Digital Product Passport: circular economy, digital transformation of (ICT) products, e-waste management

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## International Telecommunication Union



## ITU-T Study Group 5: EMF, environment, climate action, sustainable digitalization and circular economy, develops standards on:

- Electromagnetic compatibility, resistibility and lightning protection
- Soft error caused by particle radiations
- Human exposure to electromagnetic fields
- Circular economy and e-waste management
- ICTs related to the environment, energy efficiency, clean energy and sustainable digitalization for climate actions

Active work items related to digital product passport, for ICT products:

- L.GDSPP "Requirements for a global digital sustainable product passport to achieve a circular economy" 2021
- L.D4PI "An information model for digital product information on sustainability and circularity" 2022

Technical alignment of standards with ETSI EE

Focus on circularity and transparency about environmental and climate change aspects



# Importance of circular economy



#### We produce every year as many e-devices as people alive!



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# Improve the environmental sustainability of products, EC Sustainable Product Initiative 2020+





- Requirements related to product durability, reusability, upgradability and reparability, the presence of substances of concern in products, product energy and resource efficiency, recycled content in products, product remanufacturing and high-quality recycling, and for reducing products' carbon and environmental footprints.
- Improve products environmental sustainability and access to sustainability information along the supply chain.
- Incentivise more sustainable products and business models to improve value retention.
- Improve application of sustainable product legislative framework.



# Circular Economy









## Digitalisation and Products



- Related Standards: material datasheets, databases, data carriers, storage, technical data interop protocols, etc.
- Digital transformation concerns most if not all product categories: EEE, ICT, but also plastics, textile, vehicles, buildings, etc.



Global digital sustainable product passport to achieve a circular economy



Requirements of reporting key aspects related to circularity and transparency of an ICT or digital technology product in digital format.

Facilitate and automate analysis of different ICT products based on circularity aspects.

Facilitate preparation and reuse in the second-hand market and the reverse supply chain.

Help manufacturers, governments, users to implement voluntary reporting and monitoring mechanisms to assess these qualities



# The Digital Product Passport

- Elements (examples)
  - A unique product identifier: product, batch, item, part
  - Data carrier: scan code in the product
  - Details:

of Vietnam RU5-8935

Serial No. VNB4G64636

Numéro de Série

OptiPlex 7040

Owner's Menue

- Codes, compliance, economic operators
- Env. performance: materials (critical, hazardous), energy, weight, durability
- Info for buyers and end-users (maintenance, repair, parts), treatment (end-of-life), operators (handling), market surveillance, customs
- Specific details for each product category (verticals)
- Uses (need to know basis; evolutionary: already needed, used)
  - More sustainable, circular products: design, reuse, ...
  - Traceability, transparency, verifiability: accountability
  - Informed choice: procurement
  - Incentives: EPR, reuse, return, recycling
  - Automation, smart decisions!







- Devices can be upgraded, reconfigured, repaired replacing parts:
  - Serialised, one chassis for life
  - Different hardware parts
  - What a recycler sees in an end-of-life product may be very different from the first product





### Proof-of-Concept DPP Prototype



#### This is the info for Digital Passport: a305d06175:ab0f5fab03

#### Hardware

- Device
  - Chassis: Tower
  - Manufacturer: Dell Inc.
  - Model: Optiplex 790
  - SerialNumber: 13SSB5J
  - Sku:
  - Type: Desktop
  - Version: 01
- Components
  - {'type': 'GraphicCard', 'model': '2nd Generation Core Processor Family Integrated Graphics Controller', 'manufacturer': 'Intel Corporation'}
  - {'type': 'Motherboard', 'model': '0j3c2f', 'manufacturer': 'Dell Inc.', 'serialNumber': '/13SSB5J/CN7360422H02JU/', 'version': 'A21', 'slots': 4, 'usb': 2, 'firewire': 0, 'serial': 1, 'pcmcia': 0, 'biosDate': '2018-02-11T23:00:00.000Z', 'ramSlots': 4, 'ramMaxSize': 32}
  - {'type': 'NetworkAdapter', 'model': '82579Im Gigabit Network Connection', 'manufacturer': 'Intel Corporation', 'serialNumber': 'D4:BE:D9:A2:12:86', 'variant': '04', 'speed': 1000, 'wireless': False}
  - {'type': 'Processor', 'model': 'Intel Celeron Cpu G530 @ 2.40ghz', 'manufacturer': 'Intel Corp.', 'brand': 'Celeron', 'speed': 1.677685, 'cores': 2, 'threads': 2, 'address': 64}
  - {'type': 'RamModule', 'model': 'Hmt351u6cfr8c-H9', 'manufacturer': 'Hynix/hyundai', 'serialNumber': '157AAB3C', 'size': 4096, 'speed': 1067, 'interface': 'DDR3', 'format': 'DIMM'}
  - {'type': 'RamModule', 'model': 'Ct51264bd160bj.c8f', 'manufacturer': '859b', 'serialNumber': 'E2555565', 'size': 4096, 'speed': 1067, 'interface': 'DDR3', 'format': 'DIMM'}
  - {'type': 'SolidStateDrive', 'model': 'Ct240bx500ssd1', 'serialNumber': '1927E18B23E1', 'variant': 'R013', 'size': 240057.409536, 'interface': 'ATA'}
  - {'type': 'SoundCard', 'model': '6 Series/c200 Series Chipset Family High Definition Audio Controller', 'manufacturer': 'Intel Corporation'}

#### A working digital product passport for: Chassis: a305d06175 Detailed hardware ID: ab0f5fab03





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L.1033: Guidance for institutions of higher learning to contribute in the effective life cycle management of e-equipment and e-waste

https://www.ereuse.org https://ekoa.unlp.edu.ar







**Example of** standards supporting ewaste and circular economy

•ITU-T L.1030 guidelines E-waste management framework for countries •Summarizes the different and steps that countries need to adopt Frameworks in order to put in place an ewaste management system.

•ITU-T L.1023 Reduction Assessment method for circular scoring •Criteria for the assessment of circularity. definition of margin of improvement levels of ICT goods.





Diponetals in information and communicati recycling rare communicati on technoloav goods •Basic auidelines regarding the importance of recycling rare metals and the procedures applied to preserve them.

conomy •ITU-T L. 1020 Circular Economy: Guide for **Operators and** Suppliers on approaches to migrate towards circular ICT goods and networks • Provides guidance to operators and suppliers on how to improve circularity of products through supply chain actions.

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Circular

