Measuring and Managing Project Quality

If you can't measure it, you can't manage it.

Introduction

Teaching a Project Management workshop in the UK in the late 1980s, we posed the question, *"What is project quality?"* One participant responded, "Quality is meeting or exceeding the customer's project needs." We recorded that insight on the whiteboard, spelling *Qualitty* with two t's. Then we spoke of the need to be close to the Customers, to spend time to understand their needs, and so on.

After a while, one embarrassed participant pointed out that we had misspelled Quality. To which we responded, ***Au Contraire, we have merely exceeded the Customer's needs.*** This was an insightful moment for all of us.

All too often, project teams exceed the customer needs in areas where they feel they have control, as if this can make up for those many occurrences where they have no control. Why? Because it is so difficult to know all the needs, and even then, teams seldom know how to measure the quality of the project delivery until it is too late.

What Is Quality?

To cite Lew Ireland's choice of definitions, *"Quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs."* [i]

Yet many people presume that Project Quality includes (and indeed demands) more. Part of this presumption comes from the implied needs stated above. And part comes from the subjectivity of stakeholders'—including team members'—preferences about project results.

And of course, part of this must come from an inability to measure Project Quality in clear terms until it is too late to correct a flawed project process or product.

The Problems With Project Quality

Several Quality-related problems are unique to projects. For one, it ***is*** difficult to measure. In fact, often key stakeholders cannot evaluate the true quality of the results until the benefit realization point, and then it is too late to do anything to resolve gaps. To understand this distinction better, we first need to understand the role Quality has played in the Enterprise over the last several decades.

During the 1980s and early 1990s, Enterprises in the USA and other countries tried to improve global competitiveness by instituting process and project quality improvement. With process-oriented efforts it is possible to perform sampling and other quality measures. But most projects' key results cannot be rigorously evaluated until near the project end, or later.

And because projects produce something new, there are few standards against which to evaluate "good" results (despite nouveaux efforts such as Six Sigma). This particular issue is not just at the overall project level; it often affects the individual assignment delegation process, when those doing the work cannot define the difference between "inadequate quality" and "good enough".

Measuring Quality by its Absence

In projects, it is difficult to measure Quality of results during the project, but far easier once it is too late. Then, one of the most common measurements is Defect Counts. This is a classic case of measuring something not with clear, positive measures, but by **unit counts of discovered occurrences of its flaws**. While better than nothing at all, positive measures or indicators are needed.

However, even projects that can be proven to deliver zero defects can be perceived, by customers, team members and your management team, to lack quality. Thus, any method that purports to measure Project Quality must consider at least two aspects:

1. Technical Quality, as measured by Defect Counts and positive counts or indicators.
2. Perception of Quality, a subjective factor that can be measured by such indicators as Customer Involvement and Stakeholder Satisfaction.

Confusing Process and Product Quality

We observe many who place great emphasis on improving the process. The apparent thought: by improving the process, Quality results will follow. For many, mixed results occur. In some cases, Quality of results improve just because people are now actually paying attention to Quality (the Hawthorne effect[ii]).

In other cases, Quality is reduced, as the process mentality extends to blindly documenting everything, even poor practices, and then consistently following those practices. This is the school of "if a little documentation is good, then too much is better." Thus actions such as ISO 9000, intended to improve quality, become a consultants' treasure hunt while continuing to perpetuate bad practices.

Some Project Management Methodologies adopt the same mentality, as the "Quality process zealots" win out over the practical application advocates. Today, many project practitioners shirk project documentation in response to the excesses of that approach. Indeed, such movements as Lean Manufacturing and Agile PM can be traced in part to those excesses as well.

The Quality Process Zealots

We observed another horrifying movement that emerged as Enterprises struggled with a Focus on Quality. We had balanced all the Project Vital Signs for years, following the efforts of Juran[iii], Deming[iv], Guispari[v] and others. But some newfound Quality Movement advocates disdained all gurus except their own. For example, we encountered one Aerospace Enterprise whose quality experts insisted that you did not understand Quality unless you used only the Crosby[vi] dogma, processes, terminology, and tools.

While this type of malpractice tends to occur with every new fad, it was alarming to see it happen to the Quality Movement, something that had great benefit for those Enterprises that managed it well.

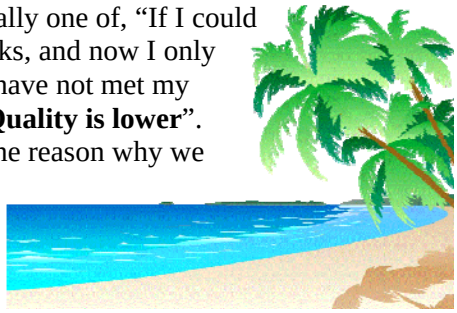
The Quality Movement Impact

So is the Quality Movement over? Well, yes and no. Yes, *this fad* has passed. But some observations: We saw many Enterprises that "sheep-dipped" their staff in a week's worth of training, and then went on to the next fad. For them, the moment has passed. We have seen others who "walked the talk", and integrated new ways of focusing on the Customer, measuring satisfaction, and balancing quantitative and qualitative measures. For these groups, Quality is part of their culture.

Discerning Scope From Quality

Sometimes it is difficult to discern Project Scope from Quality. This may rise from the inherent weaknesses of trying to manage to the obsolete "triple constraint" or "golden triangle" (Time, Cost and Technical Performance). In that approach, Technical Performance is often assumed to cover Scope, Quality, and everything else one cannot remember when under pressure.

To illustrate this distinction between Scope and Quality, in one of our workshops we use a mini-case study of an all-expense paid three-week trip to an exotic place. When it comes time to "Crash the Model", and we ask if anyone would reduce Scope to two weeks or one week, if that was one way to still go, the class reaction is, "No way!" So then we get into a discussion of whether the Quality is lower, or if it is Scope that is lower, asserting, that if you can still have a wonderful time, it is just reduced Scope.



The reaction is usually one of, "If I could have had three weeks, and now I only get one week, you have not met my expectations, and **Quality is lower**". Of course, this is one reason why we use this mini-case study. When you are on the project team, you may feel you are only reducing Scope; but when you are the Customer, the same actions are clearly reducing Quality.

Impact of Quality in Project Results

So here we are, half way through this article, and the impatient reader asks, enough already! When will we talk about Measuring and Managing Project Quality?

Have patience, we are getting close. See if you can hold on until the end of this page, and here is why: We only solve *symptoms* if the symptoms are all we understand. To solve the *real problem*, we need to understand the problem. So far we have merely traced how we have gotten to this era, where Quality appears only to be important when it is missing. What is the consequence of this Quality gap for your projects?

The consequence is independent of your projects' purposes. Some projects establish competitive advantage; some reduce costs; some meet regulatory requirements. For all purposes, lack of Quality causes your projects to fail to meet the business need. A failure. *Your failure.* If you cannot deliver the needed Quality, then even if your project meets time, cost and other easy-to-measure factors, you managed (or failed to manage) a failed project.

Thus, while we use Benefit Realization as a Primary Success Measure, the right Quality for the right Scope is the greatest contributor to your success, far more important than other easier-to measure indicators. Which brings us (finally) to the theme of this article: Measuring and Managing Project Quality.

Can It Be That Difficult To Measure Quality?

Yes it can. That is why less-competent Program and Project Managers focus on measuring the easy factors. There exist several solutions to this difficulty, including using the classic Input : Process : Output model as the basic building block of quality measurement, the individual project work package or activity assignment.

- Assure Proper *Inputs;* selecting appropriate talent for each assignment, then using effective delegation with information about how the results will be evaluated.
- Specify Quality *Processes*, then monitor the results, and correct the processes that produce defects.
- Review the *Outputs* or Results, using appropriate review levels and participants. Monitor review outcomes and correct the inputs and processes, as needed.

The less-competent practitioner whines, *"But this will cost too much, take too long, and still gain us nothing!"* Fine; stick with your incompetent status quo. In fact, if all you really want to do is save cost and time, don't even bother doing the project!

While the above Input : Process : Output model can help establish a foundation for measuring project Quality, it still does not actually measure it. Thus we need more, so we can catch problems earlier. Effective Program and Project Managers add other measures.

Measure Ease By Nature of Project

The nature of the project affects Quality measurement difficulty. In "Hard Product" projects, those that produce tangible, physical products, it is easier to review incremental Quality of the results. You can test a mile of six-lane freeway, or the foundations of a six-story building.

"Soft Product" projects are those that produce a less-tangible result. These may range from an Aerospace Research and Development project to a Pharma program to develop a new cancer cure, to an Information Technology project to support a new web-based collaborative solution. For these project types, it is more difficult to measure the quality of the result by reviewing the incremental assignment results—although for this type of project that is an even more important factor.

For both these project types, we use **Measures**, where available, and **Indicators**, where measures are not available. A key measure is Defect Count, or more appropriately, Planned versus Actual Defect Count (we also count as a Defect any earlier review that should have caught a defect).

Indicators of Quality

We also use Indicators of Quality. These are very useful, especially very early in projects, when Defect Counts may not be available. What are Quality Indicators? These are *evidence* that certain aspects of Project Quality are in place. These can be global, across the project, or incremental, for individual assignments. And, a Project Manager can monitor the Indicators for improvement when responsibility, process or talent adjustments are made.

Here are several Indicators we've used in a range of project sizes, from very small to multi-billion dollar ones. Note that many of them relate to the subjective side of Project Quality, or the Perception of Quality.

- Engagement Measures: Internal Customer involvement in key project activities; expected vs. actual.
- Planned vs. Actual Cumulative Review Count.
- Assessment Measures: Customer satisfaction surveys; stakeholder expectations evaluation.

Engagement Measures are early indicators of the level of Customer acceptance and probable benefits realization. Appropriate Customer engagement in activities such as Requirements Definition, Design decisions, and the classic Customer-satisfaction determinants of Testing, Documentation and Training have huge impact on project success. An effective Project Manager (with the support of her Sponsors) can improve Perception of Quality by assuring proper Customer involvement in these activities.

Our favorite Indicator is the Planned versus Actual Cumulative Review Count. Of course, to use this Indicator, you must plan incremental reviews of results, not just "big bang" end-of-phase reviews of everything delivered. New for many, here is how it works. Consider the table below, showing planned vs. actual cumulative reviews.

Week	Planned Reviews	Actual Reviews	Q-Status
2	1	1	100%
4	3	2	67%
6	4	2	50%
8	6	3	50%
10	7	3	43%
12	9	4	44%

In the above example, the Time and Cost data, as reported on timesheets and Status Reports show "On Target"; but what is the truth?

Managing Quality: Effective Reviews

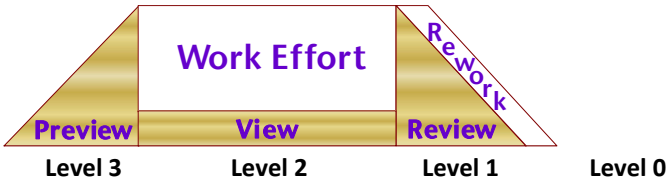
Do Reviews or Inspections of in-process results improve Quality? No, Reviews or Inspections merely detect it, or its absence in a component of the result. Ideally, this detection occurs early enough after defect creation to avoid contaminating downstream results. As has been illustrated multiple times, correcting sooner costs less.

Effective Reviews have the right participants, with the right preparation, and apply the right process, with external facilitation if needed. And, as mentioned earlier, Reviews are best-done at the completion of key project results, not in one massive review at the end of a phase. Effective Reviews should also follow these guidelines:

- Assure proper preparation: if the Review participants have not studied the materials to be reviewed before the session, their evaluation is suspect.
- Review the results, not the performer. We've seen too many Reviews that failed to follow this practice, to the extent that the Review feels more like an inquisition.
- Find the problems, not the solutions to them.
- Assure follow-up on open items. We've audited projects that still had review open items at the end.

The Role of Quality Assurance

Project Quality involves much more than Reviews. To many people (especially in some disciplines), Quality Assurance is something you do just before you throw the results over the fence to a project victim. But assurance of quality starts with effectively delegating and managing individual work package or activity assignments. The diagram below shows increasingly-effective levels of Quality Assurance, based on Deming's 1 : 10 : 100 rule.



Level 0 is the cheapest way to assure Quality of results: Let your Customer find the defects. Of course, while efficient, it is totally ineffective. Level 1 applies Reviews to detect and correct incremental defects in work products. Level 2 catches the defects in their commission, and not only corrects them, but corrects the process, skill gaps, or misdirection, the three biggest defect sources.

Level 3 plans for higher quality from the start, assuring the right skills for the job, effective delegation, and a sense of ownership in the estimates for the assignment. Why is it a 1 : 10 : 100 rule? Because what costs you $1 to manage at Level 3 costs you $10 if you wait for Level 2, and $100 if you wait until Level 1. Of course, the cost of a dissatisfied Customer is impossible to measure.

Prerequisites of Quality

Given attention to effective Reviews, there is more to managing Quality; especially when you recognize that Reviews merely detect the presence or absence of Quality in the results. A list of the prerequisites of Quality from our PM workshops shows the factors that must be in place to even have a hope of producing Quality results.

- Produce Realistic Plans.
- Involve Customers and Clearly Understand Needs.
- Use Repeatable *and Repeated* Processes.
- Engage Competent Team Members.
- Assure Team Member Ownership.
- Demonstrate Effective, Informative Delegation.
- Plan and Staff Appropriate Reviews.
- Assure Proper Testing, Documentation, And Training.

Clearly (or perhaps not so clearly to some), this rank-ordered list provides the foundation for Quality Management. Of course, it requires Quality Management to achieve this scenario. For example, the team that builds the project schedule by working backwards from an impossible deadline has no hope for project Quality.

Here Comes the Judge

Your Sponsors and Customers, whether internal or external, are ultimately the Judges **and the Jury** of the Quality of your results. These are the stakeholders who must "buy in" to the project results early and often if they are to achieve the intended project benefits.

Customer engagement in the key project activities mentioned above provides one way to assure this incremental ownership; involvement in appropriate reviews is another. And, maintaining communication to improve the perception of responsiveness throughout the project is the third leg of a Quality focus that gets project results.

Quality and Enterprise Change Management

The indicators and measures we have discussed are also essential for success in Enterprise Change Management. Here terminology problems exist because different groups use this phrase to mean different things. Some think Change Management is for changes in Scope or other Vital Signs during the project. Coders think it means keeping track of the software they are writing. The way we use it relates to the success of the Enterprise in preparing for and embracing the changes resulting from a project and thus realizing the promised project benefits.

We use the key Customer involvement activities mentioned above as predictors of successful Enterprise Change Management These indicators are also measurable early enough to redirect a project that is going astray.

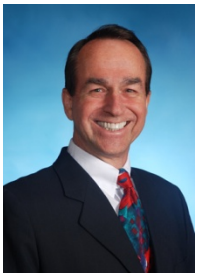
Quality and the Team's Perception

Stakeholders beyond the Customer are also judges of Project Quality. The Core Team, those persons who are performing the work of the project, must also feel a sense of pride, ownership and accomplishment for their efforts. This affects the Perception of Quality measures, which, we remind you, are just as important as defect measures in the results. Similarly, the extended management team must perceive the Quality of the process and of the results, which accentuates the importance of Communication Competence in your project efforts.

In Conclusion

Effective teams have just as much difficulty measuring and managing project Quality as do ineffective ones. However, effective teams identify the factors they can influence that affect both the defect rate in results, and the perception of Quality. Ineffective teams trade-off Quality for the easier-to-measure project success factors. Effective Program and Project Managers establish the prerequisites of Quality, and monitor their success in maintaining those prerequisites from individual assignments to overall project results.

About the Author



STACY A. GOFF is president of ProjectExperts®, a Project Management consulting, methods, tools and training company. A co-founder and current Secretary-Treasurer of *asapm*, Stacy is the USA representative to IPMA, the International Project Management Association. He has also contributed to the success of Project Management Institute since 1983.

A Project Management practitioner since 1970 and consultant since 1982, his focus is to improve Enterprise or workgroup project management competence, productivity, and effectiveness. Mr. Goff provides project consulting services and presents workshops of great interest to Executives, managers, project managers and leaders, technical staff, and individual contributors.

His Project Management tools and methods are used by enterprises and consultancies on five continents. His workshops have helped over 45,000 people improve their project success. He combines his PM Process insights with sensitivity for the human aspects of projects. ***The result***: Measurably increased project performance.

References

[i] Ireland, Lewis R. Quality Management For Projects and Programs, Project Management Institute, 1991.

[ii] In Western Electric's Hawthorne factory outside Chicago, a research study that originally focused on the impacts of lighting was later re-interpreted to find that paying attention to process had significant short-term impact on performance.

[iii] Juran, J.M. *Juran's Quality Control Handbook*, 4th Edition, McGraw-Hill, 1988. Juran made great contributions to the understanding of Quality measurement, most of which are relevant to today's Projects.

[iv] Walton, Mary. *The Deming Management Method*. Peregree Books, 1986. After the 2nd World War, Deming helped Japan rebuild, and laid the foundation for the 1980's Quality Movement back in the USA, when we suddenly realized we could not compete without improving Quality.

[v] Guaspari, John. I *Know It When I See It. A Modern Fable About Quality*; AMACOM, 1985. *Theory Why*, AMACOM, 1986. Excellent, approachable insights about Quality.

[vi] Crosby, Philip B. *Quality Is Free*, McGraw-Hill, 1979; *Let's Talk Quality*, Penguin Books, 1990.