

Survey on Quality Requirements

In the following survey you will be asked to estimate the relevance of several *quality requirements*.
At each step you will be presented with:

- a **quality concern**: an interest which pertains to the system's development, its operation or any other aspects that are critical or otherwise important to one or more stakeholders.
- some examples of **quality requirements** related to the specified quality concern.
- **questions** related to the quality concern.

The evaluation is subjective and should be based on your personal professional experience.
Before expressing your evaluation, please make sure you carefully read and understand the examples given for each quality concern. All information obtained from this study will be kept anonymous.

Motivation

The architecture of a software system is the result of a number of design decisions that aim at satisfying a given set of **quality requirements**, such as ease of evolution, good run-time performance, and rapid build times.

Architecture is rarely explicit in code and alignment between intended and actual architecture is often very difficult to validate and requires consistent human effort.

There have been several attempts to address this problem (e.g. component dependencies: JDepend, Sotograph, Structure 101; performance: JMeter) but there are still many aspects that remain ignored.

Our goal is to develop new ways for **expressing and validating quality requirements**.

We envision a set of tools that help identifying implementation solutions that break specified architectural requirements. This questionnaire will help us to identify the most relevant and commonly specified aspects of an architecture. This will provide a solid starting point for our research project.

Thanks for your collaboration.

Andrea Caracciolo
caracciolo (at) iam.unibe.ch

Start Survey

quality concern

Step 1 / 22

Naming conventions

examples of requirement related to this concern

- Component Interfaces end with the suffix '_CI'.
- Java bean classes end with the suffix 'Bean'.
- File names must conform to the following pattern: [DATE]_[SOME-ID].txt

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ **Yes**☐ **No****b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

☐ **1**

No impact on the project

☐ **2**

Low impact

☐ **3**

Moderate impact

☐ **4**

High impact

☐ **5**

Critical to project success

questions (OPTIONAL)

c. FORMALISMHow was the requirement specified ? ☐ natural language☐ semi-formal notation:☐ ad-hoc formal notation☐ common formal notation: ☐ tool-specific notation: ☐ other: **d. VERIFICATION**

How was the requirement validated during development ?

☐ no verification☐ code review☐ blackbox test☐ whitebox test☐ testing tool: ☐ other: **e. COMMENT**

Do you want to share any comment or personal example for this kind of requirement ?

Back**Next**

quality concern

Step 2 / 22

Availability

examples of requirement related to this concern

- The system must be reachable 99% of the times from 6h00 to 20h00.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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No impact on the project

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Low impact

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Moderate impact

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Critical to project success

questions (OPTIONAL)

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quality concern

Step 3 / 22

Response-time

examples of requirement related to this concern

- The system is time-critical and has to answer each request within 10 ms.
- The rendering operation has to be completed in less than 4ms.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

☐ 1

No impact on the project

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Low impact

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Critical to project success

questions (OPTIONAL)

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Back**Next**

quality concern

Step 4 / 22

Throughput

examples of requirement related to this concern

- The system must be able to execute a certain task 10'000 times per hour.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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No impact on the project

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Moderate impact

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Critical to project success

questions (OPTIONAL)

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Back**Next**

quality concern

Step 5 / 22

Recoverability

examples of requirement related to this concern

- The system has to be operational again within 1h after a crash.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ **Yes**☐ **No****b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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quality concern

Step 6 / 22

Dependencies

examples of requirement related to this concern

- Component A cannot invoke method X of component B
- Service A can only interact with service B
- Maven artifact A is not allowed to depend on any other artifact.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

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Step 7 / 22

Signature

examples of requirement related to this concern

- The web service must have the the following parameters: Amount (xsd:double), Currency (xsd:string).
- The interface of the component must provide the following methods: push(Message), pull():Result.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

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Step 8 / 22

File location

examples of requirement related to this concern

- web.xml must be located at src/main/webapp/WEB-INF/

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

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quality concern

Step 9 / 22

Data structure

examples of requirement related to this concern

- Dependencies must be specified in the configuration file in the following way: <dependency><groupId>...</groupId> </dependency>
- The database schema must conform to a specified ER diagram

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

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Do you want to share any comment or personal example for this kind of requirement ?

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Step 10 / 22

Meta-annotation

examples of requirement related to this concern

- Attributes of type DateTime must be annotated with @CustomDate(format = "d-m-Y").
- Data transfer object classes must be annotated with @DTO.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

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Critical to project success

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 11 / 22

Communication

examples of requirement related to this concern

- Communication must be synchronous; protocol used must be HTTPS
- Data is exchanged between layers using DTOs.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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Critical to project success

questions (OPTIONAL)

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 12 / 22

Data integrity

examples of requirement related to this concern

- Instance values of datatype IBAN must start with an ISO 3166-1 country code.
- Attributes with annotation @date must conform to the following pattern: dd-mm-yyyy.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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Critical to project success

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 13 / 22

Data retention policy

examples of requirement related to this concern

- Logs can only be deleted after 10 weeks.
- Only the last 4 digits of a credit card number can be stored.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 14 / 22

Accessibility

examples of requirement related to this concern

- The web front-end must be accessible to color blind users.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ **Yes**☐ **No****b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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Critical to project success

questions (OPTIONAL)

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 15 / 22

Visual design

examples of requirement related to this concern

- The web front-end must comply to the standard corporate design guidelines.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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Moderate impact

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Critical to project success

questions (OPTIONAL)

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 16 / 22

Event handling

examples of requirement related to this concern

- Exceptions of type MyException must be handled within the layer where they were generated.
- Each file download must be logged in downloads.log.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☒ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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Critical to project success

questions (OPTIONAL)

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 17 / 22

Authorization

examples of requirement related to this concern

- Access to the service is restricted to users having role A or being part of group B.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

How important was it to satisfy this kind of requirement ?

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Critical to project success

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Do you want to share any comment or personal example for this kind of requirement ?

Back**Next**

quality concern

Step 18 / 22

Authentication

examples of requirement related to this concern

- The user has to confirm his identity using the single sign-on service of the company.

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ **Yes**☐ **No****b. IMPACT ON PROJECT SUCCESS**

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Critical to project success

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 19 / 22

Code quality

examples of requirement related to this concern

- Code-coverage for unit tests must be > 85%.
- Average length of javadoc comments for non-accessor methods must be more than 10 words.

questions (REQUIRED)

a. FAMILIARITY

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☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

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Do you want to share any comment or personal example for this kind of requirement ?

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quality concern

Step 20 / 22

Software infrastructure

examples of requirement related to this concern

- All servers must run RedHat 1.23, Tomcat 1.23, Oracle 1.23.
- Components communicate with each other using CORBA

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

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Do you want to share any comment or personal example for this kind of requirement ?

Back**Next**

quality concern

Step 21 / 22

Software update

examples of requirement related to this concern

- New security updates must be installed within 1 week from their release.
- The library cannot be updated to non long-term support versions

questions (REQUIRED)

a. FAMILIARITY

Have you ever seen this kind of requirement in a project ?

☐ Yes☐ No**b. IMPACT ON PROJECT SUCCESS**

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Do you want to share any comment or personal example for this kind of requirement ?

Back**Next**

quality concern

Step 22 / 22

Hardware infrastructure

examples of requirement related to this concern

- Server must have 48GB RAM, 2 x 2.6GHz Intel Xeon processor, 1TB hard disk.

questions (REQUIRED)

a. FAMILIARITY

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Do you want to share any comment or personal example for this kind of requirement ?

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Profile & Feedback (optional)

- Email:

☒ I want to receive updates about major research results

- Role in the company:

- IT domain:

- Usually adopted Technology stack:

- Additional constraints (did we forget to mention any?):

- Notes (personal comments, clarifications, ..):

Back**Submit**