D6.13. Impact Report 3

WP	WP6
WP Leader	FBOX[1]
Responsible Author	FBOX
Dissemination Level	PU
Nature	RE

Dissemination Level:	
PU	Public
PP	Restricted to other programme participants (Including the Commission Services)
RE	Restricted to a group specified by the consortium (Including the Commission Services)
CO	Confidential, only for members of the consortium (Including the Commission Services)

Nature	
PR	Prototype
RE	Report
SP	Specification
TO	Tool
OT	Other
Synopsis	This document includes the analysis of the Impact and KPIs related to RobotUnion activities.
Keywords	Management, Impact Report, KPIs

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[1] Hereby, a reference to FBOX refers to FundingBox Accelerator Sp. z o.o., Poland and to Linked Third Parties (LTP) FundingBox Communities S.L., Spain (FBC) and FUNDINGBOX NORDIC APS, Denmark, (FBN). Detailed responsibilities of LTP are described in Section 4.2 of Part B of the DoA and referred to in Work Plan (Part A of the DoA).

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LIST OF ABBREVIATIONS AND DEFINITIONS

DoA	Description of Action
EC	European Commission
H2020	Horizon 2020
GA	Grant Agreement
CA	Consortium Agreement
KPI	Key Performance Indicator
FSTP	Financial Support to Third Parties
MoU	Memorandum of Understanding
OC	Open Call
TM	Technical Mentor

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1. Introduction

The Impact Report is part of the WP6 "Exploitation and Sustainability Plan" this deliverable has as a goal to show that RobotUnion activities have contributed to the 'ICT-27-2017' expected impacts, as well as some additional ones included in the Description of Work since the beginning of the project.

The principal impacts that the project was focused on are:

- Impact #1:· Contribute to the overall growth of SMEs targeting new robotics markets

- Impact #2:· SMEs conducting and utilising research to access new markets

- Impact #3:· More efficient development of the robotics sector and wide acceptance in both academia and industry of new benchmarking tools

- Impact #4:· Improved systems characterisation and improved means of robotics system performance evaluation

Additional impacts that the project planned to achieve as well were:

- Additional Impact N#1. Funding complemented by ESIF or other regional or national funds and/or private funds

- Additional Impact N#2. Contribute to reinforce the European Union top position in the global automation race

- Additional Impact N#3. Contribute to delivering smart, sustainable and inclusive growth and social welfare

To be sure that planned impacts are achieved, RobotUnion continuously monitored the project KPIs, which were included in previous versions of 'Impact Report' [D6.5 and D6.11] updated on different stages of the project (M9 and M18). The final KPIs and objectives achieved are presented in this report.

Periodic Report Conclusions

According to the Periodic Report Review, the previous version of this Deliverable D6.11 Impact Report 2 was focused only on quantitative KPIs that were provided in the form of general statistics and dissemination and communication KPIs that did not give the full overview on the work carried towards Impacts identified.

The final version of the Impact Report deliverable has been redefined according to the comments received after Periodic Review and includes not only KPIs reached (quantitative) but also conclusions, detailed description and devitations to allow the reader to fully understand the results of the project.
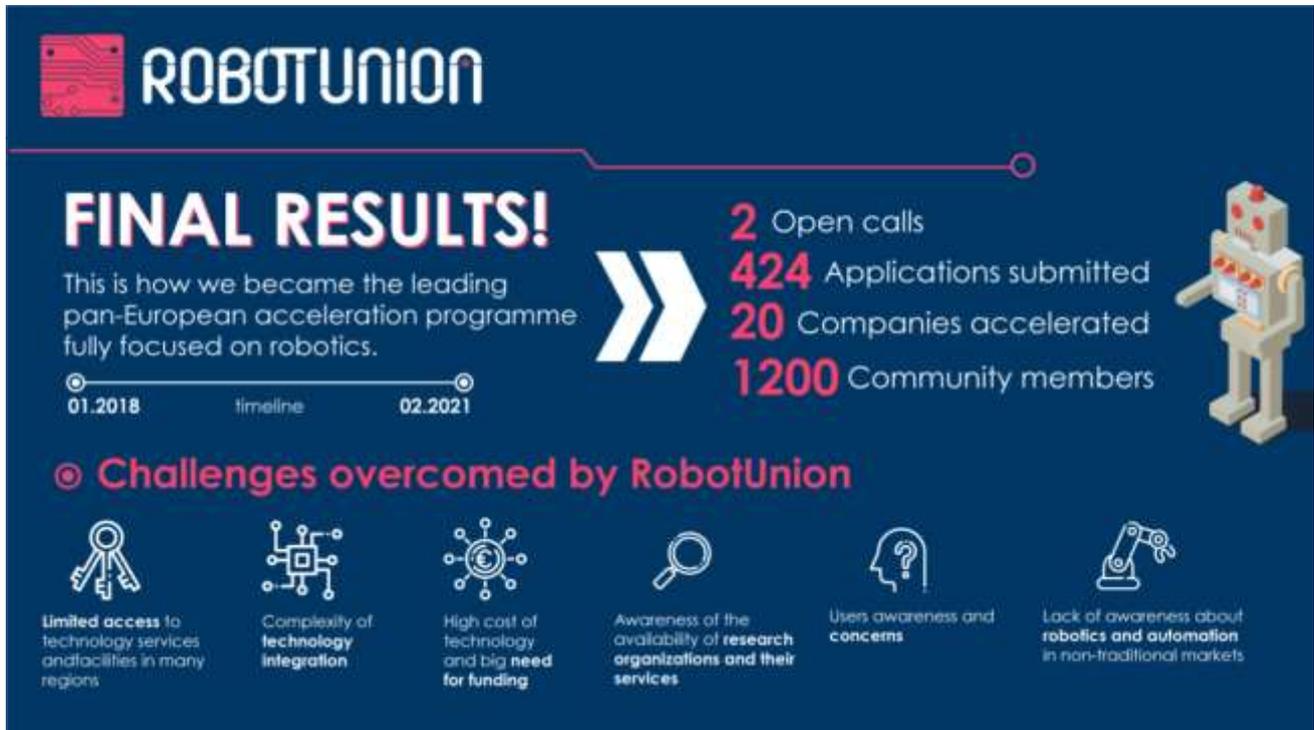
Overview of the Project Results:
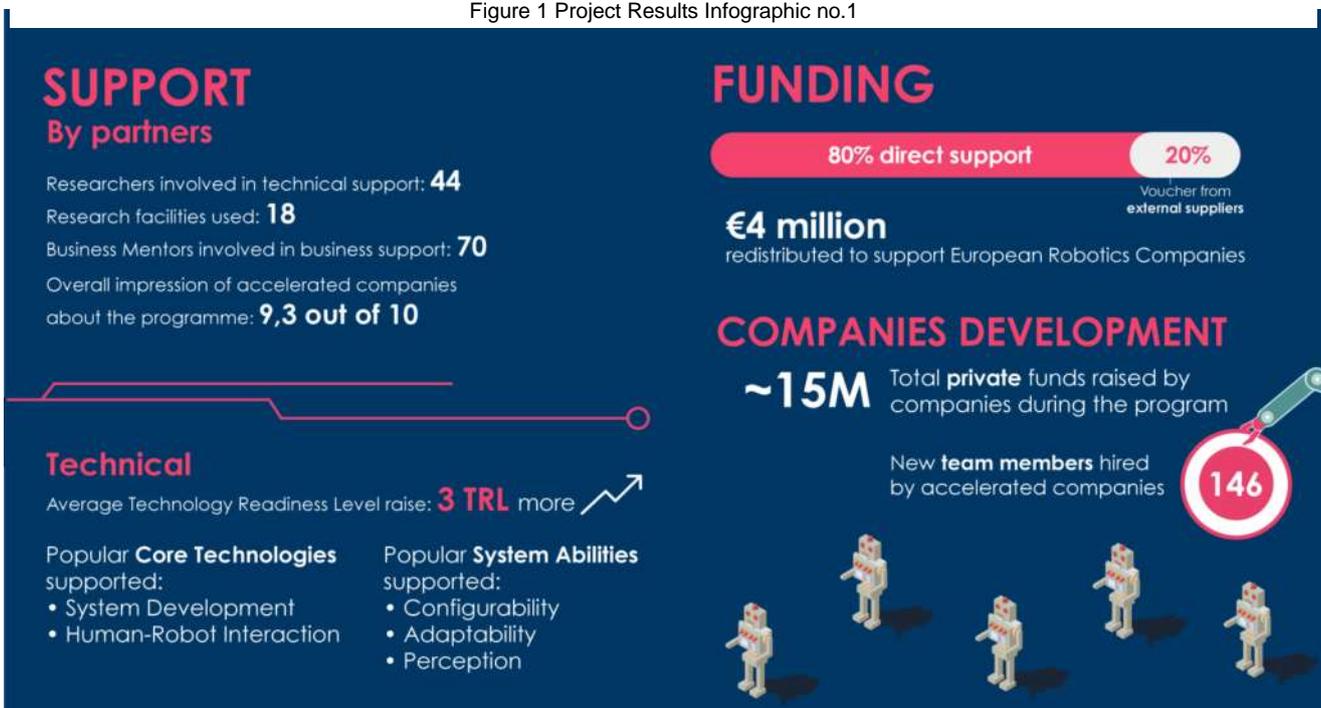

Figure 1 Project Results Infographic no.1

Figure 2 Project Results Infographic no.2

Overview of the technology developed:

First, of all, we would like to include the 20 technologies and systems developed by the companies supported through the project which are, definitely, our main result. These companies have developed a novel and challenging technology and systems applicable to prioritized markets, which are Manufacturing. Agri-Food, Healthcare and Civil infrastructure, most of them starting at TRL4 and ending at TRL6/7, thanks to the technical and non-technical support services received from the RTOs in the consortium partners and also having access to specialised development facilities or technologies provided by external suppliers when needed, thanks to the 'vouchers' scheme.

Product Developed	Company name	Description	Domain	TRL at Beginning of the program	Comment / explanation	TRL at the end of the program	Comment / explanation	RU Support
	Tendo AB	a soft robotic glove, to provide artificial strength in weak hands and enhance the quality of life for people suffering from stroke, arthritis or spinal cord injuries.	Health	4	At this point, we had just started the work with an upcoming prototype for testing; our DemoVersion. Some of the crucial mechanical parts were being designed (the worm gear and the spring), but no parts were yet produced.	7	The refined DemoVersion, the TendoGlove 1.0, will be assembled and already tested together with a few potential users. This product/prototype is what will be further developed into the Tendo OneGrip, which will be produced and with the start of sales in late 2020	**Stage reached:** 1,2,3,4 **Technical:** Lead RTO: Tecnalia PMs: 5.4 Technical Voucher: Romer Consulting Aps 12.200 EUR **Business:** Business Voucher: 3,600.00 € **Fundraising mentoring:** **Grant Received:** 223,800.00 € **Total Funding received:** 256,400.00 €
	Springa	Springa develops autonomous robotic tools for digital fabrication. The mission is to allow everyone being	Manufacturing	4	The technology of the positioning sensors is still to be defined but the platform is already tested.	6	Positioning system development is mature and its design is adopted to relevant environmental conditions.	**Stages reached:** 1,2,3 **Technical:** Lead RTO: PIAP PMs: 3 Technical Voucher:

		creative and building big projects.						DEIB, Polytechnic University of Milano 29,000.00 € **Business:** Business Voucher: 3,600.00 € **Grant Received:** € 123,800.00 **Total Funding received:** €156,400.00 €
	Somnox	Somnox helps you fall asleep, stay asleep and wake up energized. The Somnox robot helps to improve sleep by breathing regulation, soothing sounds and affection.	Health Additional: Hospitality, Retail	4	Concerns Sleep Robot 2.0	7		**Stages reached:** 1,2,3 **Technical:** Lead RTO: TU DELFT PMs: 6 Technical Voucher: Dekimo 29,000.00 € **Business:** Business Voucher: 2,800.00 € **Grant Received:** € 123,800.00 **Total Funding Received:** 155,600.00 €
	Smooth Robotics	SmoothTool by Smooth Robotics make it possible that any welding robot operator can 'plug-and-produce' a new series in just a few hours. The solution uses Intuitive Learning.	Manufacturing, Welding	Software TRL 4 Sensor TRL 5	This was our initial estimate - As later specified we were probably only at TRL 3 with the sensor and we have not reached much further, Yet.	Software TRL 9 Sensor TRL pending	We have a commercial software product for sale and we are still unaware how far we will reach with the sensor development in the extended period. We hope to reach TRL 4-5	**Stages reached:** 1,2,3 **Technical:** Lead RTO: VTT PMs: 7,5 Technical Voucher: Technicon 20,400.00 € **Business:** Business Voucher: 4,000.00 € **Grant Received:** € 123,800.00 **Total Funding Received:** 156,645.00 €

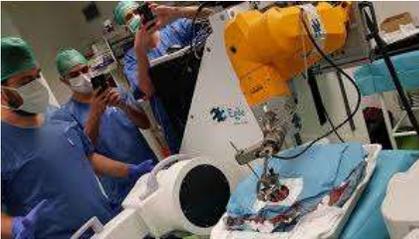|								
	Nido Robotics	Nido Robotics manufactures advanced underwater robots with an unparalleled price-performance ratio, oriented towards commercial applications in inshore waters.	Civil infrastructure	4	The specific technologies to be included in Nido underwater platforms (navigation, HMI) are developed on a general level but required several development efforts to fit into the specific case.	7	New functionalities of the Nido platforms will be fully integrated into platforms that will be verified in a relevant environment - at the client locations to confirm the development achievements.	**Stages reached:** 1,2,3,4 **Technical:** Lead RTO: PIAP PMs: 5,5 Technical Voucher: University of Murcia 29,000.00 € **Business:** Business Voucher: 4,600.00 € **Grant Received:** 223,800.00 € **Total Funding Received:** 257,400.00 €
	Kewazo	Kewazo develops a robotic material lifting system for construction sites. The initial application area is scaffolding. The system improves efficiency and saves at least 30% of installation costs.	Civil infrastructure (Construction)	TRL 5 - 6	The first system validated in a relevant environment	TRL 8 - 9	TRL 7 - 8 in February - pre-certified status, TRL 9 by December 2020 - should be completely certified and proven in the operational environment	**Stages reached:** 1,2,3,4 **Technical:** Lead RTO: VTT PMs: 4,7 Technical Voucher: Svilen Dobrev 4,584.15 € GBN Systems 24,415.85 € **Business:** Business Voucher: 5,000.00 € **Grant Received:** 223,800.00 € **Total Funding Received:** 257,800.00 €
	Faromatics	Faromatics creating a disruptive robot that balances animal welfare with farm productivity by monitoring chickens using sensors and artificial intelligence.	Agrifood	Total TRL:2 Subsys TRL 6 1 1 1 1	Chickenshipherd Subsystem: - Dead chicken detection - Mechanical solution - Gripper - Visual serving - Robot coordination	Total TRL:7 Subsys TRL 7 7 7 7 7	Chickenshipherd Subsystem: - Dead chicken detection - Mechanical solution - Gripper - Visual serving - Robot coordination	**Stages reached:** 1,2,3 **Technical:** Lead RTO: TU DELFT PMs: 4,7 Technical Voucher: Cal Xulic 23,145.60 € **Business:** Business Voucher:

							3,400.00 € **Grant Received:** 123,800.00 € **Total Funding Received:** 150,345.60 €
	CLIIN	Cliin has developed an onboard autonomous Hull Cleaning Robot (HCR). The HCR can keep the hull of a ship clean from microorganisms, algae and animal fouling at all times.	Civil infrastructure (Shipping)	Software – Localization: TRL 3 Software – Navigation: TRL 2	Software for localization and navigation to be added to existing hardware platform (TRL9) that can be used with manual control	Software – Localization: TRL 6-7 Software – Navigation: TRL 6-7 NOTE: Until June 2020	Localization and navigation software demonstrated in a relevant environment and proper software frameworks in place for future extensions of robot capabilities. Possible integration with vessel-mounted winch and cable station.	**Stages reached:** 1,2,3,4 **Technical:** Lead RTO: DTI PMs: 4 **Business:** Business Voucher: 3,200.00 € **Grant Received:** 223,800.00 € **Total Funding Received:** 227,000.00 €
	BotsAndUs	The mission of BotsAndUs is to create a fleet of autonomous service robots to work alongside people. Their goal is to drive efficiency across customer service, operations and analytics.	Open Disruptive Innovation Additional: Retail and Travel	Total TRL:5 Subsys TRL 2 2 5 2	BO Subsystem: - New Distance sensor array - New Audio perception - Visual perception - ROS industrialisation	Total TRL:7 Subsys TRL 7 7 7 6	BO Subsystem: - New Distance sensor array - New Audio perception - Visual perception - ROS industrialisation	**Stages reached:** 1,2,3 **Technical:** Lead RTO: TU DELFT PMs: 3,3 Technical Voucher: Evotronix SRL 27,500.00 € **Business:** Business Voucher: 3,000.00 € **Grant Received:** 123,800.00 € **Total Funding Received:** 154,300.00 €

				Global: 5 Cartesian Manipulator: 5 Blister cutting module: 2	Oscillation observed during Cartesian arm motions. Blister Cutting components at an early stage	Global: 8 Cartesian Manipulator: 9 Blister cutting module: 8		**Stages reached:** 1,2,3 **Technical:** Lead RTO: Tecnalia PMs: 5,5 **Business:** Business Voucher: 3,600.00 € **Grant Received:** 123,800.00 € **Total Funding Received:** 127,400.00 €
	[Quizit](#)	UnitDoseOne, the first truly scalable, automatic hospital pharmacy, prepares drugs in individual doses.	Health					

Table 1 Details of companies accelerated 1st Batch and support provided

Product Developed	Company	Description	Domain vertical	TRL at Beginning of the program	Comment / explanation	TRL at the end of the program	Comment / explanation	RU Support
	[Aether Biomedical Sp.Z.o.o](#)	Cost-effective bionic limb for upper limb amputees	Health	2	Technology formulation. Initial concept definition of pattern recognition.	6	Prototype tested on an able-bodied individual in dynamic hand position with the required number of gestures.	**Stages reached:** 1,2,3,4 **Technical:** Lead RTO: Tecnalia PMs: 8 Technical Voucher: Glaze Prosthetics 23,000.00 € **Business:** Business Voucher: 3,600.00 € **Grant Received:** 223,800.00 € **Total Funding received:** 250,400.00 €

		Company	Description	Sector	TRL start	Stage start	TRL end	Stage end	Details
		[Automato Agricultural Robotics Ltd](#)	Robotic solution for single tomato harvest in passive environments	Agrifood	7	Harvest Module	8	Harvest Module	**Stages reached:** 1,2,3,4 **Technical:** Lead RTO: PIAP PMs: 9,9 Technical Voucher: Opinya Ltd 23,800.00 € **Business:** Business Voucher: 3,800.00 € **Grant Received:** 223,800.00 € **Total Funding received:** 251,400.00 €
		[Cyber Surgery](#)	Robotic assistant for spinal fusion	Health	7	First prototype.	7.5	The prototype with integrated improvements. The ''full'' TRL 8 stage will be achieved in 2021 when the system will be certified for medical applications.	**Stages reached:** 1,2,3 **Technical:** Lead RTO: Tecnalia PMs: 8 Technical Voucher: IKUSI Electrónica, S.L.U. 28,400.00 € ACL - WPIS-conformity 5,610.00 € Pii GmbH - usability design 8,595.00 € **Business:** Business Voucher: 4,200.00 € **Grant Received:** 123,800.00 € **Total Funding received:** 156,400.00 €

	FORMHAND Automation GmbH	Industrial gripper adaptable to different objects including limp and porous materials	Manufacturing Additional: Metallurgy, intralogistics e-commerce, textile, automotive	4	Basic application tests with old gripper in robot cell of FH-Lab with relation to sheet metal handling	7	New gripper concept and materials tested in a production environment in customers site	**Stages reached:** 1,2,3 **Technical:** Lead RTO: VTT PMs: 8 Technical Voucher: NTT - textile gripper cushion 5,000.00 € **Business:** Business Voucher: 4,200.00 € **Grant Received:** 123,800.00 € **Total Funding received:** 147,205.00 €
	Bin-e	Automatic at-source-sorting of solid waste	Open Disruptive Innovation	5	Hardware	7	Hardware	**Stages reached:** 1,2,3 **Technical:** Lead RTO: PIAP PMs: 10,5 Technical Voucher: Alvo 28,000.00 € **Business:** Business Voucher: 4,200.00 € **Grant Received:** 123,800.00 € **Total Funding received:** 156,000.00 €
	mx3d bv	Software solution for Robotic Wire Arc Additive Manufacturing	Manufacturing Metallurgy	2	1. CMT welding machine integration	8	1. CMT welding machine integration	**Stages reached:** 1,2,3 **Technical:** Lead RTO: TU DELFT PMs: 4,8 Technical Voucher: KUKA 5,580.00 € **Business:** Business Voucher: 4,800.00 €

								Grant Received: 123,800.00 € **Total Funding received:** 134,180.00 €
	[Proxima Centauri ApS]	Sorting of natural casings in the food industry	Agrifood	3	Semi-automatic pickup system	9	All technologies should now have TRL9 maturity.	**Stages reached:** 1,2,3,4 **Technical:** Lead RTO: DTI PMs: 8 Technical Voucher: Egatec 28,400.00 € **Business:** Business Voucher: 3,200.00 € **Grant Received:** 223,800.00 € **Total Funding received:** 255,400.00 €
	[Rebartek AS]	Optimized design and robotic prefabrication of steel reinforcement rebars	Civil infrastructure (Construction)	6	simple robot/camera setup capable of welding in some cases	8	actual products are being produced, but some refinement is needed for a fully automated process as well as multiple variations of the products	**Stages reached:** 1,2,3,4 **Technical:** Lead RTO: DTI PMs: 9,9 Technical Voucher: Fronius 11,346.72 € Krüger 15,000.00 € **Business:** Business Voucher: 3,400.00 € **Grant Received:** 223,800.00 € **Total Funding received:** 253,546.72 €

	Rigi Technologies GmbH	Point-to-point drone delivery solution for medical samples	Health Additional Markets: eCommerce & Postal Industrial & Spare Parts Emergency & Humanitarian	1	Failsafe system/ parachute integration	8	Failsafe system/ parachute integration	**Stages reached:** 1,2,3,4 **Technical:** Lead RTO: TU DELFT PMs: 7,8 Technical Voucher: Radiate 20,666.00 € **Business:** Business Voucher: 3,600.00 € **Grant Received:** 223,800.00 € **Total Funding received:** 255,800.00 €
	ROVENSO SA	Robotic solution for unsupervised patrolling and security monitoring	Civil infrastructure (Inspection and Maintenance) Chemical industries, Energy asset management, Oil & Gas	5	The first example of security patrol done by us in relevant warehouses	7	The official pilot project starts with one of our major clients	**Stages reached:** 1,2,3 **Technical:** Lead RTO: VTT PMs: 5,5 **Business:** Business Voucher: 4,200.00 € **Grant Received:** 123,800.00 € **Total Funding received:** 128,000.00 €

Table 2 Details of companies accelerated 2nd Batch and support provided

2. Main project impacts

In this section, we are going to explain the specific contribution to each one of the impacts listed in the ICT-27-2017 topic

Impact #1:·Contribute to the overall growth of SMEs targeting new robotics markets

RobotUnion has contributed to the overall growth of SMEs targeting new robotics markets by providing support to the 20 most promising European Robotics companies (See list in Tables 1 and 2) whose innovations disrupted the Robotics market in many ways (see Additional Impact N#2).

The robotic markets addressed by the companies supported have been the 4 prioritized domains at the proposal stage, which are Manufacturing or Robotics in production, Healthcare, Civil Infrastructure (inspection and maintenance) and Agri-Food. The novel and challenging technologies and systems applicable to these markets developed, within the project, have been:

- Manufacturing: 4 solutions
- Healthcare: 6 solutions
- Civil Infrastructure (inspection and maintenance): 5 solutions
- Agri-Food 3 solutions
- Open Disruptive Innovations 2 solutions

To reach this, RobotUnion has:

Widely disseminated the open calls to reach the more outstanding robotics companies at the EU level. As result, we got a successful outcome of the Open Calls that overcame the initial expectations (424 submitted, 124 applications more than planned: KPI **I1.2** in Table 3). Outreach KPIs like social media accounts with

«Having a dedicated program for Robotics companies in Europe is a great testament to the talent and innovation in the region and we are very proud to be part of this fantastic community»

BOTSANDUS I @BOTSANDUS
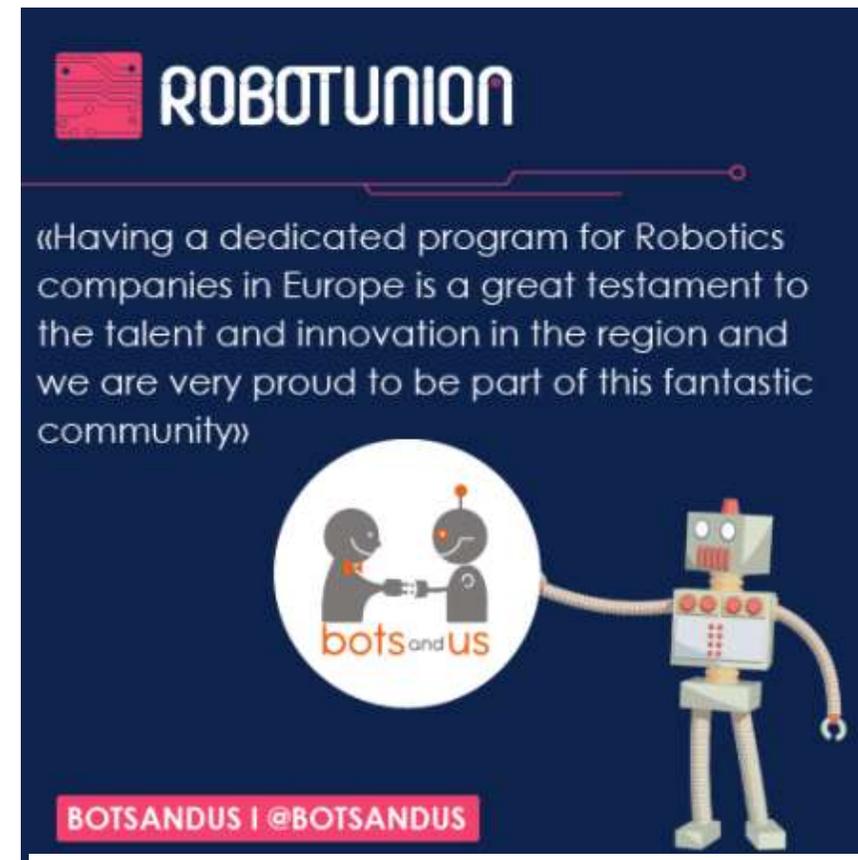
Figure 3 BotsAndUs Testimonial (1st Batch)

3000 followers, a community with more than 1200 users shows a big interest of the Robotics community in acceleration programs dedicated exclusively to Robotic companies.

Confirmed an excellent multinational collaboration by creating a unique acceleration programme where research centres, business schools, large corporations and investors came together to create an innovative way to support Robotics companies and help them to:

•Minimize elevated costs associated with the development of specific technologies for market entry by equity-free funding and support provided (see details in KPIs table)

•Provide access to technology services and facilities through 44 researchers(160 PMs) and 18 research facilities that were provided by RTOs engaged in the project (VTT, DTI, TU DELFT, PIAP, and Tecnalia).

•Raise the advantages of robotics and automation in non-traditional markets (healthcare, Agrifood, civil engineering, manufacturing) through the RobotUnion Community (1200 users) and the ecosystem created during the project

•Improve their Funding Journey and raise 15M EUR of additional private funds: (with the support of Blumorpho, ODENSE, Chrysalix)

•Connect to 70 top-notch mentors and robotics experts in different strategic fields (ISDI)

•Get international exposure through 42 events and ecosystem building (FMWC and FBOX)

The **overall impression of accelerated companies about the support programme is 9.3 out of 10[2]**, which confirms the perceived added value of the support provided.

All this support provided in the acceleration programme has resulted in 50,000 Robotics SMEs reached (see KPI1.1 in Table 3), 40 scaleups supported (see KPI I1.3 in Table 3) in 4 robotics markets, 20 solutions developed (see KPI I1.4 in Table 3), 9 Proofs of Concept in Market conditions (see KPI I1.5 in Table 3) and 15M of additional private funds raised (See KPI I1.6 I Table 3).

All this has positioned RobotUnion as the leading pan-European accelerator program in Robotics at EU Level, becoming the reference on this domain for institutions at the regional level in Europe (see Additional Impact #2 and Testimonials included in all document) in Europe.

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[2] Data gathered via a final survey at the end of each acceleration programme February 2020 for 1st Batch and September 2020 for 2nd Batch

Impact #1 KPI targets and achievement

KPIs	KPI Name	Target	Results	Explanation	Responsible	Mean of verification
I1.1	**Nº Scaleups directly reached**	2.590	51.439	RU reached an impressive number of ScaleUps directly reach through partners ecosystem and effective management of 8 main channels for its communication and dissemination activities (website, social media, press releases, newsletter, retargeting, events, partners ecosystem, scouting). Lessons Learnt from RobotUnion Community building were included in D6.11 Impact Report 2.	FMWC & FBOX	D.1.2 Community Mapping RU Community (1181 users) RU LinkedIn (1118 followers) RU Twitter (1635 followers) RU facebook (236 followers) RU supportive partners (46 entities)
I1.2	**Nº Scaleups applying to RobotUnion Open Calls**	300	424	RobotUnion launched two Open Calls (one in 2018 and one in 2019) to select the 40 beneficiaries who entered Stage 1 of the program. The goal of the Open Calls was to receive a satisfactory number of applications and to ensure the quality of the beneficiaries selected for the program. As a result, in both Open Calls 424 proposals were submitted and eligible for the program which is 141% achieved of the KPI planned	FBOX	Deliverables Report on the Open Call and its outcome D2.2 and D2.5
I1.3	**Nº Scaleups supported by RobotUnion**	40	40	40 Scaleups selected through Open Calls have received 2-month support to develop their Feasibility Plan (Stage 1). 20 of those Scaleups were selected to Stage 2 (Research Support & Product Development)	VTT + DTI + TU DELFT + PIAP + Tecnalia	Feasibility Plans Report D3.1and D3.5 Report on Research Support Programme D3.4 and D3.8

I1.4	Nº Scaleups developing a prototype	20	20	In Stage 2, 20 Scaleups presented in the Introduction received technical support to develop their solution. (see list of the scaleups and the solutions developed in Tables 1 and 2 in the Introduction Section). As the final results, the average TRL raise of the companies is 3 TRLs more (See detail for each one of the solutions developed in Tables 1 and 2 in the Introduction Section). --- In Stage 3, 20 companies received 6 months of Business Support led by ISDI. ● 70 external business mentors were engaged in the Business Support	Technical Support lead: VTT Partners involved: DTI + TU DELFT + PIAP + Tecnalia ------------ Business Support lead: ISDI	Report on Research Support Programme D3.4 and D3.8 ------------------ Report on the Business Ignition Support Programme D4.2 and D4.4
I1.5	Nº of Proof of Concept in Market conditions	8	9	In Stage 4, 9 companies were selected (Nido Robotics, Tendo, Cliin, Kewazo, Aether, Automato, RigiTech, Proxima Centauri, Rebartek) based on the feasibility of their Proof Of Concept Plan and Investment Potential. These 9 companies were representing the 4 markets prioritised. Each company received further technical support to implement the PoC (1 PM/company) and intensive Fundraising Mentoring (2,5PM/company) to raise private money and close Cooperative Agreements with potential clients and corporates.	Technical Support lead: VTT Fundraising Support lead: Blumorpho Corporates engaged: MADE, FENIN, FERROVIAL	Proof of Concept Report D5.1 and D5.4 Extended Investment Plans Report D5.2 and D5.5 Report on Extended Funding 2 D5.3 and D5.6
I1.6	€ Venture capital granted	€8M	€15M	During the project, RobotUnion acted as a third party and matchmaker and enabled companies to collect the market feedback that Scaleups alone couldn´t obtain.	BLUMORPHO	Report on Extended Funding 2 D5.3 and D5.6

					Partners involved: Odense, Chrysalix	
				The objective was to converge towards a business plan that could match both the founders' ambition and the investors' expectations in terms of return on investment. All the companies had the opportunity to meet with a network of investors in the frame of the Venture Jury day, the Odense Summit and events with investors. It has been confirmed that fundraising support provided under Stage 4 was too short to fully enable investors connection.	Partners involved: Odense, Chrysalix	
I1.7	**Nº Cooperation Agreements**	8	5 introductions 3 LoIs signed 1 agreement signed	One Cooperation Agreement per each Scaleup in Stage 4 with large Corporates was expected. During the whole process scaleups and introduced corporates have shown their willingness to collaborate and reach an agreement, in terms of introductions made. The value of the exercise was also in the learnings during the process of how to reach out to corporates and understand their background and conditions for possible testing and collaboration. The main learning is that reaching agreements with Corporates is a long process that has been started during the project but should continue beyond the project (Stage 4 lasted only 3 months which is a very short time to reach a final agreement with the corporates and potential clients). For the Health industry, the regulation is very restricted to the requirement of products having CE Medical Device Certification.	MADE, FENIN and FERROVIAL	Report on Extended Funding 2 D5.6 D6.7 PEDR 3

				In total 8 of such agreements have been initiated, the process is lengthy and conversations will follow after the project's completion		
I1.8	**Business value creation**	€3M year 3 €15M year 4 €150M year 11	7 out of 9 companies selected to Stage 4 have exceeded the goal of 150k€ of revenue in February 2021 (end of RU project) and their future predictions are very promising.	RobotUnion offered Robotics Scaleups support in their Go-to-market phase with the generation of sales and contract. The support in prototype and proof of concept permitted to engage first customers during the acceleration program to generate sales and value in a short time frame. 7 out of 9 companies selected to Stage 4 have exceeded the goal of 150k€ of revenue in February 2021 (end of RU project) and their future predictions are very promising. 100% of Scaleups selected developed their Prototypes during the project.	ALL	Report on Extended Funding 2 D5.6

Table 3 Impact #1 KPI targets and achievement

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Impact #2: SMEs conducting and utilising research to access new markets

RobotUnion has created a unique value proposition by lowering one of the main technical barriers which Robotics SMEs face when developing their technology: limited access to technology services and facilities in many regions.

Thanks to the participation of 5 European RTOs in the consortium, accelerated companies were able to use the research facilities (18 facilities used) and get the support of researchers. Each company was assigned with Technical Mentor that was able to help Scaleup to select, from the Consortium's resources, those needed according to its technical requirements and specialities or to identify external ones, if needed.

The research support was allocated to separate support tasks based on the needs of the Scaleups and the capabilities of the RTOs (max 6 PM/Scaleup). In case that some of the services were not available within the consortium level, a Technical Voucher (of up to 28.400 EUR per company) was available for contracting external services.

Research performed in the project allowed to advance the state of the art in the level of smart robotics system abilities defined in the H2020 Robotics Multi-Annual Roadmap[3]. The most frequently referred were Perception, Interaction, Configurability, Motion, Dependability (See figure 5).

In sum, the 20 scaleups supported by RobotUnion have received 160PMs of dedicated Technical Support provided by 44 researchers (see KPI I2.1 in Table 4) plus access to 18 facilities and external services through voucher mechanism. All this research support has allowed them to raise 3 TRL levels[4], on average, in the solutions developed, reaching TRL 8 in the case of the 9 companies (see KPI I2.2 in Table 4) selected to Stage 4 where they have received additional support to develop the PoC. All these services and technologies have been relevant to address the 4 main markets addressed

Figure 4 Testimonial from KEWAZO (1st Batch)

within the project, but all the companies made an important effort to **discover different market applications for their robotics solutions in markets like Welding, Shipping and Maritime, Hospitality, Retail, eCommerce, Oil & Gas, Metallurgy** (see KPI I2.3). The consortium has also contributed

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[3] https://www.eu-robotics.net/cms/upload/downloads/ppp-documents/Multi-Annual_Roadmap2020_ICT-24_Rev_B_full.pdf

[4] See detail of TRL for each one of the solutions developed in Tables 1 and 2 in the Introduction Section.

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to lowering the research barriers to access them by developing productisation guidelines for robotics solutions in these four verticals (Productisation Building Blocks).

On top of that RobotUnion has committed to making research outcomes publicly available 10 scientific documents were published as the outcome of the research tasks performed with support companies.
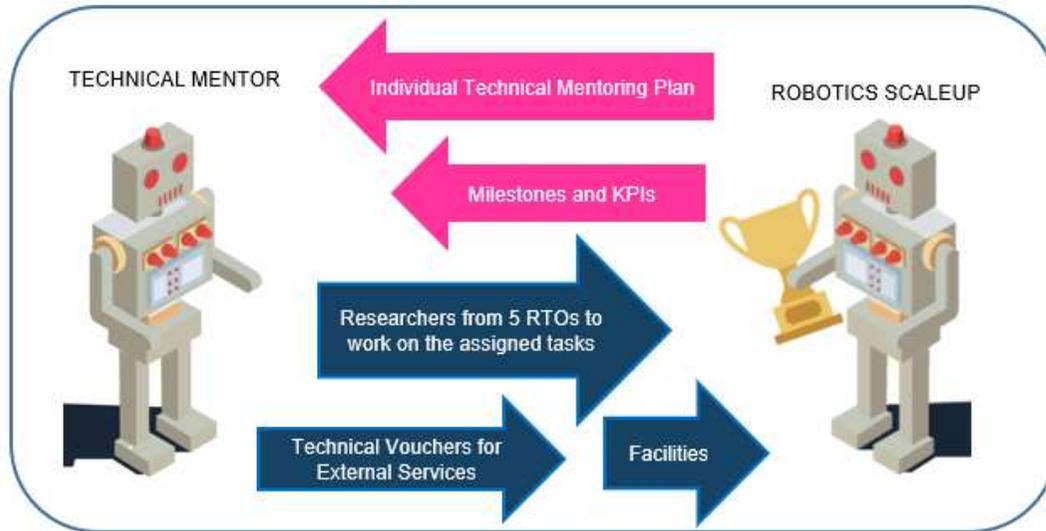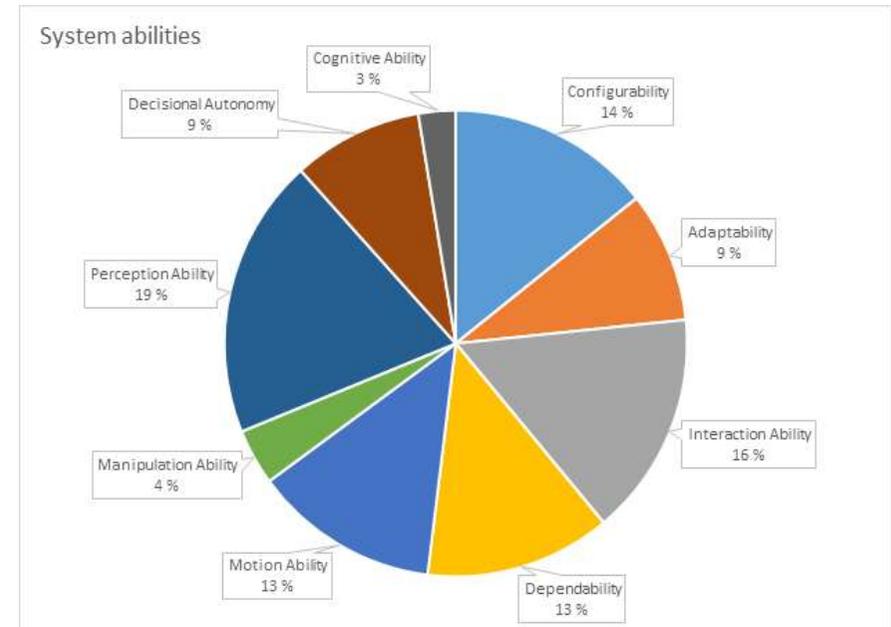

Figure 6 RobotUnion Technical Support process

Figure 5 System Abilities improved through support provided to accelerated companies

Impact #2 KPI targets and achievement

KPIs	KPI Name	Target	Results	Explanation	Means of verifications
I2.1	**Nº of TM allocated to Scaleups**	40 TM	40 TMs assigned to 40 Scaleups in Stage 1	Each scaleup was assigned a Technical Mentor appointed by RTOs in the consortium (40 TM in Stage 1 to support scale ups in developing the I feasibility plan, which continued in Stage 2 to support the 20 scale ups selected to develop the prototype). On top of that, all Scaleup had access to Researchers and domain experts	Feasibility Plans Report D3.1and D3.5

				20 TMs assigned to 20 ScaleUps in Stage 2 44 researchers engaged	available on the consortium level that was assigned by the Technical Mentor to contribute to identified research tasks.). Scaleup have also access to the research facilities provided by RTOs in the consortium. In case if support was not available inside the consortium, companies could use technical vouchers (up to 28.400 EUR per company). In total: *44 researchers (160PMs) from RTOs from the consortium were engaged in the Technical Support *18 facilities provided by RTOs were used by scaleups * Technical vouchers budget used 435,622.32 € (24 external providers)	Report on Research Support Programme D3.4 and D3.8
I2.2	**Nº of PoC** developed	8	9	9 companies selected to Stage 4 received additional technical support from RTOs (1 PM each) to develop PoC planned. All companies have successfully achieved the PoC planned.	Proof of Concept Report D5.1 and D5.4
I2.3	**Nº of new markets** addressed lowering the research barriers	4	4 main Manufacturing Agriculture Healthcare Civil infrastructure 7 additional Welding, Shipping and Maritime, Hospitality, Retail, eCommerce, Oil & Gas, Metallurgy)	The robotic markets addressed by the companies supported have been the 4 prioritized domains at the proposal stage but thanks to the support provided during the project all companies made an important effort to discover different market applications for their robotics solutions (Welding, Shipping and Maritime, Hospitality, Retail, eCommerce, Oil & Gas, Metallurgy) Deliverable D3.3 and D3.7 Productisation building block 2 presented an overview of different approaches based on the research done with supported companies and served as general productisation guidelines for robotics solutions in the four market verticals: manufacturing, agri-food, healthcare and civil infrastructure.	Innovation Management Report 3 D7.10 Productisation Building Block D3.3 and D3.7

Table 4 Impact #2 KPI targets and achievement

RobotUnion
D6.13 IMPACT REPORT 3

ROBOTUNION

Funded by the Horizon 2020
Framework Programme of the
European Union

Impact #3: More efficient development of the robotics sector and wide acceptance in both academia and industry of new benchmarking tools

Impact #4: Improved systems characterisation and improved means of robotics system performance evaluation

Even though RobotUnion was not directly focused on the implementation of robotics benchmarks and metrics that are related to Impact 3 and 4 (second scope of ICT-27 topic), it had made an effort to contribute to the more efficient development of the robotics sector by defining some Productization Building Blocks for the prioritized sectors (KPI I3.1 in Table 5) and collaboration with other ICT 27 projects that were focused on standardization (KPI I4.1 in Table 5).

Productization Building Blocks
The objective of creating the acceleration program dedicated to robotics was to contribute to general sector development through defining Productisation building blocks that will serve as a general productisation guideline for robotics solutions in the four market verticals prioritised (manufacturing, agri-food, healthcare and civil infrastructure). Due to the characteristics of the acceleration programme, the companies supported through the project were predominantly product-oriented and productisation efforts were aiming at defining individual products for a selected customer segment. Services were included mainly in the form of adaptation and integration at the client-side. Service extensions were sometimes offered in the form of data collection and analysis. Product-enabled services as the main offer are mainly found in the civil-infrastructure domain.

Cooperation with EU project covering the benchmarking and standardization to assess progress in robotics technologies and systems.
RobotUnion supported other projects approved under the ICT-27-2017 topic (see figure 7, marked in Blue), especially those approved under the ¨ Development and implementation of robotics application-relevant benchmarks and metrics to assess progress in technologies and systems.¨ with cross dissemination actions. Both projects were included in Supportive Communities.

- **EUROBENCH:** European ROBotic framework for bipedal locomotion bENCHmarking
- **COVR:** Being safe around collaborative and versatile robots in shared spaces
- **ESMERA:** European SMEs Robotics Applications

Most of the RobotUnion partners are strongly involved in robotics network EU projects which will benefit from experience gained in the RobotUnion project (see Figure 7, marked in green: **DIH2:** VTT, FBOX, BLM, ISDI, PIAP, TU DELFT, **RIMA:** FBOX, VTT; DTI, PIAP, **DIHHERO:** Tecnalia, DTI, **AGROBOFOOD:** TU Delft, DTI). On top of that, the following EU projects include the RobotUnion Accelerator model or a similar approach: DIH2, RIMA, AI4EU.

Figure 7 RobotUnion collaboration with other EU projects

The important effort was dedicated to collaboration with the DIH HERO project to support the project with an urgent COVID open call for health-related robotics solution with RobotUnion Community and FSTP budget. In the end, the collaboration was established only on the dissemination level due to difficulties with compliance between two EU budgets.

Close collaboration was established also with the INBOTS project that aims to develop standardization and benchmarking strategy related to horizontal aspects of interactive robots.

Impact #3 and 4 KPI targets and achievement

KPIs	KPI Name	Target	Achieved	Means of verification
I3.1	**Cooperation with EU projects** covering benchmarking and standardization	100%	Productization Building Blocks guidelines for robotics solutions in four market verticals: manufacturing, agri-food, healthcare and civil infrastructure	Productisation Building Block D3.3 and D3.7

I4.1	Cooperation with EU projects covering system characterisation and evaluation	100%	7		Close collaboration with 7 European projects (Eurobench, COVR, ESMERA, DIH2, RIMA, DIH HERO, INBOTS)

Table 5 Impact #3 and 4 KPI targets and achievement

3. Additional impacts

Additional Impact N#1. Funding complemented by ESIF or other regional or national funds and/or private funds

Additional Impact N#1.1. Additional Funds for scaleups supported.

Robotics oriented support provided by RobotUnion helped to raise the competitivity of the European robotics industry by increasing the value of the ScaleUps and improving their investment readiness to stimulate the European Robotics Ecosystem. The success stories generated through RobotUnion action will contribute to attracting more private investment in disruptive robotics companies. According to the final survey made with all companies at the end of the acceleration program, a total number of 15M EUR of private funds was raised by all companies during the project duration.

On top of that 9 Companies selected to Stage 4 (Super Stars) participated in 3 months custom made 'Funding Journey' (2,5PM per company) that included:

- Investment Analysis& Portfolio Management (Fundraising Mentoring provided by BLM)
- Visibility during Investor related events (Odense Investors Summit, INPHO Venture forum, RobotUnion Venture Jury Days)
- Public Funding Support (FBOX)
- Support in signing collaboration agreements (MADE; FERROVIAL and FENIN)

«Robotunion is a must-do program for any robotics startup. Our team at Aether was able to go from a prototype to a CE certified medical device placed in the market with their support. At the same time, we were able to raise major investment from VC's under the program as well»
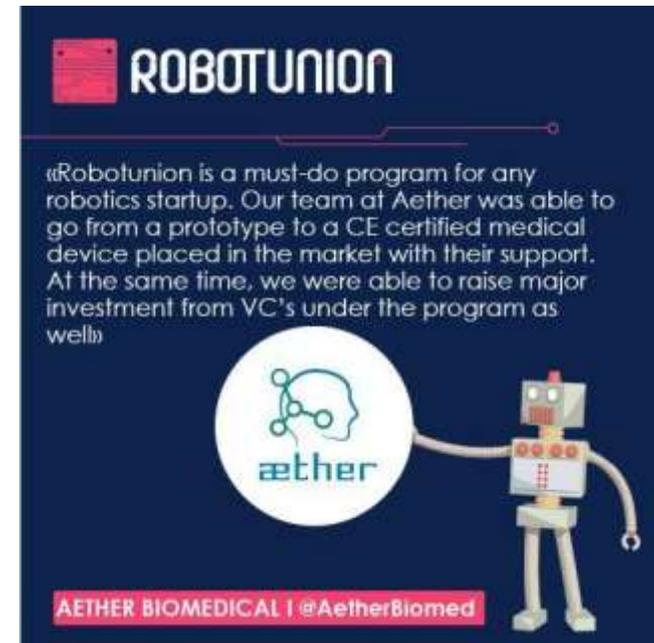
Figure 8 Testimonial from Aether (2nd Batch)

It is important to underline that according to statistics surveys performed with companies accelerated **only 50% of them were interested in Public funding.** Their main fundraising strategy is focused on private funding where RobotUnion support was concentrated. Guide for Public funding opportunities that included opportunities for Robotics startups was published in January 2020 and November 2020. Although most companies showed little interest in seeking additional public funding, some of them did apply successfully to prizes, regional and national programmes and other cascade funding opportunities (KPI AI1.1 in Table 6)

Additional Impact #1.1 KPI targets and achievement

KPIs	KPI Name	Target	Achieved	Means of verification
AI1.1	**€ National & EU Funds raised** to Scaleups Supported	€5M	Some of the recognition prizes and public program funds which 20 companies received: NCBR Fasttrack grant (Aether), Seal of Excellence EIC Horizon (Bin-e&Springa), IPA4SME project (Springa), Poland Now Prize (Bin-e), Durchstarter prize 2019 (Formhand), IHK technology transfer prize 2019 (regional recognition, Formhand), Purmundus Challenge 2020, Entrepreneurial price of Odense region (Proxima Centauri), "Le Moniteur" Innovation Day (Rebartek), Caixa Dayone Emprendedores XXI (Nido Robotics), Faromatics Awards, X Europe programme (Bots&Us), 2 million DKK in EU funding for Proxima Centauri (~267k EUR), ESA BIC Switzerland program (RigiTech), Other cascade funding EU projects: Cyber Surgery: ESMERA (100k EUR) RigiTech: DIHHERO (100k EUR) MX3D: WeldGalaxy (100k EUR), Trinity (100k EUR) Rebartek: WeldGalaxy (100k EUR)	Guide for Public funding opportunities published in January 2020 and November 2020.

Table 6 Additional Impact #1.1 KPI targets and achievement

Additional Impact N#1.2 Additional funds raised for the action

The future sustainability of the project was based on the RobotUnion Instrument idea (see Figure 9) that included multiple sources of funding, combining regional, private and public funding. The success of such an instrument depended a lot on introducing the concept to different kinds of European Contributors to measure its willingness to contribute and invest in the instrument. The principle of the future instrument was that for each Euro invested in the RobotUnion Instrument by a Region or a Corporate, one Euro will be invested by the RobotUnion Instrument in the future of European robotics companies.

An implementation plan has been executed in the last year of the project with multiple objectives:

- Confirm the interest of all the RobotUnion partners to join such a model beyond the project duration through a Memorandum of Understanding. (RU partners interest in the RU Instrument was 3,12 out of 5 according to the survey).

- Introduce the concept to external stakeholders (listed below) to measure their interest in such an initiative through a Letter of Interest.

Regions: DigitalNorway (Norway), AFIL (Lombardia, Italy), Region Adrvest (Romania), EMC2 cluster, (Pays de la Loire, France), Copenhagen Regional Office (Denmark), BIC Gipuzkoa/BIC Biscay (Spain)
Corporates: Novo Nordisk, TRUMPF Venture

- Introduce the concept to European Contributor to measure its willingness to contribute and invest in the instrument: (European Investment Bank (EIB) and the European Investment Fund (EIF)
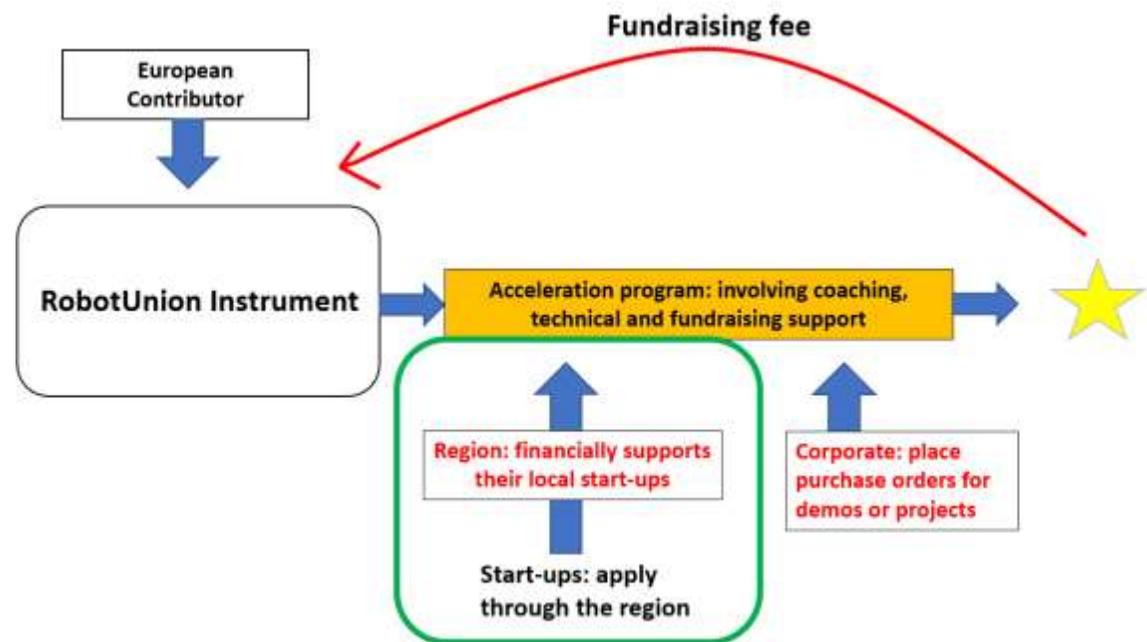

Figure 9 RobotUnion Instrument model

Unfortunately despite efforts, it was not possible to identify the appropriate European funding body that could support the model of the RobotUnion Instrument. While extensive investigations and considerations have been made to implement a sustainability model, it has not been possible to anchor this model in an organization and thereby ensure the sustainability of the RobotUnion Acceleration Program.

Despite this fact, the RobotUnion consortium worked on an alternative model where all the partners could continue to deliver value to European Robotics Start-ups and Ecosystem created during the project by maintaining the connection and synergies within the network. The Memorandum of Understanding which will be signed after the project is currently under discussion. For now, the sustainability of the acceleration program will rely on individual regions implementing its parts and the RobotUnion partners exploiting the results individually.

In any case, in the context of the new Multiannual Financial Framework 2021-2027, specific action lines could be launched, both at the national and EU level, which RobotUnion partners are willing to explore to sustain and extend the efforts done so far to support Robotics ecosystems.

Additional Impact #1.2 KPI targets and achievement

KPIs	KPI Name	Target	Achieved	Explanation	Means of verification
AI1.2	RobotUnion Instrument	€1,8M year 4 €3,5M year 5	In progress	While extensive investigations and considerations have been made to implement a selected sustainability model, it has not been possible yet to anchor the RU Instrument model into a future organization to ensure the sustainability of the RobotUnion Acceleration Program. However, the RU partners will sign the MoU to continue with the network. On top of that specific actions could be launched, in the context of the new Multiannual Financial Framework 2021-2027 to extend the efforts done so far to support Robotics ecosystems	RobotUnion Business Plan 2 D6.9 Continuity Fund Private Placement Memorandum D6.8

Table 7 Additional Impact #1.2 KPI targets and achievement

Additional Impact N#2. Contribute to reinforce the European Union top position in the global automation race

The robotics market is experiencing a significant transformation and ScaleUps supported through the RobotUnion project cover most of these technologies where robots are growing beyond the workhorses of industrial shop floors and beginning to adopt the roles of personal assistants (BotsAndUs), surgical assistants (Cyber Surgery), harvesting robotics (Automato), autonomous recycling IoT devices (Bin-e), exoskeletons (Tendo and Aether), and aerial (RigiTech) and underwater (Nido) vehicles, among many other uses developed during the RobotUnion project.

Technological innovations, concerning core technologies supported by RobotUnion like AI, navigation, human-robot interaction, and perception, have made robotics more appealing (see Figure 10). Technology and other component providers have been instrumental in moving the robotics ecosystem forward. FORMHAND´s Industrial gripper (supported by RobotUnion in 2nd Batch) adaptable to different objects including limp and porous materials have enabled the successful implementation of robotic applications in the highly variable environments of consumer goods manufacturing, food processing and packaging, and e-commerce supply chain automation.

The global battle against COVID-19 has seen technology play a crucial role in assisting humans in containing the spread of the virus and dealing with the existing cases. One of the critical technologies that have made an enormous difference on the ground is robotics. A large number of hospitals worldwide are currently using robots to aid both the healthcare staff and patients. Robots have the potential to be deployed for disinfection, delivering medications and food, measuring vital signs, and assisting border controls. ROVENSO (supported by
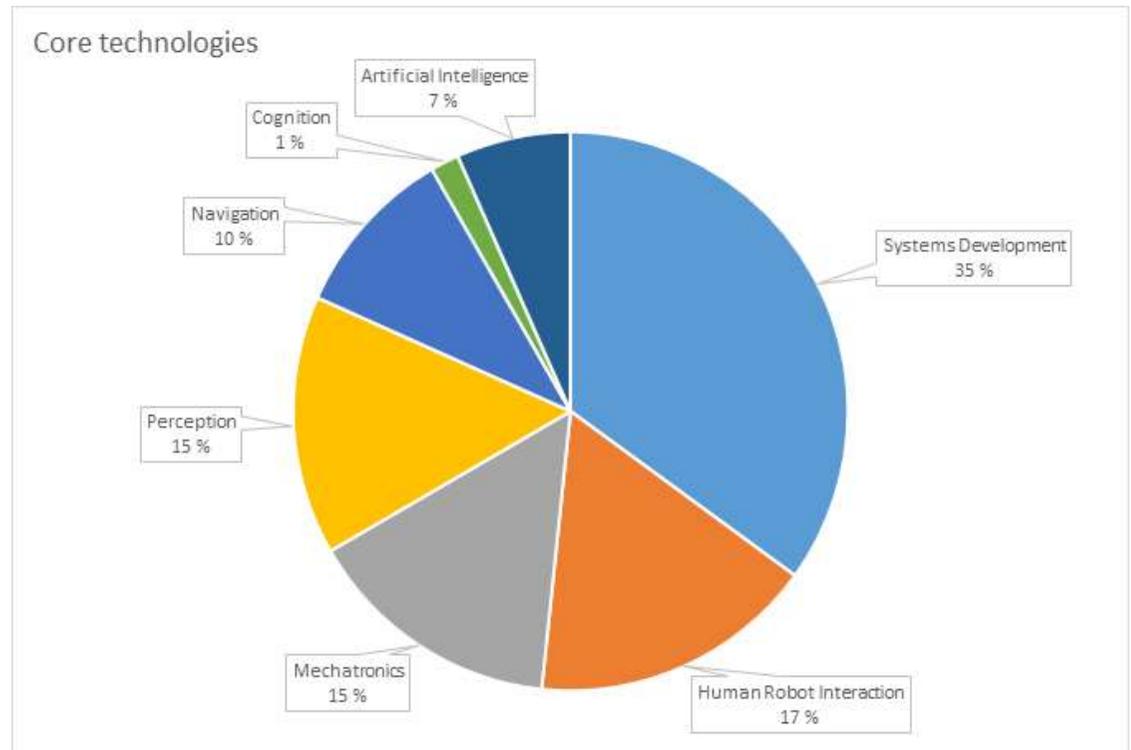

Figure 10 Core Technologies supported by RobotUnion

RobotUnion in 2nd Batch) was recently nominated by 4YFN as [Pandemic Startup Hero](#) as they managed to turn their highly mobile security robot into an autonomous and efficient coronavirus destroyer. The robot uses a UV-C disinfection system to target desktops, counters, and equipment in common spaces.

Contribute to reinforce the European Union top position in the global automation race through the sustainability of the RobotUnion Acceleration Model:

Most of the existing accelerators are based fully on Digital technologies and few of them can give support in the IoT domain, but none of them has still shown the capabilities to deliver a LEAN Startup type of program **adapted to the needs of the Robotic domain**. In this regard, RobotUnion curated an all-in-one solution that can shape the piece of the puzzle that is missing by the Acceleration ecosystem. The pool of facilities, researchers, designers, entrepreneurs, investors and managers of corporations that were engaged during the project have shaped the fundamentals of a community network of experts that empowered a RobotUnion accelerator. In this sense, the project created a practical approach to prove the scalability of the model "as a service" through creating a 'plug&play' RobotUnion Toolkit that was promoted outside of the consortium. By consolidating the sustainability of the services, we will contribute further to reinforce the EU top position at the global level as having already been demonstrated during the project duration.

Interest in such an acceleration program dedicated to robotics has been consulted by the RU consortium while developing the Sustainability model. The future model of the accelerator was based on the levering on the investment with European Contributor and that is why the consortium has dedicated the last year to show the unique value proposition (see Table 8) and gather the interest from different groups of stakeholders (SMEs/robotic companies, corporates, regions and investors) that was consulted with potential European contributors (European Investment Bank (EIB) and the European Investment Fund (EIF). Unfortunately, negotiations were not successful due to the lack of recurring revenues of current RU accelerator initiatives.

Specificity	USP for start-ups	USP for investors	USP for corporates	USP for regions
Thematic on robotics		can be	Yes	can be - new jobs creation
Duration longer than average	yes			
Scale-ups more than Start-ups		Yes (depends on funds strategy)	Yes- easier to work with	
Pan European		Yes - best in class		Can be -opens the company to international
Performed Remotely	Yes - do not need to travel			yes - maintains the jobs in the region
Technical expertise provided	yes		Yes - can fit their need	
Higher level of investment	yes	can be	Yes more stability	Yes- leverage effect on Regional investment
European source of funding		can be	Can be	Yes- leverage effect on Regional investment
It's free !!!	yes	yes		

Table 8 RU Acceleration program Unique Selling Proposition

As a final result, the standardization of the RobotUnion acceleration model was proposed to European regions through D6.10 RobotUnion Toolkit 2 (see AI2.1 in Table 9) as an innovative instrument that could be used to foster the entrepreneurial discovery in the framework of their Smart Specialization Strategies [RIS3]. The sustainability of the acceleration program will rely on individual regions implementing its parts. Lessons learned about the deployment of a smart regional specialization strategy were officially shared by the consortium partners during the Week of Regions and Cities organized by EC on 13th October 2020t through the workshop "Regional smart specialization: Robotics".

On top of that, the following EU projects have received funding and include the RobotUnion Accelerator model or a similar approach: DIH2, RIMA, AI4EU.

Contribute to reinforce the European Union top position in the global automation race through the DIH opportunity:

Currently, the DIH ecosystem is expanding, with more companies connecting to the hubs and with the further growing partnerships and competences around Europe. More robotics companies are emerging and connecting to the DIH especially under the topics of AI, lasers and robotic gripper manufacturers. The industry is also getting more and more familiar with the opportunities that robotics can offer, and more companies are starting to express interest in robotics solutions.

RobotUnion is a perfect representation of what DIH idea is about (see Figure 11) because it's based on the partnerships between business, public entities, and knowledge institutions providing services on a multidimensional level:

- Skills and Training (Business and Fundraising Mentoring)
- Test Before Invest (access to technical expertise and experimentation and collaboration agreements)
- Innovation ecosystem & networking (RobotUnion Community and Events participation)
- Support to find investments (Portfolio Management, Investor´s Day and Mentoring)
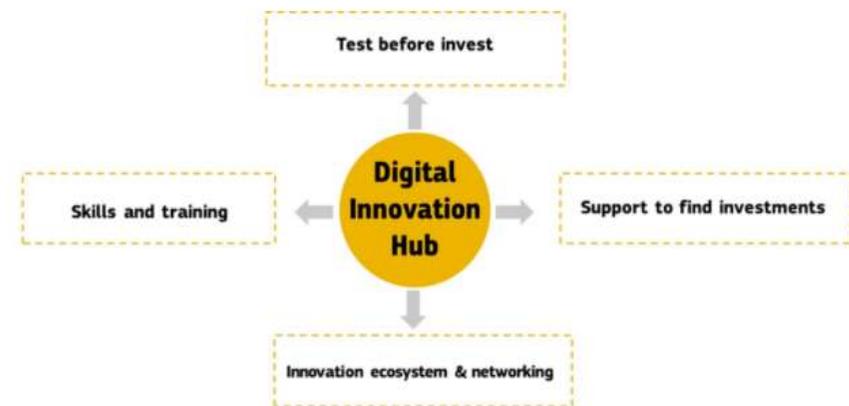

Figure 11 Basic concept of DIH

RobotUnion started negotiations with The European Investment Bank to study the possibility to support the RobotUnion project as Digital Innovation Hubs. Unfortunately, the idea was rejected due to the financial needs expressed by the RobotUnion Instrument (too small) and the project has no proof of the current business model (lack of recurring revenues).

The idea of RobotUnion becoming robotics DIH was also rejected because it does not fulfil 2 basic administrative requirements to become DIH which are: RU does not have the status of a non-profit organisation and it does not have a physical presence in any region.

While extensive investigations and considerations have been made to implement a sustainability model, it has not been possible to anchor the DIH model in an organization and thereby ensure the sustainability of the RobotUnion Acceleration Program under this scheme.

Additional Impact #2 KPI targets and achievement

KPIs	KPI Name	Target	Achieved	Explanation	Means of verification
AI2.1	**RobotUnion Accelerator**	1	RobotUnion Acceleration model	By standardizing the RobotUnion approach, the Acceleration Program could be commercialized and provided "as-a-service" to regions and corporates. For the sustainability goal, regions have been the main target audience while additional third parties could be private companies and other EU projects that are interested in implementing an acceleration model. RobotUnion is in continuous contact with EU projects that have received funding and include the RobotUnion Accelerator model or a similar approach (such as DIH2, RIMA, AI4EU).	[RobotUnion Toolkit 2 D6.10](#)
AI2.1	**RobotUnion central Robotics Digital Innovation Hub [DIH]**	1	No	RobotUnion is a perfect representation of what DIH idea is about because it's based on the partnerships between business, public entities, and knowledge institutions providing services on a multidimensional level. Unfortunately, it was not possible to anchor the DIH model and thereby ensure the sustainability of the RobotUnion Acceleration Program.	RobotUnion Business Plan 2 D6.9 Continuity Fund Private Placement Memorandum D6.8

Table 9 Additional Impact #2 KPI targets and achievement

Additional Impact N#3. Contribute to delivering smart, sustainable and inclusive growth and social welfare

This impact is directly influenced by the robots developed by companies accelerated through the RobotUnion program many of them had a significant impact on social/animal welfare and the environment. The ultimate goal was to promote and adopt scientific and technological knowledge to be applied to improve significantly the standard of quality of life in society. The below-listed projects have developed products that had a specific focus on social welfare, animal welfare and/or smart & sustainable growth.

Social welfare:

Tendo project selected in the 1st Open Call has developed a soft robotic glove, to provide artificial strength in weak hands and enhance the quality of life for people suffering from stroke, arthritis or spinal cord injuries.

Aether Biomedical has created Zeus, a low cost-high efficacy prosthesis. This bionic limb can multiarticulate 14 grip modes. This project aims to be an example of the breaking of the technology gap of people with disabilities.

Animal welfare and smart growth:

Faromatics robots have an important animal welfare impact as their robot is improving farm productivity by monitoring chickens using sensors and artificial intelligence.

Smart and Sustainable growth:

The company supported in the 2nd Batch, Bin-e developed an IoT device that sorts and compresses the recyclables automatically. It optimizes waste management, allowing to

Figure 12 Testimonial from Cliin (1st Batch)

save costs, time and labour. It ensures precisely sorted raw material through automatic recognition and segregation. Thanks to the compression of plastic and paper the frequency of emptying the bins are reduced by half.
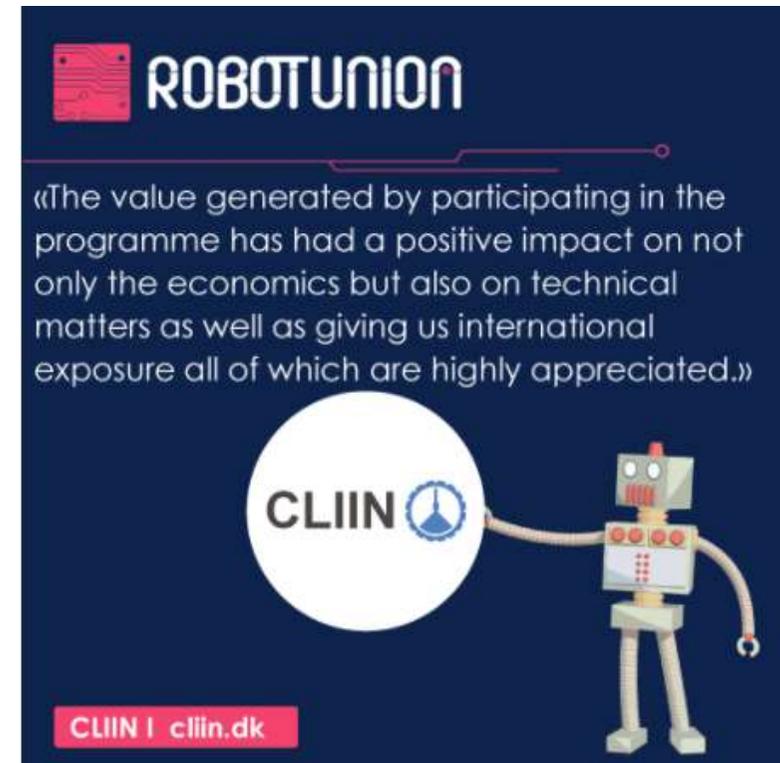
Beyond this, all supported projects contributed to delivering growth and welfare in the sense of **creating jobs in the Robotics industry**. Based on the number of 20 companies accelerated 146 new employees were hired in companies supported during their participation in the RobotUnion program and in total they are looking for 50 new employees more within the upcoming 6 months.

Additional Impact #3 KPI targets and achievement

KPIs	KPI Name	Target	Achieved	Explanation
AI3.1	**Nº of jobs created** in the Robotics Industry in sector addressed by 2025	2,000	146 new employees were hired during their participation in the RobotUnion program 50 new employees more within the upcoming 6 months	KPI established this impact was about measuring the jobs created in the Robotics industry. The only metric which was measurable is the total number of new hires in 20 companies accelerated in the program. A total number of 146 new employees were hired during their participation in the RobotUnion program and they are looking for 50 new employees more within the upcoming 6 months which shows a positive impact within companies supported by a program.

Table 10 Additional Impact #3 KPI targets and achievement

4. Summary

The summary of all KPIs related to each impact described in this Report is presented in Table 11 below. RobotUnion performed all the actions according to the plan and reached most of the Impact KPIs defined in the Grant Agreement. All these KPIs and actions taken by RobotUnion have contributed to the growth of SMEs targeting new robotics markets by conducting and utilising research facilities. It has been possible by combining within the consortium all the key assets and resources for successful innovation: technical and non-technical support services and technology research, technical differentiation, entrepreneurial leadership, market access, productization and access to funding. Some of the technologies supported had a significant impact on social/animal welfare and the environment.

The project has created a **unique value proposition** by lowering one of the main technical barriers which Robotics SMEs face when developing their technology: limited access to technology services and research facilities in many regions.

Robotics oriented support provided by RobotUnion helped to **raise the TRL of the scaleups supported in 3 levels, as average,** by providing them access to research services. It has contributed to **increasing the competitiveness of the European robotics industry** by increasing the value of the ScaleUps and improving their investment readiness to stimulate the European Robotics Ecosystem. The success stories generated through RobotUnion action will contribute to **attracting more private investment in SME-based research disruptive robotics companies.** The overall impression of accelerated companies about the programme is 9.3 out of 10, which confirms the perceived impact of the support provided to these 20 companies

The consortium had confirmed an **excellent multinational collaboration** by creating a unique programme where research centres, business schools, large corporations and investors came together to create an innovative way to support Robotics companies.

Even though RobotUnion was not directly focused on the implementation of robotics benchmarks and metrics (second scope of ICT 27 topic), it had made an effort to contribute to the more efficient development of the robotics sector through defining the Productization Building Blocks guides in the sectors addressed by the project: Manufacturing. Agri-Food, Healthcare and Civil infrastructure.

Extensive investigations and considerations have been made to implement a sustainability model. Unfortunately, despite efforts, it was not possible to identify the appropriate European funding body that could support the model of the RobotUnion Instrument and, thereby, ensure sustainability of the RobotUnion Acceleration Program. The sustainability of the acceleration program will rely on RobotUnion Network (MoU to be signed) that will exploit results in their ecosystem and individual regions implementing its parts through. In any case, in the context of the new Multiannual Financial Framework 2021-2027, specific action lines could be launched, both at the national and EU level, which RobotUnion partners are willing to explore to sustain and extend the efforts done so far to support Robotics ecosystems.

KPIs	KPI Name	Target	Results	Achieved
Main Impacts				
I1.1	**Nº Scaleups directly reached**	2.590	51.439	YES
I1.2	**Nº Scaleups applying to RobotUnion Open Calls**	300	424	141%
I1.3	**Nº Scaleups supported by RobotUnion**	40	40	100%
I1.4	**Nº Scaleups developing a prototype**	20	20	100%
I1.5	**Nº of Proof of Concept in Market conditions**	8	9	112%
I1.6	**€ Venture capital granted**	€8M	€15M	187%
I1.7	**Nº Cooperation Agreements**	8	5 introductions 3 LoIs signed 1 agreement signed	Partially (ongoing)
I1.8	**Business value creation**	€3M year 3 €15M year 4 €150M year 11	7 out of 9 companies selected to Stage 4 have overcome the goal of 150k€ of revenue in February 2021 (end of RU project) and their future predictions are very promising.	Yes
I2.1	**Nº of TM allocated to Scaleups**	40 TM	40 TMs assigned to 40 Scaleups in Stage 1 20 TMs assigned to 20 ScaleUps in Stage 2 44 researchers engaged in total	100%
I2.2	**Nº of PoC developed**	8	9	112%
I2.3	**Nº of new markets addressed lowering the research barriers**	4	4 main Manufacturing Agriculture Healthcare Civil infrastructure 7 additional Welding, Shipping and Maritime, Hospitality, Retail, eCommerce, Oil & Gas, Metallurgy)	100%

I3.1	**Cooperation with EU projects** covering benchmarking and standardization	100%	Productization Building Blocks guidelines for robotics solutions in four market verticals: manufacturing, agri-food, healthcare and civil infrastructure	100%
I4.1	**Cooperation with EU projects** covering system characterisation and evaluation	100%	7	YES
Additional Impacts				
AI1.1	**€ National & EU Funds raised** to Scaleups Supported	€5M	Some of the recognition prizes and public program funds which 20 companies received: NCBR Fasttrack grant (Aether), Seal of Excellence EIC Horizon (Bin-e&Springa), IPA4SME project (Springa), Poland Now Prize (Bin-e), Durchstarter prize 2019 (Formhand), IHK technology transfer prize 2019 (regional recognition, Formhand), Purmundus Challenge 2020, Entrepreneurial price of Odense region (Proxima Centauri), "Le Moniteur" Innovation Day (Rebartek), Caixa Dayone Emprendedores XXI (Nido Robotics), Faromatics Awards, X Europe programme (Bots&Us), 2 million DKK in EU funding for Proxima Centauri (~267k EUR), ESA BIC Switzerland program (RigiTech), Other cascade funding EU projects: Cyber Surgery: ESMERA (100k EUR) RigiTech: DIHHERO (100k EUR) MX3D: WeldGalaxy (100k EUR), Trinity (100k EUR) Rebartek: WeldGalaxy (100k EUR)	Partially (ongoing)
AI2.1	**RobotUnion Accelerator**	1	RobotUnion Acceleration model	YES
AI2.1	**RobotUnion central Robotics Digital Innovation Hub [DIH]**	1	No	No
AI3.1	**Nº of jobs created** in the Robotics Industry in sector addressed by 2025	2,000	146 new employees were hired during their participation in the RobotUnion program 50 new employees more within the upcoming 6 months	YES

Table 11 Summary of Impact KPIs