DELIVERABLE D1.2.9

9TH SIX-MONTHLY QM REPORT

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15.06.2018	Victoria Neumann, Yannick Morel	Delivery of version 1
15.06.2018	Federica Pepponi	Document review and formatting, changes in sessions 1 and 6
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Content

ECHORD++ Report on Performance Indicators (KPIs)

While the umbrella document of the QM deliverable (D1.2.3_a) outlines the methodology used to track/assess the performance of the different instruments of ECHORD++, this second part of the deliverable reports on the results of this assessment and will be updated every six months.

1 Strategic Performance Indicators

The Strategic Performance Indicators have to reflect those aspects which are important to make E++ a success. The target values are based on the lessons learned from ECHORD and are geared to the expectations of the different target groups. Important to note: these indicators were fixed from the perspective of the users – irrespective of the fact if the members of the core consortium are able to influence them to full extent. Only if the cooperation of all stakeholders works – core consortium, external users and European Commission – the target values can be met.

Indicator	Assessment	Instrument	Target value	Assessment (M49-M54)	
Time-to-grant	The time span between call deadlines and the accepted Grant Agreement	Experiments, PDTI	9 months	Not relevant in this reporting period	
Payment discipline	Time span between the submission of a Periodic Report and actual payments	All	6 months	Submission of the periodic report on the participant portal: 29.06.2017 Acceptance of Cost Claim by EC: 13.12.2017 Payments done by 31.03.2018	
Planning security	Amendments: time span between Amendment session opened in the NEF and signed Amendment	All	6 months between opening of the Amendment Session and signed Amendment request	Not relevant in this reporting period	
No. of SMEs involved	Number of Small and Medium Sized companies involved in the project for all instruments	All	Experiments & PDTI: 25% of the applicants; RIF targets as	Two out of three RIFs have a ratio of SMEs involved largely beyond threshold, the third one is	

			outlined in the RIF handbook	slightly below. On average the performance is very good.	
No. of newcomers without any former participation in EU-funded projects	Number of newcomers involved in the project for all instruments plus dissemination activities!	All	Experiments & PDTI: 25% of the applicants; RIF targets as outlined in the RIF handbook	Two of the RIFs have assisted a number of early businesses that either largely exceeds or meets their target, the third RIF comes slightly short of the target.	
Strengthening the collaboration between industry and academia	Projects in which industrial partners and academic partners work together (during the runtime of E++ and afterwards)	Experiments and PDTI	Experiments: 90% of the mixed consortia	Not relevant in this reporting period	
			PDTI: 90% of the mixed consortia	Not relevant in this reporting period	
Networking: Motivate new contacts which offer the potential for future collaboration in research projects or business leads	Number of new contacts gained by working on one of the instruments of ECHORD++	All	Experiments: 75% of the experimenting partners gained at least one new contact.	The final evaluation of Call II Experiments is still under way and final results will be reported in the deliverables of WP 3.	
			PDTI: 75% of the PDTI partners gained at least one new contact	All PDTI consortia were involved in extensive dissemination and outreach activities through which successfully helped them in strengthening their network.	
Contribution to advancing the state-of-the art (technological progress)	The technological/scientific targets are outlined in the proposals	Experiments and PDTI	Experiments: averaged traffic light value for technical KPIs across Call II. PDTI: Two consortia for each scenario receive a positive	Out of 16 experiments 4 met their objectives (40%) All four PDTI consortia completed Phase II and	

			assessment of their technical excellence	delivered a prototype.	
Impact achieved by the individual technological instruments of E++	The impact targets are outlined in the KPI documents (experiments, PDTI); impact for RIF takes time to materialize, outcome will be qualified at a later stage)	All	Experiments: 80 % of all experiments selected for funding achieve the impact outlined in their KPI documents PDTI: Two consortia for each scenario reach their targets (even with a different approach) and deliver a prototype at the end of their engagement.	See above	
Performant, strong proposals received for: • experiments • PDTI • RIFs	The potential scientific/technological success of E++ heavily depends on the quality of the proposals submitted. They form the pool from which the independent experts can select.	All	**Experiments:** 80% of the KPIs target values achieved	See above	

2 Call 2 Experiments

The aim is to present the collection of information about the progress of the selected Experiments from Call2 during the 9th six-monthly report. The progress will be displayed through one table. The table consists of the following information for each experiment that summarizes the development and status of the last six months: technological KPIs; impact KPIs; milestones; deliverables and dissemination. Detailed information on the performance of each experiment as well as an in-depth analysis is provided in the detailed traffic light report. This approach includes a performance assessment on a two-level basis to feed various information needs (executive summary and detailed analysis). An overview of each KPI on a bi-monthly basis is also provided. The summary on page 7 is based on the above-mentioned detailed traffic light report of each experiment. The status is represented by a traffic light having the colour of:

- **Green:** the progress is in line with or exceed the expectations;
- **Yellow:** the progress has some delays and/ or the quality of the work is slightly below the expectations;

- **Red:** the progress has major delays and/or the quality of the work is deeply below the expectations.
- **Blue:** The progress cannot be evaluated at this point, either because it is not applicable or not due yet.

Each KPI was evaluated by the following averaging system: In the considered categories, 1 point was given for every red light, 2 points for every yellow light and for every green light 3 points. Blue was not taken in consideration unless it wasn't possible to evaluate all the detailed KPIs of one section. For each KPI the points had been summed up and divided by the number of the detailed KPIs within its section, which leads to the averaging colour assigned in the table in sec.2. The threshold from red to yellow was set at 1,5 points, from yellow to green at 2,5 points.

	Technical KPIs	Impact KPIs	Milestones	Deliverables	Dissemination
AAWSBE1					
CATCH					
CoCoMaps					
DUALARM WORKER					
FASTKIT					
FlexSight					
GRAPE					
HOMEREHAB					
HyQ-REAL					
INJEROBOTS					
KERAAL					
MAX-ES					
RadioRoSo					
SAFERUN					
SAGA					
WIRES					

3 RIFs

The below table provides an overview of the consolidated performance of the three RIFs against targets for six months (M49-M54). The given targets refer to an annual performance (12 months). The first six months from October 2017 – March 2018 indicate the following trends:

Indicator	Explanation	Way of Assessment	Target value (to be multiplied by 3 = 3 years of operation)	Progress (M49-M54)
Businesses engaged • SMEs • Non-SMEs • Individuals	Total no. of organizations within the RIF network, including businesses, sole traders, non-profit organizations, HEIs and business start-ups.	Proposal and engagement statistics generated by E++ website & PM tools provided by BRL	Annual targets are (*total – SME*): BRL (150 - 90) CEA (100 - 60) SSSA (100 - 60)	BRL (17-10) CEA (12-4) SSSA (99-4)
Businesses assisted (>12hrs) • SMEs • Non-SMEs	Consultancy support, information, advice and guidance to individual businesses. The assistance can be face-to-face, via phone, web-based, dialogue at conferences, seminars, workshops or through networks.	Internal statistics generated by PM tools provided by BRL and sign-off by organization required	Annual targets are (*total – SME*): BRL (60 - 36) CEA (40 - 24) SSSA (40 - 24)	BRL (11-8) CEA (0-0) SSSA (1-3)
New businesses/Pre-start-up assistance	New business: The creation of new businesses including start-ups of all sizes, sole traders, partnerships and not for profit organizations. Pre-start Assistance: Inquiries from individuals on how	Internal statistics generated by PM tools provided by BRL& sign-off by organization and/or individuals required.	Annual targets are: BRL (4) CEA (2) SSSA (2)	BRL (9) CEA (0) SSSA (1)

Indicator	Explanation	Way of Assessment	Target value (to be multiplied by 3 = 3 years of operation)	Progress (M49-M54)
	to acquire the technical & entrepreneurial skills to set-up a new business venture.			
Jobs safeguarded	The number of jobs declared "at risk" by a business prior to enrolling onto the RIF programme and receiving business support, and still active twelve months from start of the engagement. "At risk" – a permanent, paid, full-time equivalent (FTE) job which is forecast to be lost within one year.	Internal statistics based on statements of users - entered into and generated by PM tools provided by BRL - This is not a hard KPI, but still useful as an indicator for long-term impact of RIFs.	Annual targets are: BRL (6) CEA (3) SSSA (3)	BRL (n/a) CEA (n/a) SSSA (n/a)
Jobs created	A new paid, full-time equivalent (FTE) job. Temporary employment is captured if it has a life expectancy of at least 8 weeks (or Pro Rata equivalent). The post is when an individual starts a new role.	Evidence & sing-off by organization and/or individual required. Generated by questionnaire at the end of the RIF stay and afterwards.	Annual targets are: BRL (9) CEA (6) SSSA (6)	BRL (n/a) CEA (n/a) SSSA (n/a)

Indicator	Explanation	Way of Assessment	Target value (to be multiplied by 3 = 3 years of operation)	Progress (M49-M54)
Number of patents & other IPR products and/or processes launched.	As a result of direct assistance provided through engagement with a RIF.	Evidence of IPR device required. This information is gathered via a survey at the end of the engagement as well as long-Term (see "Impact on Innovation")	Annual targets are: BRL (2) CEA (1) SSSA (1)	BRL (n/a) CEA (1) SSSA (1)
Number of new or improved products and/or processes launched	The launch of a new or improved product/service as a direct result of assistance provided through engagement with a RIF.	Evidence of new or improved products required and sign-off by organization and/or individual required. This information is gathered via a survey at the end of the engagement as well as long-Term (see "Impact on Innovation")	Annual targets are: BRL (10) CEA (8) SSSA (8)	BRL (n/a) CEA (1) SSSA (2)

4 PDTI

The official monitoring started during the period of this QM report. The table below provides an overview of the four teams involved in the instrument, two teams for the Urban Robotics scenario (SIAR and ARSI) and two teams for the Healthcare Robotics scenario (ASSESSTRONIC and CLARC). The KPIs have been taken over from the detailed report and contain an evaluation for the scientific and technological excellence (tKPis), the quality and efficiency of the implementation and the management, as well as the potential impact through the development (iKPIs). The traffic lights are also based on the PDTI evaluation, which initially used a point system (1(lowest) to 5 (highest)) to describe the progress of each team. The points were translated into the traffic light system in the following way:
The points have been added up and divided by the overall amount of evaluated KPIs with the highest achievable average of 5 and lowest of 1. The threshold between the traffic light colours was set at an interval of 1,3^{-}. Red translated to an average below 2,3^{-} and green to an average above 3,6^{-}. The middle range accordingly translates to the yellow traffic light.

Criterion	Healthcare		Urban Robotics	
	ASSESSTRONIC	CLARC	SIAR	ARSI
Scientific and /or technological excellence				
Quality and efficiency of the implementation and the management				
Potential impact through the development. Dissemination and use of project results				
Overall status				

5 Outreach and dissemination

Indicator	Assessment	Target values	Assessment at M54	
Online-communication	Visitors website	1000 per month		From 1.11.14 (start of tracking) to 31.03.18: on average 13.597 visitors per month
	YouTube channel	Average of more than 500 views per video		25 videos, 790 views on average
	LinkedIn Group	More than 250 members		373 members
Media c overage	References in trade press	50 per year		145 trade press in total
	References in consumer press	10 per year		168 consumer press in total
Event audience	Estimated number of people from target audience reached at the various events	1000 per year		10.000+ in total
Direct contacts	Direct contacts in contact database	More than 4.000 active contacts at the end of E++		4.335 contacts in total
		More than 70 % new contacts (without login from old ECHORD)		62 % new contacts
Scientific publications	Number of scientific publications	At least one per experiment		Not relevant, numbers will be published in the final report

6 Risk Contingency Plan

We can classify the risks for E++ into three categories: (i) risks arising from the internal organization, (ii) risks related to the acceptance of and interest in the different instruments, and (iii) risks during the execution phase of the instruments. The following table lists the risks associated with the implementation of E++.

Risk (DOW)	Potential Impact	Corrective Action	Comments on current state
Type (i) **Unclear work/task responsibilities**	*Impact high, Risk low* Specific tasks and in case of core tasks the whole project may be delayed	The DOW of E++ shows clear responsibilities of Work Packages and tasks. Different escalation levels for different delays. Retain payments to beneficiaries, payments are linked to timely Delivery. Regular meetings (Video, Skype, phone and in person) to discuss the workflow openly.	The DOW was clear on work / tasks responsibilities. As E++ is piloting numerous instruments, the initial processes had to be finetuned, sometimes by measures not foreseen in the DOW, but to be created during the project. One example is the RIF Booster Program implemented to facilitate the coordination of the RIF instruments and the communication between the partners involved.
Type (ii) **E++'s visibility too low, profile unclear**	*Impact High, Risk low* ECHORD has achieved very high visibility and credibility with clearly defined goals and means. In ECHORD, the interaction with the classical community and other projects was very strong. However, the new instruments, RIFs and PDTI activities could cause a risk	A clear communication plan including presentations at broad-spectrum and specific events will likely resolve this problem – just as we did very successfully within ECHORD. Outreach to new potential robotics community members will be achieved by (i) a strong focus on dissemination events of various types, by (ii) bringing experiments into the "real world" by on-site testing the demonstrators in the RIFs, by (iii) directly contacting new user groups, and by (iv) creating sustainable structures with the PDTI activities.	As shown by the positive results presented in paragraph 5 Outreach and Dissemination, the risk did not materialise.
Type (ii) **Lack of acceptance by stakeholders**	*Impact High, Risk low* The classical experiments as in ECHORD are widely accepted, but the new instruments RIF and PDTI rely on involvement of all stakeholders, especially robot users and customers.	Special information events and targeted campaigns at the beginning of the project and involvement of the industry in all phases, especially in case of the PDTI activities, will minimize this risk. In addition, as a result of the structured dialogue, not only can the content of all activities be adapted, but their administration aspects as well	Difficulties in securing a strong involvement from the public body involved in PDTI Healthcare. Concerted effort from the PDTI management team at the end of Phase II has allowed to tighten the connection between the stakeholders and the PDTI process. Pre-emptive measures were taken by the RIFs in reaching out to a large variety of stakeholders, whose involvement is expected to prove instrumental in allowing the RIFs to become sustainable.
Type (ii) **Lack of acceptance**	*Impact Low, Risk medium* Being pilots for new R&D	The interaction with all possible stakeholder groups in instrument- specific ways will lead to a good a priori estimation	RIFs acceptance by their prospective beneficiaries proved more difficult than

of the new instruments (RIFs and PDTI)	instruments, there is a certain risk that they will not be accepted as anticipated	of the needs and acceptance criteria. This systematic approach will minimize the risk. An adjustment of the concepts in the structured dialogue will also be possible. Finally, it is always possible to adjust the budget so that resources can be shifted into the experiments and their number can be increased if needed.	anticipated. Additional efforts were expended by the RIFs in reaching out to their target audience. Securing the involvement of interested public bodies in the PDTI instrument demanded significant initial effort. Conversely acceptance of the instrument by the robotics community at large was non problematic.
Type (iii) **Beneficiary bankruptcy**	*Impact Medium, Risk Low* Potential risk of a failure of a specific experiment	Rapid alert system due to additional reporting duties for beneficiaries with weak financial validation. Replace beneficiary Financial risk is safeguarded by guarantee fund	ROBOSOFT – the coordinator of the ARNICA consortium in PDTI Phase I Healthcare – had to declare bankruptcy. Mitigation measure were not necessary because ARNICA failed after Phase I (despite the filed redress).
Type (iii) **Delayed start of experiments and other instruments**	*Impact High, Risk Medium-High* No sound planning of resources and timeline possible for beneficiaries Experiments cannot deliver the intended results on time Project duration likely to be extended (cost-neutral) Bad image of the project and demotivation of SMEs to participate in future EU-funded projects	Realistic timetable with enough time between the Calls to realize the Amendments Timetable which avoids conflict between Cost Claims and Amendments Communication of this timetable to the beneficiaries. Beneficiaries that do not meet start deadlines will be postponed to the next batch or replaced Beneficiaries with complete documentation can start their experiments without prior signature of Amendment.	Apart from 2 experiments (CoCoMaps and Flexsight) all experiments are in a fairly good shape towards targets. Yellow traffic lights illustrate smaller delays, but will not prevent the success of the experiments. Delays (see above table) are balanced by cost-neutral extensions which are granted based on an official request and performance. b
Type (i) **Cooperation between core beneficiaries does not work well**	*Impact: High, Risk: Medium*	Preventive measures taken: Regular specific group updates (every two weeks) for PDTI, RIFs, Experiments and ExC Committee. Appointment of a facilitator to tackle issues which require in-depth communication between different instruments OR different beneficiaries involved in one instrument to achieve consensus with the best results.	The responsibilities within WP4 (RIFs) and the roles (coordination, contributors to reports and RIF owners) had to be clarified in skype calls (who is driving, who is contributing).
Type (iii) **Problems with recruitment of evaluators**	*Impact: High, Risk: High*	Intensive contact making with stakeholder groups not originally involved with the project (also by activating clusters and associations)	Not relevant for the period
Type (iii)	*Impact: High, Risk: Medium / Low*	Calibration of the proposal evaluations during the panel meeting	Not relevant for the period

Experiment reviews do not provide sufficient input to make an informed funding decision			
Type (iii) **Evaluators give high scores to proposals which do not provide a clear trackable target**	*Impact: High, Risk: High*	Analysis of the weaknesses of the proposals selected for funding and addressing these issues during the negotiations.	Not relevant for the period
Type (iii) **Tracking of take-up of results of all instruments reported by partners/users**	*Impact: High (for follow-up projects or second rounds); Risk: Medium*	Automated alarm system with deadlines for long-term tracking; implementation of the instruments for tracking (for instance questionnaires).	For Experiments and PDTI, strong ties were developed between core and extended partners throughout the monitoring process. The link of trust will be gainfully exploited to ensure continuity of discussion, following the conclusion of the RTD activities in their respective technical instruments. This discussion will allow us to track take-up of results. Concerning RIFs, proactive measures will necessarily need to be implemented to provide a measure of visibility on the outcome.

Content: detailed traffic light report

Detailed traffic light report

AAWSBE1

MODERATOR: MANUELE BONACCORSI

tKPIs	#1 Identification of batteries	#2 Identification of battery-containing objects	#3 Regain item location	#4 Adaptable pick list	#5 Picking and placing of requested items	#6 Segmentation of visible database items
						
	#7 Classification of database items found	#8 Rejection of non-database items	#9 Picking of waste items	#10 Prototype realization of automated sorter	#11 Output bin purity	
						
iKPIs	#1 Business case end user	#2 Business case Technology provider	#3 Use case redesign/ flow	#4 Increased performance in waste sorting	#5 Interviews with stakeholders	#6 Users acceptance
						
	#7 Quotes asked					
						
Milestones	#1 First images delivered to Refind from the final sensor suite	#2 Identification system working	#3 Picking works on the specified items	#4 Whole system integrated and working at DTI		
						
Deliverables	#SB Story Board	#D1.1 Final form of perception hardware and algorithms	#D1.2 20 Common items identifiable in real time	#D2.1 Dynamically prioritised pick list	#D1.3 Report on the perception system and its evaluation	#D2.2 Report on picking random, moving, waste items

						
	#D3.1 Physical demonstrator	#MMR Multi-Media Report	#RIF Report on end-user evaluation			
						
Dissemination	#1 Exhibition-DIRA roadshow/robotbrag	#2 Exhibition, speech-Salzburg IERC	#3 Exhibition-Madrid expo	#4 Exhibition- New Orleans ISRI	#5 Exhibition- Herning HI messe	#6 Exhibition-Automatica 2018
						
	#7 Newsletter 1	#8 Press release 1	#9 Newsletter 2	#10 National TV - One of the TV channels	#11 In house exhibition demos	#12 Newsletter 3
						
	#13 Press release 2	#14 Final system video	#15 networking with associations			
						

GENERAL COMMENTS:

The AAWSBE1 project produced few documentation on the technical development, the system performance, the achieved research outcomes and the future exploitation opportunities. Furthermore several delays on the documentation submission occurred, papers were often poorly written and sometimes is missing completely. Despite the official request for documentation submission or quality improvement, no recovery action has been performed. In particular, impact KPIs are completely missing or insufficient, like the expected reports named “Business case Technology provider” and the “Business case end user “.

Nevertheless, experimenters provided videos showing the AAWSBE1 prototype during the project development. The videos were shared in private E-Mail exchanges with moderators, to demonstrate the wired and battery operated waste sorting ability of the system. The videos show a promising prototype, instrumented to discriminate among the most common wired and battery operated electronic devices, including smartphone, CD players, remote controllers, standard batteries and some confounding items like CDs, sponges and paper notes. A video in particular showed the AASWBE1 ability to pick batteries and electronics, placing them in appropriate recycling bins. Taking the uploaded videos into account, the AAWSBE1 prototype ability in waste sorting is very promising. The prototype performance seems sufficient to process real time waste flow over a standard conveyor belt, while the designed multi-grip robotic arm can be smartly driven to pick different kind of products.

The AAWSBE1 sensor system is very interesting, since it uses different kind of sensors to detect, identify and segment items on the conveyor belt. Particularly relevant is the use of spectral images on warmed items, to highlight the presence of LCD/touch screens. Experimenters declared that warmed items may change their IR (Near infrared) emission, depending on the nature of the very item. This method seems to reduce the time or computational load for the detection of smartphone screens, respect to the use of traditional (visible light) camera system.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

#1 Identification of batteries – due on date 01.06.2017 ROC Charts not ok (yellow): ROC chart has not been provided so far (date 14/07/2017). KPI seems to have more than one month of delay.

#2 Identification of battery-containing objects – due on date 01.06.2017 (yellow): ROC chart has not been provided so far (date 14/07/2017). KPI seems to have more than one month of delay. Nevertheless, in the D1.1 document resubmitted (re-uploaded) on date 02/03/2017, experimenters states that AAWSBE1 was able to identify and locate on the conveyor belt, cellphones and the small battery. The performance of the system is not very clear on the document, but probably, AAWSBE1 can identify or locate a cellphones or a small battery, the 60-70% of times it is processed on the conveyor belt. Please, provide more details on the system performance.

#3 Regain item location – due on date 01.06.2017 (yellow): The KPI verification mean is "Compare system displacement to human inspection". No document has been provided so far on date 18/07/2017. On date 09/10/2017 no information has been provided yet.

#4 Adaptable pick list – due on date 01.12.2017 (green): The tKPI has been achieved as seen in an unofficial video provided by experimenters, on date 16/02/2018. The AAWSBE1 system seems to track the fixed arrangement of items on the conveyor belt, identifying the one to sort (wired or battery operated) as described in D1.1.

#5 Picking and placing of requested items – due on date 01.12.2017 (green): The proposed multigripper described in D2.2 was shown in a video, when picking objects of different weights and shapes. The gripper control system was designed to drive the suction cup above convenient picking areas on the items for lifting and sorting. Load cells were used to provide AAWSBE1 of a perception ability about object pick-up or release/fall status.

#6 Segmentation of visible database items – due on date 28.02.2018 (green): Experimenters provided an unofficial video by e-mails to moderators on date 16/02/2018, showing the system performing objects segmentation as described in D1.1.

#7 Classification of database items found – due on date 28.02.2018 (yellow): The AAWSBE1 system was provided of a database of objects and related multidimensional features, enabling the sorting of wired and battery operated electronic devices among the categorised ones. Nevertheless, this technical feature should be better investigated and more details should be provided. For example, experimenters should provide more statistics on the true positive and false positive item identification, as well as more numerical evaluation of the item identification ability.

#8 Rejection of non-database items – due on date 28.02.2018 (yellow): The AAWSBE1 seems to reject only one typology of non-database items. Experimenters showed the system rejecting yellow paper memos in an unofficial video. Furthermore they provided a confusion matrix about the AAWSBE1 (Table 1. Confusion matrix. In D1.1: Final form perception suite and algorithms). Experimenters should provide more evidences of the system rejection ability, for example using common items such as plastic boxes or item parts, broken/spare wired or broken/spare battery operated items.

#9 Picking of waste items - due on date 28.02.2018 (green): Experimenters showed the system picking wired and battery operated items with the suction system on the robotic arm.

#10 Prototype realization of automated sorter – due on date 28.02.2018 (green) The AAWSBE1 prototype was partially surprisingly already delivered unofficially on date 13/12/2016, when experimenters sent by E-Mail a video on the AAWSBE1 system able to identify wired/battery-operated items. A further video unofficially delivered on date 16/02/2018 on the youtube platform (https://mail.google.com/mail/u/1/#search/mlnn%40teknologisk.dk/1619a67a82a06156?projector=1) showed o prototype integrated with the robotic arm.

#11 Output bin purity – due on date 28.02.2018 (red): Up to now, experimenters do not provided an output bin purity measure on an official deliverable, thus it is impossible to assess/evaluate this feature.

IMPACT KPIS:

#1 Business case end user 01.01.2017 Business plan (red): Business cases where received by E-Mail on 28/02/2017. The first business case named End User Business Case - Battery Sorting Introduced an analysis of costs and revenues, produced by the introduction of the AAWSBE1, respect to the current manual operations, for battery sorting. the second business case named End User Business Case - WEE Sorting Introduced an analysis of costs and and revenues, produced by the introduction of the AAWSBE1, respect to the current manual operations, for the sorting of wired electrical components. The business cases are briefly described, it would be appreciated A More detailed introduction on the current state of the art on the industrial recycling process, costs and revenues. This would be made the document more readable and complete. In Particular, it would be also appreciated a more detailed description and justification of the values used in the tables.

#2 Business case Technology provider – due on date 01.07.2017 (yellow): The KPI is set as “Business Plan”, but no document is still available on 17/07/2017. The previous KPI named “Business case” is still poorly written, and no upgrade of the document was provided as suggested. No document was uploaded on date 17/07/2017.

#3 Use case redesign/ flow 01.03.2017 Report Not ok (red): The document is still missing on date 24/03/2017

#4 Increased performance in waste sorting 28.02.2018 Experiment performed using robot and human and compare result Not ok (red): Documentation or notes still missing on date 17/03/2018.

#5 Interviews with stakeholders 01.01.2018 Video showing the system at work and interviews with stakeholders Not ok (red): Documentation or notes still missing on date 17/03/2018.

#6 Users acceptance 28.02.2018 Survey after demo at end-user premises (red): Documentation or notes still missing on date 22/03/2018.

#7 Quotes asked 28.02.2018 Count them (red): No document, reference or any comment has been uploaded so far (on date 22/03/2018).

MILESTONES:

#2 “Identification system working” - due on date 01.06.2017 (green): On date 14/07/2017 no document has been uploaded yet, or any contribution introduced by the experimenters. I think that the milestone 2 was already reached on date 13/12/2016 where experimenters sent a video by e-mail showing the AAWSBE1 prototype identifying objects on a conveyor belt.

#3 “Picking works on the specified items” - due on date 01.07.2017 (yellow): On date 18/07/2017 no video link has been uploaded yet, or any contribution introduced by the experimenters. On date 09/10/2017 no video link has been uploaded yet, or any contribution introduced by the experimenters.

#4 Whole system integrated and working at DTI - due on date 01.11.2017 (green): Some videos where provided by experimenters using unofficial distribution channel other than the Echord++ portal or website. The provided videos show the AAWSBE1 system integrated. The robotic system is shown while detecting wired OR battery operated items on the conveyor bels. The integrated robotic arm was able to pick and sort wired OR battery operated items. The video showed the system while rejecting yellow paper notes on the convejor belt respect to wired OR battery operated items.

DELIVERABLES:

D2.2 Report on picking random, moving, waste items – due on date 01.12.2017 (green): The report describes in details the AAWSBE1 gripper design, as well the technical performances and the solutions adopted by the experimenters, to improve the grip perception and lifting ability of the robot. The use of load cells and pressure sensors to detect suction cup adherence to surfaces and object lifting is smart and provides high level perception ability to the robot, avoiding the use of cameras.

D3.1 Physical demonstrator – due on date 28.02.2018 (green): A physical demonstrator show off was performed through the sharing of video on Youtube (https://www.youtube.com/watch?v=kx2Skcwyd_0) or picture on on-line sites (including the ECHORD++ web site - http://echord.eu/aawsbe1/). I really recommend experimenters to put some official picture and video or some link on the Echord++ official portal.

MMR Multi-Media Report – due on date 28.02.2018 (yellow): No file, link or reference of any kind has been still uploaded on date 22/03/2018. Some video were uploaded on YouTube or unofficially shared with moderators. Nevertheless, no official information is provided on the ECHORD++ portal. RIF Report on end-user evaluation – due on date 28.02.2018. No RIF infrastructure was used

D2.1. Dynamically prioritised picking list – due on date 01.06.2017 (yellow): On date 14/07/2017 morning the document is still missing. Please, upload some document, picture, video o comment. It would improve the quality of the evaluation process. On date 17/07/2017 evening, so with one month and an half after the deadline, the experimenters uploaded a very few detailed Power Point document of two slides. The document details seems insufficient to understand the project progress on the dynamic prioritization of the picking list.

D1.3 Report on the perception system and its evaluation – due on date 01.07.2017 (yellow): On date 04/12/2017 (5 months delay) a draft document was updated (last two paragraphs were missing). The deliverable introduced the AAWSBE1 vision and perception system. A brief state of the art is proposed for the typology of sensors, the image processing for the item identification, segmentation and localization of picking points. The final algorithms are poorly detailed, and few tests were made to assess the algorithms performance.

DISSEMINATION:

#4 Exhibition- New Orleans ISRI – due on date 27.04.2017 (yellow): No information was provided about the milestone status up to date 14/07/2017. Is the milestone reached? Do You have any contribution, video, picture or paper to share with moderators?

#8 Press release 1 – due on date 30.06.2017 (green): Experimenters declare the milestone “in the making”, and they was featured on newspapers on date 18/07/2017. Nevertheless, no more details are provided so far.

CATCH

MODERATORS: HERMINIO MARTÍNEZ GARCÍA AND RAFFAELE ESPOSITO

tKPIs	#1 Amount of crushed cucumbers (mobile platform + grippers)	#2 Amount of lost cucumbers when placing them on the back basket	#3 Vision based cucumber detection	#4 Operating speed	#5 Efficiency	#6 Damage to plants
						
iKPIs	#1 Reduction in harvest costs per hector	#2 Patent application	#3 Number of jobs created	#4 Number of spinoffs originating from the project	#5 Number of products originating from the project	
						
Milestones	#1 Experimental plan	#2 Recognition-Localization	#3 Experiment Set-Up	#4 End of Experiment		
						
Deliverables	#D1 Experiment Plan and Conception	#D2 Vision System	#SB Story Board	#D3 Robot and Control System	#D4 Programming Environment	#MMR Multi-Media Report
						
	#D5 Evaluation of novel hortibot technology					
						
Dissemination	#1 Website of experiment	#2 Press release-I	#3 Press release-II	#4 Multi media report	#5 Networking associations	#6 Attendance to trade fairs
						
	#7 Attendance to trade fairs (Grüne Woche 2018)	#8 Attendance to scientific conference (IROS 2018)	#9 Attendance to scientific conference (Internationale Tagung Landtechnik)	#10 Scientific publications		
						

GENERAL COMMENTS

There are a lot of documents and evidences that are missing to evaluate the CATCH Experiment in a suitable way, especially for the last part of the experiment (last period of evaluation). Following the comments done in previous period, Experimenters must specify in a more detailed way, the information, potential solutions and decisions, at least, on critical aspects of vision, arms coordination and gripping in a "real" conditions context. In fact, especially, there is a lack of evidences in order to evaluate the experimental part carried out during this last period. Waiting for that relevant information, experimenters are encouraged to continue their work even some concerns were already expressed to the research team in previous periods. In fact, moderators would like to have the opportunity to attend to some of the tests and demonstrations they plan to develop in "real" conditions context.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

There is a lack of evidence in the CATCH portal that the following technical KPIs, which were expected on February 28th 2018, were actually carried out on April 10th 2018, which causes the overall status of these tKPIs to be RED. tKPI #1 ("Amount of crushed cucumbers (mobile platform + grippers)") was expected on February 28th2018. However on April 10th 2018 the Milestone Verification Means ("Animation videos") has not been uploaded to CATCH Portal. Thus, tKPI#1 is still missing. The same applies for tKPI #2 ("Amount of lost cucumbers when placing them on the back basket"), tKPI #4 ("Operating speed"), tKPI #5 ("Efficiency"), tKPI #6 ("Damage to plants").

IMPACT KPIS:

According to the DOW, the Impact KPIs (#1,#2, #3, #4 and #5) were scheduled by February 2018. However, on April 10th 2018, there is a lack of evidences in CATCH portal that these impact KPIs has been carried out. Considering the missing reporting, the status of iKPI #1 ("Reduction in harvest costs per hector"), iKPI #2, ("Patent application"), iKPI #3 ("Number of jobs created"), iKPI #4 ("Number of spinoffs originating from the project") and iKPI #5 ("Number of products originating from the project ") is RED.

MILESTONES:

The achievement of Milestone #M2 "Recognition-Localization" was related to D2. However, CATCH Experimenters didn't edit a short comment on the Echord++ Portal to confirm if the milestone was achieved. Moreover, the technical moderator expressed some doubts about #D2. Considering it, the flag is YELLOW.

The achievement of Milestone #M3 "Experiment Set-Up" was related to #SB and #D3, which was not uploaded yet in previous period but, according to the comments carried out to this deliverable (please, see below), the milestone #M3 "Experiment Set-Up" was achieved in this new period. However, CATCH Experimenters did not edit a short comment on the Echord++ Portal to confirm if the milestone was achieved. Moreover, the technical moderator expressed some doubts about #D3. Considering it, the flag is YELLOW.

The achievement of Milestone #M4 "End of Experiment" was related to #D4 and #D5, which are not uploaded yet. As a consequence, the considered flag is RED.

DELIVERABLES:

Regarding the Deliverable #D3 ("Robot and Control System"), its deadline was past September 1st, 2017. However, in October 18th, 2017 this deliverable hand not been uploaded to CATCH Portal. Thus, #D3 was still missing in previous period. In fact, it was uploaded on October 23rd, 2017 (two months late). Considering it, in this new period, the flag is changed to YELLOW.

In addition, there is a quite delay in submitting the rest of deliverables. In particular, these deliverables are:D4 ("Programming Environment"): Expected past December 1st, 2017, but it's still missing. D5 ("Evaluation of novel hortibot technology"): Expected on February 28th, 2018, but it's still missing MMR ("Multi-Media Report"): Expected on February 28th, 2018, but it's still missing.

Therefore, on April 10th, 2018 all these deliverables have not been uploaded to CATCH Portal. Considering it, the flags are RED.

DISSEMINATION:

According to the DOW, Dissemination Milestones #3, #4, #7, and #10 were scheduled in this period by April 2018. However on April 10th, 2018 the Verification Means far all iKPIs have not been uploaded to CATCH Portal.

Thus, these Dissemination Milestones are still missing. Considering it, the flag is RED for almost all Dissemination Milestones related to Oct2017-Apr2018.
In particular:
There is no evidence of #3, “Press release-II”. Considering it, the flag is RED.
There is no evidence of #4, “Multi media report”. Considering it, the flag is RED.
In addition, there are no evidences of any attendance at the planned or scheduled trade fair Grüne Woche 2018, which was held from January 19th to 28th, 2018. Considering it, these flags are also RED.
In addition, there are no evidences of any attendances at the planned or scheduled conferences Automatica 2018, and/or IROS 2018. However, considering that it sets officially on June 19th, 2018, and October 1st, 2018, respectively, the flag could remain BLUE. However, during the final review in May, in the Moderators’ opinion, the CATCH experimenters should prove that they submitted at least a paper to IROS 2018, and that they applied for Automatica 2018. Finally, there are no evidences of #10, “Scientific publications”. Considering it, this flag is also RED.

COCOMAPS

MODERATOR: ADAM SCHMIDT

tKPIs	#1 Ability of current state of the art running on one Qbo robot	#2 Ability of real-world robot-robot interaction using new collaborative CMA	#3 Ability of real-world multi-robot-human interaction (using collaborative CMA and speech)	#4 Efficiency of collaborative detection of humans	#5 Efficiency of collaborative tracking of humans	#6 Efficiency of collaborative information extraction through dialogue
						
	#7 Efficiency of collaborative task extraction through dialogue					
						
iKPIs	#1 Industrial collaborations	#2 Psyclone framework	#3 Academic collaborations	#4 Psyclone + project bundle (ready for commercially funded integration projects)		
						
Milestones	#1 Kick-off Meeting	#2 Support for Qbo platform	#3 Current state-of-the-art supported	#4 Demonstra-tion 1	#5 Collaborative Cognitive Map complete	#6 Demonstration 2
						
	#7 Demonstration 3	#8 Project completed				
						
Deliverables	#T1.D1 Specification of Experimental Platform	#T6.D1 Current state-of-the-art implementation	#T8.D1 Hannover Demo 0 Report	#T9.D1 Demo 1: Collaborative Visual Detection	#T8.D2 Draft Collaborative Cognitive Map	#T8.D3 Final Collaborative Cognitive Map
						

	#T10.D1Demo 2: Collaborative Visual Search [RIF visit 1]	#T12.D1 Four-way Turn-Taking	#T13.D1 Demo 3: Collaborative Information Extraction [RIF visit 2]	#T15.D1 Demos, results and literature publicly available		
						
Dissemination	#1 website of experiment	#2 press release - I	#3 press release - II	#4 Final demo	#5 Multi media report	#6 Networking w customers (Marel)
						
	#7Networking w customers (Magic Leap)	#8 Networking w customers (Honda)	#9 Attendance to trade fairs (Consumer Technology Association / CES)	#10 Attendance to trade fairs (Hanover Messe 2017)	#11 Attendance to trade fairs (Hanover Messe 2018)	#12 Attendance to scientific conferences (CES in the US booked and scheduled)
						
	#13 Attendance to scientific conferences (Hanover Messe 2017)	#14 Attendance to scientific conferences (Hanover Messe 2018)	#15 Create posters/leaflets/roll-ups	#16 Social media		
						

GENERAL COMMENTS

The initial goal of the project was to develop a collaborative, cognitive architecture allowing robots to have meaningful conversations with humans, to extract task-relevant information from them and then to act depending on the results of the conversation. Several components ranging from the scene-understanding to human-tracking to voice recognition were to be developed, while the cognitive architecture and conversation module were to be developed by extending the pre-existing software. The project is significantly affected by delays and divergence from the original objectives. The first is, according to the Experimenters, cause by postponed initial payment, which had catastrophic impact on the original schedule (necessity to find a new employee, unavailability of the robot originally selected for the project etc.). The second is caused by having to use different robots than the originally selected, which in turn resulted in different sensors available. The experimenters applied for an extension of the project and a revision of the KPI document to cope with those hindrances. According to the proposal, the deadlines for all the deliverables and KPIs would be postponed by three months to compensate for the initial delay. The Experimenters would also like to switch the scope of the image processing tasks from navigation and object recognition to emotions recognition and human detection, which seem to be more relevant to the development of dialogue based system. The experiments applied for a 4 months extension of the project. The request was rejected, as the observed state of the development did not guarantee that, even with the extension granted the objectives of the project would be achieved. The rejection of the request was confirmed by the reviewers of the ECHORD++ project during the last Review Meeting. The final review of the project is scheduled for the 3. May. 2018

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

Big divergence between the objectives stated in the proposal and reported state of the technical KPIs

IMPACT KPIS:

The Psyclone framework is not available for download

DISSEMINATION KPIS:

No verifiable information on attendance to some conferences or networking with potential customers. Presentation at the Hannover Messe 2017 was way below the expected quality.

MILESTONES:

None of the milestones due were achieved so far

DELIVERABLES:

T1D1 Specs are lacking – the document contains a list of modules, a couple of unreadable diagrams etc. Needs to be corrected (yellow),T6D1 describes the features of the current implementation of the Psyclone platform, it is hard to verify what has been actually implemented.

T8D1, T8D2, T8D3, T9D1, T10D1 are submitted but significantly overdue.

DUALARMWORKER

MODERATORS: ANNAGIULIA MORACHIOLI AND ANA MARIA PUIG PEY CLAVERIA

tKPIs	#1 Time to plan a dual arm trajectory	#2 Trials to obtain a suitable solution	#3 Deviation with the respect to ideal trajectory	#4 Weight carrying capability		
						
iKPIs	#1 Station Recurring Cost Reduction	#2 Number of Airbus operations as potential users of the dual-arm	#3 Open Source Software Modules release	#4 Automation in different industrial sectors	#5 Commercial exploitation of dual-arm planning libraries	
						
Milestones	#1 Dual-arm closed kinematics chain planning algorithm selected	#2 First prototype implemented	#3 final prototype implemented			
						
Deliverables	#D4.1 Story Board	#D1.1 Pilot case scenario definition	#D2.1 Intermediate report on dual arm motion planning algorithm	#D2.2 Library for dual arm closed kinematics chain motion planning	#D3.1 Prototype of the first demonstrator	#D2.3 Library of dual arm constrained automatic programming
						
	#D2.4 Library of dual arm online collision detection and avoidance	#D3.2 Prototype of the second demonstrator	#D4.2 Multi-media Report			
						
Dissemination	#1 Website of experiment	#2 Press release I	#3 Press release II	#4 Multimedia report	#5 Networking with associations (AER-ATP)	#6 Networking with associations (GDR ROBOTIQUE CNRS)
						

	#7 Networking with associations (Hisparob)	#8 Attendance to trade fairs (INNOROBO)	#9 Attendance to scientific conferences (AIM 17)	#10 Social media		
						

GENERAL COMMENTS

Even if there are some minor delays in providing information, the project is progressing well and as expected.

DETAILED REPORTING ON KPIS

DELIVERABLES:

D2.2 and D3.1 Intermediate report on dual arm motion planning algorithm submitted two months later (yellow)

FASTKIT

MODERATOR: YANNICK MOREL

tKPIs	#1 Robust and reliable navigation	#2 Robust and reliable perception	#3 Deployable and stable mechanical system	#4 Increase in speed of pick and place operation, workspace area and payload compared to competition		
						
iKPIs	#1 Reduction in lead time of the operation compared to operation by competition	#2 Reduction in investment cost compared to competition	#3 Patent	#4 New product prototype	#5 Creation of Start up	#6 Potential users (PSA, Renault, BA systems)
						
Milestones	#1 AGV and tow able to reach each position	#2 CDPR with end effector able to pick up box	#3 CDPR integrated on mobile platform			
						
Deliverables	#D3.1 Final and sub scenario design	#VD1 Simulation video of FASTKIT prototype performing scenario	#D1.1 Navigation Package (Software + Hardware)	#D2.1 Deployable CDPR prototype (Software + Hardware)	#VD2 Initial video of the robot in warehouse	#MMR Multi-Media Report
						
	#MMR Multi-Media Report	#D3.2 Integrated prototype and final scenario implementation	#VD3 Final video of the robot in the warehouse	#VD4 One AGV autonomously pulling the other one to the destination		
						

Dissemination	#1 Website of experiment	#2 Press releases-I	#3 Press releases-II	#4 Multi media report	#5 Networking w associations (IRT Jules Verne and CNRS)	#6 Attendance to trade fairs (Innorobo 2017)
						
	#7 Attendance to scientific conferences	#8 Organisation of events	#9 Create posters/leaflets/roll-ups	#10 Social media		
						

GENERAL COMMENTS

Final review was conducted 03/28/2018. Results are overall very positive. The external evaluator praised the team's achievements. The overall goal, and some of the specific KPIs, were very ambitious (again, according to the external evaluator). In terms of integrating together mobility and cable-driven parallel robot, it's a fantastic success. In terms of achieving higher TRLs and approaching commercialization, the Experiment is more of a qualified success. It's a complicated system, which makes it very effort intensive to bring towards higher TRLs. The external evaluator's TRL assessment was: start-TRL3, end-TRL5. Overall, FASTKIT is a green

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

#1: There is very little to substantiate claims made by the Experimenters. There is evidence of work done in deliverables, and a video shows basic results, but no demonstration at the review, and glaring lack of knowledge and understanding of the topic from speaker. Nothing supports claims of robustness and reliability. Yellow.
#2: Again, not much to substantiate achievement of this KPI. Yellow.
#4: Report provided shows perspectives of increase in speed, etc. Untrue of current prototype, possible in the future. Yellow.

IMPACT KPIS:

#1-2: Both iKPI 1 and 2 refer to a possible future prototype based on the technology developed in FASTKIT. Claims made are in general very optimistic. Yellow.
#5: Not happened, but does not make sense at this stage. Yellow.

DELIVERABLES:

D3.1: Excessively short, final demonstration was simplistic as well. Yellow.
D1.1: The navigation system is functional. Quality of it (mapping accuracy, localization, robustness, etc.) remains a question mark. Yellow.
MMR: Missing. Red.
D3.2: Integrated prototype functional, demonstration scenario is very limited. Yellow.

DISSEMINATION:

#4: Not done, but they have material to put one together. Yellow.
#5: They talked with CETIM. That's is good, but would have expected more. Yellow

FLEXSIGHT

MODERATOR:

tKPIs	#1 Object recognition rate	#2 Localization accuracy	#3 Operation life of FSS	#4 Algorithm parallelization: computation time vs cycle time		
						
iKPIs	#1 FSS product available	#2 FSS product cost compared to existing solutions	#3 FSS foreseen clients	#4 Interested stakeholders (systemintegra-tors/external brokerage providers)	#5 News letter	#6 Website
						
	#7 Leads					
						
Milestones	#1 Object recognition	#2 Object localization	#3 Final Prototype	#4 First system		
						
Deliverables	#D1.1 Use-Case Analysis and Requirements Report	#D2.1 Object Recognition Report	#D3.1 FSS Final Prototype Report	#MMR1 Multi-Media Report on RIF Visit Outcome	#RIF RIF visit outcome Report and Prototype	#D4.1 Final perception System Report
						
	#D5.1 Final System Report and Demonstrator	#SB Story board	#MMR2 Final Multi-Media Report			
						

Dissemination	#1 Website of experiment	#2 Press release 1	#3 Press release 2	#4 Press release 3	#5 Promotional multi media report	#6 RIF Multi-Media Report
						
	#7 Final Multi-Media Report	#8 Networking w associations- SIRI	#9 Attendance to trade fairs- MECSPE	#10 Attendance to trade fairs- Hannover Messe	#11 Attendance to trade fairs - SPS parma, Italia	#12 Attendance to trade fairs- Automatica 2018
						
	#13 Attendance to trade fairs- Vision	#14 Attendance to trade fairs-SPS Nuernberg	#15 Attendance to trade fairs- ITR open House	#16 Attendance to scientific conferences - ICRA 2017 conference	#17 Attendance to scientific conferences- IROS 2017	#18 Attendance to scientific conferences- ICCV 2017
						
	#19 organisation of events- Open-House in ITR facility	#20 Project presentation poster	#21 Prototype presentation poster	#22 Product brochure	#23 social media Facebook & Twitter	#24 scientific papers
						
	#25 other publications (e.g. newsletter, …)					
						

GENERAL COMMENTS

The work carried out by experimenters is valuable, interesting and concretely applicable, but they experienced a delay due to technical issues. An extension of the project has be granted, therefore the last milestones are delayed. From a technical point of view, some issues are occurring in the project, causing a deviation from DoW, but they have been addressed. Interesting results at the end of the project are clear and evident.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

4) Algorithm parallelization: computation time vs cycle time

IMPACT KPIS:

1) FSS Product available – 28.02.2018 not provided

2) FSS product cost compared to existing solutions – 28.02.2018 not provided
3) FSS foreseen clients – 28.02.2018 not provided
4) Interested stakeholders (system integrators or external brokerage provides) – 28.02.2018 not provided
5) Newsletter - 01.07.2017 not provided
7) Leads - 28.02.2018 not provided

DISSEMINATION:

4) Networking w associations – 01.12.2017 not provided
12-13-15-15) Attendance to trade fairs – not provided
16) Attendance to scientific conferences - 30.06.2017 not provided
17) Attendance to scientific conferences - 30.09.2017 not provided
18) Open House at ITR – 28.02.2018 not provided
21) Prototype presentation – 01.11.2017 not provided
22) Product brochure – 28.02.2018 not provided
25) Other publications – 28.02.2018 not provided

GRAPE

MODERATORS: ANTONI GRAU AND STEFANO BETTI

tKPIs	#1 Capability to cover large area autonomously after addition of electronics and the arm	#2 Vinestock structure identification	#3 3D map of the vineyard	#4 Autonomous navigation in a vineyard	#5 Robust dispenser deployment	#6 Multi-dispenser storage system for easy pick-up by a robot
						
iKPIs	#1 Industry interest in GRAPE	#2 Patentability study for potential patent application	#3 Number of jobs created	#4 Extended usage of the platform	#5 Cross-crop usage (quick reconfiguration)	#6 Open publication of data
						
	#7 Scientific dissemination					
						
Milestones	#1 Agreement on scenario definition and requirements' specification	#2 Robot navigates in a vineyard and performs a monitoring task	#3 Robot performs a dispenser deployment task	#4 Farmer can satisfactorily use the robotic platform		
						
Deliverables	#D1.1 Scenarios and requirement specifications	#D2.1 Vineyard navigation (methods and algorithms)	#D2.2 Vineyard navigation (results)	#D3.1 Vineyard monitoring technique	#SB Story Board	#D5.1 Vineyard robotic platform HMI
						
	#T10.D1Demo 2: Collaborative Visual Search [RIF visit 1]	#T12.D1 Four-way Turn-Taking	#T13.D1 Demo 3: Collaborative Information Extraction [RIF visit 2]	#T15.D1 Demos, results and literature publicly available		

						
Dissemination	#1 Website of experiment	#2 Press release- I	#3 Press release- II	#4 Multi media report	#5 Networking w associations (>50 individual stakeholders contacted)	#6 Attendance to trade fairs (>=5 trade fairs (including ERF))
						
	#7 Attendance to scientific conferences	#8 Create posters/leaflets/roll-ups	#9 Social media			
						

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

#1 Capability to cover large area autonomously after addition of electronics and the arm
Delay: 2 months. The experimenters waited the results of the integration week to upload the material (YELLOW).
#2 Patentability study for potential patent application
Delay: 2 months. The experimenters waited the results of the integration week to upload the material (YELLOW).
#3 3D map of the vineyard
Delay: 2 months. The experimenters waited the results of the integration week to upload the material (YELLOW).
#4 Autonomous navigation in a vineyard
Delay: Month late (YELLOW).
#5 Robust dispenser deployment
Delay: Month late (YELLOW).
#6 Multi-dispenser storage system for easy pick-up by a robot
Delay: Month late (YELLOW)

IMPACT KPIS:

#1 Industry interest in GRAPE
Not uploaded (RED).
#2 Patentability study for potential patent application
Not uploaded (RED).
#3 Number of jobs created
Not uploaded (RED).
#4 Extended usage of the platform
Not uploaded (RED).
#5 Cross-crop usage (quick reconfiguration)
Not uploaded (RED).
#6 Open publication of data
Not uploaded (RED).

#7 Scientific dissemination
Not uploaded (RED).

MILESTONES:

#2 Robot navigates in a vineyard and performs a monitoring task
Delay: 6 days (GREEN).
#3 Robot performs a dispenser deployment task
Delay: Month late (YELLOW).
#4 Farmer can satisfactorily use the robotic platform
Not uploaded (RED).

DELIVERABLES:

#D2.2 Vineyard navigation
Delay: 6 days (GREEN).
#D3.1 Vineyard monitoring technique
Delay: 6 days (GREEN).
#D4.1 Pheromone dispenser manipulation techniques
Delay: 10 days (GREEN).
#D1.2 Exploitation plan and commercial agreements
Delay: 7 days (GREEN).
#D5.1 Vineyard robotic platform HMI
(RED) – Not uploaded.
#SB Story board
(RED) – Not uploaded.
#MMR Multi-Media Report
(RED) – Not uploaded.
#RIF Report on RIF visit outcome and demo results
(RED) – Not uploaded.

DISSEMINATION:

#1 Website of experiment
#2 Press release- I
#3 Press release- II
Not uploaded (RED).
#4 Multi media report
Not uploaded (RED).
#5 Networking w associations (>50 individual stakeholders contacted)
(GREEN).
#6 Attendance to trade fairs (>=5 trade fairs (including ERF))
(GREEN).
#7 Attendance to scientific conferences
Not uploaded (RED).
#8 Create posters/leaflets/roll-ups
Not uploaded (RED).
#9 Social media
(GREEN).

HOMEREHAB

MODERATOR: ADAM SCHMIDT

tKPIs	#1 Protocol for safety of users	#2 Protocol for the storage of patients' data	#3 Simulation video of rehabilitation therapy robot	#4 Learning based intention and physiological state monitoring system	#5 Video Demo of control software with or without human	#6 Tele Rehabilitation interface
						
iKPIs	#1 High performance	#2 Reliability	#3 Commercialisa-tion of standalone system	#4 Certification		
						
Milestones	#1 First Results of Robot Design Specifications and Patient Bio-Signal Monitoring System	#2 Development of Robotic System	#3 Development of Monitoring System	#4 Validation of the Completed System		
						
Deliverables	#SB Story Board	#D2 State of the Art in Robot Requirements and Features for in Home Use	#D7 Protocol for safety of users	#D3 Report about New Robot Design and Patient Bio-Signals Online and Offline Analysis	#MMR Multi-Media Report	#RIF Report on RIF visit outcome
						
	#D5 Final Demonstration	#D6 Publications in International Journal and Conferences	#FR Final Report to Echord++ team			
						
Dissemination	#1 website of experiment	#2 Press release-I	#3 Press release-II	#4 Multi media report	#5 Networking associations (euRobotics)	#6 Attendance to trade fairs- (AUTOMATICA 2018)

						
	#7 Attendance to trade fairs (REHACARE 2016)	#8 Attendance to scientific conferences (BIOROB 2018)	#9 Attendance to scientific conferences (ICORR 2017 / REHAB WEEK 2017)	#10 Organisation of events (IWART)	#11 Create posters,leaflets, roll-ups	#12 Social media (Twitter account)
						
	#13 Publications in scientific magazines (Advances in Mechanical Engineering)	#14 Publications in scientific magazines (Computer Methods and Programs in Biomedicine)	#15 Other (Internal Company Newsletter)			
						

GENERAL COMMENTS

The goal of the project is to develop an affordable and mobile system for rehabilitation of upper limbs. In the last period the Experimenters have finalized development of the prototype system which will be used in the validation trials in the hospital. The robotic system offers all the expected functionalities: movement in 6 degrees of movement, force support, gravity compensation etc. The device allows the user to control 3D games in order to motivate him/her to properly execute the exercises.
The project was also supposed to develop a system for monitoring the physiological and emotional state of the patient and modify the training program accordingly. This part was developed, but is a bit simplistic compared to the original proposal. In fact, only the pulse and the galvanic skin response are considered and a system based on the fuzzy-neural architecture is used to estimate the patient's state. Additionally, a subsystem for estimation of the patient's joints poses has been proposed. The system uses 2 IMU units and can be periodically used to assess the progress of the rehabilitation program.Finally, a tele-rehabilitation platform for remote access to patients' data and rehabilitation progress was to be developed. This part of the project is not completed yet and will be further developed, as only the basic information is available so far. The experimenters applied for an extension of the project, which was granted. The additional time was used for testing the device in a hospital and comparison with a commercially available solution. The obtained results show similar level of satisfaction of the end-users with much smaller dimensions of the HOMEREHAB robot, increased portability and lower price. The HOMEREHAB team managed to find a potential investor willing to certify the product and introduce it to the market. To sum up, the experimenters managed to catch up with most of the delays and technical issues reported earlier. The final result achieved the objectives of the proposal and is ready for further steps on the road to commercialization

DETAILED REPORTING ON KPIS

TECHNICAL KPIS: 4 not documented properly but reported
DISSEMINATION: some activities delayed or replaced – e.g. IROS 2018 instead of ICORR 2017

HYQ-REAL

MODERATORS: YANNICK MOREL AND LAURA FIORINI

tKPIs	#1 Characterization of Integrated Servo Actuator (ISA) on bench test	#2 Increased robot energy efficiency due to the integrated Servo actuators	#3 Overall weight reduction due to ISA (including less cooling, smaller pump thanks to higher efficiency)	#4 Increase in operating range (hours of operation) due to the hybrid power supply	#5 Active temperature management	#6 Leg-internal hydraulic routing
						
	#7 PSU design					
						
iKPIs	#1 Patent application	#2 Number of jobs created	#3 Number of spinoffs originating from the project	#4 Number of products originating from the project	#5 Number of companies that are starting to work with Moog to adapt ISA technology for their own products	#6 TRL increase of ISA
						
Milestones	#1 Concept figures of new engine powered hydraulic system	#2 Self-righting in simulation	#3 Bench test report covering operation, performance and efficiency of hyd. system	#4 Robot power-autonomy ruggedization and self-righting of robot	#5 Joystick-Controlled robot with 25kg payload moving in operational environment	
						
Deliverables	#D1.1 Different views of CAD model of updated HyQ2Max robot with overview of plan of ruggedization	#D2.1 Different views of CAD model of the new engine-powered hydraulic system mounted inside the robot torso model.	#D3.1 Simulation video showing self-righting from different starting postures	#D2.0 Requirements of the gasoline power supply in context of the project.	#D1.2 Water and dust proofing of robot limbs	#D1.2 Water and dust proofing of robot limbs
						

	#D3.2 Joystick based control of the robot with the new ISA. Robot speed and direction can be adjusted by the joystick.	#D1.3 List of improvements gain in ISA. A complete list of what has been improved: weight, design, energy efficiency, strength, force etc	#D2.3 Combustion engine-powered hydraulic system prototype finished and delivered to IIT	#D1.4 Ruggedized and power-autonomous robot demonstration during RIF Pisa visit	#SB Story Board	#D4.1 Exploitation plan with market analysis
						
	#RIF Report on RIF visit outcome	#D3.3 Final demonstration of power-autonomous robot with joystick control showing self-righting and 25kg load carrying	#MMR Multi-Media Report			
						
Dissemination	#1 Website of experiment	#2 Press release- I	#3 Press release- II	#4 Multi media report	#5 Networking w associations (Italian Civil Protection)	#6 Networking w associations (Corpo Nazionale dei Vigili del Fuoco)
						
	#7 Networking w associations (the Nuclear Institute)	#8 Attendance to trade fairs (Innorobo and Hannover Messe)	#9 Attendance to scientific conferences(ICRA 2017)	#10 Attendance to scientific conferences (IROS 2017)	#11 Create posters/leaflets/roll-ups	#12 Social Media-Twitter
						
	#13 Scientific papers (IEEE IROS or ICRA conference)					
						

GENERAL COMMENTS

HyQ-REAL has been extended, now finishing at the end of June 2018. Design phase is well over. Current work is on finishing integration (work in progress), testing in the lab, subsystems (well underway) and overall system (starting), before testing in the field (around May for a final demo in June for the review). Progress is slow

(complicated work, it's normal) but steady. Impact of the work done in the Experiment in MOOG is starting to materialize (patents, positions created in relation to the new technology developed, ISA product, etc.). Overall status is green.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

#7: The analysis supporting design of the PSU is not as strong as it should be. They did some work, based on to numerical models (one simulating rigid body dynamics, the other the hydraulics). They used this models to evaluate the hydraulic power needs of the system, and the electric power needs upstream of that. It is not great, in particular because they cannot split things in a satisfactory way (it's an overall, system-wide feedback loop). Their results are thus not rigorous. And the overall analysis is too fuzzy and not clear enough. But they did some work, and that's helped them dimension their PSU. It's not great (or even good), but it's 'OK', in that it shouldn't lead to major system failures. Not good, but passable. Orange.

DELIVERABLES:

D2.0: It is the document supporting the PSU design analysis discussed above. Orange too.

D3.2: They have the remote control function working properly, but on a previous version of the quadruped. The functionality is there, but it will need to be integrated on the newer version of the robot. Orange.

DISSEMINATION

#2: They want to postpone this press release to a later time, at which the new robot is integrated and functional, which makes sense. The item is late though, so, orange.

INJEROBOT

MODERATORS: ANTONI GRAU AND ALESSANDRA MOSCHETTI

tKPIs	#1 Grip operation Accuracy	#2 Correct cut	#3 Success of clipping operation and correct graft	#4 Robot arm speed	#5 Time/cycle	#6 Correct positioning of grafted plants in output tray
						
	#7 Quality control calibration	#8 Number of grafted plants/ hour	#9 Survival rate of grafted plants	#10 Stakeholders involvement		
						
iKPIs	#1 System ability for grafting horticultural species	#2 Economic viability of solution	#3 Reduction of labour Cost of grafted plant	#4 Number of implementations		
						
Milestones	#1 Starting solution	#2 All needed components acquired	#3 Prototype components developed	#4 Total integration completed	#5 System test done	
						
Deliverables	#D1 Report on the state of the art	#D2 Report on requirements and specification of the prototype components	#D3 Report of conceptual design of the system	#D4 Report on metrics defined	#D5 Plans and photos of the gripper developed	#D6 Plans and photos of the auxiliary devices (cutting, clipping and others)
						
	#D7 Software package for ROS-Ind	#D8 Tested solution in TEC facilities	#D9 Report on RIF@Bristol visit outcome	#D10 Results on growing chamber		
						

Dissemination	#1 Website of experiment	#2 Press release-I	#3 Press releases-II	#4 Press releases-III	#5 Multi media report	#6 Networking associations(COEXPHAL)
						
	#7 Networking associations (Federación de agricultores Viveristas de)	#8 Networking associations (ASEHOR)	#9 Networking associations(SOCIEDAD ESPAÑOLA DE AGROINGENIERIA)	#10 Attendance to trade fairs (AUTOMATICA 2018)	#11 Attendance to trade fairs (Infoagro Exhibition)	#12 Attendance to scientific conferences (IROS 2018)
						
	#13 Attendance to scientific conferences (ROSCON 2018)	#14 Other publications (e.g. newsletter, …)				
						

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

#3: Despite the this tKPI was reached almost on time, after the onsite demonstration it was seen that the system was not able to successfully perform the clipping operation and a correct graft.

#4: The yellow light is linked to the delay in reaching the tKPI, since it was due on 01/08/17 and it was set as ok by the experimenters on 18/10/2017. However the experimenters kept on updating the portal with the status of the tKPI each month.

#5: The yellow light is linked to the delay in reaching the tKPI, since it was due on 01/08/17 and it was set as ok by the experimenters on 18/10/2017. However the experimenters kept on updating the portal with the status of the tKPI each month.

#6: The yellow light is linked to the delay in reaching the tKPI, since it was due on 01/08/17 and it was set as ok by the experimenters on 18/10/2017. However the experimenters kept on updating the portal with the status of the tKPI each month.

#7: Despite the delay (it was due on 01/07/17 and it was set as ok by the experimenters on 18/10/2017) in marking this tKPI as ok, in the on site evaluation it was verified that the tKPI7 was not reached.

#8: Despite the delay of 3 months in marking this tKPI as ok, in the on site evaluation it was verified that the tKPI8 was not reached.

IMPACT KPIS:

#1: Beyond the delay (due on 01/07/2017 and set ok at the end of January 2018) in reaching this iKPI, during the on site evaluation the ability of the system of grafting was not demonstrated.

#2: Beyond the delay (due on 01/07/2017 and set ok at the end of January 2018), the economic viability of solution was not demonstrated since the tKPIs necessary to reach this iKPI were not reached.

#3: Beyond the delay (due on 01/07/2017 and set ok at the end of January 2018), the reduction of labour Cost of grafted plant was not demonstrated since the tKPIs necessary to reach this iKPI were not reached.

#4: Even if the project ended on 30/11/2011, this iKPI was not reached, because the experimenters are adjusting and improving the first prototype in order to be able to reach the market with a competitive product.

MILESTONES:

#2: This milestone was set as ok delayed of 5 months.
#3: This milestone was set as ok delayed of 3 months.
#4: This milestone was set as ok delayed of 2 months.

DELIVERABLES:

#2: This deliverable was delivered delayed of 3 months.
#6: This deliverable was delivered delayed of 1 month.
#7: Some information about parts of the robotic system are missing.
#8: Some information about parts of the robotic system are missing.
#10: This deliverable was delivered delayed of 2 months.
#11: This deliverable was delivered delayed of 1 month. Moreover, even after the suggestion of the moderators to improve the quality of this document by adding some information about the general results of the project and about some parts of the system, the experimenters did not properly implement these suggestions.

DISSEMINATION:

#3: The workshop was done at month 21 instead of month 13.
#4: The third Press Release has not been published yet.
#14:This dissemination milestone was published with 1 month delay.
#10, #12, #13: No information is given at the moment, since they consist of participation to conference that will take place in the next months.

KERAAL

MODERATOR: ABDUL BUTT

tKPIs	#1 Number of exercises in rehabilitation identified as coachable by the robot for low back pain.	#2 Exercises implemented by the robot for demonstration	#3 Detection rate of wrong exercise or movements	#4 Percentage of patients needing the exercises coached by the robot		
						
iKPIs	#1 Number of jobs created	#2 Potential profit per sale	#3 Time saved from doctors	#4 Interest from therapists	#5 Better healthcare for patients	#6 Sales of Poppy
						
	#7 Application to other fields					
						
Milestones	#1 "Kick--off" meeting	#2 Choice of a scenario	#3 Delivery of a anthropomorphic robot	#4 Intelligent tutoring algorithm	#5 Functional robot coach	
						
Deliverables	#D1.1 Website	#D2.1 Report on the Specifications of Exercises, Robot Platform and the Human-Robot Interaction	#D1.2 Ethics committee approval	#D3.1 Anthropomorphic Robot Platform Adapted to Rehabilitation	#D4.1 Demonstrator of the HRI	#D5.1 Demonstrator of the ITS
						
	#D6.1 Demonstrator of a Functional Robot Coach	#D7.1 Evaluation Report	#D8.1 Business Model Report	#FR Final Report	#SB Story Board	#MMR Multi-Media Report

						
Dissemination	#1 Website of experiment	#2 Press releases-I	#3 Press releases-II	#4 Press releases-III	#5 Press releases-IV	#6 Press releases-V
						
	#7 Press releases-VI	#8 Multi media report	#9 Networking w associations - Ordre des kinés	#10 Networking w associations- 3th european symposium "Silver économie & Habitat"	#11 Networking w associations- Pole Images & Réseaux- Technoférence	#12 Attendance to trade fairs - INNOROBO
						
	#13 Attendance to trade fairs- Medica 2018	#14 Attendance to scientific conferences- ACCAS 2016	#15 Attendance to scientific conferences- CogRob2016 at IEEE IROS 2016	#16 Social media	#16 Attendance to scientific conferences- ISPRM 2018	#17 Create posters/leaflets/roll-ups - for Innorobo
						
	#18 Create posters/leaflets/roll-ups - for Medica	#19 Publications in scientific magazines- IEEE	#20 Newsletter- blog from IMT			
						

GENERAL COMMENTS

In the final deliverables final report, business model and evaluation reports are not delivered yet. Which were due in the feb 2018. There is no update regarding these deliverables. Similarly in Dissemination deliverables multiple delvierables are missing such as Pressrelese III in dissemination 3, Attendance of trade fare medica, Attendance to scientific conferences- ISPRM 2018, Publications in scientific magazines- IEEE. Moreover In technical KPIs Percentage of patients needing the exercises coached by the robot there is no improvement reported. In general project seems to not on track since there is no update reported in the above mentioned deliverables.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

#4 “Percentage of patients needing the exercises coached by the robot” is 80% reported, there is needed to improve the overall accuracy which is in progress (red). At the same time in technical KPI No 3 “Detection rate

of wrong exercise or movements" 83.00% accuracy is reported with video proof, which is also needed to improve and in progress (Orange). No further improvement reported up to date.

IMPACT KPIS:

#4 about the interest of therapists Questionnaire to therapists was not delivered yet which was due on 1.9.2017 (Orange). Not updated yet

MILESTONES:

#5 about the functional robot coach was not yet delivered, which was due on 01.09.2917. There is no self-assessment by experimenters (Orange).

DELIVERABLES:

D 7.1, D8.1, Final Report: There is no justification provided about the delay of deliverables throughout from the beginning of this year (red).

DISSEMINATION:

Dissemination 9 about Networking association was not delivered yet which was due 1.10.2017. Similarly, in Dissemination 2 about Press releases-I not delivered yet which was also due on 1.10.2017 (Orange). Milestones D 4, 16,19 and 20 are not yet delivered there is no updated information regarding these deliverables on portal (red).

MAX-ES

MODERATORS: ADAM SCHMIDT AND ANA MARIA PUIG PEY CLAVERIA

tKPIs	#1 Position accuracy while docking	#2 Indoor accuracy	#3 Outdoor accuracy			
						
iKPIs	#1 Costs reduction	#2 Increase in productivity	#3 Further interests			
						
Milestones	#1 Preliminary design review	#2 Pre-Integration Review	#3 Pre-trail review	#4 Post-campaign review		
						
Deliverables	#1 (SB) Story Board	#2 (RIF) Report on RIF replaced by RTA prototype presentation report	#3 (D1.1) Use Cases	#4 (D2.1) System Specification	# 5 (D3.1) Navigation Module	# 6 (D3.2) Test report for Navigation Module
						
	# 7 (D4.1) Safety Module	# 8 (D4.2) Test report for safety module	# 9 (D6.1) Docking and Handling module	# 10 (D6.2) Test report for Docking and Handling module	# 11 (D7.1) MAX Robot with all modules	# 12 (D7.2) Test report for integrated system
						
	# 13 (D5.1) Test report for Numerical Safety validation	# 14 (D8.1) Final test campaign report	# 15 (D8.2) Dissemination plan	# 16(MMR) Multi-Media Report		
						
Dissemination	#1 Website of experiment	#2 Press releases- I	#3 Press releases- II	#4 Multi media report	#5 Networking w associations- I	#6 Networking w associations- II

	#7 Networking w associations- III	#8 Attendance to trade fairs- Automatica	#9 Attendance to scientific conferences - AUTONOMOUS SYSTEM WORLD CONFERENCE	#10 organisation of events - Journées de l'industrie at Dunkirk	#11 social media- Youtube	

GENERAL COMMENTS

The experimenters unilaterally decided to change the robot used in the experiment from a laboratory prototype to a larger, serially-produced variant, which will be available later this year. Although this change may have a positive impact on the project by bringing the final solution closer to marker and delivering results better fitting the needs of the end user it has also introduced significant delays in the project. Therefore, the deliverables, technical KPIs and milestones related to the experimental verification of the solution are delayed. Despite the lack of formal reporting, initial results related to the navigation and docking components have been presented and seem to be promising in terms of achieved accuracy. The safety module for the developed AGV has also been designed. The protocol for measuring the mapping and positioning accuracy is being developed right now. The relatively low scores of the project are caused by the delays related to changing the robot used and some issues with reporting. However, the project is generally going well and will probably finish successfully.The Experimenters have applied for a 6 months' extension of the project to cope with the delays and present the final results within the timeframe of the project. The extension was granted and the project is following the updated schedule. Currently, the work focuses on the electric commissioning of the newly built prototype of the AGV. Afterwards, full integration and field tests will follow.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

tKPI #1 #2 #3: Also delayed because of the platform change. However, according to the monitoring call, the work seems to be progressing there.

MILESTONES:

Milestone #1: Title is misleading, milestone not about design but about use case and evaluation scenario definition. A short document was produced. It is woefully shallow and insufficient. They were told to provide additional details in the last monitoring call. Red, shifting to green if they fix it.

Milestone #2: The pre-integration review, as several other things, is delayed because of the change in the robot used (described below). Orange for now, until extension granted.

DELIVERABLES:

SB: Not a storyboard, not that important though. Orange.

Deliverable D1.1 use cases: See comments about milestone #1, use case description is no good, needs a lot more detail. Red. They've been told to fix it, however still not fixed.

Deliverable D2.1 specs: Still does not contain a true functional analysis, the second document just gives rough details on the requirements for the navigation component. Still needs to be fixed.

Deliverables D3.1, D3.2, D4.1, D4.2, D6.1, D6.2: Delayed because of the change in the project scope and timeline described below.

DISSEMINATION: some either not traceable (press release) not available (website) or overdue (II networking with associations)

RADIOROSO

MODERATORS: YANNICK MOREL, ANTONI GRAU AND CLEMENTINA CRUCELI

tKPIs	#1 Average single item sorting time (grasping, classification, separation from heap, measurement)	#2 Sorting error for compressible/rigid items.	#3 Percentage of wrongly detection of item radioactivity level.			
						
iKPIs	#1 Production of a new radioactivity-proof gripper (possible product)	#2 Reduction of cost of sorting procedure	#3 Improved health, safety and quality of work of personnel	#4 Attract interest of possible stakeholders in RadioRoSo technology	#5 Commercial viability of RadioRoSo results	
						
Milestones	#1 Demonstration of Scenario A with CloPeMa gripper	#2 Demonstration of Scenario A with RadioRoSo gripper	#3 Demonstration of the full-scale scenario B			
						
Deliverables	#SB Story Board	#D1.1 Detailed Experiment Specification and Evaluation Methodology	#D2.1 Gripper detailed design and interface specifications	#D5.1 Phase 1 experiment report	#D5.2 Phase 2 experiment report	#MMR Experiment Multimedia Report
						
	#D5.3 Experiment final report					
						
Dissemination	#1 Website of experiment	#2 Press release-I	#3 Press release-II	#4 Multi media report	#5 Networking w associations	#6 Attendance to trade fairs (Innorobo 2017)
						

	#7 Attendance to trade fairs (Automatica 2018)	#8 Attendance to scientific conferences	#9 Organisation of events	#10 Organisation of events		
						

GENERAL COMMENTS

This Experiment's outcome is somewhat limited. There is the clear fact, which they freely admitted at the review, that they over-promised and under-delivered. TRL of the "main product," that is the spring grasping system is, according to the external reviewer, at 4 (starting point at TRL3). One of the components, the novel gripper/end effector, was assessed to be at TRL5. Experimenters appear to have heavily relied on results from their previous project together (CloPeMa). Additional developments were fairly limited. The intervention by the monitoring team, about midway through the Experiment, to try to steer technical scope of the Experiment towards something more in line with the original proposal had some clear, rather positive, but fairly limited impact on the work done. They did bring back into focus some of the aspects promised. But a lot of the pieces of the puzzle do not fit together. There is a lack of integration of the different technologies together (e.g. radiation localization + grasping). In addition, even for the smaller-scale use case (spring grasping), the overall lack of robustness/polish/reliability suggests a lack of time and efforts invested in integrating the different parts involved together (gripper from Genoa, vision from Greece, etc.).
Perspectives beyond the project are modest. Two persons representing the stakeholder (ANSALDO-NES) were present at the review. They were fairly removed from proceedings and did not seem invested. When asked for their perspective on results achieved, they stated that the technologies developed were of strong interest to them. When pressed to describe what concrete use they would make of this technology, they explained they could integrate some of the aspects explored in the Experiment into designs/bids they present to their clients. It was very non-committal and appeared to be them paying lip service to the perspective of making use of the technology. In the discussion with Experimenters, it was claimed that, more generally, they would pursue exploitation of the vision/grasping toolchain developed. Beyond re-using it in upcoming projects, there's no clear application however (too low TRL for commercial relevance). In addition, the partner from Geno stated he would pursue commercialization of the gripper technology developed, likely with Schunk. This technology is TRL 5, requiring further development. The idea would be to motivate Schunk to either take on or otherwise sponsor this development. It is not very likely to occur.
Merit of the Experiment appears to consist mainly in the tech developed for the gripper, and "keeping the band together" after CloPeMa. In terms of resources invested, reviewers agreed that Experimenters very likely did invest the Experiment budget in pursuing the work shown at the review.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

tKPI #1: Experimenters claim some results. It is unclear if there is much substance to these claims. The put forward a sorting time of 1min, with no clear points of comparison to other, comparable results (in the literature for example), making it impossible to assess whether this is indeed fast or slow. They claim humans take over 1min per object but I4ve not seen any reference to substantiate that claim. Orange.
tKPI #2: Experimenters only detect and localize a specific type of items: Springs. They could make the case that they are sorting these springs from the surrounding rubble. However, the spirit of the work proposed clearly involved the classification of different types of objects, which they are not doing at this point. Instead, they detect, localize and grasp/manipulate springs, and perform a generic object grasping procedures for the remaining rubble. It does not address this KPI, red.
tKPI #3: They detect radioactivity levels, as reported in D5.3, but that aspects is not meaningfully tied to the overall grasping procedure. Orange.

IMPACT KPIS:

iKPI #1: A new gripper has been produced, it does have tactile features. Unclear to what extent it is radiation-resistant. Actuation (hydraulics) goes in the right direction, but presence of silicon/electronics for the haptic measure goes in the wrong direction. Orange.

iKPI #2: They have not produced the required analysis. Red.

iKPI #3: This is an orange that maybe should be a red. Their work is so far from practical relevance, they have no hope of substantiating this impact.

iKPI #4: They claim the industrial partner of the Experiment has some interest in the technology developed. That is a start but falls short of expectations. Interest of this industrial stakeholder at the review seemed very mild. Orange.

iKPI #5: No element to suggest commercial viability. When pressed on the issue at the review, partners referred to possible (future) discussions with industrial partners selling end effectors (Schunk). Red.

MILESTONES:

#1-3: They have a setup running, but there are a number of caveats. First off, they built upon their work in a previous project (CloPeMa), and efforts invested here are somewhat unclear (although new end effector looks respectable in person). Then, scope of what is shown is limited compared to what was in the proposal. Live demonstrations at the review were not very convincing. Three aspects were shown, 1) radiation source detection and localization: Functional, but not meaningfully connected to other tasks, 2) spring detection and grasping: Seems functional but success rate not seemingly as high as claimed, 3) grasping of random-shape objects: Seemed not to be working properly. The setup does a few things, but performance is underwhelming, robustness/repeatability/technology maturity are questionable. Orange.

DELIVERABLES:

The storyboard and MMR are OK, all other deliverables are orange. D1.1 defines a use-case that severely limits the scope of the work done. Experimenters argue that this is to best address the problem that is of interest to the end-user. There is some merit to this argument, but it comes across as somewhat disingenuous and an excuse to under-deliver. There is nothing stopping them from addressing the original Experiment scope, within which they would be able to easily fit this use-case. As a result, experimental reports show limited scope. This point was brought up to Experimenters before the summer, and 5 key areas in which they were lacking were identified (with respect to work reported in D5.1). In the second and third experiment reports (D5.2, D5.3), they addressed some of these 5 areas, but typically in a partial, limited manner, and in a way that makes it difficult to assess reality of the work done. Specifically, there are a few items which they affirm in the report that they addressed (experimentally), but there are no elements to support this assertion (no picture, video, figure, anything). For instance: Grasping of “previously unseen objects.” In-person demonstrations at the review were not very convincing. The core use-case (defined in D1.1, spring grasping) works best but performance was clearly not as good as stated in the deliverable. They claimed ~98% successful grasp, in practice about 1 in 5 did not work – demonstration not necessarily representative but raises doubts.

DISSEMINATION:

#2 & #3: No press releases. Red.

#5: Networking performed is real but appears limited, in particular in terms of outcome for them. Orange.

#9, #10: No evidence of completion. Red.

SAFERUN

MODERATORS: YANNICK MOREL AND ANA MARIA PUIG PEY CLAVERIA

tKPIs	#1 Handling of different weights and different types of weights (E80 plant)	#2 Test experiment No. 1 executed in a Matlab Environment	#3 Test experiment no. 2 executed in a Matlab Environment	#4 Test experiment no. 3 executed in a Matlab Environment	#5 Test experiment no. 4 executed in a Matlab Environment	#6 Test experiment No.5 executed in a Matlab Environment
						
	#7 Test experiment No. 1 executed in the E80 plant with the prototype vehicle	#8 Test experiment No. 2 executed in the E80 plant with the prototype vehicle	#9 Test experiment No. 3 executed in the E80 plant with the prototype vehicle	#10 Test experiment No. 4 executed in the E80 plant with the prototype vehicle	#11 Test experiment No.5 executed in the PG plant with the prototype vehicle	#12 Extensive tests considering real operation conditions (PG plant)
						
iKPIs	#1 Number of jobs created	#2 Provision of a novel velocity controller which adapts its speed based on the curvature and on the safety areas, instead of using constant velocity	#3 Number of PhD Positions	#4 Increase in TRLs (3 to 4)	#5 Increase in TRLs (4 to 5)	#6 Increase in TRLs (5 to 6)
						
Milestones	#1 Project specifications	#2 The safe and optimal velocity planner is tested in a Matlab environment	#3 The safe and optimal velocity planner is ported in C and tested in the E80 environment	#4 The hardware of the experimental AGVs is ready	#5 The safe and optimal velocity planner is adapted to the planning scheme used in the E80 plants	#6 Integration and debugging phase in the E80 demo plant
						
	#7 Integration and debugging phase in the PG plant	#8 The PG plant is ready for the extensive test phase	#9 The overall system is extensively tested in the PG plant			
						

Deliverables	#SR Specification Report	#D4.1 Technical Report on the Matlab implementation of the planner and corresponding comparison tests	#D2.1 Technical report	#D2.2 Prototype LGVs ready at E80 and PG	#D4.2 Technical Report on the C implementation of the planner	#D3.1 Multi-M11edia Report showing the first movements of the E80 prototype vehicle
						
	#D4.3 Technical Report concerning the implementation of the planner on the E80 vehicle and corresponding comparison tests	#D3.2 Multi-Media Report showing the first tests in the E80 plant	#D4.4 Technical Report concerning the implementation of the planner on the PG vehicle and first extensive tests on the E80 vehicle	#D3.3 Multi-Media Report showing the first tests in the PG plant	#D4.5 Technical Report concerning the first tests on the PG vehicle	#D3.4 Multi-Media Report some comparison tests in the PG plant
						
	#D3.5 Technical Report concerning a set of variable load tests executed with the E80 prototype	#D4.6 Technical Report concerning a complete set of comparison tests executed on the PG vehicle	#D5.1 Experiment demonstrator ready at PG	#SB Story Board	#MMR Multi-Media Report	#RIF Report on end-user tests outcomes
						
Dissemination	#1 Website of experiment	#2 Press releases -I	#3 Press release-II	#4 Press release-III	#5 Multi media report	#6 Multi media report
						
	#7 Multi media report	#8 Multi media report	#9 Networking associations (ANIPLA)	#10 Attendance to trade fairs (sps ipc drives)	#11 Attendance to trade fairs (Automatica)	#12 Attendance to trade fairs (Tissue World)
						
	#13 Attendance to trade fairs (Interpack)	#14 Attendance to trade fairs (Drinktec)	#15 Attendance to trade fairs (MIAC)	#16 Attendance to scientific conferences (IROS 2017)	#17 Attendance to scientific conferences (ICRA 2018)	#18 Create posters/leaflets/roll-ups

						
	#19 Social Media (Facebook)	#20 Scientific publications				
						

GENERAL COMMENTS

SAFERUN is complemented and was an unmitigated success. Review is still pending (scheduled May 16th). Algorithms were developed early on in the Experiment, simulated, tested on the vehicle in the E80 testing environment (technology user, in the business of developing factories, looking to integrate the algorithm into their products), implemented and tested in the factory of one of E80's customers, PREGEL. The software prototype has been tested in operational environment, achieving TRL7. The end user (E80) is happy with the results, therefore to that extent the Experiment is already a success. However, it remains unclear to what extent the academic partner will be able to benefit from this success. The relation with E80 is exclusive, meaning the academic partner is unable to exploit its software product with other possible interested customers. It would be interesting to try to quantify the benefit to the academic partner. In addition, quantifying improvements to E80's products (factories) is a difficult proposition, which can only be realistically pursued in simulation. Factory floor-plan is designed to account for UGV's path planning. Changes to the path planner imply a different factory design, which is a process that takes several months. There is not a single factory that would be a fair comparison case to evaluate improvement of proposed planner over existing ones. Yet, operational improvements, in factories previously designed, have been measured and quantified (PREGEL factory). The MMR looks pretty good too.

DETAILED REPORTING ON KPIS

MILESTONE #1 DELIVERABLE #SR:

The Experimenters have not technically provided specifications. Instead, they have evaluated the level of performance of the current planning solution in both the E80 test environment and the PG plant. That level of performance will serve as a comparison to assess merit of the proposed approach. It's OK and useful overall, but not actual specifications (orange).

DISSEMINATION:

The Experimenters have been very active overall and provided quite a bit of material attesting of their activity. A few spots should be clarified however, we are missing substantiating elements for items #4, 9, 12 and 15. In addition, press release II (item #3) was actually an article in an industrial journal. It is a value, but it is not a press release. Orange for this four mentioned items.

SAGA

MODERATORS: ALESSANDRO MANZI AND YANNICK MOREL

tKPIs	#1 On-board processing	#2 Usability of the system	#3 Performance in autonomous motion planning	#4 Performance in individual weed detection	#5 Ability of coordinated motion behaviour	#6 Field coverage ability
						
	#7 Scalability	#8 Collective performance in weed detection				
						
iKPIs	#1 Reduce weed control costs	#2 Definition of a business model	#3 Involvement of stakeholders	#4 Collaborations with end-users	#5 Portability to other crop/weed	#6 Fundraising
						
Milestones	#1 UAV prototype and low-level control	#2 UAV prototype with individual-level control	#3 UAV swarm with collective-level control	#4 Final demonstration		
						
Deliverables	1 SB	2 D1 Methods and guidelines	3 D2 Hardware and control design	4 MMR1 UAV w/ motion planning	5 MMR2 Collision avoidance	6 MMR4 Interactive simulations
						
	7 D3 Prototype	8 MMR3 Individual weed recognition	9 MMR5 overal multi-media report	10 RIF visit outcome	11 D4 Final demonstration	
						
Dissemination	#1 Website of Experiment	#2 Press release-I	#3 Press release -II	#4 Multi-Media Report	#5 Networking associations (ZLTO)	#6 Networking associations (Confagricoltura)
						

	#7 Networking associations (IFOAM EU Group)	#8 Attendance to trade fairs (Maker fair)	#9 Attendance to trade fairs (TUS Expo)	#10 Attendance to trade fairs (Automatica 2018)	#11 Attendance to trade fairs (Agritechnica)	#12 Attendance to trade fairs (Precisiebeurs)
						
	#13 Attendance to trade fairs (Vision, Robotics & Mechatronics)	#14 Attendance to scientific conferences (ICRA or IROS 2018)	#15 Attendance to scientific conferences (DARS or ANTS 2018)	#16 Attendance to scientific conferences (EurAgEng)	#17 Organisation of events (IEEE TC AgRA Webinar)	#18 Organisation of events (Field Robot Event, Harper Adams University)
						
	#19 Create posters/leaflets/roll-ups	#20 Social media (Twitter account)	#21 Scientifc publications (Robotics)	#22 Scientific publications (Precision Farming)		
						

GENERAL COMMENTS

The Experimenters have hard early delays due to hardware development, in particular integration of sensors on-board turned problematic. Then, after they resolved these issues, they failed to obtain the required flight certification. To circumvent this issue, they decided to fall back on a different type of drones, lighter (from 5 to 1.5Kg), which does not require certification. One such drone is integrated and being used in Wageningen to capture a data set to support vision. In parallel, work has been conducted, largely in simulation, on coordination aspects. Similarly, preliminary work was done on vision, but the real work in that respect will be performed once they have collected a sufficient data set for the application. The Experimenters have requested a four-month extension, which the Moderators have approved. The added time should allow them to successfully complete the Experiment.

There has been significant turnover in some of the partners. The researcher from Wageningen (Joris) has moved on. That has had an impact on vision. More recently, the person leading the work at Avular (Ramon Haken) has left the company (following the arrival of new investors). Impact on the hardware remains to be seen, but work was pretty advanced at the stage at which he left (April 2018). Final review to occur in June.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

#5 & 7: A lot of what the Experimenters are showing in terms of coordination and scalability is only substantiated by analysis and numerical simulation. Actually demonstrating coordination in practice, with a reasonable number of drones flying together (5+) would be appreciated. Similarly, scalability is inherent to the approach, but a better substantiation to that claim would be good. Orange for both.

#2 & 8: Unsubstantiated as of now, to be evaluated on the occasion of the final review (early June). Orange.

IMPACT KPIS:

#1 & 2: Difficult to make the case for cost reduction of weed control. System is far removed from practical relevance and could be expected to prove very costly. There is no business model analysis to support that claim, to the best of my knowledge, and reality of the system makes it unlikely that it will be achieved within the Experiment's scope. On a comparable topic, the Experimenters have not provided or shown a credible business model (although we know they have spent time looking at the issue and have consulted with a number of relevant experts, e.g. R. Champion) Red.

#5: Unsubstantiated and doubtful, as generalizability of vision work is a question mark. Orange.

MILESTONES:

#3 & 4: Difficulties with flight certification have forced the Experimenters to adjust plans, going towards a different type of drones. This has an impact on timeliness of milestones, and they are not able to demonstrate milestone #3 nor 4 at this point in time. They are working towards it however. Orange.

DELIVERABLES:

#4 & 5: Motion planning and collision avoidance are not demonstrated properly. For motion planning (#4), a video of an actual drone is provided, but there is no evidence of particular motion planning involved. For collision avoidance (#5), only simulation results are provided. Practical results are expected. Orange in both cases.

#7 & 8: The aforementioned delays have pushed back delivery of these items. The final drones will be made available to implement coordination schemes in the coming month. Meanwhile, one such prototype has been used in Wageningen to collect a data set. This data set will support learning to achieve the result expected in #8. Orange for both of these, there are not there, but should get there eventually.

#9 & 11: Final demonstration will be performed at the final review, in June. Similarly, the Experimenters have not yet produced the final MMR, waiting to have the final drone swarm working/behaving/performing as expected. Orange.

DISSEMINATION:

A number of items are not justified (#3, 7, 13, 18), those are red, event #17 is being postponed and MMR (#4) is expected around the time of the final review, both are orange for now.

WIRES

MODERATOR: ADAM SCHMIDT

tKPIs	#1 Time to complete single wiring	#2 Time to complete full task	#3 Gripper simulation	#4 Success rate in inserting wiring terminals	#5 Detection of wires	#6 Time spent to execute the connection/Overall wiring time
						
	#7 Manufacturing efficiency					
						
iKPIs	#1 Patent application	#2 Industrial collaborations	#3 Cross domain application	#4 Job creation		
						
Milestones	#1 Task execution	#2 Sensory system validation	#3 End effector validation	#4 System integration	#5 Experimental evaluation results	
						
Deliverables	#D1 Application requirements report	#D2 Simulation environment	RIF 1	#D3 Sensory system	#D5 Task planning and execution	#D6 Manipulation control
						
	#D7 System integration	#RIF2	#SB Storyboard	#MMR Multimedia report		
						
Dissemination	#1 Website of experiment	#2 Press release I	#3 Press release II	#4 Press release III	#5 Multimedia report	#6 Networking associations (unindustria)
						

	#7 Networking associations (capiel)	#8 Networking associations (anie)	#9 Attendance to tradefairs (Futuro remoto)	#10 Attendance to tradefairs (SPS IPC Drives Nuremberg)	#11 Attendance to scientific conferences (ICRA)	#12 Attendance to scientific conferences (AIM)
						
	#13 Attendance to scientific conferences (IROS)	#14 Create posters/leaflets	#15 Social Imedia (facebook)	#16 Social media (youtube)	#17 Publication in scientific magazine (IEEE-TRO)	#18 Publication in scientific magazine (IEEE-TMECH)
						
	#18 Create posters/leaflets/roll-ups - for Medica	#19 Publications in scientific magazines- IEEE	#20 Newsletter- blog from IMT	#19 Publication in scientific magazine (Automatica)	#20 Publication in scientific magazine (Mechatronics)	#21 Publication in scientific magazine (Sensors and actuators: A: physical)
						

GENERAL COMMENTS

The goal of the project is to develop an automated system for wiring of switchgears. The work involves design of a new gripper with a tactile sensors and a vision system for precise localization of the components and wires. So far the work has been progressing well, some additional tasks e.g. development of an external vision system for precise localization of the wire in the gripper has been performed. This system is used to augment the efficiency of the tactile system integrated with the gripper that was developed in the project. In order to successfully manipulate the wires during insertion in the sockets an extensive research on modelling the deformation of the wires has been performed.

The experimenters have also proposed a new method of generating semi-automatically data for deep-learning based training of electronic components recognition system.

There have been slight changes in the schedule of the project – in order to prepare two submissions to ICRA task 3 has been temporarily delayed while the effort focused on tasks 4 and 5. Overall it is a good project that can be expected to deliver meaningful results. Therefore, the new gripper has not been prepared yet, and the experiments are performed using sensorized version of two commercial grippers. The deliverables of the project are slightly delayed. However, the experiments submitted a number of papers in the meantime and are now catching up with all the delays. A gripper prototype has been developed.

DETAILED REPORTING ON KPIS

TECHNICAL KPIS:

#1 and #4 delayed because of a change in schedule, #2 need correction – it just shows a simulation of the complete task,

MILESTONES:

#3 delayed due to the change in schedule

DELIVERABLES:

RIF 1 – lack of support from the RIFs' side, the experimenters tried though

D4 – delayed

D12 – the paper won the best paper award

DISSEMINATION:

#9 – not verifiable

#7 and #8 – waiting for a reply from the associations

#3 – not verifiable