VIII. Requirements Analysis

Functional and Non-Functional Requirements

Stakeholders

From Whom Do We Gather Requirements?
How Do We Specify Them?

What Are Requirements?

"...Requirements definition is a careful assessment of the needs that a system is to fulfill...must say why a system is needed, based on current and foreseen conditions, which may be internal operations or an external market...must say what system features will serve and satisfy this context...must also say how the system is to be constructed..."

[Ross77]

- Requirements constitute a specification for the new system. They serve as a “contract” between customers and developers.
Requirements describe the system with respect to its environment, NOT its inner workings!

Functional Requirements

- Describe the processing (i.e., functions to be supported) by the new system.
- Describe the inputs into the system.
- Also describe the outputs of the system.
- Finally, they describe the data that must be managed by the system.
Non-Functional Requirements

- Describe how well the system supports the functional requirements (hence the name *non-functional*, or *quality* requirements).
- This description may include:
  - Performance criteria;
  - Reliability requirements;
  - Security considerations;
  - Usability requirements,
  - ...more...

Are Requirements Always Done in Software Engineering Practice?
**Whom Do We Gather Requirements From?**

From the *stakeholders (actors)*:

- Users - who are concerned about the features and the functionality of the new system;
- Designers;
- Systems analysts;
- Training and user support staff;
- Business analysts;
- Technical authors;
- The project manager;
- …more…

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**Stakeholders are Different for Different Types of Projects**

- *Customer-driven* projects develop customized, one-of-solutions.
- *Market-driven* ones develop (generic) software that is sold in the market.
- (Coming soon) *User-driven* projects develop software that is downloaded and used -- for a fee, on demand.
- The concept of software is evolving from that of a *custom-built artifact*, to that of a *commodity* that you buy, and soon to that of a *service/resource* that you use on demand.
What Do We Gather?

- **Scenarios (use cases)** from which we can infer functional and non-functional requirements.
- Scenarios describe desirable sequences of events that should be supported by the new system.
- They also describe undesirable ones that should be prevented.

How Do We Specify Requirements?

- Through (visual) modeling

**But Remember:**

* A Model is Usually just an Approximation!
Additional Readings