Identifying the Cost of Poor Quality

While the cost of quality is difficult to quantify, the effects of poor quality are readily apparent

Quality has been a hot topic in software development for years. Seapine Software surveyed nearly 1,000 software development and quality assurance (QA) professionals through the Seapine Software Quality-Ready Assessment (QRA) and found that the top two factors driving organizations to focus on application lifecycle management solutions are:

- The need to reduce risk by preventing poor quality from impacting customer satisfaction
- The need to quickly respond to customer requests and requirements

What factors are driving your organization to focus on ALM solutions?

24% Reducing risk by preventing poor quality from impacting customer satisfaction

22% Quickly responding to customer requests and requirements

17% Reducing costs by improving our development and testing productivity

14% Delivering applications on time and on budget

13% Improving collaboration between development and QA

**7%** Delivering applications before competition

5% Compliance and regulatory issues

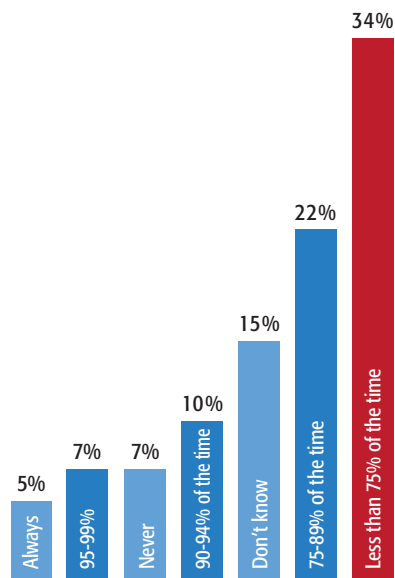## Organizations claim quality is a top priority

Software quality and reliability are lifelines to customer loyalty and profitability, and organizations are not lowering their quality metrics. In fact, 65 percent of the QRA respondents stated that building quality into their software was either a top or high priority.

If the cost of quality is high, the cost of poor quality is still higher.

What level of priority does your company currently assign to building quality into your software development environment?

Low

High

Neutral

One of Our Top Priorities

65%
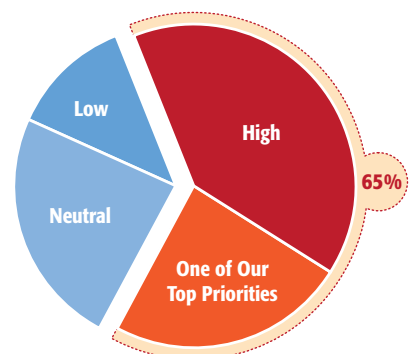
How often does your organization complete
application development on time and on budget?

34%

22%

15%

10%

5%   **7%**   **7%**

| Always | 95-99% | Never | 90-94% of the time | Don't know | 75-89% of the time | Less than 75% of the time |

Organizations still struggle to deliver on time and on budget

Customer loyalty is hard won, which means software companies cannot risk the release a buggy product. Yet development organizations still struggle to achieve quality and deliver products on time and on budget. QRA survey results indicate that more than one-third of companies completed their application development on time and within budget less than 75 percent of the time.

Research shows that given the choice of higher cost, longer delivery time, or poorer quality, customers will choose to protect quality. That means development and QA organizations need to think like customers, and put aggressive quality programs in place to remain true to their customer-focused objectives.

Costs of poor quality software

Many organizations overlook quality in the rush to develop and release products. Consider the following statistics from the Cutter Consortium, an IT advisory firm.

- 32 percent of organizations say they release software with too many defects
- 38 percent of organizations believe they lack an adequate software quality assurance program
- 27 percent of organizations do not conduct any formal quality reviews
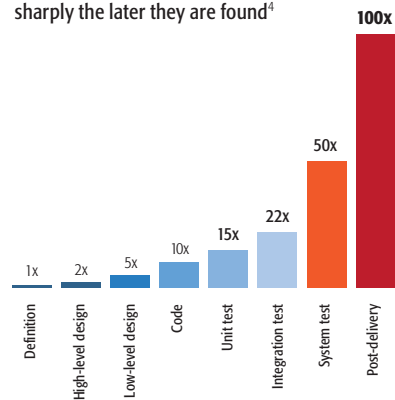
Following are some ways poor quality impacts a company's overall revenue and profitability.

Poor quality software creates avoidable labor costs

Releasing poor quality software increases defects found by customers. This increases support calls and takes developers away from creating new features to fix bugs. According to the National Institute of Standards and Technology (NIST), developers spend about 50 percent of development costs on identifying and correcting defects.[1]

The NIST also found that over 80 percent of errors are introduced during coding, but well over half of these errors are not found until later in the development process.[2] This is a direct result of not enforcing quality early in the process and allowing bugs into the code in the first place. Defects are expensive to fix, and the later in the process they are detected, the more costly they are to fix. If a usability issue is discovered during design, it might take a few sentences in a document to fix. If QA finds the issue two weeks before release, developers may have to sift through thousands of lines of code, resulting in hours of extra work and rendering some of the time spent in other stages of development useless. Studies show that the cost to fix defects increases steeply as development continues.

The cost to correct defects increases
sharply the later they are found[4]

100x

50x

22x

15x

10x

1x   **2x**   **5x**

| Definition | High-level design | Low-level design | Code | Unit test | Integration test | System test | Post-delivery |

Poor quality increases your baseline costs

Baseline costs are the money spent maintaining established IT systems or applications. In the average development organization, baseline costs account for 75 percent of spending.[3] If an organization releases poor quality software, it will likely need a large number of support representatives to help with customer issues. These dedicated expenses cut into time and money spent on new development.

Investing time in creating high quality code that requires less support reduces the percentage of baseline costs in the overall budget.

Customers delay sales, and you lose revenue because of poor quality

Releasing poor quality software builds the expectation that initial releases will be buggy. If a release date slips several times, new and potential customers may assume there is a problem with quality and will be reluctant to buy when the software is finally released. Even a single sub-par release can sow the seeds of doubt. Once doubt creeps into the minds of existing customers, they may delay purchasing new releases, preferring to allow other early adopters to work through the problems, or worse, they may decide not to buy.

Poor quality diminishes your reputation and market share

Your brand and its reputation is your most valuable asset. A positive reputation and word of mouth provides a great deal of free marketing. In fact, many customers trust recommendations from their peers more than your advertising. In today's highly connected environment, it is easy for a few dissatisfied customers to spread negative reviews. Research has found that individuals give negative information four times as much weight as positive information.[5]
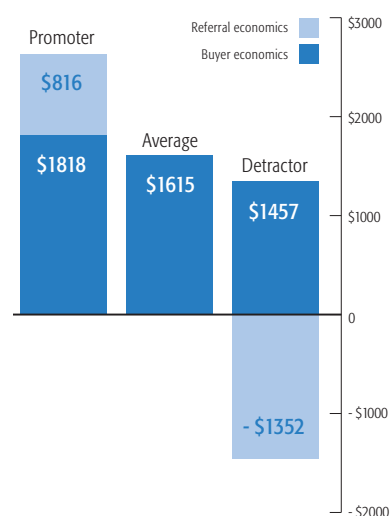
In regards to a company's brand, customers can either be promoters, detractors, or passive consumers. A recent study found that 75 percent of promoters—a company's most loyal customers—refer the company's products to colleagues. On average, promoters make 3.9 referrals a year. On the other hand, only 30 percent of detractors voice their negative opinions, but those who do share their views with 4.2 people. Combining referral and conversion rates, the study showed that two promoters produced one new customer for a company every year, while every six detractors cost a company five potential customers.[6]

For example, in the computer hardware industry, promoters spent an average of $1,818 compared to $1,475 by detractors. The difference is not large, only $361, but the true impact of customer satisfaction shows in the referral activity. Each promoter referral generated an average of $816, resulting in a total worth of approximately $2,600. On the other hand, each detractor's activities cost a company $1,352 in lost revenue. A detractor's value is less that $150 ($1,475 - $1,352).[7]

Loyal customers generate revenue for your business

Referral economics
Buyer economics

Promoter
$816
$1818

Average
$1615

Detractor
$1457
- $1352

$3000
$2000
$1000
0
- $1000
- $2000

> "There is no anchor to customer expectations. What customers expect today is not what they expected 10 years ago. Successful companies must continually ramp up their quality practices to keep pace with ever-increasing consumer demands."
>
> Jack West
> *Former American Society for Quality president*

Even if you develop software for internal customers, diminished trust among your user base can impact management support of your initiatives and affect your overall budget. A decrease in your reputation results in lost market share.

Poor quality exposes you to regulatory non-compliance and higher risk of litigation

Depending on how the software is used, poor quality can expose a company or its customers to regulatory violations. If a defect in the software reveals valuable customer information or fails to record the proper regulatory information, a company may face lawsuits, criminal proceedings, or prison time. If the software is used in mission-critical systems, bugs can result in injuries or even deaths.

Cutting costs by improving quality

Quality is not a line item on your budget. While a customer will pay more for quality, it is not always easy for an organization to guarantee that increased spending in one area will produce a corresponding improvement in quality. Checking work against quality metrics needs to be a daily activity. When these quality checks are integrated into the process, costs will shrink as a result of the cumulative affects of thousands of small activities.

Recommendations

If you are facing cost overruns, take a closer look at your environment before you begin cutting the budget.

1. **Implement metrics.** You cannot release software based on a gut feeling. You need hard numbers that prove bugs are under control. You must be able to see trends that tell if the code base is improving and is ready for release.

2. **Consider your processes.** Ensure there are checkpoints and quality measurements distributed throughout the development process. Checking for bugs at the end of the development phase is not enough. You need multiple review stages in each phase of the lifecycle.

3. **Evaluate your application lifecycle management (ALM) tools.** You must be able to manage source code, issues, and testing. Ultimately, you need ALM applications that integrate with your development tools and with each other. When they work together, the development process is unobtrusive and automatic. This enables everyone to focus on improving quality instead of worrying about what to do next.

1   *The Economic Impacts of Inadequate Infrastructure for Software Testing*, National Institute of Standards & Technology, May 2002, 36.
2   Ibid, 119
3   *IT Spending: How Do You Stack Up?* Gartner, Inc., 2003, 2
4   Software Reliability: Achievement and Assessment, B. Littlewood, ed. (Henley-on-Thames, England: Alfred Waller, Ltd., November, 1987)
5   Kroloff George (1988), "At home and abroad: Weighing in", Public relations Journal, Vol. (8).
6   Net Promoter Economics: The Impact of Word of Mouth, Satmetrix, 2008, 8-9.
7   Ibid, 9

About Seapine Software

With over 8,500 customers worldwide, Seapine Software is the leading provider of quality-centric application lifecycle management solutions. Headquartered in Mason, Ohio, with offices in Europe and Asia-Pacific, Seapine solutions help companies reliably and efficiently develop quality software applications. Seapine's products support best practices, integrate into all popular development environments, and run on Microsoft Windows®, Linux®, Sun Solaris®, and Apple Macintosh® platforms.

Contact

Discover how serious your company is about quality. Take Seapine Software's Quality-Ready Assessment at www.seapine.com/qualityready. Learn more about Seapine's ALM solutions by visiting www.seapine.com or contacting one of our sales representatives in your area.

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