University of Southampton

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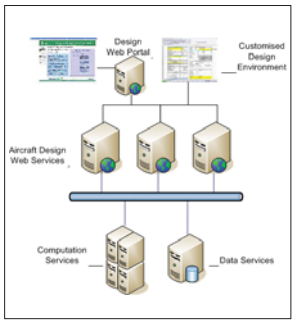
Future Flight

Inspiring the next-generation

The University of Southampton is hosting a UK-wide schools competition to design the 'Airliner of the Future'. This ground-breaking project is funded under the EPSRC Partnerships for Public Engagement programme. Using a unique web-based design system, entrants will be able to follow a step-by-step design process to come up with their own solutions for an environmentally friendly airliner for 2050. Balancing the engineering, environmental and economic factors faced by the designers of today, and particularly tomorrow, is the key. The national final fly-off in the INTECH Flight Simulator will see a panel of expert judges pick the best designs.

In this project we have used our expertise in aircraft design teaching, flight simulation and GRID/Web Services to provide an exciting web-based aircraft design framework which can be used in National Curriculum Design & Technology teaching with strong links to Geography and ICT courses within schools for Key Stages 3-4, while promoting Education for Sustainable Development. The system is accessed as a personalised web portal, built as a set of .NET Web Services, so that the system can be customised and extended by ICT students.



Design it yourself

The Southampton team has encapsulated the aircraft conceptual design process into a set of Web services that perform the design calculations. Over 100 design variables are used to define aircraft performance, including aerodynamics, propulsion and structures. The system is unique as it includes cost, emissions and noise models, so that the participants can perform trade-off studies between economical and environmental performance for the first-time. A major challenge has been presenting this in a form that can be used by anyone aged eleven years and older.

The web portal is supported by learning material on air travel, climate change, aircraft noise, and include ready-to-use lesson plans for teachers. Aircraft can be downloaded for use in Microsoft Flight Simulator 2004, so users can see futuristic airliners flying on their own PCs.

Technologies Behind

The entire Future Flight system has been constructed based on the Microsoft .NET technologies. The web portal to the system was built as a series of ASP.NET web forms. ASP.NET was also applied to implement the design Web services. The web portal uses ADO.NET to connect to distributed database servers. And the aircraft design calculation codes were compiled under the Common Language Runtime (CLR) so that they can be accessed with any .NET programming languages.

The Future Flight system is currently deployed on servers running Windows 2003. The web portal and the design Web services are hosted in Internet Information Services (IIS) 6. And MS SQL Server 2000 is used to implement the database for the web based design process.

Future Flight Greener by Design Team

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