

## **50. CAE AND ITS ROLE 2020 AND BEYOND FOR THE ENGINEERING COMMUNITY**

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### **SUMMARY**

The current state of the global economy is being discussed in quite a few papers, especially the role of CAE for the engineering community. The selling price is not the main and only driver to a product's competitiveness anymore. Being competitive means much more than that nowadays, it includes engineering support structure towards the customer, engineering support technology, time-to-market, quality guarantee at any point in time, product information access any time and, of-course, development and product costs. CAE, or better, an optimized virtual infrastructure is the only solution to achieve this.

### **CAE and its role 2020 and beyond**

Traditional CAE is not sufficient anymore in order to meet the future demands for such an optimized engineering. The engineering approach as we are used to needs to be completely re-defined. Simulation Data Management (SDM) is in discussion as a tool supporting this development in the CAE environment for a while. More and more companies are actually implementing this technology. But just this tool alone is not the answer to this. It's only one of many building blocks needed. We are talking about a completely new simulation environment.

System engineering takes on the role of another building block of this infrastructure. While SDM is the tool for handling our data, system engineering is responsible how we link the different pieces of action during the actual development together in order to come up with the optimized product solution. This requires a lot of different techniques, from 1D to 3D over layout studies and logical connections. It is our virtual development environment reflecting our traditional hands-on product development, validation and sign-off processes.

It is very clear that during that process a lot of data is being generated. Yes, SDM is helping us to manage this. But, we need to ensure that the hardware architecture lying underneath is capable of handling this amount of information without clogging the network up and providing results in a reasonable amount of time. Current High Performance Compute (HPC) systems, might they be centralized or several of them globally distributed to support local needs, will be rapidly replaced by cloud computing infrastructures. Here are currently several ideas under evaluation, ranging from private clouds to rented clouds.

Obviously, a lot of information is being generated and managed in the above mentioned environment. But information is only useful if it can be accessed any time, any place and by any one who has the rights to do so. The traditional approach of how we provide access to information is not acceptable anymore. We need to think outside of the box. It has to be in a way that if we would give a child the access point

into it's hands it would find the information easily through intuition – no extended training sessions on how to use the system are needed. Let's call such environment – iCAE.

## Summary

In order to be ready for the future the CAE infrastructure needs to be completely updated. This includes areas of data generation, data management, system architecture and data access. Some tools are already available to support this idea, others need to have still new technology developed in order to make it happen – like, network capabilities to handle huge amount of data on the fly at reasonable costs. The environment which I would call iCAE will arrive – and this very soon.