Selection of digital devices

Guide for users

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THE SELECTION OF OUR DIGITAL DEVICES...

… with circular criteria, aware of the environmental and social impact, considering the donation of devices that we do not use and the use of reconditioned devices.

2 INTRODUCTION

Reconciling the right to use ICT (Information and Communication Technologies) with the right to live in a healthy, fair world, in a safe space for humanity and the planet [1], are two of the many objectives included in the SDGs[2], widely publicised. The extractivism associated with ICTs, their remanufacturing, conversion into a brand, use (and abuse), and recycling (often premature) continues, despite eco-efficiency, beyond the social and environmental limits of the planet. The environmental footprint of the linear ICT economy continues to grow. However, the ITU warns us that by 2030 it is urgent to have reduced the environmental footprint by half compared to 2015 levels[3]. The conditions in which the devices are mined and manufactured are fraught with violations. At the same time, the digital divide, evidenced during COVID19, leaves nearly 4 billion people[4] without the same options to exercise their rights as those with access to the digital world.

Bearing this in mind, if I need a new device (PC, mobile, etc.), what can I do to get it without aggravating the problem instead of contributing to improving it? You can choose to consider environmental and socio-economic considerations and bet on a circular perspective.

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1   Raworth, K. (2017). Donut Economics: Seven Ways to Think Like a 21st-Century Economist. Vermont: Chelsea Green Publishing
2   Sustainable Development Goals, https://www.un.org/sustainabledevelopment/en/sustainable-development-goals/
3   ITU-T. 2020. NGHG emissions trajectories for the ICT sector compatible with the UNFCCC Paris Agreement,. ITU-T. https://www.itu.int/rec/T-REC-L.1470-202001-P Recommendation ITU-T L.1470.
4   Measuring digital development: Facts and figures 2020, ITU

In this guide, we try to give you some basic notions to make your choice more ethical, sustainable and caring. We will take the case of a computer as an example.

Let's start with the critical question: How long can a computer last?

A computer works as long as it is useful (functional) to cover a need until mechanical obsolescence (inherent in its manufacture) manifests itself. The resource becomes waste because it stops working well or because it no longer meets the needs of the people who use it (be they specific or not) and of any other nearby potential. That is when it should be sent to a green point for recycling with the least environmental impact.

During approximately its first ten years of life, extending the use of an existing computer is always more environmentally advantageous than acquiring a new one, since to the energy consumption during its use, we would have to add the environmental impact, the cost in CO_2 equivalent, to manufacture a new device to replace it. However, as the computer ages, it may start to crash, or it may not support the software we need to work with. You may also start to run short of processing power. We will now consider what to do with it and how to get a computer that serves our needs.

Let's see this process in the practical case of our friend Carlota.

3 AN EXEMPLARY CASE

Charlotte has had a computer at home for six years. She wants to use it for the maximum possible time, do maintenance and the corresponding updates, and be aware of her programming needs. Perhaps one day, she runs out of RAM and decides to increase it instead of buying a new device, which can also come out for a comparable price. One day he notices it gets very hot, so he takes it to the neighbourhood repair shop, where they detect too much dust inside and clean it. However, there comes a day when she decides to change it. She can see if someone needs it around you and give it to a recycling centre near you. Still, first, she must assess if her computer has potential for recycling (that she is not giving away junk but something that can be useful for others). Since this is not the case, since the computer is close to ten years old, she takes it to a recycling centre and buys another computer on the second-hand market with better features according to her needs. If Charlotte hadn't found what she was looking for on the second-hand market, she might have looked at other options, such as circular business models that rent out computers and make sure their devices last, can be repaired with available spare parts, and are easy for third parties to reuse.

How did Charlotte do it? She followed the 7R rule:

3.1 Has reduced

- First, Charlotte refuses to buy things she doesn't need. She knows that every time she buys a new device, she is causing the emission of about 235 kg. of CO_2 equivalent, extracting finite materials and supporting a manufacturing chain in which social and labour rights can be violated, for example, blood cobalt[5] in Congo, during extraction; or labour rights, for example in South East Asia during manufacturing[6]. She also knows that only 20% of the devices on the planet are properly recycled[7]. The rest are treated informally or are dumped in incinerators, losing, according to the UN[8], 47 of the 57 billion dollars generated globally per year, a figure higher than the GDP of many countries in the world.

- Charlotte tries to extend the use of the device she has. She is aware that around 80% of the carbon footprint of a mobile phone is produced during its production process[9]. Meanwhile, if we look at it globally in the countries of the European Union, 40% of the environmental impacts of ICTs are due to manufacturing. Continuing to use her device means stopping making a new one. However, the use stage also pollutes: 10% of

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5   https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/case-study-the-fate-of-women-artisanal-miners-in-katanga-in-the-democratic-republic-of-congo

6   https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/module-6-the-need-for-workers-rights-in-assembly-and-manufacturing

7   https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/module-9-the-value-and-cost-of-e-waste

8   Vanessa Forti, Cornelis Peter Baldé, Ruediger Kuehr, and Garam Bel. 2020. The Global E-waste Monitor 2020: Quantities, flows and the circular economy potential. United Nations University (UNU). https://ewastemonitor.info/gem-2020/

9   According to a *study* by McMaster University in Canada,

electrical energy consumption in the European Union is due to digital technologies[10]. This study dismantles the belief that the virtual world does not impact the physical world. Yes, it does and a lot; if you take into account that 44% of the negative impacts are due to the energy consumed, the consider the impact of server centres (*data centres*) of 18%, compared to 11% of networks and 71% in the use of the device.

- The environmental cost of using devices depends mainly on the sources of electricity used in each place. Feeding our computers with coal is not the same as with solar panels. Examples are Computer Aid's solar learning labs with repurposed computers[11] already in operation in Kenya.

- The critical and conscious use of technologies is another challenge (digital disconnection, sources of information). For example, Carlota wonders if everything should be in the cloud, if it is necessary to store so many emails, and she configures her computer to put it to sleep when it has not been used for a few minutes, she is balanced in terms of the movies she watches, etc.

Hardware maintenance and software updates are crucial to extending the useful life of computers.

3.2 Has reused

- Carlota has put the second hand first. She has been informed on how the devices can be adapted to her needs. This will help turn the linear economy more circular. Betting

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10 https://www.greens-efa.eu/opinions/2021/12/06/digital-technologies-in-europe/
11 https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/case-study-computer-aids-solar-learning-lab-sustainable-scalable-and-adaptable-to-local-needs

on reuse entails both environmental and social, and economic savings. Carlota is helping to strengthen her city's circular fabric (repair centres). For example, this calculator from AERES [12] estimates that each second-hand computer acquired generates about 3 hours of work for another person. There are more and more portals where you can buy second-hand devices (for example, eBay).

If you are an institution, public or private, plan procurement, taking into account the entire life cycle of the devices so that you can give a second use to devices that can be used by other workers or even as terminals for virtualised applications.

3.3 Has repaired

- Even if replacement parts are not always available, or products continue to reach functional obsolescence on their own, we often discard computers before they reach the end of their useful life, when repairing them is still more economically favourable than buying a new one. She turns to the repair shops in her city to get her computer back to work. In addition, more and more initiatives help us repair our electronic devices. An example is the Ifixit.com portal[13]. Meanwhile, some movements promote legislative changes that regulate the right to repair, such as Right to repair[14].

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12   https://calculadorasocial.aeress.org/
13   https://www.ifixit.com/
14   https://repair.eu/en/

3.4 Has renewed

- Charlotte has been critical of the use of information technology and knows that it is often the programs and not the machines that cause obsolescence. An excellent example of how machines fall short due to products like Windows 11. It's an excellent time to investigate other free options that don't require mistreating the planet to make them work. Free/libre operating systems do not require so many capabilities on the machines. There are multiple sources on the internet to see how to adapt your computer to work with free/libre programs without having to replace it.

3.5 Has recovered

- Before taking her computer to the recycling place in her neighbourhood, Charlotte has assessed the potential for reuse. Can it be helpful to someone else?

- In her case, the computer was too old and limited, but if it had not been, there are reuse centres, or collection points for devices, to be reconditioned and offered as a second-hand offer. The reuse centres erase data, can change the hard drive and expand the RAM, and clean and recover the aesthetic aspect by giving a new life to the devices. Its affordable price allows more people to be able to access these devices.

For example, eReuse[15], a network of entities linked to the circular economy, has been inter-cooperating with other entities since 2003 to collect donations of discarded devices from public administrations and private organisations to create a second-hand market for devices at affordable prices for citizens, especially the vulnerable. In Europe, reuse centres are represented by the international rreuse network [16]. Other examples are Computers for Education[17] in Colombia, NodoTau[18] in Argentina, and the so-called Repair Café or the Restart Project[19] in the United Kingdom, the latter two based on volunteering.

15 https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/case-study-ereuse-building-reuse-circuits-for-social-inclusion

16 https://rreuse.org/our-network/

17 https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/case-study-computadores-para-educar-ensuring-circularity-through-managing-e-waste-properly-in-a-computers-for-schools-initiative

18 https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/case-study-planta-de-gestion-de-residuos-informaticos-the-long-and-challenging-road-in-setting-up-an-e-waste-recycling-plant-in-argentina

19 https://therestartproject.org/

3.6 Has recycled

Although there is not an adequate infrastructure to treat electronic waste everywhere, most have some solutions, with various actors in the recycling chain, from those who collect and fractionate to those who melt or recover materials, which may require very sophisticated processes (occurring in the global north).

In the global north, the devices sent for recycling are often managed through Extended Producer Responsibility, a "polluter pays" system. According to the Waste Framework Directive (DMR), Waste from Electrical and Electronic Equipment (RAEES) is regulated like this in most European countries. In Spain, the manufacturer finances and participates in managing waste flows through a dozen collective systems of extended producer responsibility called SCRAP.

3.7 Has redesigned

If Carlota had not found a second-hand computer and had had to buy a new one, she would indeed have applied circular purchasing criteria or alternative business models to make her choice. Although the transparency required from manufacturers does not yet exist, the ideal would be to buy it taking into account its repairability (that it is easily repairable and that there are spare parts), reusability (that the device can be improved by incorporating new components or adapted for reuse by other people) and durability. For example, Fairphone[20] is a social company that designs and manages the manufacture of mobile phones with less social and environmental impact.
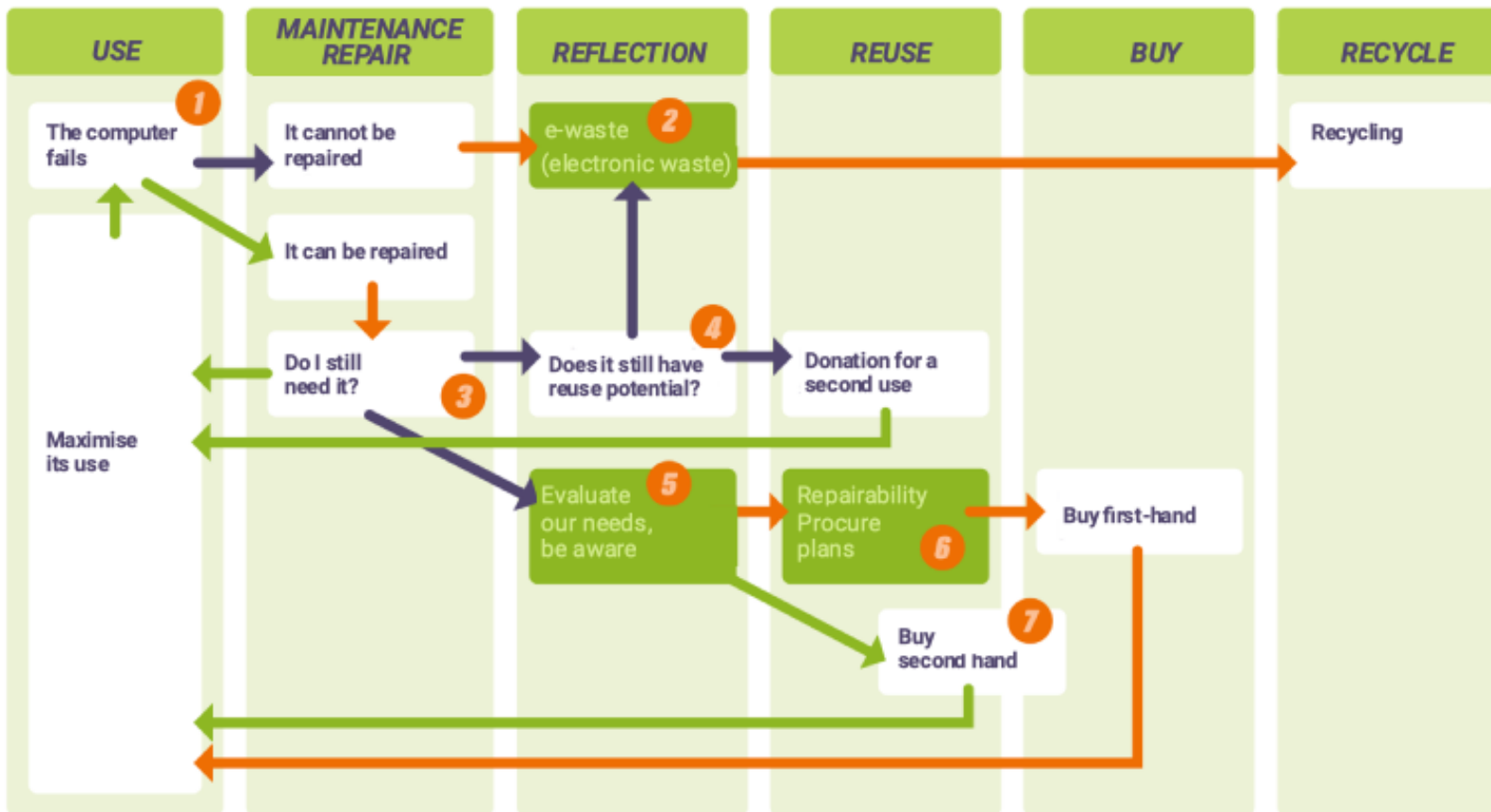
Long-term contracts that add volumes of electronic devices allow public buyers to get suppliers to demonstrate due diligence, compliance with workers' labour rights, and the application of environmental criteria in the supply chain. To do this, 330 buyers from the public sector in Europe rely on Electronic Watch[21], an independent organisation that offers the possibility of monitoring the supply chain and compliance with the social criteria established in their contracts.

20 https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/case-study-fairphone-building-a-mobile-phone-that-is-socially-and-environmentally-responsible-and-lasts-longer

21 https://circulartech.apc.org/books/a-guide-to-the-circular-economy-of-digital-devices/page/case-study-electronics-watch-utilising-public-procurement-power-to-make-the-largest-settlement-of-migrant-worker-recruitment-fees-possible

4 DECISIONS TREE

To summarise, with this decision tree, we intend to guide you in making correct decisions regarding using, reusing and acquiring a new computer.

USE	MAINTENANCE REPAIR	REFLECTION	REUSE	BUY	RECYCLE

1 The computer fails

It cannot be repaired

2 e-waste (electronic waste)

Recycling

It can be repaired

Do I still need it? **3**

Does it still have reuse potential? **4**

Donation for a second use

Maximise its use

Evaluate our needs, be aware **5**

Repairability Procure plans **6**

Buy first-hand

Buy second hand **7**

4.1 Point 1

The basic premise will be to try to maintain the device we already have for as long as it is functional. If it breaks, we try to repair it if we have the proper knowledge or take it to a repair shop.

4.2 Point 2

If it cannot be repaired, we must reflect on the waste generation and what options there are to get rid of the computer with the least environmental impact. Deliver the device to a reuse centre so it can be recycled correctly.

4.3 Point 3

Whether the computer is still working after the repair, or if it has become outdated for our needs, one day we will ask ourselves if we still need it. If yes, we continue to use it.

4.4 Point 4

If it no longer serves us, we have two tasks to perform. We will ask ourselves if it can be functional for other communities or people with lesser needs. Perhaps for a relative or a reuse centre in your city that can recondition it, erase its data, change its hard drive or increase its RAM. This process creates employment and has excellent potential for generating economic

alternatives. Also, the lower cost of refurbished computers helps make them accessible to more people.

4.5 Point 5

Suppose we have already given the computer a worthy destiny, either with second life or by making sure it is recycled correctly. In that case, it is time to choose our next acquisition and ask ourselves uncomfortable questions. What does it mean for the environment and social equity to extract resources from a finite planet, assemble them and transport them to the other side of the world? We will also ask ourselves about that second-hand market we may have contributed to in point 4. We will evaluate our needs. Do I need the latest computer that has hit the market? What usage needs do I have?

4.6 Point 6

The second-hand does not convince me. I may not have any options close to home, or I may not trust the quality. Anyway, if the only option is to buy a new computer, before doing so, there is another moment for reflection: what real needs do we have and what best suits them.

4.7 Point 7

We have decided on a second-hand computer. Before, we will have looked at where it has been reconditioned (we will always prioritise that it be local to avoid transport emissions), we

will have looked at suppliers that certify their quality, and we will have made a price mental map comparing various options.

Good luck with your computer, and thank you, on behalf of everyone and the only overloaded planet we have left.

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