

# Putting PLM to Work at Caparo Vehicle Technologies

Intrinsys implement SmarTeam and CATIA Integration at CVT

## About Caparo Vehicle Technologies

Caparo Vehicle Technologies (CVT) is an advanced automotive technology and engineering design company, focused on providing technology development, materials engineering and design services to the mainstream automotive, motorsport, aerospace and marine markets. CVT aims to accelerate the use of lightweight materials in vehicle structures to improve efficiency economy and safety.

The CVT team comprises several top-flight engineers from a range of industries. The founders spent several years as key McLaren Cars designers and respected automotive design guru Gordon Murray is on-board as director of Advanced Concepts.

**Caparo Vehicle Technologies**  
**Unit 6 The Ringway Centre**  
**Houndmills Business Park**  
**Edison Road**  
**Basingstoke**  
**Hampshire**  
**RG21 6YH**



## Caparo T1

One project gaining widespread publicity is the Caparo T1. This "F1 car for the road" features race-bred technology throughout, with composite materials used in the chassis & body and power supplied by a bespoke 3.5-litre V8 engine (delivering 575bhp at 10,500rpm) with a motorsport-derived transmission. The total vehicle mass is a lean 550kg, the powertrain contributing only 130kg to this figure. These statistics enable the company to be the first in the world to produce a road and track car with more than 1,000bhp per tonne.

## Engineering excellence

To undertake projects like the T1 requires excellence at every level of the business. Suppliers, partners and products must be carefully selected to ensure success. One of the easier decisions was the selection of CATIA V5 from Dassault Systèmes as the company's core design software. "We never considered another system", says Dan Primrose, Senior Engineer at CVT. "Most of our team had used CATIA elsewhere and we were confident it was the right tool for us. Its capability as a design tool is well known, but it's also easy to administer and as part of a huge product family affords us the ability to grow our software inventory with the business, without the overhead of managing multiple products from different vendors."

The selection of a partner to supply CATIA and to support the company's development of a PLM strategy was more involved, with Intrinsys, a leading Dassault Systèmes PLM solutions provider, ultimately winning the role. Their involvement now extends beyond PLM to engineering design support, when required. "We have built up a really good working relationship with Intrinsys. Their PLM support service is a welcome safety for when we need help and to have the same extended team available for engineering support is just a bonus."

## Putting PLM to work...

One of the first activities Intrinsys undertook was the specification and implementation of an engineering data management system. The design team had quickly amassed a wealth of engineering data – 3D models, drawings, spreadsheets and the like and it was becoming

difficult to ensure data security with multiple users working file-based on the same data set. With more parts going out for prototype manufacture the risk of an expensive mistake was increasing.

"The cost penalty for manufacturing a batch of parts or tooling to the wrong drawing issue could run into thousands of pounds, which is why we started to look into a data management system to help keep us on track", commented Dan. "We selected ENOVIA SmarTeam because of its native CATIA integration and the potential it has for data sharing across the business."

Following a comprehensive requirements gathering exercise, Intrinsys set to work supplying and installing a server and configuring SmarTeam to suit CVT's requirements.

Unlike common PC applications, SmarTeam can be customised extensively and is rarely used 'out-of-the-box'. This is an important strength of the product but does require experienced hands to get the best results. Dassault Systèmes provide good database starter templates, but they should be regarded as just that, a starting point.

"In 2006 we took a strategic decision; to invest in building 'I-SDE', our own SmarTeam template database", said Darren Cairns, Director of Intrinsys. "I-SDE is based on the Dassault Systèmes Design Express database so it benefits from being 'factory supported' at its core, but we've taken out features that don't add value to our customers and added our own tried and tested functionality, developed over the years."

The result is a robust and richly specified system that is optimised to work with CATIA V5, yet flexible enough to be adapted to any customer and to grow into all areas of their business. Regularly enhanced with lessons learned across a range of customers, it can form the basis of a very rapid deployment.

The first stage of the implementation at CVT focused on basic CATIA data management and getting users familiar with the system. Immediate benefits included the following:



For more information:

Call Angela on 01908 278650  
or  
e-mail [acairns@intrinsys.co.uk](mailto:acairns@intrinsys.co.uk)

**INTRINSYS**  
Intelligent Engineering

WE WORK WITH A DIVERSE CUSTOMER BASE. HOW CAN WE HELP YOU?

t: +44 (0) 1908 278606 | f: +44 (0) 1908 278601 | e: [info@intrinsys.co.uk](mailto:info@intrinsys.co.uk) | w: [www.intrinsys.co.uk](http://www.intrinsys.co.uk)

# Putting PLM to Work at Caparo Vehicle Technologies

## Intrinsys implement SmarTeam and CATIA Integration at CVT

- Organised project structure with comprehensive access control and document security
- CATIA data
  - Automatic revisioning and access control
  - Macro-driven CATIA Drawing border with text & revision information linked to SmarTeam
  - Standard parts catalogue
  - Tailored drafting standards
- General Office document management (MS Word, Excel etc.)
- Viewing & printing of 3D/2D CATIA data & office documents in SmarTeam (without opening native application)
- Supplier data exchange/management.



### Customer enhancements

With SmarTeam now in use in both the engineering and purchasing departments (for searching and viewing data) the company identified two areas where some customisation would be of benefit: Release process and Drawing border integration. Given the limited nature of these requirements, they were undertaken without the purchase of the SmarTeam Workflow module, usually specified for such automation.

**Release process – automated approval loop:** The original engineering release process required a Design Change Request (DCR) document to be created and emailed to nominated design authorities who would then search the file system and open the relevant documents for approval. This 'sign-off loop' was streamlined with the inclusion of a DCR form class in the SmarTeam database, vastly improving the searching and tracking of DCR status, and automatic email notification.

To initiate a design release, the user simply creates a new DCR in the SmarTeam database and attaches links to the SmarTeam documents for approval (via drag and drop). Emails are automatically sent to the approvers with a link to the DCR in SmarTeam. Once the DCR is approved the linked documents are cleared for release in SmarTeam.

**Drawing border integration with the release process:** To provide additional security a 'watermark' was included in the CATIA drawing border macro. This text clearly marks the drawing as 'Provisional – not for manufacture'. The watermark remains until SmarTeam identifies the drawing as being approved via a linked DCR, at which point it is removed.

These changes improve design office efficiency and quality and are the first step in extracting additional benefit from SmarTeam and the data it manages.

### Getting more from SmarTeam

Not surprisingly, other areas of the business are taking note. Some departments are already using SmarTeam and others are looking at how they might benefit.

**Structural Analysis:** CVT use several software packages within their analysis team but with the recent purchase of CATIA Finite Element Analysis, they have taken the next step in their adoption of SmarTeam. The Intrinsys I-SDE SmarTeam database is pre-configured to manage CATIA FEA data.

New analysis files are automatically assigned with unique part numbers and the links to all related or referenced files are managed and navigable in SmarTeam.

**Technical publications:** The technical publications team have taken advantage of the CATIA 3D digital mock-up (DMU) stored in SmarTeam to produce comprehensive maintenance and service manuals. Existing CATIA assemblies were retrieved from SmarTeam and drawings produced with associative exploded views, balloons and items lists. These in turn were stored in SmarTeam.

**Quality:** Non Conformance Reports (NCR) detailing part quality issues are currently kept in a separate database. If the process were to be managed in SmarTeam, a direct relationship could be created between the NCR and the design parts. This would enable instant visibility of outstanding or historical defects to anyone accessing associated files, helping designers make more informed engineering decisions.

**Bill of Materials (BOM) management:** Managing the BOM for a large project is complex, even more so when different options and specifications are available. With assemblies being created in CATIA, SmarTeam can manage their hierarchical structure and SmarTeam BOM can use this CAD data structure to speed up the creation of a configurable product structure, maintained separately but related to it. The BOM can further be synchronized or exported to other business systems such as ERP/MRP.

### SmarTeam – Driving competitive advantage

Caparo Vehicle Technologies have adopted a phased approach to their implementation of CATIA and SmarTeam, a sensible strategy and in-line with Intrinsys recommendations. As is normal for an engineering business, their first step was to manage CAD data, arguably one of the more complex elements of a PLM implementation but vital in establishing a central pool of data for everyone in the business to benefit from. Subsequent enhancements have been comparatively simple to implement, yet improve business efficiency and extract more value from their engineering data by making it more widely available.

With the transportation industry increasingly looking to advanced materials and intelligent design to reduce weight and energy consumption, CVT are well placed to continue their already impressive growth. Applying the same intelligence to their application of PLM as they do in their engineering will ensure they stay ahead of the competition.

