

The Philosophical Basis of Quality Measurement

The philosophical roots of the concept of quality, according to Wikipedia, can be found in observations made by Aristotle in his logical work, the "Categories". To him, qualities are formal attributes that can be categorized in four categories; habits, capabilities, affections and shape, a categorization which looks a little arbitrary for a naïve reader as I am. John Locke presented a clear distinction between primary and secondary qualities in "An Essay Concerning Human Understanding". Locke distinguishes truly existing primary qualities of bodies; like shape, motion and the arrangement of minute particles, and secondary qualities that have the "power to produce various sensations in us" such as red and sweet. It is this second mode that we nowadays think of when we use the term quality, a subjectively perceived sensation. I would even extend this idea in the sense that quality can only be perceived if one is aware, leading to our first commandment on quality:

- 1) The more aware the bigger the impact of quality.

This statement makes it clear that it is useless to improve quality if no awareness is available, don't cast your pearls before swine. This insight protects us from wasting resources in a world where resources are progressively becoming scarce.

Now if we elaborate further on the idea of quality with the goal to provide better quality in every aspect of our life we should try to define quality in such a way that we can derive strategies to improve quality with a minimum of effort. The best definition I could think of is our second commandment on quality:

- 2) Quality is the perceived distance between Realization and Idealization.

And if we include the idea of Locke about the objective versus subjective aspect of quality we can define the third commandment as:

- 3) Quality is experienced in two, almost complementary, modes; Function and Beauty.

This second and third commandment have big implications for assessing quality, if one cannot define an Idealization, quality cannot be measured. When assessing functional quality the Idealization is simple, the system should perform its Function without any flaws. In this type of quality assessment the rare event pops up. You buy a car and you want that it never fails in its function of providing a means for transport, you buy a computer and it should carry out its functions for which it was designed. However in rare occasions the system will fail and its quality is thus defined by these rare occasions of failure. If you want to deliver high quality with respect to Functionality the rare event syndrome makes the quality exponentially dependent on the cost, providing a low level of failure will be easy, even getting to a level far below 1% is rather easy, think of your car and try to estimate its failure rate, it's far better than 1%. However at a certain level of failure some unpredictable rare event will cause the car to fail. Analyzing the rare event gives the possibility of decreasing the failure rate but only at progressively more cost. The basic laws of evolutionary economics then determine the level at which the quality is stabilized. This includes the law of constant risk management, the bigger the impact of the rare event the more cost we will allow for increasing the quality. The brakes of your car are thus of higher quality than the electric windows. We can conclude our thoughts on functional quality with our fourth commandment on quality:

- 4) For quality assessment in terms of Function the Idealization is easy to define.

In terms of experiencing Beauty we have a problem, simply because the Idealization is unknown. However it is possible to make a distinction between two types of Beauty, spectacularity and stability. We can immediately relate to these terms because we have all experienced instantaneous love, either for a person, an object, or an expression of art. Unfortunately the instantaneous loved hit single of today will be replaced by the hit single of tomorrow. You may fall in love with a person but this state will not last forever. We could even ask the question if an experience of beauty can last forever? Probably not, but some experiences last longer than others, they are more stable. This aspect of duration is also linked to the time it takes to appreciate a thing of beauty, the most spectacular experience of beauty lasts only for a short time, and only takes a short time to learn to appreciate. The most stable experience of beauty lasts long, and takes a lot of time to learn to appreciate. The most direct experience of spectacularity versus stability of quality is experienced with the consumption of food and drugs. Our body needs a wide range of nutrients and we can survive on a wide range of diets, but we all long for spectacular food experiences. The most extreme spectacular quality experience is when we take a hard drug which is always followed by a severe setback, an example of instability of quality. But even if we limit ourselves to a mundane example like consuming our favorite chocolate bars, there is again an instantaneous spectacular quality experience with a feeling of instability after having consumed a few of them. We can also have a longing for bread, not a very spectacular taste experience, but certainly more stable. I would also consider this to be the core problem of "Haute Cuisine", how to make a spectacular meal which is stable. In my experience chefs seldom achieve this, the basic problem is that spectacularity and stability are very dependent on personal preference and context, e.g. it is highly dependent on what I have eaten before, its shooting at an unknown personalized moving target.

The shooting at a moving target problem is a basic beauty problem, each time we get closer to a certain beauty target, our personalized Idealization, it slowly moves away. We all have some kind of slowly moving Idealization inside our head of music, paintings, sculptures, movies, books, poems, partners. Every time we hear, see or read a new piece of art the Idealization shifts and we have no clue where we are going. Sometimes the Idealization moves unexpectedly fast, we experience something for a second time and the Realization disappoints us, apparently only the spectacularity aspect was involved in our first perception. This searching process may be described as "finding your personal neural resonance" and as soon as you find one, you start the quest for the next one. Finding Beauty is an individual quest and we can conclude our thoughts on beauty with the fifth commandment on quality:

- 5) For quality assessment in terms of Beauty the Idealization is difficult to define and has two almost complementary features, spectacularity and stability (the one day Hit wonder versus Bach).

With these five commandments we have defined a basis for quality assessment. In most quality assessments we want to assign a quality number to the Realization representing the perceived distance between the Idealization and the Realization. This perceived distance is for a major part dominated by the expectation. Probably you are reading this file after downloading the pdf from the Internet and when you hit the pdf link you expect the file to download within a certain time interval. This expectation is steered by your past experience and if the download time is significantly less than what you expected the perceived download speed is excellent. The expectation can of course be manipulated, just give someone bad quality for a certain time and anything is fine afterwards, happiness is dominated by positive differences. Another aspect of quality manipulation results from assessments where we have no direct reference available other than our own internal Idealization. One can manipulate this Idealization by providing false information about the to be expected quality. Pour

some cheap wine into the bottle of an expensive high quality wine and the perceived quality will go up simply because our taste does not allow an independent, context free judgement. If we have no direct access to a reference that is close to our Idealization the cognitive dissonance effect will dominate our perception. If we have direct access to a reference that is close to our Idealization the perceived quality is dominated by our expectation. If we have direct access to a reference that is equal to the Idealization then we have a simple quality measurement problem, the perfect reproduction problem. We see something beautiful and wish to have a copy which is indistinguishable from the original. This is represented by our last commandment:

6) Reproduction Quality is easy to define, the [Ideal copy is the same](#).

The word indistinguishable needs further elaboration. Because beauty is a personalized entity it can lead to big discussions, someone copies a painting from Vermeer and sells it as an original. If the buyer cannot distinguish the copy from the original his sense of beauty is untouched until a second copy or original pops up, Vermeer only painted the "[Milkmaid](#)" once, so from the two paintings one must be a forgery. The buyer takes a closer look and it's clear he has a copy of the painting, his neural net is trained to see the small difference and his sense of beauty is re-adjusted. We are continuously reprogramming our brain to experience ever more detail. In extreme this leads to an over trained neural net that can detect extreme small differences that no other neural net can detect, we start to live inside our own brain, we have reached the ultra-individualized state of being that is as close as possible to our personal Idealization.

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November 2012