Measurement Information Specification
Cost of Quality

Information Need Description	
Information Need	How has my productivity been impacted by the current process improvement effort? What changes can be detected in the overall cost of quality?
Information Category	Process Improvement Results

Measurable Concept	
Measurable Concept	Internal Business Processes

Entities and Attributes	
Relevant Entities	Time spent on a task (by an individual during a given day)
Attributes	Category of work [with a selection list that includes all the types of tasks needed to segment the time into the 4 cost of quality categories – ex. Planning, building requirements, fixing defects…]

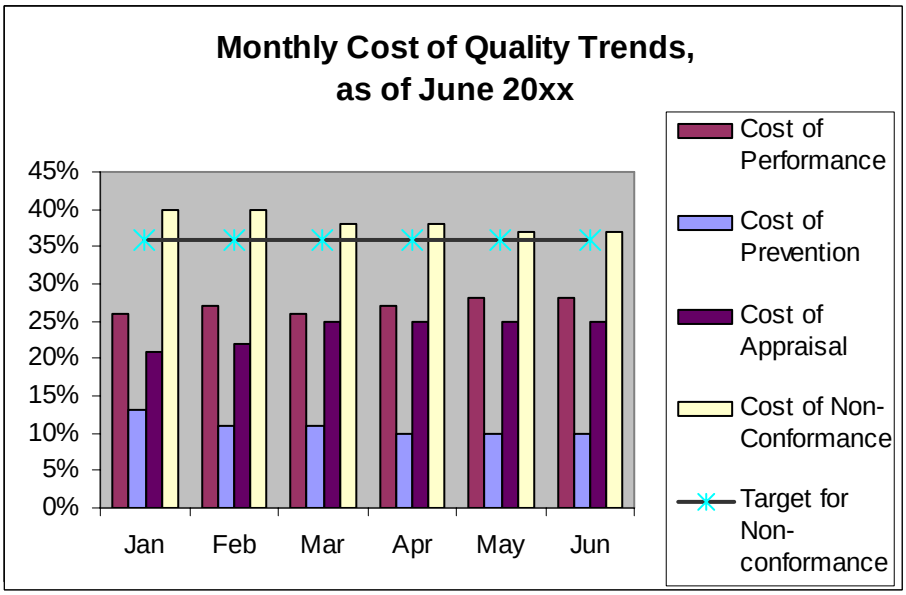
Base Measure Specification	
Base Measures	Time on Task
Measurement Methods	Use actual hours entered on daily timesheet entries by each individual, aggregated across the projects and other work for which process improvement is being applied in the organization of interest
Type of Method	Objective
Scale	Positive real numbers
Type of Scale	Ratio
Unit of Measurement	Hours

Derived Measure Specification	
Derived Measure	Cost of Prevention (for month X)
Measurement Function	Sum the amount of time spent on tasks from categories like these: - training - process development and maintenance - tools selection and installation - quality improvement projects - measurement and analysis - root cause analysis Divide this by the grand total of all time spent on all tasks.

Derived Measure Specification	
Derived Measure	Cost of Appraisal (for month X)
Measurement Function	Sum the amount of time spent on tasks from categories like these: - technical reviews, walkthroughs, inspections - testing (first time) - audits Divide this by the grand total of all time spent on all tasks.

Derived Measure Specification	
Derived Measure	Cost of Performance (for month X)
Measurement Function	Sum the amount of time spent on tasks from categories like these: - planning - defining and/or analyzing requirements - design - product construction - component integration - [other work, as appropriate to the organization, which is the primary effort to develop or deliver the product or service] Divide this by the grand total of all time spent on all tasks.

Derived Measure Specification	
Derived Measure	Cost of Nonconformance (for month X)
Measurement Function	Sum the amount of time spent on tasks from categories like these: - fixing defects in product components - reworking design - revising defects in requirements or defining missing requirements - reviewing fixes or updates - testing fixes or updates - on-site customer support - help desk support Divide this by the grand total of all time spent on all tasks.

Indicator Specification	
Indicator Description and Sample	
Analysis Model	The organization has an annual goal with respect to the cost of quality model to reduce the cost of non-conformance. In the example, it is holding approximately constant the amount of time spent in prevention activities, but increasing efforts in reviews and inspections. Thus it is expected that appraisal costs will go up, with more than a similar reduction in non-conformance costs. If the organization can reduce the non-conformance costs, while holding prevention costs approximately the same, it should see more effort going into the cost of performance.
Decision Criteria	If the amount of effort going into the reviews does not show an increase of at least 5% by mid-year, the organization needs to examine how the processes are being used.
Indicator Interpretation	In the example, the organization is seeing progress toward its goal, attempting to go from approximately 40% rework (nonconformance) to 35%. They have cut the time in prevention activities, though. Reasons for this should be examined, since it may impact their ability to maintain this level of progress.

Data Collection Procedure (for each Base Measure) *Complete this section for each base measure listed on the previous page.*	
Frequency of Data Collection	Daily
Responsible Individual	Each individual in the organization
Phase or Activity in which Collected	All phases, all activities, all tasks
Tools Used in Data Collection	Organization time recording mechanism, available to each individual, where time can be entered throughout the day or at the end of the day; entry must be done daily
Verification and Validation	Weekly review by supervisors, as well as data validation mechanisms in the time recording system
Repository for Collected Data	Organization time-tracking database

Data Analysis Procedure (for each Indicator)	
Frequency of Data Reporting	Monthly
Responsible Individual	Organization measurement team
Phase or Activity in which Analyzed	Not applicable; this is done across projects and other work efforts
Source of Data for Analysis	Organization time-tracking database
Tools Used in Analysis	Excel or other measurement system
Review, Report, or User	Organization management Project managers Process improvement leaders

Additional Information	
Additional Analysis Guidance	Monitor the trend in all four areas of cost, since each affects each of the others. Minimization of the nonconformance costs should be done without driving the prevention and appraisal costs too low, or the effect will not be persistent.
Implementation Considerations	The granularity with which data is collected in the time tracking system is a serious concern. Data must be available at the level of detail described in the derived measures here, or it will be difficult to see the improvements to the organization. It is unlikely that a standard system used for human resources accounting purposes will suffice; in general, that system needs to be seriously modified or another system must be used, to establish appropriate time categories.