

VirtualMine

as a modeling tool for Wider Society Learning

VirtualMine achievements in 2017:

- similar exhibitions and educational programs for children and youth in the world were reviewed
- the project kick-off meeting on 24-25 April 2017 in Wrocław, Poland was organized
- the reviews of available IT and multimedia technologies were carried out
- the arrangement of the exhibition was prepared
- several promotional actions of the project and educational offer in the mining area have been carried out (all project partners and task partners were involved)
- work on the assumptions of the educational program and the construction of technical exhibition module began
- additional own contribution in the form of project promotion actions and scope extension in 2017 have been made, e.g. virtual presentation of 3D mineralogical collection from Sitarjevec mine on website www.dedi.si (ZAG), design of website for promoting project results and RM educational material and activities (NTUA), collaboration with the University Camilo José Cela of Madrid for the evaluation of visual techniques and devices to enable the natural interaction of users with immersive VR environments (UPM)
- presentations of the VirtualMine project during the EIT Raw Materials University Day were held in Wrocław on September 25 and in Madrid on November 16
- the second project meeting on November 30-December 1 in Košice, Slovakia was organized
- the selection of VR applications and their substantive content have been discussed
- the final concept of the exhibition with technical guidelines and the multimedia content were jointly elaborated

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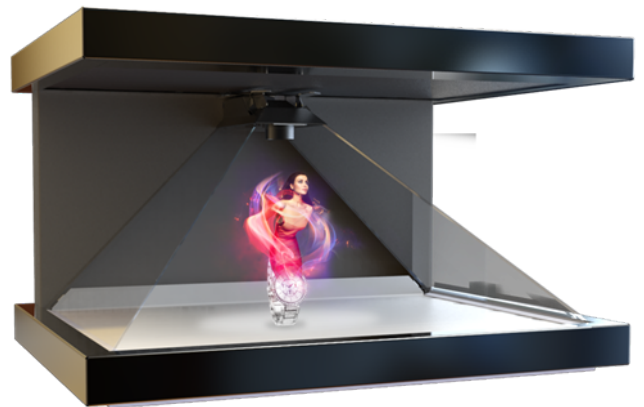
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The construction of technical exhibition module started in the field of developing the list of objects for digitalization and selection of appropriate IT tools. The multimedia part of the exhibition will consist of selected 3 Virtual Reality applications - stands:



Stand 1 – VR application (HTC Vive) - 3D visualization of the virtual mine (mining over centuries)



Stand 2 - Hologram application (Dreamoc HD3 Display) - the hologram that shows the miner in mining garment and equipment



Stand 3 - Simulation - game for children - what must be done to find different raw materials and to create items which are used in their everyday life

- as additional funding EIT Raw Materials for 2017 was provided, the following tasks were performed: most of the partners carried out additional promotional programs and actions (among others, creation movies advertising the educational offer regarding mining, intended for children for all 6 involved countries), KGHM CUPRUM in cooperation with Screen by Play prepared the innovative teaching program about mine operations with application of roboblocks and conducted pilot workshops (see page 5-6 and webpage: <http://www.screenbyplay1.usermd.net/kgbm/>)

Project website: <http://science.nmu.org.ua/en/horizont2020/virtual-mine/>

Other selected project activities:

Network with the local educational institutions:

Firm network is necessary to develop system cooperation solutions for popularization mining among general public and ultimately - to implement educational system into the practice. Collaboration activities included the following institutions, among others: Education Department of Wrocław City Hall, Copper Museum in Legnica, Ministry of Education and Science of Ukraine, University Camilo José Cela of Madrid, local Mining Institutes in Spain, University of Ljubljana, University of Primorska, High school in Sežana, Mineral Museum of NTUA-Georama, Handicraft – Industrial Educational Museum (Lavrion Technological and Cultural Park), Slovenian Museum of Natural History, Museum of Recent History in Celje, Museum in Laško, Kasárne/Kulturpark in Kosice, Rožňava Museum.

Network of the KIC institutions and selected promotional actions:

As part of establishing the network between KIC institutions, several meetings, actions and initiatives were held to develop the project internationally and also to engage other sectors (education, business, local government): Science Week (Madrid, 6th-19th November), "EIT Raw Materials: 2nd Greek Raw Materials Community Dialogue" (Athens, 23rd-24th October) - organized and jointly hosted by NTUA and the Eastern Co-Location Centre (ECLC), "The Children University" (Košice, 11th, 19th July), organizing Conference: "Ethnologist and the museum. Mining in our museums and its presentation" (Rožňava, 19th-20th September), collaboration with the EIT Raw Materials KIC partners for the hosting and preparation EIT Raw Materials University Days - in Wrocław on September 25th with the presentation by J.M. Switoń "VirtualMine as a modeling tool for Wider Society Learning" and in Madrid on November 16th with the presentation by L. Piovano "Developments in Virtual Reality and Augmented Reality", building up partnership meetings (Spišská Nová Ves, 10th October; Banská Štiavnica, 10th, 12th November), participation in 15th IEEE International Conference on Emerging eLearning Technologies and Applications (Starý Smokovec, 26th-27th October) with the paper „VirtualMine - Educational Model for Wider Society“, 5th All-Ukrainian Scientific Conference "Youth: Science and Innovations" (Dnipropetrovsk, 29th November), organizing the exhibition "ODSTIRANJA" ("STOPPING") in Laško with the works of young artists (December 4th), project presentation at "Forum of Creative Industries" - section "Innovation in Education", Researchers' Night 2017 (Athens, 29th September), collaboration at the opening of the Sitarjevec mine in Litija with the museum arrangement addressed to the mining heritage (December 3rd) with publication "DOŽIVITE RUDNIK v Srcu Slovenije!").

As additional funding EIT Raw Materials for 2017 was provided, the new project promotional actions and educational programs/exhibitions regarding RM sector were conducted. These actions and programs covered: elaboration and purchase of promotional materials (CUPRUM - the comic book for children about the use of natural resources by man throughout history and human dependence on mineral resources; ZAG - exhibition "ODSTIRANJA" ("STOPPING") in Laško, December 4th; NMU - 5th All-Ukrainian Scientific Conference "Youth: Science and Innovations", Dnipropetrovsk, 29th November), preparation and wide distribution of the movies advertising the educational offer regarding mining, intended for children and youth for all 6 involved countries (CUPRUM - Poland, TUKE - Slovakia, ZAG - Slovenia, NTUA - Greece, UPM - Spain, NMU - Ukraine), running additional workshops and partnership meetings (TUKE - Spišská Nová Ves, 10th October, Banská Štiavnica, 10th, 12th November; ZAG - Litija, Laško, regional park Sečoveljske soline, December; UPM - Mining Institutes in Spain); additional 3D visualization (ZAG - 3D visualization of post-mining Govce village), additional activities (NTUA - design of website for promoting project results and RM educational material and activities; CUPRUM - development of model of the copper mine for the exhibition).

VirtualMine 2nd Meeting - Kosice, November 30 - December 1, 2017

On November 30 - December 1, 2017 in Košice, Slovakia, a second project meeting took place. The meeting was organized by the Technical University of Košice, Faculty of Mining, Ecology, Process Control and Geotechnologies - Institute of Earth Resources. During worksessions, all project partners presented the results of activities and work related to the implementation of educational and promotional tasks by their units. The results obtained so far and work in progress as well as the objectives related to additional tasks set for the fourth quarter of 2017 and the next year have been summarized. During the meeting discussed on the range of VR applications to be a key part of the exhibition and the approach to the didactic process (education) of children and youth in the area of mining and related subjects. The subject of the discussion also included the possibility of joint participation in calls for proposals for subsequent calls to be announced by EIT Raw Materials and within Horizon2020. The organized attractions, in particular the visit to the Slovenské Opálové Bane and the participation in the traditional St. Barbara Day Celebration "Barbora 2017" at TUKE University, made a big impression on the participants of the meeting.

Thank you again and congratulations to the organizers for preparing such a constructive meeting!



Meeting participants during coffee break
(photo: G. Alexandrová)



Excavation of Slovenské opálové bane
(photo: M.Kobylanska)



Sightseeing of Slovenské opálové bane
(photo: Guide)



Sightseeing of Kasárne Kulturpark in Kosice
(photo: M.Kobylanska)

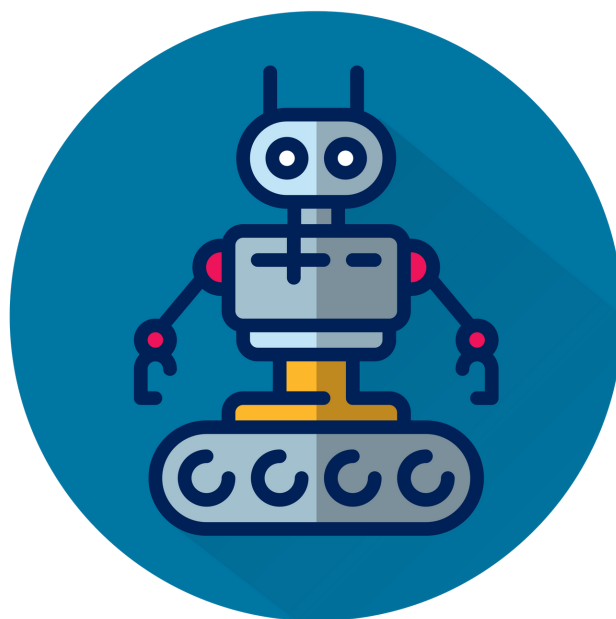
Innovative teaching program about mine operations with application of roboblocks (LEGO® Education)

The teaching program about mine operations (exploration, exploitation, transport of rocks, processing) with application of roboblocks (Lego® Education Mindstorms EV3, Lego® Education WeDo 2.0, Dash and Dot ®) for 4 robots was elaborated. Pilot workshops with application of roboblocks for over 30 children (altogether with animators' training) took place on December 19th in Humanitarium Science Centre in Wrocław, Poland. The partner of the program was Screen by Play Konrad Jurga.

During the workshops, children constructed robots: the searching robot (exploration), the drilling robot (exploitation), the crushing robot (transport of rocks) and the conveyor robot that separates the ore from the waste (processing). The workshops were also evaluated.

Website: <http://www.screenbyplay1.usermd.net/kg hm/>

Wide program distribution among the partners and stakeholders of the project will allow on a significant increase in the number of project beneficiaries (scope and impact scale of educational offer) and on an increase in quantity and quality (substantive content – technological aspects) of elaborated results which interactive workshops are.



Searching robot (photo: Screen by Play)



The construction of robots ran in groups
(photo: K.Chudy)

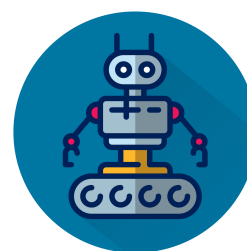


Demonstration of the operation of robots - mining machines
(photo: M.Paterek)



First successes of the workshop participants
(photo: M.Kobylanska)

*Combining learning with
fun in Humanitarium
Science Centre in Wrocław*



Crushing robot (photo: Screen by Play)



Conveyor robot (photo: Screen by Play)