

ESPRIT VLSI DESIGN TRAINING ACTION EUROCHIP

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1. Status

Within Europe the demand for designers of Very Large Scale Integrated (VLSI) circuits is rapidly increasing but a lack of trained engineers in this area is limiting the use of advanced microelectronics in a number of industrial sectors. By the late 1980s, studies had shown that Europe's academic institutions were of high quality and had considerable potential but that the existing VLSI design training capacity of about 1500 students per year had to be expanded to 4500. To meet this urgent need the VLSI Design Training Action was set up in 1989 by the Commission's Directorate General XIII within ESPRIT Basic Research.

Some 120 academic training institutions have received support for their design training infrastructure as well as free access to industrial microchip fabrication. Attracted by the benefits of the Action some 100 additional institutions have joined to take part on a "pay-as-you-use" basis. About 220 academic institutions from Community and EFTA countries are now involved and since two years there is a large and growing number of expressions of interest for cooperation from Central and Eastern European academic institutions.

Up to now 2700 CAD (Computer Aided Design) software packages have been installed. Some 80 workstations and integrated circuit (IC) testers have been provided to selected academic institutions and a further 600 stations have been bought by the institutions at their own expense but under a special discount scheme offered by suppliers to those taking part in the Action. A programme of training courses in the use of CAD software, supplied under the Action, was arranged to accommodate about 320 academic instructors.

2. Results

More than 5000 students, 500 more than the targeted number, were trained in VLSI design within the first year of the Action. The 120 academic institutions involved from the start reported that some 1200 courses have been run and more than 1000 VLSI designs have been made, of which more than 600 were fabricated. The progression of circuits through the design, fabrication and test stages is continuing.

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The Action's contribution to postgraduate as well as undergraduate training is illustrated by over 2000 internal and external reports emerging from the above courses. These include about 1000 Bachelors' course reports, approximately 800 Masters' course reports and nearly 190 PhD theses.

The provision of design facilities for training purposes and access to manufacturing of prototypes has opened the routes to chip production for academia. The Action has been augmented several times over by the institutions from their own resources.

3. Next Steps

The Action has been renewed for a second phase of 3 years' duration. In this phase, the Action will be opened to any recognised Community academic institution and it is expected that the Action will expand to accommodate up to 300 universities and polytechnics.

Proposed enhancements include the incorporation of advanced design tools and technologies into the Action's portfolio which have now become available from European sources. In addition a harmonised programme is proposed for design training, including instructor development and industry-based instructors and courses.

In response to many requests for cooperation from universities and polytechnics from Central and Eastern Europe new schemes are under preparation to establish collaboration in this field throughout Europe. Plans to provide the appropriate coordination are currently discussed between the Community and authorities in Central and Eastern Europe.

Transparencies

LAUNCHING THE ACTION

OCT	1986	GRENOBLE PROTOCOL
APR	1987	ESPRIT WORKING DOCUMENT
FEB/MAR	1988	EXPERTS MEETINGS
SEP	1988	PUBLIC CALLS FOR PARTICIPATION AND SERVICE
JAN	1989	CLOSING DATE FOR TENDERS
JUL/AUG	1989	CALL FOR FOUNDRY- SERVICES CALL FOR CAD -SYSTEMS
OCT	1989	1st STEERING BOARD MEETING
OCT	1989	COMMENCEMENT OF ACTION

LAUNCHED IN FALL 1989

ORIGINAL OBJECTIVE

- INCREASE OF VLSI DESIGN ENGINEERS TRAINED IN UNIVERSITIES AND POLYTECHNICS FROM 1500 TO 4500 PER YEAR

THE ACTION OFFERS

- ACCESS TO CHIP MANUFACTURING
- CAD SOFTWARE TOOLS
- WORKSTATIONS, TESTERS
- TRAINER POSTS
- COORDINATION AND SERVICE

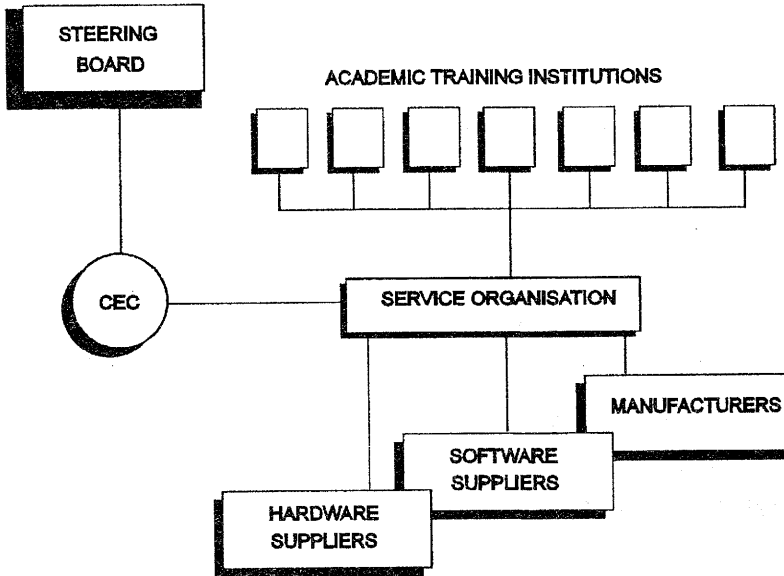
CURRENT SITUATION

- 5 FOUNDRIES WITH DIFFERENT TECHNOLOGIES
- 5 SOFTWARE SYSTEMS
- 90 HARDWARE INSTALLATIONS
- 900 SOFTWARE INSTALLATIONS
- INSTALLATIONS AUGMENTED BY A FACTOR OF 8 BY THE INSTITUTIONS ON THEIR OWN EXPENSES

RESULTS IN SPRING 1991

- 800 ACADEMIC COURSES
- 300 COURSES FOR TRAINERS
- OVER 400 REPORTS AND THESES
- 350 FINALISED DESIGNS AND 200 TRAINING PROTOTYPES MANUFACTURED
- 5000 STUDENTS TRAINED

VLSI DESIGN TRAINING ACTION



SERVICE- CONSORTIUM AND MEMBERS OF THE EXECUTIVE BOARD

CMP	CIRCUIT MULTI PROJETS (INPG) B.COURTOIS
DTH	DANMARKS TEKNISKE HOEJSKOLE O. OLESEN
GMD	GESELLSCHAFT F. MATH. & DATENVERARBEITUNG A. KAESSER
IMEC	INTERUNIVERSITAIR MICRO - ELEKTRONICA CENTRUM E. BOURDEAUD'HUI
RAL	RUTHERFORD APPLETON LABORATORY J.McLEAN

EXAMPLE OF A THESIS (POLYTECHNIC LEVEL)

- DIGITAL VIDEO MIXER
(e.g. FOR PRECISE MIXING OF CHROMINANCE AND LUMINANCE)
- FUNCTION, SPEED AND OTHER SPECS. RECOMMENDED BY INDUSTRY
- SOLUTION FROM TRAINING COURSES
- DETAILED BY A MASTERS THESIS

RESULTS:

- STUDENT COURSES USING AN INDUSTRIAL VLSI IDEA
- MASTERS CERTIFICATION
- REPORT
- PROTOTYPE CHIP FOR TESTING (PIPELINE DIGITAL ARCHITECTURE, 17000 GATES, 27 MHZ CLOCK FREQUENCY)

COOPERATION IN SCIENCE AND TECHNOLOGY WITH CENTRAL AND EASTERN COUNTRIES

1992 - 55 MECU

- MOBILITY SCHEME
- NETWORKS, CONFERENCES, WORKSHOPS AND SEMINARS
- JOINT RESEARCH PROJECTS
- PARTICIPATION IN EUROPEAN COMMUNITY RESEARCH AND TECHNOLOGY DEVELOPMENT PROGRAMMES
- PARTICIPATION IN COST ACTIONS
- PHARE PROGRAMME ASSISTANCE FOR RECONSTRUCTION OF ECONOMY (200 MECU)
INCLUDING: TEMPUS, ACE
- MEMBER OF COST, SINCE DECEMBER 91
- ALTEC PROJECT ALGORITHMS FOR FUTURE TECHNOLOGIES
- VLSI DESIGN TRAINING ACTION
- NODES OF NETWORK OF EXCELLENCE IN LANGUAGE AND SPEECH
- SUBCONTRACTS OF R&D - PROJECTS
- COOPERATION SCHEME WITH CENTRAL AND EASTERN EUROPEAN COUNTRIES
- COOPERATIVE RESEARCH IN IT (CRIT)