

INDUSTRY 4.0 - INNOVATION & INVESTMENTS

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Abstract: Industry 4.0 - Innovation & Investments panel was attended by moderator and 4 speakers who represented all segments covered by the conference: Academia, Industry and Societies. Various topics were discussed, such as: education and research in the context of Industry 4.0, readiness of Serbian industry for the application of Industry 4.0, Industry 4.0 and industrial policy, digitization in large organizations in Serbia and platform Industry 4.0 for Serbia.

Keywords: Industry 4.0, education, industrial policy, national platform

1. PANEL: INDUSTRY 4.0 – INNOVATION AND ECONOMIC GROWTH

Moderator: Prof. Dr. Radivoje Mitrović, Dean, Faculty of Mechanical Engineering, Belgrade discussed about activities of the Faculty of Mechanical Engineering in education and research in the context of Industry 4.0. In the introduction, Mitrović explained the basic concept of Industry 4.0 and listed the activities of the Faculty of Mechanical Engineering in the field of engineer education, research, and development of Industry 4.0. On October 1, 2020, the Faculty of Mechanical Engineering introduced Industry 4.0 Master Studies, whereas there are several subjects in this field at undergraduate, master's and doctoral studies. There are also several projects regarding Industry 4.0 that the Faculty of Mechanical Engineering is working on.

Participants: Prof. Dr. Vidosav Majstorović, Faculty of Mechanical Engineering, Belgrade discussed about readiness of Serbian industry for the application of Industry 4.0. Majstorović presented research on this topic, which included 49 SME

production organizations from Serbia. A developed model with ten criteria was presented, which showed that organizations are most ready / interested in the application of this model in production, then in procurement, sales, product, and technology design, etc. Strategy Criterion was the lowest ranked, which means that the awareness of the importance of Industry 4.0 for the organization is not acceptable to the top management of the same.

Prof. Dr. Dragan Đuričin, Faculty of Economics, Belgrade discussed about Industry 4.0 and industrial policy. Đuričin talked about the model of national industrial policy in the conditions of the Covid 19 pandemic for the application of Industry 4.0. He especially emphasized the importance of the so-called "Double we" model for managing economic growth of the country's economy, which is based on supporting the growth and development of the ICT-based sector, which includes Industry 4.0 with the application of this concept and in production with new added value.

Vojin Vukadinović, Director of IT Sector, Company Metalac, Gornji Milanovac discussed about digitization in large organizations in Serbia. Vukadinović presented the Digitalization Project of Metalac. It has the following modules: CAD / CAM, PLM, SCM, CRM, ERP, MES, finance and bookkeeping. These modules make up the Industry 4.0 model infrastructure for this organization. Work is now underway to develop and implement IoT for work order management.

Vidosava Džagić, PKS-PKB, Belgrade discussed about platform Industry 4.0 for Serbia. Džagić presented the framework and elements of the National Platform for Industry 4.0, which was adopted at the AMP Conference in 2019, on Industry 4.0 organized by Faculty of Mechanical Engineering in Belgrade.

2. INDUSTRY 4.0 - HISTORY OF DEVELOPMENT IN SERBIA

Industry 4.0 has become a global international project today, and it all started in 2011, when the Program of Scientific and Technological Development of German Industry called *Industrie 4.0* was presented at CEBIT in Hanover.

Today, in March 2021, 37 most industrialized countries in the world have their national programs: Europe (21), America (5), Africa (1), Asia (8) and Oceania (2).

The Faculty of Mechanical Engineering in Belgrade has initiated and held five Conferences since 2016 - International Conference on the Industry 4.0 model for Advanced Manufacturing - AMP I4.0. Proceedings were published by Springer¹.

Serbia adopted its national Program for Industry 4.0 on June 6, 2019, at the 4th International Conference on the Industry 4.0 model for Advanced Manufacturing - AMP I4.0 2019, entitled: Digital Platform for Industry 4.0 in Serbia.

So far, the Faculty of Mechanical Engineering in Belgrade with its partners (Ministry of Education, Science and Technological Development, Ministry of Economy, Ministry of Defence, PKS, PKS-PKB, Faculty of Technical Sciences in Novi Sad, Faculty of Mechanical Engineering in Nis, Science and Technology Park from Belgrade, Faculty of Mechanical Engineering and Civil Engineering from

¹ <https://link.springer.com/book/10.1007/978-3-030-46212-3>

Kraljevo, Faculty of Engineering, Kragujevac, Faculty of Economics in Belgrade, Institute “Mihajlo Pupin”, Institute “Vinča”, and others) held 29 Panels on Industry 4.0 (see Table 1 and 2).

Table 1: Overview of the number of participants in the Panels by venue.

<i>No.</i>	<i>Name and venue</i>	<i>Number of panels</i>	<i>Date</i>	<i>Number of participants</i>
1.	Faculty of Mechanical Engineering, Belgrade	6	2015 – 2019	215
2.	The International Conference on the Industry 4.0 model for Advanced Manufacturing - AMP 14.0, Belgrade	5	2016 – 2020	190
3.	Faculty of Mechanical Engineering, Niš	1	December 2017	35
4.	Science and Technology Park, Belgrade	1	June 2018	45
5.	International Conference IRMES, Trebinje	1	February 2018	60
6.	Faculty of Technical Sciences, Novi Sad	1	March 2018	50
7.	International Conference IIEP, Zlatibor	1	June 2018	95
8.	Company “Metalac”, Gornji Milanovac	2	April 2018, October 2019	120
9.	Company “Sloboda”, Čačak	1	February 2019	85
10.	International Conference Danube Strategy, Novi Sad	1	September 2019	55
11.	Kopaonik Business Forum	2	March 2019, March 2020	190
12.	Faculty of Mechanical Engineering and Civil Engineering, Kraljevo	1	November 2019	65
13.	Faculty of Engineering, Kragujevac	1	December 2019	40
14.	Technical Faculty, “Mihajlo Pupin”, Zrenjanin	1	January 2020	65
15.	Regional Chamber of Commerce of Rasina Administrative District, Kruševac	1	February 2020	70
16.	International Conference "SEE Universe 2020" Belgrade (online)	1	October 2020	65
17.	Company “Inmold”, Požega (on site + online)	1	October 2020	95 ²
18.	Faculty of Technical Sciences, Science and Technology Park, Čačak (online)	1	November 2020	55 ³
19.	Technical Faculty, Bor (online)	1	April 2021	61
	Total	29		1656 + 686^{2,3}

² Additionally, 189 views on YouTube until 28.11.2020.

³ Additionally, 497 views on YouTube until 28.11.2020.

Topics discussed at the Panels were:

- Industry 4.0 - basics and models,
- Industry 4.0 and new industrial policies in the world - an overview,
- New Industrial Policy of Serbia,
- Industry 4.0 and intelligent products,
- Industry 4.0 and the Internet of Things,
- Industry 4.0 and large data set analysis,
- Industry 4.0 for SMEs,
- Industry 4.0 and engineer education,
- Industry 4.0 and the rapid growth of the industry,
- National programs for Industry 4.0,
- Digital platform for Industry 4.0 in Serbia,
- Digitization in Serbian industry - examples,
- The path from idea to finished products through the process of digitization,
- Industry 4.0 in the process industry,
- Education for Industry 4.0,
- Industry 4.0 and accelerated economic development of Serbia,
- Industry 4.0 and Space exploration,
- Industry 4.0 - an example of best practice Inmold, Požega,
- Industry 4.0 - examples of best practice from the economy of Čačak,
- Industry 4.0 - examples of research at TF Bor, application in mining, medicine and dentistry.

Table 2: Overview of the number of participants in the Panels according to stakeholders

No	Panel - Stakeholder	Number of Participants	Percentage
1.	Academia (Faculties, Institutes), Educational institutions, NGOs	455	28 %
2.	Decision makers (Government, Ministries, Chamber of Commerce)	185	10 %
3.	Economic sector	1031	62 %
	Total	1671	100 %

Today we can proudly say - INDUSTRY 4.0 LIVES IN SERBIA!

Next panels to be held:

1. 30. online Panel I4.0 – FEFA faculty, Belgrade – 20th April 2021.⁴
2. 31. online Panel I4.0 – Kopaonik Business Forum – 25th May 2021.⁵
3. Planned Industry 4.0 Panels are: Bilateral Panel Serbia - Slovakia, Bilateral Panel Serbia - Germany, Bilateral Panel Serbia - Slovenia, University of Novi Pazar; Faculty of Dental Medicine in Belgrade, and others.

Welcome to Industry 4.0 in Serbia - more information at
www.mefics.org or www.mas.bg.ac.rs.

⁴ <https://www.fefa.edu.rs>

⁵ <https://www.kopaonikbusinessforum.rs/speakers>