D.T1.3.2 THE TML APPLIED TO THE SECTOR OF THE RIS3

D.T1.3.2: 70 SMEs (7*10) on partnership level which apply the TML index

FINAL VERSION
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1. Creation of the TML index (D.T1.3.1)

In the framework of the previous task of the project (D.T1.3.1) the partnership jointly developed and defined the TML (Transnational Maturity Level) index in order to evaluate the level of innovation of those companies which took part in the survey. Following several discussions in the partnership, the TML has become a composite index, made up of six dimensions (1: *Related variety, 2: Human Capital, 3: Project Management; 4: Research and development; 5: Breadth of Industry 4.0; 6: Depth of Industry 4.0*) and all of these six dimensions are measured as percentages. Thus the overall TML are expressed in percentages as well, being it a simple average of six dimensions expressed in percentages. There was a calculation rule for each dimension, and it was given which question(s)' answers had to be taken into account when calculating a separate dimension. (Further details of the calculation can be found in the supporting materials, already uploaded under D.T1.3.1)

As soon as the TML formula had been clarified and finalised, it has been integrated to the previously developed CRM system (where SMEs' survey results can be seen), so every PP had the opportunity to check the TML indexes of their companies, and comparing the TML results on national and transnational level as well.

The TML indexes of all companies involved in the survey can be checked here on CRM: https://4stepscrm.com/index.php

Log in with country admin account→ Questionnaires→Questionnaire statistics→TML index;

(The credentials of PBN as WP Leader (and main administrator of the system) is the following:

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- As the partnership agreed every six dimension's results are visible on the system and in the end of the row the final TML as well in percentage format.
- Every PP has the possibility to choose each country's results as well as to choose the results in an increasing/decreasing format.

2. The selection of 10 companies per region which apply the TML index (D.T1.3.2)

Following the integration of the joint TML index to the CRM system, partners were asked by PBN (WPT1 Leader) to choose the companies (10 companies per country, so 70 companies all together) to which the TML would be applied. The criteria to select the 10 pilot companies was left open to each partner, but it was important that each partner explicitly motivated its choice, criteria and motivation.

In order to support the partners on how to choose their 10 companies, CNA (LP) and RE:Lab partners (PP2), in strong collaboration with PBN (WPT1 Leader; DEXIC as WPT2 Leader and FHV as WPT3 Leader) elaborated and provided a short guideline to the partnership. This guideline has been also integrated in the report.

Based on this supporting guideline, and the e-mail/conference call discussions, the main messages for partners on how to choose their 10 companies in their regions are the followings:

- As it has been mentioned above, apart from the simple choice of the 10 companies, every PP was required to explicitly motivate its choice, criteria and motivation.

<u>Among the possible criteria, we can mention:</u>

  - Choosing the 10 companies which have the highest TML;
  - Choosing a differentiated sample (e.g.: 5 with a high TML index, another 5 with a medium TML index);
  - Combining the TML results with the transnational clustering results.

- It is possible, but not mandatory to involve those companies which are chosen now within WPT1 in Pilot Action activities in WPT3 (beginning from March 2021).
- The already finalised WPT1 tasks, but mainly the needs detailed in the Mapping reports shall be taken into account when choosing the 10 SMEs per PP.
- Since WPT3 deliverables will not common, and will be separate by PP to PP, it will be up to each PP what they will be doing in WPT3, (beginning from March 2021) but of course their own specific deliverables will have to be followed.
- It is fundamental that the PPs choose one of the suggested criteria for the selection; this will ensure that the identification will be in line with state aid rules.

3. The chosen 10 companies per region, and their motivation

*__NOTE:__ In this chapter the 70 companies chosen by each region's project partners are listed. Each PP (CNA+RE:LAB together) was required to choose 10 companies and a short explanation was also required about the choice of these companies.

As the tables in Section 3 will show, Italian, Austrian, Slovenian, and German partners were providing the company names in an anonymised way, because of the data protection rules.

3.1. Italy (CNA+RE:LAB)

CNA and RE:LAB partners have decided to choose the 10 SMEs with the highest TML index because they seem the most appropriate for possible observation and further involvement. Furthermore, they show some relevant differences in the different dimensions of the TML, so they seem an appropriate, heterogeneous sample. Moreover, the companies belong to 5 different territories of the Emilia Romagna region, therefore they are also representative of different local clusters.

NUM	Name of the company	Supplier/ End user	Why are they suitable candidates?	Overall TML index
1	Azienda 33	End user	The company carries out resin processing, has 45 employees and has a foreign market. In the company there is an R&D office and participates in R & D calls. Among the 9 enabling technologies, the company has invested in: rapid prototyping and integration systems	49.08%
2	Azienda 43	End user and Supplier	The company carries out development and production of electronic control and automation systems, has 17 employees and is present on foreign markets. among the 9 enabling technologies, the company has invested in: SIMULATION	48.61%
3	Azienda 46	End user and Supplier	The company carries out Design and production of non-invasive endoscopy medical devices, has 13 employees and is present on foreign markets. In the company there is an R&D office and participates in R & D calls. Among the 9 enabling technologies, the company has invested in: Big Data Analytics, advanced manufacturing	48.38%

4	Azienda 10	End user	The company carries out production of semi-finished products in the footwear, leather and textile sector, has 26 employees and is present on foreign markets. The company participates in R&D calls.	44.44%
5	azienda 14	End user	The company carries out production of single and double acting hydraulic cylinders, has 65 employees and is present on foreign markets. among the 9 enabling technologies, the company has invested in: advanced manufacturing	44.44%
6	Azienda 1	End user and Supplier	The company carries out manufacture of lift cabins and doors, has 52 employees and is present on foreign markets. In the company there is an R&D office. among the 9 enabling technologies, the company has invested in: advanced manufacturing, augmented reality, systems for integration, Internet of things	43.52%
7	azienda 5	End user	The company carries out production of corrugated cardboard boxes, has 38 employees and is present on foreign markets. Among the 9 enabling technologies, the company has invested in: advanced manufacturing.	43.06%
8	azienda 56	End user	The company carries out precision mechanics and small metal parts manufacturing, has 80 employees and is present on foreign markets. The company participates in R&D calls. Among the 9 enabling technologies, the company has invested in: rapid prototyping and simulation.	42.82%
9	azienda 9	End user and Supplier	The company deals with mechanical machining in general, has 35 employees and is present on foreign markets. The company participates in R&D calls. Among the enabling technologies, the company has invested in: advanced manufacturing, integration systems	41.20%
10	azienda 8	Supplier	The company deals with the manufacture of irradiation tools, electromedical and electrotherapeutic equipment, has 102 employees and is present on foreign markets. In the company there is an R&D office. Among the enabling technologies, the company has invested in: rapid prototyping.	40.74%

3.2. Poland (ARRSA)

NUM	Name of the company	Supplier/ End user	Why are they suitable candidates?	Overall TML index
1	Evatronix S.A.	Supplier/ end user	medium sized, local company, originating from the city of Bielsko-Biała and operating on the global scale; very interested in different innovation related projects and we have a good history of cooperation; despite that, it is a company with the highest TML index of all from our survey; they are working with 3D scanning and reverse engineering for different industrial sectors	65.98%
2	World Industry Program	supplier	WIP company operates in the field of Industrial Informatics, offering organizational transformation at an industrial plant, through the implementation of the radio-beacons web architecture; company	17.59%

	ming WIP sp. z o.o.		introduces Internet of Things to industrial sector; we have a good contact with the owner	
3	Technicz na Obsługa Przemysł u sp. z o.o.	supplier/ end user	big company, originated from the restructuring of a traditional, industrial company; working in the filed of production, logistics and engineering; we know the coordinator of the company;	23.15%
4	Polmotors sp. z o.o.	end user	The company is strongly associated with the leaders of the global automotive industry, such as VW, GM, BMW, FIAT, supplying its products directly to over 100 factories and other leading concerns in Europe and worldwide. Polmotors provides comprehensive order processing for the automotive industry, covering all key stages of product value creation; in our opinion company has a significant capacity in terms of R&D and Industry 4.0 development. Moreover, it is experienced in European funded projects; it is a second highest TML of surveyed companies	62.96%
5	Śląskie Centrum Naukowo-Technolo giczne sp. z o.o.	end user	company provides research and development services for entrepreneurs in the area of implementation and production of structures made of advanced composites for modern industry; company has a significant R&D center composed of two laboratories: for composite structures and materials testing; the third highest TML of surveyed companies	58.33%
6	Magneti Marelli Suspensio n System Bielsko	end user	company has an industrial infrastructure for the production of "smartt" suspenions, enabling adaptive response to events during vehicle movement; company with high indicated TML and with big R&D office; part of the big global corporation	49.07%
7	Szczęśnia k Pojazdy Specjalne sp. z o.o.	end user	company is a leader in the production of special purpose vehicles dedicated to uniformed services; an important area of activity is R&D, which aims to develop, test and implement innovative solutions in the field of technology and construction of produced special vehicles; company is very engaged in the local market, we have good history of cooperation and know an owner	42.97%
8	Lontex sp. z o.o. s.k.	end user	company related to automotive sector, operating in the field of tachograpfy and toll collect; company is selling their products and services worldwide; has developed R&D office, is currently using some of the Industry 4.0 technologies and is willing to improve it	29.17%
9	Car Solex	end user	micro company, with the lowest TML index among the surveyed companies; car, tyer and air conditioning service; company doesn't use any Industry 4.0 related technologies, but found interesting to use digital transformation in terms of services improvements	1.85%
10	Moto Wektor sp. z o.o.	end user	company manufactures car bodies for vehicles with a maximum permissible weight of 3.5 tonnes. Its main activity is the production of delivery van bodies with supporting structures made of steel or	36.11%

			aluminium: boxes, containers, isothermal, refrigerated, tippers, etc.; has the capacity to use Industry 4.0 technologies to improve their products	

3.3. Austria (FHV)

NUM	Name of the company	Supplier/End user	Why are they suitable candidates?	Overall TML index
1	nnfm	Supplier	nnfm is an organization within the industrial field of injection moulding technology. Their overall TML is quiet high, which could be observed during the interview. nnfm is interested in the 4Steps project with the aim not to lose the connection within the field of Industry 4.0 and its continuously changing and advancing technologies.	80.25%
2	hhfm	End user/Supplier	hhfm is an expert for the logistic of waste management and winter services. Their vision is a paperless office composed of digital processes for waste management companies. Their interest into the 4Steps project bases on the need for increased knowledge and expertise within the field of Industry 4.0.	72.55%
3	eefm	Supplier	eefm is a manufacturer for cooling units. The digital change within this field of manufacturing is enormous: customers demand enhanced digital functionalities of the eefm's products as well as additional services and maintenance. eefm is forced to rework its product- and service portfolio as well as to digitalize its business models.	44.54%
4	ddfm	End user/Supplier	ddfm is a manufacturer for plastic artefacts. Products, for example, include drinking cups (for extra large events (open airs, football games). Manufacturer within this industrial sector have to be of contiuous attention: a digital innovation can disrupt their business models. Therefore, the objective of ddfm as external "observer" is to keep and increase their digital maturity.	62.64%
5	oofm	End user	oofm is a contract machine and tool manufacturer and acts in the automotive sector. Their products are highly individualized and and only rarely does one product resemble another. Due to this fact, oofm is forced to deal with "batchsize 0" - a target value that only can be achieved through continuous investment into emergent technologies. Within the 4Steps project, oofm expects to step into a international network of manufacturers and to exchange best-practices and experiences.	39.26%
6	zfm	Supplier	zfm is a classical manufacturer of machineries. They supply large companies with individualized machineries and spare parts. zfm already recognized the ongoing digital transformation. As result out of the 4Steps project, zfm desires additional information about emergent technologies and innovation as well as how these technologies and innovation can be implemented into existing processes, business models, etc.	59.00%
7	ufm	End user	ufm represents a food production company. Their main product are beverages of all kinds. To keep on with the change in the food industry, ufm is forced to invest not only in physical production material but also into digital transformation and its emergent technologies. Within the 4Steps project, ufm aims to enter into heterognous network of like-minded companies that are willing to establish horizontal and vertical innovation and co-creation networks.	18.52%

8	kkfm	Supplier	kkfm represents a classical manufacturer within the field of digital printing/offset printing. Their journey of digitalization already started 25 years ago. As the interviewee said, their investment into digital technologies is about 1M EUR per year. kkfm, is a small- and medium sized enterprise. Their interest into the 4Steps project is to keep pace with the ongoing digital transformation and the introduction of emergent digital assets.	52.54%
9	vfm	Supplier	vfm is a well-known producer of food products. This industry experiences a dramatic change: the machineries get automated step by step and equipped with additonal measuring instruments that send data and information. Based on the 4Steps project, vfm is interested in Big Data Analysis and how to engineer innovation from noise and (unstructured) data.	51.90%
10	sfm	End user/Supplier	sfm is a small and medium sized company within the field of the manufacturing of agricultural machineries. sfm is highly interested in the 4Steps project and aims to participate in the Vorarlberg Digital Innovation Hub. It is interested in taking advantage out of performed Industry 4.0 research within 4Steps to further develop its manufactured machineries.	48.15%

3.4. Czech Republic (DEX)

NUM	Name of the company	Supplier/End user	Why are they suitable candidates?	Overall TML index
1	Severochema, družstvo pro chemickou výrobu	End user	Severochema is the company that was probably most interested in getting involved in the project. Although this company does not have a significant research department, in this case it played in the selection of motivation and interest in the project. In addition, after the fire in recent years, the company has undergone a major digitization of operations and wants to continue to support automation and digitization.	36.20%
2	Elmarco s.r.o	Supplier	The company is a supplier of equipment for the production of nanofibrous materials with a significant R&D office. It is mainly a supplier who also produces lines (such as Hardwario)	50.60%
3	MODELÁRNA LIAZ spol. s r.o.	End user	One of the most important Liberec companies, with relatively good contact with the owner.	52.32%
4	Formcad s.r.o.	End user	A small but innovative company with great motivation to innovate. Focus on CNC and metal production, but all using modern technology. The company has a small R&D office, but given the ratio of employees, it is about 8% of employees.	28.70%
5	LENAM, s.r.o.	End user	The company from Liberec, which deals with development for automotive, is on the border between the end user and the manufacturer. The company is engaged in scientific research and its customers are mainly from the automotive industry. Nevertheless, it is one of	74.63%

			the most interesting companies with a significant RD office.	
6	BMTO Group	End user	A company that has recently invested significantly in the digitization of its operations. The company has relatively big R&D offices (compared to other companies surveyed).	65.73%
7	VUTS	End user	An important company from Liberec. It is one of the most important research centers in the field of industry in the Czech Republic. This is a very good contact and the company has more than 130 employees in its R&D office.	70.95%
8	Merz	Supplier	The surveyed company, with almost the largest research and development office, has less than 49 employees, but they specialize in digital technologies, and it would also be interesting to have suppliers among the selected companies. It is a relatively important company, which can help us in communicating the project towards other companies.	38.97%
9	MSV systém	Supplier/End user	MSV is both a supplier and a manufacturer specializing in the production of lines not only for the food industry. The company uses 3D printing in its production in the field of development and as a supplier supplies very advanced automated lines which include, for example, robotic arms. Despite the fact that the company has only 3 employees in the R&D office, this is an interesting example where the company is both a supplier and an end user.	43.24%
10	Aries a.s.	end user	Again, a company that was relatively interested in participating in the project and therefore I would like to involve them in the analysis. In addition, they have a very well automated operation and are looking for other ways to digitize their operation. The company has its R&D office, although not significantly large and we can classify them into 5 groups.	54.54%

3.5. Hungary (PBN)

PBN has chosen companies with high TML indexes, since based on the replies, these companies have experience in Industry 4.0 pillars, since they are currently using some of the applications, therefore they have high potential in further digitization development. (e.g: the first 5 companies ranked in the table belong to the companies with the 10 highest TML indexes of the whole Hungarian sample with 50 companies).

NUM	**Name of the company**	**Supplier/End user**	**Why are they suitable candidates?**	**Overall TML index**

1	Borsodi Műhely Fémmegmunkáló Kft.	Supplier/End user	They have become a medium enterprise in the metal industry, which is proud of its past and willing to work for its future. In the present, the company serves its clients with the highest quality, in the following segments: • Automotive industry • Aerospace industry • Space industry • Military industry • Healthcare • Food industry • Electronics According to the survey results, they are dealing with I4.0 technologies and they would like to improve their digitization level.	74.01%
2	HIDROT Kft	End user	They are currently using seven I4.0 (AR and big data are not relevant) in a few level, and they would like to at least maintain the current level, but they would like to improve in autonomous robots, simulation and horizontal and vertical integration.	61.77%
3	VESZ-MONT '2000 Kft	End user	VESZ-MONT 2000 Kft., is a continuously developing company who has been designing, manufacturing and building Special Purpose Machines and Automation Systems for a wide range of industries since 1999. During these eighteen years they have gained broad and solid knowledge in manufacturing of Special Purpose Machines, Assembly lines and Automation solutions. Parallel with continuous expansion, they also have acquired more and more experience in laser technic and robotic applications. Their goal is to maintain present development in long term and increase the number of special purpose machine delivery and service abroad. Their commitment is to provide a complete engineering service to our partners on reasonable price with high quality by the agreed delivery time. Their offerings for customers include: • Purpose machines • Wagework • Commerce • Engineering services Based on their results, they are currently dealing with all I4.0 pillars at least in a few level.	60.18%
4	Pandan Kft.	End user	The main activity of the company is basically plastic processing, where it mainly produces products with a high content of plastic waste for the environmental protection and energy industries. In addition, it performs to a significant extent complete services, developments and constructions in this field. They have reached 100% in Related Variety and Human Capital dimensions.	55.55%
5	Ràbakert Alkatrészgyártó Kft	End user	According to the analysis, they are currently applying six I4.0 pillars, and they would like to develop/extend the application level in autonomous robots and industrial IoT.	52.78%

6	RÁK Antenna Kft	End user	Their main scope of activity is the injection moulding, painting and varnishing of plastic parts. They have been continuously extending their machinery, developing their technology, purchasing and constructing buildings and training their colleagues. For them the digitization development would be essential and beneficial. According to the survey, they are planning to deal with horizontal and vertical system integration, cybersecurity and additive manufacturing	50.92%
7	Verarbeiten Pausits Termelő, Szolgáltató és Kereskedelmi Kft.	End user	The company is capable of manufacturing steel structures up to 10.000 kg (individual and serial production). Their products have high added value, guaranteed by robot welding, CNC machining and the 5 cabin painting line. In the near future they would like to develop in additive manufacturing and big data analytics	42.92%
8	Bio-Textima Kft	End user	This company is producing matrasses and bed systems in high quality, and for them digitization development would be beneficial. Based on their results, currently they are applying five I4.0 pillars which they would like to continue.	42.59%
9	Julius-Globe kereskedelmi és Termékgyárto Kft.	End user	They are experienced in the fields of tool production, custom-made precision parts for automotive, packaging, electronic, plastic, high-tech, medical, tobacco and press industry. They have reached 100% in Human Capital dimensions thanks to their widespread R&D activities	42.59%
10	UNIRIV Ipari és Kereskedelmi Korlátolt Felelősségű Társaság	End user	DSU Company-group came from a Hungarian family undertaking onto existence, with that aim to produce fasteners for the automotive, assembling and building industry, adequately for the highest qualitative requirements. Our products are well known in an increasingly wider range on the past decade, due to the reliability, accuracy and modernity. The Company-group due to the quality oriented production, the constant and high standard product development. They are already planning the production of fasteners of the future, meeting the requirements of the 3rd millennium. They have reached 100% in Human Capital dimension, as well as they are partially using some I4.0 pillars in a few extent.	40.74%

3.6. Slovenia (CCIS)

They did not focus on the TML index when selecting companies, but they selected companies from different industries.

NUM	Name of the company	Supplier/End user	Why are they suitable candidates?	Overall TML index
1	J1	End user and Supplier	This company has 58 employees. The company offers several services as calibrations, testing, inspection, metrology solutions, training and products. They are developing state-of-the-art solutions and products that are the result of our own knowledge and development.	70.56%
2	M1	End user and Supplier	This company is a manufacturer of flat rolled steel products of various types. It is one of the world's leading manufacturers of stainless steel sheets and thick sheets made of high-strength, wear-resistant, tool and other special steels.In addition to thick sheet metal, the production program also includes non-oriented electrical sheets and hot and cold rolled strips made of special steels.	64.29%
3	H1	Supplier	This company is medium size and it has 268 employees. They offer product development, research, tool development and the production of polymer products.	54.26%
4	A1	End user and Supplier	This company is developing cutting - edge electronics design and electronics manufacturing services. They have their own brand of power tools.	53.54%
5	K1	Supplier	This company is medium size and electronic components producer. They have R&D, engineering and they use five loading lines for SMT assembling electronic circuit.	50.00%
6	F	End user and Supplier	They produce a wide range of animal selection of animal processed proteins and fat mixtures. With clean and environmentally friendly technology, They produce biogas from biodegradable waste and wastewater. They produce a wide range of animal fats, vegetable oils and mixtures of fats suitable for animal consumption.	48.84%
7	I1	Supplier	This company has 21 employees and is young. Their main activity are preparing special technology, development and assembly of circuit boards. They are constantly expanding their knowledge and educating team. They are work with buyer from the initial idea, through implementation, production logistics and all the way to the final product.	37.40%
8	L	Supplier	They are specializes in the production of prototypes, addressing small-scale and medium-scale high-tech products. All phases of the product life-cycle are included in their offer: the design of printed circuit boards (PCB), software development, production, assembly, testing and despatch respective to the electronics, IoT, medical and manufacturing segments.	36.11%

			They has 20 employs highly motivated and qualified engineers who specialize in electronics and software development. Based on its broad knowledge and experience, our team is able to develop, create and produce all types of electronics and corresponding software solutions – from concept to realization.	
9	E	Supplier	Their production program includes products from field: consumer electronics, home appliances, automotive industry and other fields. They make engineering aluminium products and use machining technologies.	31.55%
10	C1	Supplier	This company produce electronic components and the following services: smd mounting, optic inspection, tht insertion, testing and programming, quality control.	20.11%

3.7. Germany (VDC)

VDC has chosen 5 companies with a high TML and 5 companies with a medium TML, in order to provide a list which includes a balanced ratio between middle-sized and small enterprises, as well as technology providers and end users. The companies are: c21, c14, c28, c2, c19, c10, c47, c3, c34, c23

NUM	Name of the company	Supplier/End user	Overall TML index
1	c21	End user and Supplier	72.55%
2	c14	End user	72.04%
3	c28	End user and Supplier	60.91%
4	C2	Supplier	59.26%
5	C19	Supplier	56.48%
6	C10	End user and Supplier	49.21%
7	C47	End user	43.52%
8	C3	Supplier	40.74%
9	C34	Supplier	36.11%
10	C23	End user and Supplier	32.40%