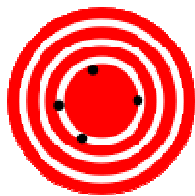


Dictionary of Non-Functional Requirements

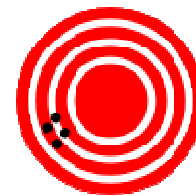
Operational and Execution Qualities

Accuracy: indicates proximity to the true value.

Precision: the repeatability or reproducibility of the measurement.



← High **accuracy**, but low precision.



High **precision**, but low accuracy. →

Performance: an overall statement or measure of a systems ability to perform actions over time, typically with a number of different metrics and measurements for specific aspects of performance, including:

- **Speed:** elapsed time per transaction.
- **Throughput:** number of transactions per unit of time.
- **Latency:** Wait time for a response (result of a transaction).

Quality of Service (QoS): refers to resource reservation control mechanisms (rather than the achieved service quality). QoS is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow.

Capacity: the number of users, entities or transactions the system can support for a given configuration at a fixed level of performance.

Scalability: the ability to increase capacity.

Reliability: the length of time a system can operate without failure (often measured in the 'mean time between failures').

Robustness: the quality of being able to withstand stresses, pressures, or changes in procedure or circumstance.

Availability: typically a core part of a Service Level Agreement (SLA):

- Percentage of time available and/or hours of availability.
- Expected recovery time (of the existing (failed) system, fail-over to a DR system or both).

Evolution Qualities

Portability: The effort required to move the software to a different target platform. The measurement is most commonly person-months or % of modules that need changing.

Compatibility: Is the software able to operate with other products? Is there any impact on common dependencies?

Dependencies: what does the system depend on? Includes both components needed for execution (software and hardware) and parties responsible for system development and support (vendors, manufacturers, business owners and goals).

Stability: a reflection of the systems ability to operate, how suitable the systems design and implementation are (such as in terms of development) and the execution ability of the supplier (and there viability – are they going out of business?).

Extensibility: the measure of how easily new capabilities can be added to the system without major changes to the underlying architecture.

Modifiability: the effort required to make changes in the software. Often, the measurement is personnel effort (person - months).

Modularity: the degree to which a system can inherently support changes in its make-up (the exchange of sub-components); usually supported by specific and deliberate design and implementation.

Maintainability: the ease with which a software product can be modified in order to:

- Correct defects
- Meet new requirements
- Make future maintenance easier
- Cope with a changed environment

Security Qualities

Vulnerability / Attack Surface: a measurement or understanding of all the parts of a system which are visible to an attacker.

Confidentiality / Privacy: the ability to ensure that information is accessible only to those authorized to have access to it. As part of this the full life-cycle of the information must be known so as to identify its foot-print or visible surface, for example: is sensitive information stored in system logs – and who has access to those?

Authenticity: the ability to prove that a user, data, transactions and communications (electronic or physical) are genuine.

Auditing / Non-repudiation: Proof that a party was responsible for an action.

Support and Use Qualities

Supportability: a measure of how easy the system is to install, configure and monitor. Aspects such as fault finding and isolating are closely related, as well as documentation.

Testability: the ability of the system to be tested in a meaningful way (i.e.: reproducible and clearly measurable).

Usability: depth - the degree to which the system is usable by the target user community; generally measured in terms of workflow and efficiency.

Accessibility: breath – a measurement of who can access the system (but not in a security sense) in terms of users with impairments (blindness, colour-blindness) or technical restrictions (network connectivity, small screen size)

Certification and Compliance: does the system need to meet any recognized standards?

Availability Context

1 full day = 24 hours = 1440 minutes = 86400 seconds	Availability	Required Up-time (in minutes)	Permitted Down-time (in minutes / seconds)	
	%99	1425.6	14.4	864
	%99.9	1438.56	1.44	86.4
	%99.99	1439.856	0.144	8.6
	%99.999	1439.985	0.014	0.864

9am – 5pm = 8 hours = 480 minutes = 28800 seconds	Availability	Required Up-time (in minutes)	Permitted Down-time (in minutes / seconds)	
	%99	475.2	4.8	288
	%99.9	479.55	0.48	28.8
	%99.99	479.952	0.048	2.88
	%99.999	479.995	0.004	0.288

1 month = 30 days = 720 hours = 43200 minutes = 2592000 seconds	Availability	Required Up-time (in hours)	Permitted Down-time (in hours / minutes)	
	%99	712.8	7.2	432
	%99.9	719.28	0.72	43.2
	%99.99	719.928	0.072	4.32
	%99.999	719.993	0.007	0.432

Maintenance Window	% Availability (Daily / Weekly / Monthly)		
	Daily	Weekly	Monthly
5 minutes	%99.652	%99.95	%99.988
15 minutes	%98.958	%99.851	%99.965
60 minutes	%95.833	%99.404	%99.861

Calculations based on a 24 hour day, 7 day week, 30 day month.