Is Software Process Re-engineering and Improvement the “Silver Bullet” of the 1990’s or a Constructive Approach to Meet Pre-defined Business Targets?

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Our experience in the process control business started consciously in 1990 and probably unconsciously before. When we started, the CMM model from the Software Engineering Institute was available to the public and we used it as the basis for development of a methodology for software measurement\(^1\). In late 1993, we noticed some interest among our customers in Europe for process improvement; analysing the reasons for the customers’ enthusiasm, we observed that there were two main justifications:

- competitors in the market place were involved in Process improvement,
- senior management had understood the role of software performance for the future of the company.

In both cases, senior managers were the initiators of the Process Improvement programme but we also observed that, after a while, their interest in software progress decreased and they became non-supportive. The decrease in motivation resulted from lack of a clear link between their vision of the business and the progress achieved. Other problems came to the surface and the actions decided for software process re-engineering were left behind with low priority. Furthermore, operational managers were unable to allocate the right people to work on the process when projects were behind schedule and market shares decreased.

Let’s summarize the basic concepts for Software Process Assessment and Improvement; they are simple:

- evolution is possible but takes time. There is a systematic approach to improving the way software is developed and maintained. This approach—a process view—is in contrast with the “silver bullet” one.
- there are stages of process maturity. The levels of CMM or the capability dimension of SPICE (ISO standardization in progress) are indicators of process maturity and, as a consequence, of decreasing of risks and increasing of performance.
- evolution implies that there is a recommended sequence to get control of the process, depending on external constraints.
- maturity will erode unless sustained. Maturity regression may be observed in some cases.

In other words, SPI is a long term program and should never be initiated without a clear vision of why and where to go. Maturity in itself cannot be the goal but a result of the effort performed. Process maturity means fewer risks for the projects, better control of costs, delay and quality, better use of resources, more visibility of the difficulties and better management of the software asset. Re-engineering actions or improvements have to be calibrated according to the real needs of the market; time to market will be a key success factor for some domains, development cost or margin for others, fault detection level for a third domain. Therefore, the very first stage of a process improvement programme is to understand the role of software components in matching the business goals. This understanding will greatly help to define adequate, pragmatic and cost-effective actions to re-engineer the software process wherever it is weak. Another main parameter to be considered for success is relative to measurement in order to ensure the improvement program supervision: metrics enable the traceability between primary goals, improvement actions and maturity target. Visibility is given to all the participants, including the program sponsor.

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1. CMM was used in the amiAE development (ESPRIT 5474) as the way to assess the environment prior to the definition of measurement goals.