Ansys

Ansys + Honda Motors

"Because of its huge comparative advantage, including extra functions to automatically create a link between records and overlap graphs contained in multiple records, we chose Granta MI."

Tsuyoshi Ito
Assistant Chief Engineer, Power Unit Materials Section / Honda Motors

Halving the Number of Prototype Materials and Tests Using Ansys Granta MI During Model-based Development

HONDA
The Power of Dreams

Honda Motors sees a growing need for enhanced automotive parts with reduced weight, cost and higher functionality. By introducing Ansys Granta MI, Honda built a full-feature system to centrally manage materials information and use materials informatics to predict unknown material properties with accuracy, providing direction for the development of new materials. This system has enhanced operational efficiency across their engineering teams and reduced overall development costs.

Challenges

The primary challenge is a rapidly evolving set of materials that have a wide range of factors determining material properties, with high costs to acquire them through testing. These new materials and manufacturing parameters need to be updated in the materials database, sometimes daily. Critically, these materials properties data should be accessible enterprise-wide for design and simulation engineers, for crash analysis as an example. Data expression consistency, irrespective of the team inputting the data, needs to be maintained.

Ansys Products Used

- Ansys Granta MI Enterprise Server and Users
- Ansys Granta Advanced Materials
- Additive Manufacturing, Metals and Composites Templates

Benefits

This system has enhanced operational efficiency across the engineering teams and reduced overall development costs.

- Design and simulation teams instantly accessed and shared materials properties, leading to higher design quality and reduced development rework.
- Cost-savings with materials property acquisition costs were reduced by 41% for simulation models (see Figure 1).
- Overall number of prototype materials and tests were reduced by about 50% compared with conventional trial-and-error methods (see Figure 3).
- Stored materials test data in Granta MI were exported in a standardized format, which enabled data cleansing time to be reduced by 80% (see Figure 2).

Company Description

The Honda Motor Company, Ltd. is a Japanese public multinational conglomerate manufacturer of automobiles, motorcycles and power equipment, selling approximately 30 million units every year. Honda's 2030 Vision focuses on creating value for mobility, utilizing technology to help people and striving to be an industry leader in safety and sustainability.
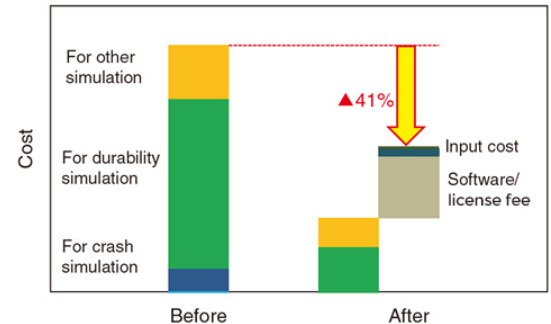

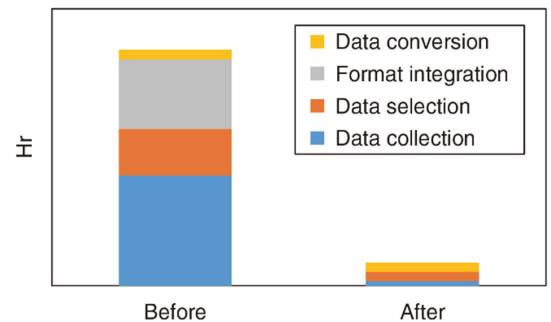Figure 1. Material property measurement cost for simulation model.

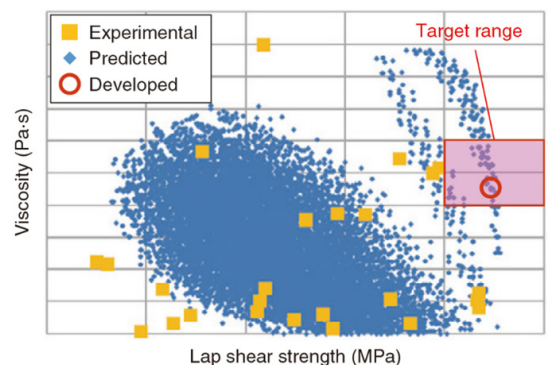
Figure 2. Change in data cleansing time.

Figure 3. Example of material property predicted results.

/ Engineering Solution

Granta MI provided the database foundation for Honda Motors to explore the use of materials informatics to predict prototype materials properties. The following features were key to a successful engineering solution:

1. Using Granta MI created a centrally managed hub for materials information accessible across Honda Motors, with administrators able to limit the data viewing, input and export ranges according to team responsibility and expertise.

2. Features such as automatic creation of input templates, search and export with complex conditions and batch modification of data were important to adapt the use of Granta MI across the wider business.

3. Granta MI simplifies data collection, selection and format integration for data cleansing, a prerequisite for using machine learning for materials informatics.
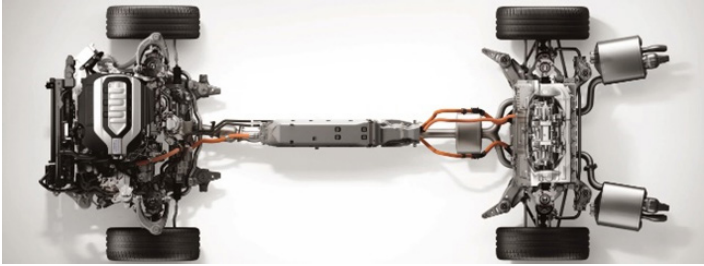
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