Requirements Quality Attributes
Quality Attributes

- A superset of nonfunctional req.
- Drive architectural and design decisions
- Often not explicitly described by the customer
- Quality attributes may conflict with one another, and trade-offs may need to be explored (and possibly negotiated)
Characterizing Requirements: FURPS+

- One way to categorize requirements: FURPS+
  - Functionality
  - Usability
  - Reliability
  - Performance
  - Supportability
  - “+”
    - Design constraints
    - Implementation requirements
    - Interface requirements
    - Physical requirements

Quality requirements “-ilities”

Non-functional Requirements

[RUP]
Another Way to Characterize Requirements: CRUPIC STMPL

- Operational categories
  - Capability
  - Reliability
  - Usability
  - Performance
  - Installability
  - Compatibility

- Developmental categories
  - Supportability
  - Testability
  - Maintainability
  - Portability
  - Localizability

- Customer and user requirements
- Mostly visible at run-time

- Developer and support requirements
- Mostly visible at build-time
CRUPI C STMPL

- **Capability.** Can it perform the required functions?
- **Reliability.** Will it work well and resist failure in all required situations?
- **Usability.** How easy is it for a real user to use the product.
- **Performance.** How speedy and responsive is it?
- **Installability.** How easily can it be installed onto its target platform?
- **Compatibility.** How well does it work with external components & configurations?
CRUPI C STMPL

- **Supportability.** How economical will it be to provide support to users of the product?
- **Testability.** How effectively can the product be tested?
- **Maintainability.** How economical will it be to build, fix or enhance the product?
- **Portability.** How economical will it be to port or reuse the technology elsewhere?
- **Localizability.** How economical will it be to publish the product in another language?
Attaining balance to quality attributes

- Identify
- Specify
- Prioritize
- Assess conflicting goals
# Table 12-2 Translating Quality Attributes into Tech. Specs

<table>
<thead>
<tr>
<th>Quality Attribute Types</th>
<th>Likely Technical Information Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrity, Interoperability, Robustness, Usability, Safety</td>
<td>Functional Req.</td>
</tr>
<tr>
<td>Availability, Efficiency, Flexibility, Performance, Reliability</td>
<td>System Architecture</td>
</tr>
<tr>
<td>Interoperability, Usability</td>
<td>Design Constraint</td>
</tr>
<tr>
<td>Flexibility, Maintainability, Portability, Reliability, Reusability, Testability, Usability</td>
<td>Design Guideline</td>
</tr>
<tr>
<td>Portability</td>
<td>Implementation Constraint</td>
</tr>
</tbody>
</table>