



CASE STUDY /

Engineering Productivity Improvement using Ansys ACT — Robert Bosch Engineering & Business Solutions

“Ansys ACT has made our work much easier. We are able to make parametric studies at a quicker rate compared to previous years. Automation is very important in modern engineering; it not only helps us build robust products but with a shorter lead time and our team is taking complete advantage of ACT.”

Karthik Doddaballapura

Simulation Engineer, ECU / Mechanics for Automotive Electronics / Robert Bosch Engineering and Business Solutions Private Limited

The Automotive Electronics section at Robert Bosch Engineering and Business Solutions Private Limited (RBEI) supports the development of electronic control units (ECUs) and components for engines, transmissions, chassis control and several other automotive and non-automotive functions. To sustain a cost and time advantage, one of our strategic levers has been to bring significant productivity and efficiency improvements across all our functions, including engineering and simulation. In RBEI, the department responsible for the mechanics of automotive electronics takes pride in the development and modification of several simulation-based procedures for reliability analysis of ECUs and components. Ansys software has been the key pillar around which most of these simulation processes have matured and been deployed.

/ Company Description

Robert Bosch Engineering and Business Solutions Private Limited is a 100% owned subsidiary of Robert Bosch GmbH, one of the world's leading global suppliers of technology and services, offering end-to-end engineering, information technology (IT) and business solutions. With over 17,000 associates, it's Bosch's largest software development center outside Germany, making it the technology powerhouse of Bosch in India, with a global footprint and presence in the Europe, U.S. and the Asia Pacific region.

/ Challenges

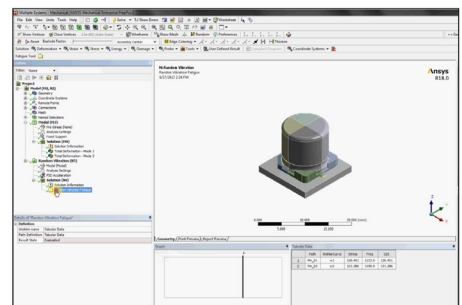
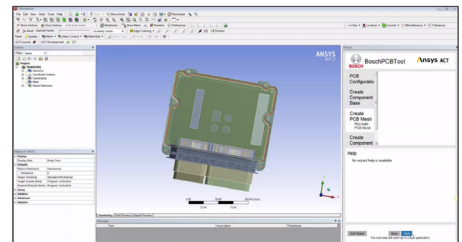
While RBEI had very intensive and rigorous simulation-based practices for reliability (thermal and structural) of ECUs and components, many of these practices required repetitive manual steps, making the entire process tedious and prone to human error. Many practices were also based on Ansys Mechanical APDL and therefore were not taking advantage of Ansys Mechanical within the Ansys Workbench framework for efficiency and usability improvement. One such problem was vibration analysis of printed circuit boards (PCBs). The process would start with assembling components on a bare PCB based on information provided in ECAD, and continue with making modifications to the bare PCB model, generating the optimum mesh, creating contacts and, finally, solving. Our experience showed that the first step created the bottleneck, so we wanted to bring down the time and iterations it would take to assemble the components on the PCB.

/ Technology Used

- Ansys ACT
- Ansys Mechanical

/ Engineering Solution

To solve this problem, Ansys suggested the customization platform ACT and offered to demonstrate the model development (including assembly, meshing and contact generation) using Ansys ACT as a consulting services project. Ansys also offered to train our engineers on the ACT technology so that we could customize our simulation-based workflows, automate them and realize efficiency improvements. We adopted a structured approach of executing the consulting project and training our RBEI engineers. Within a few months of ACT training, our engineers started to develop ACT tools and plugins that effected efficiency improvement on several workflows. With additional help from Ansys, and over the course of a six-month period, our team developed three additional ACT-based workflows.



/ Benefits

The training on — and adoption of — ACT led us to develop workflows, which resulted in substantial engineering time savings. Together, the four ACT-based workflows yielded a 25 to 30% improvement in overall engineering productivity, which led to a savings of approximately three man-months per engineer.

The new ACT development capability we acquired got recognition within the Bosch world, and our centers of competence asked us to develop further ACT extensions for additional number of workflows. The journey for us has just begun.

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