# SE463
# Software Requirements Specification & Analysis

## Scope, Stakeholders, and Goals

Readings:

Robertson, S. and Robertson, J., *Mastering the Requirements Process, 3rd ed.,* Chapter 3 "Scoping the Business Problem"

# Project Types

smaller projects, short lifetimes, small number of stakeholders, iterative development with customer in close proximity

projects of medium longevity, dozen+ stakeholders, geographically distributed

large projects, outsourced development, or need for certification

# The Problem Is To Know What the Problem Is

"If I had only one hour to save the world, I would spend fifty-five minutes defining the problem, and only five minutes finding the solution."

*- Albert Einstein*

# Scoping the Problem

Purpose of the project: a rationale for *why* the project is wanted, what benefit it brings to the business.

Goal: Some high-level measureable criterion of success

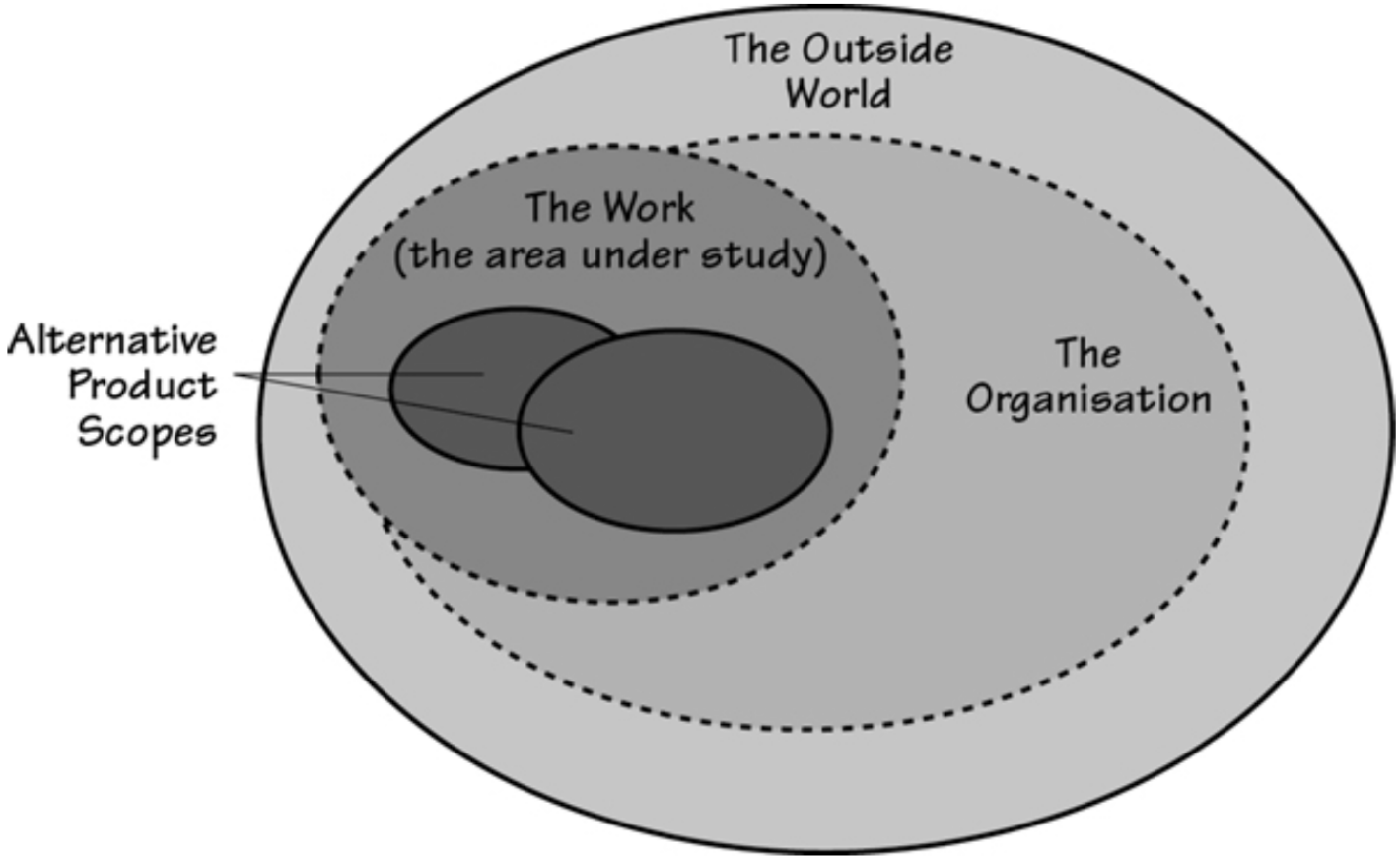
The scope of the work: The business area affected by the installation of the system. You need to understand this work to specify the most appropriate product.

The stakeholders: The people with an interest in the system.

Constraints: Restrictions on the scope or style of the system.

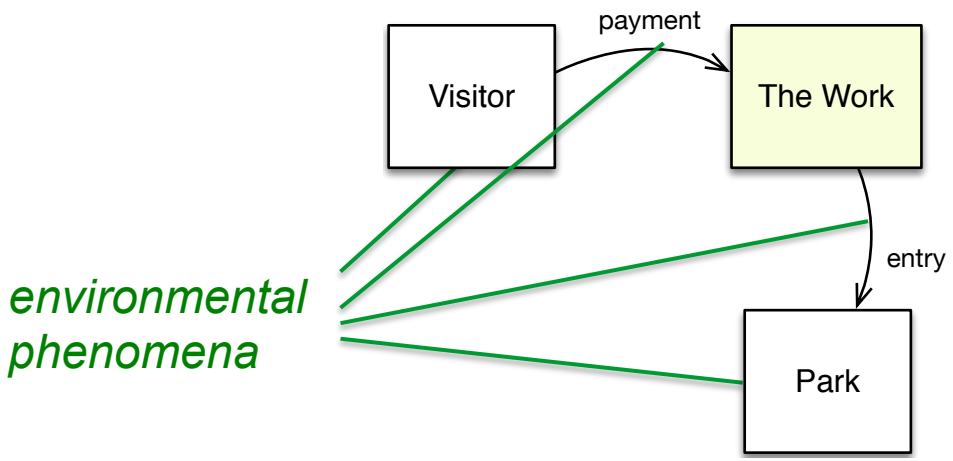
- predetermined design solutions that must be used
- constraints on changing current business processes
- time and money that are available for the project

# Scoping the Problem




Robertson, Robertson, *Mastering the Requirements Process*, 2012, Figure 3.3.

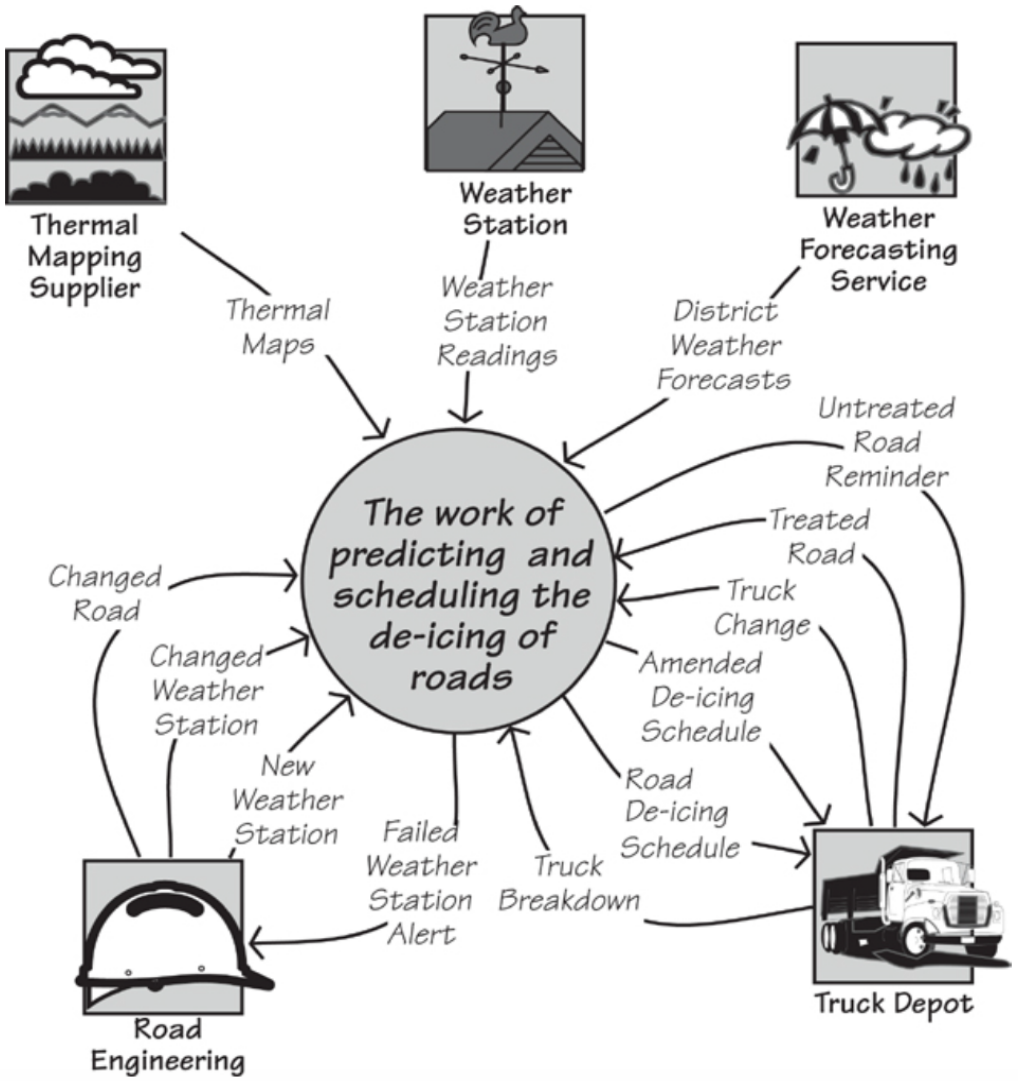
# Context Diagram




A context diagram is a graphical model of the context (Environment) in which the Work exists

- Phenomena that are relevant to the descriptions of the requirements
- Modularizes the phenomena into domains.
- Precursor to Domain Models (next week)

# Context Diagram




Robertson, Robertson, *Mastering the Requirements Process*, 2012, Figure 3.5.

# Context Diagram

Patients in an intensive-care ward in a hospital are monitored by sensors of various kinds (i.e., by electronic analog devices attached to their bodies). Through the sensors, the devices measure the patient's vital factors: pulse rate, temperature, blood pressure, and so on. A program is needed to read the factors, at a frequency specified for each patient, and store them in a database. The factors read are to be compared with safe ranges specified for each patient, and readings that exceed the safe ranges are to be reported by alarm messages displayed on the screen of the nurse's station.

# Early Deliverables

## Project Purpose

Not a description of *what* the proposed project will do, but a rationale for *why* it is wanted

## Measureable Goal

Some high-level *measureable criterion* for what it means for your project to be deemed a success (i.e., fit for purpose)

## Technical Feasibility

(1) Evidence of a promising solution that meets the measurable goal and (2) the organization (team) has or can acquire the skills to build the system

## Constraints

Restrictions on acceptable solutions

- pre-ordained design decisions (platform, OS, existing database, COTS, etc.)
- project constraints, like limits on budget or development time

# Example: JobMine

Problem Statement:

- Facilitates the scheduling of job interviews.
- Matches job applicants with job openings, according to applicants' and employers' preferences.

Project Purpose

Measureable Goal

Technical Feasibility

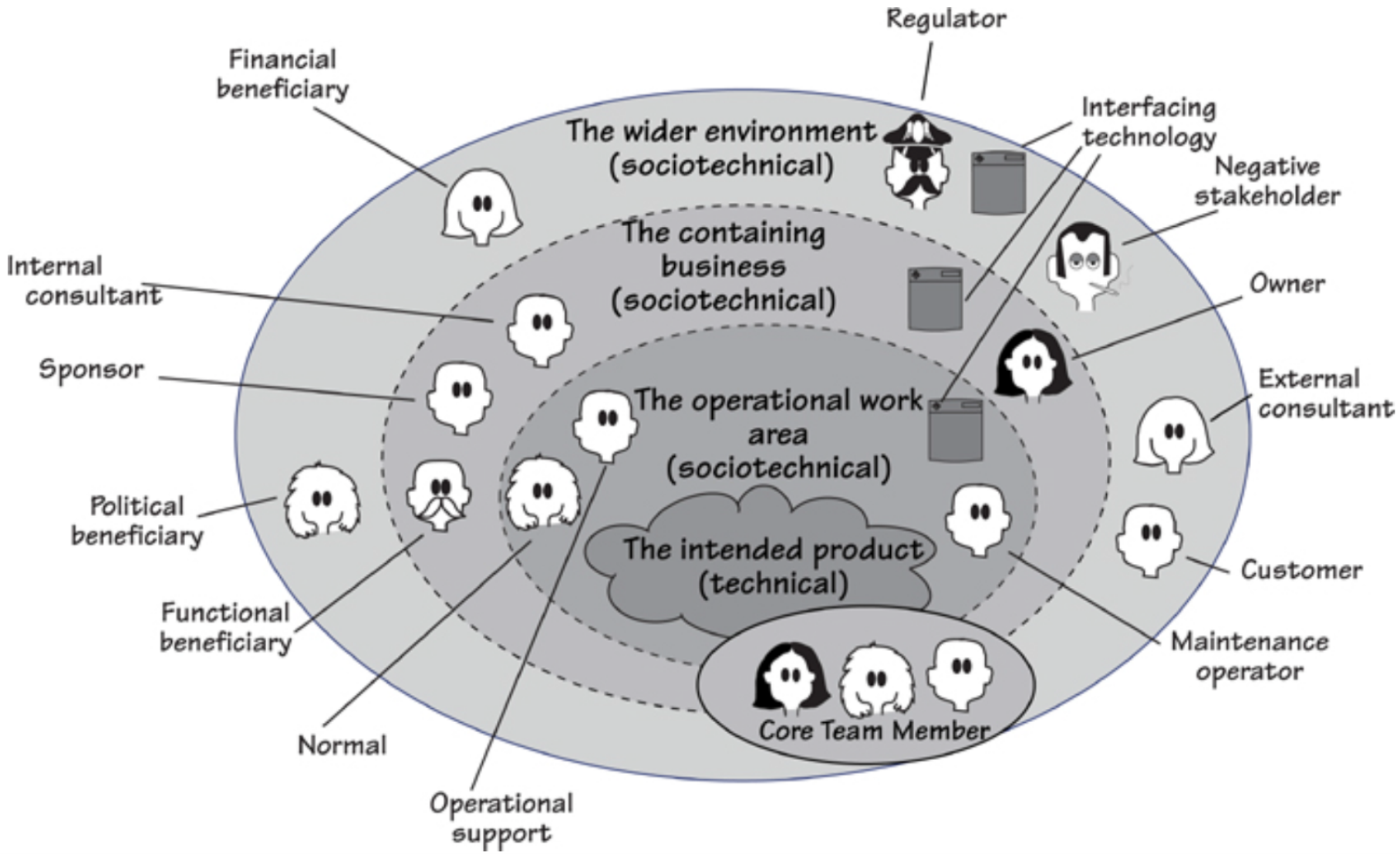
Constraints

# Stakeholders

- A stakeholder is anyone who has a stake in the ultimate success of the project.
- During elicitation, we want to talk to all of the stakeholders.
  - But sometimes we have to make do with proxies


© 2007 Oxford Creativity

# Stakeholders




Robertson, Robertson, *Mastering the Requirements Process*, 2012, Figure 3.7.

# Stakeholders: Owner/Client

- The *owner/client* is the person paying for the software to be developed
  - They are the ultimate stakeholder — almost always, the client has the last say in what the product does
  - For “bespoke” or customized systems, the client is the person with the chequebook ☺
  - For software for the mass market, the client may be the company developing the software
  - For in-house software, the client is probably the manager of the product’s users
    - Since his/her employees will be the primary beneficiaries, it is reasonable for him/her to pay for the project
  - Likely represented by a proxy

# Stakeholders: Customer

- A *customer* is a person who buys software after it is developed; possibly a manager
  - May be the same as the client
  - May be the same as the user; other times, the customer is an office manager who buys software for his / her staff
    - For what requirements will he / she pay? Which are trivial or are excessive?
  - Must be an active participant in the project (or have an active representative if there are many customers)
    - Sometimes a marketing person or experienced manager serves as a proxy

# Stakeholders: Users

- *Users* (of both the current and future systems)
  - Experts on the existing system — tell us which features to keep and which need improvements, or
  - Experts on competitors' products — give suggestions about how to build a superior product.
  - May have special needs or requirements to be satisfied, e.g., regarding usability, desired features.
  - May want to consult special-interest groups: users with disabilities, users who have computer phobias, expert users, novice users, older users, etc.
  - May be simulated by a persona.

# Diversity Matters!

Different users make different demands on your project.

1) What categories of users do you need to consider?
   - e.g., normal users, operational support, maintenance

2) For each category of user, describe their background, skills, experience

3) For each category of user, identify the accessibility characteristics that your project must cater to

# Stakeholders: Domain expert

- *Domain experts* know the problem domain well
  - Familiar with the problem that the software must solve.

    e.g., financial experts for financial packages,
    aeronautical engineers for aircraft navigation systems,
    meteorologists for software that models the weather,
    travel agents for travel industry, etc.
  - … and are familiar with typical users and their expectations
  - … and are familiar with typical deployment environments

# Stakeholder: Software engineer

- *Software engineer* == technology expert
  - May include managers too
  - Represents the rest of the development team (developers, testers)
  - Ensures that the project is technically and economically feasible
  - Accurately estimates the cost and development time of the product
  - Educates the customer about innovative hardware or software technologies, and recommends new functionality that takes advantage of these technologies

# Other Stakeholders

- *Inspectors* == experts on government and safety regulations
  - Familiar with government and safety regulations relevant to project

    e.g., safety inspectors, auditors, certification inspectors
- *Market researchers*
  - Experts who have conducted surveys to determine future trends and potential customers' needs.
  - May assume the role of client, if the software is being developed for the mass market and there is no identifiable customer.
- *Lawyers*
  - Familiar with legal requirements
  - Familiar with licensing, e.g., for use of open source components
- *Industry standards*

# Other Stakeholders

- *Experts on adjacent systems*
  - They know about the interfaces to adjacent systems, and any special demands for interfacing with the adjacent system.
  - They need to be forewarned about the planned new system -- they could be affected by your work!
  - They can help to improve your work, by enhancing the services they provide.
- *Negative stakeholder*
  - It is best to understand why they do not want the project to succeed
  - They may simply have competing requirements that you'd be best off considering

© 1993 Groening. Dist. By Fox Network

# Early Deliverables

## Stakeholders

- Types, Names, What information they can provide
- Categories of users
- For each category of user, describe their background, skills, experience
- For each category of user, identify their accessibility characteristics

# Volere Req. Spec. Template

**Project Drivers**

1. The Purpose of the Project
2. The Stakeholders

**Project Constraints**

3. Mandated Constraints
4. Naming Conventions and Terminology
5. Relevant Facts and Assumptions

Robertson, Robertson, *Mastering the Requirements Process*, 2012, Appendix A.

# Summary

Earliest stage of requirements engineering

- Scoping the problem
- Context diagram
- Identifying the stakeholders
- Volere Requirements Specification Template