

## VIII. Requirements Analysis

Functional and Non-Functional Requirements  
Stakeholders  
From Whom Do We Gather Requirements?  
How Do We Specify Them?

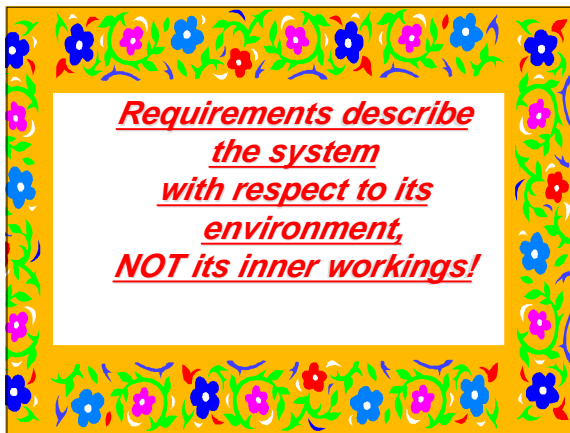


## What Are Requirements?

"...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.



## 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?



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## 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...



## 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.

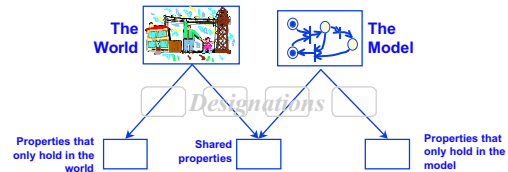
## What Do We Gather?

- **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

- [Kotonya98] Kotonya, G. et all. *Requirements Engineering: Processes and Techniques*, John Wiley & Sons, 1998.
- [Macaulay96] Macaulay, L., *Requirements Engineering*, Springer-Verlag, 1996.

