Proof-of-Concept Submission

eReuse

Challenge	Collaborative E-waste Management
Venture Team	eReuse
Challenge Owner	City of Sant Boi
Main Contact	*David Franquesa d.franquesa@ereuse.org*
Submission Date	*29/1/2021*

Overall Context

Using a maximum 500 words total, please describe any barriers / challenges to participation and progression in DLT4EU you have experienced - for example, the impact of COVID-19 on running a pilot, changes in your Challenge Owner, or a delayed start to the programme. This section must be reviewed and countersigned by either your VFL Coach or the DLT4EU Programme Manager in advance of the submission deadline of 29 January 2021.

COVID has been a positive lever for the project. Before COVID there was a digital divide but it was not visible to the Challenge Owner. COVID forced distance education, which made apparent that 30% of the students did not have adequate computer devices to carry out distance learning. The project's mission is to promote the reuse of the Challenge Owner's devices by minors in situations of digital vulnerability. The COVID context has allowed the Challenge Owner to undertake this process, which has helped them to implement commitments and make the organizational changes that this transition to collaborative consumption represents.

However, working with public bodies with delimited competences means that any new process may have administratives obstacles. The Local Authority has the responsibility to address the needs of their vulnerable population, even though the Catalan Government is the competent authority for Education. This has caused delays in the decision-making and the refurbished devices have not been delivered to the final users yet, planned to take place in the next few weeks of February.

DLT4EU

Evaluation Criteria #1: Challenge-Solution Fit

The Venture Team has clearly demonstrated how their Proof-of-Concept (PoC) solves the challenge area set by the Challenge Owner and / or key components of the challenge. Additionally, the Venture Team have clearly articulated the intended impact of their PoC by setting appropriate impact targets and / or use established frameworks such as the Sustainable Development Goals.

| How does your Proof-of-Concept solve the challenge area set by the Challenge Owner, solve the needs of the end user, and what is the intended impact of the PoC?

Additionally, how have you considered how the PoC is applicable to a broader environment and / or set of beneficiaries? | Electronics, including computers, tablets or smartphones is increasing exponentially and is one the biggest and most environmentally damaging industries. The main problem is that the consumption model of digital devices is non-circular, non-resilient and non-affordable. Governments and companies buy new hardware every 3-6 or less years guided by financial reasons (depreciation can only be accounted for over 5 years) not sustainability-driven. The way they dispose of old hardware is not sustainable, or responsible, and often guided only by economic criteria. Furthermore, manufacturers do not build for durability.

To change the usual model, eReuse has brought together a federation of refurbishers (the local companies that collect used devices from governments and companies to repair, distribute in the second hand market and finally recycle them). eReuse provides refurbishers with a new mindset and a DLT-based tech to bootstrap local and collaborative circular economy data-driven platforms to make reuse tech transparent and impact accountable.

The Challenge Owner (Sant Boi de Llobregat City Council) needs support for reuse of its out-of-use computing devices for families with dependent children. Currently, most computing devices from the City Council are recycled (dismantled & shredded) instead of reused. When we recycle a device that could be reused we lose computer use-value, we preserve the linear consumption model, so damaging to nature, and we exclude those that cannot afford if then only option is buying new products. By the POC end, the Challenge Owner is reducing inequality by bringing computer access to supported homeschooling students without computers during COVID-19 confinements and is expected to save not less than 500€ and 200 Kg CO2 per reused device. The reuse programme receives support because the DLT makes the impacts accountable.

The City Council challenge is to bootstrap in the City a collaborative reuse of digital devices to reduce premature recycling and foster circular consumption in the City. Their primary need is to evaluate the social, circular and environmental return on the investment made in used devices, human resources and services from refurbishers. The challenge is to trace these devices with a standardised protocol and accounting for the lifetime extension over multiple owners and possessors without affecting privacy and ensuring data reliability. The DLT has emerged as a response to these use cases where transparency, trust and traceability are needed. The system records and attests that a device has been reused by a specific segment of citizens and that the device at the end of its usage lifetime has been properly recycled by authorised waste management companies.

eReuse systems are designed for replication, in fact being replicated in other Spanish city councils, and regions such as Latin America and USA. City Councils and refurbishers are the true owners of the system themselves, a system where the generation of data enables the extension of the devices' life today and will change the industry tomorrow. This relates to SDG 4 (education), SDG 10 (reduction of inequalities), SDG 12 (responsible consumption), SDG 13 (climate change), SDG 15 (waste pollution), SDG 16 (wars for raw materials). |

Evaluation Criteria #2: Innovation

The Proof of Concept is novel and unique thanks to the team's creativity in finding an original solution that meets the challenge requirements. The innovation extends beyond just the technical side, in the sense that its originality encompasses social, environmental, economical, legal, and ethical perspectives. The innovation may also be of benefit to a broader set of beneficiaries, including EU citizens.

How is your PoC innovative for the Challenge Owner and end user (if not the Challenge Owner)? What has been tried before, why it didn't work, and why is the PoC different? How is your PoC addressing social, environmental, economical, legal, and / or ethical perspectives? How have you improved upon the current state-of-art in the relevant field? Why is decentralisation appropriate?	eReuse systems are managed and governed locally by governments (Product Owner role) and social enterprises (refurbisher role). Product Owners want to dispose of used IT devices such as computers and laptops, and *refurbishers* collect, refurbish and deliver to business and citizens (Final Users role) willing to reuse a second-hand device. To preserve personal and business privacy Final Users do not have a user account in the system. In the POC, the Product Owner persona is the City Council of Sant Boi de Llobregat and acts as the end user of the system by renting free of charge their devices to Final Users and subcontracting the refurbishment services to the Marianao high school. In a scalable scenario, the refurbishment and renting would be done by the refurbisher. Final Users are schools and homeschooling students without computers during COVID-19 confinements. Until now, there has been no standard traceability protocol to assess impacts and bring transparency to the refurbishment and reuse sector of electronic devices. In the business as usual refurbishers providers have non-transparent redistribution channels based on undisclosed business relationships. This prevents impact accounting. eReuse enhances trust while conciliating business privacy. We differentiate from others by providing a disruptive traceability & impacting accounting as a stand-alone service that can be used by existing refurbishers. Refurbishers are our partners, not competitors, and help them provide better services. eReuse traces the reverse-chain of ownership custody, and reports data to assess social and environmental impact. In eReuse every single piece of an old laptop or desktop collected from a company or a government by the refurbisher is broken down into individual pieces, recorded and indexed in a transparent and privacy-preserving database. The refurbisher repairs and rebuilds the machines, and their value and quality are reported in the system and potential customers. Refurbishers then loan the repaired machine in a second-hand market and monitor the process till every single item is correctly reused and finally recycled. As a result, eReuse systems prevent much more waste from going to landfill, extend the lifetime of digital devices and make obsolescence visible (real durability of devices in hours and reparability). This contributes to changing consumer habits and ultimately manufacturers' policies by empowering governments, refurbishers and citizens with new DLT-based technology that provides for device traceability and impact accounting. eReuse enables a circular revenue model based on renting and pay-per-use. In the POC, the City Council rents (at no cost, simulated) the devices to schools. The school pays for the availability of a product (where final users are families). The school does not have to buy but rent it for the time needed. In addition to periodic payments, the system allows payment by hours as the number of hours is securely obtained and immutably stored in the DLT. In the POC, the Challenge Owner has used an eReuse template to draw up a "commodatum" agreement with the schools. This agreement defines how sensitive data must be treated and the rules to protect personal data (see Criteria #7 for details).

Evaluation Criteria #3: Useability and Inclusiveness

This assessment is of both the user interface and experience, and the underlying principles of the PoC. The PoC is of benefit to a broader set of beneficiaries than the Challenge Owner / intended end user of the PoC.

How have you engaged and acted on user testing / feedback to improve the PoC? Does your PoC benefit a broader set of beneficiaries, including EU citizens?	Training, user testing and pilots have been carried out with the City Council and the Marianao high school. We did a co-design to define epics and user stories, in cooperation with the venture team and the DLT4EU partners. As a result, we have defined these requirements: i) treat and anonymize data and the decision to only store timestamps of data into the DLT, ii) development of a desktop application installed on reused devices that, every time it is executed, requests permission to the Final User to report the functional status of the device and the aggregate usage hours, iii) define a "commodatum" agreement between the Challenge Owner and the Schools to ensure privacy, reuse, recycling and impact accounting, iv) initially, the idea was a transfer of ownership of devices to the Final Users although currently it is just a change of possession (the Challenge Owner is owner), which enables the City Council to reuse refurbished devices for future social needs. In October to December, three training sessions were carried out. During the training we also resolved UX/UI issues and implemented new github issues that tracked features requests and fixes. In the first training, we explained how to register a device and its components (that create a kind of product passport), perform data erasure with a certificate, refurbishment, generate quality certificates about the devices with tests/benchmarks, and compliance on end-of-life IT asset disposition. In the second, we explained how the Challenge Owner can modify the status of the devices on the app and assign them to anonymous codes that represent the final users. The persona behind final users is unknown by the Challenge owner, only by the school. In the last session, we have explained to the Challenge Owner how to generate impact reports and how to timestamp them in the DLT. As a result of the training, the UX/UI sessions and the POC, we now have an application much more adapted to the needs of the Challenge Owner. The POC has allowed us to validate our MVP and technology in a real environment. To date, 30 devices have been registered, refurbished and in process of being allocated to schools. The delivery to schools is expected in the beginning of February. The data collected by each refurbisher is consolidated in a dataset, whose value is systems change, as it shows to citizens the real durability of equipment, which manufacturers produce more durable and repairable devices. Citizens can measure durability as: 1) the average hours a model has been operating, and 2) the average years each model has been ready to be used. With this data eReuse elaborates a durability ranking by brands and models. So far, the eReuse dataset contains data about +5,000 computing devices. A first dataset as CCBY4.0 license has been released (30/07/2020, see the open-source section) with a new release planned (February-2021). In addition,we are contributing to the ecosmartphones.info study and to the Ecodesign recommendation (DG-Growth and DG-Connect).

Evaluation Criteria #4: Commercial Feasibility and Scalability

The Venture Team has developed a strategic roadmap for the market entry of the PoC. This roadmap can include market research, user research, engagement with investors / financing needs, and the business model. The roadmap addresses key barriers to market adoption (i.e. legal, regulatory, governance etc.) and their mitigation. The roadmap also considers the different routes to scaling their PoC.

Please provide an explanation of your strategic roadmap for the PoC. This roadmap can include market research, user research, engagement with investors / financing needs, the intended or actual business model, and go-to-market strategy. The roadmap addresses key barriers to market adoption (i.e. legal, regulatory, governance etc.) and their mitigation.

Ereuse has developed software, protocol and data commons for local refurbishment ecosystems with traceability and impact accounting. Ereuse is a B2B, open-source system ready to be used and extended. The software development is supported by contributions from research centres and companies. The role of eReuse is to coordinate a roadmap and ensure the code is freely available to the federation of refurbishers. The DLT device traceability cost and impact reporting would not be economically sustainable just from economic contributions of the current eReuse federates. In Spain, we have identified many operating refurbishers (100) and 25 eReuse federated ones that could pay €75-150 monthly.

Revenue from refurbishers can only cover the essential expenses. The go-to-market strategy must include Product Owners (governments and companies with devices for sale/donation) as end users. The unique value proposition is that they can account for the social and circular impact of reuse. In other words, they can sell or donate in a responsible way. Devices used once only would generate a large negative social and environmental impact, but by extending its lifetime spreads this impact over a longer lifespan. Tracing allows identifying the partners (refurbishers, final users) that maximise reuse and account for the impact.

The revenue model for Product Owners is to pay 1€/device and year for impact certification. In Spain alone, approximately every year 2M of devices are sold/donated by Product Owners. This creates a serviceable available market of €8M of tracing an impact accounting. If we include mobiles, soon supported, there are beyond 17 billion devices in use worldwide. Today small IT devices not tracked generate more than 5 million tonnes of ewaste every year. We propose to raise awareness among Product Owners so that they devote small money to add traceability.

During the POC we have validated the City Council is interested in being an end user and is willing to pay this annual amount. For each reused device, it will be able to demonstrate a cost saving of around €500 in digital divide reduction, 200Kg in CO2, and creation of €100 in local economy and around 5000 hours per device in usage by vulnerable families. To demonstrate this impact it will cost the City Council only €3 per device (estimate of 3 years lifetime extension). In addition to POCs with governments, we are also conducting POCs with private companies interested in this impact for their Environmental Social and Governance indicators.

COVID has made purchasing used devices a widespread habit (1). During the confinement period it became the only way to get devices. With the technology innovation peak, consumers are increasingly considering repairing (77%)(2) and buying refurbished devices (64.6%)(3). The main barriers are the control that OEMs exert over the devices they manufactured, even not being owners, blocking refurbishment. We hope the new European Green Deal will promote the right to repair and reuse, undoubtedly the best example of circular economy, technological appropriation and inclusion of the most economically disadvantaged who cannot opt for new devices.

(1) https://www.accenture.com/_acnmedia/PDF-140/Accenture-Consumer-Pulse-Wave-Five-and-Seven.pdf
(2) https://www.europarl.europa.eu/news/en/press-room/20201120IPR92118/parliament-wants-to-grant-eu-consumers-a-right-to-repair
(3) https://ec.europa.eu/info/sites/info/files/ec_circular_economy_final_report_0.pdf

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Evaluation Criteria #5: Technical Feasibility
The PoC has a high Technology Readiness Level (TRL) and progression rate.

Using the TRL framework, please provide an end TRL for your PoC, and whether you feel you "exceeded, "met", or "missed" your expected technical progress over the duration of DLT4EU.	The city council in collaboration with refurbishing companies use the open source eReuse System. The eReuse.org software architecture has been developed in the framework of several EU and regional research projects, and it is conformed by the following apps: (1) Workbench USB, (2) Workbench Desktop, (3) Devicehub , (4) DLT.
	The City Council uses a bootable pendrive (1) to perform the data erasure, quality testing and inventory of each of their discarded devices. The inventory takes less than a minute and the result is written to the cloud app Devicehub (3). They also use the Devicehub (3) to monitor and account for the impact generated by reuse and final recycling of these devices. As a result of the first phase, i.e. the processing for reuse, every device has its own product passport, an URL that shows a reuse potential score, data erasure certificates, hours of usage and a list of quality tests carried out.
	The City Council shares these quality certificates and schools and Final Users trust because they are generated automatically and can not be manipulated. During the second phase, where devices are reused, schools deliver the devices to the Final Users. When devices are received by final users, the city administration changes their status to "assigned" in the Devicehub (3). If a final user expresses consent to usage data collection, a desktop application (2) installed on the device reports the functionality status of the device and the hours the device has been powered on. Each time the app is executed the final user has to express consent.
	Based on the collected data contributed by final users, the city council uses DeviceHub (3) to generate reports at any time to account for social impact of closing of the digital divide and the circular economy impact such as extended durability. Generated reports are timestamped using the DLT (4) to ensure their auditability, allowing an external auditor to verify the authenticity of the data. When the final user returns the device to the City Council or brings it to a recycling point, there is a web app (3) to notify the process.
	During the POC, the main developments have been carried out: the Workbench Desktop (1) has been developed from scratch, validated and is ready to be operational although we still have to add small improvements, so we assigned it TRL 5. For Devicehub (3) we have implemented the new features for device allocation and after solving several bugs, we have moved forward, from TRL 7 to 8. Finally, we have worked on the DLT, where we have developed from scratch the timestamp functionality and its frontend, going from TRL 4 to 5.

Evaluation Criteria #6: Open Source

The Venture Team has or will plan to release part or the entirety of the PoC (DLT application) under an open source license of their choice.

Please provide an explanation of your existing or intended plan for an Open Source License for the PoC (the DLT element) and why. Additionally, please provide a link to a public code repository with relevant component(s)/ modules used in the PoC or in its entirety has been provided as part of your submission.	**Open data**. A public dataset (1) about reuse of computing devices in eReuse under CCBY4.0 license: The original dataset has been anonymized and exported from the refurbishers' Devicehub. 1. Data set July 2020. We have limited the study to only refurbishers with operations in Spain that has accepted the *data commons license*. Data collected between 2013-10-08 and 2019-06-03. https://dsg.ac.upc.edu/sites/default/files/dsg/eReuseDataJun2019_0.html **Open Code**. The following paragraphs describe from a more technical point of view the respective components that are part of the eReuse system. We indicate the TRL level, license and its link to the code and application. 1. Workbench USB (TRL 8-9), AGPL-3.0, a software tool for logging, testing and erasing device data. The Workbench is run via a bootable USB stick and if the device is connected to the internet it sends the result (snapshot) to the Devicehub component (3). The time to perform the registration is less than one minute. Code: https://github.com/eReuse/workbench-live Demo erase and rate: https://www.usody.com/demo-usody-free/ 2. Workbench Desktop (TRL 5), GPL-3.0, is a desktop cross-platform application which extracts details about the hardware of computer devices and submits a snapshot to DeviceHub with the status of functioning and the hours has been in operation. This component has been developed specifically for the DLT4EU as an alternative to using the USB Workbench for end users. Code: https://github.com/eReuse/workbench-desktop 3. Devicehub (TRL8), AGPL-3.0, a cloud-based IT asset disposition and management system where Product Owners and Refurbishers can manage device traceability, tag and exchange devices. Devicehub instances are federated and autonomous. If they want to certify impacts, they can write a timestamp of their data to the DLT (4). Devicehub is implemented as a RESTful Python 3 web application built on the open source micro-framework Teal, part of this Devicehub; built on Flask and uses the PostgreSQL database. The DeviceHub client is a browser application built in Javascript, CSS and HTML in the Angular framework. Code: https://github.com/eReuse/devicehub-teal Demo: https://app.usody.com/login , user: hello@usody.com, pass: usody 4. DLT (TRL 5), GPL-3.0, A privacy-preserving DLT only storing timestamps of reports. A frontend allows the end user to attach a CSV, create a timestamp and store it in the DLT. To ensure that the data comes from a Devicehub the frontend queries the corresponding Devicehub to check if if the timestamp is valid. If so, it is recorded in the DLT, a Permissioned Ethereum PoA. Frontend code, AGPL-3.0: https://github.com/DSG-UPC/reports-platform Frontend app: https://dlt.ereuse.org/ DLT: https://github.com/DSG-UPC/eReuse-Blockchain

Evaluation Criteria #7: Compliance and Transparency

The PoC complies with relevant data and privacy protection legislation, such as the General Data Protection Regulation (GDPR). The Venture Team has undertaken activities to ensure the end user understands the data and privacy implications of the PoC.

Please provide evidence that your PoC complies with relevant data and privacy protection legislation, and the activities you have undertaken to ensure the end user understands this.	The unique value proposition of eReuse is to implement a traceability protocol for impact accounting that enhances trust while conciliating business and end-user privacy. Business as usual refurbishers providers have non-transparent redistribution channels based on undisclosed business relationships. This prevents impact accounting. We differentiate from others by providing a disruptive traceability & impacting accounting as a stand-alone service that can be used by existing refurbishers. Privacy and ethical treatment of information are our core business values. Our end users are municipalities and social economy enterprises that deal with highly sensitive data of the economically vulnerable population. eReuse systems must be private by design. During the POC we have discussed these issues with our Challenge Owner, the Sant Boi City Council, and this has led to specific privacy preservation clauses in the device transfer agreement between the City Council and the schools. These points are specifically listed in the agreement: ● In all relations arising from this collaboration agreement, the provisions of Regulation (EU) 2016/679 of the European Parliament and the Council on the protection of individuals with regard to protection of natural persons shall be complied with. The processing of personal data and the free movement of such data as well is compliant with the Spanish organic law 3/2018, of 5 December on the protection of personal data and the guarantee of digital rights. ● The LENDER agrees not to disclose the data of the families using the Devices provided by the LENDER. - The Lender undertakes only to publish anonymised and aggregated data about the usage of the devices and only for the purpose of being able to communicate the impact of the project in the social, economic and environmental terms that arise ● The LENDER undertakes not to use in any case the data about usage of the devices to the detriment of the user families in any future subsidies or enjoyment of services. The eReuse end user application does not store personal data about the final users and the DLT cannot store detailed data but only timestamps of that data. Final users have an application installed (Workbench Desktop) and each time it sends data to Devicehub they have to confirm acceptance of the privacy policy. Under no circumstances data such as the hours of use by a user be made public and even outside of the app the City Council should not know the relationship between end-users and hours of use. To cope with that in the POC the school acts as a firewall, it knows which are the Final Users of the devices but does not know how many hours these have been used. We are currently participating in the EU Project Smoothplatform.eu focus on helping micro enterprises to be GDPR compliant. We are currently receiving free assessment of their data processing and tailored suggestions on what we can improve. From February we will have a 12-month free subscription to the tool. As mentioned, this aspect is our main differentiator for our business model and customers.

The City Council and the refurbisher Marianao high school uses the eReuse system for data erasure, quality testing, tagging and inventory of discarded devices:

At the end of the above process for each device, a web page is created where the quality certificate is displayed. Example: https://api.usody.com/usody/devices/369

Tower hp compaq 8000 elite sff

(hewlett-packard) S/N CZC038BQSP

- Model: hp compaq 8000 elite sff
- Manufacturer: hewlett-packard
- Serial Number: czc038bqsp
- Chassis: Tower

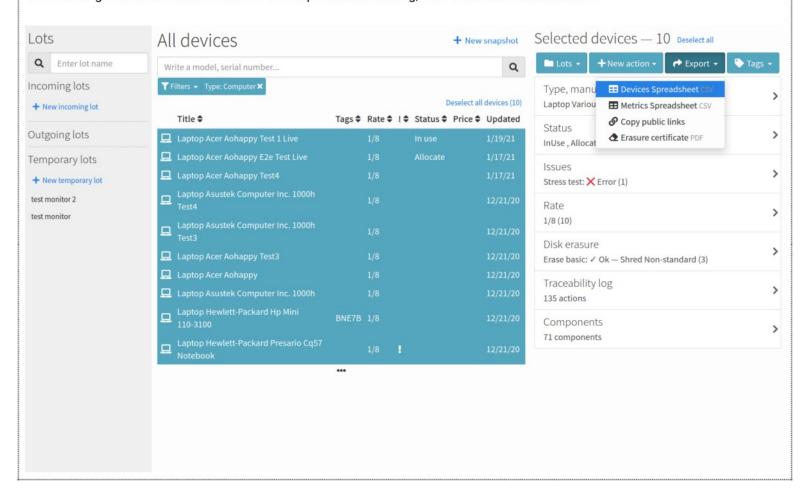|	Range
CPU – intel core2 quad cpu q9550 @ 2.83ghz	Processor Rate = High (3.92)
RAM – 4 GB	RAM Rate = High (4.16)
• RamModule 8jtf25664az-1g4d1	
jedec id:80 2c C0B01931	
• RamModule 8jtf25664az-1g4d1	
jedec id:80 2c BFB01931	
Data Storage – 320 GB	Data Storage Rate = High (3.88)
• HardDrive st3320418as	
seagate 5VMHGJQJ – 320 GB	
Graphics – 4 series chipset integrated graphics controller	
• GraphicCard 4 series chipset integrated graphics controller	
intel corporation	
Network – Ethernet max. 1000 Mbps	
• NetworkAdapter 82567lm-3 gigabit network connection	
intel corporation 00:23:24:02:90:49 – 1000 Mbps	
Total rate	High (3.98)

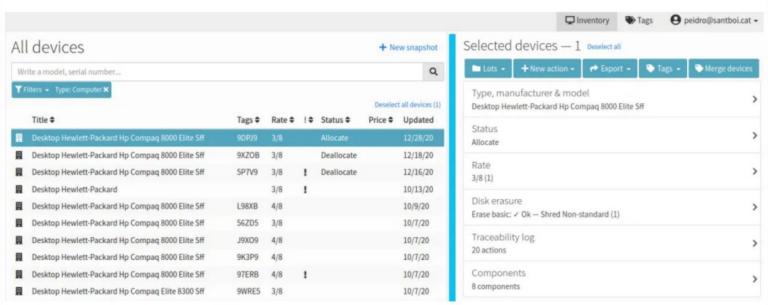The refurbishment process is also recorded:

Public Refurbishment log of the device

1. **Allocate** — ✓
2. **Deallocate** — ✓
3. **EreusePrice** — 79.60 €
4. **RateComputer** — High (v.None)
5. **StressTest** — ✓. Computing for 0:10:00
6. **BenchmarkRamSysbench** — 5.9699 points
7. **BenchmarkProcessorSysbench** — 10.3172 points
8. **BenchmarkProcessor** — 22610.0 points
9. **BenchmarkDataStorage** — Read: 102.0 MB/s, write: 23.3 MB/s
10. **TestDataStorage** — Completed without error with a lifetime of 2.9 years.
11. **Snapshot** — ⚠. Workbench version 11.0b11.

The Challenge owner and the refurbisher can export the device log, data erasure and tests details.
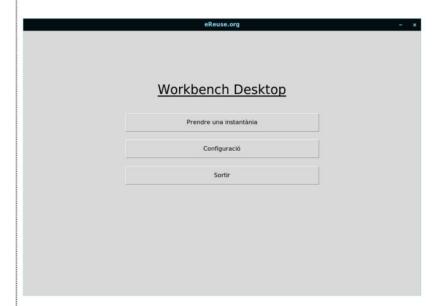
When devices are received by final users the City Council changes their status to assigned.
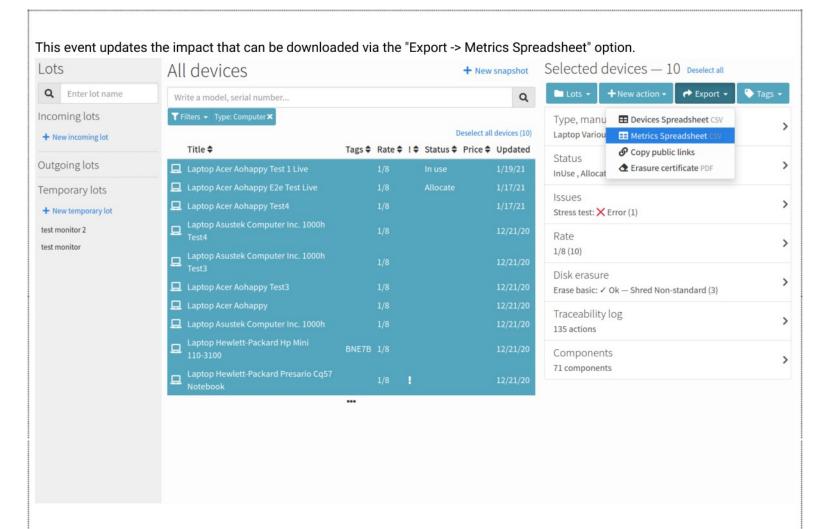

Final Users have an application installed (Workbench Desktop). Each time it sends data to Devicehub they must confirm acceptance of the privacy policy.

This application sends an "in-use" event to its DeviceHub

Title ⬍	Tags ⬍	Rate ⬍	! ⬍	Status ⬍	Price ⬍	Updated
Laptop Acer Aohappy Test 1 Live		1/8		In use		1/19/21
Laptop Acer Aohappy E2e Test Live		1/8		Allocate		1/17/21
Laptop Acer Aohappy Test4		1/8				1/17/21
Laptop Asustek Computer Inc. 1000h Test4		1/8				12/21/20

This event updates the impact that can be downloaded via the "Export -> Metrics Spreadsheet" option.

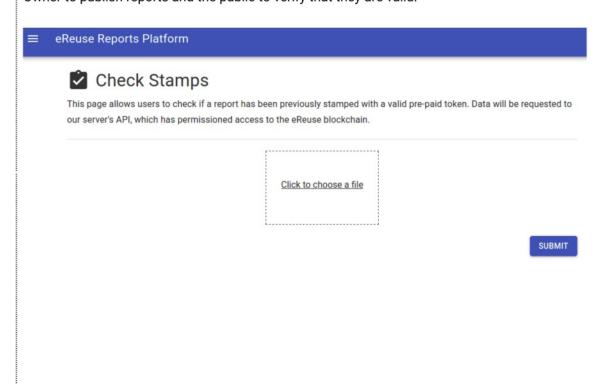Finally, generated reports are timestamped using the eReuse.org DLT to ensure auditability. There are three steps: 1) Attach the CSV report exported from the Devicehub app, and the frontend creates a timestamp of the document, 2) Enter the Devicehub address, and the frontend checks this timestamp exists in Devicehub. Note: As this is a decentralised system, there are multiple Devicehub instances. 3) The report is stamped in the DLT.

eReuse Reports Platform   FAQ

Create Stamps

Stamping is the process of storing the hash of a report in a blockchain. In this way the hash is permanently recorded on the blockchain and linked to a particular point in time. This hash can only be linked to the original content of the user's electronic file, thus also linking that file with the particular timestamp.

✓ Upload a Report ——— ✓ Enter a Verification URL ——— ③ Stamp Report

Stamping Details
Hash: 0xaeb2...0400
Verification URL: https://api.usody.com
/documents/check

STAMP

BACK   RESET

Auditors and any citizen who has access to the report can check if the timestamp exists in the DLT. This allows the Challenge Owner to publish reports and the public to verify that they are valid.

eReuse Reports Platform

☑ Check Stamps

This page allows users to check if a report has been previously stamped with a valid pre-paid token. Data will be requested to our server's API, which has permissioned access to the eReuse blockchain.

Click to choose a file

SUBMIT

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In the Evaluation Criteria #6 you will find a detailed description. Below there is a list of eReuse system components and their license and link to the code/app.

Workbench USB, AGPL-3.0
Code: https://github.com/eReuse/workbench-live
Demo erase and rate: https://www.usody.com/demo-usody-free

Workbench Desktop, GPL-3.0
Code: https://github.com/eReuse/workbench-desktop

Devicehub, AGPL-3.0
Code: https://github.com/eReuse/devicehub-teal
Demo: https://app.usody.com/login   , user: hello@usody.com, pass: usody

DLT (TRL 5), GPL-3.0
Frontend code, AGPL-3.0: https://github.com/DSG-UPC/reports-platform
Frontend app: https://dlt.ereuse.org
DLT: https://github.com/DSG-UPC/eReuse-Blockchain

Open data, CC BY 4.0 license
https://dsg.ac.upc.edu/sites/default/files/dsg/eReuseDataJun2019_0.html

Supporting Documentation: Technical Feasibility

Please provide a short prose overview of how the PoC has been constructed and its main functionality / functionalities at a high-level, explaining the working parts and how the DLT element has been leveraged to full advantage. This does not need to be in-depth code documentation that explains each functionality for a technical audience to replicate. Please provide a link to a public code repository with relevant component(s) / modules used in the PoC or in its entirety.

In the Evaluation Criteria #5 you will find a detailed description and the link to the code is in the previous section. In the eReuse system, each piece of electronic hardware, at component level, has an ID, and each piece is tracked by a blockchain software which keeps a record about the traceability of the devices while respecting the privacy of the refurbishers´ clients. This software makes every piece and every stage of the process totally transparent and traceable. It is a plug and play technology, that allows the process to be quickly implemented and not a burden for the refurbisher. They can also download the software (https://github.com/eReuse) and create their own traceability system. This is open-source AGPL v3. The software has no cost for them. If they report the information to the eReuse blockchain then they get certified.