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# MIND

Erasmus+ strategic partnership for Higher Education  
**DEVELOPMENT OF MECHATRONICS SKILLS AND INNOVATIVE  
LEARNING METHODS FOR INDUSTRY 4.0**

## E1 REPORT

<b>Project Title</b>	<b>Development of mechatronics skills and innovative learning methods for Industry 4.0</b> <b>2019-1-RO01-KA203-063153</b>
<b>Output</b>	<b>E1 – MIND Platform for learning new skills in mechatronics within the network for Industry 4.0</b>
<b>Date of Delivery</b>	<b>September 2021</b>
<b>Authors</b>	<b>Erwin-Christian Lovasz, Corina Gruescu (UPT)</b>
<b>Version</b>	<b>V1, 14.09.2021</b>

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## 1. Description of MIND Project

EU founded Erasmus+ project MIND (Development of mechatronics skills and innovative learning methods for Industry 4.0, Project Reference: 2019-1-RO01-KA203-063153) follows the main objectives:

1. Determine the most frequent mechatronics skills necessary for Industry 4.0 in the partner nations' regions.
2. Raise students' employability, relevant knowledge, and competencies by taking into account the demands of firms implementing Industry 4.0 principles.
3. Construction of an online e-learning platform that will support courses and learning materials on cutting-edge industrial issues will improve the learning experience of teaching staff and students.
4. Enhance and build cross-sector synergies through collaboration between higher education institutions and private sector representatives with the goal of closing the gap between company needs and real capabilities acquired through higher education curriculum.

The activities planned during the project development include more multiplier events, organized by different partners.

## 2. Summary of the multiplier event

On the project timeline, the Multiplier event (E1) was scheduled for March 2020. According to the recommendation of the National Erasmus Agency, due to pandemic and restrictions imposed with it, the event was postponed. It was rescheduled for 25<sup>th</sup> February 2021. It was organised by the Romanian partner University Politehnica Timisoara and was held as an online event. The main target of the event was the dissemination of results obtained in the IOs of the project.

The audience consisted of industry experts affiliated to regional companies and academic staff. The purposes of the event were:

1. Presentation of Project MIND. Mechatronics competences and skills and innovative learning methods for Industry 4.0.
  2. Presentation of the results of Intellectual Output IO-1 MIND
  3. Presentation of the results of Intellectual Output IO-2 MIND
  4. Presentation of the results of Intellectual Output IO-3 MIND.
- Lecture: Smart Manufacturing and Automation with Industry 4.0  
Lecture: Smart Manufacturing and Automation with Industry 4.0  
Lecture: Implementation of new manufacturing technologies and systems for Industry 4.0.

The schedule of the event is presented in the following table:

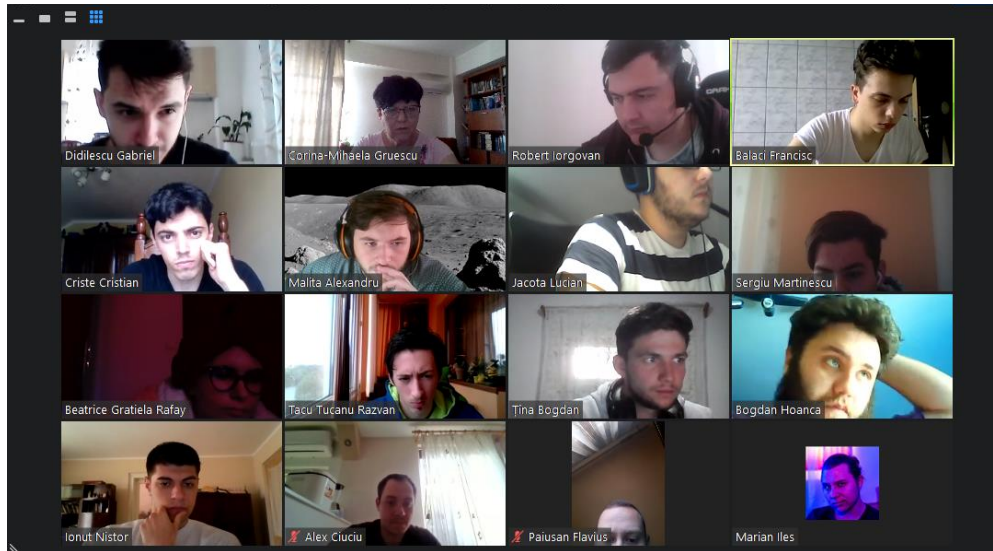
18:00–18:20	Opening session. Presentation of Project MIND. Mechatronics competences and skills and innovative learning methods for Industry 4.0.
18:20-18:40	First session. Presentation of the results of Intellectual Output IO-1 MIND. Mapping and scientific literature review on the mechatronics skills for Industry 4.0
18:40-19:00	Second session. Presentation of the results of Intellectual Output IO-2 MIND. MIND Curriculum
19:00-19:20	Third session. Presentation of the results of Intellectual Output IO-3 MIND.

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	Lecture: Smart Manufacturing and Automation with Industry 4.0
19:20-19:40	Fourth session. Presentation of the results of Intellectual Output IO-3 MIND. Lecture: Implementation of new manufacturing technologies and systems for Industry 4.0
19:40-20:00	Fifth session. Feedback and final remarks. Conclusions

The Multiplier event was planned to have five main presentations which were held by the UPT representatives. The presentations were focused on Mind outputs description.



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Setting

## Intellectual Output IO-2 MIND Curriculum

**MIND. DEVELOPMENT OF MECHATRONICS SKILLS AND INNOVATIVE LEARNING METHODS FOR INDUSTRY 4.0**  
E1: First Multiplier Event  
Timisoara, 25.02.2021

Lecture	Content of course	Content of project	Developed by
<b>Smart Manufacturing and Automation with Industry 4.0</b>  42 hours/sem. (20C - 14P) 4 ECTS credits	Introduction - general concepts of smart manufacturing for Industry 4.0. Smart manufacturing paradigms, Machine networking, Smart equipment. Advanced robotics, New manufacturing concepts, Connected devices and services, Big data & machine learning. Product traceability, Real-time production scheduling, Quality assurance & quality control. Communications and technology overview for complementing machine automation, M2M communication standards. The role of CV/ML in smart manufacturing. Smart maintenance - the key to keep a factory in top condition. Examples of smart manufacturing in other areas. Smart manufacturing for the energy-save challenge. Examples of Smart Manufacturing for manual processes. Adaptive pick by light.	Project thematic selection State of the art exposé Proposed solution selection Proposed solution description Project compiling and writing Project presentation and grading	University Politehnica of Timisoara

### 3. Attendance

For inviting participants, e-mails were sent directly to regional companies who could be interested in the project and to academic staff and students. The invited participants received an invitation with the agenda and a feedback questionnaire, per e-mail.

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Project Nr:  
2019-1-RO01-KA203-063153

**ERASMUS+ Strategic Partnerships for Higher Education**  
**MIND - Development of mechatronics skills and innovative learning**  
**methods for Industry 4.0**  
**2019-1-RO01-KA203-063153**  
**First Multiplier Event –E3**

Thursday 25 February 2021

- 18:00 – 18:20 Opening session** **Presenter: Prof. Lovasz Erwin-Christian**
1. Presentation of Project MIND. Mechatronics competences and skills and innovative learning methods for Industry 4.0.
  2. Session of Q&A.
- 18:20-18:40 First session** **Presenter: Prof. Lovasz Erwin-Christian**
1. Presentation of the results of Intellectual Output IO-1 MIND.  
Mapping and scientific literature review on the mechatronics skills for Industry 4.0
  2. Session of Q&A
- 18:40-19:00 Second session** **Presenter: Prof. Gruescu Corina Mihaela**
1. Presentation of the results of Intellectual Output IO-2 MIND.  
MIND Curriculum
  2. Session of Q&A
- 19:00-19:20 Third Session** **Presenter: Prof. Valentin Ciupe**
1. Presentation of the results of Intellectual Output IO-3 MIND.  
Lecture: Smart Manufacturing and Automation with Industry 4.0
  2. Session of Q&A
- 19:20-19:40 Fourth Session** **Presenter: Prof. Carmen Sticlaru**
1. Presentation of the results of Intellectual Output IO-3 MIND.  
Lecture: Implementation of new manufacturing technologies and systems for Industry 4.0
  2. Session of Q&A
- 19:40-20:00 Fifth Session** **Presenter: Prof. Lovasz Erwin-Christian**
1. Feedbacks and final remarks
  2. Conclusions
- 20:00 End of the sessions**

The following companies were present at the event:

- Mitsubishi Electric, Timisoara
- Honeywell, Lugoj
- Heraeus Romania, Timisoara
- Robsol, Timisoara
- Hamilton Central Europe, Timisoara
- Kromberg & Schubert, Timisoara
- Continental, Timisoara
- Continental Automotive, Timisoara

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- Contitech, Timisoara
- Vitesco Technologies, Timisoara
- Emerson Electric, Timisoara
- Hennlich, Timisoara
- Drass Romania, Timisoara
- Hella Romania, Timisoara
- Hella Romania, Lugoj
- C&A Logistic, Timisoara
- IFB Finwest, Timisoara
- Obrist Eastern Europe, Timisoara
- Ortokinetica VMC, Timisoara.

The list of the attendees during the multiplier event (E1) is presented below.

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#### 4. Questionnaire/Inquiry data and results

The attendees were kindly asked to complete anonymously the following questionnaire. In this questionnaire were included questions about the organizational part of the event, about the materials that were presented and the overall impressions about attending the Multiplier Event E1. Also, the attendees could give suggestions about the aspects that can be improved.



*Chestionar privind Evenimentul de multiplicare organizat de Universitatea  
Politehnica Timisoara, 25.02.2021*

Tipul evenimentului	Eveniment de multiplicare
Organizator	UPT – Universitatea Politehnica Timisoara
Data	12 Februarie 2021
Locul de desfasurare	On line

**Instructiuni:** Va rugam indicate in ce masura sunteti de acord cu enunturile de mai jos, pe o scara de la 1 la 5, pe care:

- 1 – Dezacord puternic      3 – Indiferent      5 – Acord puternic  
2 – Dezacord                  4 – Acord

##### A. Obiectivele evenimentului de multiplicare

Enunt	Scor				
	1	2	3	4	5
1. Obiectivul de deseminare a realizarii din proiect a fost atins					
2. Prezentarile au reflectat corect tematica proiectului					
3. Temele prezentate sunt consistente din punct de vedere tehnic si didactic					
4. Continutul a fost bine organizat si usor de inteles					
5. Am dobandit cunostinte noi si utile profesional					

##### B. Organizarea evenimentului

Enunt	Score				
	1	2	3	4	5
6. Evenimentul a fost bine organizat, din timp si cu invitatie personala pentru participanti					
7. Structura agendei a fost logica si bine organizata cronologic					
8. Participarea interactiva a fost incurajata					
9. Timpul alocat discutiilor a fost suficient					

10. Ce v-a placut in mod deosebit la acest eveniment in ceea ce priveste continutul sau oragnizarea?

11. Ce aspecte ale unui astfel de eveniment considerati ca pot fi imbunatatite?

12. Va rugam sa transmiteti comentarii sau sugestii relative la aspecte care nu au fost acoperite de intrebarile de mai sus.

**VA MULTUMIM PENTRU RASPUNSURI!**

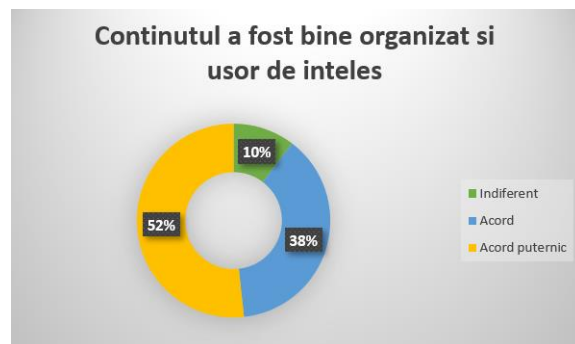
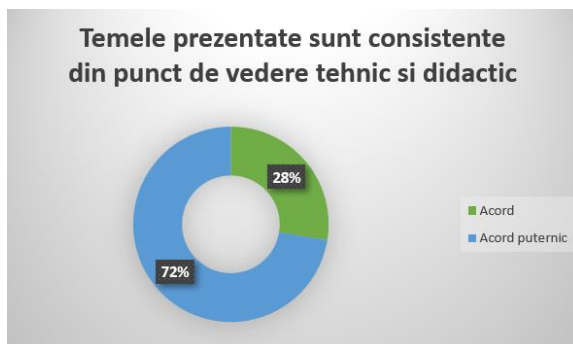
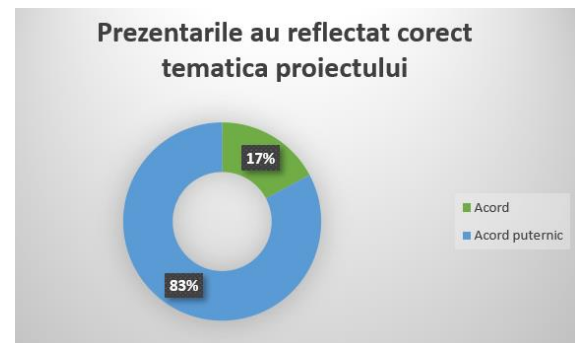
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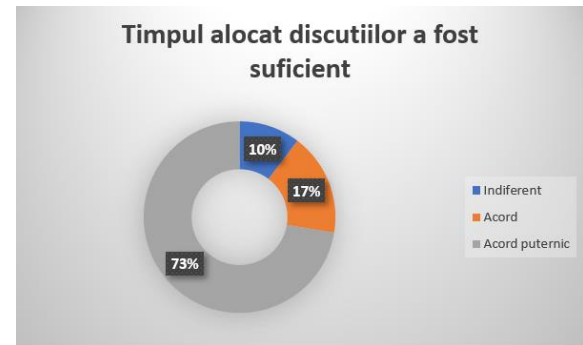
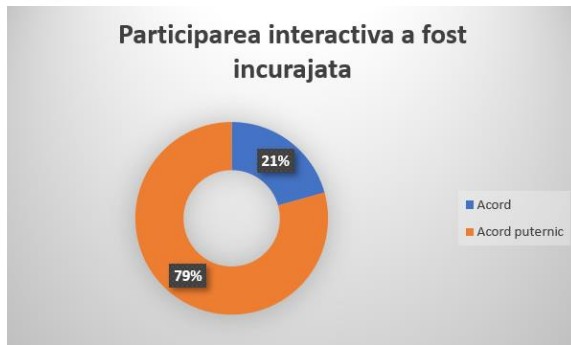


A total of 39 participants completed the feedback questionnaires and the result is presented in the following graphs.



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Several comments of the participants are given bellow:

- Mi-a plăcut faptul că se dorește ca, prin introducerea acestor concepte de industry 4.0 în universități, șansele studenților să își gasească un loc de muncă să crească considerabil.
- Ceea ce m-a atras cel mai mult la această prezentare a fost ideea folosirii acestei noi tehnologii pentru a crea proteze în cadrul proteticii.
- Prezenta invitatilor in primul minut, respectarea programului planificat.
- Mi-a placut in mod deosebit faptul ca se acorda aceste noi oportunitati tuturor studentiilor.
- Timpul a fost structurat foarte bine încât să nu plictisească studenții, iar conținutul a fost ușor de înțeles și concis.
- Continutul evenimentului aduce in prim plan concepte, ideologii si situatii din tendintele de dezvoltare a fabricilor moderne.
- Mi-a plăcut faptul că a fost abordat subiectul automatizării și conceptul de smart industry, care consider că sunt importante pentru dezvoltarea producției.
- Continutul a fost prezentat foarte bine, mi-a captat atentia si mi-a deschis noi orizonturi spre dezvoltarea profesionala.
- Continutul si accesibilitatea a fost la îndemana. Claritatea si calitatea a fost foarte buna din punct de vedere al prezentarii.
- În ceea ce privește conținutul, am fost interesat de informația prezentată în modulul 6 despre proiectarea și imprimarea 3d
- Mi-a plăcut în mod deosebit la acest eveniment faptul că a fost bine organizat, conținutul a fost bine prezentat și ușor de înțeles.
- Subiectele au fost interesante si de actualitate, prezentarile au fost foarte bine realizate.
- Mi-a plăcut în mod deosebit interactivitatea și abordarea practică a subiectelor.
- Consider că evenimentul a fost foarte bine organizat.
- Aș fi dorit un dialog deschis cu participantii, de o durata mai lunga.
- Am fost foarte placut impresionat de continutul si de prezentarea acestui eveniment.
- Crearea de parteneriate între insituții pentru diseminarea cât mai puternică a informațiilor transmise.
- Prezentările se puteau face mai aerisite și mai dinamice cu mai multe imagini și videouri. Unele slide-uri au fost foarte încărcate cu informații.
- Sunt de parere ca aceste prezentari ar fi mai interactive sustinute fizic, dar avand in vedere situatia, evenimentul s-a desfasurat intr-un mod frumos si in online.

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## 5. Conclusion

The results of the questionnaire show that the attendees were mostly satisfied with the organization part of the event, the objectives of the Multiplier Event were clearly presented and achieved at the end of the event.

Also, the materials of the presentations were well structured, and it was easy to follow the aspects that were discussed, even for the participants that weren't familiar to Mechatronics and Industry 4.0.

It needs be mentioned that plenty of questions were received during the Q&A session after the presentation about the MIND Platform and didactic videos, that shows the interest of the participants for the results of the intellectual outputs presented during the event. The attendees were motivated to try the platform and develop new mechatronic skills, that are needed for integration of the Industry 4.0 in the companies that didn't adopt this technologies yet, or are at the beginning of this process.

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