

Information and information systems engineering : the end of patches

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The consequences of real time, big data and massive parallelism on IT projects management

Abstract

The goal of this paper is to examine if the consequences of the so-called “*digitalized society*” : real time interactions between actors, processing of massive data bulk of questionable quality, what is called “*Big data*”, in real time on demand, and the possibility of massively parallelized programs, an old dream of computer scientists now reality. In other words: will all that stuff have a significant impact on IT projects management, or will business continue “as usual”? The question is: a) are we facing an evolution such as those which have marked out the IT landscape since the beginning of computer and information age; or b) are we facing a true revolution, a watershed which separate two worlds: 1) the world of the “*bricoleurs*”¹ which allows anybody to deliver larger and larger pieces of codes working as a system, on empirical basis, the well known patches or spaghetti coding, and 2) the world of scientific engineering, mainly software and system engineering, a world where the actions of the information engineers are organized in a much more formalized way, a world where the architects know exactly where they go and how they proceed to fulfill the requirements of the customers, in a deterministic and constructive way.

Since now several decades, the tools for classical engineering are based on modeling techniques, using a variety of mathematical notations in order to be able to compute something, allowing to simulate what could occur if we proceed that way, and also to test and validate several hypothesis before to decide what to do.

Everybody knows that it has not been the case in traditional information system engineering where the “rule of thumb” and common sense have been very often the ultimate engineering tool. Is it still the case today? Numerous companies, using massive amount of software, claim that their software portfolio is as large as 100 millions lines of code, written by their programmers and IT teams, and sometimes even more ... The question is: can we continue to manage such “cathedrals” as usual?

What is claimed in this paper is that the response is NO. We will explain why empirical techniques are no more sufficient, for not to say harmful. Why information architects should necessarily adopt new tools, mainly modeling and simulations tools, to master and organize the inherent complexity of the “digitalized world”. Now, it is becoming a matter of death or life! Not more, but not less.

The un-mastered increase of complexity, a buzzword for disorder, sometimes exponential, will sooner or later have a strong negative impact on the growth of the digital economy. The complexity wall will be the referee, or may be the judge between the god, the bad and the ugly way [in Chinese[道]² Tao/Dao]. If we don’t organize the complexity of the digital world through sound architecture principles and adapted tools, the complexity will kill us.

¹ A French word not easy to translate, between handicraft at home and patch-up job, done in a hurry, just the contrary of engineering. The paradigm of this activity have been for a long time the “*patches*” to solve problems encountered during system execution, initiated by IBM and all the followers.

² A good translation given by the Swiss sinologist J-F.Billeter is *the way or art of doing things properly*, their *deep framework*, or even more simply *method*.