

WP2 - Training need analysis and definition of the BoK on IE&M

Action Plan for the Survey on Academics, Alumni, Students, and Companies



Co-funded by the
Erasmus+ Programme
of the European Union

The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

DOCUMENT VERSION 01

AUTHORS

Giovanni Mummolo
Giorgio Mossa
Salvatore Digiesi
Francesco Facchini

Summary

1. Introduction	3
2. National Coordinator in each Partner Country	3
3. Content and Structure of the Questionnaires.....	4
4. Methodologies, Technique, and Tools.....	6
5. Target to be reached.....	8
6. Data collection period.....	9
Annex I.....	10
Annex II.....	19
Annex III.....	29
Annex IV	39
Annex V.....	47

1. Introduction

In WP2, in order to define the Body of Knowledge in Industrial Engineering and Management (IE&M), four surveys have been designed. They are addressed to Academics, Students, Alumni, and Companies. The aim of the surveys is to evaluate the training needs and the gap between the industry needs in implementing I4.0 paradigm and the Master Level Academic Programs in the field of IE&M offered by European Universities.

This document has been prepared in order to provide partners a reference for carrying out the surveys, and to summarize key information concerning the task.

2. National Coordinator in each Partner Country

Each project partner identified a responsible for WP2. They are in the “Quality Assurance Plan” of the project. In Tab. 1, they are listed with the reference person of associated partners of the project involved in WP2. Project partners listed in Tab.1 will be actively involved in the surveys.

Project Partner	Name and Surname	Email address
POLIBA	Francesco Facchini	franceco.facchini@poliba.it
LIU	Janerik Lundquist	jel@ipe.liu.se
UPM	Joaquín Ordieres	j.ordieres@upm.es
PUT	Joanna Oleśków Szlapka	joanna.oleskow-szlapka@put.poznan.pl
VALUE	Alessandro Guadagni	aleguadagni@gmail.com
INFO	Gianluigi De Pascale Francesco Paolo Contò	progetti.infotech@gmail info@infotechsrl.net gianluigi.depascale@gmail.com
TDIT	Claudio Giuseppe Scarpetta	claudio.scarpetta@it.bosch.com
IMPE	Eskil Rehme	eskil.rehme@implema.se
ARRUTI	Carlos Urueña	ceo@suhalur.com
ALCO	Maria Łuczak	finanse@alco-mot.pl
AIM	Giovanni Mummolo	giovanni.mummolo@poliba.it
ESTIEM	Joao Oliveira Duarte	djco1997@hotmail.com

Tab. 1 – WP2 reference contacts

3. Content and Structure of the Questionnaires

Questionnaires have been designed in order to evaluate the training needs and the gap between the industry needs in implementing I4.0 paradigm and the Master Level Academic Programs in the field of IE&M offered by European Universities. A questionnaire has been designed for each stakeholder identified (Academics, Students, Alumni, and Companies). The four questionnaires are in Annex I to IV.

Structure and content of all questionnaires are based on:

- results obtained in WP1 from syllabi collection and analysis;
- results obtained in WP2 from semi-structured interviews carried out by project partners with companies;
- discussions with all partners of the project;
- feedbacks received from partners during the test phase of the questionnaires.

The common structure of the four questionnaires is in Fig. 1 and is discussed in the following.

Introduction to IE3 Erasmus+ Project
Disclaimer
General information
A. Learning skills and competencies A.1 Knowledge, skills and competencies A.2 Operational tools Digital Technology Competencies Analytical skill Competencies
B. Learning environment B.1 Knowledge Transfer Methodology B.2 Learning activities (*)

Fig. 1 – Structure of the questionnaires; (*) = not in the questionnaire for Companies

In the first part of the questionnaire (“Introduction to IE3 Erasmus+ Project”), basic information on the project as well as all links to official web resources (project website, Facebook and LinkedIn project accounts) are provided.

In the section “Disclaimer”, mandatory information as per GDPR 2016/279 are provided. Moreover, in this section the responder is invited to insert his/her email address in order to receive results of the survey and to register to the project newsletter in order to stay updated on project development.

In the section “General information” responder is asked for anonymous information allowing to profile themselves and his/her organization (if applicable). Quality and quantity of information required in this section vary in the four questionnaires.

Section "A. Learning skills and competencies" is organized in two subsections. In subsection A.1, the responder is asked to assess both the degree at which a set of knowledge, skill, competences (items in the following) are offered inside his/her "organization" and the importance he thinks each they have to enter the job market. In case of Academics, Alumni, and Students, the "organization" represents the Study Program identified in the "General information" section. In subsection A.2, the responder is asked to rate in the same way a set of operational tools competences, further grouped into "Digital Technology Competencies" and "Analytical skill Competencies". Section A consists of 25 questions, 16 in subsection A.1 and 9 (5+4) in subsection A.2. Section A is the same in all four questionnaires.


The section B "Learning environment" is not the same for all questionnaires. In the questionnaires for Academics, Alumni, and Students, this section has the same content and structure: it is organized in two subsections. In subsection B.1, responder is asked to indicate the frequency of adoption (offer side) and of the expected adoption (demand side) of a set of knowledge transfer methodology by the selected Study Program. In subsection B.2, the responder is asked to evaluate in the same way a set of Learning activities. In the questionnaires for Academics, Alumni, and Students, section B consists of 16 questions, 7 in subsection B.1 and 9 in subsection B.2; at the end of each subsection, responder has the opportunity to add and rate further items. In the questionnaire for Companies, this section consists of only 3 questions, and the responder has the opportunity to add and rate further items.

4. Methodologies, Technique, and Tools

In order to investigate on both training offer and demand of different stakeholders, and to receive good-quality answers, detailed instructions at the beginning of each section are provided (see Fig. 2), and questions have been structured in such a way the responder is asked to jointly give his/her opinion on each topic investigated with reference to both demand and offer side (see Fig. 3). This will make easier for the responder to provide the correct (more reliable) answer for each topic and will give the opportunity to easily evaluate the gap between knowledge offer and demand. Moreover, questionnaires have been designed in order to obtain the same information from all stakeholders (except for the knowledge transfer methodologies in the case of the questionnaire for companies). This will enrich the next analysis of results, in which there will be the opportunity to compare results obtained from different stakeholders as well as to weight them (depending on the topic and the stakeholder) in order to achieve comprehensive results.

In order to make as easy as possible the spread of and the filling in the questionnaires, they have been coded in MS Forms®. The choice will allow to automatically collect answers and to monitor the achievement of the targets (see next Section). The links to the four MS Forms® in which questionnaires have been implemented are in table 2.

Tentative text of messages to be sent to different stakeholders are in Annex V. Partners are invited to modify/integrate the text depending on the information they want to share with stakeholders invited in the filling of the questionnaire.



A. Learning skills and competencies
A.1 Knowledge, skills and competencies

In questions from 10 to 25 a list of knowledge, skill and competences is provided.
 At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the courses of the selected Study Program(s).
 At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:
OFFER:
 Low = poorly addressed in the selected Study Program(s)
 Medium = moderately addressed in some courses in the selected Study Program(s)
 High = highly addressed in the selected Study Program(s)

DEMAND:
 Low = not so important to enter the job market
 Medium = moderately important to enter the job market
 High = highly important to enter the job market

Fig. 2 – Example of instructions at the beginning of a section of the questionnaire

10

Project management *

	not offered (OFFER) or not required (DEMAND)	low	medium	high	don't know
OFFER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DEMAND	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fig. 3 – Example of question and answers

	MS Forms® link
Questionnaire for Professors of HEI (Deans, Program Coordinators, and Professors)	https://forms.office.com/Pages/ResponsePage.aspx?id=q2pAW_GhE0-nqt1XPaPTMI5oaZ_gczJCILb7fe_aoGtUMzJEVIhQUTBUQIFKNUNDTFpJQIk0Q1FEUC4u
Questionnaire for Alumni	https://forms.office.com/Pages/ResponsePage.aspx?id=q2pAW_GhE0-nqt1XPaPTMI5oaZ_gczJCILb7fe_aoGtUNFdNQIE0Q1Q0SEJMVVdNUkhWVU80U1dROS4u
Questionnaire for Students	https://forms.office.com/Pages/ResponsePage.aspx?id=q2pAW_GhE0-nqt1XPaPTMI5oaZ_gczJCILb7fe_aoGtUMEIVVU9OSEw4SDZDTkY0Wk5XOFREQktVVS4u
Questionnaire for Companies	https://forms.office.com/Pages/ResponsePage.aspx?id=q2pAW_GhE0-nqt1XPaPTMI5oaZ_gczJCILb7fe_aoGtUMk1JUkJTNjkwRjZFOjNVSDNMVUxKVkU0TC4u

Tab. 2 – Links to the questionnaires

5. Target to be reached

The quantitative targets to be achieved for each stakeholder category are in table 3. They should be considered low limit values. The achievement of a higher numbers of answers will let the results of the next analysis gain in generality.

	Target
Questionnaire for Professors of HEI (Deans, Program Coordinators, and Professors)	100 answers (60% partner Countries + 40% other EU Countries by the involvement of AIM and ESTIEM)
Questionnaire for Alumni	120 answers (50% partner Countries + 50% other EU Countries by the involvement of ESTIEM))
Questionnaire for Students	800 answers (50% partner Countries + 50% other EU Countries by the involvement of ESTIEM);
Questionnaire for Companies	48 answers (50% partner Countries + 50% other EU Countries by the involvement of AIM and ESTIEM, and Asociación Madrid Network).

Tab. 3 – Quantitative target to be reached for each questionnaire

In Tab. 4 a possible distribution of targets is provided, considering the joint involvement of academic and associate partners.

	Specific target
Questionnaire for Professors of HEI (Deans, Program Coordinators, and Professors)	15 answers from POLIBA 15 answers from PUT 15 answers from LIU 15 answers from UPM 40 answers (in total) from AIM and ESTIEM
Questionnaire for Alumni	15 answers from POLIBA 15 answers from PUT 15 answers from LIU 15 answers from UPM 60 answers from ESTIEM
Questionnaire for Students	100 answers from POLIBA 100 answers from PUT 100 answers from LIU 100 answers from UPM 400 answers from ESTIEM
Questionnaire for Companies	6 answers from POLIBA 6 answers from PUT 6 answers from LIU 6 answers from UPM 24 answers (in total) from AIM, ESTIEM, Asociación Madrid Network, and Company partners

Tab. 4 – Specific target for partners of the project

6. Data collection period

The data collection period is

20/05/2020 - 05/06/2020

In the last days of May, a virtual meeting will be organized in order to discuss the targets already reached and to take any corrective measures in case they are still far from targets as per tab. 4.

In case the partners won't be able to reach the targets by 05.06.2020, the deadline will be extended until 19.06.2020.

Annex I



IE3 Erasmus+ Project Questionnaire for Professors of Higher Education Institutions

IE3 – Industrial Engineering and Management of European Higher Education

Erasmus+ Program - Knowledge Alliance EAC/A03/2018. Agreement Number 612402
The IE3 project is co-funded by the Erasmus+ programme of the European Union

Introduction to IE3 Erasmus+ Project

IE3 project aims at designing, testing, and validating a new model of Higher Education in Industrial Engineering & Management (IE&M) to meet Industry 4.0 knowledge needs.

The research on educational offer is the part of IE3 project that strives to recognize the gap between contemporary industry needs and the offer of Higher Education Institutions (HEIs).

This questionnaire is designed to identify the most important features of HEIs programs in the field of IE&M offered by Universities at Master level (2nd cycle study) and is addressed to Deans, Program Coordinators (responsible for educational issues), and Professors, whose expertise is of utmost importance to meet the project goal.

For more information on the Project please refer to:

<http://ie3.eu>

<https://www.facebook.com/IE3officialpage/>

<https://www.linkedin.com/in/ie3-knowledge-alliance-5b3398198/>

The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1

If you want to receive the result of the survey, we invite you to leave your e-mail address in the box below. The e-mail address is not compulsory.

2

Your e-mail address will be processed in accordance with the General Data Protection Regulation (GDPR 2016/279). Our request is determined, explicit and legitimate, as it aims at the possibility of receiving the result of the questionnaire (which, once sent, will be accessible only to IE3 project partners).

More information on privacy policy here: <http://ie3.eu/privacy-policy/>

I agree to receive results of the survey by e-mail

3

To receive further information on the IE3 project, we invite you to subscribe to the Newsletter here:

<https://ie3.eu/>

I agree to receive information by the Project newsletter

4

Country (in english)

Italy

Poland

Spain

Sweden

Other: _____

5

University (in english)

6

Position

Teacher

Program Coordinator

Dean

7

The Total number of students enrolled in the University

no more than 10.000 students

10.000 students or more but less than 20.000 students

20.000 students or more but less than 40.000 students

more than 40.000 students

8

Which program(s) within IE&M are offered at Master level or 2nd cycle study (in english)?

Industrial Engineering and Management

Engineering Management

Production Management

Manufacturing Management

Industrial Management

Other: _____

9

Number of students enrolled each academic year in the programme above

- no more than 50 students
- 50 students or more but less than 100 students
- 100 students or more but less than 200 students
- more than 200 students

A. Learning skills and competencies

A.1 Knowledge, skills and competencies

In questions from 10 to 25 a list of knowledge, skills and competences is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the courses offered by the selected Study Program(s).

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
10 Project Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
11 Operations Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
12 Quality Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
13 Logistics	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
14	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium

Problem Solving and Decision Making	<input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> high <input type="checkbox"/> don't know
15 Firm Organization	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
16 Industrial Marketing	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
17 Investment and Finance	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
18 Strategic Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
19 Innovation and Change Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
20 Entrepreneurial Mindset and Skills	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
21 Leadership Issues	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
22 Ergonomics	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
23 Safety of Work	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
24 Communication skills	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

<p>25</p> <p>Team working</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
--------------------------------------	---	--

A. Learning skills and competencies

A.2 Operational tools

- Digital Technology Competencies

In questions from 26 to 30 a list of digital technology competencies is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the courses offered by the selected Study Program(s).

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
<p>26</p> <p>3D Printing competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>27</p> <p>Augmented/Virtual Reality competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>28</p> <p>Cyber Security competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>29</p> <p>Sensor-based monitoring competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

<p>30</p> <p>IoT monitoring competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
---	---	--

A. Learning skills and competencies

A.2 Operational tools

- Analytical Skill Competencies

In questions from 31 to 34 a list of analytical skill competencies is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the courses offered by the selected Study Program(s).

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
<p>31</p> <p>Computer-based Statistics competences</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>32</p> <p>Management software tools (e.g. ERP, CRP, MES, etc.)</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>33</p> <p>Big Data Analysis</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>34</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high

Machine Learning/AI competences	<input type="checkbox"/> don't know	<input type="checkbox"/> don't know
---------------------------------	-------------------------------------	-------------------------------------

B. Learning environment

B.1 Knowledge Transfer Methodology

Please indicate the frequency (*) of adoption (OFFER) and of the expected adoption in the view of implementation of I4.0 paradigm (DEMAND) of each Knowledge Transfer Methodology by the selected Study Program(s).

Please refer to the following scales:

OFFER

Low = rarely adopted

Medium = moderately adopted in some courses

High = frequently adopted

DEMAND

Low = not required to be adopted

Medium = required to be adopted

High = highly recommended to be adopted

(*) In providing answers, please do not consider recent "forced" experience of virtual classrooms due to COVID emergency.

	OFFER	DEMAND
35 Traditional Face-to-Face Lectures	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
36 Seminars/Tutorials	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
37 Workshop	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
38 Field trips (factories/companies)	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
39	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high

Web based: Synchronous learning on the web <i>(e.g. lectures on streaming, workshop on streaming)</i>	<input type="checkbox"/> don't know	<input type="checkbox"/> don't know
40 Web Based: Asynchronous learning on the web <i>(e.g. e-learning modules/MOOCs, video tutorials, augmented reality environment/virtual factory tour)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
41 Other Knowledge Transfer Methodology (in english)		

B. Learning environment

B.2 Learning activities

Please indicate the frequency (*) of adoption (OFFER) and of the expected adoption in the view of implementation of I4.0 paradigm (DEMAND) of each Learning Activity by the selected Study Program(s).

Please refer to the following scales:

OFFER

Low = rarely adopted

Medium = moderately adopted in some courses

High = frequently adopted

DEMAND

Low = not required to be adopted

Medium = required to be adopted

High = highly recommended to be adopted

(*) In providing answers, please do not consider recent "forced" experience of virtual classrooms due to COVID emergency.

	OFFER	DEMAND
42 Theoretical studies (books, educational materials, ...)	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
43 Seminars/Exercises	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high

	<input type="checkbox"/> don't know	<input type="checkbox"/> don't know
44 Case-based learning	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
45 Individual projects	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
46 Group projects	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
47 University physical labs	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
48 University virtual/computer labs <i>(e.g. simulation labs)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
49 Experiential learning <i>(e.g. internship - industry problem tackled with company staff support)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
50 How long is the internship in the selected Study Program(s)	<input type="checkbox"/> not offered <input type="checkbox"/> 1 ÷ 4 weeks <input type="checkbox"/> 4 ÷ 8 weeks <input type="checkbox"/> > 4 weeks <input type="checkbox"/> don't know	<input type="checkbox"/> or not required <input type="checkbox"/> 1 ÷ 4 weeks <input type="checkbox"/> 4 ÷ 8 weeks <input type="checkbox"/> > 4 weeks <input type="checkbox"/> don't know
51 In how many courses industry professors are involved in teaching within IE&M programs?	<input type="checkbox"/> none/ not applicable <input type="checkbox"/> 1 course <input type="checkbox"/> 2 ÷ 4 courses <input type="checkbox"/> > 4 courses <input type="checkbox"/> don't know how many courses	<input type="checkbox"/> none/ not applicable <input type="checkbox"/> 1 course <input type="checkbox"/> 2 ÷ 4 courses <input type="checkbox"/> > 4 courses <input type="checkbox"/> don't know how many courses
52 Other Learning Activity (in english) _____		

Annex II



IE3 Erasmus+ Project Questionnaire for Alumni of Higher Education Institutions

IE3 – Industrial Engineering and Management of European Higher Education

Erasmus+ Program - Knowledge Alliance EAC/A03/2018. Agreement Number 612402

The IE3 project is co-funded by the Erasmus+ programme of the European Union

Introduction to IE3 Erasmus+ Project

IE3 project aims at designing, testing, and validating a new model of Higher Education in Industrial Engineering & Management (IE&M) to meet Industry 4.0 knowledge needs.

The research on educational offer is the part of IE3 project that strives to recognize the gap between contemporary industry needs and the offer of Higher Education Institutions (HEIs).

This questionnaire is designed to assess the opinion of alumni of Industrial Engineering and Management (IE&M) academic Master programs. The experience of alumni is of utmost importance to meet the project goal.

For more information on the Project please refer to:

<http://ie3.eu>

<https://www.facebook.com/IE3officialpage/>

<https://www.linkedin.com/in/ie3-knowledge-alliance-5b3398198/>

The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1

If you want to receive the result of the survey, we invite you to leave your e-mail address in the box below. The e-mail address is not compulsory.

2

Your e-mail address will be processed in accordance with the General Data Protection Regulation (GDPR 2016/279). Our request is determined, explicit and legitimate, as it aims at the possibility of receiving the result of the questionnaire (which, once sent, will be accessible only to IE3 project partners).

More information on privacy policy here: <http://ie3.eu/privacy-policy/>

I agree to receive results of the survey by e-mail

3

To receive further information on the IE3 project, we invite you to subscribe to the Newsletter here:
<https://ie3.eu/>

I agree to receive information by the Project newsletter

4

Country (in english)

- Italy
- Poland
- Spain
- Sweden
- Other: _____

5

University attended (in english)

6

Company

7

Position in the company (in English)

8

When did you graduate?

- 2020
- 2019
- 2018
- 2017
- 2016
- Other: _____

9

In which program within IE&M offered at Master level or 2nd cycle study did you graduate? (in english)

- Industrial Engineering and Management
- Engineering Management
- Production Management
- Manufacturing Management
- Industrial Management
- Other: _____

Overall evaluation of the Master program attended

Evaluation scale:

low = poor consistence/effectiveness

medium = good consistence/effectiveness

high = high consistence/effectiveness

10

Compliance of the attended Master program contents with job market requirements

- not compliant
- low
- medium
- high
- don't know

11

Compliance of the attended Master program contents with my professional work

- not compliant
- low
- medium
- high
- don't know

12

Effectiveness of knowledge transfer by education activities of the attended Master program

- not effective
- low
- medium
- high
- don't know

A. Learning skills and competencies

A.1 Knowledge, skills and competencies

In questions from 13 to 28 a list of knowledge, skills and competences is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list was addressed in the courses offered by the attended Study Program.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market. Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
13 Project Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
14 Operations Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
15 Quality Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
16 Logistics	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
17 Problem Solving and Decision Making	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
18 Firm Organization	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
19 Industrial Marketing	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
20 Investment and Finance	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
21 Strategic Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium

	<input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> high <input type="checkbox"/> don't know
22 Innovation and Change Management	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
23 Entrepreneurial Mindset and Skills	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
24 Leadership Issues	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
25 Ergonomics	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
26 Safety of Work	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
27 Communication skills	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
28 Team working	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

A. Learning skills and competencies

A.2 Operational tools

- Digital Technology Competencies

In questions from 29 to 33 a list of digital technology competencies is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the courses offered by the attended Study Program.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
29 3D Printing competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
30 Augmented/Virtual Reality competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
31 Cyber Security competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
32 Sensor-based monitoring competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
33 IoT monitoring competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

A. Learning skills and competencies

A.2 Operational tools

- Analytical Skill Competencies

In questions from 34 to 37 a list of analytical skill competencies is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the courses offered by the attended Study Program.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
34 Computer-based Statistics competences	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
35 Management software tools (e.g. ERP, CRP, MES, etc.)	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
36 Big Data Analysis	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
37 Machine Learning/AI competences	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

B. Learning environment

B.1 Knowledge Transfer Methodology

Please indicate the frequency (*) of adoption (OFFER) and of the expected adoption in the view of implementation of I4.0 paradigm (DEMAND) of each Knowledge Transfer Methodology by the attended Study Program.

Please refer to the following scales:

OFFER

Low = rarely adopted

Medium = moderately adopted in some courses

High = frequently adopted

DEMAND

Low = not required to be adopted

Medium = required to be adopted

High = highly recommended to be adopted

(*) In providing answers, please do not consider recent “forced” experience of virtual classrooms due to COVID emergency.

	OFFER	DEMAND
38 Traditional Face-to-Face Lectures	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
39 Seminars/Tutorials	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
40 Workshop	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
41 Field trips (factories/companies)	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
42 Web based: Synchronous learning on the web <i>(e.g. lectures on streaming, workshop on streaming)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
43 Web Based: Asynchronous learning on the web <i>(e.g. e-learning modules/MOOCs, video tutorials, augmented reality environment/virtual factory tour)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
44 Other Knowledge Transfer Methodology (in english)		

B. Learning environment

B.2 Learning activities

Please indicate the frequency (*) of adoption (OFFER) and of the expected adoption in the view of implementation of I4.0 paradigm (DEMAND) of each Learning Activity by the attended Study Program.

Please refer to the following scales:

OFFER

Low = rarely adopted

Medium = moderately adopted in some courses

High = frequently adopted

DEMAND

Low = not required to be adopted

Medium = required to be adopted

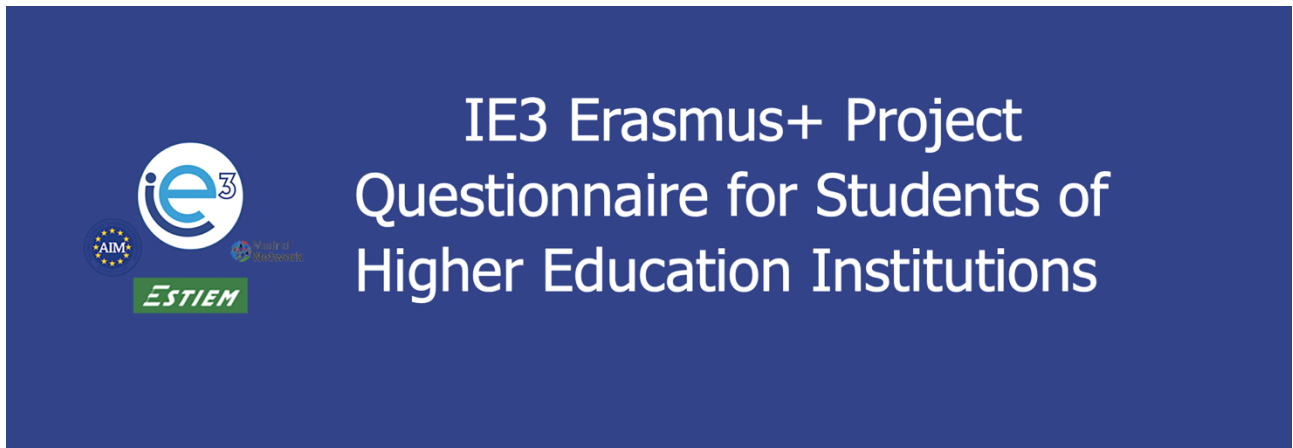
High = highly recommended to be adopted

(*) In providing answers, please do not consider recent “forced” experience of virtual classrooms due to COVID emergency.

	OFFER	DEMAND
45 Theoretical studies (books, educational materials, ...)	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
46 Seminars/Exercises	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
47 Case-based learning	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
48 Individual projects	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
49 Group projects	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
50 University physical labs	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

<p>51</p> <p>University virtual/computer labs <i>(e.g. simulation labs)</i></p>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>52</p> <p>Experiential learning <i>(e.g. internship - industry problem tackled with company staff support)</i></p>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>53</p> <p>How long is the internship in the selected Study Program(s)</p>	<input type="checkbox"/> not offered <input type="checkbox"/> 1 ÷ 4 weeks <input type="checkbox"/> 4 ÷ 8 weeks <input type="checkbox"/> > 4 weeks <input type="checkbox"/> don't know	<input type="checkbox"/> or not required <input type="checkbox"/> 1 ÷ 4 weeks <input type="checkbox"/> 4 ÷ 8 weeks <input type="checkbox"/> > 4 weeks <input type="checkbox"/> don't know
<p>54</p> <p>In how many courses industry professors are involved in teaching within IE&M programs?</p>	<input type="checkbox"/> none/ not applicable <input type="checkbox"/> 1 course <input type="checkbox"/> 2 ÷ 4 courses <input type="checkbox"/> > 4 courses <input type="checkbox"/> don't know how many courses	<input type="checkbox"/> none/ not applicable <input type="checkbox"/> 1 course <input type="checkbox"/> 2 ÷ 4 courses <input type="checkbox"/> > 4 courses <input type="checkbox"/> don't know how many courses
<p>55</p> <p>Other Learning Activity (in english)</p> <p>_____</p>		

Annex III



IE3 – Industrial Engineering and Management of European Higher Education

Erasmus+ Program - Knowledge Alliance EAC/A03/2018. Agreement Number 612402

The IE3 project is co-funded by the Erasmus+ programme of the European Union

Introduction to IE3 Erasmus+ Project

IE3 project aims at designing, testing, and validating a new model of Higher Education in Industrial Engineering & Management (IE&M) to meet Industry 4.0 knowledge needs.

The research on educational offer is the part of IE3 project that strives to recognize the gap between contemporary industry needs and the offer of Higher Education Institutions (HEIs).

This questionnaire is designed to assess the opinion of students attending Industrial Engineering and Management (IE&M) Master programs. The experience of students is of utmost importance to meet the project goal.

For more information on the Project please refer to:

<http://ie3.eu>

<https://www.facebook.com/IE3officialpage/>

<https://www.linkedin.com/in/ie3-knowledge-alliance-5b3398198/>

The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1

If you want to receive the result of the survey, we invite you to leave your e-mail address in the box below. The e-mail address is not compulsory.

2

Your e-mail address will be processed in accordance with the General Data Protection Regulation (GDPR 2016/279). Our request is determined, explicit and legitimate, as it aims at the possibility of receiving the result of the questionnaire (which, once sent, will be accessible only to IE3 project partners).

More information on privacy policy here: <http://ie3.eu/privacy-policy/>

I agree to receive results of the survey by e-mail

3

To receive further information on the IE3 project, we invite you to subscribe to the Newsletter here:

<https://ie3.eu/>

I agree to receive information by the Project newsletter

4

Country (in english)

Italy

Poland

Spain

Sweden

Other: _____

5

University

6

Which semester of the Master's program or 2nd cycle study are you attending?

1st

2nd

3th

4th

7

Which program are you enrolled in (in english)?

Industrial Engineering and Management

Engineering Management

Production Management

Manufacturing Management

Industrial Management

Other: _____

Overall evaluation of the Master program attended

Evaluation scale:

low = poor consistence/effectiveness

medium = good consistence/effectiveness

high = high consistence/effectiveness

8

The content provided by Master program is consistent with my internship (If applicable, otherwise skip this question)

- not compliant
- low
- medium
- high
- don't know

9

Effectiveness of knowledge transfer by education activities of the attended Master program

- not effective
- low
- medium
- high
- don't know

A. Learning skills and competencies

A.1 Knowledge, skills and competencies

In questions from 10 to 25 a list of knowledge, skills and competences is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list was addressed in the courses offered by your Study Program.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
<p>10</p> <p>Project Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>11</p> <p>Operations Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

<p>12</p> <p>Quality Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>13</p> <p>Logistics</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>14</p> <p>Problem Solving and Decision Making</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>15</p> <p>Firm Organization</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>16</p> <p>Industrial Marketing</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>17</p> <p>Investment and Finance</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>18</p> <p>Strategic Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>19</p> <p>Innovation and Change Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>20</p> <p>Entrepreneurial Mindset and Skills</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>21</p> <p>Leadership Issues</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>22</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low	<input type="checkbox"/> not required <input type="checkbox"/> low

Ergonomics	<input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
23 Safety of Work	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
24 Communication skills	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
25 Team working	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

A. Learning skills and competencies

A.2 Operational tools

- Digital Technology Competencies

In questions from 26 to 30 a list of digital technology competencies is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the courses offered by your Study Program.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
26 3D Printing competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

<p>27</p> <p>Augmented/Virtual Reality competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>28</p> <p>Cyber Security competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>29</p> <p>Sensor-based monitoring competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>30</p> <p>IoT monitoring competencies</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

A. Learning skills and competencies

A.2 Operational tools

- Analytical Skill Competencies

In questions from 31 to 34 a list of analytical skill competencies is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the courses offered by your Study Program.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter the job market.

Please refer to the following scales:

OFFER:

Low = poorly addressed

Medium = moderately addressed in some courses

High = highly addressed

DEMAND:

Low = not so important

Medium = moderately important

High = highly important

	OFFER	DEMAND
<p>31</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high

Computer-based Statistics competences	<input type="checkbox"/> don't know	<input type="checkbox"/> don't know
32 Management software tools (e.g. ERP, CRP, MES, etc.)	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
33 Big Data Analysis	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
34 Machine Learning/AI competences	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

B. Learning environment

B.1 Knowledge Transfer Methodology

Please indicate the frequency (*) of adoption (OFFER) and of the expected adoption in the view of implementation of I4.0 paradigm (DEMAND) of each Knowledge Transfer Methodology by your Study Program.

Please refer to the following scales:

OFFER

Low = rarely adopted

Medium = moderately adopted in some courses

High = frequently adopted

DEMAND

Low = not required to be adopted

Medium = required to be adopted

High = highly recommended to be adopted

(*) In providing answers, please do not consider recent "forced" experience of virtual classrooms due to COVID emergency.

	OFFER	DEMAND
35 Traditional Face-to-Face Lectures	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
36 Seminars/Tutorials	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium

	<input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> high <input type="checkbox"/> don't know
37 Workshop	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
38 Field trips (factories/companies)	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
39 Web based: Synchronous learning on the web <i>(e.g. lectures on streaming, workshop on streaming)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
40 Web Based: Asynchronous learning on the web <i>(e.g. e-learning modules/MOOCs, video tutorials, augmented reality environment/virtual factory tour)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
41 Other Knowledge Transfer Methodology (in english) <hr/>		

B. Learning environment

B.2 Learning activities

Please indicate the frequency (*) of adoption (OFFER) and of the expected adoption in the view of implementation of I4.0 paradigm (DEMAND) of each Learning Activity by your Study Program.

Please refer to the following scales:

OFFER

Low = rarely adopted

Medium = moderately adopted in some courses

High = frequently adopted

DEMAND

Low = not required to be adopted

Medium = required to be adopted

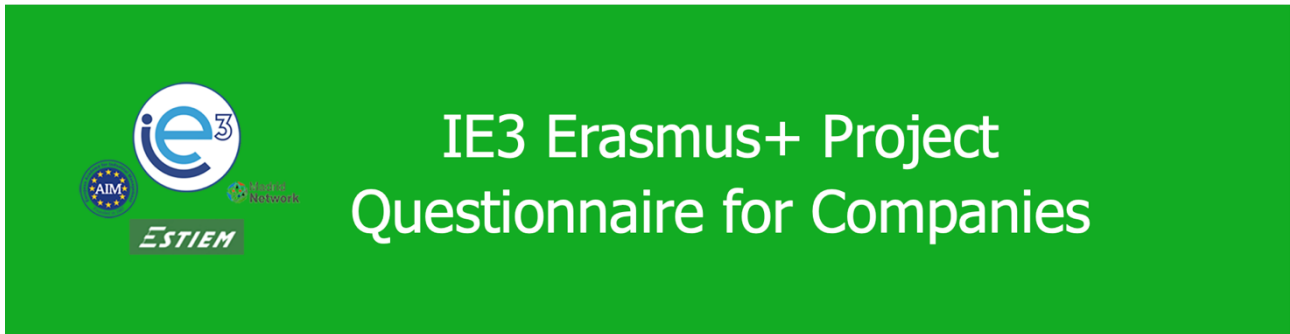
High = highly recommended to be adopted

(*) In providing answers, please do not consider recent “forced” experience of virtual classrooms due to COVID emergency.

	OFFER	DEMAND
42 Theoretical studies (books, educational materials, ...)	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
43 Seminars/Exercises	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
44 Case-based learning	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
45 Individual projects	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
46 Group projects	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
47 University physical labs	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
48 University virtual/computer labs <i>(e.g. simulation labs)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
49 Experiential learning <i>(e.g. internship - industry problem tackled with company staff support)</i>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
50 How long is the internship in the selected Study Program(s)	<input type="checkbox"/> not offered/not required <input type="checkbox"/> 1 ÷ 4 weeks <input type="checkbox"/> 4 ÷ 8 weeks <input type="checkbox"/> > 4 weeks <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> 1 ÷ 4 weeks <input type="checkbox"/> 4 ÷ 8 weeks <input type="checkbox"/> > 4 weeks <input type="checkbox"/> don't know

<p>51</p> <p>In how many courses industry professors are involved in teaching within IE&M programs?</p>	<p><input type="checkbox"/> none/ not applicable</p> <p><input type="checkbox"/> 1 course</p> <p><input type="checkbox"/> 2 ÷ 4 courses</p> <p><input type="checkbox"/> > 4 courses</p> <p><input type="checkbox"/> don't know how many courses</p>	<p><input type="checkbox"/> none/ not applicable</p> <p><input type="checkbox"/> 1 course</p> <p><input type="checkbox"/> 2 ÷ 4 courses</p> <p><input type="checkbox"/> > 4 courses</p> <p><input type="checkbox"/> don't know how many courses</p>
<p>52</p> <p>Other Learning Activity (in english)</p> <p>_____</p>		

Annex IV



IE3 – Industrial Engineering and Management of European Higher Education

Erasmus+ Program - Knowledge Alliance EAC/A03/2018. Agreement Number 612402

The IE3 project is co-funded by the Erasmus+ programme of the European Union

Introduction to IE3 Erasmus+ Project

IE3 project aims at designing, testing, and validating a new model of Higher Education in Industrial Engineering & Management (IE&M) to meet Industry 4.0 knowledge needs.

The research on educational offer is the part of IE3 project that strives to recognize the gap between contemporary industry needs and the offer of Higher Education Institutions (HEIs).

This questionnaire is designed to identify size and range of the educational offer provided by manufacturing companies of different sizes and of their knowledge requirements in the IE&M field, with particular attention to Industry 4.0-related topics.

For more information on the Project please refer to:

<http://ie3.eu>

<https://www.facebook.com/IE3officialpage/>

<https://www.linkedin.com/in/ie3-knowledge-alliance-5b3398198/>

The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1

If you want to receive the result of the survey, we invite you to leave your e-mail address in the box below. The e-mail address is not compulsory.

2

Your e-mail address will be processed in accordance with the General Data Protection Regulation (GDPR 2016/279). Our request is determined, explicit and legitimate, as it aims at the possibility of receiving the result of the questionnaire (which, once sent, will be accessible only to IE3 project partners).

More information on privacy policy here: <http://ie3.eu/privacy-policy/>

I agree to receive results of the survey by e-mail

3

To receive further information on the IE3 project, we invite you to subscribe to the Newsletter here:
<https://ie3.eu/>

I agree to receive information by the Project newsletter

4

Country (in english)

- Italy
- Poland
- Spain
- Sweden
- Other: _____

5

Company

6

Position in the company (in english)

7

Production site location (the english name of the city where the production is located)

8

Production process

- Manufacturing by Parts
- Process Manufacturing
- Service

9

Industry (EU NACE code)

https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NACE_REV2&StrLanguageCode=EN

10

Size of the company of the owner

- micro (no more than 10 staff)
- small (staff 10 or more but less than 50)
- medium (staff 50 or more but less than 250)

large (staff 250 or more)

11

Capital structure

- domestic capital only
- mixed capital
- foreign capital only

12

How are training sessions organized? not effective

- no training sessions organized (skip the next two questions)
- they are organized inside the company
- they are based on external education offer
- both previous options
- don't know

13

What is the frequency of training sessions?

- Low (only at the recruitment stage)
- Medium (at the recruitment stage and when strictly required)
- High (regularly, at least yearly)

A. Learning skills and competencies

A.1 Knowledge, skills and competencies

In questions from 15 to 30 a list of knowledge, skills and competences is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the training sessions.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter your company.

Please refer to the following scales:

OFFER:

Low = poorly addressed in the training sessions

Medium = moderately addressed in the training sessions

High = highly addressed in the training sessions

DEMAND:

Low = not so important to enter my company

Medium = moderately important to enter my company

High = highly important to enter my company

	OFFER	DEMAND
<p>15</p> <p>Project Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

<p>16</p> <p>Operations Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>17</p> <p>Quality Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>18</p> <p>Logistics</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>19</p> <p>Problem Solving and Decision Making</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>20</p> <p>Firm Organization</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>21</p> <p>Industrial Marketing</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>22</p> <p>Investment and Finance</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>23</p> <p>Strategic Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>24</p> <p>Innovation and Change Management</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>25</p> <p>Entrepreneurial Mindset and Skills</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>26</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low	<input type="checkbox"/> not required <input type="checkbox"/> low

Leadership Issues	<input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
27 Ergonomics	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
28 Safety of Work	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
29 Communication skills	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
30 Team working	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

A. Learning skills and competencies

A.2 Operational tools

- Digital Technology Competencies

In questions from 31 to 35 a list of digital technology competencies is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the training sessions.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter your company.

Please refer to the following scales:

OFFER:

Low = poorly addressed in the training sessions

Medium = moderately addressed in the training sessions

High = highly addressed in the training sessions

DEMAND:

Low = not so important to enter my company

Medium = moderately important to enter my company

High = highly important to enter my company

	OFFER	DEMAND
31	<input type="checkbox"/> not offered <input type="checkbox"/> low	<input type="checkbox"/> not required <input type="checkbox"/> low

3D Printing competencies	<input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
32 Augmented/Virtual Reality competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
33 Cyber Security competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
34 Sensor-based monitoring competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
35 IoT monitoring competencies	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

A. Learning skills and competencies

A.2 Operational tools

- Analytical Skill Competencies

In questions from 36 to 39 a list of analytical skill competencies is provided.

At the row "OFFER" you are asked to assess the degree at which each item of the list is addressed in the training sessions.

At the row "DEMAND" you are asked to estimate the importance you think each item of the list has to enter your company.

Please refer to the following scales:

OFFER:

Low = poorly addressed in the training sessions

Medium = moderately addressed in the training sessions

High = highly addressed in the training sessions

DEMAND:

Low = not so important to enter my company

Medium = moderately important to enter my company

High = highly important to enter my company

	OFFER	DEMAND
--	-------	--------

<p>36</p> <p>Computer-based Statistics competences</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>37</p> <p>Management software tools (e.g. ERP, CRP, MES, etc.)</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>38</p> <p>Big Data Analysis</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>39</p> <p>Machine Learning/AI competences</p>	<input type="checkbox"/> not offered <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> not required <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know

B. Knowledge Transfer Methodology

Please indicate the frequency (*) of adoption (OFFER) and of the expected adoption in the view of implementation of I4.0 paradigm (DEMAND) of each Knowledge Transfer Methodology in the training sessions.

Please refer to the following scales:

OFFER

Low = rarely adopted

Medium = moderately adopted

High = frequently adopted

DEMAND

Low = not required to be adopted

Medium = required to be adopted

High = highly recommended to be adopted

(*) In providing answers, please do not consider recent "forced" experience of virtual classrooms due to COVID emergency.

	OFFER	DEMAND
<p>40</p> <p>Traditional Sessions are: Face-to-Face <i>(e.g. Lectures, Seminars/Tutorials)</i></p>	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know	<input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know
<p>41</p>	<input type="checkbox"/> never <input type="checkbox"/> low	<input type="checkbox"/> never <input type="checkbox"/> low

<p>Training sessions are: Web-based - synchronous <i>(e.g. lectures on streaming)</i></p>	<p><input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know</p>	<p><input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know</p>
<p>42 Training sessions are: Web-based - asynchronous <i>(e.g. e-learning modules, video tutorials, augmented reality environment/virtual factory tour)</i></p>	<p><input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know</p>	<p><input type="checkbox"/> never <input type="checkbox"/> low <input type="checkbox"/> medium <input type="checkbox"/> high <input type="checkbox"/> don't know</p>
<p>43 Other Knowledge Transfer Methodology (in english) _____</p>		

Annex V

In the following, a tentative text of messages to be sent to different stakeholders is proposed. Partners should consider this as a proposal and feel free to modify it (and/or translate it in their own languages) when sending the emails to their contacts.

Mail to Professors of Higher Education Institutions.

Italic text has to be modified according to the sender.

Obj: Questionnaire for Professors of Higher Education Institutions. Industrial Engineering and Management of European Higher Education (IE3). Erasmus+ Program - Knowledge Alliance EAC/A03/2018 (Agreement Number 612402)

Dear *Professor/Dean/Program Coordinator*,

I'm contacting you to kindly ask your precious support to the IE3 research project as per the object of the present email.

The IE3 project aims at assessing the gap between industry needs in implementing I4.0 paradigm and the Master Level Academic Programs in the field of Industrial Engineering and Management offered by European Universities.

This questionnaire is addressed to **Deans, Program Coordinators** (responsible for educational issues), **and Professors**, whose **expertise is of utmost importance to meet the project goal**.

Your contribution would consist in filling the questionnaire that can be found at the following URL:

https://forms.office.com/Pages/ResponsePage.aspx?id=q2pAW_GhE0-nqt1XPaPTMl5oaZ_gcZJCILb7fe_aoGtUMzJEVlhQUTBUQIFKNUNDTFpJOIk0Q1FEUC4u

Filling the questionnaire requires around 20 min.

Results of this survey will be sent to responders who will provide the email address in the proper section of the questionnaire.

Project's details, progress, and results are available on the project website (www.ie3.eu). If you want to stay updated, please subscribe to the project's newsletter (www.ie3.eu).

For any question, please do not hesitate to contact us by using the "contact" section on the IE3 web site.

I do hope you will provide us with your valuable contribution.

On behalf of the IE3 Project's Team

Signature of the sender

Mail to Alumni.

Italic text has to be modified according to the sender.

Obj: Questionnaire for Alumni of Higher Education Institutions. Industrial Engineering and Management of European Higher Education (IE3). Erasmus+ Program - Knowledge Alliance EAC/A03/2018 (Agreement Number 612402)

Dear *Alumnus*,

I'm contacting you to kindly ask your precious support in contributing to the IE3 research project as per the object of the present email.

The IE3 project aims at assessing the gap between industry needs in implementing I4.0 paradigm and the Master Level Academic Programs in the field of Industrial Engineering and Management offered by European Universities.

This questionnaire is designed to assess the opinion of alumni who attended an Industrial Engineering and Management (IE&M) academic Master program. The **experience of alumni is of utmost importance to meet the project goal.**

Your contribution would consist in filling the questionnaire that can be found at the following URL:

https://forms.office.com/Pages/ResponsePage.aspx?id=q2pAW_GhE0-nqt1XPaPTMI5oaZ_gczJCILb7fe_aoGtUNFdNOIE0Q1Q0SEJMVVdNUkhWVU80U1dROS4u

Filling the questionnaire requires around 20 min.

Results of this survey will be sent to responders who will provide the email address in the proper section of the questionnaire.

Project's details, progress, and results are available at the project website (www.ie3.eu) as well as at Facebook (<https://www.facebook.com/IE3officialpage/>) and LinkedIn (<https://it.linkedin.com/in/ie3-knowledge-alliance-5b3398198>). If you want to stay updated, please subscribe to the project's newsletter (www.ie3.eu). For any question, please do not hesitate to contact us by using the "contact" section of the IE3 web site.

I do hope you will provide us with your valuable contribution.

On behalf of the IE3 Project's Team

Signature of the sender

Mail to Students.

Italic text has to be modified according to the sender.

Obj: Questionnaire for Master Students of Higher Education Institutions. Industrial Engineering and Management of European Higher Education (IE3). Erasmus+ Program - Knowledge Alliance EAC/A03/2018 (Agreement Number 612402)

Dear *Student*,

I'm contacting you to kindly ask your precious support in contributing to the IE3 research project as per the object of the present email.

The IE3 project aims at assessing the gap between industry needs in implementing I4.0 paradigm and the Master Level Academic Programs in the field of Industrial Engineering and Management offered by European Universities.

This questionnaire is designed to assess the opinion of students attending Industrial Engineering and Management (IE&M) academic Master programs. The **experience of students is of utmost importance to meet the project goal.**

Your contribution would consist in filling the questionnaire that can be found at the following URL:

https://forms.office.com/Pages/ResponsePage.aspx?id=q2pAW_GhE0-nqt1XPaPTMI5oaZ_gcZJCILb7fe_aoGtUMEIVWU9OSEw4SDZDTkY0Wk5XOFREQktVVS4u

Filling the questionnaire requires around 20 min.

Results of this survey will be sent to responders who will provide the email address in the proper section of the questionnaire.

Project's details, progress, and results are available at the project website (www.ie3.eu) as well as at Facebook (<https://www.facebook.com/IE3officialpage/>) and LinkedIn (<https://it.linkedin.com/in/ie3-knowledge-alliance-5b3398198>). If you want to stay updated, please subscribe to the project's newsletter (www.ie3.eu). For any question, please do not hesitate to contact us by using the "contact" section of the IE3 web site.

I do hope you will provide us with your valuable contribution.

On behalf of the IE3 Project's Team

Signature of the sender

Mail to Companies.

Italic text has to be modified according to the sender.

Obj: Questionnaire for Companies. Industrial Engineering and Management of European Higher Education (IE3). Erasmus+ Program - Knowledge Alliance EAC/A03/2018 (Agreement Number 612402)

Dear *Mr/Mrs*,

I'm contacting you to kindly ask your precious support in contributing to the IE3 research project as per the object of the present email.

The IE3 project aims at assessing the gap between industry needs in implementing I4.0 paradigm and the Master Level Academic Programs in the field of Industrial Engineering and Management (IE&M) offered by European Universities.

The **experience of Companies is of utmost importance to meet the project goal.**

Your contribution would consist in filling the questionnaire that can be found at the following URL:

https://forms.office.com/Pages/ResponsePage.aspx?id=q2pAW_GhE0-nqt1XPaPTMI5oaZ_gcZJCILb7fe_aoGtUMk1JUkJTNjkwRjZFOjNVSDNMVUxKVkU0TC4u

Filling the questionnaire requires around 20 min.

Results of this survey will be sent to responders who will provide the email address in the proper section of the questionnaire.

Project's details, progress, and results are available at the project website (www.ie3.eu) as well as at Facebook (<https://www.facebook.com/IE3officialpage/>) and LinkedIn (<https://it.linkedin.com/in/ie3-knowledge-alliance-5b3398198>). If you want to stay updated, please subscribe to the project's newsletter (www.ie3.eu). For any question, please do not hesitate to contact us by using the "contact" section of the IE3 web site.

I do hope you will provide us with your valuable contribution.

On behalf of the IE3 Project's Team

Signature of the sender