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Learnings & Recommendations for future CSAs

This document results from U4IoT - User Engagement for Large Scale Pilot Projects in the Internet of Things[1], a Coordination and Support Action (CSA) with a duration of three years (2017-2019). The purpose of the project was to provide the Internet of Things (IoT) Large-Scale Pilot (LSP) projects – ActivAge[2], MONICA[3], SynchroniCity[4], IoF2020[5] and AUTOPILOT[6] - in the IoT-LSP Programme[7] with end-user engagement support.

One of the main uptakes from the concluding work done in U4IoT are the learnings and recommendations for future CSA practices concerning end-user engagement, derived from evaluative interviews with the lead IoT-LSP end-user engagement representatives. The IoT-LSP end-user engagement representatives were consulted by means of interviews, concerning their view on end-user engagement practises in

[1] U4IoT - https://u4iot.eu
[2] ActivAge - http://www.activageproject.eu
[3] MONICA - https://www.monica-project.eu
[4] SynchroniCity - http://synchronicity-iot.eu
[5] IoF2020 - https://www.iof2020.eu
[6] AUTOPILOT - https://autopilot-project.eu
[7] IoT-LSP Programme - https://european-iot-pilots.eu

future IoT-LSP programmes. Answers from the IoT-LSP representatives were clustered into topics and interpreted by the U4IoT representatives. The target groups towards whom the recommendations are directed are the policy officials from the European Commission (EC) and other funding institutions. Moreover, future programme leads, CSA and IoT project partners are considered as target audiences.

The recommendations are as follows:

1. Establishing early communication between CSAs and IoT-LSPs by means of a formalised protocol;
2. Considering receptiveness towards end-user engagement collaboration on different levels;
3. Raising end-user engagement awareness and streamlining the vocabulary;
4. Providing meaningful and targeted end-user engagement tools and support;
5. Establishing a baseline of continuous 'stand-alone' end-user engagement tools and support;
6. Flexibility with regard to end-user engagement in project Description of Actions (DoAs);
7. Consistency and exchange of end-user engagement activities <u>within</u> projects;
8. Balance between generic and specific tools & support services from a CSA for use within IoT-LSPs;
9. Consistency and exchange of end-user engagement activities <u>between</u> projects;
10. Sustaining the U4IoT tools and support services as a baseline.

The goal of these recommendations is to learn from the U4IoT process and IoT-LSP experiences, to provide concise yet grounded suggestions on how end-user engagement could become a more integral part of future IoT projects. The recommendations and accompanying quotes from the interviews are listed underneath:

1. Establishing early communication between CSAs and IoT-LSPs by means of a formalised protocol: It is recommended to establish a protocol to connect project partners (CSAs and IoT-LSPs) and stimulate early communication, e.g., to start with automatically sharing necessary contact information and project Description of Actions (DoAs). This is to enable projects to understand the projects' structures, align end-user engagement objectives and agree on a common process. Moreover, the frequency and instances of interaction could be formalised in this protocol, with flexibility to changing circumstances, to streamline communication from the start of the programme.

*"As a recommendation for future CSAs: communication is key, early communication in a dynamic way, to engage the project that needs to communicate with you in the beginning. We are about to start new IoT-LSPs in independent living, I don't know if there will be a CSAs around that topic. We have been having meetings already and know that they were granted. More time is advancing the preparation, as time during the project is limited, as the schedule is very tight. All promises are made in a very early stage. There is limited time to think, process and define the objectives". *** Quote from the interview with ActivAge ****

*"In between, a lot of things happened in the project. If we could have made use of all tools, more opportunities to interact could have been useful. It seemed very much focused on once a year events. Thinking of U4IoT, it comes back to the impression that interaction was very much focused on the IoTWeek. Maybe we missed other occasions. It would be good to find support actions for all projects, stronger engagement by means of more meetings would have been useful. Also, we were in charge of one task of a total of 40-50 tasks in the project. Of course we are doing user evaluation, but it is a technical project."…"To have a wider dissemination. Did not know U4IoT had a newsletter, but by organising more meetings, etc, there would have been more opportunities to engage and learn what is happening. It also could have been put on the website, for external or internal communication". *** Quote from the interview with AUTOPILOT ****

2. Considering receptiveness towards end-user engagement collaboration on different levels: It is recommended to look out for proposals with an outward focus, where the approach of the proposal and the culture of the partners reflect an external interest in terms of end-user engagement, rather than an internal (solely technical) focus. Awareness of a larger ecosystem, where both vertical and horizontal collaboration is necessary, can increase receptiveness to co-create on a programme, project and actor level.

"Culture, approach and experiences with end-user engagement are important when it comes to autonomous uptake and usage of the tools and support services". *** Quote from the interview with MONICA ***

"Projects are very focused on their own issues, need to be pushed to go out of this shell and be open to other activities. It was difficult to get deployment sites (DS) to learn about CSAs, in our case they're focused on the local level and only at project level they are aware of the larger ecosystem. At the end it's voluntary work (referring to the collaboration with the CSAs) from projects, they feel that it's something extra that they have to do or even incorporate in their DSs". *** Quote from the interview with ActivAge ***

"Probably interaction could have been better from the beginning. Only discovered U4IoT when AUTOPILOT was starting and U4IoT was already running. Speaking to the coordinator of AUTOPILOT, there has been very little awareness of activities. Sometimes there also has been impression that AUTOPILOT was supporting U4IoT rather than the opposite, there has not been opportunities to benefit from the support". *** Quote from the interview with AUTOPILOT ***

"On the other side, it should be noted that also IoT-LSPs, innovation projects, were not required in their proposals to line up very precisely how they planned to work with the IoT-LSPs/CSAs. This was not specifically written in the proposal, e.g., in IoF2020 there were not enough linkages with the CSAs in the proposal. The EC should have it already in the call text: these are the CSAs, please find the interfaces". *** Quote from the interview with IoF2020 ***

3. Raising end-user engagement awareness and streamlining the vocabulary: It is recommended to already in the call start with raising awareness by explaining the need for end-user engagement and streamlining the vocabulary. This is to broaden the knowledge and getting past the technology-first approach.

"From user-engagement perspective, in most cases most deployment sites (DS) are quite knowledgeable already, not something new for them in U4IoT offer, most had partners that are experienced with user-engagement and methodologies. So the U4IoT offer was nice to have, but the DSs already know the field. These tools would be more useful in domains that are not so familiar with these kind of user engagement methodologies, like technology-driven domains". *** Quote from the interview with ActivAge ***

"At the moment the EC is not promoting user engagement on a wide scale in a mobility and automotive research projects. But in an innovation project where these issues would be of importance, the tools would be useful. It is difficult to say if there is enough expertise in the project to use the tools. We are a consumer organisation, we interact a lot with end-users, run surveys and do a lot of this kind of activities, one of our members also knows how to engage end-users. In AUTOPILOT, there are mainly either research organisations or industry partners involved, they don't have that know-how". *** Quote from the interview with AUTOPILOT ***

"When projects are very technical, the entire end-user focus hasn't been thought of. But there is a place for that for any project. It's about getting past the technology-first approach". *** Quote from the interview with MONICA ***

4. Providing meaningful and targeted end-user engagement tools and support: It is recommended for a CSA to stimulate transparent communication to gain an understanding of deeper project levels and target audiences, to be able to provide

meaningful support. Shifting weight to hands-on support, rather than creating new handbooks and toolkits, which can be taken from existing resources (see recommendation baseline and sustainability). Different experience levels, in terms of end-user engagement, should be taken into account. Also, the communication strategy (e.g., tone-of-voice, vocabulary, definitions), is to be adapted to the target audience and emphasized that different tools can be used for different experience levels.

> *"Not all levels of CSA would be of added value for everyone involved"..."The approach of U4IoT was the right way to tackle the knowledge transfer (i.e., with hands-on workshops) and was far more valuable than how it was provided in the project itself. Most value comes from workshop setting. If a new project launches, U4IoT workshops for new project would be obligatory, it would be easier now to start with them than to program them again"..."It is difficult to find out what has been done in projects".* *** *Quote from the interview with SynchroniCity* ***

> *"The set-up is the same for all IoT-LSPs with complex value chains, all have multi-actors and complex legal issues. It will be a challenge for the next years, to bring in the right discussion format; business model standards would be needed rather than technical standards. Problem lies always in the details of things, in IoF2020 a specific organisation has been working on the issue [of privacy aspects]. It took time to translate the general guidance to sector-specific documents. This was also due to IoT-LSPs not being 100% perfectly designed".* *** *Quote from the interview with IoF2020* ***

5. Establishing a baseline of continuous 'stand-alone' end-user engagement tools and support:
It is recommended that from the start of the IoT-Programme, a baseline of end-user engagement tools and support should be available (see also recommendation sustainability). Ideally these 'stand-alone' tools and support serve different phases of the project end-user engagement processes and continue to be available during the project lifetimes.

> *"We couldn't make extensive use of the tools and support services, because of project synchronization. Tools would have been very useful if we had them earlier in the project"..."CSAs would need to start earlier, before the project starts. They're useful, but the way they're organised needs to be modified. It could be more helpful if when projects start, they already know what can be expected from CSAs and what will be expected from projects to make the collaboration work".* *** *Quote from the interview with ActivAge* ***

> *"First, we should not design CSAs when we don't know what Innovation Actions are doing and don't know about their timeline. The EC has to learn about this, they have 5 projects running, with all different timelines, then CSAs with their own timelines. Also, IoT-LSPs are very different with their approach, some really started with the exploration phase, trying to develop use cases and putting into practice and evaluation. But IoF2020 started with the ready use cases, nearly ready products at the beginning"..."Two different stage-orientations would be better. Problem-solution and one which is improvement of existing solution to a really good and acceptable tool. In terms of design: visual and user experience - making it really attractive. But that is something to be looked at now. Not really design guidelines, but rather product support".* *** *Quote from the interview with IoF2020* ***

6. Flexibility regarding end-user engagement in project DoAs:
It is recommended that both CSA and the IoT-LSPs allocate non-earmarked time and budget in their DoA for collaboration with regard to end-user engagement. Upfront awareness of collaboration and division of responsibilities would be beneficial. Within this collaboration, the resources for "open support" can flexibly be defined based on occurring end-user engagement needs and mutually agreed support activities. There should be room for an iterative end-user engagement process, with resources to experiment and implement findings in a responsible way. Measuring performance of

these "open support" activities, ideally also allows flexibility and leaves room for "failure" to stimulate innovation.

> *"Yes, the timing issue was difficult, does not know how could be solved, as DoA needs to be set, and there is no room for flexibility. This is something that should be considered in the documentations. Projects should know about CSAs and plan that in their activities - time, resources and responsibilities to be allocated for "open" support. It is difficult, as in the proposal, evaluators want to see clear plans, but in reality room for flexibility would be needed. The "free", non-defined activities should be in the DoA defined in terms of resources, partners etc".* *** Quote from the interview with ActivAge ***

> *"The project needs to do a lot of stuff with stakeholders and it's important that it happens at the beginning. What happened due to the way H2020 function, you start off following the document. But it would be better to start with the end-users. IN MONICA, there was no dedicated time in project deliverables for this, and it was depending on culture of partners".* *** Quote from the interview with MONICA ***

> *"Situation was such that the time for implementation was too short even in terms of technology, but if everything was more integrated from start, the question about engaging end-users would have popped up early enough".* *** Quote from the interview with SynchroniCity ***

> *"Also the EC when designing calls, should give the CSA proposals an opportunity to know what will be the Innovation Action (IA), even if CSA would be starting a bit later. Now we have very general CSAs and there is a lack of uptake in IoT-LSPs, as IoT-LSPs feel that CSAs are not designed for them. IAs didn't need support at the beginning, thus CSAs could start later, and they could make dedicated proposals for that, having Innovation Actions proposals as the starting point. This is a major suggestion for this".* *** Quote from the interview with IoF2020 ***

7. Consistency and exchange of end-user engagement activities <u>within</u> projects: It is recommended to integrate end-user engagement within the IoT-LSP project DoAs, e.g., by creating a Work Package (WP) with regard to end-user engagement and establishing an additional task within this WP for exchanging end-user engagement findings vertically with a link to horizontal processes. Consistency can be established through appointing an IoT-LSP representative that has access to both of these processes. This is to reduce the gap between knowledge disseminated (e.g., by a CSA or other IoT-LSPs) and stimulate deeper integration of knowledge in project processes.

> *"The DSs had different approaches to defining the requirements - a lot of work was needed to make the requirements more consistent".* *** Quote from the interview with ActivAge ***

> *"It is about end-user engagement awareness with technical partners, during the full length of the project.* *** Quote from the interview with MONICA ***

> *"The tools and support are really on point, the gap exists that they find their way to the project and the project integrates them in a better way"..."There is no information on the pilots' experience level. A big factor was the way the open call was set up, they didn't have co-creation and Living Lab Support as high on the agenda. Some guidelines were provided, but if it is not a necessity, it is not followed up. None of the pilots really used any of the processes"..."How about the cities, did they use the tools and support (from U4IoT or SynchroniCity), did they do co-creation sessions?". "Not sure about that, if yes, I was not involved. I only know that Porto was always mentioning that they did it, as they had invested in co-creation quite a bit, but I am not aware of the details."* *** Quote from the interview with SynchroniCity ***

> *"I do not have information on user engagement, there is too much focus on tech-research. A lot of technology is ready but not taken up by users or in a broad sense all stakeholders. We need to push it, bring infrastructure, accommodate, as there is very little awareness of all the issues. There is very much a lack of awareness, people don't realise how useful user engagement would be, when you make the investment it is very beneficial."* *** Quote from the interview with AUTOPILOT ***

> *"Communication lacks a bit between the IoT-LSPs. What was done in the Activity Groups (AGs) was awesome, but on working bases the projects are too disconnected, there is unacceptance towards the CSAs' support. CSAs need to be more integrated in each project. This is not a fault of the CSAs, but a fault of IoT-LSPs."* *** Quote from the interview with IoF2020 ***

8. Balance between generic and specific tools & support services from a CSA for use within IoT-LSPs: It is recommended to a CSA to offer generic tools that are part of the baseline support (see recommendation baseline). When innovation actions are known, flexible support can be offered to IoT-LSPs to help them specify the tools according to upcoming project needs. Sharing mutual expectations and agreeing on task division including responsibilities concerning execution of the end-user engagement activities is beneficial for conscientious collaboration. Rather build in an equal division of resources for supporting each IoT-LSP project, instead of a first come-first-served approach. In negotiation between a CSA and the IoT-LSPs, if needed, support can be re-divided according to arising needs.

"One of the Co-Creative Workshops was mentioned several times, it was highlighted during the SynchroniCity meetings, city representatives were very keen on that. Annoyance was expressed as someone wanted to keep on using the support beyond the project, there was a misunderstanding and wrong expectations about the extension of the support services that could be delivered. But it tells something about the good quality of the support". *** Quote from the interview with SynchroniCity ***

"IoF2020 has different needs in terms of user experience and design. A few things could be put into guidelines, this is also what we did, as we gave two webinars on this topic. But you need to also put in very practical work. We did videos with most of the use cases showing their current product, currently we are identifying the products that can be most improved and will work with them one-one on improving the product. We have to instruct them by hand". *** Quote from the interview with IoF2020 ***

"Yes, maybe there will be a need for the U4IoT toolkit in the following year, but we have to define our own things first, also we have unique end-users (the farmers). The toolkit has already been adopted, but we had to adapt it, as the general toolkit does not always work as the end-users and also the solutions have to be specific. IoF2020 reaches towards business-to-business solutions, we are working as a data hub and have a completely different set-up of users and approach to usability. Purely hardware-related things". *** Quote from the interview with IoF2020 ***

"For sure we will try to implement the U4IoT tools and support, some partners are thinking about setting up new Innovation Actions and also hackathons to further acquire new innovation. We are making things sustainable and ensuring that things developed in IoF2020 will be taken up by industry. We are setting up accelerated innovation programs and are consulting with corporates, the toolkits will play a role in this. We will think if the tools and support can be used, not to develop them again, but adapt the existing toolkits, workshop guidelines and concepts. Probably not anymore in IoF2020 but within structures that will be set-up in future actions. We are still using some parts of the privacy guidelines, but also established our own privacy guidelines, it is a process of back and forth development. Privacy guidelines are difficult, yet you cannot always reinvent the wheel, we are all working towards one thing, that industry needs to accept. Privacy guidelines need to be taken up with our recommendations, the manufacturers and farmers associations. We therefore just added sector-specific guidelines. There has been a lot of balancing between generic support and sector-specific needs". *** Quote from the interview with IoF2020 ***

9. Consistency and exchange of end-user engagement activities between projects: It is recommended to continue the promising work of the Activity Groups (AGs), with a dedicated group solely for end-user engagement. Defining the group as part of the DoAs, appointing end-user engagement representatives from each of the IoT-LSPs and starting the group from the start of the programme would increase the chances of a successful launch and continuous horizontal collaboration. Higher level coordination of an end-user engagement activity group is taken up by a CSA to coordinate the exchange of findings, streamline results and collectively publish work. The agenda could leave room for different facets of end-user engagement, depending on the topic the group can collocate with other activity groups, e.g. concerning topics as sustainability, privacy or ethics.

"It is necessary to align better with the partners from the other IoT-LSPs. From the start, the interaction could be more integrated and forced, as now it is more about good-will and interpersonal relations. It is not so easy to connect between projects, something like U4IoT could be more integrated within other projects". *** Quote from the interview with SynchroniCity***

"It would be good to have exchange between different industries, everyone tries to solve it now with different methodologies. A little bit of exchange has been happening, e.g. in AG05. The connection is there, but the process takes too much time to actually get there. It is however a success, although it doesn't really feel like it, but the fact that it is established, is already a success"..."We learned a few structures that were integrated, e.g. in the AGs, the EC could take those as a standard procedure. It took quite a lot of time to define them before these structures worked and it could have been done earlier, with a common design and coordinated approach to the specific topic". *** Quote from the interview with IoF2020***

10. Sustaining the U4IoT tools and support services as a baseline: It is recommended to sustain the online end-user engagement tools and support services developed by U4IoT to act as a baseline for future innovation actions already during the proposal writing phase. This requires a common recognized repository platform where final end-user engagement results from all projects can be uploaded and combined. Agreements on maintenance, possible updating of content and follow-up requests need to be taken into account already in the proposal phase of a CSA to ensure continuity and sustainability of the project efforts.

"The city council is already working according to a service design approach. If they had access to the tools, they could have been used, as they are conducting a lot of digital innovation projects. So if they'll stay online, there would be a need for them". *** Quote from the interview with MONICA ***

"Very useful, something that for sure in the new projects we could consider to use. Even at the proposal phase, it is very useful if you want to have a user-engagement project, it is a very good repository. Normally I would do it from experience, but with the U4IoT tools it could be very well based on the diagram-flow, to link to the different phases of the innovation project". *** Quote from the interview with ActivAge ***

"It would be of added value to reference to U4IoT in the proposal phase. Project outcomes should be kept available and referenced to in future projects, a baseline, maybe they could be updated, but starting from scratch would be ridiculous". ..."The question is how do you gather the assets that have been created and provide them in a way that they can continue to function. I feel like there are too many brands between the projects, it is going to be even harder to reference back to them. Organisations that align with this theme could continue hosting them, a knowledge base would then continue to exist and provide the interaction. Continuation of workshops, that would also make sense, i.e., an expert pool that can provide hands-on guidance, that would be the ideal. But at minimum it would be nice to see the videos and deliverables to exists somewhere, outcomes from all projects in one place. As there is a lot of expertise in several projects within this area." *** Quote from the interview with SynchroniCity ***

"It would be good to have suitable organisations to continue supporting the online resources, e.g. European Network of Living Labs (ENoLL), EIT Digital. Also to enable new projects to take things further - now in IoF2020 we are transferring things to our accelerators. It could be beneficial to think about how to maintain the structures and establish sustainability within the upcoming projects. I would like to see the support being specified to specific themes. Also, it would be useful to have a repository platform to combine results from different projects". *** Quote from the interview with IoF2020 ***