

VirtualMine

as a modeling tool for Wider Society Learning

Impact of VirtualMine project - from seed to harvest

In the short term, the proposed actions will identify good practices, best models of conveying knowledge in terms of science education and consider the impact of this information on people who live in the mining regions. In the medium term, the results of the present action will help the EU to better understand the effects of science education outside the regular education institutions and will increase the range of innovative products in science education that reflect societal needs. In the long term the results of the project should be implemented in educational systems of European countries. Additionally the project should also contribute in developing prosumption and co-production - as a result of the wider learning VirtualMine model. The participants – customers become also the future producers of other services while being our hidden resources. The project involves future professionals, producers and users in the implementation of their own services. The more consumers are able to make informed decisions, the greater the impact they can have on strengthening the Single Market and stimulating growth.

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Consortium - strength of partners



VirtualMine Project includes Partners that cover entrepreneurial education approaches to support effective transformation of ideas into business. Another reason to have a wide range of different Partners is that this project is the starting point of a European wide network of mining regions with its strategic importance. The partners are coming from European countries including non-members state. Project consortium includes Partners from 3 sides of the knowledge triangle (education - universities, research - research entities, business - SME).

There are eight Partners from different European countries: three from Poland, one from Slovenia, one from Slovakia, one from Greece, one from Spain and one from Ukraine. The Partners and their experience in the field of education and mining enable to achieve both the goals of the project and KIC strategy either.

"The VirtualMine project is the starting point of a European wide network of mining regions with its strategic importance"



Geologists in KGHM underground copper-silver mine (photo: kghm.com).

Background of each partner:

KGHM CUPRUM sp. z o.o.

Research and Development Centre - leading partner

KGHM Cuprum sp. z o.o. Research and Development Centre initiated series of long-term actions (Minnovation Project – The Min-Novation Network) over a span of 3 years worked to understand and appreciate mining waste both as a corporate, community, regulatory and strategic issue. Set against the background of mining activity and waste management in the partner countries: Estonia, Finland, Germany, Norway, Poland and Sweden, both good practices and problem areas, which need to be addressed, The route of old mining in Mirsk – construction the route of Zink mining (17th century), the project has contributed to the development of the region) meant how mining and history of mining can create the conditions for economic growth based on community well-being. Very often community which live in the mining region has negative attitude towards its history. To change it many educational projects must be performed in the future. The challenge is to meet the needs of communities that seek to re-invent and co-shape the economic future of mining neighborhoods and districts. KGHM Cuprum is ready to share with its experience in this fields. Additionally KGHM Cuprum represents KGHM Polish Cooper – one of the biggest copper producer in the world, it is also research organization – do research in the field of mining.

Slovenian National Building and Civil Engineering Institute (ZAG)

Considering the mining heritage research, we already cooperated with our project partner ZAG during a »Perkmandeljč« project (LIDER – rural region development program), where together with a Laško museum engagement expert material for a visit to the abandoned mediaeval Padež lead and silver mine were created. Learning path was induced; there is now printed material available as a brochure for chance guests as well as an interesting didactic reference book for school children. Padež mine along with other examples of natural and cultural heritage associated to mineral materials are compounded into the context of Slovenia's natural and historical heritage Encyclopedia, which came to be as a result of DEDI II project.



ZAG is also involved in other complementary research in the area of soil remediation (ARRS project no. L7-6747: In-situ remediation of polluted ground in the area of the Old Zinc-Works at Celje, 201-2017, ZAG being a project leader), water remediation (LIFE RusaLCA - Nanoremediation of water from small waste water treatment plants and reuse of water and solid remains for local needs, 2013-2016, ZAG being a project leader), recycling (LIFE REBIRTH - Promotion of the Recycling of Industrial Waste and Building Rubble for the Construction Industry, 2011-2014, ZAG being a project leader) and architectural heritage of the 20th century (Interreg SLO-IT project MACC - Modern Art Conservation Center, 2011-2014, ZAG being a partner).



National Technical University of Athens (NTUA)

National Technical University of Athens (NTUA) has organized “University Day” in Athens in the framework of EIP Raw Materials with the inclusion of all the relevant stakeholders of the raw materials sector with the participation of more than 300 school and university students. Greek Ministry, mining industries, mining associations, academia, governance from regions with mining activity presented the importance of the raw material sector for the society and for the Greek economy, and promoted the profession of miner.

NTUA has two active educational sites covering all the group ages (7-24) and NTUA facility visits for professionals of the raw material sector. The first is the Handicraft – Industrial Educational Museum based inside the Lavrion Technological and Cultural Park with educational programs covering children from the elementary school up to high school. The educational programs are directly connected to the mine environment and equipment used in ancient years up to today. The second site is the Oryctology Museum of NTUA-Georama which is situated in the premises of Mining and Metallurgical Engineering school and offers a real and virtual scale educational program covering ages of 7-24.



TECHNICKÁ
UNIVERZITA
V KOŠICIACH

Technical University of Kosice (TUKE)

Technical University of Kosice (TUKE) cooperates with non-mining subjects in Slovakia (via Association of Mining society and crafts of Slovakia), which have prepared realization of educational initiative called "Mining University" to increase interests of children in area of geology, mining and montane heritage. Additionally, TUKE disposes with number of related projects in the relevant area and some of them are following:

- I2Mine - FP7 - Innovative technologies and concepts for intelligent deep mine of the future (2011 - 2015);
- PTBP21 – ASFEU - Advanced technology for the mining company of 21st century (2011 – 2015);
- DO7RP-0037-11 – APVV : Innovative Technologies and Concepts for the Intelligent Deep Mine of the Future;
- EU structural funds project: New detection methods and technologies for obtaining new unconventional energy sources (2010 – 2014)
- Scientific Grant Agency project: Virtual reality objects creating and using in raw materials extraction and treatment area (2005 – 2007);
- In 2015 TUKE organised the "Raw Materials University Day" in cooperation with general partner - European Commission.



POLITÉCNICA

Technical University of Madrid (UPM)

The Virtual Reality group at CeDInt-UPM has participated in the following projects in the area of virtual reality demonstration for educational and/or training purposes:

- EV-MIC: Multimodal, Immersive and Collaborative Virtual Environments
- COST Action - 3D Content Creation, Coding and Transmission over Future Media Networks
- ImmersiveTV: An approximation to immersive media (Ministry of Industry Tourism and Commerce, The purpose of this project is to overcome the main technical challenges hindering the integration of multisensorial and interactive content into the 3DTV value chain in order to enable a more immersive and interactive multimedia experience.
- 3DDB: Indoor multi-user markerless tracking system (Ministry of Industry Tourism and Commerce). The project goal was to develop a low-cost markerless tracking system aimed to capture and store 3D human movements to be further reproduced in a virtual environment for ergonomic studies.

National Mining University of Ukraine (NMU) - Task Partner

One of the latest projects of scientists of the National Mining University in the field of simulation models creation is the successful introduction of technological process visualization system at JSC "Zaporizhzhya Iron Ore Enterprise". The project envisages the creation of a virtual display system processes and management decisions, which are formed in the range of possible output parameters of activity. It is possible due to use of the software «SingleBlast», which was developed by the leading experts of the National Mining University. «SingleBlast» is such differ from the similar software. It is developed with Visual C ++ programming language using a powerful visual interface for the specific mining conditions. Software was carried out by stages since 2005. Up to date it makes the possibility to visualize the main processes of the enterprise during mining operations of any complexity using simulation models.





free your dimensions

i3D S.A. (i3D) - Task Partner

i3D S.A. delivers top-quality products and services of the innovative technologies. The i3D strategy is to effectively optimize resources, know-how, internal processes and obtain expertise in new technologies. The company structure enable proactive approach to the changing business environment. i3D successfully combines the R&D activities with business, creating and implementing novel projects, including those developmental ones, in advanced virtual reality technologies (HighTechVR). i3D builds the most innovative, complex application and equipment solutions on a world scale which enable interaction and full reproduction of the real world in a virtual reality. The company's activities have been appreciated by many business awards.



HUMANITARIUM
GARDENS OF EXPERIENCE

SCIENCE CENTRE

Wroclaw Research Centre EIT+ Ltd. (WRC EIT+) - Task Partner

Development of VirtualMine model mobilises the participants through working in projects and learning collaboratively. The method of design thinking is a valuable approach to be adopted during the workshop. Design Thinking is an approach to learning that focuses on developing students' creative confidence.

The project will contribute to enhancing and deepening of the interests of pupils issues in the mining industry and supporting the development of new specializations needed in the region, such as technician underground mining.

The results of the project will be implemented in Humanitarium

The project will influence development of the social innovation activities introduced in Humanitarium namely:

- the fulfilment of social needs for continuous learning and the lack of opportunities to develop, assimilate knowledge and learn new - innovative forms of education.
- Improvement in the ability of society to act through the development of available resources and better utilization. These processes entail positive changes in social relations. They arouse interest in learning, stimulate the desire to act and inspire, regardless of status, increase the participation of vulnerable population marginalized.
- Multiplication of the VirtualMine wider society learning model in the similar type of institution in the region and Poland eg.
- Discovering research talents among young people. This approach shall awaken the interest in the mining industry and the modern production process involving copper based products and explain the participants the application of science in industry.
- "Experiencing knowledge" and the effectiveness of VirtualMine workshops is also connected with the system of social values, which is improved by directing a special offer for few target groups.