The Pursuit Of Quality

(Note: This is a philosophy — a collection of ideas I believe have value. This is not a vision of how things must be. Each enterprise is unique, and even the projects within the enterprise can be unique. The value of this philosophy is to help bring focus to a specific vision for an enterprise.)

Introduction

We live in an age where "Every company is a technology company, no matter what product or service it provides." *(see these articles from <u>Business.com</u> and <u>Forbes</u>)*. In this competitive landscape of software development, it is imperative to recognize that the pursuit of quality is not just a goal—it is a strategic necessity. Quality should be viewed through the lens of customer satisfaction. Customer satisfaction revolves around their perception of the quality in our products. Quality is a team sport, requiring contributions from every department and division. To turn our customers into fans of our products requires that our quality goes beyond meeting customer expectations to exceeding them. When driven by the pursuit of quality, we will ultimately provide products from which our customers will derive genuine pleasure.
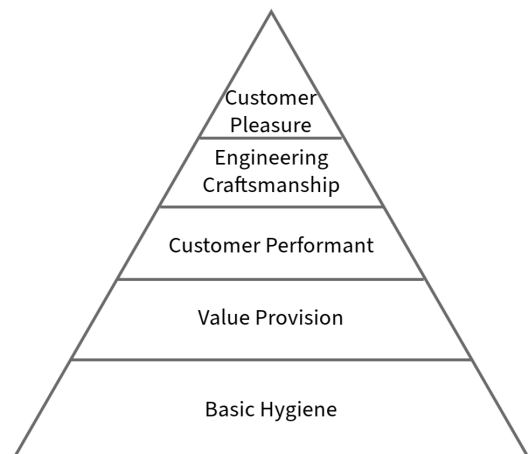
Defining Quality

Customer Satisfaction

Quality is in the eye of the beholder. At the heart of this philosophy is a simple yet profound principle: quality is defined by customer satisfaction. It is more than just eliminating bugs or achieving technical excellence; it is about developing products that resonate with our customers, meet their needs, and surpass their expectations.

Perceived Value

While quality is defined by customer satisfaction, customer satisfaction, in turn, is defined by the value the customer perceives they receive from the product.

QUALITY PYRAMID

Customer Pleasure

Engineering Craftsmanship

Customer Performant

Value Provision

Basic Hygiene

(from Hee-Meng-Foo's *You Can't Fix Quality Just By Catching Bugs* article)

Attaining Quality

Listed below are key components that underpin this vision of quality and how Engineering can impact and monitor them.

1. Delivering Perceived Value

The simplest way for our customers to perceive value in our products is by delivering undeniable value through them. This is our top priority. The delivery of value is manifested in various forms, such as solving customer challenges and issues, fulfilling unmet needs, or providing unique benefits that set us apart from competitors.

Beyond the obvious building of the software, Engineering contributes to this component of quality by facilitating the continuous improvement and delivery of the product. Some examples:
  • **Automated Testing** — which is thorough in its coverage of the product's features
  • **Feature Flags** — which allow:

- Hiding features under construction
- Completed features to go through acceptance testing (aka UAT) in a production environment prior to release
- Incremental release to the customer base:
  - Facilitates Control/Variant testing
  - Minimizes the impact of any issues that occur
- Full production release
- **Maintenance Planning** — which ensures updates and architectural changes go unnoticed.

2. Ensuring Exceptional Performance

Performance is a cornerstone of quality. Our products must perform flawlessly under all conditions to sustain customer satisfaction.

Engineering owns the majority of this component. The three areas of focus are:
- **Scalability**:
  - Initial architectural designs that:
    - Avoid Single Points of Failure
    - Account for the expected demand on the system
  - Incremental architecture of the system in order to accommodate increased demands
  - Load testing
- **Reliability**:
  - Monitoring and alerting on Latency, Availability, and Customer-usability metrics
  - Load testing
- **Efficiency**:
  - Regular analysis of usage statistics with an eye for potential gains in higher traffic areas.
  - Performance testing

3. Optimizing Customer Experience

A seamless user experience (UX) for customers is crucial. Products that are cumbersome or unintuitive can lead to customer frustration. The same can be said for the developer experience (DX) of B2B customers whose software engineers depend on the functionality of our developer portal and the accuracy of our API documentation.

Engineering supports this component of quality in the areas of:
- **Accessibility**: by providing automated testing that ensures our products are, and remain, accessible to customers of all abilities.
- **Responsive Design**: by using automated testing to ensure our products retain the intuitive interaction designed for the product by our UX professionals across various devices and screen sizes.
- **Contract Testing:** by providing automated testing which validates the contracts of our API endpoints are honored. Contract testing can include collecting usage statistics, which are valuable for determining the ways and the frequency with which our customers use the APIs.

4. Fostering Customer Delight

The pinnacle of quality is achieved when our customers derive genuine pleasure from using our products.

Engineering's impact on this ultimate component of quality is the natural outcome of its efforts in the previous three. Those results are:
- Zero impact on the existing customer experience from the incremental implementation of new features and enhancements
- The systems providing these products meet SLA/SLO requirements and are either self-healing (resilient) or alerted on so someone can repair them
- Zero impact on the customer experience for all customers and environments supported

The ~~Cost~~ Value of Quality

What is Your "Come From?"

There is a common proverb in project management that has come to inform many people's perspectives on quality. Known as *"Cheap, Fast, or Good — Pick 2!"*, where the "Good" in this scenario is quality. The perspective this proverb is communicating is:

- You can lock in the delivery date and the quality by spending more money (not necessarily true — see Brooks' Law)
- You can lock in the cost and the quality by extending the delivery date
- You can lock in the cost and the delivery date by sacrificing the quality

This is flawed thinking! Product Development's three pillars need to be Cost, Time To Market, and Feature Set—with quality being an integral part of the feature set. We need to adopt the new paradigm of *"Cheap, Timely, or Feature Rich — Pick 2!"*

Determining Quality for a Product

The key to assessing the quality requirements for a product, or even a feature, is found in our original principle: *quality is defined by customer satisfaction.* What level of customer satisfaction is appropriate for our customer base? Remember, since customer satisfaction is based on the quality the customer perceives, the quality value we build into the product is tied to the customer base. Two hypothetical examples:

1. A product which collects patient's monitored vital signs and provides a dashboard used by emergency room personnel
2. An accounting product's feature which collects employee card access data once per day to populate timesheets

Due to the life-or-death nature of the Vital Signs Monitoring product, the quality requirements it demands are many and complex. Some of these are:

- The layout of the dashboard cannot change without proper notification and training
- The architecture of the product must be highly scalable and reliable
- The dashboard needs to be simple to use, requiring only the minimum amount of physical interaction to navigate
- The dashboard needs to be responsive to the abilities of the personnel using it as well as to the device on which it is displayed

By comparison, the Card Access Collector has more simplistic quality standards:

- Automated testing sufficient to cover the single end-to-end workflow
- Basic reliability requirements
- Automated contract testing sufficient to cover the single API request/response

The product's highest quality value is attained by defining and addressing a product's quality requirements for each level of the Quality Pyramid. Customer Pleasure, the pinnacle of the Quality Pyramid, was attained in both scenarios:

1. The emergency room personnel were delighted with the dashboard because they know from past experience what it was like to have to make rounds to check vitals
2. Finance and Accounting staff were delighted when they think back to how time-consuming it was to collect timesheets from every employee each pay period

Conclusion

The pursuit of quality is a multi-faceted journey that extends beyond technical excellence to encompass customer satisfaction and delight. By focusing on value, performance, customer experience, and emotional connection, we can create products that not only meet but exceed customer expectations. Ultimately, our highest goal is achieved when our customers derive genuine pleasure from using our products, fostering long-term loyalty and endorsements.

In this ever-evolving digital landscape, we must set the bar for quality at a level that sets us apart from our competition while also providing the appropriate value via quality to achieve the highest level of customer satisfaction. Our commitment to quality must be unwavering. We must also commit to continuously striving to understand and delight our customers. In so doing, we position our products for unparalleled success and create a lasting impact in the market.