TagItSmart!
Smart Tags driven service platform for enabling ecosystems of connected objects

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Circular economy for electronics reuse

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Approvals

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Introduction

This first management report presents a snapshot of the work progress of eReuse at the beginning of Month 5 (June 2018). The first five months of the project have run smoothly and the intended work has been carried out with regularity. The greatest weight of the work has relapsed on the WP2 with the aim of adapting the eReuse.org software modules for compatibility with the TIS modules and develop the Tags proposal to run a pilot experiment (See D.2.1 System architecture and design) and the definition of our use case and refinement with partners (See D.3.1 and D3.2). All the Work Packages started their work, and 7 deliverables were due, including this progress report. Deliverables were completed on time and delivered to the TagItSmart! consortium. The results so far obtained in each WP are reported in the next section, broken down per WP and Task.

Section 1 - Explanation of the work carried out and overview of the progress

1.1 Objectives

A circular economy is about capturing value lost in traditional linear systems. This implies transforming the linear supply chain into loops that retain more value. It goes beyond recycling, involving repair, refurbishment and reuse of products where more of the original value is captured with reduced environmental impact.

eReuse proposes to develop the use case of a “Circular Economy” of “slow moving” circular goods (SMCG), based on an the integration of the eReuse.org community with the use of SmartTags and the TIS ecosystem where stakeholders exchange certified data about the status, value and traceability of digital devices, and perform a pilot project about circular economy in a real business environment.

The first objective is to extend the TIS ecosystem with additional eReuse.org modules. We identify four issues that need to be addressed: 1.1 Usage of SmartTags and TIS modules and extensions, 1.2) adapt and Integrate eReuse.org key modules to TIS, 1.3) Deployment of use case business needs and 1.4) Define partnerships with TIS partners (IPR/path to market).

The second objective is define, develop and test the use case of SMCG with a pilot with the eReuse.org communities. We work with a key subset of SMCG: digital devices (laptops, desktops, mobiles) that have parts/components, that can be refurbished externally but also internally (cleaning digital storage from personal digital data), and therefore being traded/transferred in the reuse market.

In our pilot project the users of eReuse platforms will test the integration with the TIS platform and the use of SmartTags to control the devices and components. Thus, the goal is to run at pilot experiment with partners for an evaluation of feasibility (technical and commercial).

1.2 Explanation of the work carried per WP

Deliv #	Deliverable name	Work package number	Type	Dissem level	Deliv. date
D1.1	Midterm report (draft)	1	Report	Public	M3
D2.1	System architecture and design (draft)	2	Report	Public	M2
D2.2	System prototype	2	Software	Public	M3
D2.3	Process design (draft)	2	Report	Public	M3
D3.1	Use case & pilot design	3	Report	Public	M2
D4.1	Dissemination plan	4	Report	Public	M2
D4.2	Marketing and exploitation strategy design	4	Report	Public	M3

1.2.1 WP1 Project and Pilot Management

The work of WP1 perform the following tasks that have produced a single deliverable, D1.1: Project and Pilot Management (Midterm report). It's a draft that will be completed by the end of the project (M9).

Task WP1.1. Supervision, monitoring, coordination and reporting of the work

- At the beginning of M2 we held a meeting with the project partners at the University of Padua. We presented our **D2.1 System architecture and design,** and a **first draft of our Tag**.
- At M2, M3, and M4 several teleconferences have been held with Dondelotiro, VTT, ThinFilm, and Evrythng to define the integration of eReuse key modules to TIS, deployment of use cases business needs, and partnerships with TIS; resulting in a new version of the architecture.

Task WP1.2. Coordination meetings, trainings and agreements with pilot agents (donors, refurbishers, retailers).

- At the end of M1 we had a co-design session with the eReuse user community at the Mobile Social Congress. The partner responsible for TIS in our project, Dondelotiro, Durst, Evrythng, Thinfilm and VTT, presented the TIS project to our community and we co-defined the Tag. In this session we detected the need to include an NFC tag to our proposal.

- At the end of the M1 eReuse held the first co-design session as an event of the Mobile Social Congress. The DondeloTiro partner presented the TIS project and we our proposal to the eReuse community. Twenty-nine people from twenty-two entities attended. Two new segments have appeared: the first are community networks that use hardware such as routers and LoRa devices, and the second are technology companies (besides Pangea) that want to be service providers on the platform of eReuse Catalunya (in brackets we indicate the segment to which the entities belong): Solidança (Refurbisher, Recycler), Trinijove (Refurbisher, Recycler), Fundació Marianao (Refurbisher, DDI), Alencop (Refurbisher, Recycler), Abacus cooperativa (Buyback, Retailer, DDI), Blueterabyte (Refurbisher, Retailer, DDI), Comunitària (Refurbisher, Retailer, DDI), Jamgo (Platform provider), Dondelotiro (Platform provider), Agencia de Residus de Catalunya (Waste Agency), Direcció General de Societat Digital (DDI, Catalonia Goverment), Fem procomuns (Platform provider), TTN.cat (Comunity network), Fundació catalana de l'esplai (Refurbisher, DDI), Banc de Recursos (Refurbisher, Exporter, DDI) Guifi.net (Community Network), Universitat Politècnica de Catalunya (Research Institution), TagITSmart.eu, Donalo.org (Refurbisher, DDI), Direcció de Serveis d'Economia Cooperativa, Social i Solidaria i Consum (DDI, Barcelona City Council), BaseTIS (Platform provider), Engrunes (Refurbisher, Recyler, Retailer), Andròmines (ITAD, Refurbisher, Retailer, Service), and Pangea (Pltaform provider).

- During months 1 and 4 the User Interface (UX) and Marketing teams have hold several meetings, interviews and training sessions with the eReuse community. Nine entities were interviewed (Abacus, Alencop, Engrunes, Comunitaria, Fundación real dreams -Donalo, Fundación Marianao, Solidança, UPC-Reutiliza (refurbisher, DDI). Users segments have specific business needs that are present in the Deliverable **D3.1 Use case & pilot design** have been implemented in **D2.3 Process design** (draft) and partially implemented and validated in deliverable **D2.2 System prototype** and the **D4.2 Marketing and explotation stratedy design**. We identificate the roles to be played within the platform, as well as its objectives, expectations, challenges, needs and problems. At the same time, we wondered how they thought it should govern, manage the platform and compensate for services.

- On 18 May (M4), an agreement was signed between the Barcelona City Council and Pangea to channel digital devices to NGOs and collectives in a situation of digital exclusion. In this agreement, the Barcelona City Council has defined some constraints that Pangea must respect. The main ones are: 1) devices must be transported, refurbished and retailed by social economy entities, the selling price must be cost-oriented and not market-driven, the devices must be reused by non-profit entities and people accompanied by Barcelona City Council social services, and finally the devices must be recycled at the end of their reuse time.

Task WP1.3. Coordination meetings and agreements with reuse and repair sector

- During the months from 1 to 5, several face-to-face and online working sessions were held with our main partners in the reuse and repair sector such as EEB.org (Europe), RREUSE.org (Europe), ZeroWasteEurope.org (Europe), TheRestarProject.org (World), APC.org (World), Repairably.com (Europe), TradeLoop.com (USA), cfsc-opec-org (Canada), RECOSI.net (Ireland), Electronicwatch.org (World) and Openrepair Alliance. You can see a more complete description of the purpose of these meetings in the section 1.2.4 WP4 Dissemination and exploitation of the present deliverable.

- The European Commission has now launched a study to analyse and develop a potential scoring system to rate the ability to repair and - where relevant - upgrade products. This study will be carried out by the Commission's Joint Research Centre (Directorate B, Circular Economy & Industrial Leadership Unit). The technical background resulting from the study may be used to set the framework and grounds for the development of a graphical label. eReuse is participating as a Technical Working Group representing environmental consumer NGOs and the product group "Laptop". We will be present at the 1st meeting on 26 June 2018 in Seville to discuss the general approach and to obtain product-specific preliminary guidance.

1.2.2 WP2 Software, system, process development and TIS integration

The work of WP2 perform the following tasks and have produced three deliverables: D2.1 System architecture and design (draft), D2.2 System prototype, and D2.3 Process design (draft). The objectives of this WP are the 1) design, system and service development and testing of TIS+eReuse Platform; 2) Design and development of the electronics reuse use case; 3) Integration of eReuse.org modules with TIS to offer a service platform to run a pilot experiment.

Task WP2.1. Design, system and service development and testing of TIS+eReuse Platform

The main activities carried out in this task have been of three types: 1) design and test the tags we need for our use case, 2) develop the eReuse.org software modules for compatibility and integration with the TIS modules, and 3) develop and test the eReuse.org software modules to implement the use case of a *Circular Economy* of *slow moving* circular goods (SMCG), generating their corresponding user stories to meet the new requirements. These are some of the activities carried out grouped by subactivities.

1) Design and test the tags we need for our use case.

- Tag co-design with TIS partners and eReuse community. During M3 and M4 the tags have been defined making up to 5 mockup versions. This was defined during M2, M3 and M4 with tag partners DondeloTiro, Durst, Evrythng, Thinfilm and VTT. In the deliverable D2.1 System architecture and design there is a description of the design and manufacturing process carried out and our tag proposal.

- Resistance (environmental, friction) and data reading tests have been performed on the two sample tags, one photochromic and one NFC. In M3 we received a sample of each. The tags have been hooked onto sample equipment (our personnel) to determine the deterioration. We are currently determining the type of adhesive that

best suits metal surfaces, in the middle of the M5 we will carry out these last tests and in the middle of the M6 we will start the pilot with the definitive tag.

2) Develop the eReuse.org software modules for compatibility and integration with the TIS modules. The tag design, use-cases, and technical documentation are an annex at the following deliverable D2.1 System architecture and design.

- eReuse.org Tag, a server that connects TIS tags with the rest of the eReuse.org software: https://github.com/ereuse/tag
- Modules inside the Devicehub software to manage TIS tags.

3) Develop and test the eReuse.org software modules to implement the SMCG use case.

The eReuse modules must develop new features coming from our SMCG use case and from the capabilities provided by the SmartTags and the TIS platform. We can summarize our new epics/features to implement as follows: 1) identify uniquely the devices using NFC tags, 2) set non operative and operative devices by certified refurbishment tests, 3) ensure devices quality in refurbishment protecting brands image and consumers, 4) selling price and value of use of used devices is transparent to end-users and restricted by ITADs, 5) Devices are traced during all full lifespan until final recycling, 6) Recycling is restricted to when the use value is lower or there is no demand for reuse.

This has meant making changes to the main eReuse software Devicehub, our backend, during the first 5 months through a code refactoring that changed underlying technologies like the database.

- Old Devicehub. It requires Python 3.5 and MongoDb 3.4 or newer.
- New Devicehub. It requires Python 3.5 or higher and PostgreSQL 9.6 or higher.
- Teal. Microframework supporting the new Devicehub.

For more information consult the deliverable D2.1 System architecture and design (draft) (M2).

Task WP2.2. Design and development of the electronics reuse use case

The interface of the eReuse Devicehub module has been redesigned. On the one hand, to improve the current features usability, and on the other hand, to include aspects such as: redefine device statuses based on our SMCG case study, include product sales price and margins for stakeholders, include licenses and commitments to ITADs and donors, show performance tests on devices, show quality tests on restored devices to be visible to retailers, and implement device sharing functionality between refurbishers and retailers.

- Software of the interface, DevicehubClient.
- Frontend prototype of new DevicehubClient.

Task WP2.3 Integration of eReuse.org modules with TIS to offer a service platform to run a pilot experiment.

In task WP 2.1 the necessary TIS and eReuse modules are developed and the integration for the pilot is carried out in this task.

To date we have developed tools that facilitate the eReuse.org community to order SmartTags that work with the eReuse.org software presented above. This is the case of the eReuse.org Tag, a software that manages the SmartTags in eReuse.org. It generates the information the TIS NFC/QR tag manufacturer requires (Tag ID and QR value) in order to create the tags and then it links it back with the NFC information the tag manufacturer sends with the new tags. Moreover, it allows to send this information to Devicehubs so eReuse.org users can work with them. We have already performed internal tests and have a running software, and we are waiting for the first pilot with the tags to perform a final test.

In the case of the Evrythng platform we have not integrated it yet with the eReuse.org ecosystem, although we are experimenting with it already. This is because the part in the process where we use Evrythng is after linking the tags with the device, which we want to test and polish first with the tags prior moving to this point. At the end of the M6, the integration of the modules will begin, so that the pilot can start at the end of the M6. For more information consult the eTag in the deliverable D2.1 System architecture and design (draft) (M2).

1.2.3 WP3 Pilot implementation

The work of WP3 has produced a single deliverable; D3.1: Use case & pilot design (M2). The objectives of this task are: 1) Run a pilot experiment with partners and customers for an evaluation (technical and commercial) of the smart tags, software tools and services, in terms of performance and scalability; contributing to refine the tags, the software system, and the involved processes. 2) Implement and evaluate the feasibility, time, cost, adverse events, and variability of the pilot, and improvements for the scaling of the business proposal with smart tags, and market development roadmap of the use case.

Our use case is: *Circular Economy* of *slow moving* circular goods (SMCG) where stakeholders exchange certified data about the status, value, and traceability of digital devices. Specifically, we work with a key subset of SMCG: digital devices (laptops, desktops, mobiles) that have parts/components and can be refurbished externally but also internally (cleaning digital storage from personal digital data), therefore being traded/transferred in the reuse market.

Our use case will test and validate generates a set of user stories carried out by our eight user segments that you find defined in the deliverable D3.1 Use case & pilot design and D3.2 Use case pilot (interim). In our pilot project the users of eReuse.org platforms will test the integration with the TIS platform and the use of SmartTags to control the devices and components. A summary of user segments and planification of our pilots is presented below:

- This first pilot will be done with 500 tags in M6 and M7, and involves the following stakeholders: **6) ITADs:** donors of used digital devices; **5) refurbishers:** restore and share their certified stocks with retailers and DDI; **2) retailers:** purchase refurbished computers and resell to end users; 8) **Digital Divide Initiatives (DDI) :** public or NGOs, similar to retailers, but must guarantee a fair pricing to receivers with a minimal charge for circularity services to support economically disadvantaged recipients while ensuring traceability until final recycling; 7) **recyclers**: being able to offer their collection services and reporting systems to the competent authorities.

- The second pilot will take place in M7 and M8, including the following stakeholders: **1) buyback**: buy used devices from end users, they need an scoring and pricing systems to automate the price calculation for the purchase of used computers; **3)**

service: offer maintenance to end-user, they need a desktop application that allows to check the incidences of an individual computer registered in the system; **4) exporters**: export digital devices and need secure tags that report and certify the state of, either good operation or its classification as ewaste, of the devices being exported.

Task WP3.1 Definition of use case and refinement with partners in the circular economy circuit and more tightly with the pilot participants.

- On 18 June (M5) is expected that the refurbisher Alencop collect a lot of devices from Seidor.es ITAD facilities. This ITAD is responsible for carrying out the disposal of the equipment of the municipality. In this pilot, 450 desktops of the ACER, HP and 120 monitors of the ACER, DEL and HP brands will be refurbished and distributed by others retailers and DDI. For these devices we will use tagitsmart tags and the newly developed modules.

- At the beginning of July (M6) devices will be tagged with eReuse tagitsmart tags at refurbisher's facility. The devices that pass the performance tests will be published in a B2B portal for retailers. There are at least three retailers that will participate in its distribution, which are: donalo.org, abacus.coop and the same alencop that is also retailer. Devices that do not pass the certification tests performed will be recycled by ACS recycling.

- At the end of July (M6) month retailers pick some of these devices from the facilities of refurbishers and read the tag to confirm the reception and ensure the device is properly certified. These devices will be delivered to end users who will be able to apply a more throughout validation or learn about the life-cycle of the device by reading the ID Tag. In this first test the end-user will read the QR/NFC tag which leads the user to a Web App with the information about the device.

- At the beginning of September (M7) a second test will be performed, the end-user can also read the photochromic tag to ensure the veracity of the Tag by illuminating it. The Web App, in step 2, allows to illuminate the Tag correctly using the phone flashlight (Android smartphones) or instructs how to illuminate the tag manually in case their smartphone is not compatible (no flash light for example).

Task WP3.2.1 Business process definition and design: service modes, pricing definition and partnerships.

DeviceTag.io is a service provided by Pangea, based on eReuse.org open-source components. DeviceTag.io offers eReuse.org as software as a service for businesses to exchange certified data about the digital devices they want to exchange and certifies such data and automates involved processes, reduces overhead, human-made mistakes and ultimately boosts confidence between peers. Devices such as desktops, phones and laptops processed by DeviceTag.io are traceable at component level (hard drive, motherboard, CPU, etc) and track where devices are and detect changes in the components (upgrade/repair). This tool assist in dealing with each device by 1) collecting information about it; 2) managing inventories of devices; 3) preparing a device for reuse by uniquely identifying it, reliably erasing its data, performing tests and benchmarks, algorithmic estimation of price for the B2B marketplace, and reinstalling the OS; this process verify the refurbishment process of turning broken, obsolete or misused digital devices into as-new devices, protecting consumers, retailers, and brands of buying/selling non-functional digital devices. Two services have been defined:

Platform as a Service (PaaS)

Our current commercial model is based on a platform as a service (cost as a percentage of the price of sale). The sale price of second-hand products is determined by an algorithm accepted by the entities participating in platforms. For further information you can consult the deliverable D4.2 Marketing and exploitation strategy design.

Software as a Service (SaaS)

A software as a service billed independently to customers or platforms that prefer to pay for services and not based on a percentage of the retail price, for further information consult the deliverable D4.2 Marketing and exploitation strategy.

Task WP3.2.2 define proof of concept (POC) for vendor business roles and define Marketing KPI indicators, strategy and progress indicators (KPI).

- A website has been developed (https://ereuse-org.gitbook.io/ereuse-training/) for the technical training of the SaaS and proof of concepts that explains the main processes to be carried out. This website is in Spanish, as we add the new TIS modules it will be modified. Last version in spanish is expected at M8 and translated to english at M9.
- Two marketing KPIs have been defined: 1) Increased platform usage due to TIS integration and 2) Customer satisfaction increased due to TIS integration. In the case of "platform usage" indicator during the months prior to the project and during the project has been collected the number of devices processed monthly by each customer segment. In case of "customer satisfaction" we have two indicators, one qualitative and one quantitative. The qualitative indicator asks questions to all customer segments to measure Expectations and Experience and Loyalty. The quantitative indicador measure allows to measure user experience of support guides.

1.2.4 WP4 Dissemination and exploitation

The work of WP4 has produced two deliverables D4.1: Dissemination plan (M2) and D4.2: Marketing and exploitation strategy design (M3). The objectives of this task are: 1) Dissemination and promotion of the results, 2) Engage the eReuse.org community on TIS integration, 3) Increase followers on social networks, 4) Publish open data about pilot, 5) Present papers at circular economy events and 6) Explain circular economy impact of the data and the pilot to related stakeholders and marketing activities explaining TIS integration and adoption.

Task WP4.1 Definition of the dissemination plan, identification of dissemination partners, targets and activities.

- Realized
  - Mobile Social Congress (M1)
  - Mobile World Congress (M1)
  - European Week for Waste Reduction (M4)
  - UPC.edu Reuse Workshop (M4)

- Barcelona Maker Fair (M5)
- Congress Limits 2018. Fourth workshop on Computing within Limits, Canada (M4)

- To be realized
  - Congress EUA. Electronic Reuse Conference, Oct 29th-31st (M9),
  - Campaign with Zero Waste European (M8)
  - Campaign with APC.org (M9)

Task WP4.2 Preparation of dissemination materials (video, testimonials, poster, articles, workshops, demos).

- Paper:
  - David Franquesa and Leandro Navarro. 2018. Devices as a Commons: limits to premature recycling. In Proceedings of Fourth Workshop on Computing within Limits (Limits'18). ACM, New York, NY, USA, Article 4, 10 pages. http://computingwithinlimits.org/2018/papers/limits18-franquesa.pdf.

Task WP4.3 Participation in TagItSmart dissemination activities.

- Mobile World Congress (M1)
  - Joint exhibition at the tagitsmart stand
- Mobile Social Congress (M1)
  - https://twitter.com/eReuseOrg/status/989057355697524736

Task WP4.4 Community and media management (social networks, interviews).

- Award: Finalist for the EWWR award out of 14000 candidates (M4)
  - http://www.ewwr.eu/en/article/ewwrawards-finalists-business-fundacin-real-dreams
  - https://twitter.com/eReuseOrg/status/998939008645419008
- Interviews:
  - TV show on Tv3 (Program Valor Afegit)
    - https://twitter.com/eReuseOrg/status/996736799367221249
    - To be published on M6
  - TV interview beteve.cat
    - http://beteve.cat/david-franquesa-barcelona-reutilitzacio-pionera/
- Press: Barcelona City Council (M5)
  - To be published (M5)

- Events:
    - Presentation of eReuse project in EU project MARES Madrid (M5)
        - https://twitter.com/MARES_Madrid/status/1007180264999718912
        - https://maresmadrid.es/evento/semana-del-reciclaje-reutiliza-reduce-recicla/
    - Event: Barcelona Maker Faire. Presentation of eReuse project and Photobox device for photometry and machine learning for the aesthetic grading of digital devices
        - http://barcelona.makerfaire.com/maker/entry/422/

Task WP4.5 Design and implementation of marketing and exploitation strategies to SMEs & large enterprises.

- Meeting with Zero Waste Europe and RREUSE (M4)
    - https://twitter.com/eReuseOrg/status/999327988490620929

Task WP4.6 Coordination with TIS activities.

- Meeting with TIS partners in Padova (M1)
    - Notes: Report and notes:
        - https://ereuse-org.gitbook.io/tis/meetings/meeting-at-university-of-padua-february-2018

Task WP4.7 Dissemination in related initiatives organized by related entities (see section 2.2), participation on sectorial conferences about electronics reuse and recycling, internet of things, blockchain, logistics and circular economy, participation in several workshops and reuse days (at least 4 in total)

- During the months from 1 to 5, several face-to-face and online working sessions were held with our main partners in the reuse and repair sector such as.
    - EEB.org (Europe): The EEB is the largest network of environmental citizens' organisations in Europe. We are looking for collaboration in the campaign https:// www.coolproducts.eu, a coalition of European NGOs working to ensure that ecodesign and energy labelling truly work for Europeans and the environment. Investigate durability requirements, notably on the battery performa
    - RREUSE.org (Europe) and AERESS (Spain): The RREUSE.org European network that represents social enterprises active in re-use, repair and recycling that brings together other national networks, such as AERESS, the Spanish network. We have established a collaboration with the AERESS network in the field of traceability where we are helping the associated entities to implement the recent entry into operation of the royal decree (110/2015).

- ZeroWasteEurope.org (Europe): ZWE brings together and represents the European municipalities that have openly committed to the goal of continuously reducing waste generation and improving waste separate collection and hence redesigning the relationship between people and waste. We are defining a campaign for municipalities with the objective of to increase the number of municipalities willing to promote the circular economy of digital devices. With the help of ZWE we want to find interested municipalities, local zero waste organizations willing to launch local reuse circuits and social reuse centers that repair, refurbish and retail second hand used digital devices.

- TheRestarProject.org (World): The Restart Project helps people learn how to repair their broken electronics, and rethink how they consume them in the first place. They run regular Restart Parties where people teach each other how to repair their broken and slow devices – from tablets to toasters, from iPhones to headphones. To facilitate eReuse use by citizens we have developed a prototype of the eReuse.org workbench module to be executed in a USB. In September it will be put into practice. This segment of end-users (citizens repairing its tecnology) is not in our pilot but if there is interest the restart parties could offer smart tags to citizens.

- APC.org (World): A network and an organisation of The Association for Progressive Comunications is both a network and an organisation. APC members are groups and individuals working in their own countries to empower and support organisations, social movements and individuals in and through the use of information and communication technologies (ICTs) to build strategic communities and initiatives for the purpose of making meaningful contributions to equitable human development, social justice, participatory political processes and environmental sustainability. In month 8 of the project we will start a global campaign to promote the creation of reuse circuits in municipalities, since month 8 of the project one of its members, Nodotau de argentina, has started using eReuse. It is not part of the pilot for the usage of smart tags but but we will identify to what extent the smart tag becomes a priority for NodoTau.

- TradeLoop.com (USA): Is one of the biggest wholesale marketplace for used IT. With Tradeloop and other organizations we are defining how to implement in blockchain a set of use cases that affect aspects of traceability of electronics. There have been several online meetings and during the eReuse conference in USA, in the framework of ereuseconference.com, we will try to close a potential collaboration of eReuse + TIS for the realization of pilots on blockchain.

- cfsc-opec-org (Canada): Computers for Success Canada (*CFSC*) is a national non-profit established in 2005, focused on the impacts of digital inclusion and economic participation. Since 1993, the CFS program has delivered, at little or no cost, more than 1.5 million computers across Canada, 80% of which have historically been to schools. We are in discussions to identify challenges that organizations like yours have and how eReuse can include them in your roadmap. No collaboration has been formalized.

- RECOSI.net (Ireland): Is a Regional and European Co-Operative for Social Industry, a not for profit organisation providing solutions for social enterprises, which are working in the area of the recovery and reuse of electrical and

electronic. We are looking for collaborations to complement the eReuse modules with the technology they use.

- Electronicwatch.org (World) and (Netherlands): Is an organization with the mission to help public sector organisations work together and collaborate with local monitoring partners to protect the labour rights and safety of workers in their electronics supply chains. We're looking for which data structures are needed to be able to achieve traceability starting at component manufacturing.

- Openrepair.org: Is a group of community repair organizations collaborating to achive electrical and electronical products that are more durable and easier to repair. eReuse has applied to participate to the Advisory Group and to contribute the open data standard they are building. Our interest is to incorporate the data schema that they suggest to homologate the repair certificates and specifically contribute with our schema of traceability and chain of custody, specifically the data structure of events on devices (repair, in use, for sale, recycled...) (ex. open device traceability data standard). Members of openrepair are The Restart Project, Repair Cafe, Ifixit, Anstiftung, and Fixit Clinic.

Section 2 - KPI Monitoring

KPI	Measure of the indicator	Measurement period	Target Value	Measured Value
KPI 1 - TIS	KPI1.1 # of key eReuse.org software modules integrated to TIS	3M	1	1 eReuse.org Tag
KPI 1 - TIS	KPI1.2 TIS use case business needs deployed (e.g: buyback, retailer, refurbisher,...)	3M	1	0
KPI 1 - TIS	KPI1.3 Define partnerships with TIS partners (data agreements, confidentiality restrictions and IPR)	3M	1	5 ThinFilm, VTT, Dondelotiro, Durst, Evrythng
KPI 2 - Pilot	KPI2.1 Pilot: # of devices managed & tracked w/TIS integration	3M	250	0
KPI 2 - Pilot	KPI2.2 Market: eReuse.org customers testing TIS	3M	2	0
KPI 2 - Pilot	KPI2.3 Increased platform usage due to TIS integration	0M, 3M	5%, 15%,	0%
KPI 2 - Pilot	KPI2.4 Customer satisfaction increased due to TIS integration	0M, 3M	5%, 15%	0%

KPI CE	3 -	KPI3.1 Dissemination: Spreading TIS Ecosystem	3M, 9M	4 (events or publs)	4
KPI CE	3 -	KPI3.2 Marketing: Price of assets managed in TIS (~60€ /item)	3M	15.000€	0€
KPI CE	3 -	KPI3.3 Relationships with other key interested shareholders willing to know about TIS (e.g.: government, regulators, professional bodies, suppliers, communities)	3M	10	3 ZWE, ARC, JRC

Section 2 - Conclusions

Our Tag design proposal was finalised in mid-May (M4) and the time foreseen to receive the final tags will be in month 6. However, we have received 3 prototypes with which we have been able to begin to make the integration between the tag and the eReuse system. During M7 we will start the first cycle of the pilot (small scale to test and validate), and in M8 the second cycle of the pilot (full scale). This has led to a delay of 2 months in the start of the pilot. To correct the situation, software developments planned for the M6 have been anticipated.

To date we have developed tools that facilitate the eReuse.org community to order SmartTags that work with the eReuse.org software presented above. This is the case of the eReuse.org Tag, a software that manages the SmartTags in eReuse.org. It generates the information the TIS NFC/QR tag manufacturer requires (Tag ID and QR value) in order to create the tags and then it links it back with the NFC information the tag manufacturer sends with the new tags. Moreover, it allows to send this information to Devicehubs so eReuse.org users can work with them. We have already performed internal tests and have a running software, and we are waiting for the first pilot with the tags to perform a final test.

In the case of the Evrythng platform we have not integrated it yet with the eReuse.org ecosystem, although we are experimenting with it already. This is because the part in the process where we use Evrythng is after linking the tags with the device, which we want to test and polish first with the tags prior moving to this point. At the end of the M6, the integration of the modules will begin, so that the pilot can start at the end of the M6.

Section 3 - References