

SIEMENS

Ingenuity for life

Automotive and transportation

RML Group

High-performance automotive engineering company uses NX to enable innovative automotive design and development

Product

NX

Business challenges

Meet the precise requirements of OEM customers

Develop innovative designs quickly

Work to the exacting standards required to win racecar competitions

Keys to success

Design team responds at the high speed demanded by the motorsports industry

Engineers quickly establish which components will fit within a car shell

Team uses analysis tools for easy design optimization and synchronous technology to expedite engineering changes

Results

Everyone works on the same assembly using accurate data

Attention to detail and tight tolerances achieved within very short timescales

Models modified quickly and easily

NX acts as the backbone to RML's engineering organization



NX provides the foundation for championship-winning teamwork at RML

Passion and a winning pedigree

With a 30-year heritage of excellence, RML is respected for exacting standards in high-performance automotive engineering as well as competitive prowess. Having achieved success in multiple world championships with numerous partners, the company won the FIA World Touring Car Championships (WTCC) drivers' and manufacturers' titles, in partnership with Chevrolet in 2010, 2011 and 2012. RML began racing as an independent entry in the 2013 FIA WTCC.

Nurturing homegrown talent and promoting teamwork, RML applies its expertise to powertrain and chassis development as well as concept vehicles and high-performance road and touring cars. The in-house team, which has designed, developed and built some of the best performing, most efficient race engines in the world, also works for original equipment manufacturers (OEMs) and specialist automotive suppliers.

RML uses product lifecycle management (PLM) technology from Siemens Digital Industries Software to help meet its demanding goals, employing NX™ software to address its rigorous computer-aided design/computer-aided engineering/computer-aided manufacturing (CAD/CAE/CAM) needs.

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“We selected what we felt to be the state-of-the-art CAD to work with, and that is Siemens Digital Industries Software’s NX,” says George Lendrum, managing director at RML. “NX has stood us in good stead for a decade and continues to be the backbone of our engineering organization. OnePLM facilitates the support of that software within RML and has done a wonderful job over the last few years.” OnePLM, the longest-established Siemens Digital Industries Software reseller in the United Kingdom (UK), is now RML’s official technology partner for all ongoing vehicle programs.

A backbone for engineering

Daniel Manse, senior design engineer at RML, says that the designers really appreciate NX for surfacing work and make extensive use of assemblies, in particular to assist with clearance and geometry analysis of moving parts, such as those used in a vehicle’s suspension. “The ability to use NX for assemblies and the enhancement of assembly management tools over the years are some of the significant advantages we gain from NX. The automatic, lightweight handling of large assemblies has made a big difference to how we work. With a full car assembly on screen, everyone can comfortably work using the same data without guesswork or interpretation. There is no chance of getting lost in our own corner of the car; we see the whole picture and avoid costly errors.

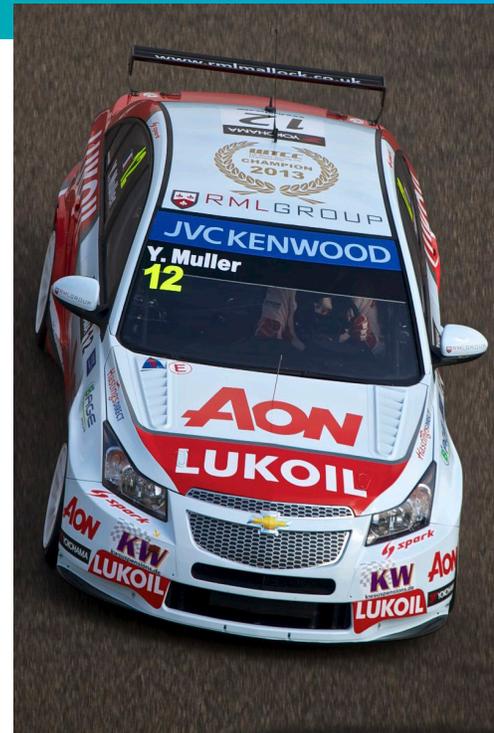
That's an important feature for us because of the timescales involved in making sure that we can design the car with a lot of details and tight tolerances in a short period of time.

"Manse points out: "One of the beauties of NX is that it has lots of tools, such as synchronous technology. We frequently use the direct modeling tools within NX to make quick changes to STEP or IGES models received from suppliers. We can, for example, move holes and bosses around very quickly. We also tend to use those tools for exporting products to CFD (computational fluid dynamics), where we need to remove the features quickly to dumb-down a model before it is sent out to specialist suppliers for CFD and FEA (finite element analysis) study."

RML's design team employs the CAD models created using NX to feed the production department. Manse explains that RML does quite a lot of work with sheet metal: "Creating flat patterns allows us to laser or waterjet cut the profiles. This cuts down significantly on the cost of sheet metal parts whilst increasing accuracy and reducing the need for jigs on some components. NX is completely fundamental to everything we do. We could not design a racecar without it."

Innovation and efficiency

Nissan's DELTAWING project is typical of the innovation embodied by RML. A blueprint for both racecars and road cars of the future, its revolutionary design is half the weight of a conventional Le Mans prototype. It therefore generates half the drag, so needs half the power and consumes half the fuel. At the heart of Nissan's DELTAWING is an ultra high-efficiency 300 bhp (brake horse power), 1.6-litre four-cylinder turbocharged Nissan® engine developed by RML and weighing just 91kg. The car ran in Garage 56 (a category reserved for experimental vehicles) at Le Mans in 2012 and Michael Mallock, business development manager, describes it as



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Solutions/Services

NX
siemens.com/nx

Customer's primary business

RML specializes in delivering Touring Car, GT, Sports Prototype and Rallying programs in major motorsports series for global automotive brands. Applying a nimble and winning mindset, the company develops high-performance road car derivatives and advanced automotive technology for OEMs.
www.rmlmallock.co.uk

Customer location

Wellingborough,
Northamptonshire
United Kingdom

Solution Provider Partner

OnePLM
www.oneplm.com



a huge success story: "NX was vital in the development of Nissan's DELTAWING engine; for example, we had to spend time on removing a lot of weight from the crankshaft. The analysis tools that we use within NX were crucial for that process."

The JUKE® R crossover vehicle came about as a way to publicize the sporty nature of Nissan's JUKE. RML and Nissan came up with the concept of pulling together the entire powertrain of RML's flagship GT-R, with 480 horsepower and four-wheel drive, into Nissan's small crossover. "Working with NX software and the data we brought in from Nissan enabled us to very quickly establish the boundaries of what could fit in and where," says Mallock. "The response was fantastic from both the customer's perspective and also from the press."

Automotive agility and effectiveness

Ron Hartvelt, WTCC project manager says, "NX underpins what we do on a daily basis. The ability to be agile and effective with our design processes is important in the motorsports industry, and that's exactly what NX gives us."

RML is working with OnePLM to roll out Teamcenter® software in order to simplify the control of CAD files by automating processes and reducing the risk of human error. The long-term plan is to incorporate the engineering release process into Teamcenter and then consider linking Teamcenter with the company's enterprise resource planning (ERP) system (InforSyteline). This would enable non-CAD users concerned with part number, material and weight detail to access information from NX.

Lendrum concludes: "As we move forward with our Teamcenter installation, we are streamlining current processes and making better use of our existing data. This should enable us to move more quickly and efficiently between projects, keeping more accurate historical records of different projects. As the company grows, this will be important for ensuring that we maintain the same high standards across every project we do."

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