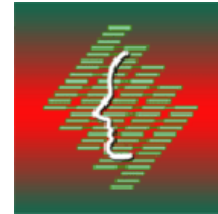




Life Cycle Management Interest Group

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**EASN Technical Workshop
23-03-2009, Athens, Greece**

Outline

- ❑ History - Past IG activities
- ❑ LCM in Aeronautics
- ❑ LCM Future Challenges
- ❑ LCM vs. FP7 Call
- ❑ LCM IG activities
- ❑ A success story – the VISION project
- ❑ Joining the IG



History

- ❑ The IG was established in the *4th EASN Workshop, Toulouse, 2003* as “Life Cycle Engineering in Aeronautics”, under the leadership of NTUA
- ❑ A proposal called RALIA “Risk analysis based LCE in Aeronautics” was prepared and submitted in 2004, in the context of the IG activities
- ❑ The IG had limited activity during 2005 and 2006
- ❑ In 2007 the IG was renamed to “*Life Cycle Management in Aeronautics*” *LMS / University of Patras* has undertaken the IG leadership
- ❑ A project called *VISION* “Immersive interface technologies for life-cycle human-oriented activities in interactive aircraft-related virtual products” has been the first success story of the IG



LCM in Aeronautics

LCM Areas according to the **ASTERA taxonomy**

Area of Activity 6: Integrated Design and Validation

➤ **Domain: Life-cycle Integration**

- Design for Maintainability
- Life-cycle cost analysis
- Integrated development

➤ **Domain: Methods and IT tools for Collaborative Product & Process Engineering**

- Enhanced Aeronautical Concurrent Engineering
- Virtual environments for Collaborative working
- Product Lifecycle interaction



LCM upstream research

LCM research priorities according to **ACARE SRA**

- **The Highly Cost Efficient Transport System (HLTC)**
 - A maximised standardisation of the aircraft and its systems
 - Lower operating and maintenance costs
 - Life cycle cost driven multidisciplinary optimization
 - Customised missions
 - Simulation of Disposal/Recycling processes and their cost implications
- **The Ultra Green Air Transport System**
 - Novel aircraft concepts to reach emissions reduction
 - Adaptive structures to fuel-efficient missions
 - Low environmental impact throughout its life cycle from manufacture through service operations to disposal.
 - The Environmentally Friendly Aircraft



LCM Future Challenges

ACARE SRA: Towards the future – Long-term research possibilities in terms of LCM

- The processes of design and manufacture will be increasingly *automated especially with respect to assembly*
- The air vehicles of the future will require very little or no *routine maintenance* and will have *monitors of condition built into all the principal systems*
- At the end of their life they will be totally *re-cycled or re-used*



LCM vs. FP7 Call

LCM research opportunities according to **FP7 Call** priorities

- ❖ 7.1.1 The Greening of Air Transport
 - 7.1.1.2 Ecological Production and Maintenance
- ❖ 7.1.2 Increasing Time Efficiency
 - 7.1.2.1 Aircraft Systems and Equipment for Improved Aircraft Throughput
- ❖ 7.1.4 Improving Cost Efficiency
 - 7.1.4.1 Aircraft Development Cost
 - 7.1.4.2 Aircraft Operational Cost



IG Activities

Present & Future IG activities

- ❑ *Co-ordinate contacts* and activities for *proposals preparation* under the EASN umbrella
- ❑ *Establish interactions* with running projects to *disseminate knowledge and promote synergies*
- ❑ Prepare *scientific contributions / technical presentations* for EASN events
- ❑ *Establish links with LCM* related initiatives and *key stakeholders at European level*
- ❑ *Web-based seminars & workshops to demonstrate R&D work and discuss synergies*



A success story – The VISION Project

“Immersive interface technologies for life-cycle human-oriented activities in interactive aircraft-related virtual products - VISION (ACP7-GA-2008-211567)”

An EASN endorsed project

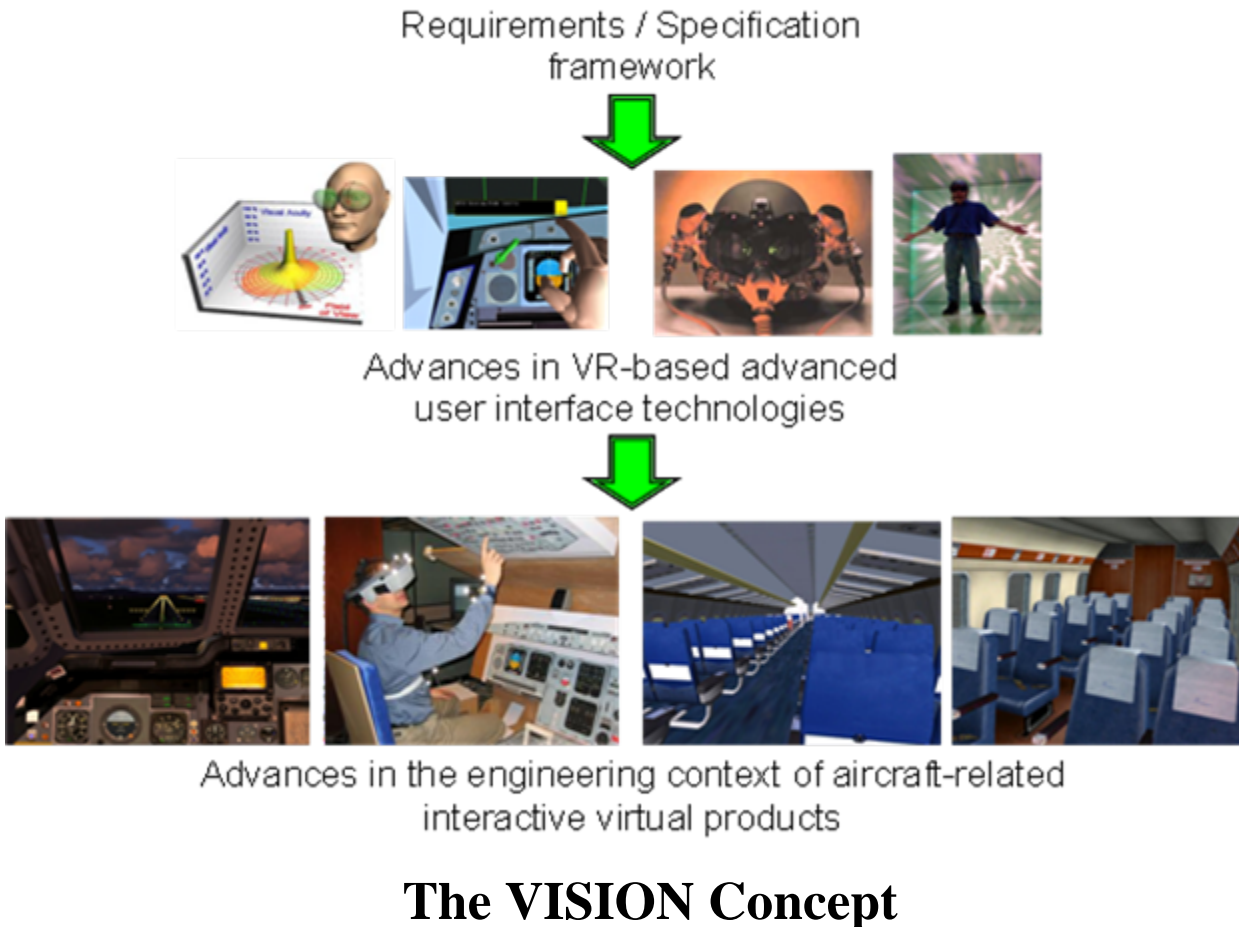
Start date: 01-11-2008, Duration: 30 months

Partners	Country
University of Patras / Laboratory for Manufacturing Systems & Automation (<i>Co-ordinator</i>)	Greece
EADS Deutschland GmbH	Germany
EADS France - Innovation Works Department	France
Universitaet des Saarlandes	Germany
VTT Technical Research Centre of Finland	Finland
Vienna University of Technology	Austria



A success story – The VISION Project

Concept & objectives



The **technology** oriented objective of VISION is to specify and develop key interface features in fundamental cornerstones of Virtual Reality (VR) technology, namely in **(1) photorealistic immersive visualization** and **(2) interaction**.

The **application** oriented objective of VISION is to drive specific technological advances in immersive VR improving the **human-oriented functionality and usage of aircraft-related virtual products**



A success story – The VISION Project

Concept & Objectives

VISION will enhance fundamental aspects of VR

- ❑ Increase of the *level of accuracy* of visual simulations and the visual perception in Virtual Environments (VE).
- ❑ Improvement of the *realism and visual quality* of real-time rendering (i.e. shadows, transparency, global indirect lighting, reflections etc) to account for interactive VE.
- ❑ Definition of *generic interaction concepts* with the virtual products and the different software modules of VISION.
- ❑ Introduction of *new methods to control various aspects of the virtual scene*, as well as definition, integration, synchronization and assessment of multi-modal interfaces.
- ❑ Development of *programming interfaces* (API) to integrate the different technologies represented in VISION.



A success story – The VISION Project

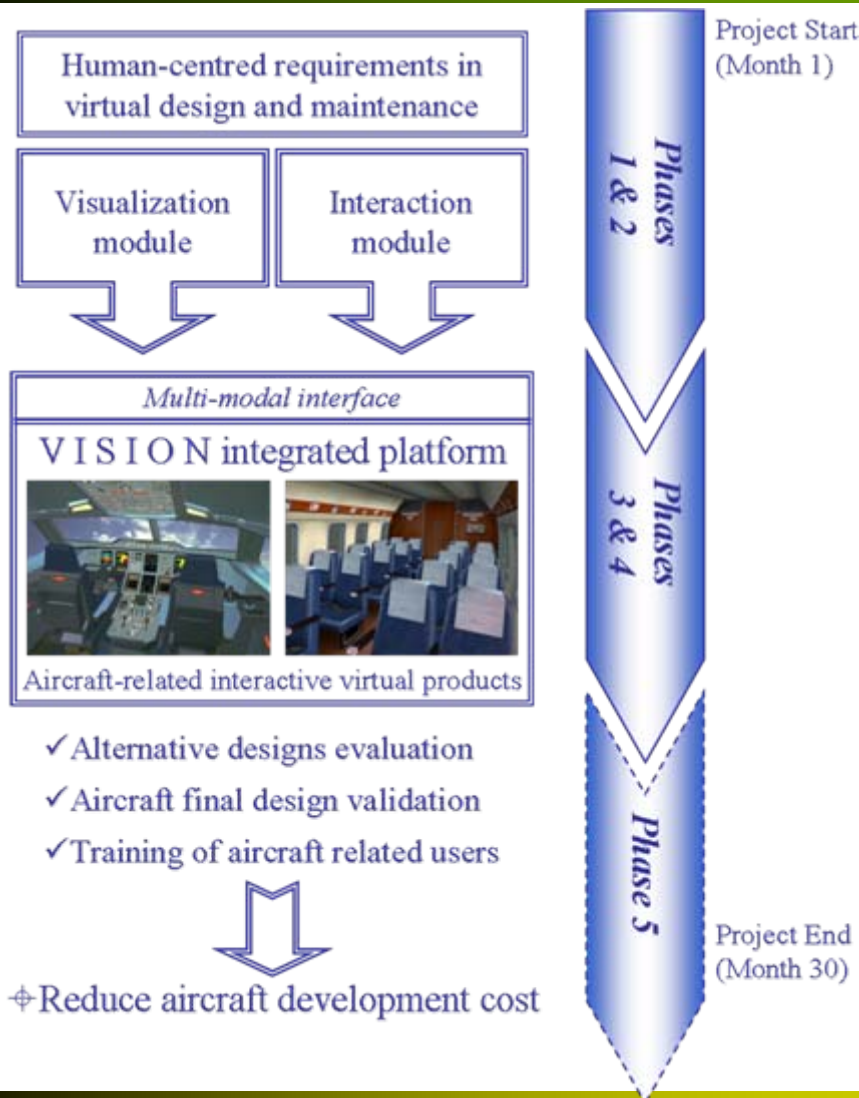
Concept & Objectives

VISION will deliver aircraft-related product simulation improvements

- ❑ *Interactive global illumination*, by adding some specialized technological subjects, focusing on enhancement of light simulation task and the simulation itself.
- ❑ Design and development of new general methods for easy usage of VR scenes including *navigation, intuitive interaction, user-adapted interaction, gestures, etc*, with the aim to achieve a unified interface for several aircraft-related virtual product applications.
- ❑ Design and development of new general methods and techniques *for marker less motion body tracking*.
- ❑ Provision of appropriate simulation features in order to *enable experimentation with the virtual product*



A success story – The VISION Project



Phase 1: Virtual product and technology requirements

Phase 2: Development of VISION individual modules

Phase 3: System integration

Phase 4: System validation

Phase 5: Exploitation and dissemination

Implementation Plan



Joining the LCM IG

The IG is Open to all interested organizations !!!

How to join ?

1. Register your organization at EASN website
2. Express your interest in joining the IG by contacting

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