

MONTENEGRO BUSINESS *outlook*

August 2016 / № 56



Montenegro on its way to EU membership

Interview with Željka Radak Kukavičić, NTO director

ProDE laboratory-new technologies on board

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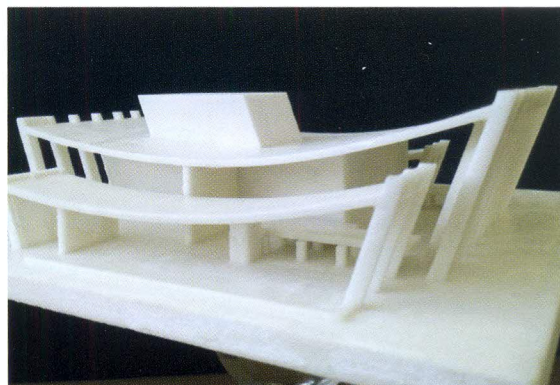
Challenges in innovation processes arise from the past, but the future is not the linear extrapolation of the past. To be able to manage the path to the unknown, a good way to carry on is by experimenting. Rapid prototyping in real-world settings, seem to be a right way to proceed.

The Laboratory for product design ProDe, is located at the University of Donja Gorica. It is equipped with the latest Rapid Prototyping equipment and includes 3D Printer-ProJet 660, 3D Scanner- Artec Eva, 3D modeling software – 3D StudioMax, Shimadzu EZ Tester - Table top 5KN universal testing machine and wide-format printer.

It is a process of manufacturing a three-dimensional solid object of virtually any form, based on a previously defined digital model. Consecutive deposits of material are placed layer by layer until the complete object is built. 3D printing equipment and materials were developed in the 1980s. By the early 2010s, the terms 3D printing and manufacturing, became a synonym for modern technologies.

The 3D Printer ProJet 660 is a powder based printer, where a model is built by binding of powder, plaster-based materials. ProJet 660 3D printer, uses the infused media to support overhangs and thin walls in the part being produced, which reduces the need for temporary auxiliary supports for the piece. The printer creates the model, one layer at a time, by spreading a layer of powder (plaster) and printing a binder in the cross-section of the part, using an inkjet-like process. The process is repeated until every layer has been printed. This technology allows the printing of full color prototypes, overhangs, and elastomeric parts.

Rapid 3D prototyping in combination with cloud computing technologies, allows decentralized and geographically independent distributed production. Cloud-based Rapid 3D prototyping refers to a service-oriented networked manufacturing model, in which 'service consumers' are capable of creating parts through 'Infrastructure-as-a-Service' (IaaS). Distributed manufacturing as such is carried out by some enterprises. Services like 3D Hubs also put people needing 3D printing in contact with owners of printers.



Scale architectural models produced in ProDe UDG Laboratory

3D printable models at ProDe UDG Laboratory may be created with a Computer Aided Design (CAD) package, or via a 3D scanner Artec Eva. 3D printed models created with CAD, result in reduced errors and can be corrected before printing, allowing verification in the design of the object, before it is built. At ProDe Laboratory at UDG, for modeling and design process, we use Solid Works and 3D Studio Max software packages.

Printing a 3D model is done from an STL file. STL – short for STereoLithography, is a file format native to the stereolithography CAD software, created by 3D Systems. The STL file is further processed by software called 'slicer', which converts the model into a series of thin layers and produces a G-code file. The G-code file contains instructions customized to a specific type of 3D printer.

The ProDe Laboratory is established under the project 'Laboratory for product design including disciplines as graphic, fashion and interior design', funded by a HERIC (Higher Education and Research for Innovation and Competitiveness) grant and financed by the Ministry of Science of Montenegro through World Bank credit. The main intention of the project is to enhance the performance of the Montenegrin economy, by creating an environment for technology transfer. The staff and students of the Faculty of Polytechnics UDG, in collaboration with national and international partners, manages the ProDe Laboratory.

The Laboratory commercialization was announced on Info Day, organized for Montenegrin companies, at UDG, on May 18, 2016. ■



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