

**When does finding fewer bugs equal
successful Quality Assurance?**

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Introduction

A project manager keeping a project on time and on budget, a business analyst succeeding in delivering the functional specifications, and a developer adding new functionality to an application are all clear examples of when individual team members brings value to a business. What about QA? If the success of a QA team is only measured by the number of defects found, then quality is lost throughout the process. The success of QA should be measured by how effectively they advocate for quality.

By embracing the practices defined in this paper, Menlo Innovations has been able to build an effective Quality Advocacy program that results in fewer defects in the end product. This occurs not because there is insufficient time or effort for testing, but rather because we have made quality the responsibility of every person on the team.

The importance of a collective team approach to quality cannot be understated. Rather than a QA team that is often overburdened with work, short on resources, and crunched for time, we have brought the full strength of the team to bear the responsibility of ensuring that quality is built in to the product from the very start of a project.

Menlo's Quality Advocates

In order to understand the role of the Quality Advocate (QA) at Menlo, it is important to understand what they are not. The Quality Advocate at Menlo is not a tester. We design and execute tests, however we do not define ourselves as testers. Quality Advocates are not the "process police". We evaluate process failures, however we do not police the team on process. The Quality Advocate does not decide if a build is releasable. We gather information about bugs and features within a build, but it is the responsibility of the business to determine what and when to release. The Quality Advocate does not do the majority of their work at the end of a project. Quality must be considered at the beginning, middle, and end of a project. Most importantly, the Quality Advocate does not assure the quality of the product; our responsibility is to advocate for it.

As an integrated part of the project team, the Quality Advocate is there to keep quality at the forefront of everything we do. We support the team. We help the client and key stakeholder(s) determine an appropriate level of quality. We evaluate how closely the product meets the quality goals as set forth by the client stakeholder. We know we have been successful at advocating for quality when the few bugs found have been clearly communicated to and prioritized by the client stakeholder.

Measuring quality: Quality vs. Grade

Determining a single definition of quality for a project is challenging yet, it is vitally important to understand and define the goal before a project can be judged against it. Try the following experiment: Ask five people to describe what makes a quality roller coaster ride. Their judgment of quality is going to be greatly affected by their expectations and prior experiences, thus their definition of quality may vary greatly. The same is true for users of software. Ask any software user to describe a quality email application. Their definitions will vary depending on how often and for what purpose they use email. Quality is subjective.

On a typical software project, a QA team might judge quality by simply verifying that the application meets the specifications. A more mature QA team might consider two important

perspectives for judging quality: 1.) Does the application meet the business needs? 2.) Does it meet the needs of the user? While at times these both may be in alignment, it is more often the case that they are at odds with one another. The challenge is to describe in tangible and measurable terms a set of goals that meet a defined set of user and business needs. To do so, we must define the grade of the application.

The Project Management Body of Knowledge (PMBOK) defines grade as a way to distinguish functionally similar items that do not share the same quality requirements. (Project Management Institute) For example, consider the following three ways to access the internet: dial-up, cable, or DSL. We would not expect the inexpensive dial-up connection to be fast and reliable. However we would have those expectations of the more expensive cable or DSL options. Already we have established three basic criteria for determining the grade of an Internet connection: cost, speed, and reliability. These, in turn, can be used to define a measurable set of criteria for judging quality. In other words, one must define grade in order to determine measurable quality requirements.

From Assurance to Advocacy: Quality assurance as a team responsibility

Quality assurance is defined as “The planned and systematic activities implemented in a quality system so that quality requirements for a product or service will be fulfilled.” (The American Society for Quality) In other words, quality assurance must be built in to the processes used to create a product. Follow this logic and quality quickly becomes the responsibility of the entire project team. The following examples are some of the practices Menlo uses to assure quality.

The **open and collaborative environment, constant pairing, daily stand-up, and iteration kick-off** activities foster continuous communication among team members across all disciplines. For instance, the QA team on a project discovers a sporadic defect that is proving difficult to reproduce. They could spend hours testing all possible combinations trying to find the magic key to reproducing the defect or they could shout “Hey Team!” across the table. During a brief exchange the defect is described to the team and the team suggests two or three likely cases to try. The QA team learns a little more about how to better test the application, and the development team learns more about repercussions of architecture decisions. The risk of the bug is quickly codified and the team is back to work in minutes. Quality requires communication.

Our High Tech Anthropology® (HTA) team works closely with the client stakeholder and users to build or perform **goal analysis, design assessments, and persona maps**. These tools become steering mechanisms used by both the team and client to focus the project towards addressing both business and user needs. Often times at Menlo we will hear a team member ask, “Will Brad use that?” (Brad being the primary persona on one of our projects). In effect, the persona guides the quality of the product.

Each week the development team goes through the process of **estimation**. Menlo’s project managers, HTAs, and QA are also there to answer any question the team may have. The HTAs provide details around new design or design changes. The QA team has several roles: provide more detailed explanation of defects, bring up edge case scenarios relating to new functionality, and interpret between the development team and HTAs who often end up speaking two different languages. Once all have a clear understanding of the described work, the developers are then able to provide more accurate estimates. These estimates and further input by all team members at the **planning game** provide the client the information necessary to make more informed decisions around the tradeoffs between scope, schedule, and budget. You must plan for quality.

Continuous code review, test first unit testing, continuous integration, and refactoring are various tools the development team uses to ensure the code architecture meets the needs of the business and the product meets the design specification. When our developers are tasked with fixing a defect, the first thing they do is write a unit test to codify the defect. Only after they have a failing test do they go about developing a fix. As a part of the unit test suite, this test will now be run every time they integrate code. Quality must be repeatable.

Green dotting is the practice of determining if a story card (work package) is complete. QA and HTAs along with the development pair that did the work will come together for a first chance at considering the changes made to the application. The HTAs will consider design and usability. QA will look to see that the application functions as it should. All will discuss and determine if the work is complete. On average this is a fifteen minute session with all parties present. The intention is to clear the surface level issues, allowing QA to focus their testing efforts on deeper aspects of the application. Quality runs deep.

Finally, **show and tell** is the client stakeholder's first chance to assess the iteration's changes. With the team watching, the client is encouraged to play with the application and assess whether it meets expectations. Often this is the first opportunity for the team to watch a user use the application and the first chance to assess whether the application meets the determined grade. When it falls short, appropriate story cards are written to address the problem. Quality is iterative.

Notice how few of these are traditional testing tasks. Likewise, QA plays no more than a supporting role. However, Menlo relies on these practices to be our systematic activities supporting the fulfillment of the quality requirements. They are a set of iterative checks and balances throughout the duration of a project, all of which allow us to consider quality as we build the product.

The Role of Quality Control: A means to measure success

How do we then know if we have been successfully building quality into the process?

Quality control is comprised of the processes by which we verify and measure quality. We have established grade as a measurable definition of quality and quality assurance as the responsibility of the whole project team. Thus, we can define successful quality assurance as discovering fewer defects in the course of performing quality control. Fewer bugs found during **build testing, client testing** and **beta testing** doesn't mean we performed fewer tests. It means we successfully built quality into the process.

Final Thoughts

When does finding fewer bugs equal successful quality assurance? Clearly, we do not mean QA should stop looking for bugs. On the contrary, we believe the goal should be to continuously build quality into the process in such a way that the defects found are fewer but more complex than the iteration before. In order to achieve such a goal, quality assurance must be seen not only as a responsibility but also a measurable process that includes everyone. By following this work ethic, it helps clear the way for the QA staff to become Quality Advocates rather than mere bug hunters.

References

Project Management Institute (2004). *A Guide to the Project Management Body of Knowledge* (Third Edition (PMBOK Guide)). Newton Square, PA: Project Management Institute, Inc.

The American Society for Quality (n.d.). *Quality Assurance and Quality Control*. Retrieved March 18, 2009, Web site: <http://www.asq.org/learn-about-quality/quality-assurance-quality-control/overview/overview.html>