

WBCInno Benchmarking assessment visit
Kragujevac, 27th August 2013

Collaborative Training Centre (CTC) Centre for Virtual Manufacturing (CEVIP)

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Collaborative Training Centre (CTC) Centre for Virtual Manufacturing (CEVIP)





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Collaborative Training Centre (CTC) Centre for Virtual Manufacturing (CEVIP)



History

- New regional model of UNI-ENTRP.
- 1000 new VMnet members
- At least 15 new experts, trainers...
- +6 VM software, 4 new PC classrooms, RP and RE equipment
- Updated sistem. knowledge
- 5 new international projects
- 3 semin, 3 worksh, 3 brock. events
- 10 new vocational courses
- SME joint structure (cluster...)
- 30 Industrial fellowships
- 100 students past PPP programme

2012

CTC Rijeka

CTC Banja Luka

CTC Kragujevac

CTC Podgorica

On the university level

2008

- On the MFK level
- VMnet - 440 members
- 13 VM experts
- 6 VM software
- VR and QC equipment
- Systematized knowledge
- Reference list – 35 enter.
- 9 international projects
- Seminars, workshops...

2006



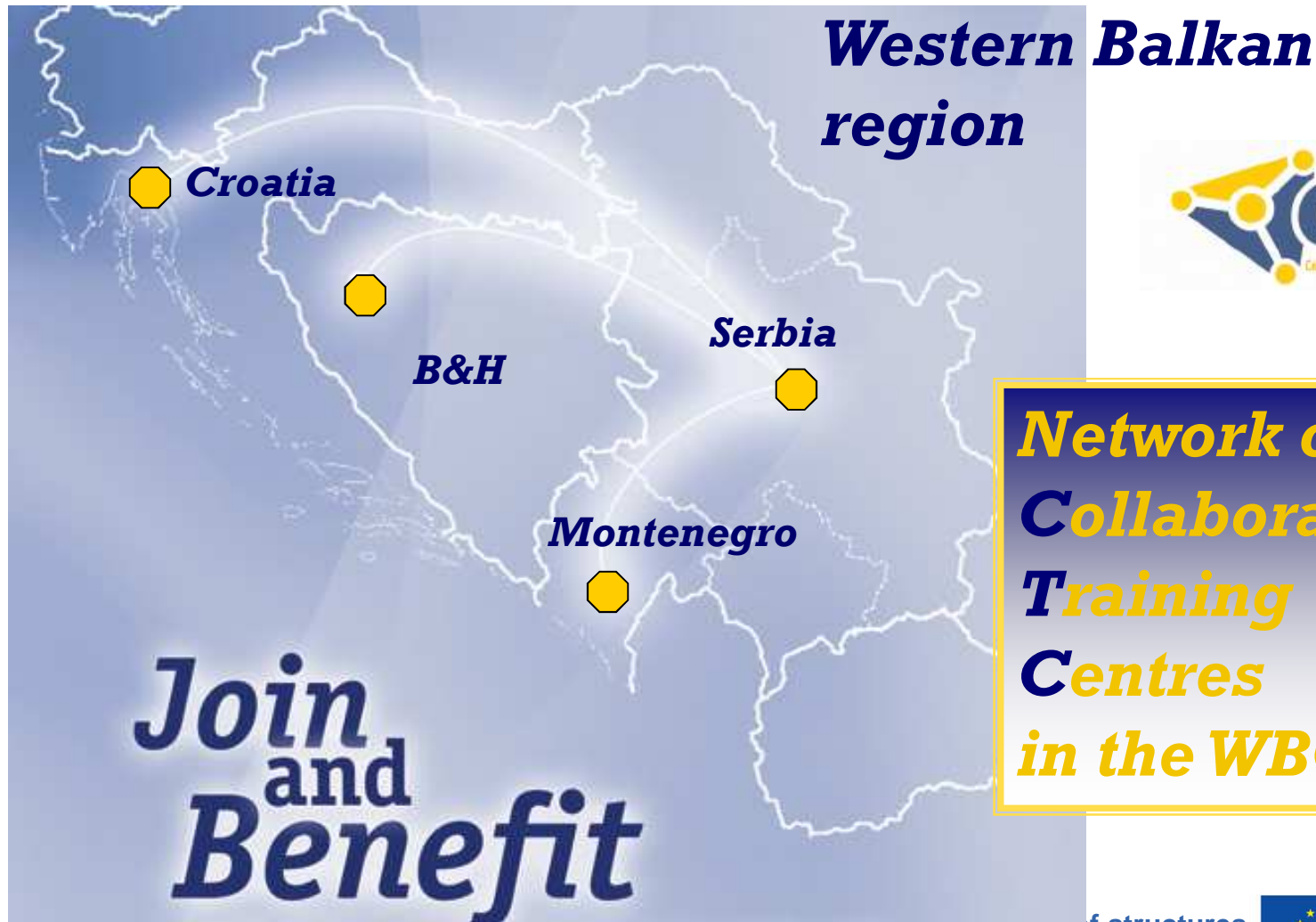
2009



Modernization of WBC universities through strengthening of structures
and services for knowledge transfer, research and innovation



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Collaborative Training Centre – CTC Kragujevac



Vision

To become a strong cooperative center that will initiate, mediate and maintain mutually beneficial partnerships between universities, that is its members, students and graduates on one hand and enterprises and other partners that support SME sector on the other hand.

Mission

To develop efficient and effective mechanisms for cooperation between universities and enterprises, through the projects' implementation, vocational trainings for enterprises and the unemployed, industrial scholarship programs (Industrial Fellowship Programme - IFP) and student practice (Student Practical Placement Programme - PPP).





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Centre for Virtual Manufacturing - CEVIP

Vision

To be leading R&D centre in Serbia, for supporting SMEs in application of innovative, cost effective and environmentally friendly methods for virtual development of products, processes, tools and equipment.

Mission

Support Serbian enterprises and SME to become more innovative and competitive at the market by offering broad spectrum of services focused on advanced technologies and techniques of virtual development of products and process optimization

Centre objectives

- Provide services for improvement of existing and development of new innovative products, processes and tools for large enterprises and SMEs in Serbia
- Monitoring and dissemination of the state of the art on virtual technologies
- Establishing and extending virtual manufacturing network in Serbia - VMnet
- Become self-financed R&D organization



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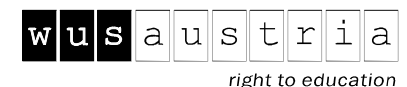
Realized international projects

1. TEMPUS, IMG-Individual mobility grant, Type 3 - IMG-SCG1007-**2004**
2. WUS Austria, CDP+, **2005/06**, Modeling and Simulation in Metal Forming,
3. EUREKA/ASMATA, **2005**, E!3240: Renewal of steel car parts with aluminium, – ASMATA
4. Bilateral project between Serbia and Slovenia, **2006/07**, Optimization of material forming processes through physical modelling, FE simulation and inverse analysis.
5. eLearning WUS project, **2006**, No. 002/06, Development of Metal Forming Electronic Instructional Resources
6. Course Development Plus WUS project, **2006**, Virtual Engineering
7. Virtual Manufacturing Support for Enterprises in Serbia, EAR-EDEP Programme, **2006-2007**
8. Reinforcement of Research Capacity in Software Development and Innovative Collaborative Design and Engineering in Serbia and Montenegro, RRCSD INNCODE, FP6 INCO 043820, **2007-2009**,
9. WBC Virtual Manufacturing Network – Fostering an Integration of the Knowledge Triangle TEMPUS 144684 (**2009-2012**)
10. Promoting Innovation in the Industrial Informatics & Embedded Systems Sectors through Networking SEE 2009/222-910 (**2009-2012**)
11. Bilateral project between Serbia and Croatia, Modelling and optimization of tool by application of information technologies of virtual manufacturing with experimental verification, **2011-2012**.

World University Service - Austrian Committee



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Current international projects

1. “WBCInno”

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2. “ICES”

Improvement of the competitiveness of enterprises in Serbia through new technologies transfer and support of innovations, GIZ project 83124094 LS/2012/07, (October 2012 / December 2013)





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CTC and CEVIP
use modern
approach

in

INTEGRATED PRODUCT AND PROCESS DEVELOPMENT

based on virtual
engineering
applications





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Equipment for VR

- ✓ 3D projector INFOCUS with 5 pairs stereoscopic glasses
- ✓ 5DT Data glove
- ✓ VR Space Wintracker
- ✓ VRCO Trackd Software

CNC calibration device

- ✓ Ballbar QC10 Renishaw System

Multi-sensor Coordinate Measurement Machine WERTH

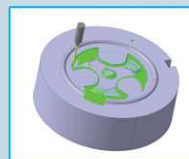
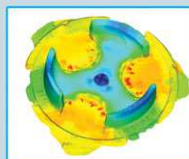
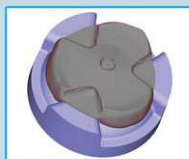
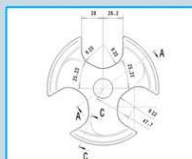
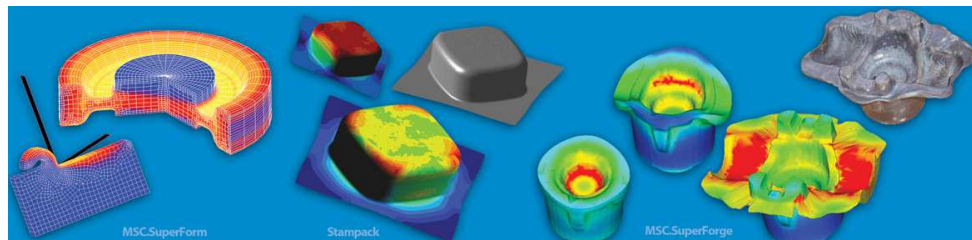
- ✓ VideoCheck IP250

Software

CATIA V5
DELCAM PowerMill
CAMPform 2D
MSC.SuperForm
MSC.SuperForge
Stampack
Vulkan
Simufact

3D printer - OBJET

- ✓ Alaris 30



Equipment for VR

- ✓ 3D projector INFOCUS with 5 pairs stereoscopic glasses
- ✓ 5DT Data glove
- ✓ VR Space Wintracker
- ✓ VRCO Trackd Software





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Software

CATIA V5

DELCAM PowerMill

CAMPform 2D

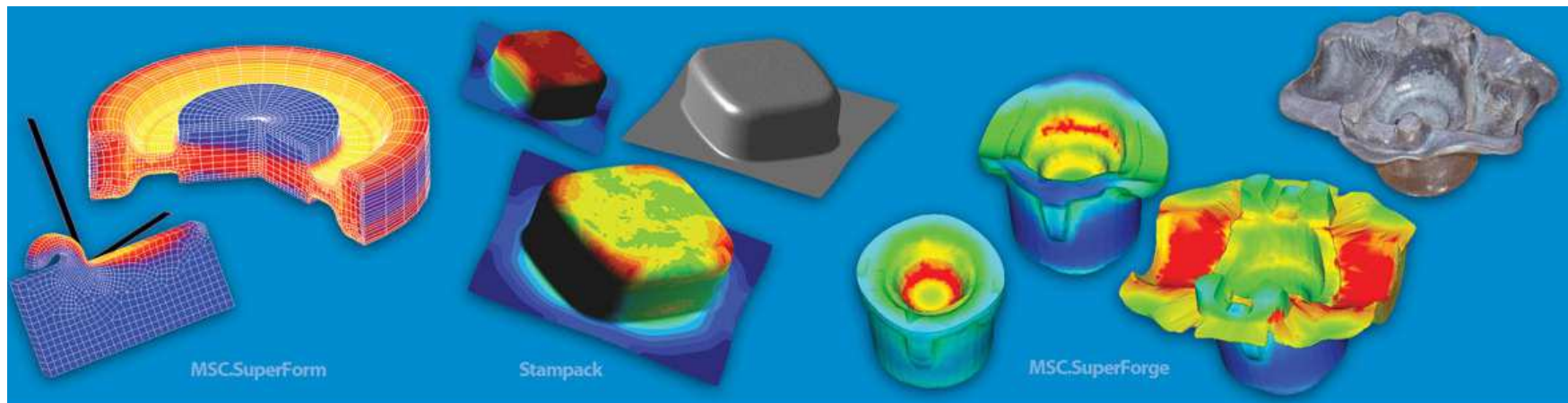
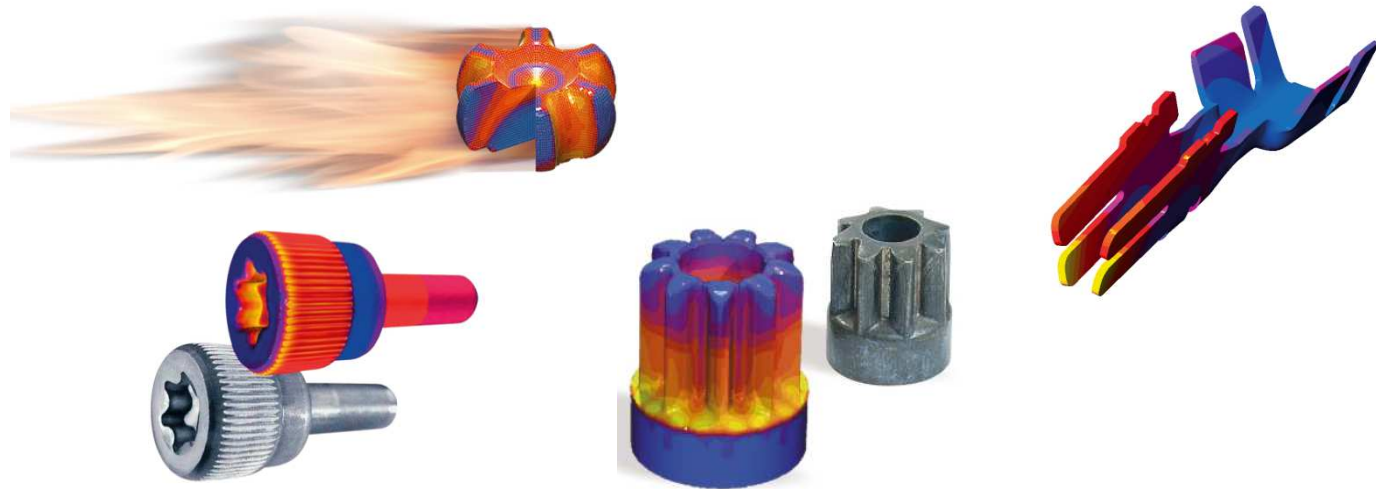
MSC.SuperForm

MSC.SuperForge

Stampack

Vulkan

Simufact



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CNC calibration device

✓ Ballbar QC10 Renishaw System



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Multi-sensor Coordinate Measurement Machine WERTH

✓ VideoCheck IP250



Three sensors:

- **Optic** (image processing, scanning, auto-fokus, 3D Patch)
- **Laser**
- **Fiber** (contact senzor)

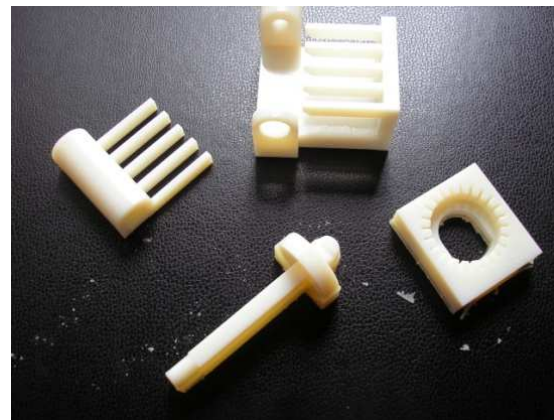
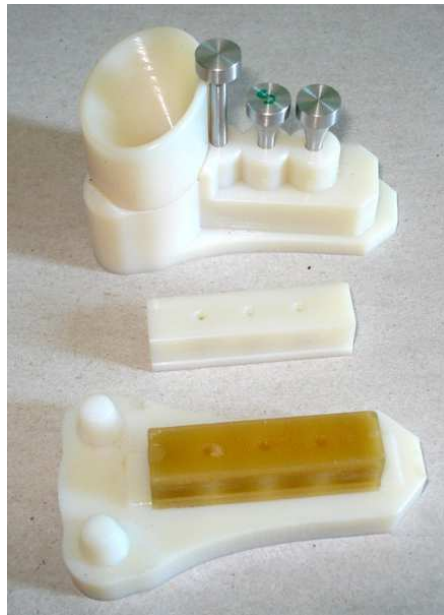
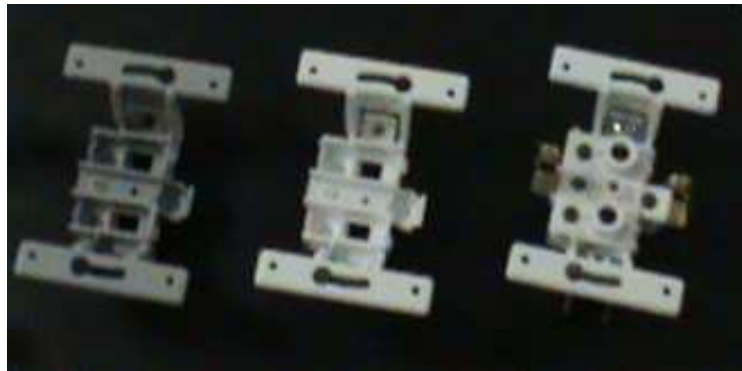
3D printer - OBJET

✓ Alaris 30



Applications:

- Medicine;
- Electronics;
- Automobile industry;
- Production of consumer goods;
- Architecture;
- Education;
- Entertainment etc.





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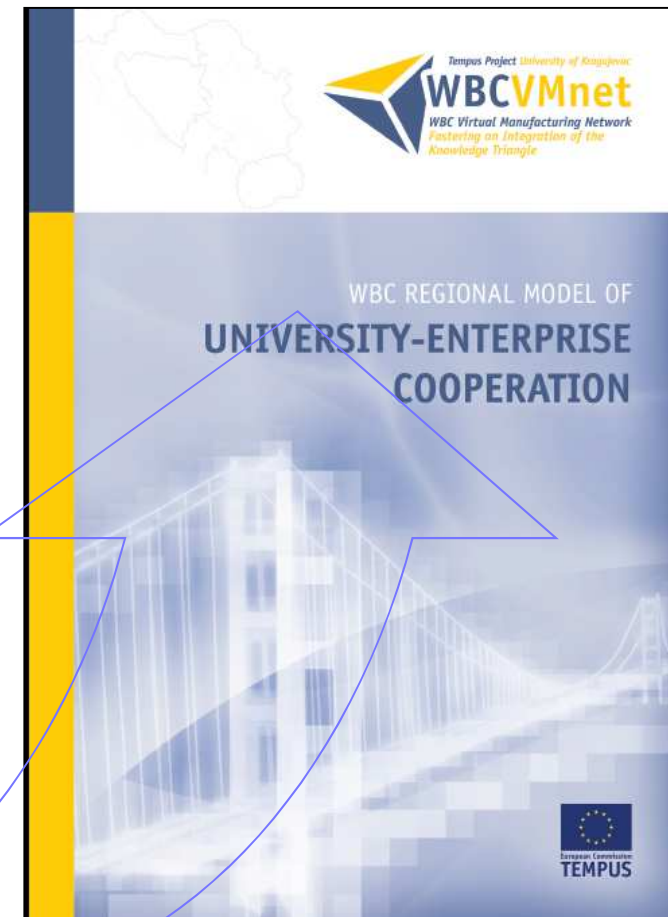
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WBC Regional model of University – enterprise cooperation



1. Science and Technology parks
2. WBC regional industrial clusters
3. University-enterprise consortia for joint projects
4. Collaborative training centres
5. Open Innovation Networks with SMEs
6. Practical placements for students
7. Industrial fellowship programme



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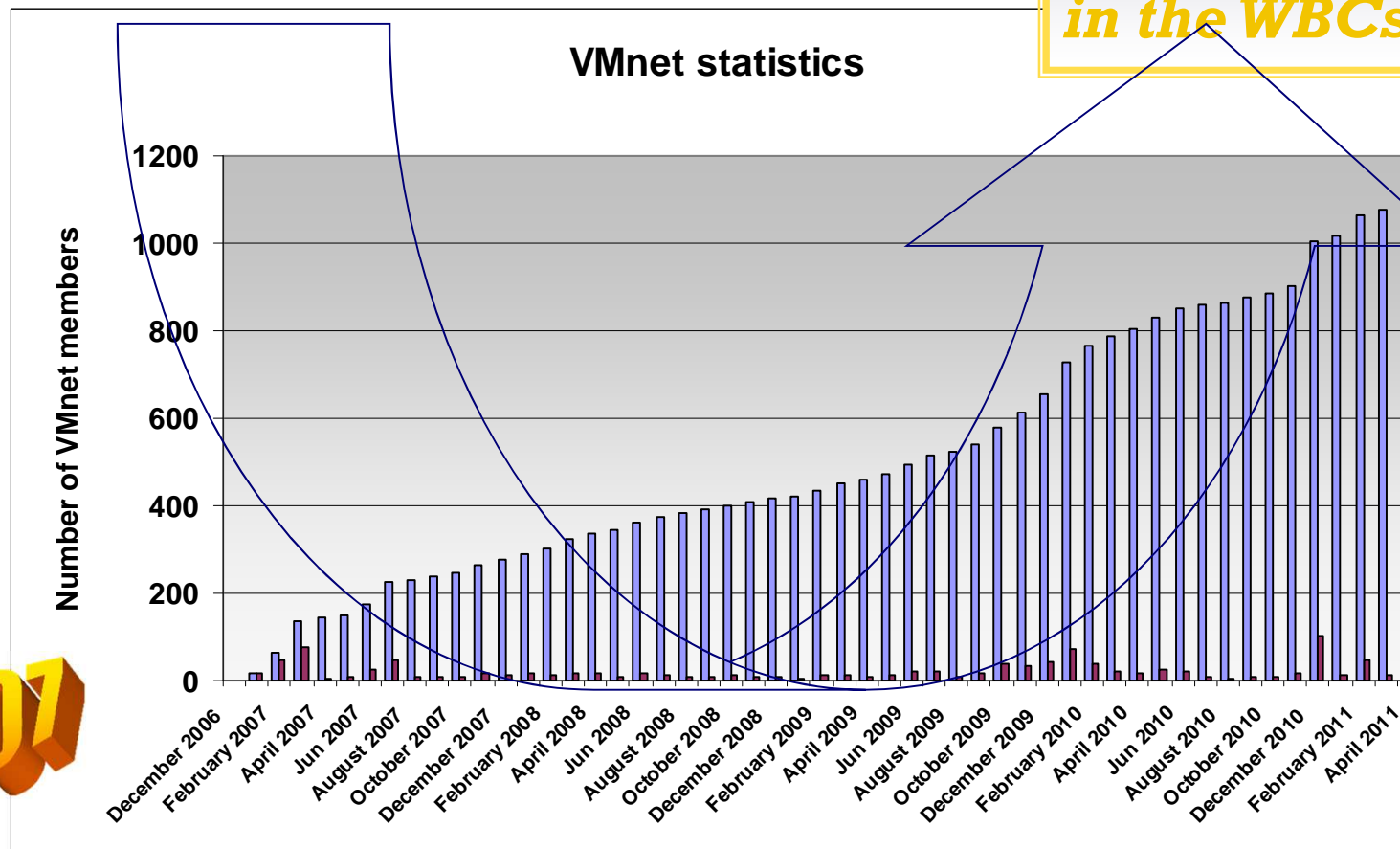


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WBC - Virtual Manufacturing Network

1400 members from WBC region

**Virtual
Manufacturing
Network - VMnet
in the WBCs**



2007

2013



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Registered VMnet members can :

- ✓ Access to database of systematized knowledge
- ✓ Be updated about important events via email
- ✓ Use services of CTCs and CeVIP under more favorable conditions
- ✓ Have a priority in realization of services
- ✓ Demand an expertise they need
- ✓ Get the early tips about matters they are interested in
- ✓ Be provided by number of electronic journals, by e-mail:
 - **Woodworker's Journal eZine**
 - **Aluplanet daily**
 - **European Plastic Product Manufacturer**
 - **The 9000 Store Newsletter**, Guide to ISO 9001
 - **Tube Talk**, Fabricators & Manufacturers Association
 - **Go Industry Online Auction**
 - **ASM International Online**
 - **Industrial Engineering News**
 - **Fabricating Update**, Fabricators & Manufacturers Association
 - **All Metals & Forge**
 - **CAD Library new catalogs**
 - **ThomasGlobal.com Newsletter**
 - **European Toll & Mould Making Weekly Newsletter**





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Systematization of the knowledge

1. Proizvodne tehnologije

Tehnologije zapreminskog deformisanja
Osnove dubokog izvlacenja
Tehnologija injekcionog presovanja polimera
Obrada lima i alati

2. Razvoj novih materijala

Razvoj materijala i principi dobijanja

3. Obradivost i metalurgija

Obradivost limova
Razvoj i primena Al-Mg legura visoke čvrstoće

4. CAD/CAM/CAE tehnologije

CAD/CAM
Parametarsko modeliranje
Simulacija dinamičkih procesa u CAD software-u
Katalozi CAD modela
Istorija CAD-a
CATIA V5 - Uvod

5. VM tehnologije (FEM/FVM simulacije)

Virtuelna proizvodnja odlivaka primenom CAE tehnika
Tehnologije virtuelnog inženjeringa
Numeričke simulacije procesa. Ulazni podaci za FE simulaciju
Integracija tehnologija virtuelnog inženjeringa

6. RP/RT/RE tehnologije

Brza izrada prototipova (Rapid prototyping)
Brza izrada alata (Rapid Tooling)
Reverzni inženjering (RE)
Korisni linkovi

7. VR tehnologije

Virtuelna realnost, vizuelizacija i tehnike simulacije
Uređaji za virtuelnu realnost

170 documents

Modernization

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and This project has been funded by the European Commission

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Vesna Mandić

Members Library Rec

Partners Service

Group summary

AG - VRPM - Virtual/Rapid Prototyping/Manufacturing

44 members

Description: Virtual/Rapid Prototyping/Manufacturing group established in July 2011 with the aim to provide collaborative framework for rapid product development, from one side, and to realize joint research and d... [+]
Group leader: Vesna Mandić

[Review how non members see this group](#)

[About Partners Service](#)

Group members

MEMBER	
	Sasa Vujic
	Ivana Boskovic
	Sanida Omerovic
	Sujata Tilak
	ITCONSULT Wittig
	Danijela Milosevic

VRPM group – July 2011

- 72 members
- 19 from Serbia
- teams and institutions from 20 countries
- networking in R&D projects





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Customized vocational trainings

CTC Kragujevac

CAD/CAM modelling

Tool design

Modelling and optimization of production processes using the FE / FV simulation

Project management

CAM modeling and generating NC code for 3 axis CNC milling machines

Industrial metrology

CTC Rijeka

Simulation of machining processes and rapid prototyping techniques (SolidWorks, SolidCam)

Product design and development with CATIA

Process Quality Improvement Methods

Fundamentals of project management

Application of MS Project for planning and monitoring projects

Qualification program for new product/production system development

CTC Banja Luka

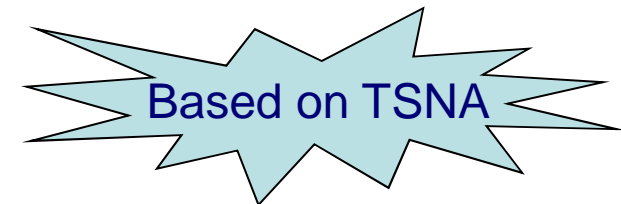
Advanced CAD modeling using Solid Works

NC programming and the basics of CAM modeling

CTC Podgorica

CAD - ProEngineer

Office informatics



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- | | | |
|-------------------------------------|------------------------------------|--------------------------------|
| 1. Ekofarm, Ušće | 23. Milanović Inženjering, Kraguj. | 45. Zastava oružje, Kragujevac |
| 2. Toza Marković, Kikinda | 24. Budućnost, Bajina Bašta | 46. Vlatacom, Beograd |
| 3. Preseraj, Kragujevac | 25. IVA28, Beograd | 47. Intranea, Kragujevac |
| 4. Metalac INCO, Gor. Milanovac | 26. Sloboda, FSP, Čačak | 48. Quadel, Niš |
| 5. Kovačnica – Kragujevac | 27. ASB alati, Donji Ribnik | 49. BELIT, Beograd |
| 6. Petar Drapšin, Mladenovac | 28. Prva petoletka, Trstenik | 50. Comtrade, Kragujevac |
| 7. Jucit invest, Kragujevac | 29. Unimet, Kać | 51. ... |
| 8. Fadip, Bečej | 30. Tehno, Kragujevac | |
| 9. Woksal, Užice | 31. SCGM, Kragujevac | |
| 10. Metal produkt, Sm.Palanka | 32. VMPlast, Čačak | |
| 11. Assema, Kragujevac | 33. Prizma, Kragujevac | |
| 12. SCGM, Kragujevac | 34. MITRES, Beograd | |
| 13. Nissal, Niš | 35. Topy company, Beograd | |
| 14. Alatnica Unior, Kragujevac | 36. Microelektronika, Beograd | |
| 15. Hemotehna, Subotica | 37. Naučno-tehnol. park, Rijeka | |
| 16. Blažeks, Kragujevac | 38. Triple Crown, Niš | |
| 17. WBC centar, Beograd | 39. Metalac posuđe, G.Milanovac | |
| 18. Prvi Partizan, Užice | 40. Grah Automotive, Kragujevac | |
| 19. Institut autom. Zastava, Kraguj | 41. Galeb Metal pack, Šabac | |
| 20. ITNMS, Beograd | 42. INMOLD, Požega | |
| 21. WEBA, Kragujevac | 43. TPV Šumadija, Kragujevac | |
| 22. Metalka Majur, Jagodina | 44. Promotor Irva, Kragujevac | |

Improvements in

- products
- processes
- technologies
- NPD
- knowledge of HR

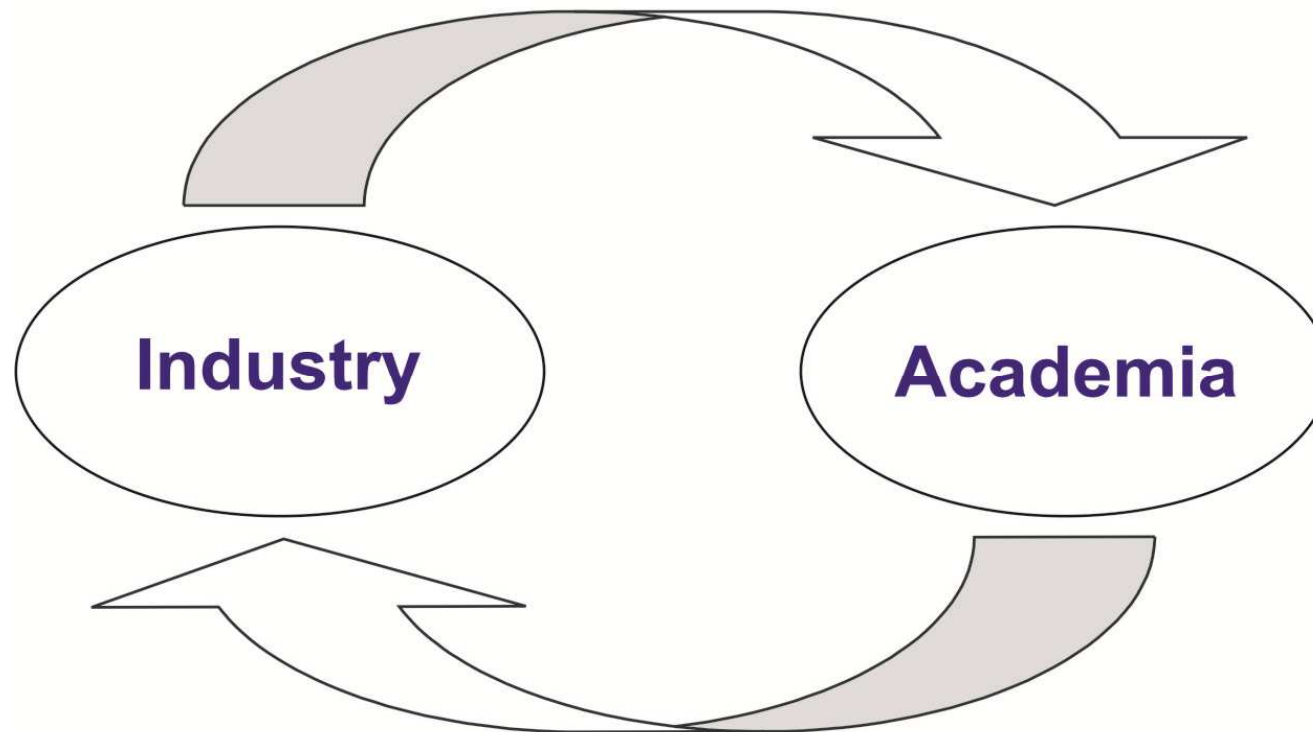
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Inter-sectorial cooperation – network between industry and academia

Industrial fellowship programme



Practical placement programme

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Practical Placement Programme

- ❖ In order to improve and acquire **new knowledge of students**, CTC centers have developed and coordinate a new Practical Placement Programme (PPP) which provides students the opportunity to gain practical experience in industry, in an area that relates to their academic studies, and to further develop their professional, technical and interpersonal skills.
- ❖ Placement programs have the important role of creating a **bridge** between **education** and **employment**.



PPP programme and annexes are available at

www.wbc-vmnet.rs

www.ctc.kg.ac.rs

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Industrial Fellowship programme

- ❖ IFP program is intended for the establishment of **sustainable partnership** between universities and industry through hosting industrial fellows in academic centers, with the aim to realize advanced targeted trainings of industrial fellows and joint research according to the needs of industrial sponsor.
- ❖ The IFP program is an excellent opportunity for **technology transfer** and involvement of young people in innovative projects that contribute to the exchange of experience, ideas, knowledge, and increase of innovative potential and competitiveness of enterprises.



IFP programme and annexes are available at

www.wbc-vmnet.rs

www.ctc.kg.ac.rs

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I3E - WIKI database of 120 good practices in transforming research into innovation


Based on a specific good practice collection methodology the I3E project partnership has collected **120 international good practices** (GP). **WIKI database** contains all good practices presented in standardized form describing following information:

- Location of GP;
- GP executive summary;
- GP classification;
- Description of GP;
- Description of research team/Institution;
- Applied financial mechanism;
- Impact and benefits;
- Sustainability;
- Evaluation criteria.
- Contacts for R&D team and facilitators of the applied financial mechanism

I3E Wiki database

Structure of WIKI is organized per partner and is available on address

www.i3e.eu/i3e_wiki/index.php?title=Category:Partners_List



Promoting Innovation in the Industrial Informatics
and Embedded Systems Sectors through Networking

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- Good Practices
- Best Practices

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Best Practices

An assessment of 120 Good Practice on the transformation of Research to Innovation created a short list of 30 Best Practices (BPs). These Best Practices represent successful experiences relevant to the transformation of research to innovation and provide useful feedback for the elaboration of the Methodology Guide on Innovation. A table of two Reserve Best Practices follows at the [end](#).

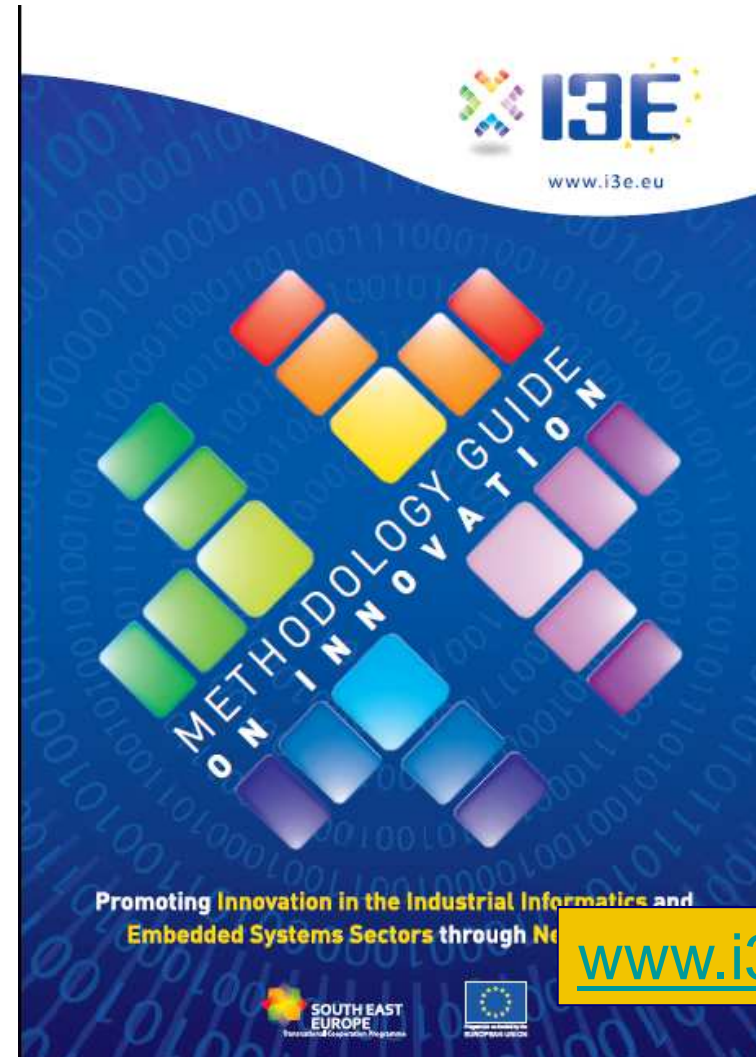
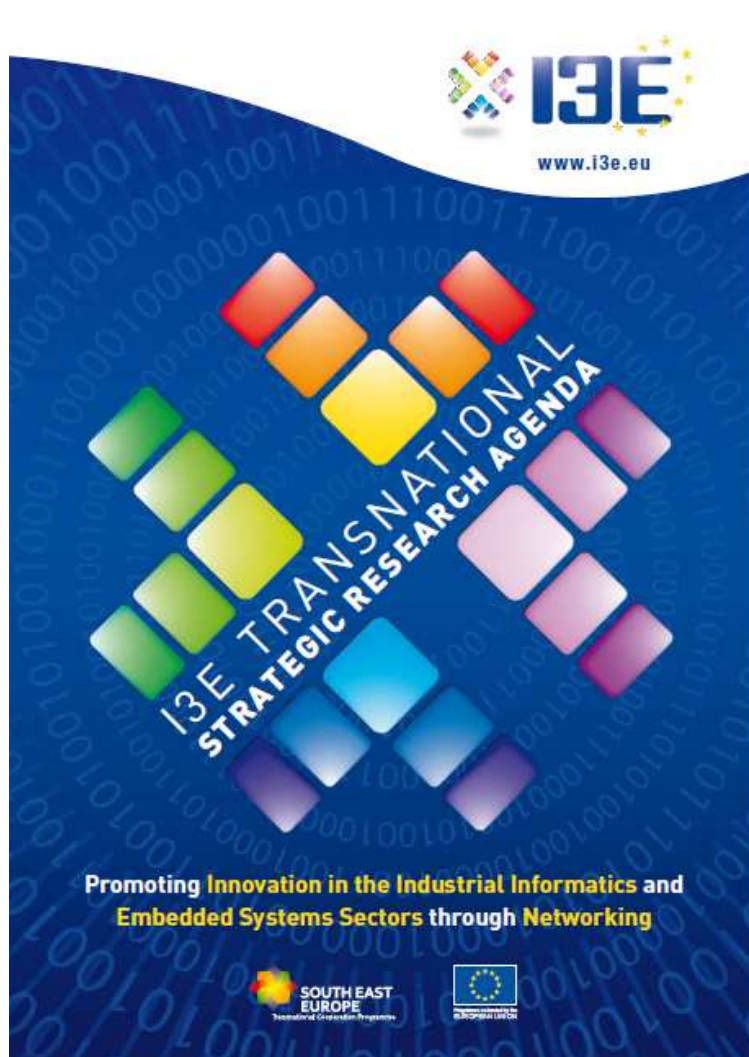
Moreover, a **SWOT** (Strengths Weaknesses Opportunities Threats) analysis has been conducted for each of the 30 BPs and the output, along with valuable conclusions and comparative remarks, is documented in a report that can be found [here](#).

Name	Location	Description	Report
Basilicate Innovazione	Italy, Basilicate Region, Potenza	Basilicate Innovazione has been developed thanks to an accord between the regional government and AREA Science Park, the science and technology park of Trieste, signed in June 2009. This accord allowed to transfer into Basilicate Region a model successfully tried by AREA, with the aim of providing the regional territory with a permanent body useful to give services and instruments to sustain the enterprises competitiveness and to valorize the research.	
Cardio & Brain Signal - Signal conditioning system for	Slovenia	The project was developed by joint effort of several research institutions under the 6 th framework project BRACCIA. The main goal was to design and develop a new system for data acquisition where the main stress would be on signal	

www.i3e.eu



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18 info days, 5 seminars, 5 workshops, 3 brokerage events, 11 trainings ...



**Dissemination and
training events**

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Thank you for your attention

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