

SAMS Project

Software Quality Assurance

Thomas Travers
Grantham University
CS406

Context/Overview:

Assume OO design and an agile process for delivery of the SAMS project. Consider the software quality assurance needs of the SAMS project.

1. Specify quality attributes applicable to the SAMS project

Quality Attributes: A software quality attribute is a software attribute that describes, or characterizes, a quality-related aspect of the software. (Kung, p470)

Reliability Attributes: Ability of the software to perform its required functions under stated conditions and produce correct and consistent results.

Robustness: The ability of the software to perform its required functions under rough or exceptional conditions.

Efficiency: The ability of the software to perform its functions and produce desired results with minimum expenditure of time and resources

Interoperability: The ability of the software to interact and exchange information with other software.

Maintainability: The aptitude of the software to undergo repairs and evolution.

Testability: The aptitude of the software to permit all desired and applicable forms of assessment, including inspection, peer review, white-box testing, and black-box testing.

Portability: The aptitude of the software to permit itself to be transported to run on different operating environments or platforms.

Reusability: The aptitude of the software to facilitate integration or arrangement of its component modules.

Modularity: The aptitude of the software to facilitate integration or arrangement of its components modules.

Cohesion: The degree of relevance of the functions of a software module with respect to the module's core functionality.

Coupling: The degree of dependency and interaction between a module and other modules.

- **Operating Systems:** To keep results consistent, all the web services should be hosted on the same operating system with the same software setup, and security settings. This could also provide the benefit of setting up one LAMP server and duplicating this setup for rapid deployment across all servers for the project. It also makes load balanced services identical on each server.
- **Network Load:** This project will deal with several aspects that could be placed under load. For this example, network load will be a big one to consider. This project deals with uploading and distributing documents such as letters of recommendations and applications. These are shared to the server and distributed among select students and staff. A network load test to determine the max capacity of the network in terms of users uploading at once will give valuable analytical data as to when to scale (on a load balanced design).
- **User Capacity Load:** This attribute will test when the service reaches the max capacity of users logged in at once.
- **Database Load:** The database for the SAMS project should be tested for query load.
- **Hardware:** A change in hardware could change capacity and load analytical data. Keeping the system specs as close as possible would provide greater accuracy in determining when to scale the project.
- **Communication Protocols:** Much of the project will communicate via TCP/IP stack as it is a network application project. Some aspects of the project will communicate between services and servers on the network as well as perform network load balancing tasks. Some aspects might utilize network sockets. Backend services might also utilize ports other than port 80.
- **Unit Testing:** Testing functions for things like out of range values can help determine the quality of error checking and enforcing correct input values.
- The system must also be designed to be easy to integrate updates and integrate into current systems (such as the 3rd party sites where it polls for data about available classes from partner programs abroad).
- We also want to keep coupling low as to prevent errors across the board when we modify a line of code in one module.

2. Evaluate the requirements, design, implementation and system metrics in figure 19.2. Which metrics will you use to assess the quality of the SAMS project, and why?

To assess the quality, I will use a combination of Reliability and Availability metrics, and Object Oriented Quality Metrics. I chose these because failure to comply with these metrics could produce the most noticeable bad results to the end user of the software project. These metrics can help us direct resources to critical areas of the project.

3. Which static and dynamic verification and validation techniques will you use in the SAMS project?

For static, we can use inspection, walkthrough, and peer review. For dynamic, we can develop functional and non-functional tests for the sams project to ensure that it meets the requirements.

4. What QA techniques will you use to ensure the quality of the SAMS software?

Software Development Activities, Software Requirements analysis, Software Design, Software Implementation, Integration and system testing, and Software operating and maintenance will be the basic process used to ensure the quality of the SAMS software.