GLOBAL INFORMATION SOCIETY WATCH 2020

Technology, the environment and a sustainable world: Responses from the global South

Association for Progressive Communications (APC)
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SPAIN

REUSING COMPUTER DEVICES: THE SOCIAL IMPACT AND REDUCED ENVIRONMENTAL IMPACT OF A CIRCULAR APPROACH

eReuse, LaKalle and Pangea
Mireia Roura Salietti, Juan Flores Morcillo, David Franquesa Griso and Leandro Navarro Moldes
https://www.ereuse.org, https://www.lakalle.org, https://pangea.org

Introduction

Across the world there are many more end-user computing devices – including laptops, desktops, mobiles – than citizens; but still some citizens (3.7 billion, according to the ITU)[1] cannot effectively participate in society due to the lack of access, meaningful use and appropriation of telecommunications and information and communications technology (ICT) goods. This situation has been worsened by COVID-19, with the out-of-school rate reaching 1985 levels.[2] In 2019, USD 57 billion worth of recoverable metals such as gold, silver, copper and platinum included in electronic devices were discarded globally.[3] It is an unpleasant figure if we take into account the known environmental and social violations that have been committed in the extraction, assembly and treatment of these raw materials.

Manufacturing more devices is part of the problem. The production and consumption of devices that is non-circular and not inclusive is not sustainable for the planet and people. The reconciliation of the Earth's planetary limits with human ICT needs in a dignified, just and sustainable way can be achieved through a holistic circular economy perspective.[4] Sharing, repairing and reusing devices we are not using any more – even reusing recycled components or raw materials – is part of the solution. The collective management of a pool of devices and components results in a circular electronics ecosystem, a common-pool resource to satisfy the needs of the citizens involved. In this way, we can match the right device with the right need with minimal environmental impact, as devices can last much longer through reuse (refurbishment, repair, upgrade). This approach also helps ensure the social appropriation of ICT goods and services and creates local jobs.

Social and environmental sustainability is directly linked to feeding, preserving and maintaining this pool of shared devices and people involved in their maintenance, while preventing any waste, otherwise called "circularity".

Computer reuse: +computing, +reuse, +social impact, -env impact

There are many individuals and groups working on collecting used electronics and developing software and circular tools. Some of them are commercially driven by private economic profit, while others, including us, are driven by considerations of the social and environmental impact of technology and have social justice goals.

After years of volunteers at local NGOs preparing an increasing volume of discarded computers at the Technical University of Catalonia (UPC) for reuse, we started eReuse.org in 2015 with the aim of promoting economic opportunities, while generating environmental and social impact. This was driven by the vision of reusing electronics and ensuring the proper final recycling and the transfer of know-how to reuse centres and refurbishers. We want to contribute to the transition to a collaborative and circular consumption of electronics, by bootstrapping local and autonomous collaborative platforms for reusing electronics.

At eReuse.org, members and collaborators bring together the skills, training and open technologies necessary to help sustain and grow platforms that optimise refurbishment. Under a commons governance, these ecosystems are able to ensure the quality of second-hand electronic products and bring management, traceability and accountability into the reverse supply chain to ensure that reused devices are ultimately recycled and impacts can be assessed. Locality is one of the keys to being efficient: the local appropriation of technology that allows local repair and reuse, right into your neighbourhood. We call theses ecosystems circuits.

1 ITU. (2020). *Measuring digital development: Facts and figures 2020*. https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2020.pdf

2 UNDP. (2020). *COVID-19 and Human Development: Assessing the Crisis, Envisioning the Recovery*. https://hdr.undp.org/sites/default/files/covid-19_and_human_development_0.pdf

3 https://www.itu.int/en/ITU-D/Environment/Pages/Spotlight/Global-E-waste-Monitor-2020.aspx

4 Raworth, K. (2018). *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. Chelsea Green Publishing.

In Spain there are several eReuse "circuits" where public administrations, universities and companies pool devices disposed after a period of first usage, which then get prepared for new uses, and finally recycled when no further use is feasible. Social enterprises collect, refurbish, repair and upgrade the devices, provide maintenance, and deliver them to receivers. In these reuse communities, the receivers of a device only need to pay for the cost of preparing that device for circulation, not the cost of the product itself, as responsibility and ownership can be shared. All stakeholders rely on the eReuse.org open source software tools and services to optimise preparation, extract and share traceability data, ensure quality of refurbishment, promote reuse and ensure final recycling at proper points, and to account for the devices through traceability and measuring their impact on the environment and people over their lifespan. The authors of this report come from Pangea.org, the initial promoter of eReuse circuits in Catalonia, and LaKalle.org, which coordinates a reuse circuit in Madrid. These circuits involve the collection of publicly and privately used devices from donor organisations, social enterprises that refurbish these devices, and social work entities that support families affected by digital inequality.

In mid-March 2020, COVID-19 confined people to their homes. Most social interaction moved to the safer digital medium, including economic, social work and education activities. As a result, in Catalonia and Madrid, respectively, 15% and 12% of families did not have access to a device at home (tablet, PC or laptop)[5] so they were isolated as they could not continue their work online. Many scenarios appeared: a family had a phone but not a computer; one computer was shared by all family members; people had enough mobile data for light interactions but not enough for continued online activities, etc. It was not only about a lack of material resources, but also a lack of skills to configure and use technology effectively. The uncertainty, isolation and anxiety of a health crisis was worsened by economic and job difficulties experienced by many.

Reuse under social and environmental pressure

The immediate public sector response to mitigate the situation of families in need of urgent assistance to get online has been mainly following a linear purchasing and consumption model and disproportionate public spending that benefits the usual suppliers. For instance, the Catalan government decided to spend several million euro to buy 300,000 devices, but the devices were not allowed to be manufactured in China, and needed to be transported and delivered immediately. In December 2020, nine months after the "State of Alarm" was declared in Spain, 93% of devices had not arrived. It was not just a matter of more money; it was simply unfeasible under a global crisis. Interestingly, the Catalan government alone has more than 196,000 workplaces with computer devices that are periodically renewed.

There are more questions than answers. Why does the government have such a response to solving the digital divide? What impact does this have on public finances and on the environment? What are the root causes of the problem of a model of consumption of devices that is not circular, inclusive and sustainable to the planet? There are some national root causes, such as specific industry lobbies in Spain, mostly distribution intermediaries because we do not have national manufacturers. Other causes relate to the business culture, etc. But when we talk about sustainable and inclusive development, we are talking about going beyond the simple action of providing a device. Families, social entities and educational communities must be guided in their choice of devices, connectivity and the kinds of services offered, which should include a commitment to maintaining and repairing the devices. This commitment has to be above all with families who are socially vulnerable, offering them the best possible solutions to solve the multiple dimensions of digital inequality (competences and strategies for the proper use and appropriation of ICT goods and services). If a family has no financial resources, it will not be able to take on the unplanned cost of fixing a faulty device.

Something to take into account and improve is the situation that arises when a second-hand device is donated to a family. There is a barrier of uses that can make it difficult for these families to meet their needs or use ICT resources strategically. Sometimes the device comes preloaded with proprietary software, generating software licence problems, or it comes with various hardware issues such as the case of deteriorated batteries or slow or damaged hard disks. These are two examples. For these families, it can generate a dependency that they did not have before, and therefore, after some trouble, being pushed into buying another device – in many cases without enough knowledge of what they are actually buying. It is important to study and take into account the variables that influence access,

5 Instituto Nacional de Estadística. (2019). Resumen de datos de Viviendas por Comunidades y Ciudades Autónomas, tamaño del hogar, tipo de hogar, hábitat, ingresos mensuales netos del hogar y tipo de equipamiento. https://www.ine.es/jaxi/Datos.htm?path=/t25/p450/base_2011/a2019/lo/&file=09001.px#!tabs-tabla

good use and appropriation of ICT goods in order to have a real social impact.

We propose that social entities, specialised in refurbishment, collect and refurbish devices no longer used by public and private donors, so that they can go to vulnerable families. This activity contributes to create resilient ecosystems of repair that feed a reuse economy, generating big savings to the public finances, and eroding the barriers created by non-collaborative manufacturing lobbies against the right to repair.

In fact, two reuse models can coexist: the individual voluntary model, of a person who decides to stop using a device and prepares it for reuse in his or her free time to give it to another user (see, for example, Labdoo.org). The second is the collective and professionalised model, of a social enterprise or non-profit that generates employment in the collection, refurbishment and distribution of many devices for people in vulnerable situations (e.g. Reuse.org, eReuse.org). In the first model, one device goes from person to person at no economic cost with voluntary personal contributions. In the second model, volumes of devices are managed, providing quality assurance and guarantee during usage. This activity generates jobs in that someone has to pay for the processing costs (devices get donated, and the processing is professionalised).

One of the key factors is that the entities grouped in circuits can retain the collective ownership of the devices, so it is the community, and not the end-user, who decides when a product becomes waste according to whether it is useful for some other user (what we call "value of use"). According to research,[6] the fact that the use value of devices is audited throughout their life cycle, together with the fact that the decision of when an item should be recycled is transferred to the community, increases the efficiency of the circular economy.

As for the business model, the entities perform their services in exchange for economic compensation provided by the receiving entities or families for the use (commodate[7] or loan for use, or referred to legally as "usufruct") of the equipment they receive with a maintenance guarantee. This is a community co-ownership model,[8] or even an IT service model,[9] in which the user contracts the service of a number of computing seats and because of this has access to a range of devices and maintenance teams to ensure the quality of the service. The contribution made by the end-users depends on the costs of circularity. The entities that are part of the circuits receive economic payments for the services they have performed according to a co-created and predefined cost-oriented compensation system. These costs include the management costs of working with donors (receipts, chain of custody, compliance, fulfilment of commitments), distribution of the devices received among the entities in the circuit, transport, storage, remanufacture and repair, sale or rental, maintenance, replacement, etc.

During the first Spanish home confinement, circuits in Madrid and Barcelona managed to give as usufruct thousands of second-hand computers that had been donated by the Barcelona City Council and public and private entities to families affected by digital inequality. The services of putting these items into circulation were paid in multiple ways: UPC cooperation for development funds, crowdfunding, non-profit organisations and even public administrations through socially responsible public procurement policies. However, the majority of public administrations are caught in a mercantilist logic: they discard functional devices that could go to alleviate access to ICT goods among vulnerable families and, at the same time, spend about EUR 300-400 (roughly USD 360-480) buying newly manufactured devices built far away that feed the linear consumption model. The alternative is to pay for the refurbishment of local devices by local suppliers. This only costs about EUR 50-100 (5-10%) (about USD 60-120) and feeds a local ecosystem of repair and reuse that benefits us all.

In general, manufacturers and distributors promote collection for, in many cases, premature device recycling, with the effect and interest of removing still operational devices from the market. That benefits demand at the expense of producing more e-waste. Manufacturers also participate in the second-hand market with remanufacturing, where devices are returned to the factory to be processed and sold again. This may lead to abuse of consumer rights and block local repair. Apple, for example, blocks devices so that only they can prepare them for a new use, makes it difficult to access repair information and prevents users from obtaining repair parts – the brand limits the buyer's access to the device. There have been cases where Amazon expels independent repairers or Google does not display independent repairers trying to advertise their services. Our proposal

6 Franquesa, D., & Navarro, L. (2018). Devices as a Commons: Limits to Premature Recycling. *Proceedings of the 2018 Workshop on Computing within Limits*. https://computingwithinlimits.org/2018/papers/limits18-franquesa.pdf

7 https://en.wikipedia.org/wiki/Commodate

8 Schlager, E., & Ostrom, E. (1992). Property-Rights Regimes and Natural Resources: A Conceptual Analysis. *Land Economics, 68*(3), 249-262. https://doi.org/10.2307/3146375

9 World Economic Forum. (2019). *A New Circular Vision for Electronics: Time for a Global Reboot*. http://www3.weforum.org/docs/WEF_A_New_Circular_Vision_for_Electronics.pdf

is in line with and part of the European Right to Repair campaign manifesto.[10]

Conclusion

Access to telecommunications and the internet has been claimed by various forums and coalitions as a human right,[11] as well as an enabler of the economic, social and cultural rights of humanity.[12] However, the emergence of COVID-19 has aggravated and made more concrete the social, economic and gender inequalities in populations affected by the digital divide. Being connected or not may have been the difference between being alive or not; it may have made the difference between keeping a job or being unemployed (because of the lack of possibility of teleworking, especially among women); or it may have kept children connected to school or, on the contrary, totally disconnected from one's future.[13]

All this is taking place amidst a desperate need to increase the decarbonisation needed to address environmental degradation and meet the target of limiting global warming to 1.5°C as described in the UN Intergovernmental Panel on Climate Change (IPCC) Special Report[14] on climate change. The global challenge is enormous: a dramatic reduction of the environmental impact of ICTs by at least 50% by 2030 is required. This need for decarbonisation conflicts with the expansion of communication and computing infrastructure in the most disadvantaged and underserved areas, which only a local, circular and cooperative model can address.

It is more necessary than ever to have sustainable, transversal, decentralised and institutionally strengthened ecosystems and infrastructures,[15] governed by community management models that work towards the common good.[16] These need the capacity to train in a critical digital culture that facilitates technological appropriation from a social equality and gender perspective.

The circular economy is a powerful catalyst that helps to work in a community disadvantaged by the digital divide in a sustainable way. It helps reduce the environmental risks caused by the extraction of natural resources, e-waste and the emission of greenhouse gases and equivalents associated with the manufacture of new items. Furthermore, it avoids welfarism, thanks to its capacity to generate employment and local collaboration, especially in vulnerable groups, and is capable of creating resilient strategies with multiplier effects if it is articulated under a participatory and transparent logic. After preparing more than 10,000 devices (as detailed in the eReuse dataset)[17] we are hopeful about the future.

Action steps

Our experience shows that the following priorities need attention:

- Responsible public procurement: Ensuring the right of access to devices discarded by the public administration, purchased with public money. These devices cannot be recycled prematurely or given away to manufacturers to prevent reuse. This can be implemented in the form of clauses in public procurement contracts and automatic disposal agreements to non-profit reuse circuits upon end of use. An initiative in that direction is the European Commission's recommendations on circular procurement.[18] Barcelona City Council is a good example of an institution that has collaborated in the circuits, although its importance is not only in its input (donation of computers), but also in its output, promoting demand with sustainable public procurement.
- Transparency and accountability: Ensuring the right to know about the environmental impact and social responsibility involved in end-of-use devices. This includes what buyers do with their devices, and what manufacturers and recyclers do with the devices they collect for recycling (i.e. there is a need for integrated waste management systems). If recycled prematurely, manufacturers and recyclers should pay the

10 https://repair.eu

11 APC. (2006). *APC Internet Rights Charter*. https://www.apc.org/en/node/12333

12 Finlay, A. (Ed.). (2016). *Global Information Society Watch 2016: Economic, social and cultural rights and the internet*. APC & IDRC. https://www.giswatch.org/2016-economic-social-and-cultural-rights-escrs-and-internet

13 APC. (2020). *Closer than ever: Keeping our movements connected and inclusive – The Association for Progressive Communications' response to the COVID-19 pandemic*. https://www.apc.org/en/node/36221

14 ITU-T. (2020). *L.1470: Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement*. https://www.itu.int/rec/T-REC-L.1470-202001-I/en

15 Franquesa, D., & Navarro, L. (2017). Sustainability and Participation in the Digital Commons. *Interactions, 24*, 66-69. https://interactions.acm.org/archive/view/may-june-2017/sustainability-and-participation-in-the-digital-commons

16 Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press. https://www.cambridge.org/core/books/governing-the-commons/A8BB63BC4A1433A50A3FB92EDBBB97D5

17 Distributed Systems Group. (2019). Public datasets about reuse of computing devices in eReuse, June 2019. https://dsg.ac.upc.edu/ereuse-dataset

18 European Commission. (2017). *Public procurement for a circular economy: Good practice and guidance*. https://ec.europa.eu/environment/gpp/circular_procurement_en.htm

social, environmental and economic costs (future opportunity cost) of having to manufacture new devices. If recycled badly (for example, due to insufficient investment) it results in the non-recovery of many materials that cost more to extract through mining than the value of the raw materials obtained (there is a need for open data for accountability, auditability of durability, circularity, audits on environmental impact, an EU product passport, etc.).[19] Open data about real durability of devices will help consumers to make informed decisions to buy more durable goods.

- Right to repair, as the right to maintenance and to make changes on devices (aligned with the repair.eu campaign) including: good design (to perform, to last, to be repaired, related to the idea of ecodesign),[20] informed consumers who can make an informed choice (e.g. manufacturers indicating the degree of repairability with a scoring system, including an energy label, and information on obsolescence and durability), and fair access to repair (e.g. repair instructions and fair access to spare parts).
- Fiscal/tax incentives for activities with a reported impact for the common good (socio-environmental), like the donation of devices (similar to tax deductions for charitable organisations) and for activities that help to extend device lifespans (such as incentives for repair and reuse by individuals and organisations). These incentives should reward adding value instead of throwing devices away, or device use and share models instead of ownership that benefit society and the environment. By the way, at least value-added tax and depreciation schemes should not penalise circular models.

19 European Commission. (2013, 8 July). European Resource Efficiency Platform pushes for 'product passports'. https://ec.europa.eu/environment/ecoap/about-eco-innovation/policies-matters/eu/20130708_european-resource-efficiency-platform-pushes-for-product-passports_en

20 https://ec.europa.eu/growth/industry/sustainability/ecodesign_en

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The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

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