Measuring Process Performance

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"People do what you inspect, not what you expect." [Anon.]

Developing capable processes

When we work with clients to help them implement Process Management we often introduce a simple "Process Capability and Maturity Model". This framework can be used to help plan what needs to be done at an organisational level, but can also be applied at the level of individual processes.

It's something that can be used by Process Owners and Managers to guide them in building capable processes. The Model has 5 levels of capability:

It's easy to get a process to the "Managed" level: this requires clear definition (the SIPOC tool helps), process mapping and identification of customers and their requirements.

Moving on to "Defined" is where many people start to struggle. They can document the "systems standards" required, but often don't know how to develop a balanced set of measurements.

That's what we want to focus on in this article and then mention, briefly, how these can be used at the "Quantitatively Managed" and "Optimising" maturity levels. There's much more information on how to use the Maturity Model in our "Process Manager's Handbook".

Balanced Measurement

Every process should have a balanced set of measurements (Key Performance Indicators - KPIs) against which its performance can be tracked, communicated and improved.

There are three types of measurement required:

- Internal measures

- Output (or quality) measures

- Satisfaction measures

Internal measures enable you to assess the basic performance of the process itself. **Output** measures enable you to assess the quality of the intermediate or final outputs. Both (Internal and Output) can be measured without involving the customer(s) of the process. **Satisfaction** measures are direct assessments of the customer's view of the process and can only be gathered by asking the customer. Here are some examples of each type:

Internal Measures	Output Measures	Satisfaction Measures
❑ Processing time (work time in process steps)	❑ Error Rate or Accuracy (Right First Time)	❑ Perceptions of reliability, assurance, tangibles, empathy, responsiveness
❑ Cycle-time (end-to-end, elapsed time)	❑ Timeliness (delivery vs. deadline/requirement)	
❑ Delay or Waiting time (e.g. between steps)	❑ Completeness	❑ Any "objective" measures gathered by customer(s) or stakeholder(s)
❑ Volume (input)	❑ Conformance to Standard	
❑ Cost (direct cost per transaction)	❑ Success Rate/Attrition Rate/Output Volume	❑ Compliments
❑ Overhead cost (if attributable)	❑ Complaints	❑ Awards

The measurements you select should be based on the purpose of the process and what you are trying to achieve. For example, a process to recruit new staff exists to ensure you can employ the right people, in the right place, with the right skills at the right time. So, you will almost always need to know how many people

(Volume) are being recruited. The time it takes to recruit someone (cycle-time) is probably irrelevant; what's important is Timeliness – is the person available, when needed? Quality of recruit is also important – do they meet agreed criteria? Finally, you will want to measure the customer's views – Line Manager perception of the process and of the employees it supplied.

As a Process Owner, you will probably only need 4-7 KPIs in order to manage and continuously improve any process. If you have too many, it probably means you don't understand what is really important about your process' performance.

For each measurement you select, you need to define:

- what it is (a precise definition)

- how you will gather the data (including sample sizes)

- how often you will gather the data

- how often you will report and review the data (including the format in which the data will be presented)

- any targeted levels of performance (if known)

- who is responsible for measurement

Data collection tools include:

- Checksheets (Tallysheets)

- Concentration Diagrams (pictorial Checksheets)

- Traveller Time-logs

- Surveys/Questionnaires

- Interviews/Focus Groups

In many cases, we obtain data through sampling; often because it is simply not possible to measure every single item, or to log every activity, transaction or incident. The purpose of sampling is to collect an unbiased subset which will give you a manageable amount of data. When you take samples, they should be representative (statistically correct and reliable) and economic to collect (quick and cost-effective).

When designing data collection approaches, you also need to consider how you want to stratify your data. Stratification means dividing data, or information, into sub-groups according to specific criteria; for example: age, sex, ethnicity, length of service, grade, risk level, etc.

Moving beyond "Defined"

Three activities need to be carried out to achieve the "Quantitatively Managed" level of performance:

1. Measure Performance (gather data and analyse it)
2. Implement Corrective Actions (address any immediate performance gaps)
3. Review Performance (regularly check that the process is "fit for purpose")

One of the distinguishing criteria at the "Quantitatively Managed" level is the ability to identify and eliminate what are known as Special Causes of process variation. These are the one-off factors that cause you to take corrective action. They are things like:

- A new member of staff joining, but not being skilled enough to do the job

- A change in standards or policies which has not been reflected in the process design

- Equipment failures which cause the process to fail

Special causes arise from time to time, with an unstable and unpredictable pattern. They are however, often within the control of staff or work-teams, for example in setting up and following procedures, using the correct paperwork or information. They generally only affect a minority of people, equipment, procedures or materials. Good corrective action (problem solving) tools and techniques are needed to eliminate Special Causes.

Three activities need to be carried out to achieve the "Optimising" level:

1. Establish DMAIC Improvement Projects (teams to make bigger changes than from Corrective Action)
2. Establish Statistical Process Control (SPC)
3. Benchmark Externally (compare with known performance leaders)

Note that any of these activities could be carried out while the lower-level activities are also being carried out. However, they are activities you would

expect to see happening systematically in any "mature" process-managed organisation. As the focus of this article is on Measurement we'll just concentrate on SPC here.

SPC enables a judgement to be made about whether or not a process is in statistical control, and therefore to determine when to make an adjustment in the process (to avoid over-adjusting the process). It is used to improve performance by reducing process variation. We've described "Special Cause" variation above. The second type is "Common Cause".

Common causes are numerous and always present. Cumulatively, they produce a stable, repeatable and predictable pattern of variation in the output of a process. The level of common causes can usually only be reduced by making major changes to the process itself; i.e. they are within the control of management. They include factors such as the capability of equipment, the level of training given to staff, and the choice and specification of paperwork/materials used in the process.

A Control Chart is the main tool used in SPC to give a visual representation of performance based on data collected from the process. It is an important tool in SPC and helps to identify statistically significant variation in the process so that improvement action can be taken.

The purpose of a control chart is to provide guidance (using the Mean and Control Limits) on to when to take action (thus avoiding the possibility of allowing errors to be produced) and when not to take action (thus avoiding the possibility of over-adjusting or over-reacting).
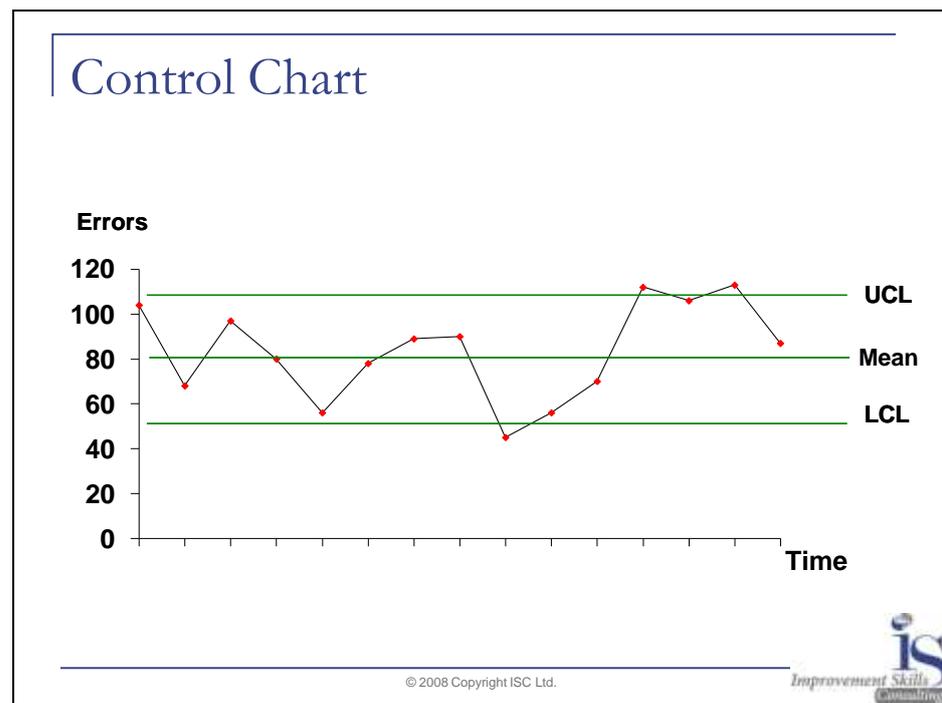
Making progress with process maturity

Clearly, you won't be able to use Control Charts if you've not been able to identify the right set of process measurements.

Organisations that struggle to understand the basics of effective process measurement are doomed to stay at a relatively immature level of process capability.

The good news is that none of this is difficult and you don't even have to be a "Maths Whiz" to be able to apply these tools. We have numerous examples of clients who have quickly learned to "make numbers work" for them to drive continuous performance improvement.

Our track record

Our consultants have been helping organisations in the private and public sectors to manage and improve their processes for nearly two decades. We have supported European Quality Award winners in their approach to process management.

We are not wedded to a particular methodology. We help clients identify their improvement goals and then develop an approach to achieve these; invariably ensuring their people develop the skills to make further improvements themselves.

Please contact us for more information about how we can help you to define, measure, manage and improve your processes.

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