Essay 2: What is Software Quality and why does it matter so much?

Software Quality Characteristics

- **Capability**: Some aspects, such as completeness, can be tested with test cases derived from the specification. Accuracy can be tested with unit testing, interoperability with component and integration level testing.
- **Reliability**: There are three main types of reliability testing: feature, regression, and load testing. Many of these tests can probably be automated when testing.
- **Usability:** Affordances, intuitiveness, and learnability vary a lot based on the user. Many of these things can be covered with manual testing, but there is no guarantee that all end-users will feel the product is easy and logical to use. In my current librarian profession, I have seen the struggles many people encounter as the digital wedge continues to widen. To get a better understanding of different user groups, testing with diverse user groups can be beneficial. Some accessibility features can be measured, such as sufficient contrast levels.
- **Charisma**: As with usability, charisma varies from user to user. These things can probably be measured from a market analysis perspective. Focus groups might also be beneficial.
- **Security**: There are many types of security testing, such as penetration testing. Security is often highly regulated, and different standards must be followed.
- **Performance**: There are different types of tests, such as load, stress, and soak testing. Performance can often be measured and thus directly tested, as with many other functional requirements.
- **IT-bility**: System requirements can probably be tested to an extent, but we can never be entirely sure how the customer uses products. Testing on different operating systems, machines with limited resources, and missing components.
- **Compatibility**: This can also be tested to an extent. For example, a web library supplier must have access to test their product with different library database management systems to make sure that the API's work as intended.

Internal Software Quality Characteristics

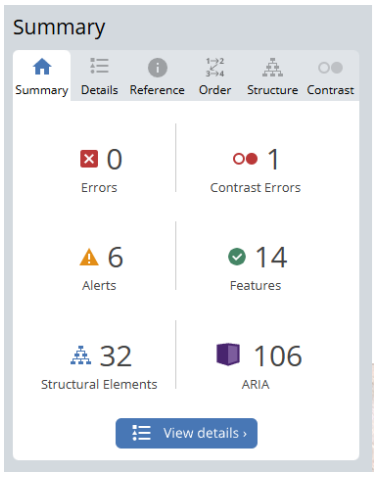
- **Supportability**: Identifying versions and getting hold of internal states are probably testable, but the ability to use the product in more ways than it was intended for might be trickier. Intentions are linked to the specification, and testing often relies on the specification.
- **Testability**: Some aspects, such as traceability, monitorability, and controllability, can be tested.
- **Maintainability**: Many of these overlap with good coding principles such as OOP, but some testing techniques, such as unit testing and component testing, can be useful.

- **Portability**: Many of these things should be addressed at a design level and overlap with good coding principles, too. Compatibility can be tested with common interfaces.

Analysis of a Service – Accessibility & Operability

Many of these quality characteristics would require access to the specification, but I have chosen usability characteristics.

National Library Finna Web Library: https://finna.fi/



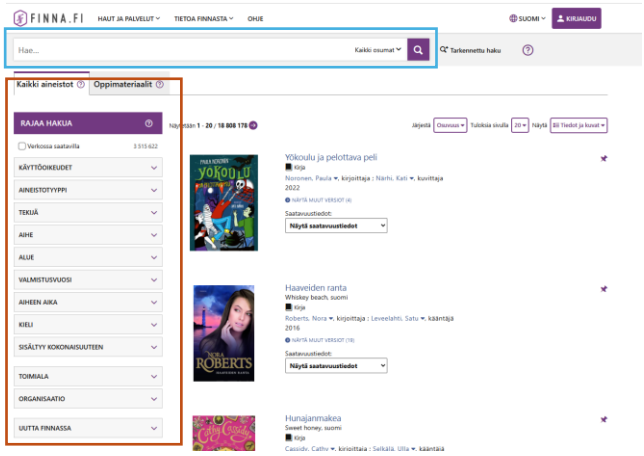


Figure 1: Wave report summary. Figure 2: Finna web library search options

Accessibility: A quick accessibility check with the Wave tool reveals that most basic accessibility features are in order. There is one small contrast issue on the front page that could be solved by darkening the text color. The Wave tool can be used to check for WCAG requirements. The site also follows a clear structure of header levels, to make it easier for users to understand the structure and navigate the page with screen readers.

Operability: The main function of the web library is information searching. For this, two ways are provided: a single line search and an option with added features such as truncating, and a facet with filtering options. There are user guides for professionals for quick use. As a library professional, Finna web libraries offer versatile ways to combine different search strategies. It has proven itself to be easy to teach to both coworkers and non-technical library patrons. In addition, most public and university libraries use the Finna web library service, so consistency exists between different Finna web libraries. Once a user knows how to use the web library in Turku, they also know how to use the one Parainen uses.

The Finna web library product is developed by the national library, and they maintain the different Finna web libraries. Customer organizations participate in monthly status updates and receive training in managing the web library and other aspects, such as ensuring WCAG standards in the different Finna web libraries.

The Profession of IT Software Quality

Delighting software is a subjective concept, but in several competitive commercial sectors, customer satisfaction must be outstanding to outperform competitors. Also, some non-commercial services, such as libraries, need software and third-party apps that customers want to use. As for e.g. libraries, success is measured in the number of loans; it is important to stay relevant with products customers like to use to continue to get funding. Some personal level 4 favorites:

- Withings app and devices: Long-term health statistics (weight, body composition, and sleep) encourage users to stay healthier
- Grocery store apps: Statistics on shopping habits and sustainability measures
- Health insurance apps: Quick access to chats with health professionals, ease in booking medical treatment, and applying for compensation
- Parking applications: locating the right areas and being able to extend parking time without going to the car

When it comes to low levels of excellence, I often find that most users are not educated enough, rather than not caring about their experience. The digital wedge is widening, as even the working population is falling behind as the world gets more technical; this is not just an issue for the elderly. Low information literacy levels make it hard to assess quality and security in online services. In addition to building accessible products, services should also focus more on educating their users, such as banks. Unfortunately, onsite services are often withdrawn as the services grow more digital. How can we properly work with quality for all when many users lack the basic skills and courage to use the products to begin with?

Common Level -1 usages, where users might be aware of the risks, are sites used to download illegal content such as TV series and movies. In these cases, users take conscious risks.

Another Level -1 scenario is web shops that are so cheap that it is too good to be true. Here, some people might take conscious risks, but I would still argue that many users are not educated enough.

Cynical Level 0 satisfaction might be products that used to be decent, but after ownership changes, etc., have lower tech support from the new owner. This happened at my library with our database management system, which was not the top of the market choice to begin with, as all non-commercial organizations must participate in competitive bidding. This led to several API issues that were never fixed, thus making our services harder to use for the end-user, and we had an information security breach when their server was hacked. The management system is currently being replaced.