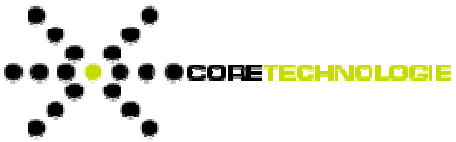
Paving the way for unlimited interoperability
- Collaboration in aircraft construction -



Challenges to aviation industry collaboration

Aviation, aerospace industries and their suppliers are facing ever-increasing pressure to provide high quality products with outstanding service, simultaneously meeting high technical security and certification standards. Growing demands with the acquisition of new customer groups, coupled with growing competition on the Asian market pose diverse challenges on European suppliers, considering that production, marketing and service are increasingly being reallocated to several countries. To address increasing competitiveness, the main challenge for suppliers competing for big contracts with aviation companies is ensuring optimal interoperability: notably, those pertaining to the exchange of data among partners working with differing 3D CAD systems. The anomalies arising from poor quality data translations affect the data structure: crucial data, including features of the original format, may be lost. Re-work due to poor quality data migrations is not only time-consuming, but expensive, causing designers and engineers to spend more time in software application than on their design and business. In brief, good strategies are needed for an effective data exchange, optimizing the process chain.

Effective data exchange reduces time and cost

Loss-free data migration is crucial for the success of businesses depending on technology transfer between business partners. Often, the migration processes between partners include comprehensive amounts of data, to be mastered in the shortest time possible. A maximum degree of compatibility is required, ensuring loss-free migration, maintaining the features of the original formats. CoreTechnologie's conversion tool 3D_Evolution, with its powerful modules (FEM Tools for geometry optimisation, Featurebased Module for the conversion of CAD models with history and parametrics, or Simplifier Module for bounding geometry creation or Intellectual Property Protection), has been successfully integrated in projects in the aviation businesses.

Interoperability for AIRBUS SUPPLIER

Breeze Eastern Corporation, New Jersey, manufactures helicopter rescue hoists, cargo hooks, cargo winches, munitions hoists and motion control devices for the aerospace and aviation industries, among others. The support of co-production for the new Airbus A400M design would have made Breeze Eastern dependent on the CAD system utilized by Airbus. Breeze Eastern deploys Pro/Engineer WildFire through all its internal product constructions, Airbus CATIA V5. The company put 3D_Evolution to the test and decided to overcome these barriers through direct interfaces for the implementation of the Airbus projects. Quick and reliable conversion results of high quality and, above all, the independence of CAD-system of their customers, was the outcome.

LOCKHEED MARTIN Benchmark for data conversion software

Following a benchmark in the context of the major project Joint Strike Fighter F-35 for the U.S. Air Force and Navy, Lockheed Martin opted to use 3D_Evolution. The quantity and quality of the interfaces, the efficiency of the automatic healing function and the user-

friendly surface and functionality were put to the test. Another criterion was the competent support service provided by the producer and resellers. By applying the software, the aircraft manufacturer was able to optimize the translation of 3D-models with all project partners, working with different CAD-Systems such as CATIA, UG, Pro/E or SolidWorks. Lockheed Martin uses all modules of the integrated software solution.

PLM Assembly for BUCHER LEICHTBAU AG
Bucher Leichtbau AG, the Swiss supplier of Airbus, manufactures galley systems and stowages, cabin interiors, as well as products for emergency medical use in aircraft and helicopters, and in air ambulance systems. For migration purposes with EADS, CT programmed a specific integration, allowing CATIA VPM assembly structure of EADS, using STEP formats. (Using CATIA representing product structure, CATIA Data in CATIA PLM Assembly in ProE product structure)

Internet access on board LUFTHANSA
Lufthansa Technik AG's (LHT) deploys high quality interoperability solutions for its project to install a kit for Internet and a satellite communication system on board. To realize this, highly advanced interior and exterior antennas had to be considered for mock up purposes. In exchanging data with suppliers and collaborating with specialists from the industry, extensive CATIA V4/V5 data had to be migrated to Solidworks and v.v.

Perfect Solids for OTTO FUCHS
Otto Fuchs KG, supplier of die- and hand-forgings for aerospace companies, including Airbus, Boeing, etc, provides landing gear and wheel systems, wings, rotor systems, empennages, engines and fuselage. Utilizing mainly UG, Otto Fuchs receives CADDS V from partners and customers. The task here is to accomplish the conversion of data as perfect solids and of parametric data from CATIA in UG, in order to modify parts.

Data migration for HYDRO ALUMINIUM ALUCAST GMBH
Hydro Aluminium Alucast GmbH/(Nemak Dillingen GmbH & CoKG) is supplier of aircraft industries with a wide range of ground support equipment (namely tripod jacks, towbars, axle jacks and maintenance tooling) and lifting systems. Test runs for aircraft lifting systems, especially for the Airbus 380, are common. Hydro employs Solidworks, but for construction purposes, data has to be read from CATIA, within a loss-free environment.

Interoperability for AIRBUS
Airbus deploys interfaces in the VR-field as integration in the Software product DeltaGen of RTT AG/RTT USA Inc. (supplier of visualisation technologies and services for industrial applications in the automobile and aviation industry and consumer goods industries)

THE INTEROPERABILITY SOFTWARE SOLUTION

3D_Evolution is a breakthrough product deployed by many (aviation) industries and suppliers to manage interoperability. The product possesses special conversion and healing technologies, allowing for very high process reliability and data quality, even complete assembly-structures, complex geometries and the loss-free conversion of data. The system is easy to handle. Most models are automatically converted in batch mode without geometric or topological mistakes. In case of problematic models, the powerful and "intelligent" interactive modus of 3D_Evolution comes into operation: eventual topological mistakes and warnings

can be checked, allowing the user a quick and easy analysis of model quality. Local Healing-Functions support the user in the conversion of complex models, providing optimal results in target models.

The interoperability software solution 3D_Evolution offers many benefits for aviation and aerospace industries and their suppliers:

- Data migration between various formats: CATIA V4, CATIA V5, Unigraphics, ProEngineer, Parasolid, STEP, etc.
- Automatic data exchange system
- Advanced healing and feature recognition capabilities
- Accelerated engineering and design processes
- Loss-free environment, reducing time and costs
- License free, enhancing flexibility
- Increased reliability through highest model accuracy
- Reliable conversions of complex and extensive data within short time

To meet the demands of the aviation industries, innovations in CATIA V4 and V5 have been enhanced in line with the used modules and technology there. The optimised memory management of the software allows for trouble-free conversion of huge amounts of CATIA-V5-assemblies (CATProducts), taking full consideration of the extensive structural data of the aircrafts. CATIA-V5-mixed models, also „CATProducts“, which refer to „CATParts“ as well as to CATIA-V4-modell and STEPData were imported. As far as CATIA V4 is concerned (model, session and exp), 3D_Evolution also supports the so called VPM Sessions (Airbus), the structural data being displayed in a STEP-Data and the single models packed in an Export data. Several special functions, including those for handling Airbus specific CATIA-V4-Piping-elements, free the user from specific CAD-systems-dependency, as well as from specific modules, techniques and integration restraints posed by the diverse systems of business partners.