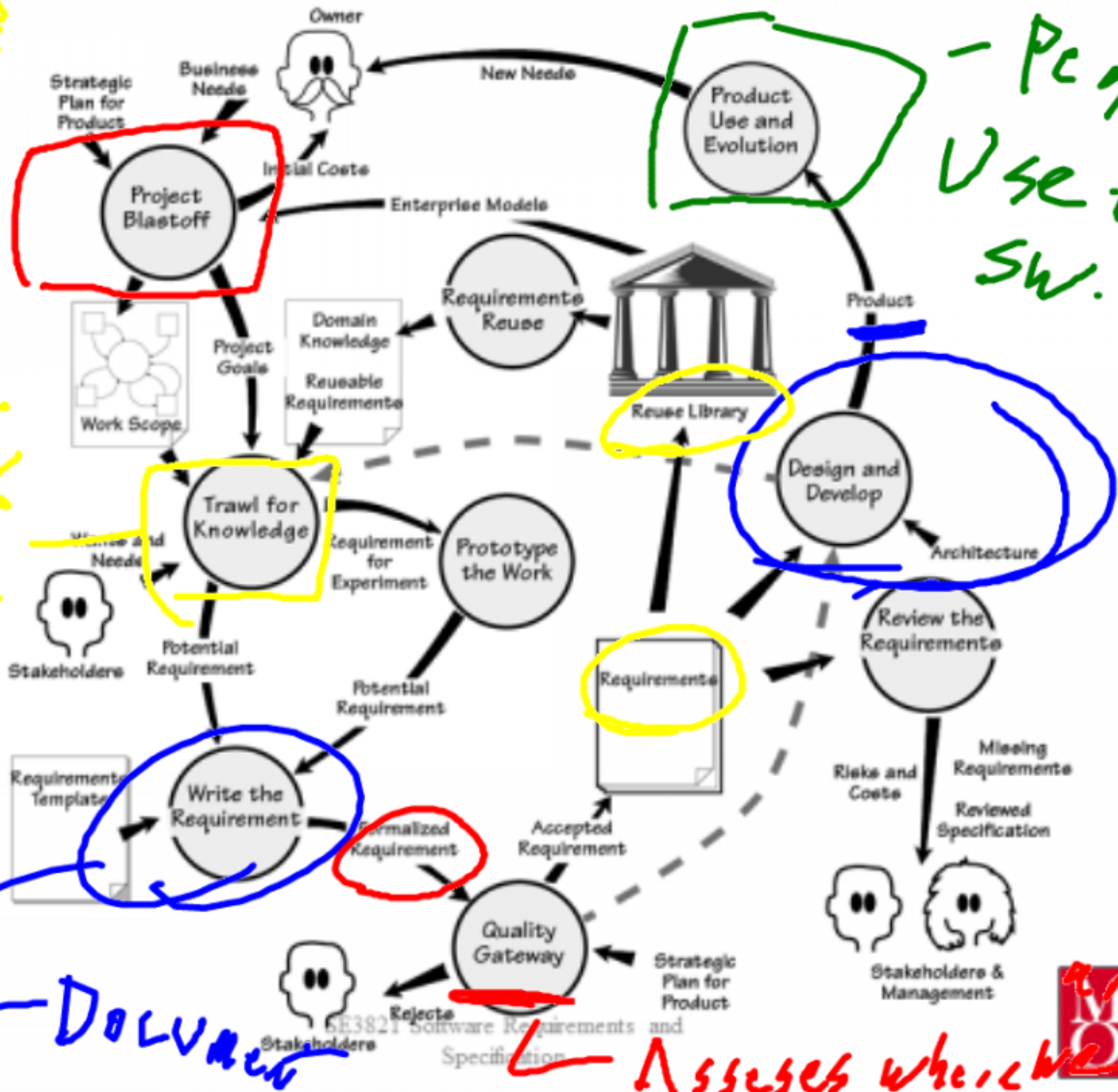
MSOE

# Requirements Engineering

- **Elicitation**
  - Interviews and QA with the customer to determine what they want in their system

- **Requirements Analysis**
  - The requirement statements are checked for accuracy
  - requirements are categorized and prioritized

- **Requirements definition**
  - Requirements are formally written up

- **Requirements prototyping**
  - Construction of prototype systems to demonstrate to users
  - Typically done for UI portions of a system

- **Requirements Review**
  - Requirements are shared with the user for their input.

- **Requirements specification**
  - Final documentation of the requirements is delivered

- **Requirements agreement**
  - Customer signs off on the requirements document

MSOE

Volere Requirements Process

Talk to Consulos.

- People Use the SW.

Owner
Business Needs
New Needs

Strategic Plan for Product
Initial Costs

Project Blastoff

Enterprise Models

Product Use and Evolution

Product

Requirements Reuse

Domain Knowledge

Reuseable Requirements

Work Scope

Project Goals

Reuse Library

Design and Develop

Architecture

Trawl for Knowledge

Wants and Needs

Requirement for Experiment

Prototype the Work

Requirements

Review the Requirements

Stakeholders

Potential Requirement

Potential Requirement

Missing Requirements

Risks and Costs

Reviewed Specification

Requirements Template

Write the Requirement

Formalized Requirement

Accepted Requirement

Quality Gateway

Strategic Plan for Product

Stakeholders & Management

Rejects

Stakeholders

Documen

Assesses whether

SE3821 Software Requirements and Specification

## Project Blastoff

- Constructs a <u>foundation</u> for the requirements discovery that is to follow
  - Scope of the business problem *— How biz is the project*
  - Construct a context diagram of the system *Show the structure of the system*
  - Identify the stakeholders
  - Confirm the goals of the project
  - Preliminary estimate of cost

MSOE

- Blastoff may have other names
  - Project kick-off
  - Project initiation
  - Project launch
  - Etc.

*All basically the same*

MSOE

Outcomes from Blastoff phase

Risks

How much $$.

Outcomes from Blastoff phase

Risks

Costs

Terminology

Stakeholders

Scope of the work area

Constraints.

Goals

People who care about

Specific Acronymyhs. lhc

Of Rabbits, Horses, and Elephants

Very Fast
Very agile
Blastoff is a set
a notes/post-its on
wall.

Few
Projects
here

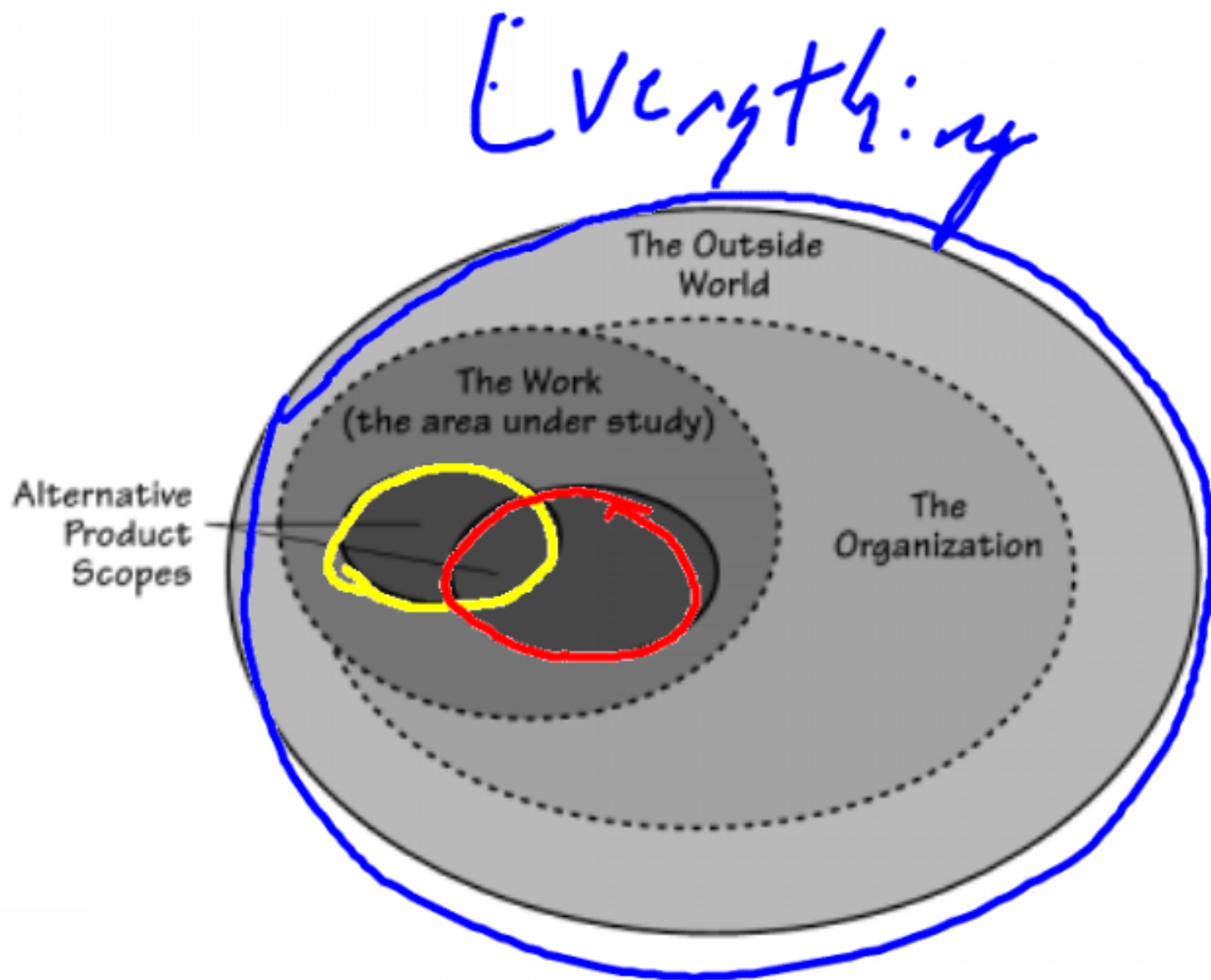Slightly more formal
Better documented.
etc.
Many/More
Projects.

Very Formal
Complex Blastoffs.
Big Projects / high risk.

MSOE

**What is scope?**

Addresses the bounds of the system.

MSOE

Various Project scopes

Everything

The Outside World

The Work
(the area under study)

Alternative
Product
Scopes

The
Organization

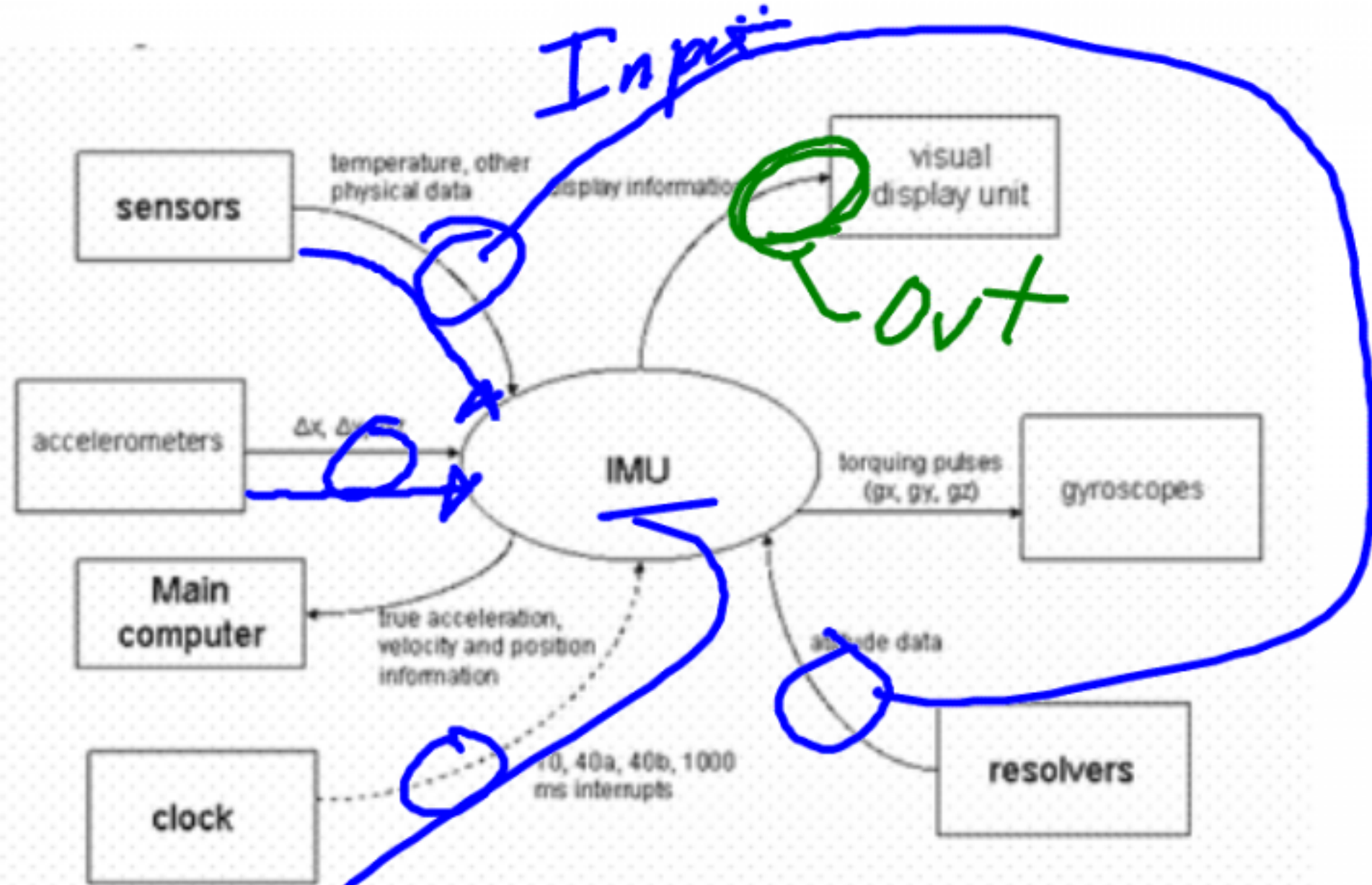SE3821 Software Requirements and
Specification

**Context Diagram**

- A context diagram is a data flow diagram
  - one central process that subsumes everything inside the scope of the system.
  - Shows how the system will receive and send data flows to the external entities involved.
  - DFD that summarizes all processing activity for the system or subsystem
- Other attributes
  - Highest level (most abstract) view of system
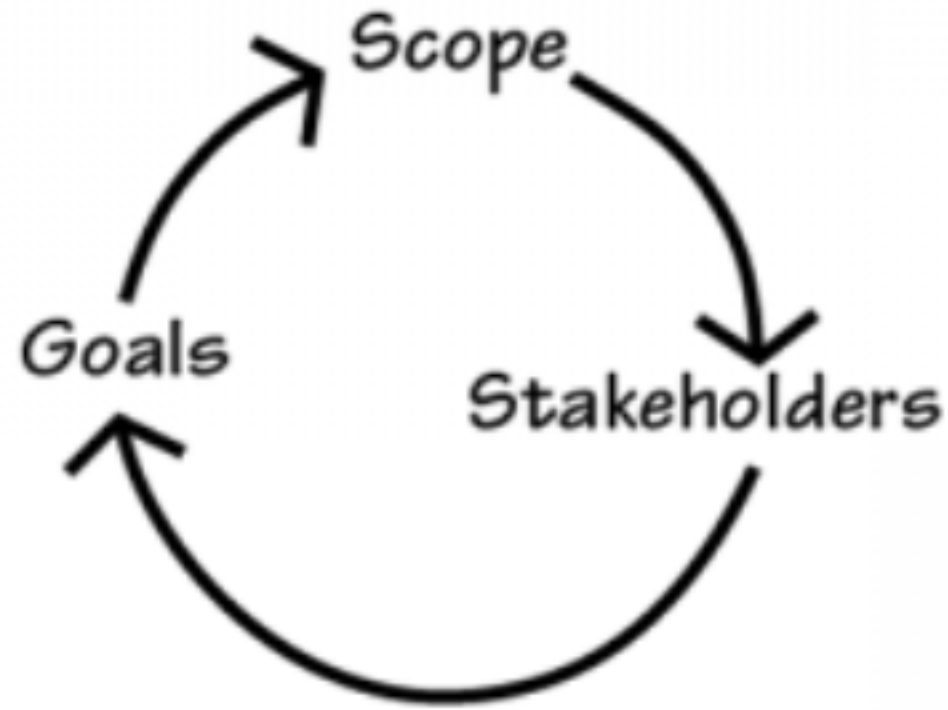  - Shows system boundaries

Movement of data in a system.

MSOE

Context Diagram Example

sensors

temperature, other physical data

display information

visual display unit

accelerometers

Δx, Δy, Δz

IMU

torquing pulses (gx, gy, gz)

gyroscopes

Main computer

true acceleration, velocity and position information

clock

10, 40a, 40b, 1000 ms interrupts

attitude data

resolvers

Input

Out

Internal Measurement Unit

- Draw a context diagram for an automated toll collection system which uses a toll transponder mounted in a vehicle.
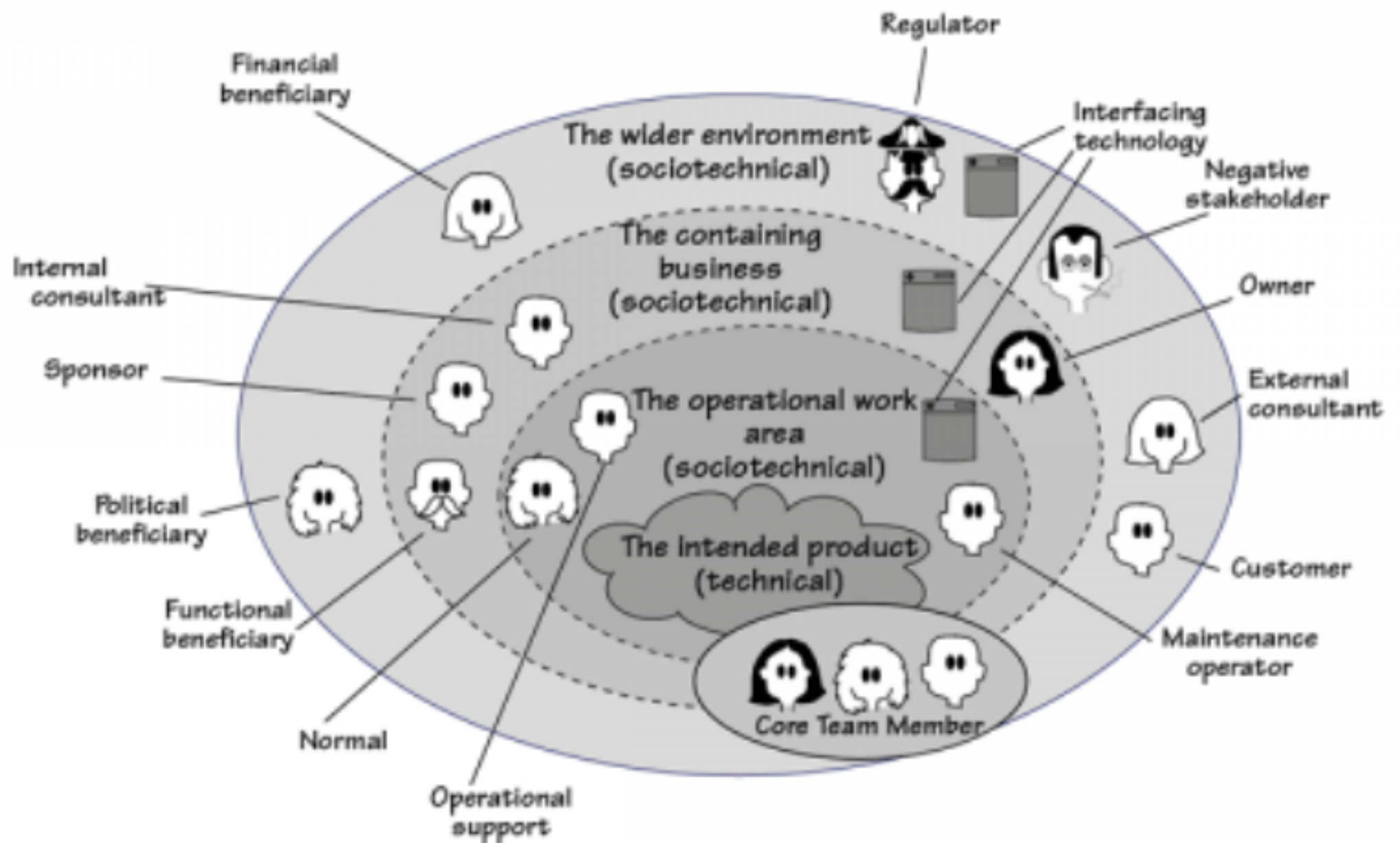
MS OE

# The trinity of a project



Scope → Stakeholders → Goals → Scope (cyclic diagram)

MSOE

# Stakeholders

- Anyone with an interest in, or an effect on, the outcome of the product.

MS OE

# Stakeholder roles

Financial beneficiary

Regulator

Interfacing technology

The wider environment (sociotechnical)

Negative stakeholder

Internal consultant

The containing business (sociotechnical)

Owner

Sponsor

The operational work area (sociotechnical)

External consultant

Political beneficiary

The intended product (technical)

Customer

Functional beneficiary

Core Team Member

Maintenance operator

Normal

Operational support

- *This lecture brought to you by the MSOE Software Engineering Program.*
- *The time of the lecture was sponsored by the MSOE Registrar's office.*

The owner of the product.

The one who is to receive ultimate value.

The person who si to pay the bills.

# Turn to your neighbor: Who si the sponsor?

- A product is being build by MSOE students to ensure that appropriate registration occurs. Given a list of courses, a set of instructors, and a list of available classrooms, the system will generate a course schedule that is fair to all students and optimal. Who is the sponsor?

MS OE

- A software application is to be built and sold. This application will allow students to text home for money when it is needed. The product is to be sold by a company named Really Useful Software, Inc. Who is the sponsor?

MS
OE