Too much information – an explosion in both data quantity and variety of formats, ‘big data’

Up-front robustness being included in the ‘normal’

True convergence between development and validation

Innovations and learning from experts being harnessed

Poor tools – commercially available tools constrain what you can do

Inefficient work processes – desired benefits of sharing & learning require new approaches

Swimming in Big Data

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- Too much information – an explosion in both data quantity and variety of formats, ‘big data’
- Poor tools – commercially available tools constrain what you can do
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MAHLE Powertrain has developed the MAHLE Applications (MApps) platform to help engineers to stay afloat in this sea of big data. MApps provides a modular platform for developers to create, and manage the application of, bespoke tools. MAHLE is exploiting the capabilities provided by MApps to capture knowledge, share tools and realize efficiencies across various areas of its powertrain business, but the benefits are not restricted to powertrain developments.

MApps Development

MAHLE launched MApps in 2012. ProLogiq had proved to be a ground breaking tool (and is still in use) but more flexibility and further efficiencies were needed. The challenge in developing MApps was to support engineers to develop data manipulations and analysis in a familiar environment and in parallel to provide a powerful, user friendly platform to co-ordinate the application of these developments to actual data selections.

There are conflicts between the capabilities of business specialist software tools and software specialist tools which make this difficult - there are no simple routes to combine the two specialisms. MAHLE Business and Software specialists working very closely have bridged the gap between the two domains. MApps creates an environment that supports side-by-side operation of components developed using both sets of software tools, combining the experience of developing ProLogiq components and MAHLE’s vast experience in applying more conventional calibration and data analysis tools (such as Matlab, Excel, VBA and Unix). MApps Architecture

Simple graphical user interfaces (GUIs) allow an engineer to configure data filters, analysis functions and reporting functions. Functions may be selected from a central library or created from new. The collection and control of these functions to a central library is a big step forward in capturing and sharing the latest and best approaches between projects and teams. With this approach the frustrating proliferation of multiple copies, each with minor changes made for separate applications, must not be suffered.

Powertrain calibration using MApps

Typically, the report formats will focus on key numerical parameters and graphically show trends against time / limits and the only limits to the ways the data can be manipulated are set by the specific business specialist software tools called upon for specific tasks. A problem with many networked database solutions is that sometimes one might want to work without having network access. MApps has been developed to support both local and network data processing solutions.

Accessing the jumble of raw test bed data is another common problem. MAHLE has developed a new tool ‘Engine Dyno Browser’ on the MApps platform, which provides a single clean flexible interface for data in ASAM-ODS and other proprietary formats.

Increasingly calibration and development analysis tasks are being performed in the MApps environment. Engineers can run functions generated by other engineers from the library and they do not even need the specific software to be installed on their machine, for example MATLAB library scripts can be run in MApps without MATLAB actually being installed.

In conclusion, MAHLE Powertrain continues to be a leader in providing solutions to the big data dilemma. The new MApps platform uniquely allows engineers to develop analysis functions within familiar data manipulation environments and to manage the application of these functions to datasets. With this approach MAHLE is finally able to realise major efficiency improvements through:

- True convergence between development and validation tools & approaches
- Up-front robustness being included in the ‘normal’ development process in more areas
- Innovations and learning from experts being harnessed and shared in a growing library of controlled and maintained functions

MAHLE offers flexible and cost effective support to OEMs for data collection and processing within powertrain application and development projects using these powerful tools and approaches.

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Background

MAHLE Powertrain was the first to develop automated tools to process powertrain data from development vehicle fleets over ten years ago and has since supported OEMs in collecting, processing and analyzing masses of data on different systems. MAHLE’s data analysis and support services have been very successful for our OEM customers – finding a vast number of issues in development and final validation and so saving valuable development resources and avoiding production recalls.

Over this period MAHLE has offered fleet data processing services using its ProLogiq (formerly IDAA) toolset (see 2010 issue).