Lecture 5
Requirements Discovery & Analysis
Functional Requirements


sta-monica-museum-of-art

Com S/SE 409/509

Robyn Lutz

rlutz@iastate.edu

Office hours:

Robyn: 11 Tues, 230 Atanasoff; ***3 Wed in 230 (just this week),*** & by appointment

Carter: cwunsch@iastate.edu,12 Tues (0112 Pearson); 12 Thurs (https://iastate.webex.com/meet/cwunsch), & by appointment

Arushi: arushi17@iastate.edu, 1 Wed (0112 Pearson) & by appointment

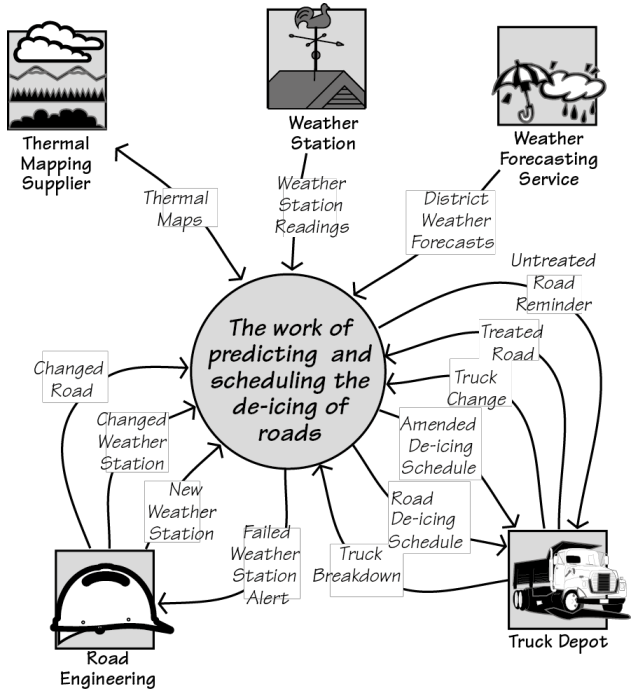
Homework 1 due Thurs, 9/19

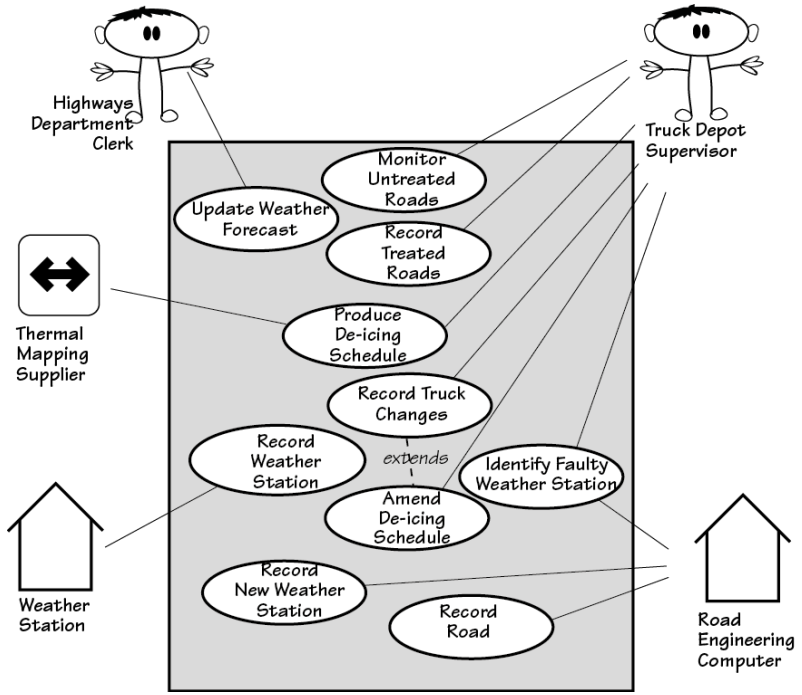
To catch up on reading assignments*

- Lectures 1-2: Chaps. 1-3 (Intro & Context Diagram)
- Lecture 3: Chap. 4 (Use Cases)
- Lecture 4: Chap. 6 (Scenarios) & Chap. 8 (Product Use Case Scenarios section toward end)
- **Lecture 5 (today): Chap. 10 (Functional Requirements)**

* We've skipped most of chapters 5, 7-9 for now.

Context Diagram → Product Use Cases → Scenarios → *Functional Requirements*





Product use case name:
passenger
checks into airline flight
Trigger: passenger activates the machine
Preconditions:
Interested stakeholders:
Actor: passenger
Steps:* (1) software asks for passenger's
name . . . (9) software prints baggage tag
Outcome: passenger has boarding pass & baggage tag . . .

Figure 8.8

An **adjacent system** maintaining the thermal map database is not owned by the de-icing business, but the de-icing system is allowed access to the data. When it does so, it expects to get data quickly.

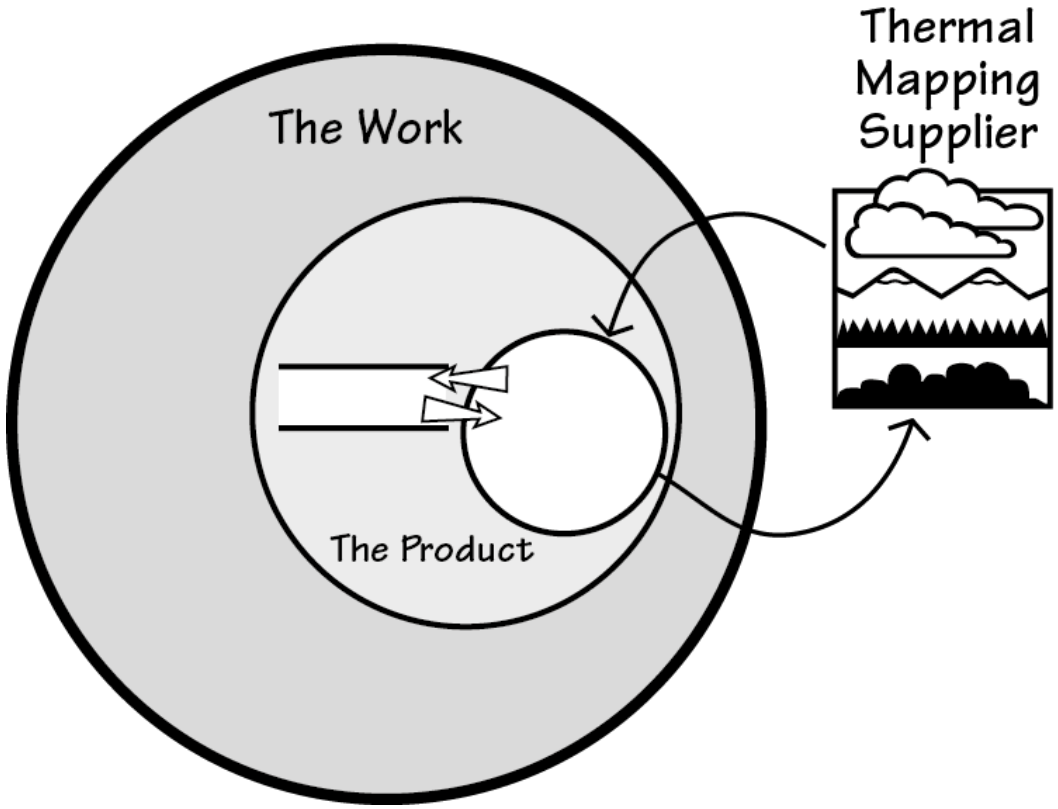
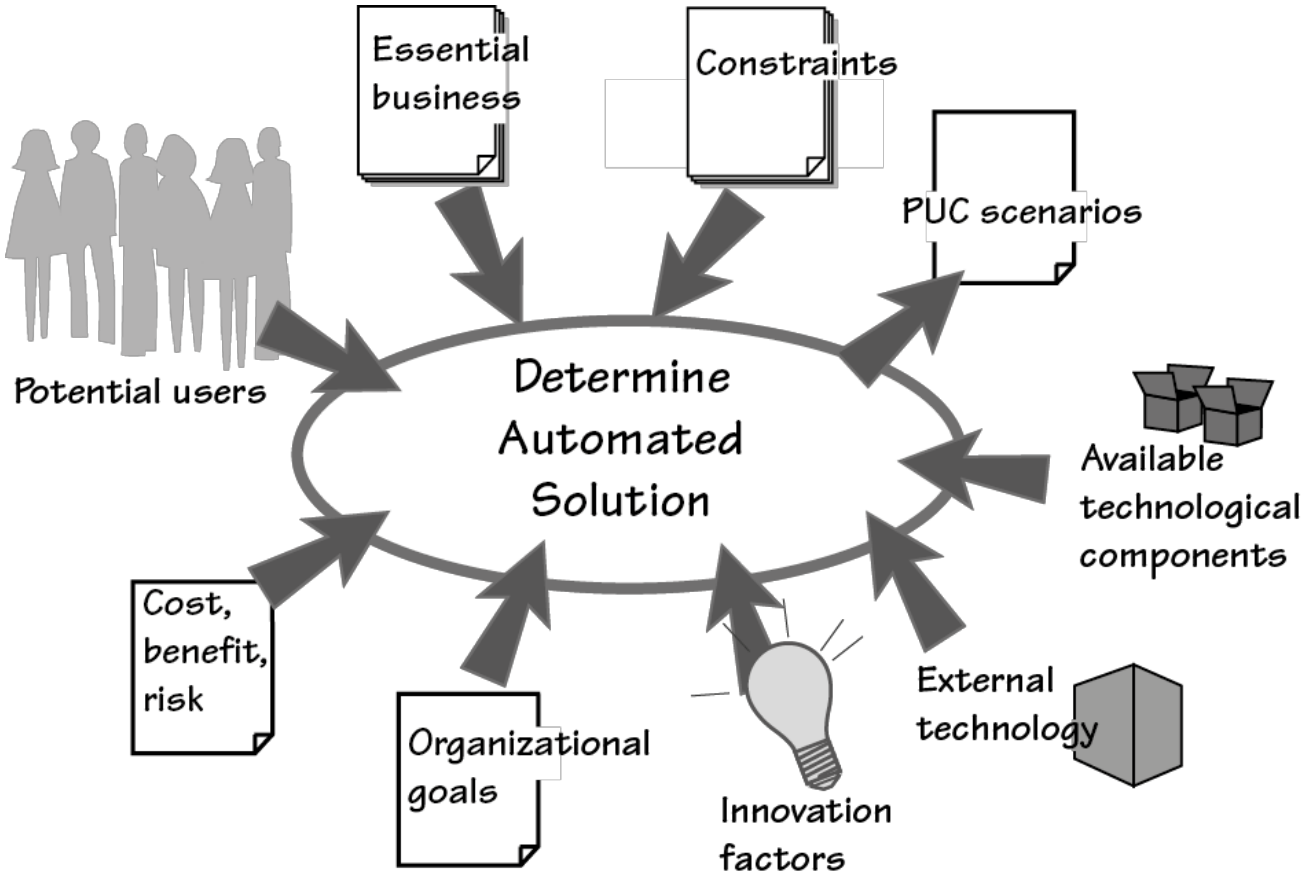


Figure 8.2

The business analyst juggles many factors to decide the most appropriate product to build.



Scenarios → Functional Requirements (FRs)

Functional requirements (FRs) are what the software product must do

For example, a service that the software should provide is a functional requirement

Q: Where to get them?

A: From the steps of the product use case scenarios

Q: How?

A: **for each *scenario***

for each *step* in that scenario

ask: "*what does the software have to do*?"

Scenarios → Functional Requirements (FRs)

Q: How many? What level of detail?

A: FRs need to contain enough detail for the developer to build the right (that is, the needed) product.

Robertsons' rule of thumb: a step in a scenario maps to ~1-5 FRs

A: FRs need to be testable

A: FRs need to be specified (well-written) so as to communicate clearly

Usually of the form, "The software **shall** . . ."

IceBreaker example: Scenarios → Functional Requirements

A product use case:

"Produce road de-icing schedule"

- PUC maps to 1 or more scenarios
- Each scenario consists of steps to achieve it

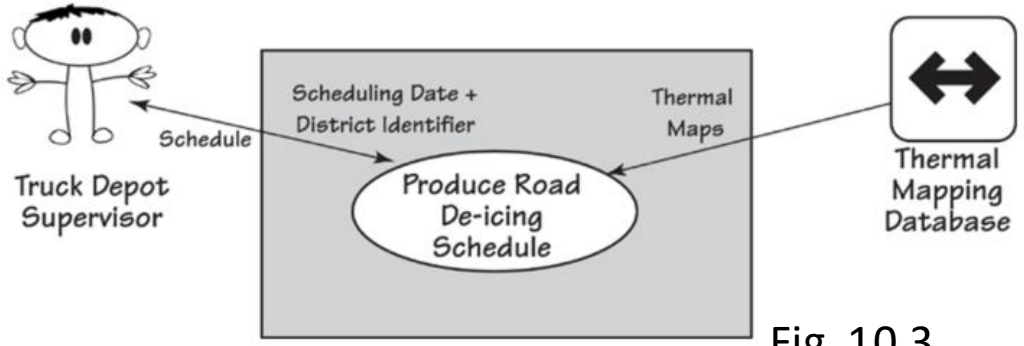


Fig. 10.3

This product use case maps to 1 scenario, having the same name

Its scenario has 6 steps (see "Uncovering the FRs" section in Chap. 10)

The 1st step in its scenario: "Engineer provides a scheduling date & district identifier"

Each step in a scenario maps to 1 or more functional requirements (FRs):

1. The product shall accept a scheduling date.
2. The product shall warn if the scheduling date is neither today nor tomorrow.
3. The product shall accept a valid district identifier.
4. The product shall verify that the district is within the de-icing responsibility of this truck depot.
5. The product shall verify that the district is the one wanted by the engineer.

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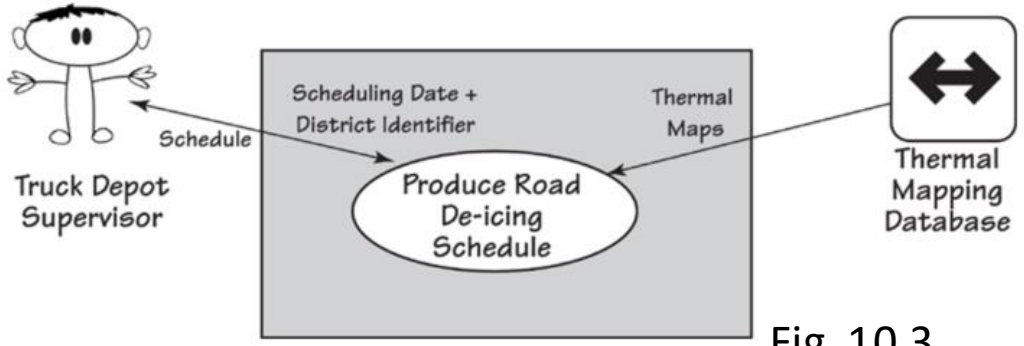

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More examples: Scenarios → Functional Requirements

- Unwanted scenario (failure/exception/misuse) → Functional Requirement

  "If there are no trucks available, the product shall generate an emergency request to truck depots in adjacent counties."

- Alternative scenario (branching behavior) → Functional Requirement

  "If 1-click is turned on, the product shall record the sale."

  "If 1-click is turned off, the product shall . . . "

For HW (& life), if you find that a FR you wrote for one scenario also applies to others, then reuse it & add cross-references

(Why cross-reference?)

Summary

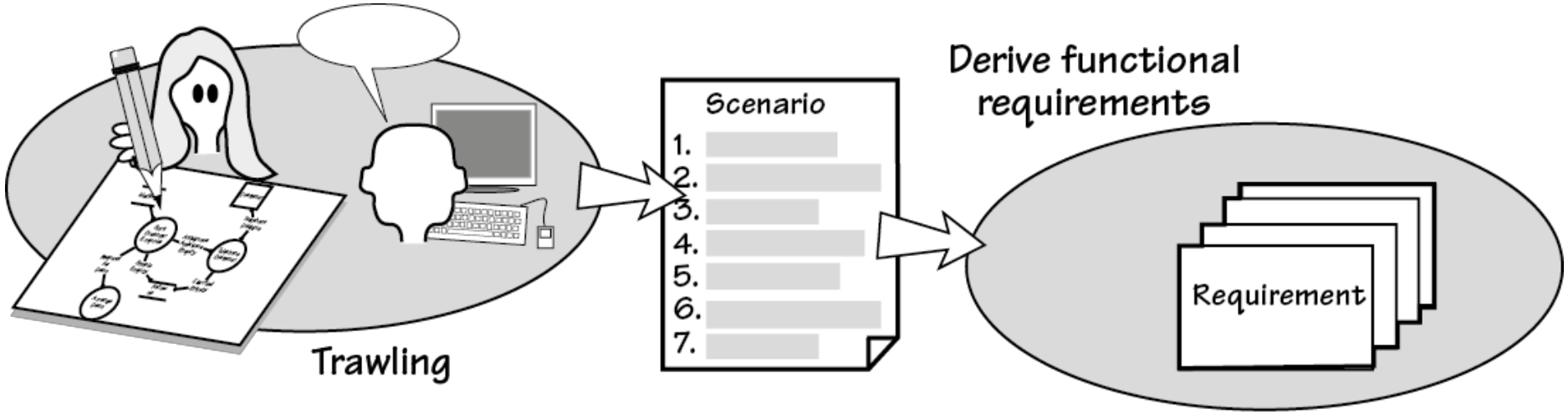

Figure 10.1

The functionality of the work is determined during the trawling activity, and you usually communicate this back to the stakeholders by writing a scenario. You then write functional requirements from the scenario. The end result is a set of functional requirements that specify what the product has to do to support the work.

HW#1 due next Thurs, 9/19