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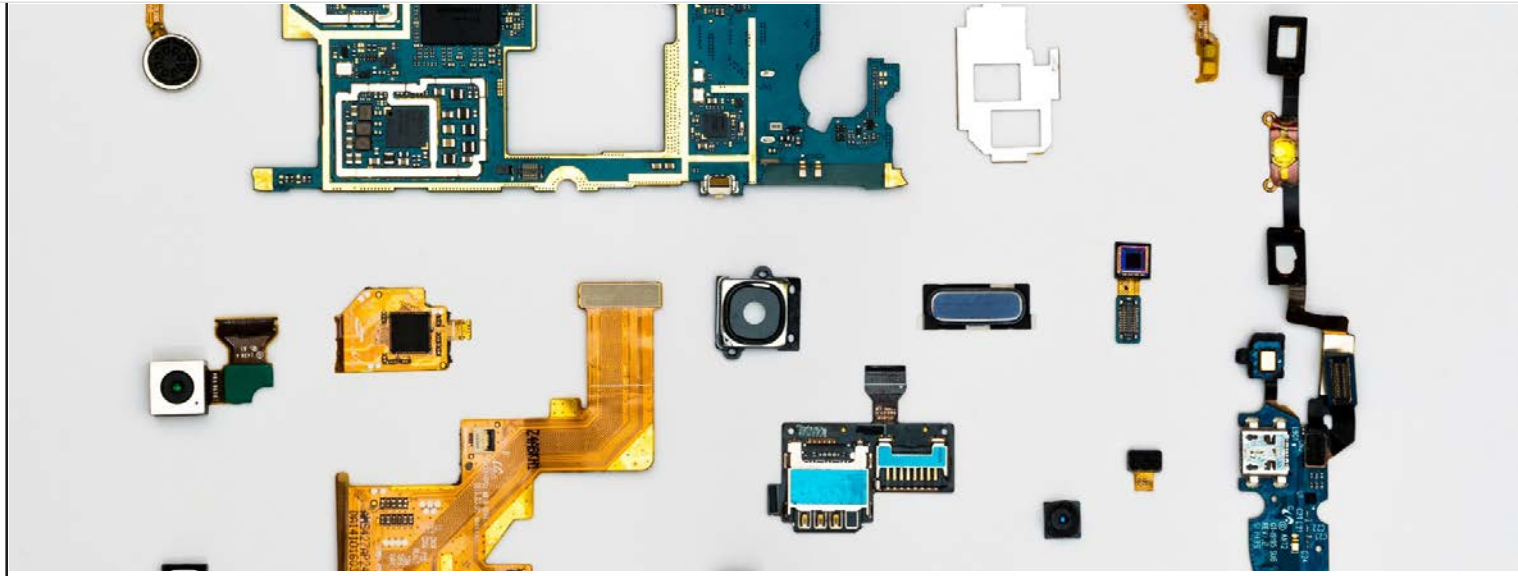
MoDeSt

INaS



INAS 2.0
SUMMARY & DOCUMENTATION

Workshop 2:
“New Service Opportunities through Sustainable Modular Product Design”

02. October 2020, Leuphana Universität Lüneburg (online)
Authors: Ferdinand Revellio, Clara Amend, Erik G. Hansen, and Stefan Schaltegger

Centre for Sustainability Management
IQD Institute for Integrated Quality Design

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Join our Whatsapp group:
https://chat.whatsapp.com/HRH5vfvnfYi7KpqkSZ3QS0

Overview of Participating Organisations

Firms along the Smartphone Value Chain

Suppliers

AT&S

umicore

GSN
WE MAKE CONNECTORS BETTER

BeSpoon

TRUMPF

OEMs

shift
shiftphones.com

innovaphone
PURE IP COMMUNICATIONS

FAIRPHONE

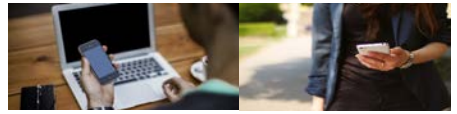
Gigaset

SAMSUNG

Distributors

T

WEtell



Use-phase(s)

Akkutauschen.de

w-support.com

ESCOR

Teleplan
Lifecycle care for electronics

refurbed

Recovery

AfB social & green IT

teqcycle
Return Rework Reuse
TEQPORT
Asset Recovery Solutions

kaputt.de

REVIVED PRODUCTS

RITTEC
UMWELTTECHNIK

Hosts & Coordinators

Centre for Sustainability Management

IQD Institute for Integrated Quality Design

Scientific Partners

Fraunhofer IZM

berlin

Additional Participants

bitkom

Effizienz Agentur NRW

efa+

Agenda 2nd October 2020, Leuphana University of Lüneburg (online)

VORAB	INaS Welcome-Package per Post
Prerecorded sessions	*«Inside Circular Consumption»*
	Prof. Dr. Melanie Jaeger-Erben, TU Berlin
[online]	*«Circular Services for Modularity: a case study»*
	Clara Amend, CSM

WORKSHOP	**2. OKTOBER 2020**
ab 9:30 Uhr	Registrierung & Technikcheck
START	
10:00 – 10:30	Begrüßung: **Prof. Dr. Stefan Schaltegger,** CSM, **Prof. Dr. Erik G. Hansen,** IQD und **Ferdinand Revellio**, CSM & IQD
	«Grußworte vom virtuellen INaS-Host»
	Daniel Büchle, Geschäftsführung AfB gGmbH
10:30 – 11:15	Interaktives Networking und Team Check-In
	Susanne Heinz, Design-Thinking Coach
11:15 – 11:30	Kaffeepause [offline, Zoom-Raum bleibt offen]

IMPULS	**NEUE SERVICE DESIGNS**
11:30 – 12:15	*«Strategische Dienstleistungen bei Samsung DE»*
	– Keynote mit Diskussion –
	Andreas Beck, Vice President Service - Samsung DE
	Moderation: **Ferdinand Revellio**, CSM & IQD
12:15 – 13:00	Mittagspause [offline, Zoom-Raum bleibt offen]
KREATIV	**SERVICE DESIGNS @ INaS Community**
13:00 – 14:15	Teamarbeit in Break-Out Sessions mit Jamboard
	→ Mit Herausforderungen von 4 INaS-Teilnehmenden
	Moderation: Team-Coaches aus dem INaS-Team
AUSBLICK	
14:15 – 15:00	Abschließende Diskussion und Ausblick
	Prof. Dr. Erik G. Hansen, IQD
	Ferdinand Revellio, CSM & IQD

GRAPHIC RECORDING JAKOB-KOHLBRENNER.DE

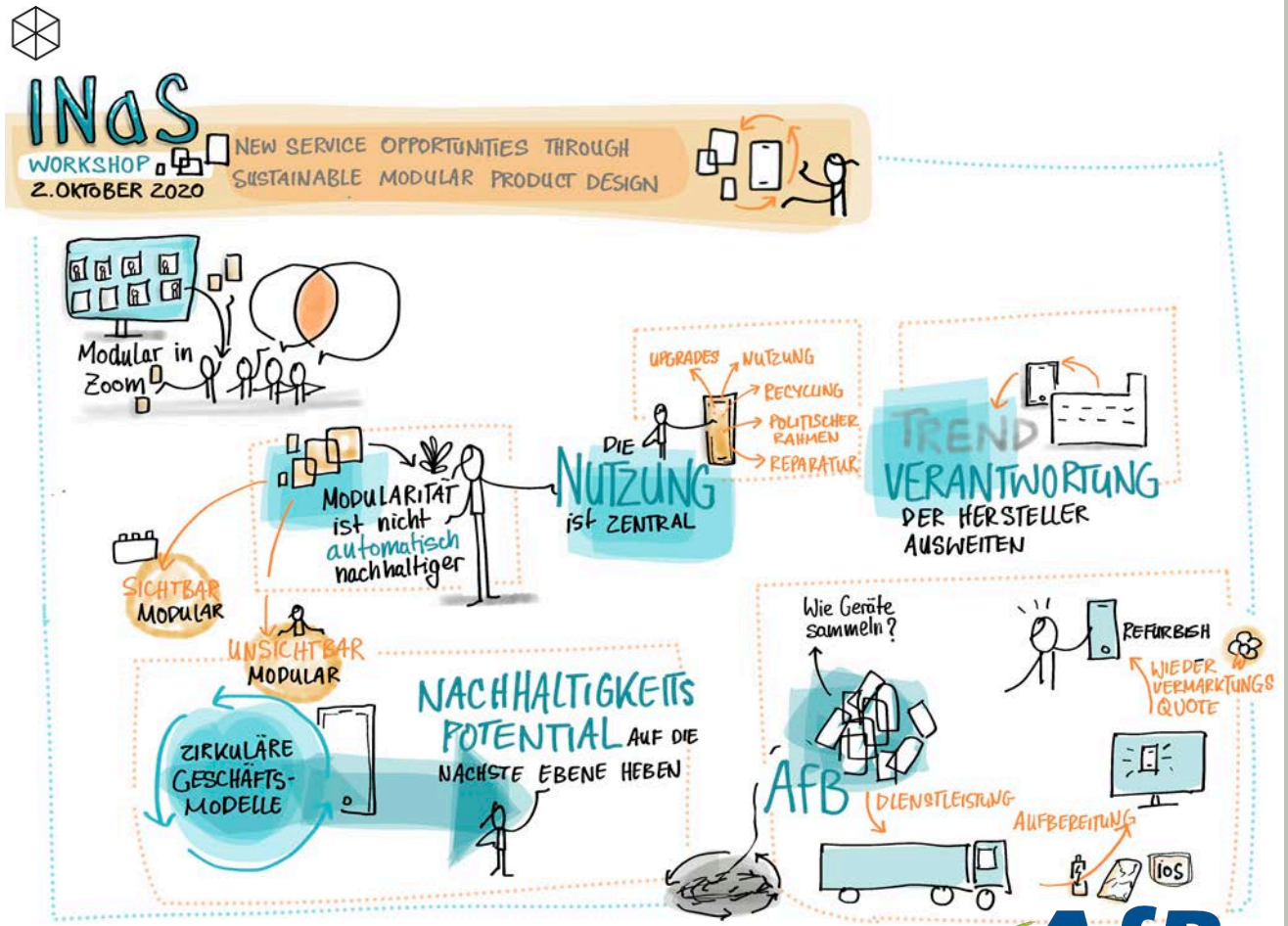
Introduction
Focus and Goals of 2nd Workshop

Innovation Network aiming at Sustainable Smartphones (INaS)
- Innovation lab at CSM (Leuphana) and IQD (JKU) since 2016
- Science-practice interaction for knowledge transfer and co-creation
- Joint problem definition and co-creation of solutions

Review of the first workshop on modularity (Jan. 2020)
- Differentiate visible (user-focused) and non-visible modularity
- Modularity may lead to environmental overhead (connectors etc.)
- Sustainability of modular designs depend on *use characteristics*

Circular product design requires complementary services
- Conventional eco-design regulation enable immediate positive effects for energy savings in the use-phase
- New circular design (amendment of EU eco-design) on material-productivity require complementary services for positive effects

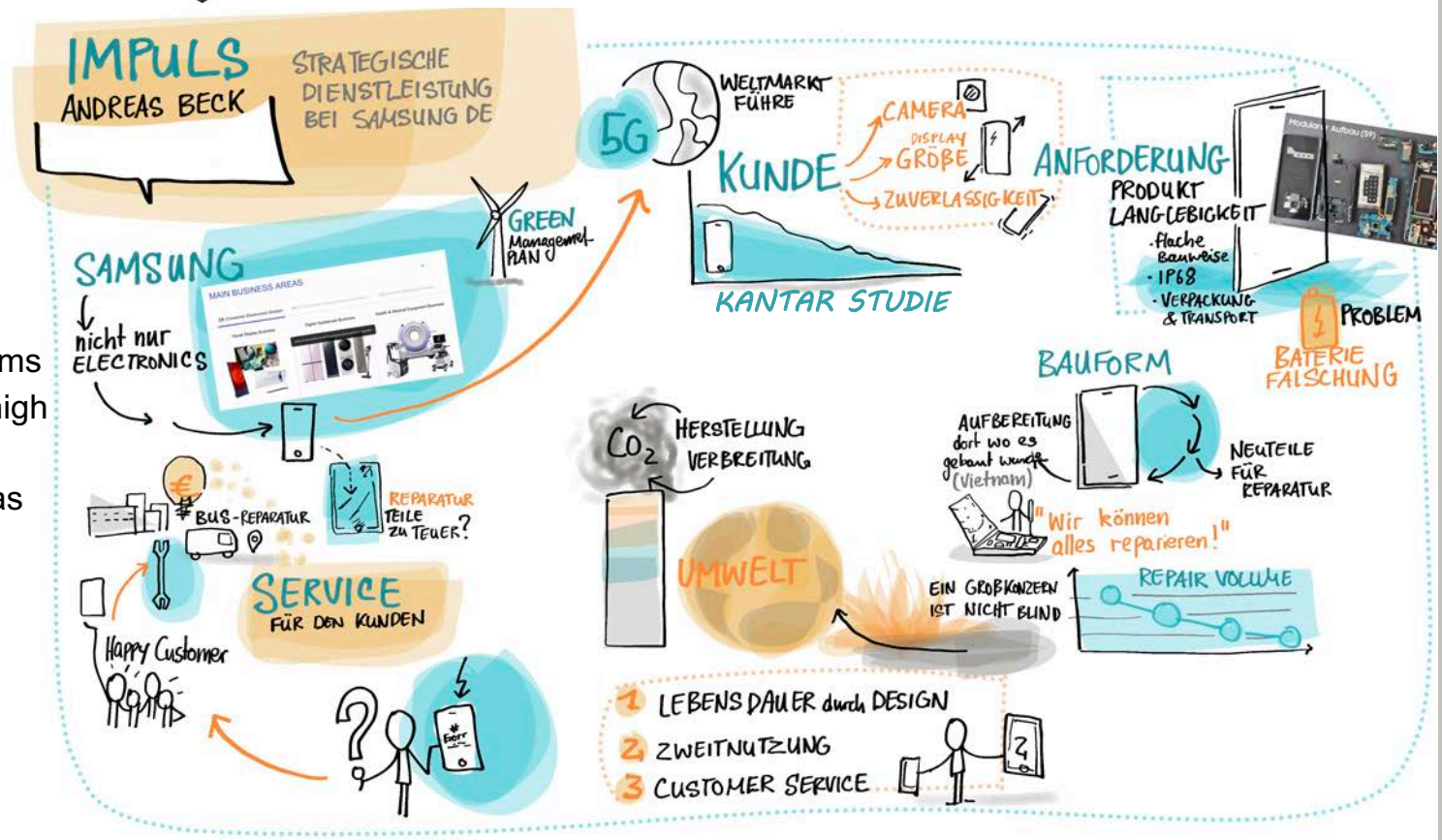
Goals of today: Focus on complementary circular services
- Uncover potentials of repair, reuse and refurbishing services
- Modular design can enable and facilitate these circular services
- Work on real challenges by INaS-members in creativity sessions



Virtual Host @ AfB gGmbH
- Welcome statement by Daniel Büchle, managing director
- AfB covers full recovery process for electronics incl. remarketing
- Accounting and report of sustainability benefits, 20 locations in Europe
- INaS members are welcome for site visits

Keynote – Andreas Beck, Samsung

«Produktdesign, Service, Nachhaltigkeit»



Basics

- Users demand for high-tech and reliability, however this implies indirectly for sustainability (longevity)
- Climate crisis and Fridays for Future also affect global firms
- Extended lifetimes are favorable (and desirable) due to high impact in production → product design is important
- Differentiate customer groups! Trade-in and second-life as growth markets. Samsung explores leasing with Grover

Closed design as key for reliability achievements

- Radically reduced repair volume through closed design
- IP68 certified to withstand dust, dirt and sand, water
- Enclosed battery to reduce safety threats and fake parts
- Samsung aims at internal modularity with exchangeable parts, learnings from own repair experiences are valuable

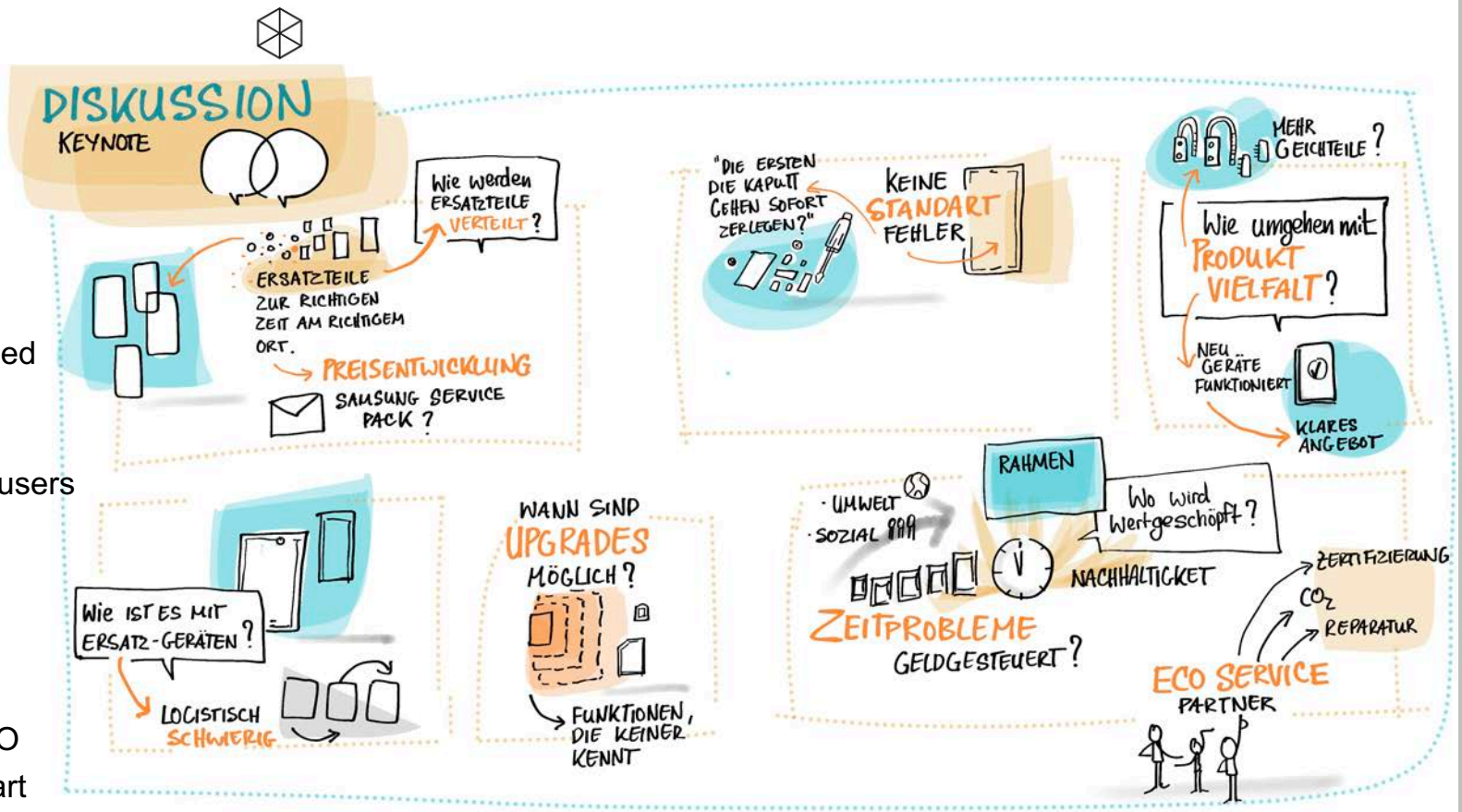
Repair solutions based on same-unit repair

- Vertical integration of repair services at Samsung
- Walk-in and instore solutions
- Mobile repair at user location (repair vehicles)
- Board level repairs are favored
- *"We can repair everything"* customers also demand for it

Key insights keynote

- Closed design is key to reach high reliability, low failure rate and low repair volume
- Repair volume decreased by approx. 25% since 2016 (due to closed design)
- Prioritizing same-unit repair solutions over repair pooling with refurbishing
- Repair down to board level is prioritized, repairs serve as learning for product design
- New repair services are emerging: onsite and mobile solutions
- Software updates guaranteed for 3 years now, security patches even longer

Discussion – Andreas Beck
Samsung Electronics GmbH



Repair activities (details)

- To reach loyal customers, repair services are needed
- User guidance is key, as many issues are not actually linked to defects on hardware level
- Repairs previously perceived as too expensive by users
- Consumer want to observe repairs (data privacy)
- Samsung certifies as Eco-Service Partners
- Close relationship to repair partners and operators

Spare parts accessibility and refurbishing

- Wide access to spare parts possible through ASWO
- Variety: serial number is necessary to find exact part
- Refurbishing of devices and modules in original factories
- No refurbished parts for repairs in EU (other countries yes)

Going forward with sustainability in general

- Green public procurement as catalyst for new markets
- Hardware upgrades to re-boost performance of devices, is not part of the sustainability strategy so far

Key insights discussion

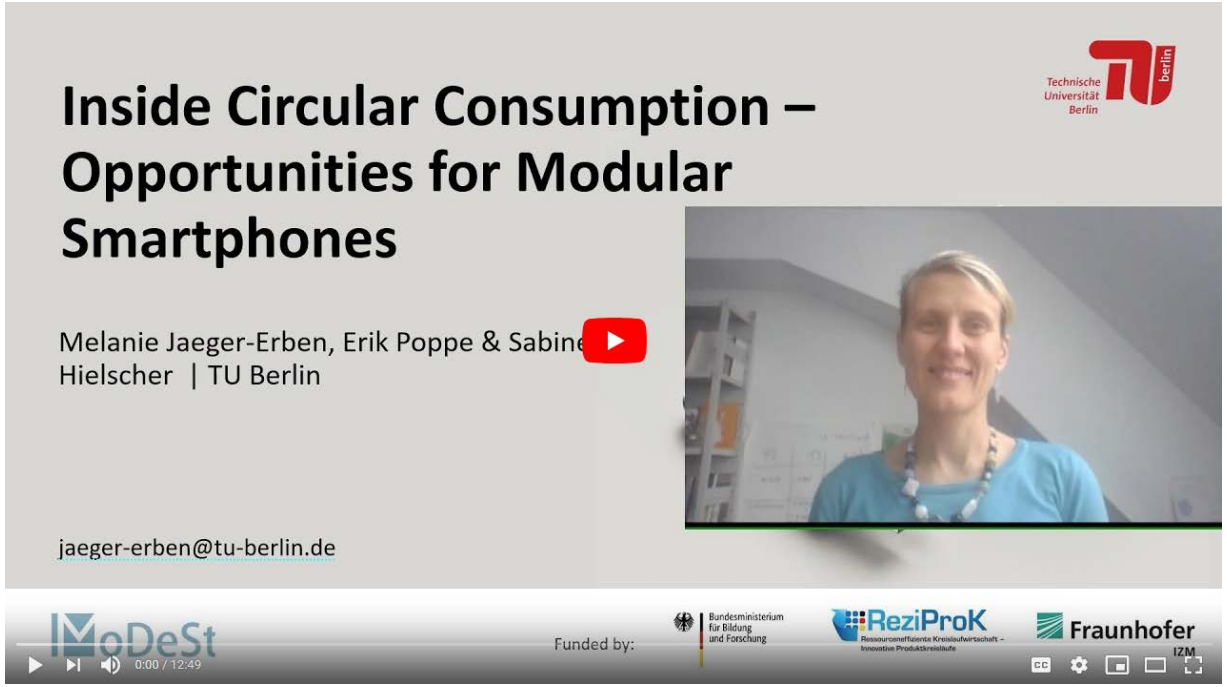
- Repair prices reduced through new contracts with service partners and fixed fee
- Centralized repair is “fast” (3 working days)
- Specialized repair technicians are more efficient than all-rounder or even users
- Large variety of products complicates after-sales due to reduced common parts
- Focus on repair, performance upgrades (main operating unit) not on agenda

Input – Melanie Jaeger-Erben, TU Berlin
«Inside Circular Consumption»

The status quo
- Smartphone designs have become more and more homogeneous
- Degree of (visible) modularity decreased compared to feature phones
- Functionality increased, replacing other electronics (e.g. alarm clock, camera) → *static modularity* which is neither down- nor upgradable
- Sale of devices (ownership transfer) as dominant business model

What users think and how they behave
- Insights through individual smartphone-stories and local user-labs for discussing user expectations or required competences for repair
- ~2-year replacement cycles are seen as normal, smartphone adapts parallel to user´s life, users mostly expect *"new and better"*
- Values-based communication bears little fruit (also for ecological values), as users primarily evaluate a smartphone's functionality

No "one size fits all"
- There are *different user types* for which different modular product designs are required → these must reflect the functional expectations
- Modular product designs require suitable service designs, which should be as modular as the product design



Modular smartphones for the mass-market
- Modularity as a means to an end, e.g. as part of a circular economy strategy is not a straightforward process
- There might be low intrinsic motivation → no sure-fire success
- Support from politics is required to facilitate increased material productivity and low-carbon economy

Input – Clara Amend, CSM

«Circular Services for Modularity: a case study»

How users repair

- Visible-modular devices are most often repaired by users themselves
- Semi-modular devices (non-visible modularity) are most often sent to a professional repair service or manufacturer repair

→ The type of complementary circular service that is needed depends on the product design

Importance of repair instructions and services

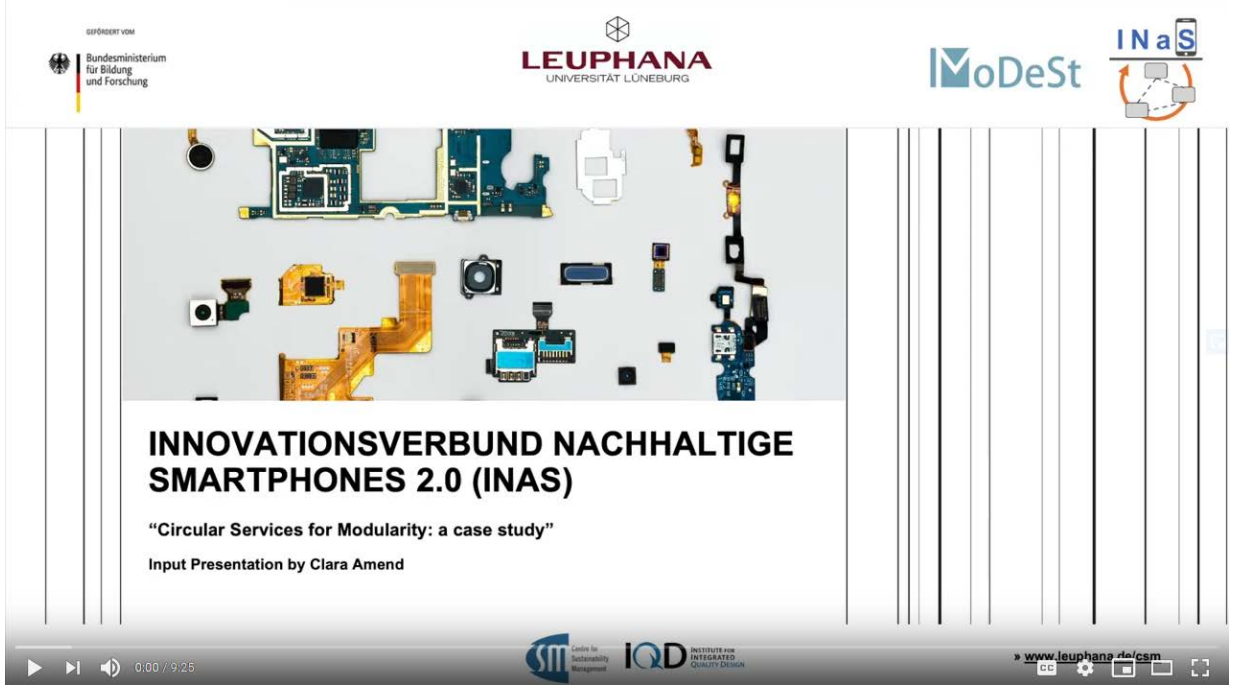
- Users who choose to repair, prefer *official repair instructions* by the manufacturer or the manufacturer´s repair service
- Users who do not choose to repair most often find the effort too high, the repair too expensive, or lack the knowledge to repair it

→ Repair-related transactions costs can be decreased by offering *easy and more accessible repair* instructions and inexpensive professional repair services

Influence of perceived repairability on repairs

- Users who perceive their device as more repairable, decide to repair themselves more often, modular devices have a higher perceived repairability

→ Communication about device repairability may also influence decision to repair positively



Contract upgrades as incentives for smartphones "as-a-service"

- A basic contract that covers only self-caused defects would be chosen by 1/3 of the respondents
- A contract with additional options, such as a refurbished device, self-repair, or module upgrades would be chosen by 3/4 of the respondents

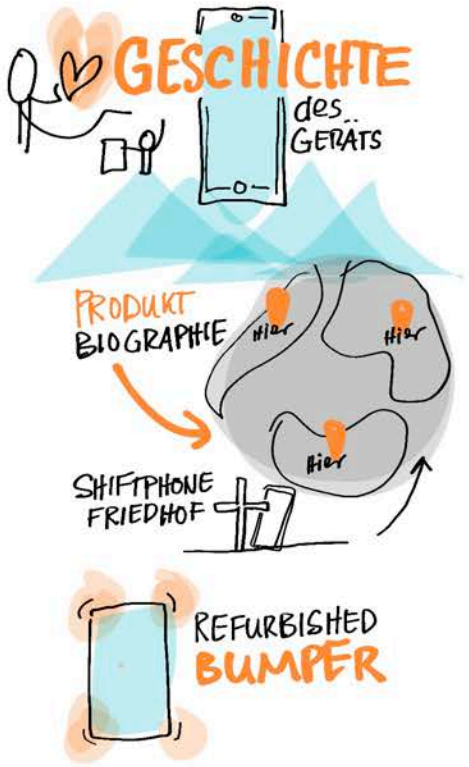
→ Contract upgrades could be a solution to make product-service systems more successful

KREATIV-SESSIONS

ACTION IN BREAKOUT GROUPS

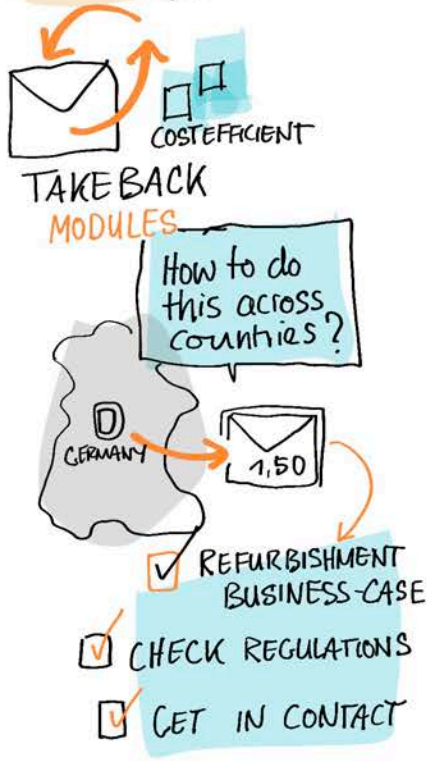
GROUP A

UMGANG MIT KUNDEN mit GELIEHENEN GERÄTEN



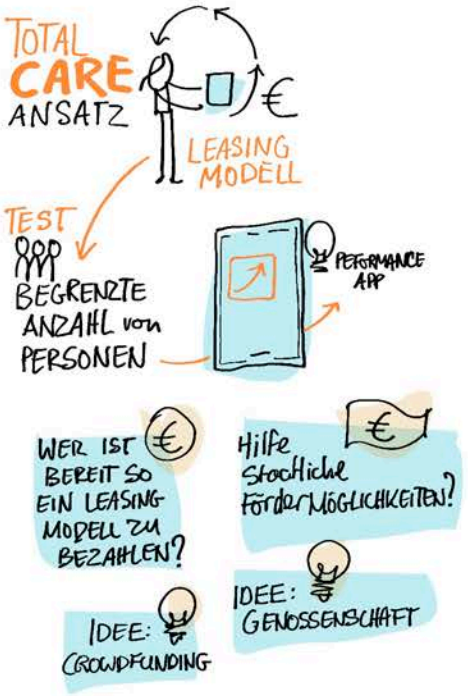
GROUP B

TAKE-BACK OF DISPLAYS



GROUP C

FINANZIERUNG EINES LEASING-MODELLS



GROUP D

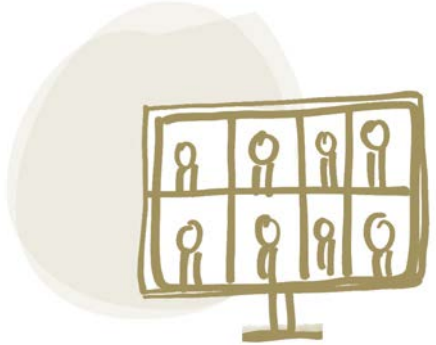
DIENSTLEISTUNG UND SKALIERUNG

Group A

The Challenge

Don’t be gentle – it’s a rental!
Wie können Kunden*innen motiviert werden zur Langlebigkeit (Akku, Ästhetik) von zukünftigen Leasinggeräten beizutragen?

Team-Members
Theresa Gruber (AT & S)
Tobias Kronawitter (kaputt.de)
Erik Poppe (TU Berlin)
Melanie Jaeger-Erben (TU Berlin)
Mareike Kühnel (Wetell)
Cornelia Szyszkowitz (Deutsche Telekom)
Kilian Kaminski (Refurbed)



Challenge Owner
Samuel Waldeck (SHIFT)

Moderation
Clara Amend (CSM - Leuphana Universität)

Group A

The Solution Space

kostenloses Upgrade oder Urlaub bei guter Nutzung

vorab Kaution --> je nach Gerätezustand bei Rückgabe bekommt Kunde gesamten, teilweisen oder keinen Betrag rückerstattet

vorinstallierte App, die den Wertverlust über Zeit zeigt (in Verbindung mit der Nutzung)

Kostenloser Refurb und Akkutausch nach bestimmter Nutzungsdauer (aktiver Werterhalt)

Wenn ich Gerät leihen möchte, kann ich vorab entscheiden, in welchem Zustand es ok für mich ist (schlechterer äußerer Zustand = niedrigerer Mietpreis)

positives Verhalten wird belohnt!

Idee 1: Finanzielle Beteiligung der Nutzer*innen

Am Ende von Mietzeitraum kann man das Gerät übernehmen (Grover)

Längere Nutzungsdauer, fallende Mietpreise

Wer Pflegeprodukte/ Bumper oder Panzerglas bestellt erhält Bonuspunkte oder Mietvergünstigung.

Vermietung nach Vermietung: Ab bestimmt gutem Zustand gibt es einen Einmal- oder wiederkehrenden Betrag oder einen Storecredit

Zustand des Geräts bei Rückgabe = Prämie bei sehr gutem Zustand (nach vorab festgelegten Kriterien)

Beteiligung auch am Marketing: Kund*innen schreiben Nutzungsempfehlungen für nächste potentielle Kund*in

Kunden*innen an nächster Vermietung beteiligen

Clean Label - "frei von..."

Wo war mein Gerät schon. Hat es prominente Menschen fotografiert, welche Sehenswürdigkeiten hat es schon gesehen? Die Erlebnisse zusammengefasst in einer Art Fotoalbum.

Aufklärung --> Geschichte erzählen: Neues Gerät, was ist passiert damit es hergestellt wurden konnte, inwelchen Ländern war es schon etc.; Refurbished war schon bei Person x; wer hat alles mitgearbeitet und

Kund*innen können online/ über App zur Geschichte des Geräts selbst beitragen. Evtl. auch die Geschichte dazu, warum der Erschütterungssensor gerade ausgeschlagen ist etc.

Idee 2: Story Telling

Auskunft über enthaltene Materialien, Rohstoffe und Ressourcen

CO2 Bilanz

Tragedy of the Commons und Pfadfinderregel Beiblatt (besser abgeben als bekommen) + Onlinekurs bei Mietung (Generell, Zertifikat)

Im Welcome-Package mit dem Telefon erhält Kunde/ Kundin ein Heftchen mit der "Lebensgeschichte" des Geräts (Oder einen Link zu einer Webseite/ Video

Weltkarte mit Produktionskette auf der Hülle abgebildet

Group A

Key-Insights

How can we motivate users to take care of their device?

Reward positive instead of negative behavior

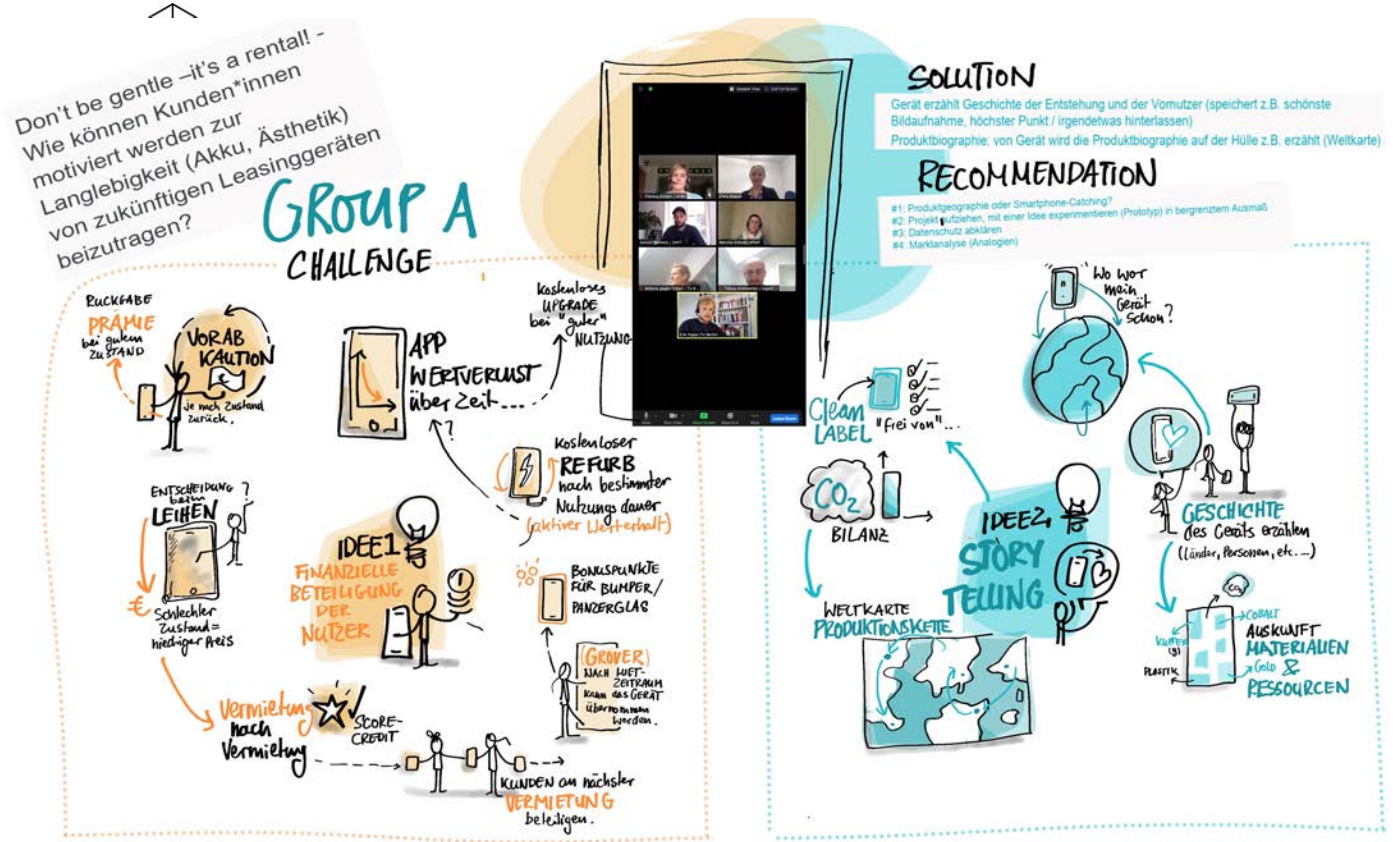
- Monetary interest: user participates in the after-use value of their device
- Non-monetary interest: user participates in marketing, write use recommendations
- Reduce information asymmetries: anonymized use statistics (intensity) and tips for caring behavior

Personalize the smartphone to target the users´ emotions

- Product biography: Device tells the story of its creation and its previous use
- World map of production chain on smartphone case
- Diary of the smartphone´s previous main events (e.g. highest mountain climbed)

Challenges on the way

- Data privacy laws may prohibit implementation
- Users must enable sharing of data and notifications



Next steps and recommendations

- Conduct market analyses to identify opportunities and user preferences
- Check data privacy laws
- Build technological environment (e.g. app for use statistics or product biography)
- Test the new product in a pilot

Group B

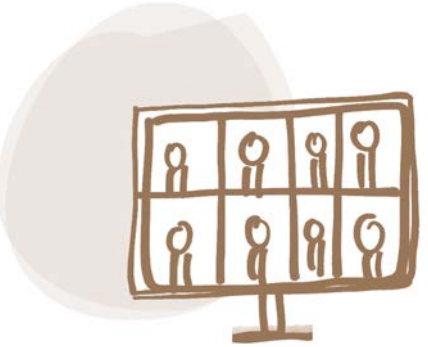
The Challenge

How to integrate display take-back in repair-service design for European markets?

(as often only the glass is broken and the display (LCD) can be easily refurbished)

Team-Members

Thorsten Rieke (Umicore)
Frank Röpke (Teleplan)
Jana Rückschloss (Fraunhofer IZM)
Marcel den Hollander (Independent designer)
Sebastian Klöß (Bitkom e.V.)
Sabine Hilscher (TU Berlin)
Carsten Waldeck (SHIFT)
Daniel Büchle (AfB)
Jörg Wissing (Gigaset)



Challenge Owner

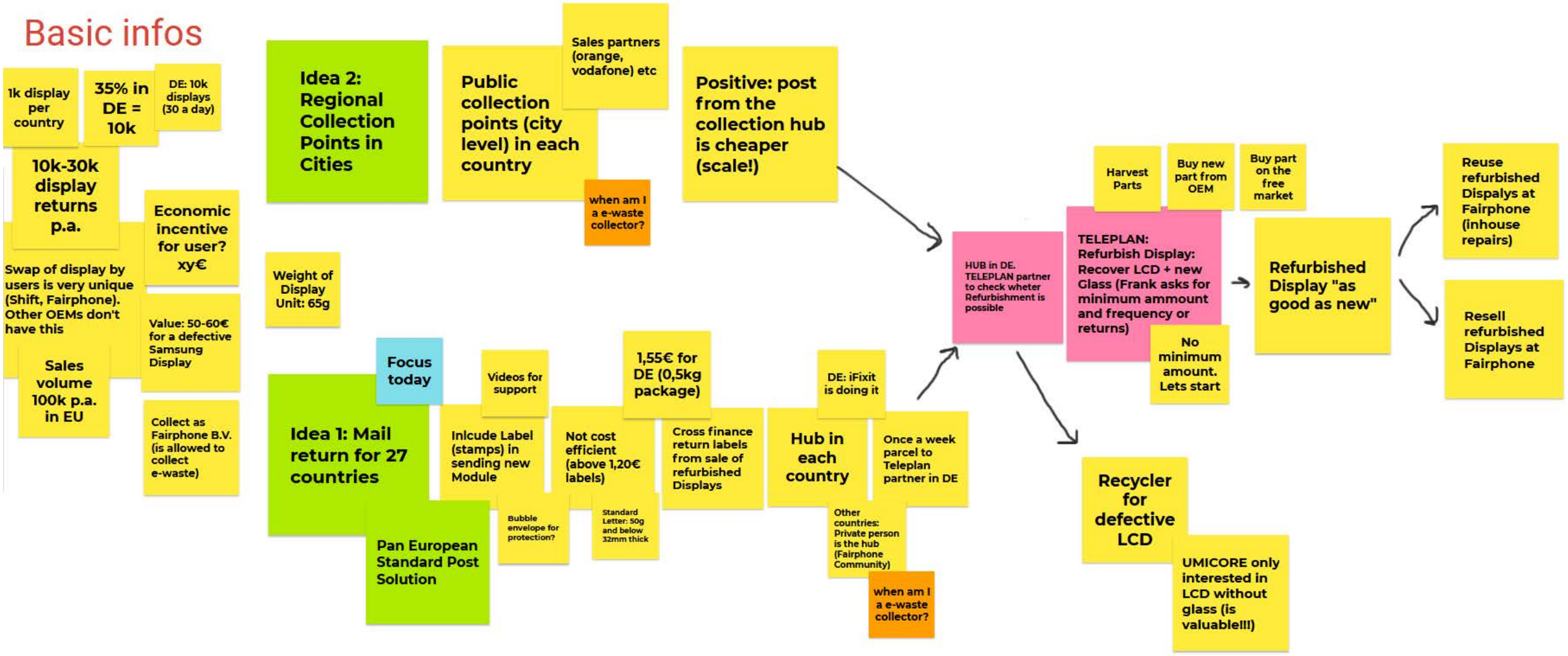
Miquel Ballester (Fairphone)

Moderation

Ferdinand Revellio (Leuphana University)

Group B

The Solution Space (Jamboard)



Group B

Key-Insights

Cracked screens are valuable!

- Brocken screens as no. 1 defect for smartphones
- Mostly the glass is cracked, LCD with valuable materials intact
- Re-sell refurbished displays in shop or use for internal repair processes

Two major solutions for efficiently returning defect displays

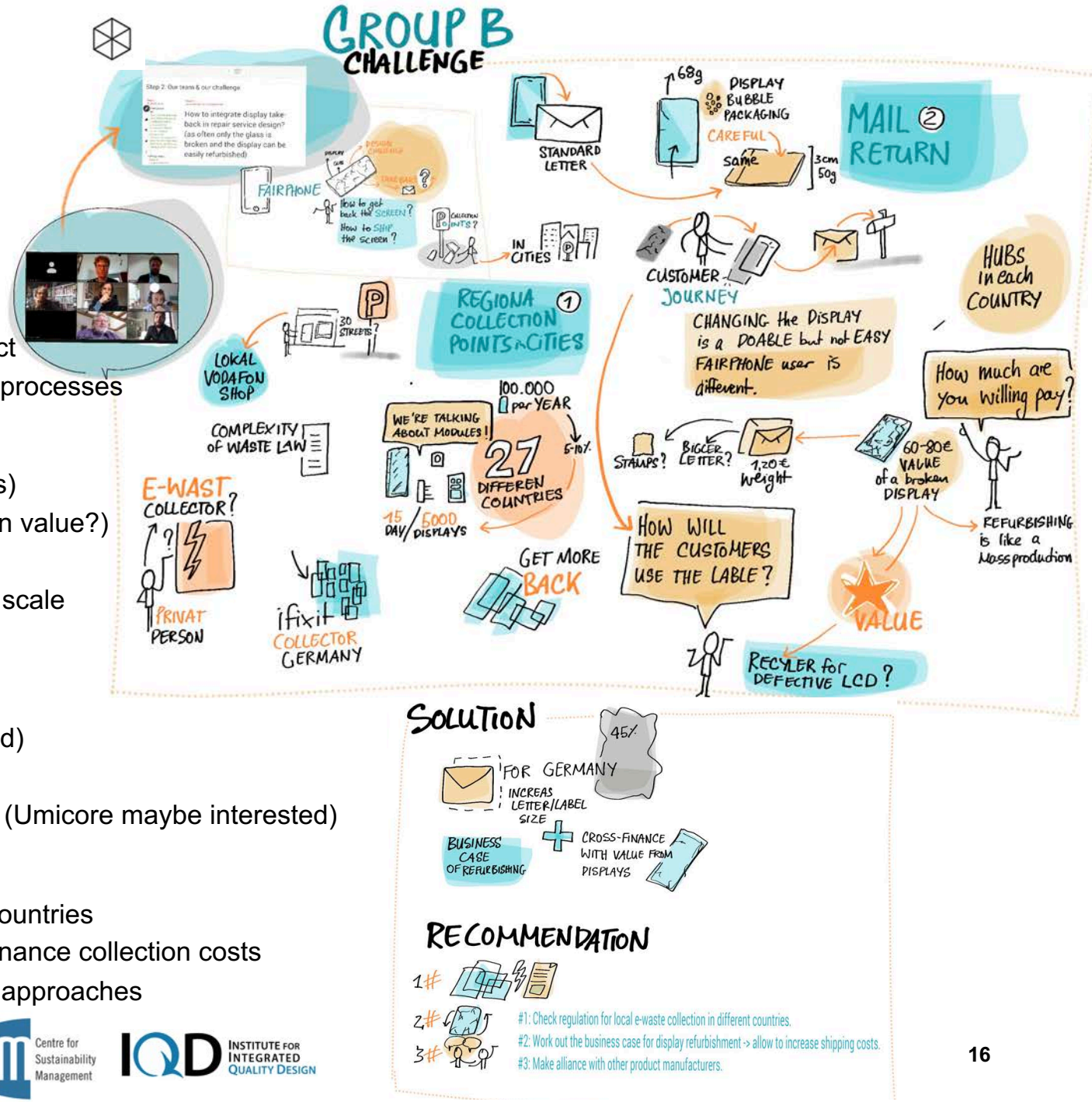
- Regional collection points (city level, e.g. telco provider shops)
- User receives return label (+additional incentive depending on value?)
- Mail return to country specific hub (pilot in Germany)
- Bulk forwarding to refurbishing facility, refurbishing is easy to scale
- Cross-finance return costs with refurbishing revenues

Challenges on the way

- Defect screens count as e-waste (although can be refurbished)
- E-waste collection laws may prohibit decentralized collection
- High-grade LCD recycling only viable if separated from glass (Umicore maybe interested)

Next steps and recommendations

→ Check regulation for local e-waste collection in different EU countries
→ Workout the business case for display refurbishing to cross finance collection costs
→ Make alliances with other product manufacturers with similar approaches



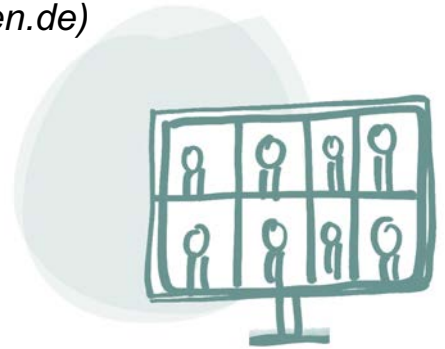
Group C

The Challenge

Wie können wir als KMU unabhängig von großen Investoren unsere Produktion auch mit einem Leasing-Modell finanzieren?

Team-Members

Andreas Beck (Samsung)
Christoph Teusch (AfB)
Ursula Weber (Rittec)
Stefan Alscher (Effizienz-Agentur NRW)
Dr. Ralf Brüning (Dr. Brüning Engineering)
Julia Wolf (Dr. Brüning Engineering)
Britta Josenhans (Akkutauschen.de)



Challenge Owner

Thomas Krause (SHIFT)

Moderation

Prof. Erik Hansen (JKU Universität Linz)

Group C

The Solution Space

Einschränkung Zielgruppe:
Produktart+Kunde.
Kleine Zielgruppe für
Testballon, um finanziellen
Aufwand gering zu halten

Stichworte:

KUNDENGRUPPEN:
- Dauerkunden / Performance-Kunden
- Digitalisierung von Schüler vs. Schulklassen

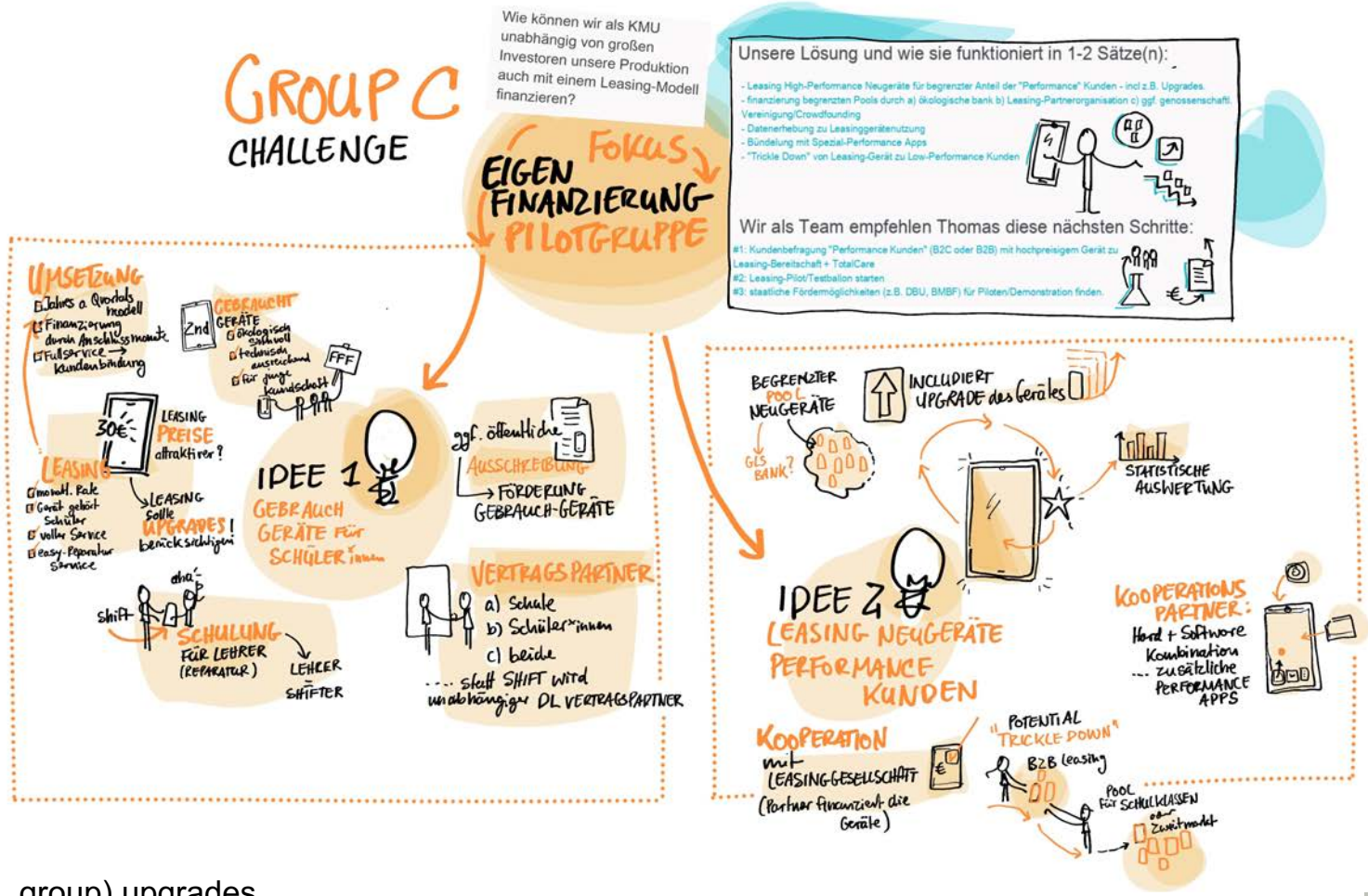
X:
SHIFTER-NETZWERK (im Aufbau/in Planung!)
Handy ist an Mitgliedschaft gekoppelt

- Was sagt die Hausbank? Noch unklar.

- Welcher GERÄTETYP: Gebrauchte retournierte Produkte stehen für Leasing-Pool zur Verfügung
- Begrenzter Zufluss von Neugeräten.

Group C

Key-Insights



How can we self-finance SHIFTPHONES-as-a-service?

Two pilot-groups identified (small scale)

- First use (leasing): new devices for performance user
- Second use (leasing): refurbished devices for students

Identify allies on the way

- Partnering with leasing-corporation
- School as service-provider (buying devices from SHIFT)
- Hardware-Software bundles (teaching/learning & high-performance apps)

More than just a usual service

- Full service (repairs etc.) + device (1. group) or module (2. group) upgrades
- Repair-workshops for teachers and students

Next steps and recommendations

- Conduct surveys targeted at both pilot-groups to identify potentials
- Testing pilots on small scale (clearly defined test-group)
- Apply for funding, e.g. DBU, BMBF

Group D

The Challenge

Who you gonna call?
Wie kann Trumpf einen geeigneten Dienstleistungs-partner für Reparaturservice und Kreislauf für ihre neuen IoT-Devices mit Infrastruktur weltweit finden?

Team-Members
Corinna Meier (GSN Corporation)
Lars Dietrichkeit (innovaphone)
Annjana Engler-Sass (Escoor Service Systems)
Marina Proske (Fraunhofer IZM)
Sebastian Stiegler (Samsung)
Robert Küchler (W-Support/KOMSA)
Frank Breuer (Akkutauschen.de)

Challenge Owner
Ebbse/ Eberhard Wahl (TRUMPF)

Moderation
Sanne/ Susanne Mira Heinz (Circular Thinking)

Group D

The Solution Space

Automatisierte Kennung: Möglicher Partner Refind (Kontakt Marina)

automatisierte Bilderkennung: www.refind.se

vielleicht macht es Sinn für die Verlässlichkeit die Funktion zu splitten: Tracking getrennt von Anzeige.

Wie könnte man z.B. der GLS Bank erklären, was durch dieses Produkt "Mehr Ressourcen" schont?

Die Telekom hat ein bestehendes System um Festnetzgeräte zu reparieren und aufzuarbeiten.

Warum "vermietet" Ihr das nicht?

SLA!

Trumpf Marker (Elektronischer Laufzettel/ oder von anderen Anbietern digitales Tag für Objekt + ipad für User)

standardisiert über omlox

Foxcon bietet doch (noch) gar keinen Dienst an! Die sind NUR Hersteller bzw. Produzent.

Noch könnte man das Gerätedesign an die automatische Reparatur und ein Mietmodell anpassen...

Wieso die Reparatur nicht automatisieren?

Reparaturwürdigkeit / Reparaturfähigkeit?

Reparaturwürdig für Drittanbieter eigentlich erst ab VK 150€ bei Technikerlohn 45-60€/h

Was ist mit diesen AfB Zertifikaten der "Nachhaltigkeit" (Vortrag Daniel Büchle)

w-support.com Reparatur & Datenrettung

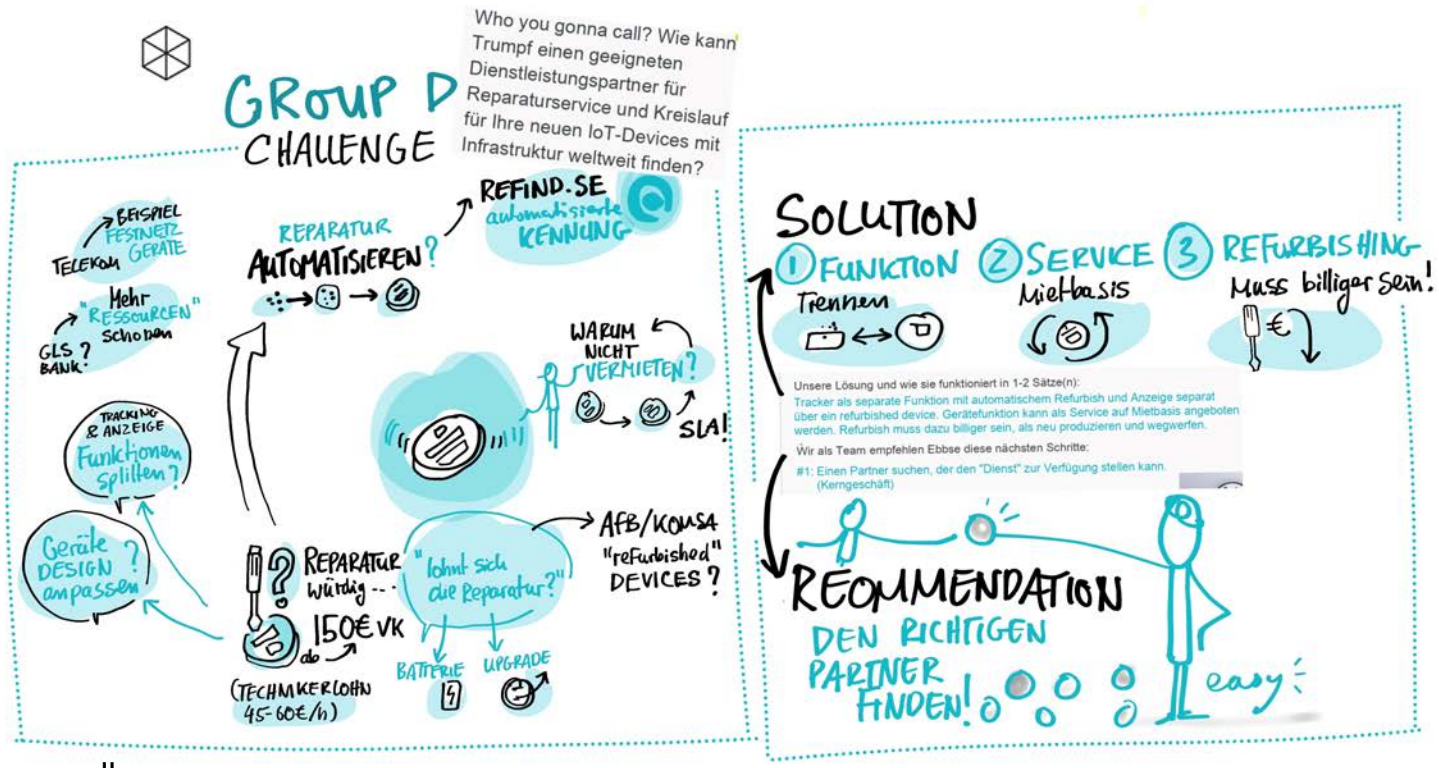
Faire Metalle?

AfB / KOMSA könnte "refurbished" Omlox fähige Devices zur Verfügung stellen

Wer hat denn hier die höchste Wertschöpfung?

Group D

Key-Insights



Initial situation

- Who can offer refurbishing and repairs worldwide?
- Repairs, battery replacement, upgrades as service
- Large volume, small device, low price

Possible solutions

- Leasing model: retain ownership of devices for collection
- Performance model: sell the solution not the device
- Are upgrades possible? New tracking technology?
- Potential partners in INaS community available, but some too small

Challenges on the way

- Refurbishing costs unknown, but definitely labor intensive if not automated
- Adapt product design to enable and facilitate upgrades/refurbishing
- Service operator must be able to process thousands of devices

Next steps and recommendations

→ Find large-scale partner that can provide the service
→ Find allies (e.g. telco operators) who also have high quantitates of equipment (modems)
→ Automation for refurbishing processes might be a viable option (adapt product design)

Figure: Exemplary IoT device for tracking in production

Workshop Summary

Increased relevance for more circular electronics and interest in INaS

With over 25 member firms in our community, INaS now includes also larger incumbent firms, such as Samsung. This growth reflects the pioneering spirit in the industry, which among others, is triggered by regulatory developments in the EU. Both the EU Green Deal and upcoming eco-design regulation for material productivity demand for more circularity.

Circular services require close alignment with the product architecture

A large variety of modular product architectures exists (visible and non-visible), each with their own characteristics and potentials for product lifetime extension. While certain architectures are optimized for user-repairs and upgrades, others specifically facilitate professional repairs. For both, environmental benefits are linked to use and reuse characteristics.

Business cases for circularity are out there, but require skilled crafting and strong partners

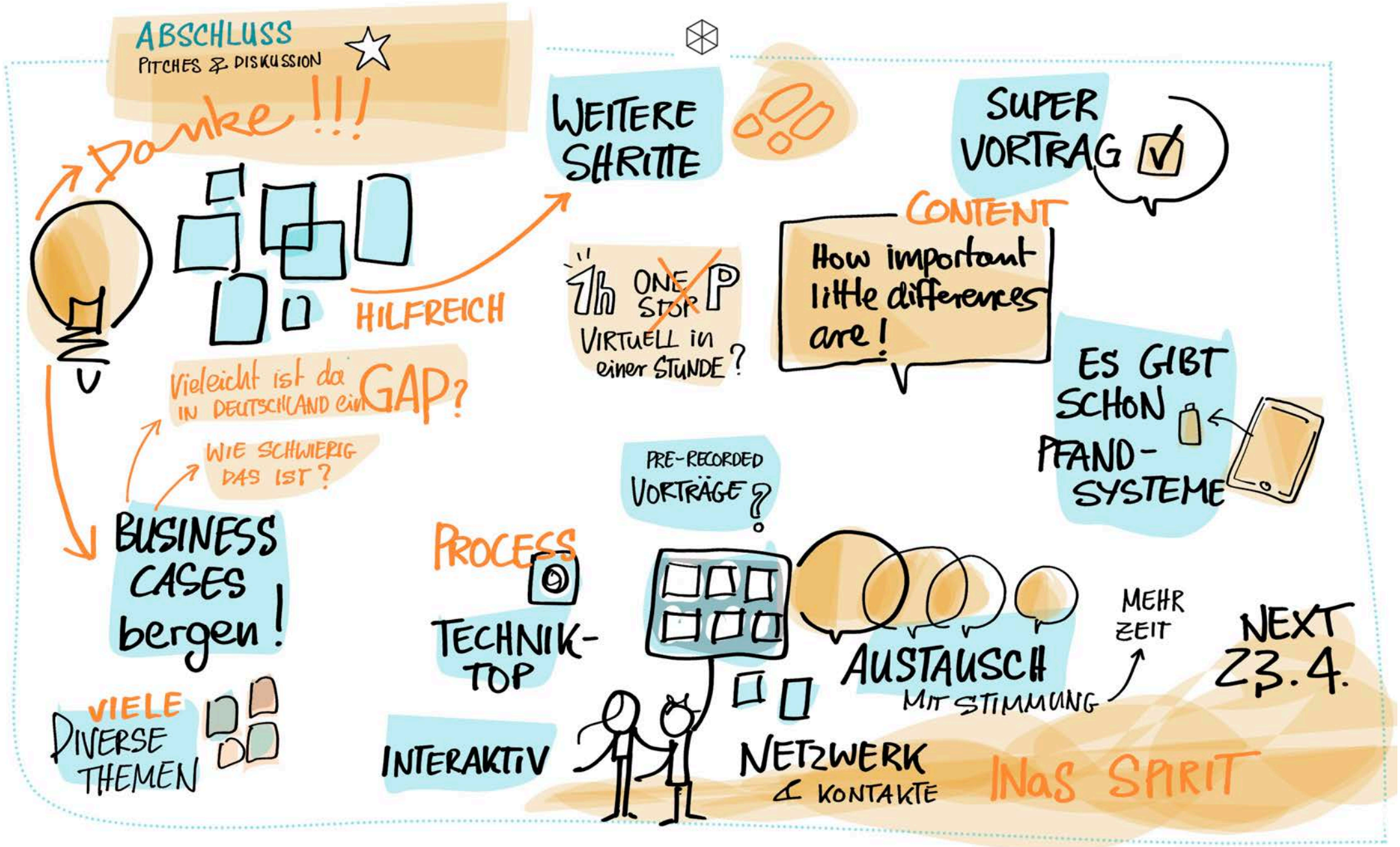
Circular business cases require carefully crafted pilots, as they have impacts on multi facets of conventional business. It seems that scaling may be tricky due to missing infrastructure. Make-or-buy (or anything between) of these circular activities is a strategic question for most OEMs. We currently observe a trend towards developing allies with new market entrants or established specialists, as seen with Samsung's announcement to invest in electronics rental firm Grover.

INaS as a platform for circular electronics

„Together we are stronger": over the years INaS developed towards a vivid community for pioneers and established actors embarking towards circularity. As partnerships become more important INaS acts as a community manager.

Interactive digital meetings also have advantages

Digital meetings reduce transaction costs and facilitate participation for a wider audience. However it does not replace personal interaction and networking, so urgently needed in a circular economy. Looking forward to our onsite workshop.


ABSCHLUSS
PITCHES & DISKUSSION
Danke !!!
WEITERE SHRITTE
SUPER VORTRAG
CONTENT
How important little differences are!
HILFREICH
1h ONE STOP VIRTUELL in einer STUNDE?
ES GIBT SCHON PFAND-SYSTEME
Vielleicht ist da IN DEUTSCHLAND ein GAP?
WIE SCHWIERIG DAS IST?
PRE-RECORDED VORTRÄGE?
BUSINESS CASES bergen!
PROCESS
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AUSTAUSCH
MIT STIMMUNG
MEHR ZEIT
NEXT 23.4.
VIELE DIVERSE THEMEN
INTERAKTIV
NETZWERK & KONTAKTE
INAS SPIRIT

See you on 23rd April 2021 @Leuphana University Lüneburg (on-site, or hybrid)

MoDeSt

AP 1 | AP 2 | AP 3 | AP 4 | AP 5

INaS 2.0 – Workshop series

Experimentelles Anwenden

Workshop I
30. Januar 2020, Lüneburg
Business Opportunities for Sustainable Modular Product Designs

Workshop II
2. Oktober 2020, online
New **Service Opportunities** through Sustainable Modular Product Design

Workshop III
23. April 2021, Lüneburg
Circular Business Models Enabled by Sustainable Modular Product Design

Bleiben Sie mit uns in Kontakt!

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Das **Centre for Sustainability Management (CSM)** der Leuphana Universität Lüneburg unter Leitung von Prof. Dr. Stefan Schaltegger ist ein international führendes Kompetenzzentrum zu Forschung, Lehre, wissenschaftlicher Weiterbildung und Transfer in den Bereichen unternehmerisches Nachhaltigkeits-management, Corporate Social Responsibility (CSR) und Sustainable Entrepreneurship.

Das **Institute for Integrated Quality Design (IQD)** der Johannes Kepler Universität Linz unter Leitung von Prof. Dr. Erik Hansen ist ein interdisziplinäres Forschungs- und Lehrinstitut mit Fokus auf die Schnittstelle Qualität, Innovation und Zirkulärwirtschaft. Erik Hansen ist wissenschaftlicher Leiter der Arbeitsgruppe „Zirkuläre Geschäftsmodelle“ der Circular Economy Initiative der acatech (Deutsche Akademie der Technikwissenschaften).

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