

INAS 2.0 SUMMARY & DOCUMENTATION

**Workshop 3:
“Circular Business Models Enabled Through Modular Design”**

**23. April 2021, Leuphana Universität Lüneburg (online)
Authors: Ferdinand Revellio, Clara Amend, Erik G. Hansen, and Stefan Schaltegger**



Table of Contents

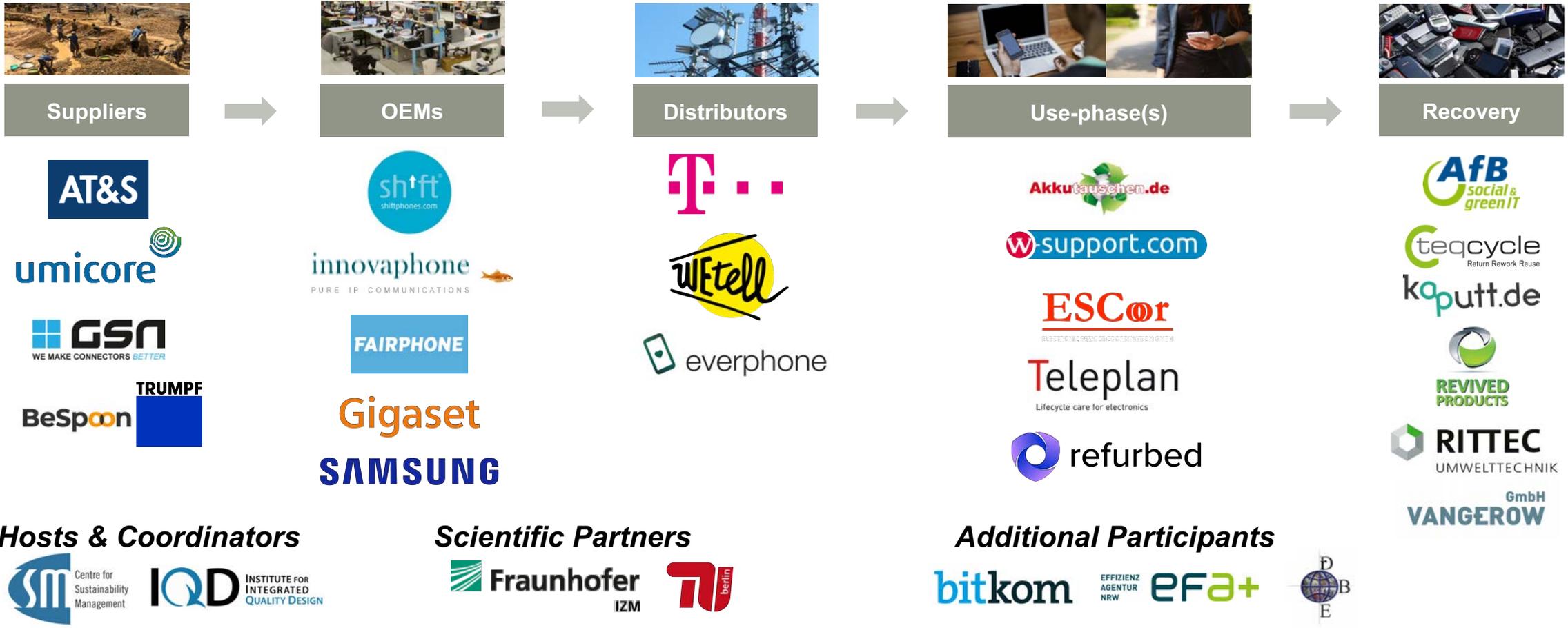
Participants & Agenda	3
Introduction 3rd Workshop	5
Input	6
Ferdinand Revellio (CSM)	
Impulses	
Prof. Florian Lüdeke-Freund (ESCP Berlin)	7
Jan Dzulko (everphone GmbH)	8
Creativity Sessions	
Overview	9
Group A: (INaS)	10
Group B: (AfB)	13
Group C: (Telekom/Vangerow)	16
Group D: (Teleplan/Teqcycle)	19
Summary and Outlook	22

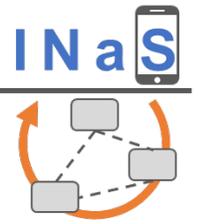




Overview of Participating Organisations

Firms along the Smartphone Value Chain





AGENDA 23. April 2021 (9:00-12:30 h)

Circular Business Models Enabled Through Modular Design

ab 8:30 Uhr Registrierung & Technikcheck

START

09:00 – 09:35 Willkommen & Einführung
Prof. Dr. Dr. h.c. Stefan Schaltegger (CSM) & Prof. Dr. Erik G. Hansen (IQD)

INaS-Rückblick: *Ferdinand Revellio (CSM & IQD)*
Speed-dating: Break-Out Sessions

IMPULSE NEW BUSINESS MODELS

09:35 – 10:15 «The Role of Business Models»
Prof. Dr. Florian Lüdeke-Freund (ESCP Berlin)
«Phone-as-a-Service im B2B»
Jan Dzulko (everphone GmbH)
Moderation: *Ferdinand Revellio (CSM & IQD)*

10:15 – 10:30 Kaffeepause [offline, Zoom-Raum bleibt offen]

KREATIV

10:30 – 11:45 Teamarbeit in Break-Out Sessions mit *Google Slides*
Arbeiten an Herausforderungen von TN & 'INaS GmbH'
Moderation: *Team-Coaches aus dem INaS-Team*

11:45 – 11:50 Pause [offline, Zoom-Raum bleibt offen]

ABSCHLUSS

11:50 – 12:30 Pitches & Abschlussdiskussion
Erik G. Hansen (IQD) & Stefan Schaltegger (CSM)
Ausblick & Forschungsanträge
Clara Amend (CSM)

OPTIONAL

12:30 – 13:30 **BROWN-BAG*: PEER-TO-PEER MARKTPLATZ**
Aktuelle Herausforderungen im Unternehmen in
Break-Out Sessions diskutieren, frei wählbar
**eignes Mittagessen mitnehmen*



Introduction

Focus and Goals of 3rd Workshop INaS 2.0

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

Our starting point (from Workshop I & II)

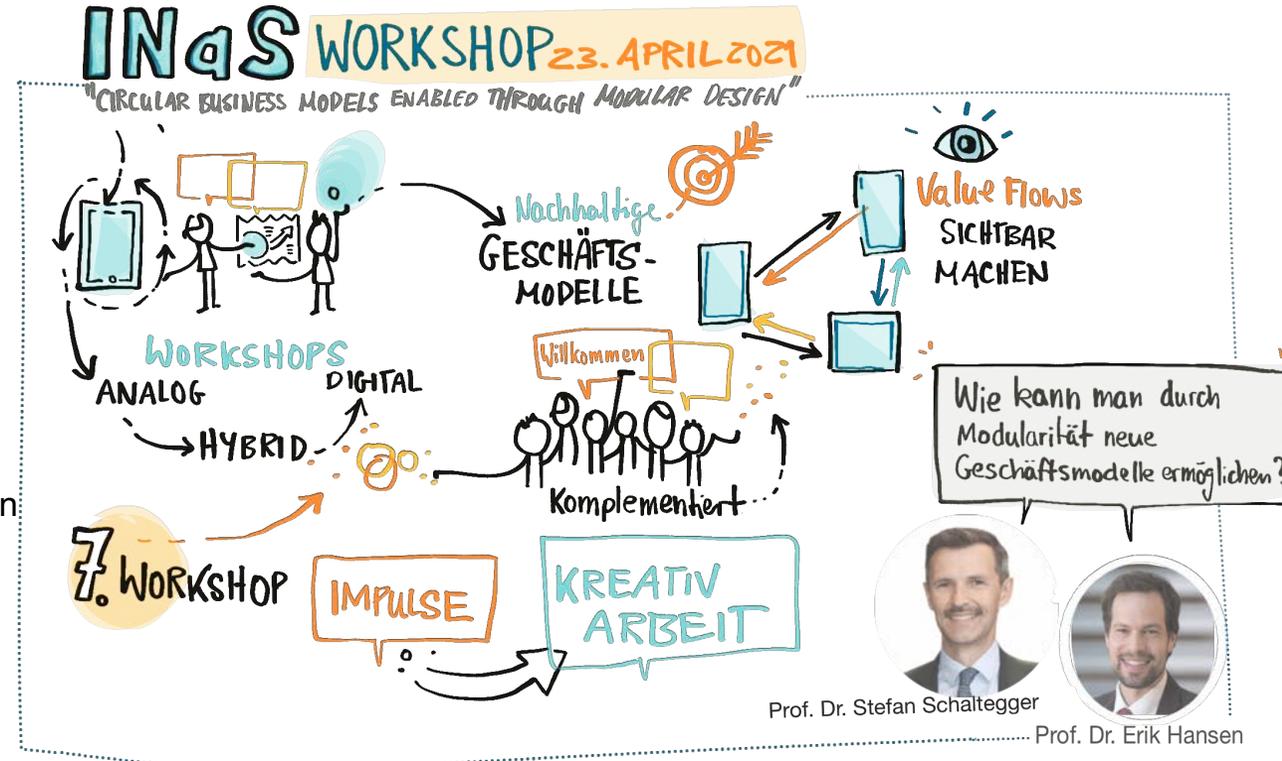
- Modular product designs are not automatically more sustainable → „modularity overhead“, extra consumption → depends on use
- Complementary services are necessary & must match product design
- Business cases for circularity have potential, but require a strategic approach and strong partners

Goals of today:

- How can modularity support circular business models?
- Networking, interconnecting previously unknown actors
- Food-for-thought from impulses and teamwork

Agenda Highlights

- Brief review of INaS-community and PhD journey *Ferdinand Revellio*
- Academic impulse by *Prof. Dr. Florian Lüdeke-Freund* (ESCP Berlin)
- Best-Practice example by *Jan Dzulko* (everphone GmbH)
- Group-work on INaS-member challenges for business models



INaS Key Facts

- Founded in 2016, second round INaS 2.0 started in 2019
- So far seven workshops in Lüneburg and online
- Over 30 participants from organizations along the whole smartphone value chain



Input – Ferdinand Revellio, CSM & IQD

INaS research journey and key insights PhD-project

Managing Product Circularity

- Implementing circular business models requires a strategic approach
- Circular service operations (CSO) as complementary strategic offers
- Covering key circular loops: repair, reuse, refurbish, recycle
- Trend towards vertical integration and strategic partnerships for CSO

Actor perspective on Circular Economy is key

- A number of emerging circular actors in the market challenge the status quo
- Who takes over what role and where to collaborate with 3rd parties?
- Investigated strategic question of “make-or-buy” for OEMs and retailers
- This resulted in a typology of Circular Value Creation Architectures (CVCA)
- Service providers take over key role as central coordinators in the value cycle

Open and Closed Circularity

- *Open circularity* allows for distributed service ecosystems to involve independent circular complementors and pooling approach for products and components
- *Closed circularity* takes maximum advantage of vertical integration and efficient circular systems, but may lead to circular monopolies

A big Thank You to all INaS members

- INaS members provided greatly acknowledged input in form of interviews, data, site visits, and informal conversation within and beyond INaS workshops



Key Publications

- Hansen, E. G. and F. Revellio. 2020. *Circular Value Creation Architectures: Make, ally, buy, or laissez-faire*. Journal of Industrial Ecology 24(6): 1250–1273. [Open Access](#)
- Revellio, F., L. Shi, E. G. Hansen, and M. R. Chertow. 2020. *Sustainability Paradoxes for Product Modularity: the case of smartphones*. Electronics Goes Green 2020+, Berlin. IEEE Xplore. [Download here](#)
- Zufall, J., S. Norris, S. Schaltegger, F. Revellio, and E. G. Hansen. 2020. *Business model patterns of sustainability pioneers - Analyzing cases across the smartphone life cycle*. Journal of Cleaner Production (244): 1–15. [Request Access here](#)



Keynote – Prof. Dr. Florian Lüdeke-Freund, ESCP Berlin

„The Role of Business Models“

Circular value network actors as agents between product design and business model

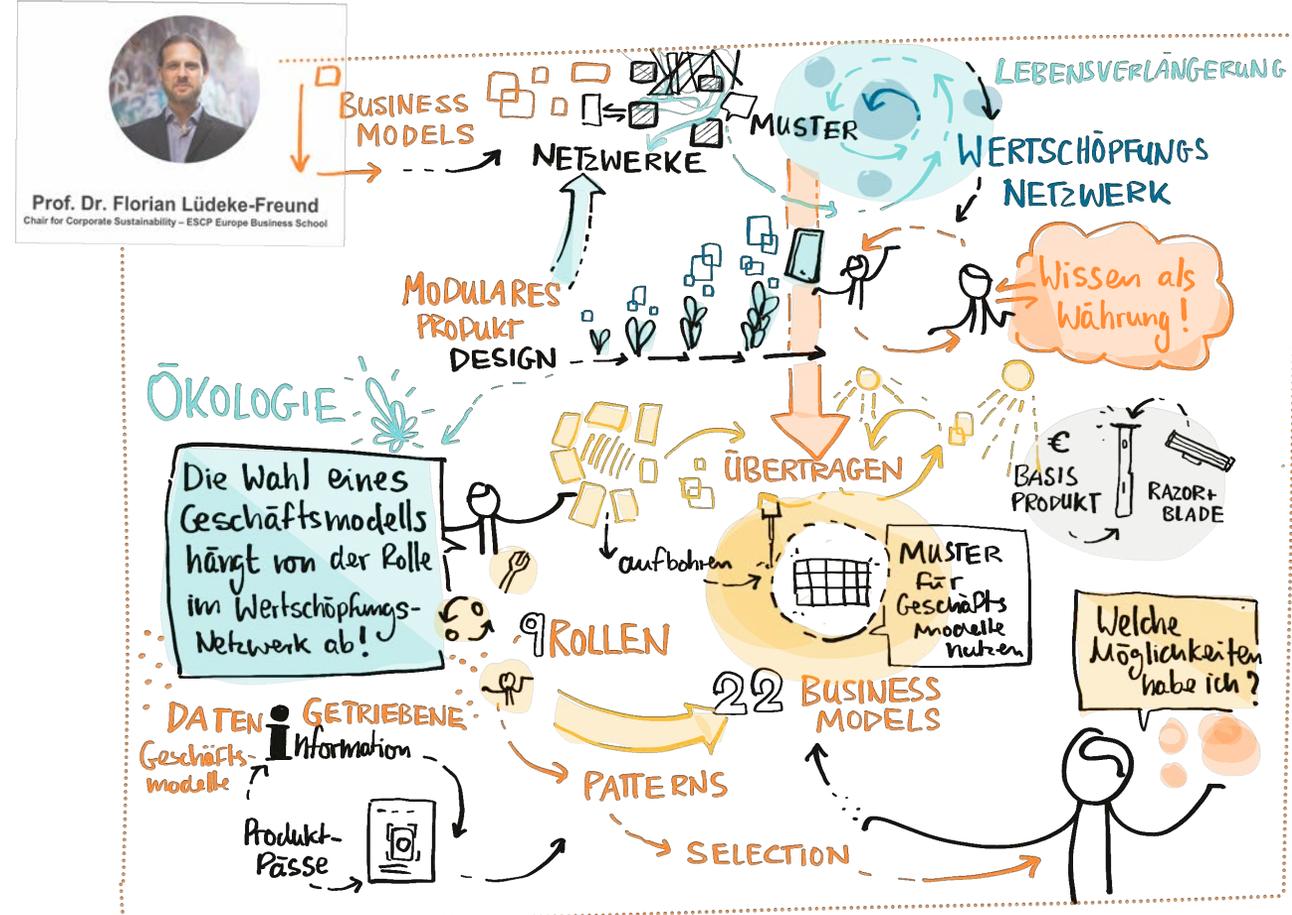
- Who is needed to turn product design into circular value networks?
- Which business models allows actors to participate in circular value networks?
- Each actor's choice is unique and relates to other actors' choices → "ecology of business models"

Various CBM patterns and pattern systems are available

- Example: razor and blade (Nespresso) vs. green razor and blade (Sodastream)
- Circular business model patterns differ in terms of circular strategy, actor role, and service level (stemming from acatech Report)
- Choice of business model pattern depends on approach to modular product design, value network position, and value creation and capture goals of each individual value network actor

Discussion

- Green Razor & Blade approach for modular tools: handle stays with customer → offer basic handle at attractive price and changeable heads at extra-price; ask yourself what is the user's price advantage compared to a new purchase
- Importance of knowledge transfer (user data, product passports) → is it a mindset question?



Impulse – Jan Dzulko, everphone GmbH

Circular Economy

B2B market focus (phones-as-a-service)

- everphone GmbH provides smartphones on a fee basis
- Key to success: everphone owns devices, only provisions licence to use
- End-users (employees) expect high service level (from IT department)

The problem/solution

- Short initial use-times limited to first user (usetime = lifetime)
- Low recovery rates of hibernated devices at B2B IT-departments
- Business devices additionally to private phone (no MDM utilized)
- Traditionally, all actors in the value chain, not only OEMs, have incentives to sell more devices and promote use-times of two years

High sustainability and circularity potentials

- everphone has an intrinsic incentive to keep value on highest level
- Choose-your-own-device with co-payment leads to efficient use
- Currently everphone doubles lifetimes from 2 to 4 years (more than 1 user)
- Modular product design key to radically increase lifetimes (goal 8-10 years)
- This requires high quality devices, initial sales prices becoming less relevant

Discussion

- Missing software support is limiting factor for product lifetime (security patch)
- Chipset manufacturers and Android updates as bottleneck



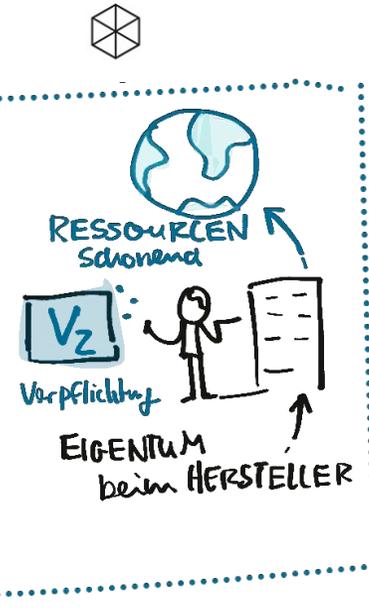
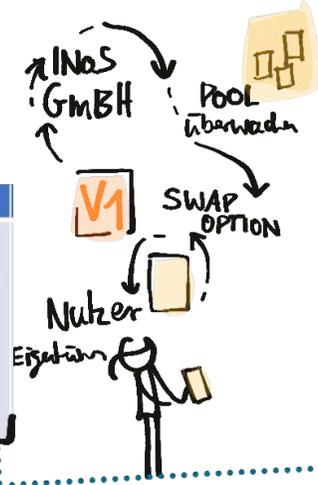
everphone GmbH

- Founded 2016 by Jan Dzulko
- Initial problem situation: un-used but new smartphones went to draw
- Steady growth of devices: first year 500, today 55.000 and growing
- Equity investments among others from Telekom AG

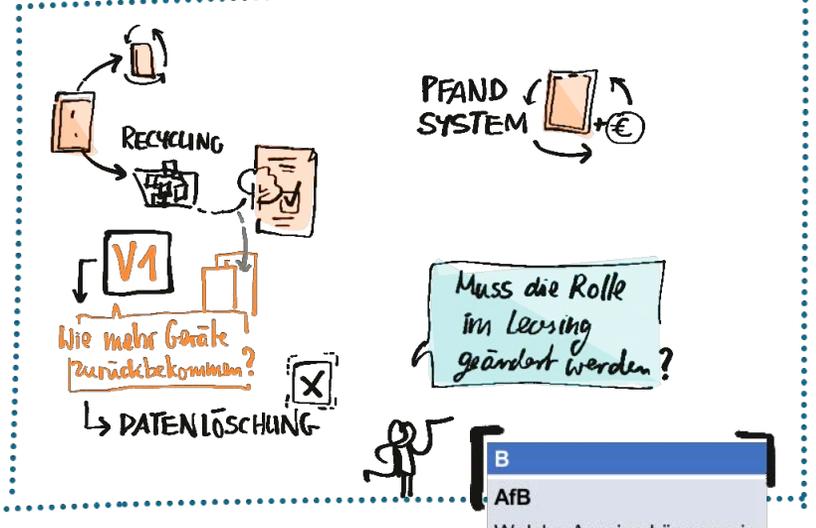
Group-Work in Breakout Sessions

A INaS

A
INaS
Wie können wir gemeinsam eine Plattform für die Optimierung des Smartphone-Lebenszyklus gestalten?
Value Delivery

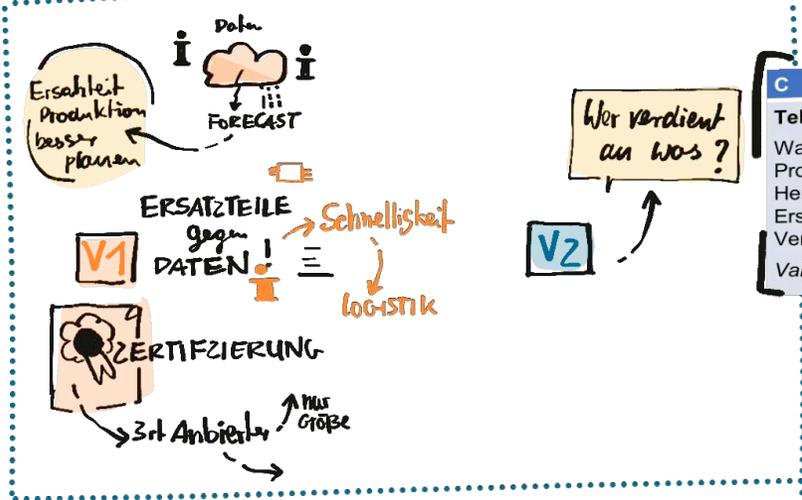


B AFB



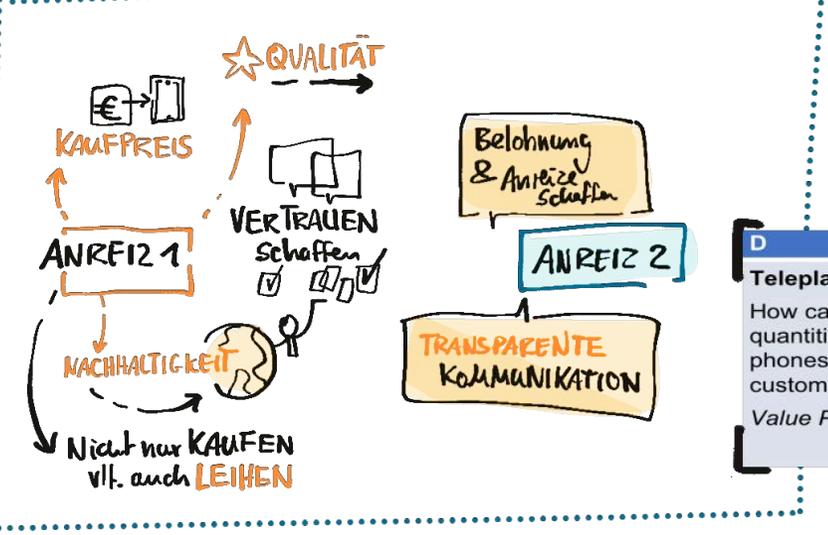
B
AFB
Welche Anreize können wir Unternehmen bieten, ihre Alt-Geräte in einen Kreislauf zurückzugeben?
Value Proposition

C TELEKOM/VANGEROW



C
Telekom/Vangerow
Was können Service-Provider bieten, damit Hersteller eine adequate Ersatzteilverfügbarkeit zur Verfügung stellen?
Value Capture

D TELEPLAN/TEQCYLE

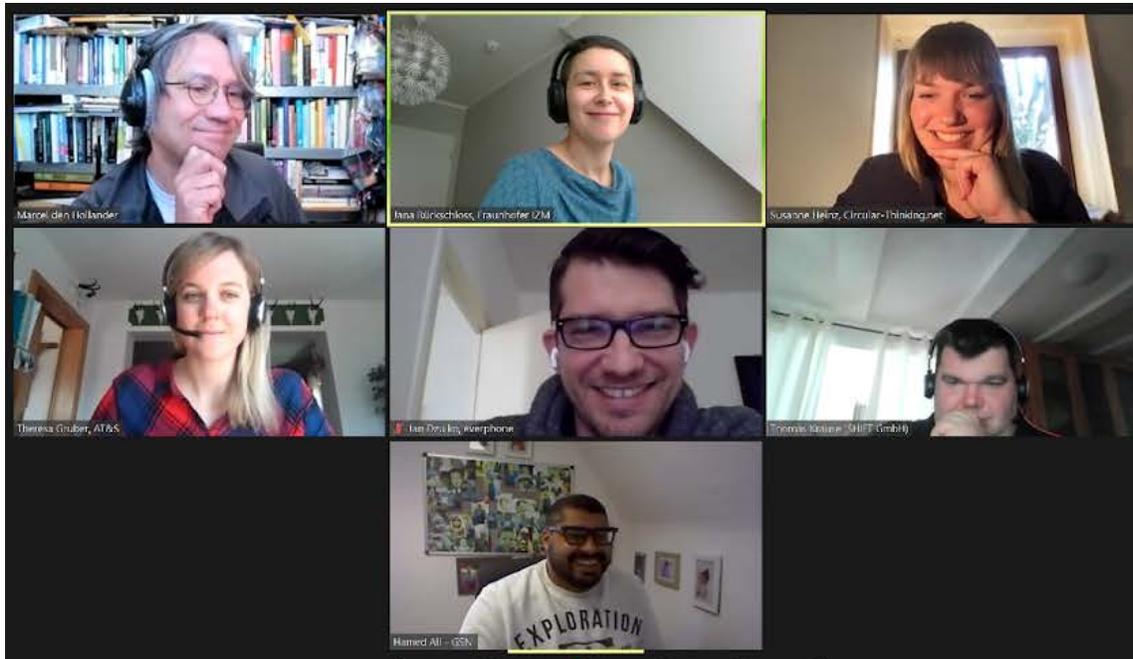


D
Teleplan/Teqcycle
How can we sell large quantities of refurbished phones to private customers?
Value Proposition



The Challenge

Wie können wir gemeinsam eine Plattform für die Optimierung des Smartphone-Lebenszyklus gestalten?



Team-Members

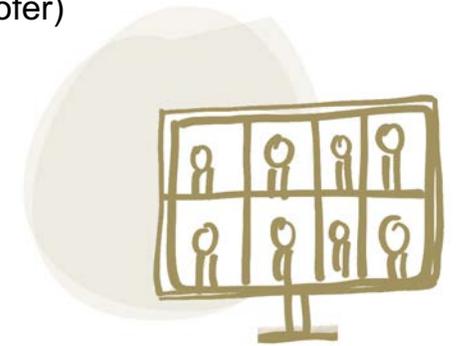
- Daniel Büchle (AfB)*
- Hamed Ali (GSN)
- Jan Dzulko (everphone)
- Jana Rückschloss (Fraunhofer)
- Marcel den Hollander
- Theresa Gruber (AT&S)
- Thomas Krause (SHIFT)

Challenge Owner

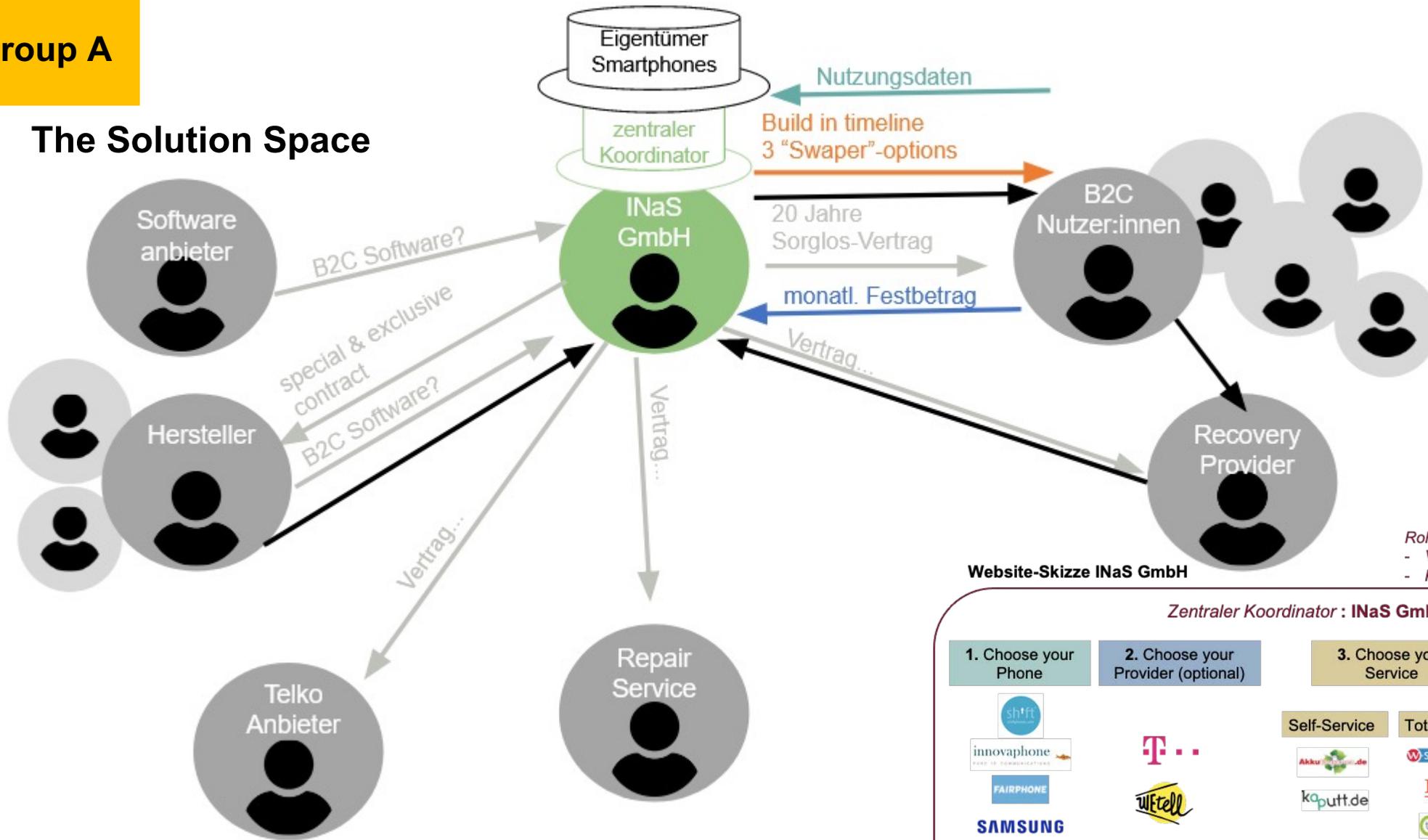
INaS

Moderation

Sanne/ Susanne Mira Heinz (Circular Thinking)



The Solution Space



Rolle zentraler Koordinator?
 - Vermittler (Verträge mit Akteuren)
 - Kauf und Weitergabe

Website-Skizze INaS GmbH

Zentraler Koordinator : INaS GmbH

1. Choose your Phone kaufen leihen	2. Choose your Provider (optional) 	3. Choose your Service Self-Service: Akku, kaputt.de Total-Care: wsupport.com, ESCor, teacycle Forward Trade-in: Teleplan, refurbid Pfand: AFB, REVIVED PRODUCTS	4. Choose your Recovery option
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Key-Insights

How to design a joint platform aiming at product lifetime extension for smartphones?

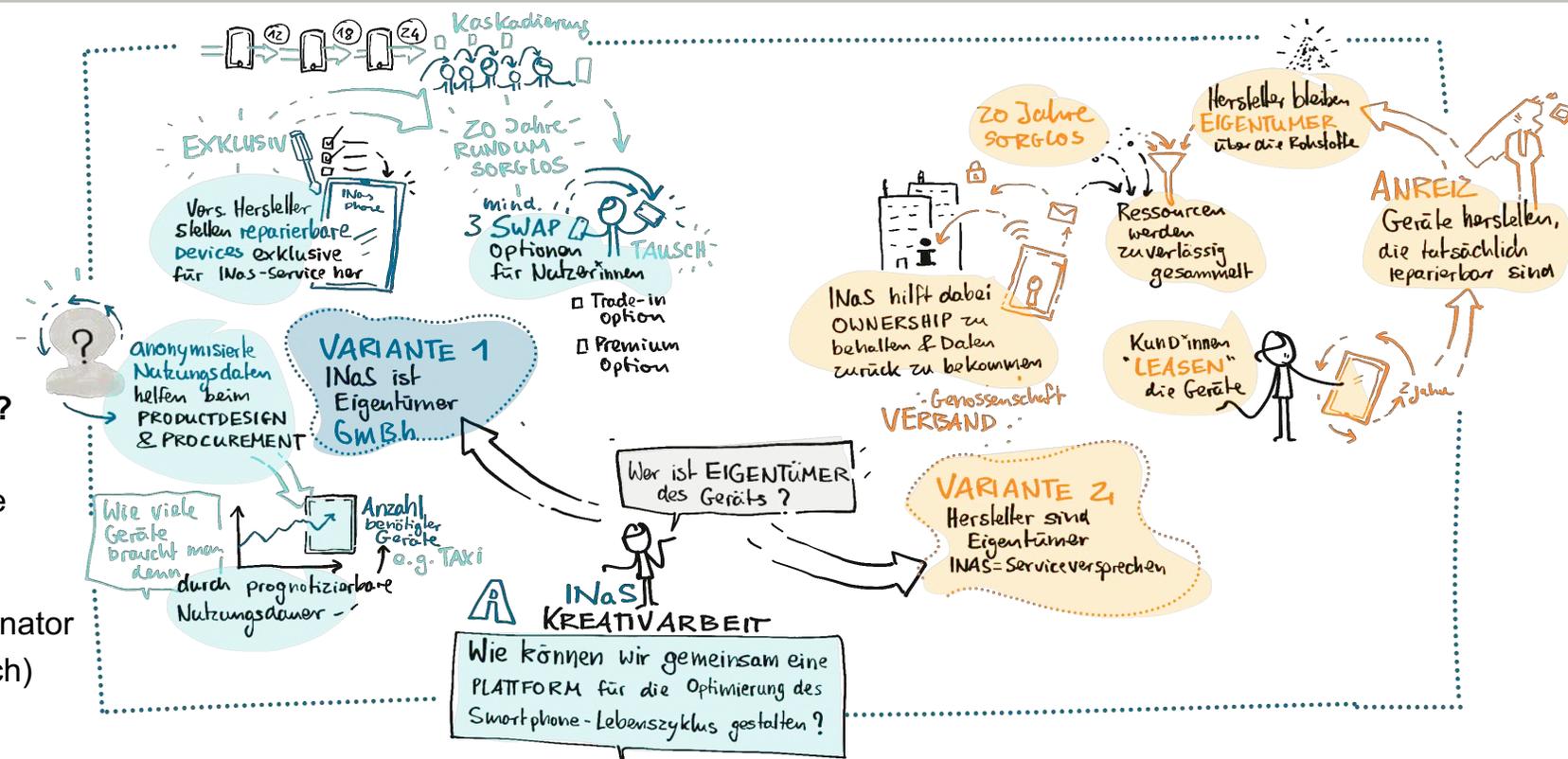
- INaS members cover all relevant roles
- Provocative goal: reaching 20 years lifetime

First solutions

- INaS GmbH is owner of devices and coordinator
- Full-service contract to end-users (one touch)
- Exclusive devices which are adapted to INaS services
- Cascading approach: subsequent multiple users for one device
- End-users receive new or refurbished phone (not relevant)
- Premium service: Four times a year swapping a phone
- Use data helps to optimize product design towards durability and forecast device management in pool

Outlook

- Customize service plan to product lifetime stage
- Cascading model as promising approach to decouple product usetime and lifetime



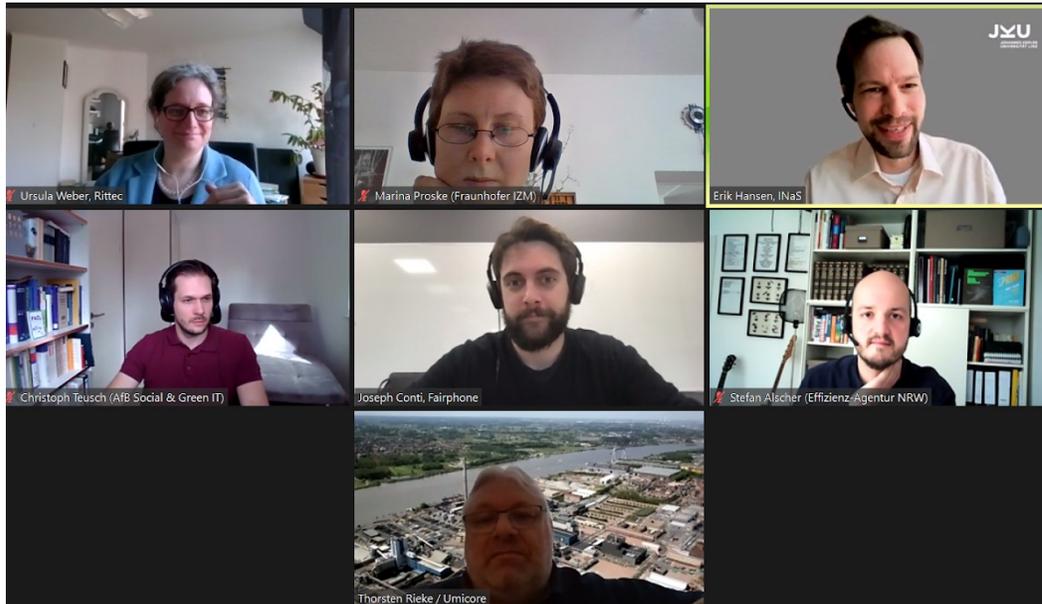
Second solution

- OEMs remain ownership of devices and incorporated materials
- INaS as central coordinator is organized as a cooperative/association
- OEMs lease their devices to INaS long-term
- INaS provides end-users with a total-care service offer over 20 years
- Repair and use statistics are shared with OEM, this provides incentives for OEMs to adapt design towards circularity
- OEM remains ownership on materials, reducing supply risks



The Challenge

Welche Anreize können wir Unternehmen bieten, ihre Alt-Geräte in einen Kreislauf zurückzugeben?



Team-Members

Christoph Teusch, Fiona Jäger (Afb)

Cornelia Szyszkowitz (Telekom)

Joseph Conti (Fairphone)

Marina Proske (Fraunhofer)

Niklas Meyer-Breitkreutz (Bitkom)

Stefan Alscher (Effizienz-Agentur NRW)

Thorsten Rieke (Umicore)

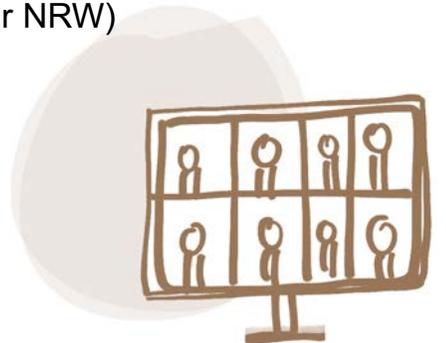
Ursula Weber (Rittec)

Challenge Owner

Afb

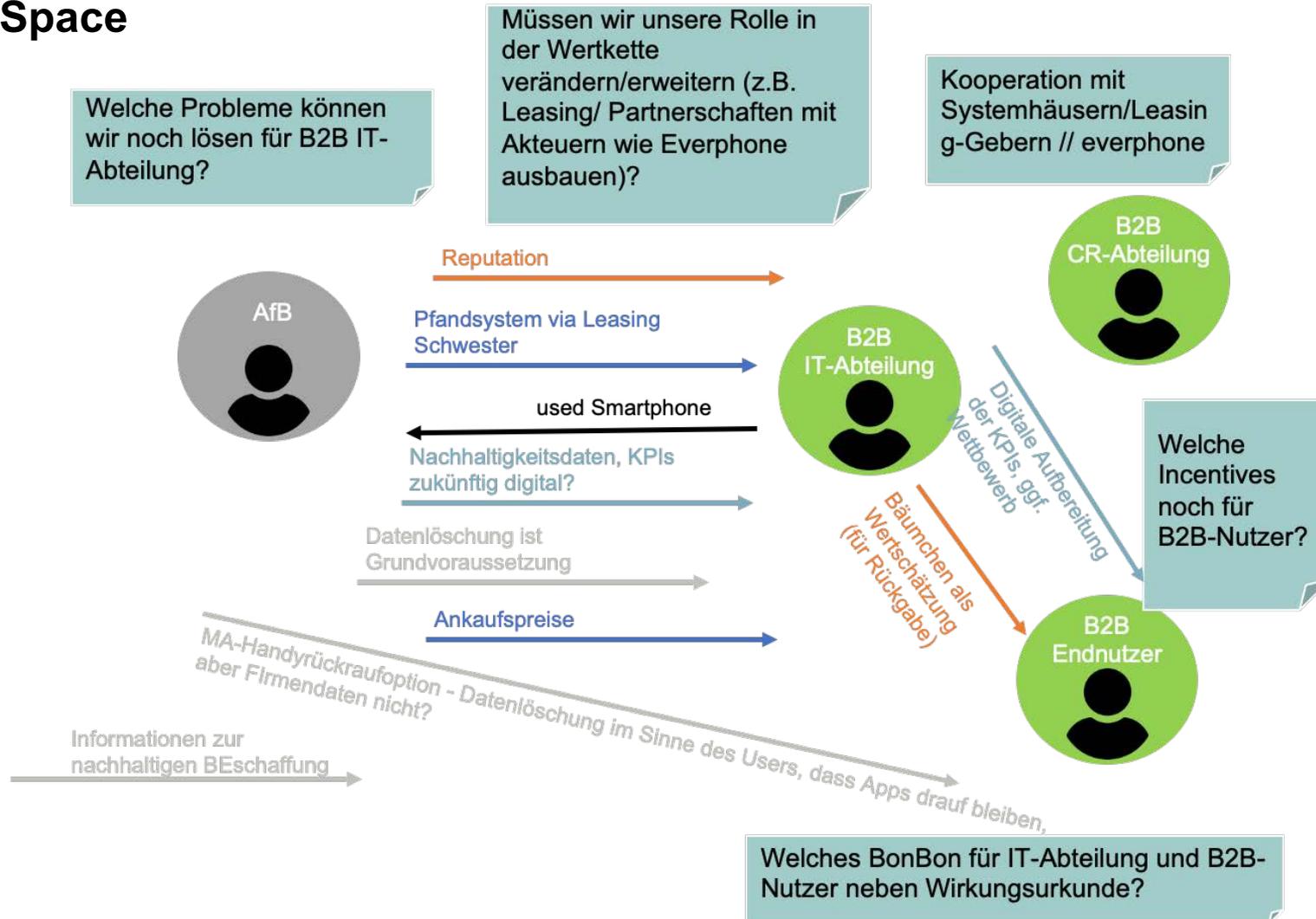
Moderation

Prof. Erik G. Hansen (JKU Universität Linz)





The Solution Space



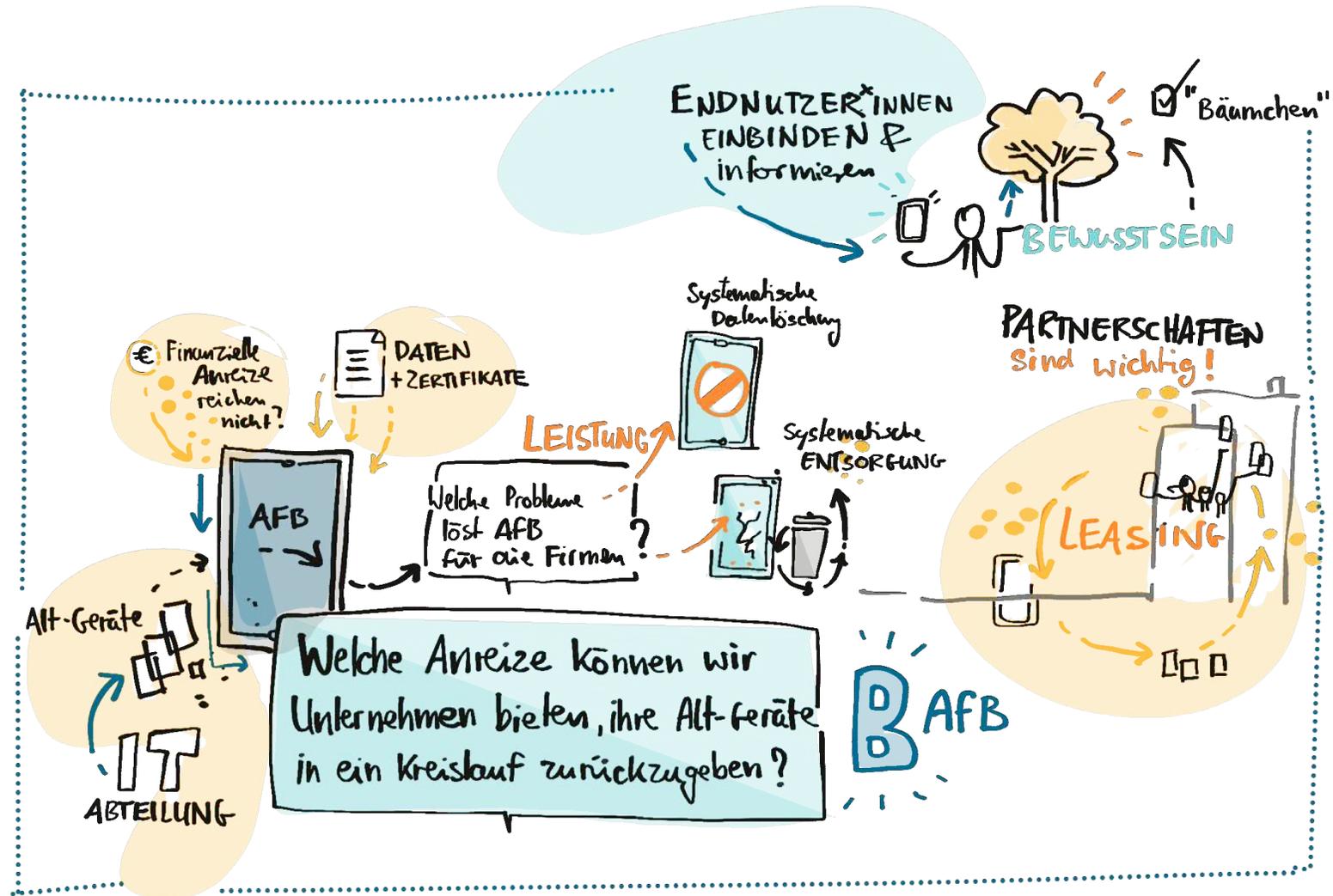
Key-Insights

Purely monetary incentives not sufficient for returning devices → others pay more (e.g. for export to China)

- Highlight unique services and usage of systematic data deletion and disposal
- Involving end-users via information sharing, digitalizing and communicating KPIs
- Sustainability certificates, e.g. "green tree", visualized digitally, showing users their contribution of returning (well-maintained) device

Towards a leasing business model and stronger partnerships

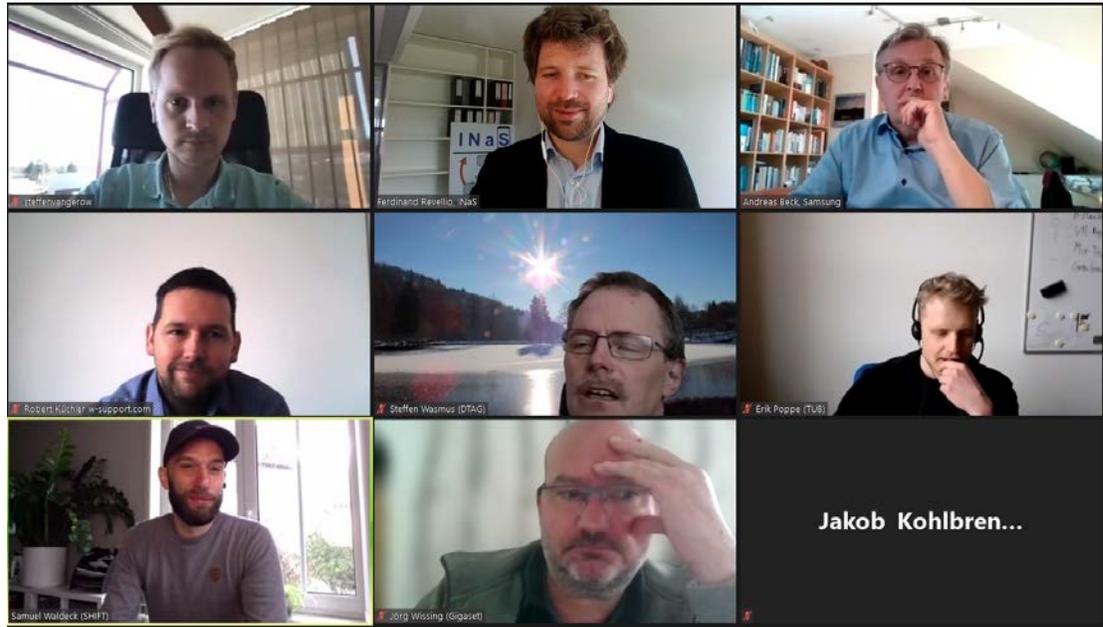
- Own leasing department too small → partnering with companies such as everphone
- Allows to influence value chain from procurement onwards
- Alignment of communication between departments/actors, i.e. user, CR, IT, and procurement, is key for success





The Challenge

Was können Service-Provider bieten, damit Hersteller eine adäquate Ersatzteilverfügbarkeit zur Verfügung stellen?



Team-Members

Steffen Vangerow (Vangerow)

Steffen Wasmus (Telekom)

Andreas Beck (Samsung)

Erik Poppe (TUB)

Jörg Wissing (Gigaset)

Robert Küchler (w-support)

Samuel Waldeck (SHIFT)

Tobias Kronawitter (kaputt.de)

Challenge Owner

Telekom/Vangerow

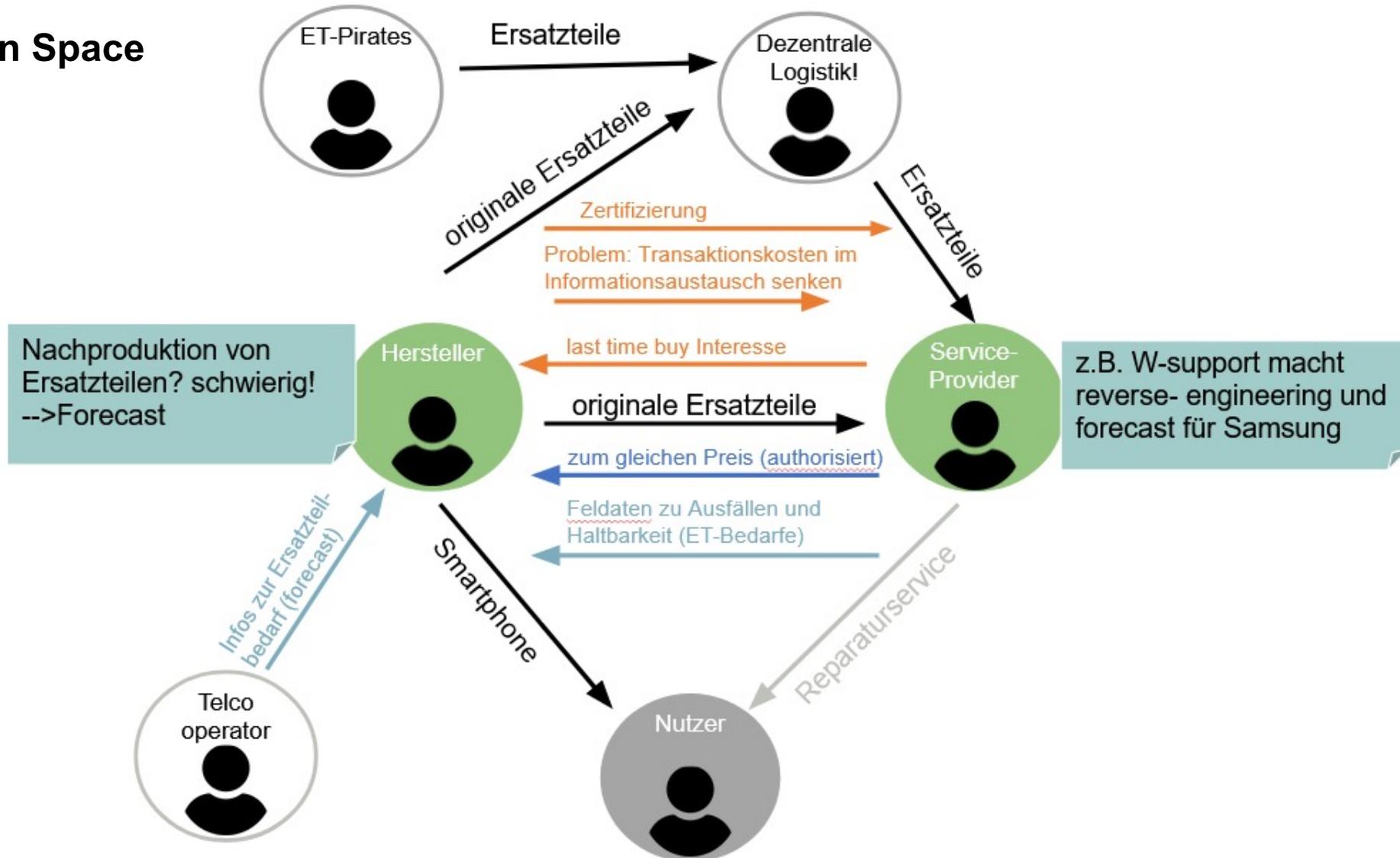
Moderation

Ferdinand Revellio (CSM & IQD)





The Solution Space



Key-Insights

What may circular service provider have to offer to OEMs in return for adequate spare parts supply?

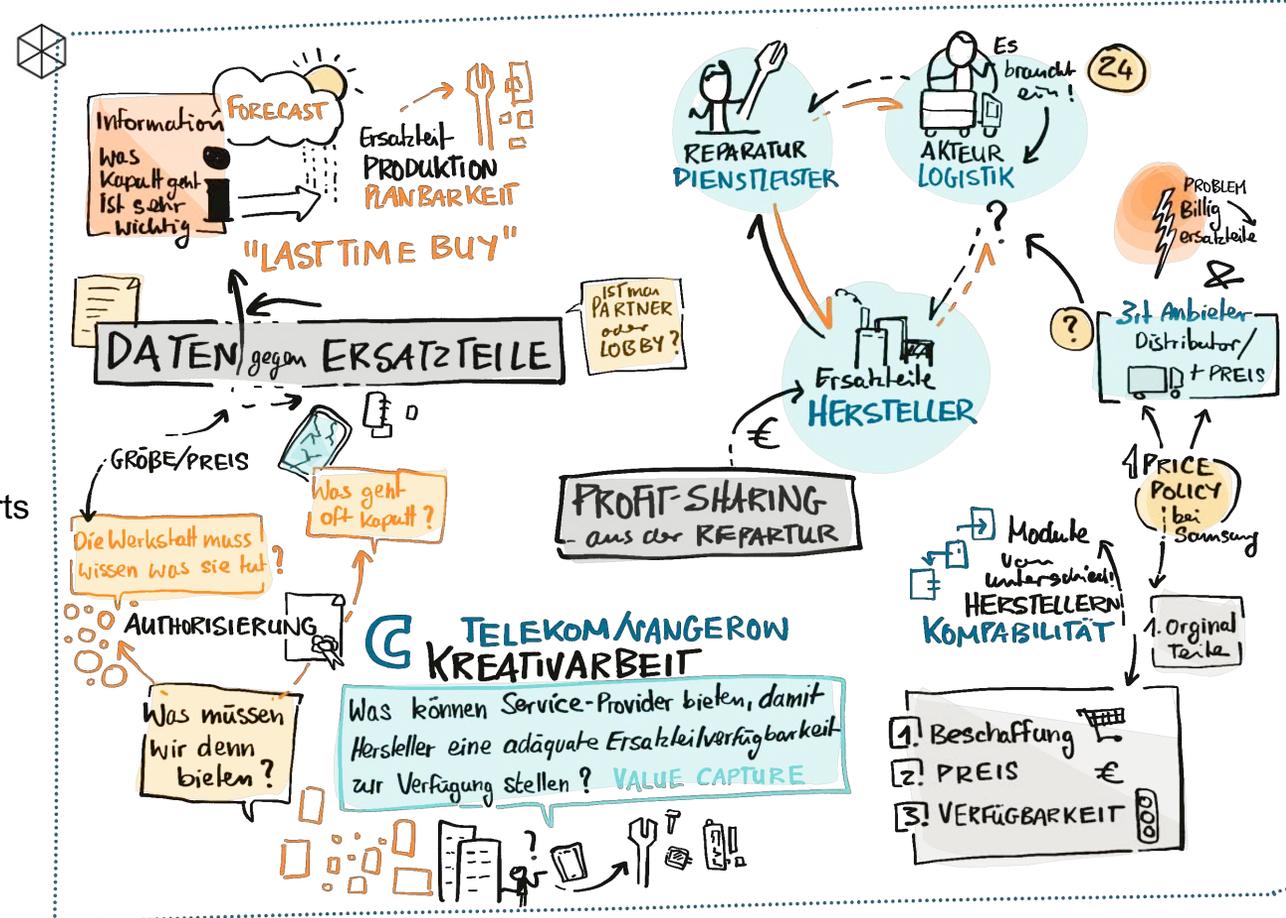
- Currently many service providers, who want to prolong product lifetimes for their customers, struggle to receive adequate spare parts
- Is there a market-based solution to become partners of OEMs?

First solution

- Spare parts for data (repair statistics etc.)
- Circular service providers collect valuable data on the products
- This allows for forecasts on spare parts' demand
- Relationship based on mutual dependency and partnership
- Repair shops would benefit from a last-time-buy option
- Certification may still be necessary to ensure quality levels

Second solution

- Collaboration of OEMs and repair operators based on profit sharing
- Repairs are a profitable business
- Share profits from spare parts and manual labour



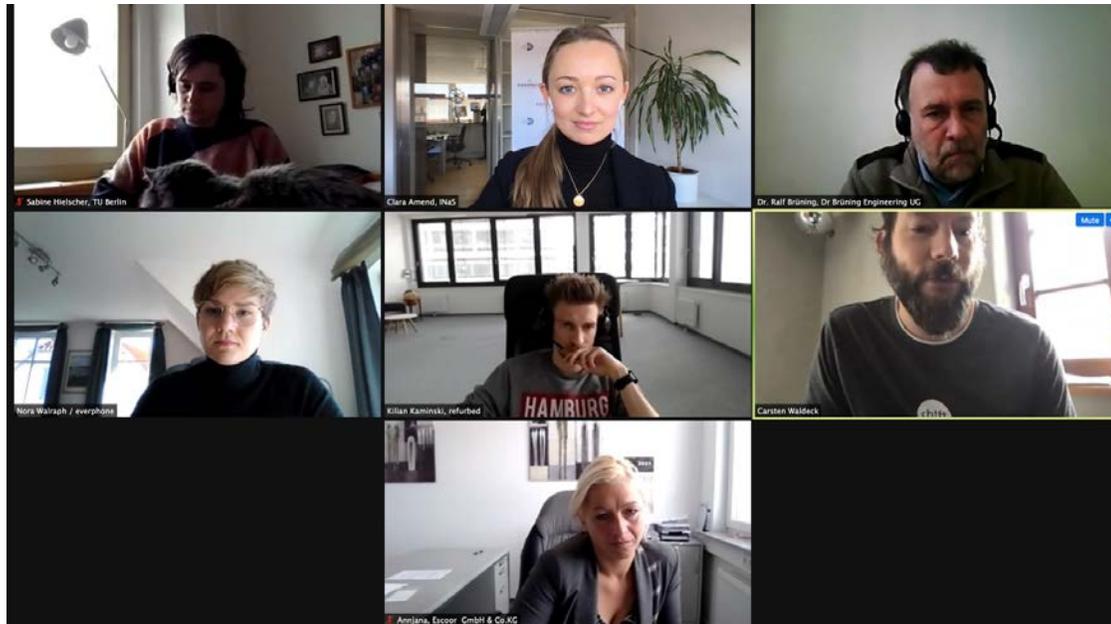
Regulation as alternative solution

- If no voluntary agreement can be reached within industry
- International *Right to Repair* movement counters market discrimination
- Demands free access to spare parts and repair manuals
- In Germany: "Reparatur Runder Tisch" & "Smartphone Allianz"
- In 2020, European Parliament voted in favor of the *Right to Repair*



The Challenge

How can we sell large quantities of refurbished phones to private customers?



Team-Members

Frank Röpke (Teleplan)

Annjana Engler-Sass (Escoor)

Carsten Waldeck (SHIFT)

Kilian Kaminski (refurbed)

Nora Walraph (everphone)

Ralph Brüning (Dr. Brüning Engineering UG)

Sabine Hielscher (TUB)

Challenge Owner

Teleplan/Teqcycle

Moderation

Clara Amend (CSM – Leuphana Universität)



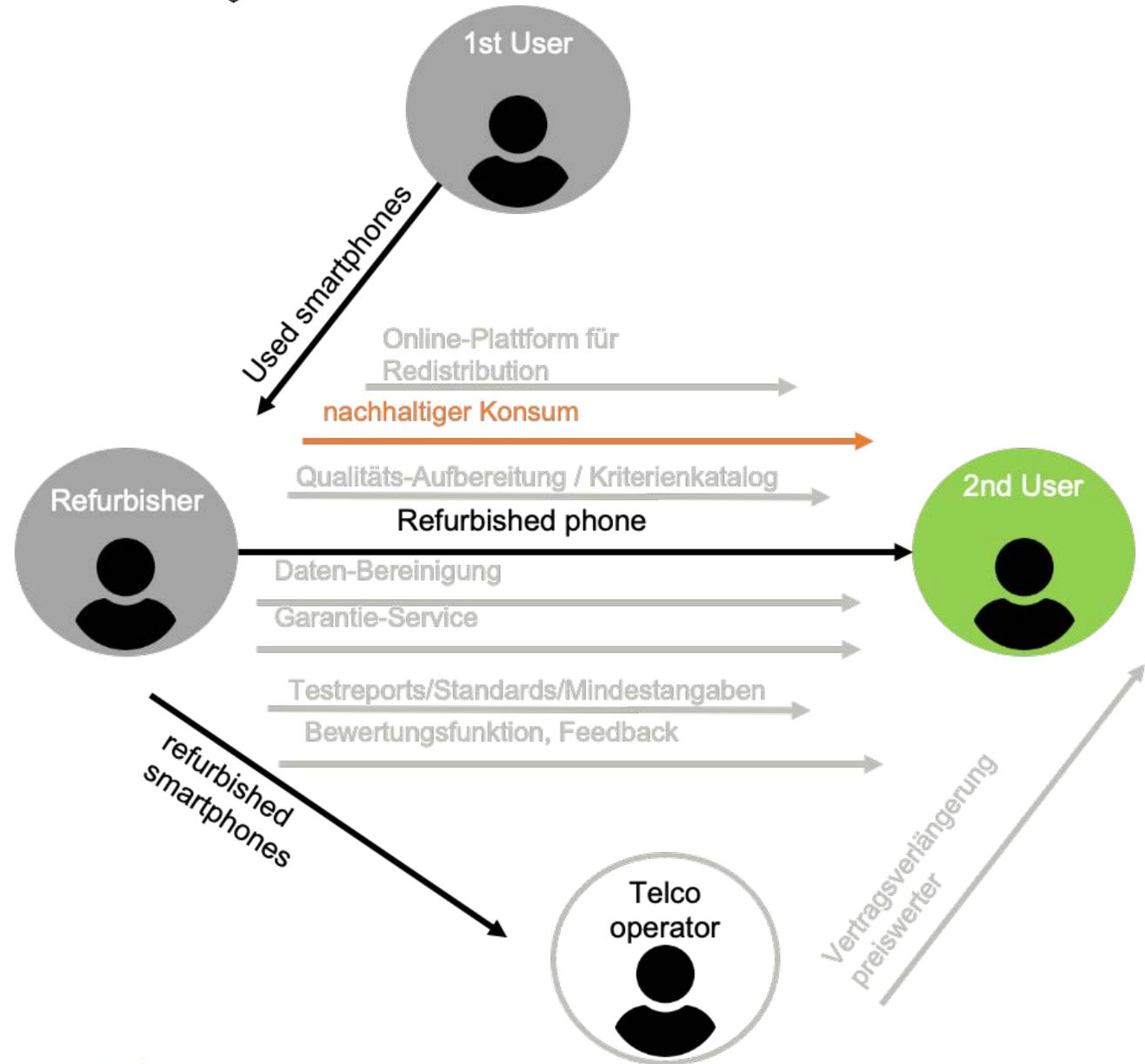
The Solution Space

Herausforderungen:

- Qualität, Garantie
- jedes Gerät ist anders → jedes Gerät/Modul kennen
- Ersatzteilverfügbarkeit- und beschaffung

Lösungen:

- Auf eine Auswahl von Geräten konzentrieren -> Know-How entwickeln
- Kurze Lagerzeiten, schneller Turnaround wichtig!





Workshop Summary



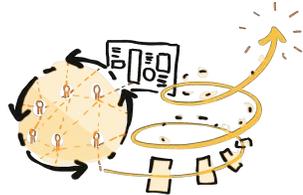
INaS as an unique network with high trust and coverage of the value cycle, creating a family feeling

We understand INaS as a circular economy living lab (CELL) facilitating product circularity beyond individual firms' boundaries and technological solutions. It now includes mainstream OEMs and pioneers, helps actors to develop new competences, serves as neutral collaboration space, and initiates transformative processes.



Moving from product sales to a service dominant logic

We observe a growing trend towards rethinking ownership in favor for full-service models that inherently cover repair and reuse. Thereby product lifetime extension is achieved not with one user, but rather by cascading with different users. Repair data for product design feedback and to incentivize users (e.g. labels) are valuable for these business models.



Circular economy transition creates strong dynamics for business models

Each actor is increasingly urged to rethink their position in the value chain and their circular offers. While academia has discussed these dynamics theoretically for many years, we now see practical solutions and implementation.



Value cycle mapping, interconnections between value chain actors and circular strategies

Strategic partnerships are key to uncover and internalize benefits of a circular economy. The INaS GmbH prototype illustrates the role of a central coordinator and platform for users to choose among products and lifecycle services.



How to scale pioneering circular solutions in large scale (mass market)?

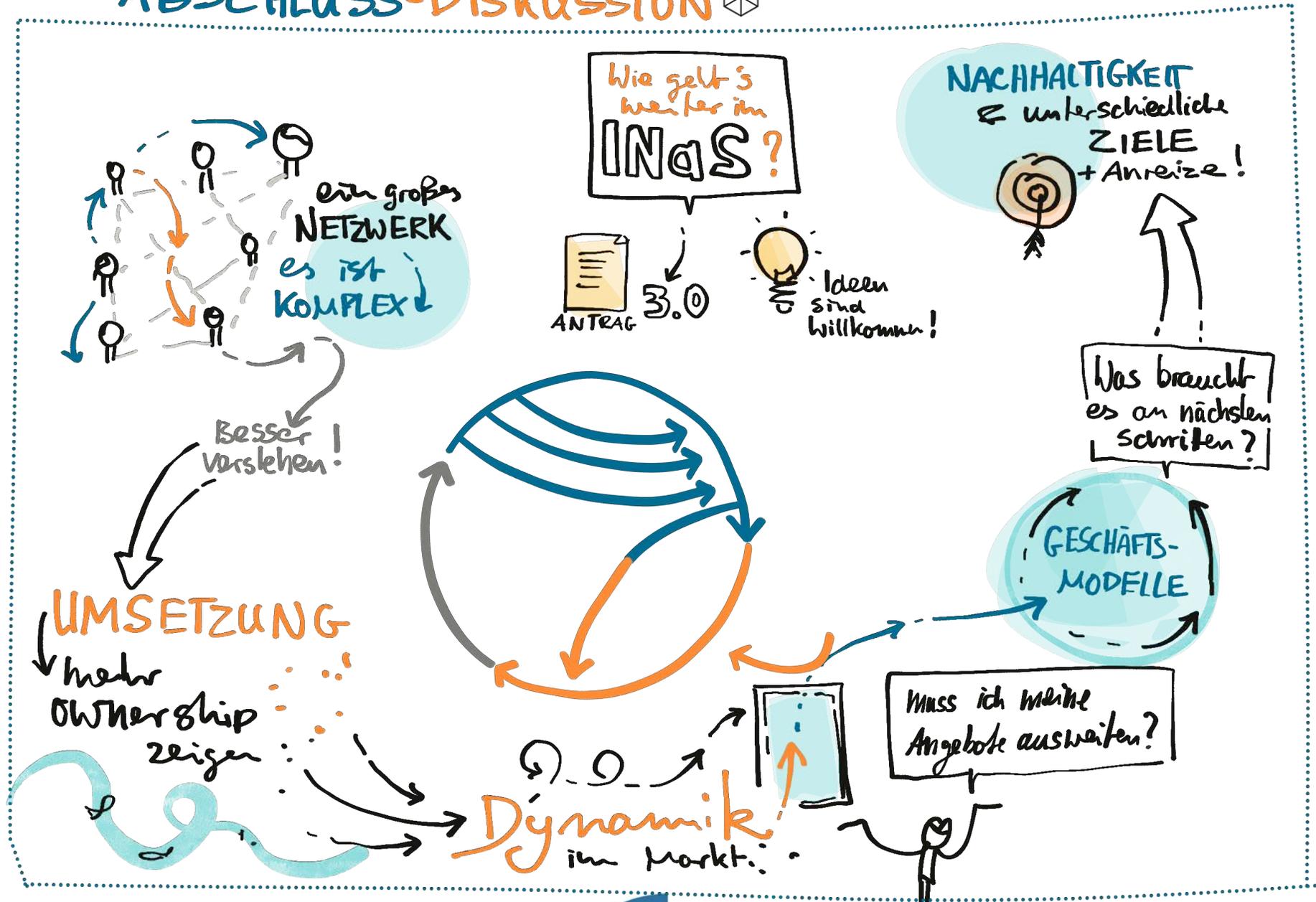
This is the next step. Pioneers could collaborate with incumbents, like everphone demonstrates with Samsung.



Software still represents a bottle neck for product lifetime extensions

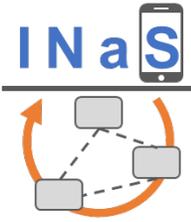
Lifetime of durable products is limited by software updates → lock-in by software companies. We need Google @ INaS.

ABSCHLUSS-DISKUSSION



ABSCHLUSS-RUNDE





Contact us for the planned INaS 3.0 founding round

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, online

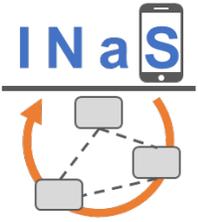
Circular Business Models Enabled by
Sustainable Modular Product Design



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PROGRAMME (2021 – 2027)





Bleiben Sie mit uns in Kontakt!



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Ihre Ansprechpartnerin am CSM

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 Nachhaltigkeitsmanagement, 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).

Das Verbundforschungsprojekt **MoDeSt** wird gemeinsam mit dem Fraunhofer IZM, der TU Berlin, der SHIFT GmbH und der AfB gGmbH, sowie der JKU Linz als assoziierter Partner durchgeführt. Es wird vom BMBF im Rahmen von ReziProk (Ressourceneffiziente Kreislaufwirtschaft – Innovative Produktkreisläufe) gefördert (Förderkennzeichen 033R231D).