



General presentation of the Company

1. A historical reference

In the 1600s, it was thought that the orbits of the planets were circular: this resulted in errors in the calculations relating to the alignment of the planets, and therefore in the realization of the horoscopes.

Emperor Rudolph II, in Prague, asked Kepler, Imperial Mathematician, to solve this difficulty; Kepler had data collected by Tycho Brahe, consisting of angular views of planets and stars, with a precise date. They were of very good quality for the time but marred by a systematic error: light undergoes refraction as it passes through the atmosphere and the laws of Snell Descartes were not known.

Kepler set to work; he estimated that it would take him three weeks to determine the orbit of Mars; in the end, it took him 5 years. His work consists of three empirical laws (Kepler's laws), to which Newton then brought a general explanation in terms of gravitational force.

Kepler's work is the most remarkable example of empirical law obtained from imperfect data in all of human history.

2. The role of SCM

Founded in February 1995, SCM SA carries out works that are exactly the extension of those of Kepler, minus the talent, of course. We are presented with a process that does not give satisfaction, and a quantity of data collected on this process. We determine the parameters that have the greatest influence on the quality of the process, their mutual dependencies, the settings that give satisfaction, those that are dangerous, etc. The processes are very variable in nature: quality of a steel, adjustment of a furnace, lifespan of equipment, organization of maintenance, definition of logistics, etc. The common point is that they depend directly on the laws of Nature. Like Kepler, we know nothing about the process itself, but work on the data collected.

We have an advantage over Kepler: we have probabilistic methods, essentially due to Laplace (*Théorie Analytique des Probabilités*, 1812). To Napoleon I, who asked him "Where is God in all this?", he replied: "Sire, I did not need this hypothesis". Neither do we: we just treat the data as it comes, without making any additional assumptions. For example, it was fashionable in the 1970s to assume that the lifetime of electronic circuits followed an exponential law; data collected over 50 years shows that this is not the case. It is therefore necessary to resume the study of the reliability of the components in the light of the data collected.

3. No innovation

If you have a water leak in your head office, you call a plumber. If this one tells you: "I am going to try a brand new seal, based on galvanized rubidium dichloride, it has just been released", you are wary; you want a repair that lasts and you don't want to "wipe the plaster".

The same goes for the repairs we make: they have to hold. Better, they must be able to be submitted to inspection and even be produced in court, if there is a dispute (we have encountered this situation on several occasions). In other words, we are not a consulting firm. Our activity can be compared to that of a geologist, who is asked if there is oil in a field (which influences the resale value of the field); he responds as best he can, given the data available. Our service is paid for by the person requesting it; it transcribes the laws of Nature, from the data collected, and is not there to please anyone. Our reports, by definition, are presented very clearly and all conclusions are carefully reasoned.

This is only possible, of course, because we rely on methods that have been proven for a long time: Archimedes for all quantitative mathematics, Laplace for probabilities. For us, anything after Gauss is suspect. A theorem demonstrated the night before by some academic in need of publication has no place in our work.

4. Critical approach

We have a general critical analysis activity, relating to system design flaws, in particular for the drafting of "safety demonstrations". It is no longer a question (as it may have been in the past) of seeking a consensus between experts, but of ensuring that all possible situations have been considered, with the associated risks.

We can play the role of Devil's Advocate. It is a practice introduced by the Catholic Church in 1587 by Pope Sixtus V, for canonization trials: someone was responsible for saying that the pretender did not deserve to be canonized, looking for all the reasons to that.

This is completely essential for a large project: someone must be explicitly paid to research the reasons why the project may fail, even before the launch. The board of directors of the company, before giving its approval, should say: show us the report drawn up by Devil's Advocate.

In reality, we see that many great projects are born of the shameful coitus of intrigue and complacency; they fail miserably when the subsidies disappear.

5. Worthless products, born of a corrupted century (Baudelaire)

We try to limit ourselves, in principle, to processes governed by the laws of Nature, which obviously includes all industrial processes. In other cases, the separation with human foolishness is not clear. This is typically the case with insurance: the number, intensity, floods or storms are governed by the laws of Nature, but if people decide to build in a flood zone, or to cultivate vines in regions exposed to hail, we can't do anything about it. We then limit our response to calculating the risk, but not the premium, since the latter depends on the number of situations exposed.

We never work on a subject resulting from intellectual fads; the era is one of crusades of all kinds, entirely devoid of rational foundations. "The honest man steps back and leans aside" (Victor Hugo).

We contemplate with irony the approaches that are fashionable today: to think as little as possible, to collect as much data as possible, to process them as quickly as possible. Humanity has known many periods of obscurantism; this one is no worse than the previous ones and mathematics, in 6,000 years of existence, has survived all of them.

Our site: www.scmsa.eu, where you will find multiple competence sheets, relating to the various aspects of our activity.

In order to contact us: contact@scmsa.com



It is Satan who is at the origin of the laws of Nature; if they don't suit you, please see directly with Him.