

49. SIMULATION LIFE CYCLE MANAGEMENT AND IT'S GAME CHANGING ROLE IN THE CURRENT CAE WORLD

Rohit Ramkumar

Dana Holding Corporation, Lisle, USA

SUMMARY

In the current continuously challenging state the world industry is in we all have to refine / redefine our engineering approach in order to be competitive while at the same time improving quality and performance of our products. In particular, the automotive industry is undergoing a significant transformation. The new players from emerging markets challenging traditional market leaders from the Western Hemisphere, and Japan are facing now as well the head wind of the global challenges. In such an intensely competitive environment, OEMs are increasingly challenging their supply base to provide sophisticated technology solutions, guarantee the quality, and provide global support while meeting the cost demands imposed by the consumer. This scenario is not

unique to automotive suppliers and is repeated in a number of industry segments. The main question every automotive supplier has to answer for itself is; what part of their work makes a real difference in winning profitable business. Quite often for traditional product lines the product itself becomes a commodity, the engineering support structure starts to become the competitive differentiator. How to best leverage this engineering expertise, and extend the asset directly to the customer for competitive advantage becomes the critical question.

CAE and its role in modern engineering

Traditional engineering, going way back to the beginning is all about how we can make things faster than someone else, in a better quality than someone else, cheaper than someone else if it is of same quality in order to be able to sell it, adding more or new features to a product, making our lives easier. Most of the time those were new features or processes. It is relatively seldom that an idea represents a major break-through.

But how did we implement those new ideas? The main approach was always through experimental testing and prototyping. Only, the more we developed and improved, the tougher the competition became globally the more there was as push for new ways on bringing products to the market, to be the market leader. The traditional experimental way to develop and validate products is not cost and time efficient anymore. Not only is this in-effective, it is also not supporting the new demand for a much better product quality and conscience of the human mankind towards our environment. This is where detailed up-front studies and evaluations, often scientific one, are needed. A switch to committing costs at a later stage is needed in order to stay competitive. Especially in an environment plagued by recession and the fear of a recession innovative approaches are needed. System engineering and with it CAE became a major focus.

CAE is now the “language” for communicating product performance and alignment with customer requirements, and plays a very central role in the collaborative engineering process. Companies with a solid CAE foundation had a better chance to not only get through the recession but come out of the economic downturn in better shape than companies which did not have developed their CAE capabilities. Especially with the renewed softening of the world markets this becomes even more so a major driver for success. The next significant evolution required to achieve sustainable growth in such a competitive environment demands companies transform themselves into engineering-driven, knowledge-intensive companies that are capable of capturing and leveraging their knowledge assets such as a simulation and related product performance IP. System engineering helps to reduce time-to-market drastically while controlling cost, quality and performance of the product in a much better way. Thus, while engineering costs in the past were

committed early in the game this allows huge flexibility in optimizing the product before committing to the full expenses.

Simulation Lifecycle Management and it's game changing role

During such a heavily simulation loaded process a tremendous amount of data and information is being generated. In a traditional engineering process much of this content is more or less lost once development of the product is completed. Simulation Life Cycle Management provides companies with an optimal tool to capture, catalog, and leverage this otherwise lost data and information. In a traditional approach about 80% of the data is not captured by traditional PLM systems as it represents work-in-progress.

Capturing the progress through templates not only allows improving simulation quality and turn-around time in development – especially for globally organized organizations, like Dana this allows a truly 24/7 engineering through a collaborative environment. At the same time it functions as development engine within CAE since freshly developed IP is being captured. However, the same business environment imposes a significant burden on justifying the investment in such Knowledge Assets like a Simulation Lifecycle Management System.

We went through a detailed Business Value Assessment (BVA) to identify the financial impact of a SLM deployment. This included all engineering functions linked one way or the other with simulation. Traditionally companies pay attention to hard savings first. Here we looked into how SLM will be able to help reduction in prototype and testing costs, improve warranty and reduce material waste. Alone this analysis justified the implementation of SLM as a payback period of about 1.4 years is realistic. From a strategic perspective the potential is even much bigger (this often can be referred to as soft dollars). Here we see operational efficiency improvement in general of at least 10% in engineering, in particular of about 20% in the CAE area. On top of this win rates can be improved in double digits via improved CAE analysis, consistency and partnerships. Expanding the tool into physical testing will improve this even further.

Implementing such a new tool requires also a new thinking of interaction with the software. A visual intuitive approach is in our believe very critical in order to easily deploy throughout the different engineering disciplines. This on its own is a new

dimension in engineering about how we interact with each other within the company and how we link up to the outside. It frees us up more and more from all the time first focusing on learning a new tool before we become productive. We are almost from the beginning focused on the essential task – development of a product, process or feature. It allows us to spend more time on being creative. All of sudden we change the way we do our day-to-day business.

The deployment of such a new tool through-out an engineering organization is always a challenge itself. Having a successful pilot project with the major engineering disciplines involved (starting with the needs assessment and ending with the business value assessment) played a significant role. This way the deployment time could be reduced to a few months for a user base of 100 users globally. Part of the deployment was setting up the global infrastructure for SLM, training the users, rolling out the templates and setting up the maintenance structure.

Summary

SLM as a dynamic knowledge driven productivity tool pushes CAE onto new productivity and quality levels. It improves the financial exposure of engineering development. Companies implementing such tools will definitely see an improved win rate of new business. At the same time SLM is changing the way we do business with each other. It allows us to spend more time on being creative and truly being a development partner to our customers.