Matching the Supply and Demand within the Circular Economy for Used Electrical and Electronic Equipment applying Condition Assessment

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Motivation

- Short use time of EEE-devices results in increasing global E-waste with 53,6 Mio tons in 2019 [1]
- One solution is extension of product usage by cascade use within Circular Economy (CE) (e.g. repair, resell)
- Cascade use increases resource effectiveness but is not well established [2]
- Used products have individual condition resulting in different further usage options and markets

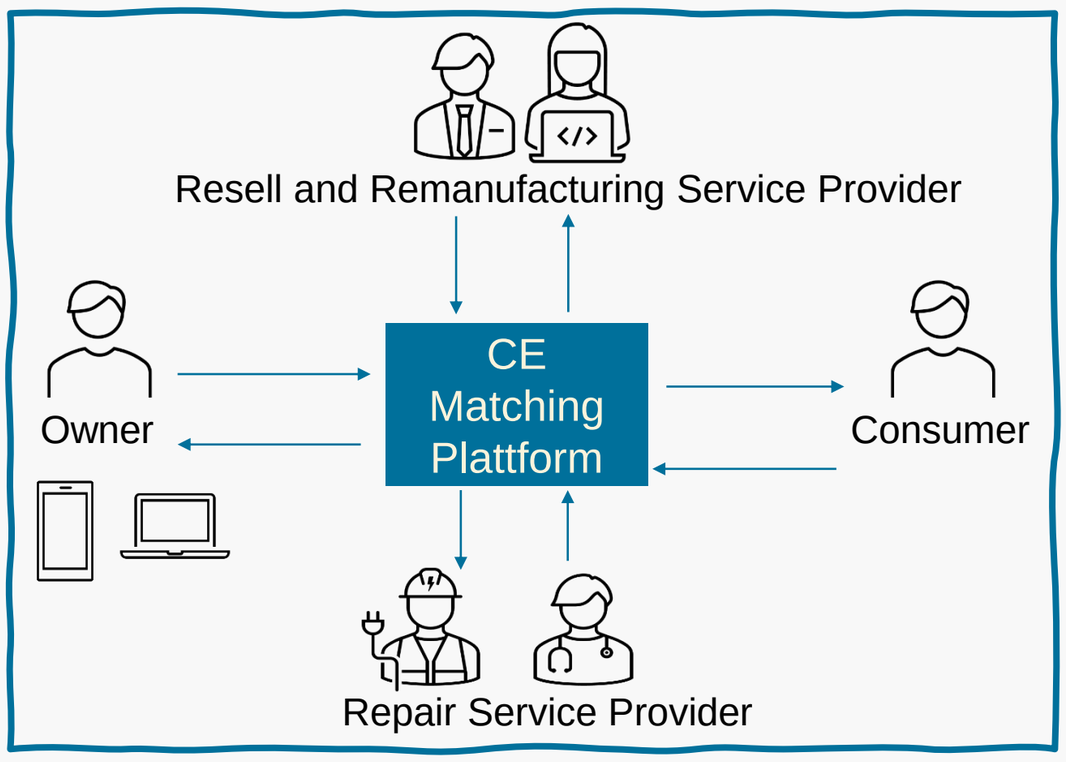
➢ *How can the holistic condition assessment of individual used EEE contribute to match supply and demand?*

Product condition assessment

- Fast assessments are state of the art which bases mainly on optical criteria (e.g. rebuy, backmarket)
- Holistic condition assessment (CA) based on optical (appearance) and technical (functionality) criteria, e.g. scratches, battery state, is required for sustainable CE

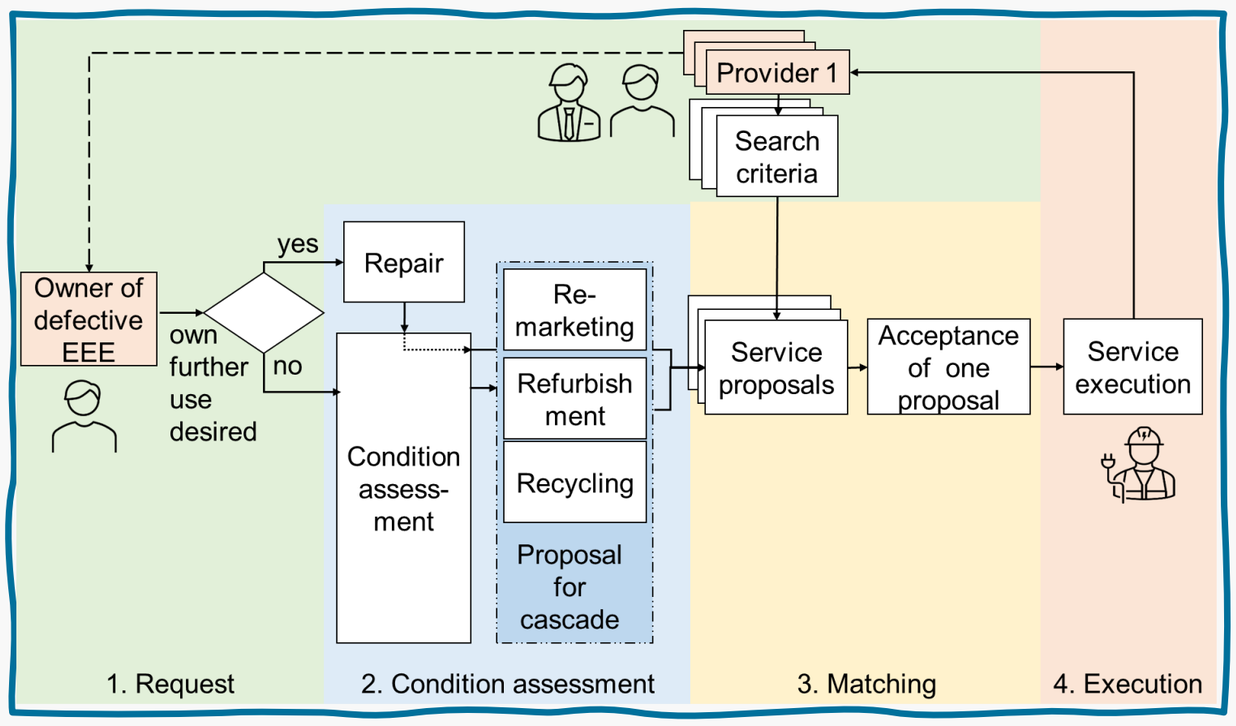
Stakeholder of EEE in CE

- Various stakeholders (e.g. owner, buyer, service provider) with specific profiles are involved
- Matching between cascades and stakeholders is required following product condition assessment



Process model for matching

- 1. Step: Request of product owner and service provider
- 2. Step: Automated cascade proposal based on results from holistic CA
- 3. Step: Matching cascade proposal and search criteria of interested stakeholders (e.g. provider, buyer) followed by acceptance of one proposal
- 4. Step: Execution of service or purchase



Conclusion

- Extended product life time by matching different seller, user and CE-services
- Method supports CE and realizes more effective resource usage

Outlook

- Further validation of product data is required
- Development of prototypical platform
- Including rating of involved stakeholders

References

[1] Forti, V. et al.: The Global E-waste Monitor 2020. Quantities, flows, and the circular economy potential, 2020.
[2] Laitala, K. et al.: Increasing repair of household appliances, mobile phones and clothing: Experiences from consumers and the repair industry. In Journal of Cleaner Production, 2021.

SPONSORED BY THE
Federal Ministry of Education and Research
grant number 033R240C

LCM 2021