MEDEA's Contribution to the Strength of European Design and CAD

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Microelectronics production is of considerable importance in Europe. It is vital and strategic for the electronics systems industry in Europe, which is by far larger and which is facing markets with a global competition, high growth rates, shortest innovation cycles and permanent price decreases. Europe developed an encouraging position in IC wafer fabrication due to the Jessi programme. On the application side, Europe's system houses have been able to use Europe's improved semiconductor expertise to develop state-of-the-art chips that are the heart of several world beating electronic systems contributing to Europe's competitiveness. In order to keep this strength and improve on it, MEDEA as one of the largest EUREKA programmes was started in January 1997, with a runtime of 4 years.

Key of this R&D programme is the strong co-operation between system companies and IC companies in the most important application areas: Multimedia, Communications and Automotive Electronics. Projects in these application fields work on new algorithms/methods and prototype implementations in systems-on-a-chip, using advanced silicon. The 'glue' of this work is the availability of advanced CAD and design tools, methodologies and libraries. Some of these necessitites are not available from the big American CAD vendors. MEDEA therefore has introduced a CAD programme which contains currently 7 projects. These projects are running in the following key areas:

- **Deep submicron Design:** the projects are on the way in this area dealing with the development of new tools for the design flows and methods for $0.25\mu m$, $0.18\mu m$ technologies and below. This includes methodologies how to handle very complex circuits with a multilevel approach, how to develop and use hierarchical test methods for system debug, system maintainability and manufacturing tests. Tools for modelling and parametrisation of IC's in terms of physical coupling are part of the development.

- **System Level Design:** the projects in this area cover hw/sw codesign tools and methodologies, reusability of hw and sw modules. Hierarchical design flows in which IP's could be introduced are also part of the work in this area. Tools for IP's development and interface standardisation are part. The projects contribute to international standardisation activities, e.g. ECSI and VSIA.

- **Analogue Design:** the project in this area has the goal to increase the design productivity and quality of analogue and mixed-signal IC designs. A library of basic functions used by the tools and required for demonstrators will be developed. Re-useability of analogue and mixed-signal modules is also part of the project.

- **RF-Design:** a project develops tools and methodologies for the development of RF building blocks required in future terminals in the fields of Digital European Cordless Telephone, Private Mobile Radio Communication and Global System for Mobile Communication.

This last mentioned project demonstrates the principle and the advantage of the MEDEA project structure: the vertical co-operation of projects. Application projects need results from MEDEA CAD projects and technology projects in order to achieve their goals, and vice-versa, MEDEA and technology projects need input from the application projects in order to define their own goals. To achieve these goals a broad variety of expertise is necessary: MEDEA includes in its CAD programme 25 companies, 9 institutes/universities from 6 European countries.

The MEDEA Design and CAD projects cover an essential part of the design part of the SIA roadmap, esp. this part which is needed by the European system companies. MEDEA intends to co-operate with SIA in the improvement of the roadmap.