REPARABILITY SCORING SYSTEM FOR LAPTOPS

COMMENTS FROM CIVIL SOCIETY ORGANISATIONS

10 January 2024

The Right to Repair Europe coalition represents over 140 organisations from 23 European countries. It represents environmental NGOs and repair actors such as community repair groups, social economy actors, spare parts distributors, self-repairers, repair and refurbishing businesses, and any citizen who would like to advocate for their right to repair. This is a rapidly growing movement, and its objective to make repair affordable, accessible and mainstream is aligned with the objectives of the European Green Deal and the Circular Economy Action plan. Browse member organisations by country here.

The Coolproducts campaign is a coalition of 22 European NGOs working to ensure that ecodesign and energy labelling truly work for Europeans and the environment. Browse member organisations by country here.

Following the stakeholder consultation held on 7 December 2023, in which the JRC presented their progress made on the laptop reparability scoring system (RSS) study, Coolproducts and Right to Repair Europe members welcome the opportunity to comment on the proposal. We particularly support the approach consisting in preventing the bundling or soldering of priority parts currently proposed by the JRC. However, with the particular contributions of iFixIt, the Environmental Coalition on Standards (ECOS), Halte à l'Obsolescence Programmée (HOP) and the European Environmental Bureau (EEB), we would like to provide the JRC suggestions on the following aspects:

Priority parts:

- No bundling/soldering of priority parts
- Trackpad missing from priority parts list
- Recalibrating score where no fans or cooling fins present

Parameters:

- Improvements to disassembly depth
- Inclusion of spare part interoperability
- Improvements to fasteners (type)
- Improvements to tools (type)
- Improvements to spare parts availability (target group)
- Improvements to spare parts availability (duration)

- Inclusion of spare parts price
- Inclusion of spare parts delivery time
- Improvements to information availability (target group; cost)
- Inclusion of reliable and easy data erasure
- Inclusion of software availability

Weighting & aggregation:

- Parameter interdependencies

Assessment & verification:

- Public database provision

Next steps:

- Complementary durability index.

PRIORITY PARTS

We support the approach to priority parts. However, there is a need to clearly define priority parts, and stakeholders should be better included in that process. Further, we have the following detailed comments:

CLARIFY NO BUNDLING/SOLDERING OF PRIORITY PARTS

We strongly support the position of the JRC that all priority parts must be separable and assessed independently of one another. iFixit has observed a design trend towards soldering parts directly onto motherboards. Whilst this may be beneficial for durability, parts inevitably have limited lifetimes. Soldering presents a significant barrier to repair and upgrade, especially microsoldering which can make replacement all but impossible[1].

- SSDs

SSDs have a limited lifetime. Each time storage cells are written on, they become more worn down. This results in longer response times, data corruption, and eventually total drive failure. It is not sufficient to rely on cloud or USB storage as an alternative to a worn-out SSD as these alternatives would impact user convenience and security considerations and may still result in the end of life of the laptop.

The ability to upgrade storage can significantly increase the lifetime of a laptop, so avoiding soldering also contributes to durability/longer lifetimes. As companies like Apple were able to design their products without soldered SSD in the past, they have the capacity to do so again.

- RAM

[1] The memory (RAM and SSD) on Apple M1 chips are BGA (ball grid array) soldered. While it seems this does not make it totally impossible to replace them on an experimental level, it is an extremely difficult and risky operation, making this a very unrealistic repair option: Charlton H. (2021, April 6). M1 Mac RAM and SSD Upgrades Found to Be Possible After Purchase. MacRumors. (available here) and Miani L. (2023, August 11). UPGRADING an M1 Mac mini SSD from 256gp to 2TB!!. Youtube. (available here)

The argument presented by manufacturers is that soldering RAM to the mainboard provides speed and durability advantages. However, the new JEDEC CAMM2 standard[2][3] for fast and user-exchangeable RAM shows that soldering is not necessary: "Notably, CAMM2 will make non-soldered LPDDR5(X) memory possible, and could also discourage the use of soldered DDR5 RAM."

Action: Retain and clarify within the RSS guidance the position that priority parts cannot be soldered to one another or other parts.

Definitions should clarify the boundaries between priority parts. For example, the differences between the state-of-the-art GDDR (graphics) RAM and DDR5 RAM designs may justify different fastening and joining requirements for each.

TRACKPAD / POINTING DEVICE MISSING FROM PRIORITY PARTS LIST

The assumption that the trackpad and keyboard are always combined is incorrect and damaging for the following reasons:

Trackpad failures are significant: Trackpad failures are sufficiently significant (yet different to that of keyboards) to justify their inclusion as a separate priority part in their own right. The IDC study (2016) quoted by the JRC in their presentation suggests that 27% of respondents suffered damage or breakage to their laptops due to the trackpad / pointing device. There can also be notable variations between manufacturers. For example, while iFixit replacement instructions for keyboards are within the top 5 most viewed laptop repair guides and trackpad / touchpad instructions lag significantly behind, for Apple laptops the touchpad replacement procedure has higher views than the upper case replacement (which is required for a keyboard replacement on current Macbooks).

Trackpads are not always combined with the keyboard: iFixit has found that combining the trackpad and keyboard is not a common practice, except in specific models like MacBooks and newer Microsoft devices.

Bundling trackpads and keyboards encourages a lack of modularity: The most repairable laptops would design the trackpad unit and the keyboard available as separate parts, as can be observed in Framework laptops. This should be rewarded in the scoring. Assuming bundling of trackpads and keyboards encourages less modular construction, leading to more expensive repairs and greater material use. A failure in a keycap should in no case require changing the whole keyboard and trackpad assembly.

Action: Given the lack of complexity that the replacement of these two parts entails, and the frequency at which they fail, they should be separately accessible to end-users. Ecodesign requirements should specify keyboards and trackpads as separate priority parts that must be unbundled. We therefore encourage the JRC

[2] Harding, S. (2023, December 11). CAMM standard published, opening door for thin, speedy RAM to overtake So-Dimm. Ars Technica. (available here)

[3] Connatser, M. (2023, December 10). New space-saving Ram Sticks that jam up to 128GB of memory in a laptop get industry's stamp of approval - CAMM2 standard ratified by JEDEC. Tom's Hardware. (available here)

to specify the keyboard and the trackpad as two different spare parts, with the 10% keyboard weighting split into 7% keyboard and 3% trackpad as shown in the column "proposal 1 weighting" in the table below.

If the separation of these parts is not specified in the ecodesign requirements, it would still make sense to see these two parts included in the RSS, and to reward those designs with separate trackpads. In this case, we propose that the scoring approach includes the separate trackpad as an extra priority part, with a 3% weighting, so that the total % weighting is 103% rather than 100%. Those products with separate trackpads would then obtain an additional boost on their score, and meeting the reparability criteria would not lower the importance of the score for the other parts. This approach is detailed in the column "Proposal 2 weighting" below.

Part	Original JRC weighting	Proposal 1 Weighting	Proposal 2 Weighting
Battery	25%	25%	25%
Screen assembly	25%	25%	25%
Storage	10%	10%	10%
Memory	10%	10%	10%
Keyboard	10%	7%	10%
Ports	5%	5%	5%
Fans	5%	5%	5%
Cover	5%	5%	5%
Mainboard	5%	5%	5%
Tracking pad	-	3%	3%

RECALIBRATING SCORE IF NO FAN/COOLING FINS PRESENT

It is suggested by the JRC that, if fans or cooling fins are not present, then the top score for the availability of these particular parts should be assigned. This effectively penalises those designs that include cooling, ensuring that laptops run at lower temperatures and potentially increasing the durability of the device. This approach is not appropriate to account for parts that may or may not be present in the laptop.

Action: We recommend the JRC take an adaptive approach to scoring. When fans and cooling fins are not present, the % weighting on the other priority parts should adapt proportionately. This can easily be implemented using a spreadsheet approach. Alternatively, a middle rather than top score could be awarded to products that do not contain these parts.

PARAMETERS

As spare part delivery time is already addressed in the regulation on phones and tablets, and spare part pricing is included in the French Repair Index, we strongly encourage these two parameters to be included in the RSS for laptops. In addition, spare part interoperability, software availability and data deletion are not currently addressed in the RSS proposal, even though these can represent a substantial barrier to repair and second use. We therefore propose the following adaptations to the parameter list and weightings to ensure that there is a comprehensive and appropriate coverage of the key factors that increase the likelihood of repair.

Note: As there is some resistance to including the parameter of spare part price in the repair score, two options are proposed. Option 1 weights spare part price at 10% and option 2 focuses on spare part interoperability as an alternative (assuming interoperable parts have lower price), weighting this parameter at 20% instead.

	OPTION 1	OPTION 2
Disassembly depth	25%	25%
Spare part interoperability	10%	20%
Fasteners (type)	10%	10%
Tools (type)	10%	10%
Spare parts (target group)	10%	10%
Spare parts (duration)	10%	10%
Spare parts (price)	10%	/
Spare parts (delivery time)	7.5%	7.5%
Info (target group; cost)	7.5%	7.5%
Reliable and easy data erasure	2.5%	2.5%
Software availability	2.5%	2.5%
	100%	100%

The following sections explain our proposals to address and refine these parameters within the scoring.

INCLUSION OF SPARE PART INTEROPERABILITY (PART PAIRING)

We are observing increases in product designs with technical restrictions on the interoperability of replacement parts through parts pairing. Products can be designed so that functionality becomes impaired or parts do not function at all if they are replaced by a part that is either i) not formally paired through an approvals process with the manufacturer or ii) is simply not an OEM-supplied part.

This is especially the case for smartphones but is also an emerging trend for laptops. On some recent devices it has been found that screens, lid angle sensors and touch ID sensors have been paired to the logic board[4]. The reasons why manufacturers use part pairing are unclear. Motivations may include anti-theft or quality

[4] See for instance this description of pairing issues with M2 Macbook screen replacement: Mokhtari, S. (2023, March 23). M2 MacBook Pro Screen Swaps are Kinda Haunted?. iFixIt. (available here)

control concerns, or simply the creation of an obstacle to repair to incite new purchases. Part pairing creates market distortion and an uneven playing field through establishing:

- **Monopoly on spare parts:** Through pairing, manufacturers create a de facto monopoly on spare parts, enabling them to charge higher part prices. This encourages replacement to be chosen over repair.
- **Monopoly on repair activities:** Pairing prevents consumers from self-repairing or enlisting the services of an independent repairer, thus giving manufacturers a de facto monopoly on repair of their products.

Despite a ban on software and technical obstacles to repair that exists in France since 2020, products that are subject to part pairing are still marketed there[5]. To enable users to carry out repairs at an affordable and non-discriminatory cost, the spare parts market must be left to free competition. It is therefore necessary to reward designs that avoid such practices and make repair possible with a range of spare parts options.

Action: The minimum requirements for smartphones oblige manufacturers to give access to software to authorise part changes to repairers or users who request it, within three days, to change an original part. The repair score for laptops should be designed to reward those who go even further.

JRC should develop a parameter for scoring spare part interoperability building on the minimum requirement, e.g.

- 5 points: Full spare part interoperability unobstructed by part pairing. All replacement parts are accepted without any need for pairing and no degradation in functionality.
- 3 points: Some part pairing but re-pairing solutions are available free of charge to the product owner as well as independent repairers, resulting in the full functionality of the part and device without a manufacturer authorisation step.
- 1 point (aligning with smartphone regulation approach): Part pairing is present for at least one part, where the part cannot be replaced to operate at full functionality without needing to be paired again to the product through a remote manufacturer authorisation step, with professional repairers having non-discriminatory access to all software tools, procedures etc. needed to ensure the full functionality of the parts and of the device.

Note: The definition of part pairing will be important to ensure the robustness of this scoring. We suggest the following definition:

> *"Part pairing means design of products that contain a part or parts that have a unique serial number, which is paired (usually by manufacturers) to an individual unit of the product using software. If paired parts are replaced, they are not fully accepted, or some functionality is lost unless paired to the device again, usually via software only available through the manufacturer."*

IMPROVEMENTS TO DISASSEMBLY DEPTH

The definition of a disassembly step is very important to the scoring and needs to be clarified.

It is unclear how the thresholds for disassembly steps were arrived at. The levels proposed are more lenient than the French Repair Index (FRI) which has the following tiers: x<7,7<x<9, 9<x<11, x>11). In particular, the reasoning behind the top threshold of 15 steps is unclear. The upper limit of a washing machine in the FRI is

[5] (2022, December 7). Nouvelle plainte de HOP contre Apple pour obsolescence programmée et entraves à la reparation. Halte à l'Obsolescence Programmée. (available here)

19 steps or more and for laptops, the French Repair Index's upper limit is 11. This suggests that a limit of 15 for laptops is too lenient and would be out of step with potential proposals for regulatory minimum requirements. We recommend that data relating to the French Repair Index (and any other market data on popular 2023 laptops) is used to analyse the proposals and ensure an appropriately ambitious spread between the different scoring classes.

Action: JRC to clarify which definition of disassembly steps is being used and examine the proposed thresholds against data for laptops on the market in order to determine the distribution between classes and the most appropriate thresholds.

IMPROVEMENTS TO FASTENERS (TYPE)

The categorisation of fasteners was communicated differently in the meeting on slide 10 (EN 45554:2020 categorisation) compared to slide 18 (mobile phones and tablets regulation categorisation), which we consider could create some confusion. The proposed scoring approach for fasteners includes three categories (removable, resupplied or reusable) in line with the approach taken in the mobile phones and tablets regulation.

As a foundation, we support the use of the 3 category approach from the smartphone regulation and ask that the chosen categorisation be communicated consistently to avoid confusion. We consider that it is entirely acceptable to diverge from EN 45554:2020 as the EN 4555X series of standards was created with the intention that it would act as a toolbox that could be adapted as required for product-specific initiatives.

We strongly support that resupplied fasteners should score lower than reusable ones. Fasteners that cannot be reused are essentially consumable and will therefore be inherently less accessible for repair (e.g. one time use adhesives) and have additional material impacts. We consider "resupplied" as a proxy for "more difficult to handle", because they are likely to require breaking or tearing off the disposable fastener and replacing it with a new one. An example could be adhesive strips attaching a battery that requires heat for removal, or an adhesive seal holding a coverglass that would need to be carefully removed and then replaced with a new one.

In addition, we believe that the scoring approach can further differentiate reusable fasteners for the laptops product group. Captive screws are already used, for example, in Framework and HP Elitebook notebooks. These avoid screws being lost or mixed up, which could lead to damage when inserting a screw in the wrong hole. Therefore, we propose an improved classification of fasteners incorporating this category (reusable, captive fasteners) as the highest fastening class. This approach will also be proposed in discussions around the next revision of EN 45554:2020.

Action: JRC to improve how the fastener classes are communicated to prevent future confusion regarding the divergence from EN 45554:2020. JRC to adopt a refined version of the fastener scoring as follows:

- 5 points: All fasteners are reusable captive fasteners.
- 4 points: All fasteners are reusable.
- 3 points: All fasteners are at least resupplied and require no heating or cooling to be removed
- 2 points: All fasteners are at least resupplied. Some require heating or cooling to be removed
- 1 point: All fasteners are at least removable

Where:

- 'reusable captive fastener' means a fastener that remains attached/retained within the relevant assembly of the product even when unfastened and can be completely reused for the same purpose

in the reassembly, without any damage either to the product or to the fastener that would make their multiple reuse impossible;

- 'reusable fastener' means a fastener that can be completely reused for the same purpose in the reassembly, without any damage either to the product or to the fastener that would make their multiple reuse impossible;
- 'resupplied fastener' means a removable fastener that is supplied at no additional cost with the spare part which it is intended to connect or fix; adhesives shall be considered resupplied fasteners if they are supplied with the spare part in a quantity that is sufficient for the reassembly, at no additional cost;
- 'removable fastener' means a fastener that is not a reusable fastener, but whose removal does not damage the product, or leave residue, which precludes reassembly;

IMPROVEMENTS TO TOOLS (TYPE)

After consulting internally and with industry, we would like to propose an alternative approach to the tool classification as follows:

JRC proposal	Alternative proposal
Group 1: Screen, battery & keyboard:	**Group 1: Battery, keyboard & touchpad:**
5 points: No tools (by hand). **3 points:** Basic tools. **1 point:** Tool provided with the product or spare part.	**5 points:** No tools (by hand). **4 points:** Basic tools. **3 points:** Basic or product group specific tool(s) provided with the spare part. **2 points:** Basic or product group specific tool(s) provided with the product. **1 point:** Product group specific tool(s)
Group 2: All other parts:	**Group 2: Screen & all other parts:**
5 points: No tools (by hand). **4 points:** Basic tools. **3 points**: Tool provided with the spare part. **2 points:** Tool provided with the product. **1 point:** Commercially available tools (available for purchase by the general public).	**5 points:** No tools or basic tools. **4 points:** Basic or product group specific tool(s) provided with the spare part. **3 points:** Basic or product group specific tool(s) provided with the product. **2 points:** Product group specific tool(s) **1 point:** Commercially available tools (available for purchase by the general public).

The rationale for these suggested improvements are as follows:

- **Screens in Group 2:** Durability and form factor trade-offs of designing the screen for tool-free removal make this option less feasible, so it is a better fit for Group 2.
- **Touchpad in Group 1:** There are laptop designs already available (Framework) in which the keyboard and touchpad can be replaced without tools.
- **Incentivising product group-specific tools:** Tools which are not proprietary and serve to repair tools produced by different manufacturers are more likely to be of use beyond the single repair for which they are intended, providing additional material efficiency. In addition, if the tool supplied with the product gets lost or if the tool is supplied with the part but a harvested or aftermarket part is used, there remains a higher likelihood of the repair succeeding as the required tools are more widely available.
- **Incentivising tools provided with the part over those provided with the product:** Tools provided with the product are likely to be mislaid by the user before the repair operation occurs (= lower likelihood of repair), whilst those provided with the spare part are not.
- **Incentivising tools provided with parts or products that are basic or product group specific over those that are uncommon (e.g. product specific or proprietary):** tools that are less common will be more difficult to replace if lost, and may be more complicated to use.

Action: We propose that the JRC adapt the tool classification to account for different groupings of parts and additional tool classification classes as per the proposal above. In addition, we recommend the JRC draft a finite list of product group-specific tools which are not proprietary and are necessary for repairing, preparing for re-use or upgrading products produced by at least two different manufacturers. These could include less common screwdrivers or bits such as hexalobe with recess, pentalobe and tripoint[6].

IMPROVEMENTS TO SPARE PARTS AVAILABILITY (TARGET GROUP)

We support the JRC proposed categories for spare parts availability by target group.

We propose that rather than the target group of professional repairer, the definition of independent operator is adopted that will be defined in the ESPR.

Action: JRC to adopt the following definition instead of professional repairer:

> *(46a) 'independent operator' means a natural or legal person who is independent from the manufacturer and is directly or indirectly involved in the refurbishment, repair, maintenance or repurposing of the product, and includes waste management operators, refurbishers, repairers, manufacturers or distributors of repair equipment, tools or spare parts, as well as publishers of technical information, operators offering inspection and testing services and operators offering training for installers, manufacturers and repairers of equipment;*

IMPROVEMENTS TO SPARE PARTS AVAILABILITY (DURATION)

We consider that JRC proposed categories for spare part availability by duration are rewarding very small improvements in the availability of spare parts and should encourage longer availability time durations to truly reward the best performing laptops.

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[6] These are the non-basic tools (according to EN45554:2020) which are present in iFixit's Essential electronics toolkit (available here)

Action: Our alternative proposal is shown below:

JRC proposal	Alternative proposal
5 points: (1) screen, battery (2) keyboard, HDD/SSD, RAM = 10 years, All others = 9 years	**5 points:** (1) screen, battery (2) keyboard, HDD/SSD, RAM = 12 years, All others = 11 years
4 points: (1) screen, battery (2) keyboard, HDD/SSD, RAM = 9 years, All others = 8 years	**4 points:** (1) screen, battery (2) keyboard, HDD/SSD, RAM = 11 years, All others = 10 years
3 points: (1) screen, battery (2) keyboard, HDD/SSD, RAM = 8 years, All others = 7 years	**3 points:** (1) screen, battery (2) keyboard, HDD/SSD, RAM = 10 years, All others = 9 years
2 points: All parts available for 7 years	**2 points:** All parts available for 8 years
1 point: (1) screen, battery, (2a) keyboard, HDD/SSD, ports/connectors = 7 years	**1 point:** (1) screen, battery, (2a) keyboard, HDD/SSD, ports/connectors = 7 years

INCLUSION OF SPARE PARTS PRICE

The French Reparability Index already addresses spare parts price, but would likely be replaced by a pan-European index like the JRC RSS. To avoid losing this essential parameter that has a major bearing on likelihood of repair, it is important that it is addressed in the JRC RSS.

Ensuring manufacturers provide a score for spare part pricing is crucial for promoting the design and distribution of affordable spare parts. Without this requirement, manufacturers might develop a spare parts price policy that is disincentivizing repair, or they might opt for designing and replacing integral parts bundled with other components. For instance, instead of offering the display assembly as a standalone part, they may combine it with the top cover, camera, and other elements. This bundling could result in a more expensive part with greater material impacts, potentially limiting the feasibility of repairs.

In the French Repair Index, the spare parts price metric is established by calculating the ratio between, on the one hand, the sum of the pre-tax price of the most expensive priority part and the average of the pre-tax prices of the other priority parts and, on the other hand, the pre-tax price of the model of laptop they relate to. We consider that there should be no issue in determining a European level price. Many manufacturers have fixed prices for their parts across Europe and those who do not can be provided with adequate guidance on how an EU level price should be determined from their Member state level prices. We would recommend a population-weighted average.

Action: We propose that the following scoring approach is adopted:

- **5 points:** ratio under 10%
- **4 points:** ratio of 11% to 14%
- **3 points:** ratio of 15% to 18%
- **2 points:** ratio of 19% to 22%
- **1 point:** over 23%

To enhance clarity, one could consider incorporating distinct ratio ranges for parts commonly required for repairs as opposed to those intended for upgrades. Prices should be derived from the pre-tax price outlined in the applicable tariff schedule (for professional buyers) at the time of calculation. This information is to be

sourced from the manufacturer's or importer's general terms of sale, or if unavailable, from any pertinent contractual document.

Note 1: If the professional pre-tax tariff schedule is unavailable, the consumer pre-tax price can be used.

Note 2: The calculation should exclude transport / delivery costs, so if the latter are included in the tariffs of the general terms and conditions of sale, the producer or importer should deduct these. Methods for deducting transport or delivery costs are 1) individually for each of the priority parts or 2) on a flat-rate basis (as an absolute value or as a percentage).

Note 3: If options are offered for the same model, and do not influence the technical characteristics for the purpose of calculating the index, then the calculation of the price ratio to be achieved would be based on the price of spare parts and the price of the most current version of the laptop concerned.

INCLUSION OF SPARE PART DELIVERY TIME

Spare part delivery time is especially important for laptops as many users are dependent on laptops for work and a longer delay in repair completion could be a determining factor in whether the product is repaired or replaced.

Action: Include a requirement on spare part delivery time as a parameter, with the minimum requirement in line with the smartphone regulation, for example:

- 5 points: Delivery within 3 working days after receiving the order during the first 5 years, and after that within 4 working days.
- 3 points: Delivery within 4 working days after receiving the order during the first 5 years, and after that within 5 working days.
- 1 point (which should also be the minimum ecodesign requirement): Delivery within 5 working days after receiving the order during the first 5 years, and after that within 10 working days.

Note: SMEs (defined by the EC as having less than 250 staff, turnover of ≤ € 50 m and balance sheet total ≤ € 43 m) would be likely to have smaller inventories, fewer warehouse locations and less competitive logistics rates. To avoid such manufacturers being penalised, SMEs could benefit from a less challenging scoring approach and have 1 to 2 extra days more for each tier (eg. 4 working days to get 5 points, 5 working days to get 3 points, etc.).

IMPROVEMENTS TO INFORMATION AVAILABILITY (TARGET GROUP; COST)

It is not yet clear what repair and maintenance information would be included in this requirement. We consider it important that in the list of information to be made available, troubleshooting is required at the very least for user-replaceable priority parts. This can optimise material usage by avoiding, for example, accidental purchase of spare parts that do not resolve the issue. We also consider it important that reference is made to the priority parts coverage of the information to be provided. The score should either explicitly require that the specified information is available for ALL priority parts, or be broken down into separate scores for each priority part that are then aggregated. As for the spare parts target group, we recommend that the ESPR term and definition of the independent operator be used.

Further, we consider that the score could be expanded.

Action: Our alternative proposal is shown below:

JRC proposal	Alternative proposal

5 points: to both professionals and end users at no cost. **3 points:** to professionals at no cost. **1 point:** to professionals at a reasonable price.	**5 points:** to both independent operators and end users at no cost. **4 points:** to independent operators at no cost and to end users at a reasonable price. **3 points:** to independent operators at no cost. **2 points:** to independent operators and end-users at a reasonable price. **1 point:** to independent operators at a reasonable price.

INCLUSION OF RELIABLE AND EASY DATA ERASURE

Secure data deletion is essential to ensuring the reuse of laptops and avoid them being i) stored past the point at which they can undergo a second use, or ii) being destroyed due to security concerns. Password reset and factory settings should also be addressed within such a scoring as this is currently causing issues for the reuse of laptops - for example Apple reactivation lock functionality is a barrier to the reuse of Macbooks[7].

Action: As table A.13 in EN45554:2020 is somewhat basic for these purposes, we propose a more complete formulation, shown below:

- 5 points: Data deletion is via encryption key or similar technology, managed and verified through a user-friendly graphical user interface (GUI) that also provides options for factory and password reset without user authorisation. Instructions are provided on recommended data sanitisation options based on different levels of data sensitivity and how to implement and verify data deletion.
- 3 points: Data deletion is via encryption key or other methods supported by instructions on recommended data sanitisation options based on different levels of data sensitivity and how to implement data deletion. GUI, verification and additional tools and support may not be provided.
- 1 point: Only the basic BIOS (Basic Input/Output System) deletion capabilities are available with basic or no information or tools to support the use of these commands or verify that deletion has been successful.

INCLUSION OF SOFTWARE AVAILABILITY

As mentioned in the JRC presentation, technical support for laptop operating systems is provided for 8 to 10 years. However, there are two issues with this assumption:

[7] Lovejoy, B. (2023, January 27). Activation lock is a great feature, but needs a rethink as 2020 macs are turned into landfill. 9to5Mac. (available here).

- Data on MacOS laptops suggests shorter support periods (of between 4.3 and 7 years) than those cited in the JRC presentation[8]. Note: This data references discontinued products, and is up to date for 2023, the most recent discontinued product being from 2017.
- On the other hand, computers can be used for longer than 10 years if they are designed to last and can be repaired over time. Our Open Repair Alliance data shows a notable proportion of laptops being used for more that 10 years by the time they are brought to a community event to be repaired[9].

Manufacturers should be encouraged to provide software maintenance for as long as possible in order to extend device lifetimes. The end of technical support can cause premature obsolescence. A device whose operating system is no longer updated exposes its user to risks as well as malfunctions. It is important to separate the security and functional updates, as has been done in the server firmware regulatory requirements.

Action : JRC to include a scoring approach on software availability:

- 5 points: Minimum guaranteed availability of security/corrective updates and functionality updates to the operating system for at least 15 years and separate provision of security/corrective updates and functionality updates.
- 3 points: Minimum guaranteed availability of security updates, corrective updates and functionality updates to the operating system for 12 years and separate provision of security/corrective updates and functionality updates.
- 1 point: Minimum guaranteed availability of security updates, corrective updates and functionality updates to the operating system for 10 years

The above durations refer to years from the date of end of placement on the market of the product model.

WEIGHTING AND AGGREGATION

PARAMETER INTERDEPENDENCIES

In the second iteration of the French Repair Index, interdependencies between parameters have been taken into account to avoid products being rewarded points for certain criteria for parts that are not actually replaceable because other criteria are not met. For example, the availability of information on spare parts replacement to consumers is of little use if the actual spare parts are not also made available to consumers. Similarly, a low number of disassembly steps for a priority part becomes irrelevant if the price of the spare part is prohibitive.

Action: We recommend that JRC review the final scoring to identify any parameter interdependencies and introduce limiting factors to prevent nonsensical combinations of parameters being possible. Specifically, points should not be awarded for the availability of information on spare parts replacement to consumers if the actual spare parts are not also made available to consumers, and vice versa. Also, points should not be

[8] Cunningham, A. (2023, July 17). How long will the last Intel Macs be supported? MacOS Sonoma gives us some hints. Ars Technica. (available here)

[9] Open Repair Alliance. (2022, July 14). Insights: Laptops. (available here): About 10% of laptops brought to repair events are older than 10 years with some even being twice as old.

awarded for a low number of disassembly steps for a priority part if the price of the spare part exceeds the zero score threshold (in the case that a spare part price parameter is implemented).

ASSESSMENT AND VERIFICATION

PUBLIC DATABASE PROVISION

In line with the approach of the French Ministry to the Durability Index, details of the scoring grid with subscores per criterion for each laptop should be made publicly available on a central web-based platform. This strengthens the weight of the repair scoring by putting pressure on producers because the general public can check the results and question producer commitments.

Action: JRC to make it compulsory for manufacturers to send their scoring grids with subscores per criterion to a dedicated Commission department, which will group the data together on an online database (EPREL) as it is required in the smartphone regulation (Annex V).

NEXT STEPS

COMPLEMENTARY DURABILITY INDEX

Beyond the reparability scoring system we foresee the potential for a complementary durability index that could score information such as provision of information on minimum/expected lifetime, drop / shock resistance, scratch-resistance (e.g. display and casing), water and dust resistance (IP rating), and battery endurance (cycle stability).

Action: JRC to make a commitment to building upon the RSS through future work to develop a complementary durability index, providing a list of the types of parameters that could be included in this.

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