SMART
Saber Model Automatic tRanslation Tool
Software for Saber models conversion to multi-systems simulation platforms

State of the art - Background
The ever-increasing systems complexity in aeronautic applications requires a highly detailed (and costly) simulation phase accompanying every step related to the design and maintenance of system components. This phase is accomplished by integrating different software components, each modeling different aspects of physical systems as mechanical, electric and thermal systems. Components are then connected together for creating the model of the whole system under consideration, in order to perform simulations. In a detailed simulation, a simulator, dedicated to model very specific details of a device, has to be used together with others for producing a big system model using that device (co-simulation). Then, the co-simulation allows the joint simulation between models created for different dedicated simulation environments and for different simulation engines.

Although apparently simple, the co-simulation has some well-known drawbacks; a system can exhibit a tendency to crash for complex simulations, due to the increased computational burden caused by the simultaneous execution of both simulation environments. This approach is not always applicable because of functional incompatibility between different simulation environments and high validation costs of the model.

Objectives
The design of complex systems often requires the cooperation of several teams coming from different domains of expertise and using different development and validation tools. The main SMART project objective will be allowing the use of a multi-physical simulation environment MODELICA based in aeronautical applications, to reduce the efforts and to evaluate the physical mutual interactions.

The proposed solution is the creation of a software tool that allows integration of SABER simulation models into a visual MODELICA based environments, ensuring a difference of simulation values less than 5%.

Description of work
SMART proposes an ambitious technological research program allowing the Design, Development and Validation of software tool for visual languages translation. The validation of tool’s results will be assured by addressing the activities using schematic model of real electrical systems derived by More Open Electrical Technologies project.

Expected Results
Advantages expected by proposed tool are:
- Allow the integration of multi-physical systems in the aeronautic applications
- Eliminate the need to be skilled on different work packages, leaving the user free to focus on technical aspects of the system
- Reduce computational burden and increase simulation reliability
Conversion complex system

Advanced software architecture

Error on translated model about 1%
**Project Summary**

Acronym: SMART

Name of proposal: Saber Model Automatic rAnslation Tool, a software for Saber models conversion to multi-systems simulation platforms

Technical domain: Electrical system simulation

Involved ITD: Eco design

Grant Agreement: 267608

Instrument: Clean Sky

Total Cost: 199 080 €

Clean Sky contribution: 149 310 €

Call: JTI-CS-2009-02

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Ending date: 8/2012

Duration: 24 months

Coordinator contact details: Giovanni Perrotta, A.Pini 10, +390825784296 – Int.21,
g.perrotta@italsystemsrl.it

Project Officer: Paolo Trinchieri

paolo.trinchieri@cleansky.eu

Participating members

- ItalSystem S.r.l. IT
- Dipartimento di Ingegneria dell’Informazione
- Seconda Università degli Studi di Napoli IT