

## Knowledge Alliance “IE3 – Industrial Engineering and Management of European Higher Education ”

29<sup>th</sup> June 2020

AGENDA 29/06/2020		
Timing	Topic	Responsibility/Participants
14:30 – 14:40	Welcome greetings and presentation of the agenda	PoliBa and ValueDo
14:40 – 15:10	WP1: <ul style="list-style-type: none"> <li>Discussion on the final version of R1.3 "Report on education &amp; training convergences and divergences and company good practices in IE&amp;M" and official validation</li> <li>Planning in of next steps for concluding WP1</li> </ul>	PUT
15:10 – 15:40	Revision of the work done in WP2: targets reached and first findings	PoliBa
15:40 – 16:10	R2.3 Training Needs Analysis: main aims and proposal for the structure of the report	PoliBa
16:10 – 16:30	Coffee Break	
16:30 – 17:00	R2.4 Body of Knowledge: brainstorming on the general structure and contents of the report	PoliBa
17:00 – 17:20	WP8 - Planning external evaluation by experts on ML3 – Body of Knowledge	UPM
17:20 – 17:30	Planning of next steps for WP2	Poliba/Valuedo

### List of participants

- Politecnico di Bari (**POLIBA**) represented by Giovanni Mummolo, Francesco Facchini, Salvatore Digiesi and Giorgio Mossa;
- Linköping University (**LIU**) represented by Janerik Lundquist;
- Universidad Politécnica de Madrid (**UPM**) represented by Joaquín Ordieres;
- Poznań University of Technology (**PUT**) represented by Marek Fertsch, Joanna Oleśków-Szłapka and Agnieszka Stachowiak;
- ValueDo (**VALUE**) represented by Alessandro Guadagni and Giuditta Pasta;
- INFOTECH (**INFO**) represented by Gianluigi De Pascale;
- TECNOLOGIE DIESEL (**TDIT**) represented by Felice De Stena Felice, Paolo Ciannamea, and Paolo Scarpetta
- Implema (**IMPLE**) represented by Eskil Rehme;
- Arruti (**ARRU**) represented by Carlos J. Urueña;
- **ESTIEM** (Associated partner) represented by Joao Oliveira Duarte and José Dinis Cardoso

Mummolo (PoliBa) presents the agenda. The first point to be discussed is the final version of R1.3 "Report on education & training convergences and divergences and company good practices in IE&M" and its official validation.

**WP1: discussion on the final version of R1.3 "Report on education & training convergences and divergences and company good practices in IE&M" and official validation**

Stachowiak (PUT) takes the floor and gives a presentation ([here full version](#)) on WP1 starting from the tasks carried out and the results obtained. Stachowiak presents also an additional section for R3.1 in which PUT has analyzed the results gathered during the interviews adopting a data-mining approach. PUT team has adopted an analytical methodology starting from a simple question: what is I4.0 and which are the elements that characterize it?

Furthermore, during its research, PUT team was able to reach many countries and this made the research pretty complete and exhaustive. Generally, there are core clusters identified within the course content covering [*the convergences*]: automation issues; innovation; industrial robots; virtual reality; data analysis. On the other hand, the least often used terms [*the divergences*] suggest that the gap in courses offered content includes the following topics: functions; robot; resources management; artificial intelligence; data mining; logistics; strategies; technical aspects; CAD.

According to research conducted by PUT, it emerged that:

- I4.0 is a well recognized research subject
- HEIs understand the importance of I4.0
- Companies strive for I4.0 implementation
- Some topics are well covered by courses
- On the other hand, some topics should require more attention. Among these:
  - o Functions (regression, linear, discrete=
  - o Robot
  - o Resources management
  - o Artificial intelligence
  - o IoT
  - o Data mining
  - o Logistics
  - o Strategies
  - o Technical aspects
  - o CAD
  - o fog computing
  - o CPW

PUT shares also further research questions that could raise after WP1 activities:

- What are the causes of the gaps identified?
- Do the offered contents meet the expectation of stakeholders (students, alumni, companies) in terms of quality?
- What are the future trends and development directions in the industry that HEIs' offer should align with?

Stachowiak specifies that what we have now is the state of the art to date and that the entire document is present in the WP1 folder on GoogleDrive [here](#). Comments and improvement suggestions from all the partners are more than welcome.

Lundquist (LIU) points out that the title of the report is unclear because - for an external reader - it may be difficult to understand what divergences and convergences the report refers to. The reference to I4.0 is missing; it must be made more visible.

Guadagni (VALUE) points out that R1.3 is a public result and, therefore, will be shared on the official website. For the version that will be made public, it could be effective to define another title, more attractive and easier for the wide public. PUT will suggest some titles by email and the partners will select among them to the most effective one.

Finally, the partners agree on the following deadlines:

- All the partners to provide suggestions and comments on the final version of R1.3 (uploaded on GDrive [here](#)) by 10.07.2020
- PUT to deliver the final version of the document for internal purposes by 31.07.2020
- Infotech to work on the editing of the document, including a cover page by 11.08.2020

### **Revision of the work done in WP2: targets reached and first findings**

Digiesi (PoliBa) presents the target numbers reached for the 4 stakeholders surveyed. The results are updated to 19.06.2020, even if the surveys for students was kept open for some additional days. Full presentations, one for each stakeholder, can be found [here](#). The maps used in the presentations are at the following [link](#).

In respect to the target established the partners reached the following results:

- Companies: 156%
- Professors: 114%
- Students: 46%
- Alumni (additional target group): 144%

All the targets were reached and overcome, except for the students. In this case, the target number to reach was really ambitious (800 answers) and the specific period when the survey was conducted, coinciding also with the close of Universities due to the pandemic emergency, didn't help. By the way, having added alumni as an additional target group, we have reached other students that have already started working in companies and they gave a very interesting and innovative perspective on the topic. All the partners are satisfied with the target reached and for the fruitful collaboration had with the associated partners, especially ESTIEM and AIM.

During the presentations, the partners have a deep discussion on the first data collected. The main points are summarized in the following lines.

Digiesi points out that when we talk about "offer" in the case of companies we are referring to the internal training offer that the companies give to their employees.

Duarte (ESTIEM) thinks that companies will always demand mostly soft-skills, even though the partnership might go for more targeted and narrow research. This has been ESTIEM's prediction for the last 5 years. Ciannamea (TDIT) agrees with Duarte: large companies are always oriented to soft skills as a base for the team working. Nevertheless, they are interested to the new technologies and the technical basis for the people to hire. Of course, specialist skills, needed for specific business oriented will be deepened internally.

Stachowiak (PUT) underlines that this research from PoliBa will be useful also for R1.3 as some of the information gathered in companies' offer could be included in that report as well.

Referring to the proposal of PoliBa of going more into details with the analysis of the data gathered with the questionnaires, Lundquist (LIU) suggests not concentrating too much on details, as the data already gathered are relevant and should be enough for taking our decisions, but put more effort on their correct interpretation. We must be aware of the characteristics which make IE&M unique with respect to the other Engineering curricula (such as computer science and Mechanics) and focus on this for understanding how we should renew it, respecting its original spirit. The main question could be: what is characteristic of that kind of program? We should learn from students and alumni what they miss. Are the soft skills more important for them than other hard skills/knowledge? The IE&M is unique in Europe and we should keep it unique, our focus must be on a unique program throughout Europe

Mummolo (PoliBa) agrees with Lundquist: the general idea is to keep the analysis as wide as possible as we have a significant sample to consider and highlighting the information that will help us in defining the Body of Knowledge.

Concerning the main aspects that emerged for the initial research, Digiesi (PoliBa) remarks that skills for which the gap is higher are communication skills, entrepreneurship and leadership. The partnership should take these aspects, which will be better detailed in the R3.2 – Training needs analysis, into consideration when defining the contents of the revised training courses. However, considering that in the first analysis target groups are referring to some of those that are called soft skills, the partners start a discussion on this specific point.

Stachowiak (PUT) points out that the technical skills are changing at speed pace, while the soft skills are expected to remain the same, but it is difficult to learn them by themselves. Consequently, it could be an interesting understanding of how to better embed them in the courses offered in IE&M.

Ciannamena (TDIT) thinks that soft skills are something that companies can provide or offer in terms of training; while technical skills are something that the future workers should learn at the University.

Duarte (ESTIEM) underlines that soft-skills are the clear winner in terms of the gap and he asks if we have data to rank them in terms of importance and if we know which skills are the most important to include in the new subjects. These results depict reality; the students do not feel to have soft skills acquired. The key question could be the following: how to teach students them? Including them as a training methodology for teaching the defined training content.

Partners agree that soft skills can be learned, trained and taught, but their training process is long. Also, the most effective way for training learners in this work is to adopt innovative and different methodologies when delivering the courses. For instance, methodologies as “flipped-classroom”, micro-learning, project-based learning, etc. On the other hand, the life process of hard skills is shorter than the one for soft skills and the most important thing is to maintain a balance between them.

Mummolo (PoliBa) concludes that when analyzing the data and commenting on them we should always keep in mind the importance of Industry 4.0 paradigm for the IE&M curriculum.

As far as additional and further analysis is concerned the partners propose the following:

- to compare the answers of the alumni with the ones of the companies, as this could give interesting suggestions for the training need analysis
- to compare the results from the students that have completed the 2<sup>nd</sup> semester and those who have completed the full course (4<sup>th</sup> semester).

Partners decide to stop the collection of the answers today, the next step will be the formalization of the results already collected in a full detailed report.

Digiesi (PoliBa) presents the overall structure of the R2.3 Training Needs Analysis, underlying its main aims and proposing a structure for the report ([full presentation here](#)).

At the end of the presentation, the partners agree on the following deadlines concerning WP2:

- PoliBa to complete the draft analysis (ppt format) of the survey results for the 4 target groups by **15.07.2020**;
- All the partners to provide feedback to PoliBa on the contents of the draft analysis by **22.07.2020**;
- Poliba to prepare the first version of R2.3 - Training need analysis by **31.08.2020**;
- All the partners to provide feedback on the contents R2.3 taking into account their experience and knowledge by **15.09.2020**;
- PoliBa to deliver the final version of R2.3 by **30.09.2020**.

As the partners did not manage to discuss all the points of the agenda, they decide to start the second session of the meeting from this point and they agree to fix further sessions if needed.