

Exemplary System Development Framework Needed!

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Having a broad variety of project types and development styles at Saab, we have a fair amount of project and process know-how. Despite this, we have difficulties to effectively reuse all the important project and process knowledge and experience. Managing a very broad variety of project types and development styles, we need help on how to manage a broad portfolio of processes and how to mine and reuse knowledge and experience from them. Unfortunately today, we feel lost in the myriad of current process models and their, many times, contradicting guidelines. As an international representative of the system development industry, we would therefore highly appreciate help from focused research efforts in this domain.

Our reusability problem demonstrates itself in three sub problems that we constantly and continuously encounter as a company. These are (1) lack of a process framework aiding us in understanding and reusing our processes, (2) gap between the process descriptions and their realizations, and (3) lack of a common nomenclature supplied with appropriate definitions and translations.

We need a process framework that leverages our own best practices, lessons learnt and in-house process knowledge that are unique for our company. The large number of development processes that we have today makes it difficult to track the master processes, identify their variants, and thereby extract knowledge and experience from them in order to reuse them in the future. This hampers us from improving the processes and makes us to continuously reinvent the wheel.

To achieve process reusability and harvest its advantages, it is essential to know which types of projects should be supported by which types of processes and why. This requires a framework providing an inventory of processes including their master processes and their variants and motivating their use and efficiency in various contexts. Such a framework should also include methods for how to effectively manage and maintain the results of such an inventory.

As a multinational enterprise, we have several hundreds of ongoing projects on a daily basis all over the world. Each project has different characteristics with respect to factors such as size, system complexity and criticality, personnel, culture and customer. To make them more uniform, we have defined organization-wide guidelines in form of policies and standards for regulating their use. Despite this, our projects still do not follow them, and hence, our process implementations strongly diverge from the organizational guidelines.

One reason to this is the fact that the standards that we base our processes on are very general and thereby free to interpret and reuse. They do not provide any guidelines for how to adapt them to different development contexts. This makes them difficult to reuse and adapt to the different development scenarios that we have within the company. It is probably very difficult to create generic process standards complemented with variant process descriptions. However, we believe that this could be solved by creating a development process base equipped with a selection of proven development practices that are essential and common to most projects.

Another problem that impedes our ability to effectively reuse processes concerns lack of a common, unified system development nomenclature supplied with appropriate definitions and translations. Lack of a common, unified vocabulary is directly counterproductive in many ways, including process reusability. There are several research efforts and standards that provide guidance on terminology, e.g. by IEEE, but none has potentially succeeded to set a fully accepted global standard. They differ both in scope and selection of terms and definitions. In some aspects, they provide contradicting definitions. As a company, we continuously struggle with the lack of a common vocabulary for system development. Consequently, we waste much time on trying to understand the standards, our processes, and also each other, even when it comes to the most basic terminology.

It would be very useful to have a common nomenclature providing a unified base for communicating about system development. By establishing a set of fundamental terms and definitions, both the industry and academia could better communicate and harvest each other's results. This would save us all from a lot of unnecessary misunderstandings and eventually immensely costly development errors and rework. Without a common basic language, we will have to continue to struggle when communicating system development within and outside the company.

We strongly believe that the SEMAT initiative will help addressing the issues that we have presented in this position paper. We also sincerely hope that SEMAT will help us and other system developing companies to combine our resources to address these issues by developing a common framework for managing organization-wide process portfolios and for extracting common process know-how.