



### Goals of the 2nd DiDaT Stakeholder Conference

Markus Beckedahl, Stephan Noller, Ortwin Renn, and Roland W. Scholz<sup>1</sup>

#### Good preconditions are given

The 2nd stakeholder conference marks the end of the planning phase and the beginning of the main phase of the DiDaT project. This phase consists of the joint preparation of chapters on the **seven vulnerability spaces (VSs)**, which form the core of the **White Book** and provide **guidance on the responsible use of digital data**. The content of the White Book is shown in Table 1 (p. 3)

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The DiDaT project started with the planning phase (see Figure 2) on November 1, 2019, with the release of the basic funding (400,000 €) from the **BMBF FONa** and the coverage of the costs of the stakeholder conferences of 100,000 € by a **Stakeholder Consortium** of private and public institutions from Germany and Austria. Thus, the initiation phase, which was financially supported by the **Plettner Foundation in the Stifterverband**, was successfully continued.

#### Use of the Newsletters as Workbook

The DiDaT newsletters also serve to familiarize the participants with the transdisciplinary project DiDaT and to introduce them to the content and methodological challenges of sustainability research. NL01 was dedicated to the understanding of transdisciplinarity (Td). NL02 gave insight into vulnerability/resilience management. The present NL03 focuses on socially robust orientations as a product of Td processes. This **newsletter** is longer than the other two because it **also serves as a kind of workbook to support the achievement of objectives** for the vulnerability space working groups.

The knowledge of the **working groups**, which are equally made up of academics and practitioners and guided by facilitators, and of the **Steering Board** represents the operative core of the transdisciplinary process. Since we now have a co-leadership from science (Renn and Scholz) and practice (Beckedahl and Noller), the project is equally represented at all functional levels. Markus Beckedahl represents the **view of civil society** and Stephan Noller the **view of the economic actors**.

The BMBF project is a **joint project** between the IASS Potsdam (Renn and Scholz) and the BTU Cottbus-Senftenberg (Albrecht, Missler Behr) and is carried out in cooperation with the Danube University Krems and other organizations that carry out further **participatory deepening research** and, in the second year, transdisciplinarity laboratories (Td-Labs) aiming at exploring socially robust solutions in various areas of practice and developing orientations for essential unseens.

The aim of the White Paper is

- identify major **unseens** in different vulnerability spaces

<sup>1</sup> Lead Author of this Chapter

- To describe the **causal factors** of the development of the Unseens
- To discuss and determine the **goal** of and **direction** for sustainable handling of Unseens
- To construct **socio-technical innovations** (of the interventions) and building upon that
- To **construct socially robust orientations**.

These orientations should serve as **guardrails and guidelines** for the responsible handling of digital data. What needs to be safeguarded in order to develop guidelines into **socially robust orientations** is described in Parts 6 and 7. All groups will present the considered unseens at the 2nd stakeholder conference. These will then be discussed in the Steering Board and in the plenary and, if necessary, modified so that a basis for the White Book is created.

From the point of view of the economy, it would additionally be important to be able to derive **economically robust orientations**, since - unlike in the private sector - working without the development of data-driven business models will no longer have a promising future. Ideally, it will even be possible to identify ways of sustainable digital business models in some cases, considering the vulnerabilities described and the associated resilience concepts.

### Finding common structures and causes for different unseens

The same syllogistic form of the orientations in the chapters of the White Book should make it possi-

ble to identify commonalities (generics) with respect to the mechanisms, orientations, etc. for dealing with the unseens in a sustainable way. This should support the general statements in the introductory chapter of the White Book, which will be produced in the second half of 2020.

### First outline of the orientations as a goal of the 2nd Stakeholder Conference

The challenge of the 2nd Stakeholder Conference is that the working groups of the VSs give an outline of socially robust orientations. Based on the system analysis, the Unseens × Orientations table provides an overview of the changes that are needed in Germany from the perspective of the impact areas produced by the digital transformation in order to arrive at a responsible practice of digital data. The following "formula" is used in Fig. 1 to differentiate between a rough plan and a detailed plan preparation:

**Figure 1:** The fine plan supplements the rough plan

Detailed/ fine plan	
=	revised rough plan
+	Unseens × Orientations table
+	Deepening research

Table 1: DiDaT Organigram of January 2020.

DiDaT: Organizational Chart\* (20 January 2020)

Science		Practice	
<b>Transdisciplinary Project Leaders</b>			
Ortwin Renn (IASS) und Roland W. Scholz (IASS, Donau Uni Krems / DUK), Markus Beckedahl (Netzpolitik), Stephan Noller (Ubirch und Bundesverband Digitale Wirtschaft)			
<b>Steering Board</b>			
<b>Speakers:</b> C. Eckert (LMU, Fraunhofer AISEC), M. Mißler-Behr (BTU). <b>Members:</b> D. Helbing (ETH Zürich), G. Gigerenzer (MPI für Bildungsforschung, Berlin), M. Latzer (Uni Zürich), R. Neuburger (Münchner Kreis), P. Parycek (Fraunhofer Fokus, DUK, Deutscher Digitalrat), C. Woopen/M. Friele (Uni Düsseldorf, Deutscher Ethikrat)		<b>Speakers:</b> H.-J. Sippel (Stiftung Mitarbeit), T. Thiele (Deutsche Bahn). <b>Members:</b> T. Clausen (Edelmann Media), H. Gleiss (Netz), S. Ober (NABU), C. Ulmer (Telekom), J. Landvogt (tbc) (BfDI), M. Scheier (DGB), N.N. (VDI), N.N.	
<b>Project Team</b>			
<b>Project Management:</b> D. Marx (BTU), V. van Zyl-Bulitta (IASS), L. Kätker (BTU), M. Mönch (BTU). <b>Senior legal expert:</b> G. Lentner (DUK). <b>Td-Method Lab:</b> C. Hartmann (BTU), H.P. Takam (BTU)			
<b>Vulnerability Spaces</b>			
<b>Impact-oriented Vulnerability Spaces</b>			
Science	Topics/Facilitators	Practice	
<b>Mobility (01)</b>			
W. Canzler (WZB), J. Maesse (Uni Siegen), W. Palmethofer (Open Knowledge Foundation), L. Schebek (TU Darmstadt), W. Serbster (DGH Hochschule), U. Reisach (HS Neu-Ulm)	K. M. Hofmann (Network Institute)	D. Baidinger (Deutsch Bahn), E. Fischer (VDV), K. Teille (VW AutoUni), J. Tiffe (Form:f), T. Waschke (Denkbank), C. Wust (Ford Europe)	
<b>Health (02)</b>			
G. Antes (Uni Freiburg), G. Glaeske (Uni Bremen), F. Tretter (LMU), M. Friele (UK Köln), N.N., N.N.	H. Köckler (HSG Gesundheit Bochum), L.A. Rosenberger (Uni Wien)	A. Eichhorn, M. Weller (Spitzenverband der Krankenkassen), S. Sauerland (IQWiG), S. Völker (KV W-L), N.N., N.N.	
<b>SME (03)</b>			
G. Müller-Christ (Uni Bremen), A. Reichel (Zukunftsinstitut Karlsruhe), G. Steiner (DUK), F. Goll (FZI Karlsruhe), N.N., N.N.	R. Czichos (DUK, CTN)	W. Hofmann (TMG), G. Knieneder (EMUGE), L. Probst (IHK Cottbus), N.N., N.N., N.N.	
<b>Agriculture (04)</b>			
F. Berger (ZALF), R. Brunsch (Leibniz ATB), J. Dörr (Fraunhofer IESE), C. Reichel (Leibniz IBZ), L. Frerichs (tbc) (Uni Braunschweig), N.N.	J. Zscheischler (Leibniz ZALF)	H. Buitkamp (VDMA Landtechnik), H.-W. Griepentrog (DLG, Digitalisierungsausschuss, Uni Hohenheim), C. Tölle-Nolting (NABU), W. Haefeker (DBIB), P. Pascher (Bauernverband), N.N. (BASF), N.N. (tbc) (Verbraucherschutz)	
<b>Value- and Impact-oriented</b>			
<b>Social Media (05)</b>			
P. Freytag (tbc), N. Kersting, (Uni Münster), C. Montag (Uni Ulm), C. Sindermann (Uni Ulm), L.-M. Neudert (Uni Oxford), N.N.	R. Hess (Werkstatt für Innovation, Berlin)	F. Ebner (Mecodia), H. Gleiss (Netz), B. Thull (LFK Stuttgart), L. Simon (Cyberstalking), A. Schenk/C. Reher (semasio/Platform 161), W. Gründinger (tbc; BVDW)	
<b>Institution- and Regulation-oriented</b>			
<b>Reliable and Trustworthy Digital Data (06)</b>			
R. Jaster (HU Berlin), A. Kaminski (Uni Stuttgart), M. Reissig (IASS), C. Reuter (Darmstadt), N.N., N.N.	J. Lambing (Forschung Gutes Leben), Kabusch, S.	S. Hallensleben (VDE), M. Fuchs (Blogger und Politikberater), S. Thürmel (München), M. Breuer (Ubirch), N.N., N.N.	
<b>Cybercrime (07)</b>			
A. Panchenko (BTU), D. Labudde (HS Mittweida), H. Hug (BTU/TMS), P. Gladyshev (UC Dublin), N.N., N.N.	E. Albrecht (BTU), D. Marx (BTU)	B. Brocher (Sonderstaatsanwaltschaft Cottbus), V. Hagen (Land Vorarlberg), D. Nagel (Vodafone), B. Otupal (Dell), H. Wu (Huawei)	

\* Expert committees are included from law, politics, and science and are currently under construction.

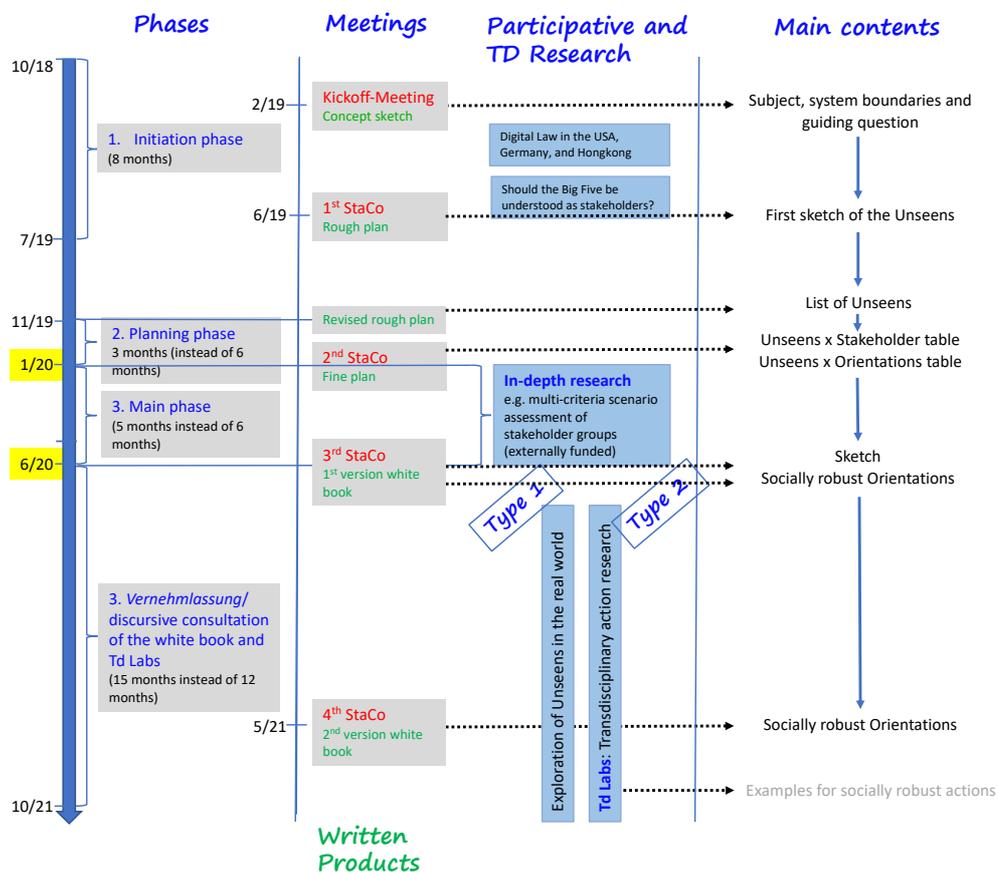
## Using the potentials of the transdisciplinary process

In each of the seven working groups, 13 people representing different perspectives of knowledge will each write a chapter of the White Book under the guidance of a facilitator. The advantages of a transdisciplinary process can only come into play if the relevant knowledge of the participants can be used in an open and discursive way. The challenge here is to follow the rules of a transdisciplinary discourse (see NL01, pp. 3-4) and to create a protected arena of discourse that makes it possible - also with the help of in-depth research - to find fundamental or even groundbreaking orientations. In order to achieve this and to ensure that no participant\* is disadvantaged by participating in the process, all participants will sign extended Chatham House Rules. What is said in the working

groups must not be communicated to the outside world in a personalized way.

One aim of the 2nd stakeholder conference will be to improve the working methodology of the groups with regard to knowledge integration. For this purpose, the groups have triangulated the representatives of the stakeholders and the scientists. We believe that on the basis of the detailed plans (see Figure 2, column 2) and the carefully worked out relationship of unseens to stakeholder groups (unseens x stakeholder table) and of unseens and social orientations (unseens x orientations), the basic building blocks for a structured and systematic knowledge integration have been found. These basic building blocks can be found on (most) posters of the working groups.

**Figure 2:** DiDaT schedule with division into phases, conferences, written and other results.



## Socially robust orientations for responsible use of digital data as the core of a White Book

Ortwin Renn and Roland W. Scholz

DiDaT is the result of the recommendation of the **European Science Expert Round Table on Sustainable Digital Environments** in 2018, which addressed serious unintended and unwanted side effects of the digital transformation from the poorly understood **interrelationship of ownership, economic value, access, and use** (including AI) of **digital data**. The European experts have also suggested that a societal learning process on this topic should be tackled in a transdisciplinary process. The DiDaT project implements this proposal for the case of Germany.

The DiDaT project deals with the **unseens** (this is a short form of unintended side effects) of digitalization. The aim is to contribute to a smooth transition to the digital era and to resilience management by anticipation combined with sustainable management of the unseens. This is also described in the DiDaT guiding question.

At this point in time, after a good one-year initiation phase (financed by the Plettner Foundation in the Stifterverband), we can say that the recommendation was absolutely the right guidance to follow. In the four **impact-oriented vulnerability spaces** (VSs) VS01 **Mobility**, VS02 **Health**, VS03 **SMEs**, and VS04 **Agriculture**, for the **social values-related** VS05 **Social media**, as well as for the **institution-oriented vulnerability spaces** VS06 **Trustworthy and reliable data** and VS07 **Cybercrime** Unseens, we were able to identify the sensitive stakeholder groups and subsystems of Germany.

### Guidance and guard rails for dealing with general unseens

A white book with socially robust orientations for sustainable handling of the Unseens is an essential product of the DiDaT project. Around 140 people are currently involved in this process. The core is

formed by 53 scientists in the management, the steering board and in the working groups as well as 7 facilitators, who steer the process in the working groups. Five people (including student assistants) work in the project team. About 20 experts from science and practice help the project to respond to overarching questions such as: "What is the current marketing practice of surfing data? Or: "In which areas are similar legal regulatory systems missing from the General Data Protection Regulation GDPR? The organizational chart of the transdisciplinary process can be found in Table 1 (page 3). There are a number of general (generics) and specifics in the seven VSs. Throughout we encounter problems, such as:

- **Data sovereignty:** who has access to which data? Who has access to my digital twin? Which data should be accessible to all?
- **Data solidarity:** What data need to be communicated to serve the public good (for example, public health data)
- **Data privacy:** How can I protect myself against access to my data?
- **Reliability and trustworthiness** of data: How can I determine that the data is not corrupted?
- **Legal uncertainties:** Which law from which country is relevant for which data?

Interestingly, the financial costs of Internet use do not play a dominant role. This is certainly due to the payment model of the Internet, social media and many other areas of the Internet through data. It is rather

- **various forms of indirect costs** of use for certain stakeholder groups and also for Germany (the threat to the preservation of the democratic capacity), which create special problems.

A major challenge will be to formulate socially robust orientations for dealing with digital data from the synthesis of the seven selected perspectives. Ideally, these orientations should provide Guidance and guard rails for decision-makers, which help to ensure a resilient approach over a longer period of time.

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### Key Question / Goal of DiDaT

*DiDaT aims to increase the adaptive capacity of subsystems and the stakeholders involved in these subsystems when using digital data with regard to intended and undesirable side effects (unseens). This should contribute to developing a safer, more beneficial and ultimately more sustainable use of the potentials of digital data and technologies. The aim is to develop social and technological innovations, to identify the prevailing systemic risks and vulnerabilities that arise and to transform them into opportunities by actively shaping them.*

*(compare: DiDaT NL02, S.2)*

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## From Unseens to Orientations

The **unseens** discussed in the transdisciplinary groups for over a year now form the **backbone** of the project. The unseens served to **identify stakeholder groups**, whose knowledge and interests - for example, as affected parties, causers, regulators, or for other reasons - should be considered in the process. How the interests of the important groups are covered by the existing representatives of the Expert Bank is an important task of the working groups. The Unseens × Stakeholder Groups overview table serves here as a starting point for problem solving.

A central step consists of the derivation of orientations for dealing with the unseens. This is done by discussing and listing the causes of each unseen. In order to arrive at orientations, socially accepted objectives and socio-technological innovations/interventions are needed. To ensure that all working

groups generate statements of the same type, a kind of "manual for the creation of orientations" was constructed and applied in the groups. The **Unseens × Stakeholder tables** as well as the **Unseens × Orientations tables** can be found at the end of this newsletter.

A first version of the chapters of the White Book will be available on June 23rd at the 3rd DiDaT Stakeholder Conference. These first versions of the chapters will then be sent to a larger number of representatives of stakeholder groups, decision-makers, and interested parties, with the request that they read the chapter carefully and examine whether and how it can be improved, for example by checking its factual accuracy, comprehensibility, argumentation logic, or presentation. The respondents are asked to agree on the extent to which they wish to express dissent or consent with the overall message and the individual statements of a chapter. This is done in the form of a position statement that can be easily introduced into the revision process. We are talking about a **discursive consultation**. In principle, this is the **Swiss consultation procedure (Vernehmlassung)**. Ordinances, laws, but also trend-setting papers are subjected to a consultation process. This is to be understood as a means of social communication (and not only as a legal procedure). It serves to increase the acceptability and understanding of democratic processes through the participation of many actors (for example, in a segregated, fragmented democratic social system characterized by a diversity of interests).

Dr. Christiane Roth-Godat describes the nature of a consultation process in an understandable way (Box 1). For us, this procedure represents an essential component of transdisciplinary processes.

## Socially robust Orientations

We consider the formulation of **socially robust orientations** as an essential product of mutual learning between science and practice and as a major goal of the DiDaT project. Central characteristics of an orientation towards a socially robust orientation are the integration of knowledge from sci-

ence and practice (mutual learning) and the securing of this knowledge through (state of the art) knowledge.

The right column in Fig. 2 describes the **main contents** of DiDaT, which are generated in the different **phases** (left column) and manifested in **different written products** at DiDaT meetings.

As we had expected, the working groups on VSs in DiDaT had considerable difficulty in defining the crucial key question and the system boundaries in such a way that unseens could be adequately described and addressed. Thus, the results of the working groups can provide **orientation, long-term guidance** for a **sustainable approach to an unseen**.

A fundamental difficulty is that goals are needed to formulate guidelines. For some objectives, such as

- Maintaining the capability for democracy (VS05)
- Low consumption of energy and non-renewable resources for digital (information processing) systems (VS01 and others)
- Use of digital data to support organic farming (in businesses of all sizes)
- Protection of privacy (VS02, VS05 and other VSs)

are relatively simple to handle, as one can refer to the **Constitution** or **global conventions** (such as the Rio 1992 Convention). However, if we refer to targets such as

- Preservation of SMEs from VS05

It is more difficult to address such a complex issue. In this case, one rather may refer to governmental programs (which can change) or has to fall back on a social consensus (such as maintaining SMEs as the backbone of the German economy). In some other cases, optional (and thus several) objectives should also be considered and there must, therefore, be "target-oriented orientations".

### In-depth research to support the statements

DiDaT is committed to ensuring that the guidelines are scientifically - as far as possible - justified and substantiated. This is difficult in view of the complexity and the relatively rapid changes to which a topic such as responsible handling of data is subjected. One aim is to make central questions or assumptions, whose construction is subject to an as yet unclarified or controversial orientation, transparent to all audiences and subject to in-depth research (see the center of Figure 2).

For example, it is not clear what preferences different stakeholder groups have with regard to the practice/reality of data sovereignty (who is allowed to use which data when, how, why?). Tools that are used in many transdisciplinary projects include **multi-criteria evaluation of different scenarios** (of data sovereignty) by **representatives of different stakeholder groups**. The DiDaT Td-Method Lab will develop a software tool for this purpose by the beginning of March, which can then be used in a targeted manner. Until this date, external financial support could not yet be secured due to the shortened planning phase (see Figure 2). This could, in fact, mean that in-depth research is not possible in parallel and in support of the preparation of the White Book. The DiDaT Method Lab (Hartmann, Missler-Behr, Scholz, Takam) will nevertheless try to enable the application of multi-criteria scenario evaluation in the VRs, if this is desired.

### Participative Research and Td Labs

After completion of the main phase, the consultation procedure of the White Book takes place. On that occasion, there are a number of questions/options for orientations, which cannot be answered adequately. **Participatory research** (see Figure 2, **Type 1**), in which practitioners are involved in scientific projects to clarify the questions, will serve to resolve this problem.

It is also important - in the sense of the last sentence of the guiding question of DiDaT - that opportunities, innovations or interventions are developed. This will be done within the framework of **Transdisciplinarity Laboratories** (Td Labs). The **Td Labs** are jointly developed and run by scientists



and practitioners. The project ***Adaptation and Innovation Strategies of SMEs in Lower Lusatia*** is to be seen as a prototypical example, which is run jointly with the Cottbus Chamber of Commerce,

Industry, and companies from this region. The socially robust orientations of the VS03 SME, digitalization and digital data form the starting point for this endeavor.

**Box 1: *Vernehmlassung* - Hearings / Discursive Consultation as an essential element of Swiss discourse culture**

**Dr. Christiane Roth-Godat\***

Transdisciplinary processes should - I have simply remembered this - serve to bring together the various interests and opinions from society on a controversial, important social problem and combine them with scientific knowledge in such a way that paths are taken that are socially sustainable. This is also a fundamental idea of Swiss grassroots democracy. In Switzerland, the **process of consultation** (*Vernehmlassung*) **serves to ensure that different stakeholders deal with a defined issue, read and understand it, evaluate it, identify false statements and formulate arguments for and against it, which are then incorporated into the decision-making process.** A current example is the draft of the Health Care Strategy of the Government Council of the Canton of St. Gallen, which was sent to all those concerned and involved. The feedback is analyzed and made available to the political decision-making body - in this case, the Cantonal Council. A consultation process can also serve to shape the opinion of a company or an organization that is of social relevance and wants to reorient itself strategically and organizationally.

*\*Ms. Roth- Godat was/is chairperson of several boards of directors of health insurance companies and hospitals (and was chairperson of the hospital management of the University Hospital of Zurich, etc.).*

### 3. Expectations for the 2nd DiDaT Stakeholder Conference

Dirk Marx and Verena van Zyl-Bulitta

**Td Head of Civil Society**



**MARKUS BECKEDAHL**

Markus Beckedahl is a net-political activist and journalist from Berlin, as well as founder and editor-in-chief of netzpolitik.org. He is a partner at newthinking communications GmbH, founder of re:publica and member of the Media Council of the Berlin-Brandenburg State Media Authority, Advisory Board iRights.info, Advisory Committee Prix Ars Electronica (category "Digital Communities")<sup>2</sup>.

**Td Head of Economy**



**STEPHAN NOLLER**

Stephan Noller, psychologist, maker and Internet technology entrepreneur from Cologne. Co-Founder and CEO of ubirch GmbH and Co-Founder of Calliope gGmbH. He is one of the founding members of D64 e.V. and is vice president of the Federal Association of the Digital Economy (bvdw) as well as a member of the advisory board "young digital economy" in the BMWi.<sup>3</sup>

#### (1) WHAT ARE THE MAIN HISTORICAL / EVOLUTIONARY CHANGES OF THE DIGITAL TRANSFORMATION?

The fact that humans and machines can communicate directly with each other. That this is and would be possible without gatekeepers and yet new gatekeepers have created quasi-monopolies.

The invention of the distributed architecture of the network (TCP/IP stack, Arpanet, HTTP etc.), the invention of the smartphone, invention of the concept of digital twins/shadows, development of data-driven/algorithmic architectures (Google, Facebook, Amazon, etc.), Blockchain

#### (2) WHAT ARE THE THREE MAIN CHALLENGES OF RESPONSIBLE DATA HANDLING?

Protecting the privacy and better enforcement rights and sustainable anonymization technologies, finding strategies to use much of the data for the common good, preventing business models that are harmful to society

To recognize how centrally data constitute and drive the new economy and society; to recognize how much "data" has already driven our previous analog life, and to distance ourselves from the concept of "data ownership".

#### (3) WHAT MOTIVATED YOU TO TAKE ON THE TRANSDISCIPLINARY CO-LEADERSHIP OF DIDAT?

I find the transdisciplinary approach interesting and hope for other perspectives on how we can create sustainable data politics.

The fascinating in-depth view of the phenomenon of data-driven processes - also in their negative accompanying effects. And the broad circle of qualified people who engage with it.

<sup>2</sup> <https://netzpolitik.org/author/markus/>, [https://de.wikipedia.org/wiki/Markus\\_Beckedahl](https://de.wikipedia.org/wiki/Markus_Beckedahl)

<sup>3</sup> <https://re-publica.com/de/member/256>, <http://stephannoller.eu/>



#### (4) WHAT EXPECTATIONS DO YOU HAVE OF DIDAT?

Different views and perspectives and exchanges across disciplinary boundaries on how sustainability, openness and data policy can be thought of together.

To be able to give better answers for digital resilience, for a more enlightened but also more discerning handling of its potentials and accompanying effects. More understanding of the fundamental risks and accompanying phenomena of a transformation into a digital society. But to have a playful look at the chances and potentials between the lines, from time to time...

#### (5) WHAT SHOULD THE DIDAT WHITE BOOK CONVEY?

An overview and current state of the debate, with suggestions to politicians. Perhaps also a small answer to the question, ***in which kind of digital world do we want to live?***

Tools for good data handling in the digital world, bearing in mind the risks involved. Deep insights into the mechanisms of action of data-driven processes in the various vulnerability spaces. And finally, an understanding of overarching patterns in all this in order to expand the spectrum of possible actions and make them more robust.



## 4. The contribution of DiDaT to the BTU Cottbus – Senftenberg

**Dirk Marx**

The transdisciplinary research project *DiDaT* is anchored at the *Faculty 5 Economics, Law and Society* and at the two chairs of *Public Law*, especially *Environmental and Planning Law (with Civil Law)* as well as the chair *ABWL (general business management), especially Planning, Innovation, and Foundation*.

Both chairs are part of a faculty newly founded after the university merger in 2013, which unites all social and societal science disciplines and provides and further develops corresponding courses at the Brandenburg University of Technology Cottbus - Senftenberg; this also includes the contents of e.g. transdisciplinary scientific concepts.

However, a search on the BTU website with the search term *Transdisciplinarity* leads to TransLAB and its research project DiDaT. This feature indicates that BTU, which is primarily a technical university, has lacked such a spirit of research. However, in view of the civil society challenges of the 21st century and the resulting questions, especially for science, not only in the structural change region of Lusatia, the demand for more transdisciplinarity is justified. In this respect, it must be recognized how valuable and significant the DiDaT project can be for the institutional orientation of the faculty and the university as a whole.

For the region of Brandenburg as it is here is considered a kaleidoscope of social and structural change, the likes of which cannot easily be found elsewhere due to its comparative uniqueness, because the interventions and transformations associated with it are both a trademark and a stigma.

Against this background, it is important to take dependencies and reflections seriously on all levels of coexistence and the associated learning and living processes from different motivations. Where can this be done better than at a university? However, it must succeed in being accessible to the potential of the origin and future of knowledge and experience, even to understand itself institutionally as such a component and to pursue scientific formats such as transformation science from this location.

Today, BTU is in the process of bringing together knowledge on the topics of transformation, transdisciplinarity, and transition with the concepts of sustainability in such a way that it is possible to unite effects and identification beyond the scope of the courses offered. Such a merging of kaleidoscopic diversity as the focus of conscious change can mature so that the university, which is shaped by the people living and working here, achieves a unique institutional position that is not conceptual and systematic, but rather trans-formative; and DiDaT is the first building block in this process

The cooperation in association with the IASS and the creation of collaborations such as the Stakeholder Conference Consortium (StaCoCo) and the establishment with research teams in the TransLAB of BTU, shows how great the need is to start new and fundamentally innovative science formats such as those of DiDaT. In this respect, it can be said in conclusion that the reorientation of Faculty 5 at BTU is on a good and future-oriented course owing to these research initiatives.

## 5. Major News

### Dirk Marx and Verena van Zyl-Bulitta

#### Core funding

The research project carried out by the Institute for Advanced Sustainability Studies Potsdam (IASS), the Brandenburg Technical University Cottbus-Senftenberg (BTU), the Danube University Krems (DUK) and the Stakeholder Consortium (StaCoCo) is officially funded by the Federal Ministry of Education and Research (BMBF) from November 1, 2019 until October 30, 2021. The basic funding is thus secured.

The project management agency for the BMBF project is the German Aerospace Center (DLR) in Bonn. We would like to take this opportunity to thank Ms. Müller and her DLR team, who have gone through many routes faster than in conventional procedures. Thus, an interruption of the project could be avoided.

Contractually (with the BMBF), administratively and scientifically, the project is managed jointly by IASS and BTU Cottbus-Senftenberg. Responsible project managers are Professor Magdalena Mißler-Behr (BTU) together with Professors Ortwin Renn (IASS), Roland Scholz (IASS/DUK; co-ordinator of the project) and Eike Albrecht (BTU).

#### Rough plans

The rough plans were reviewed in their entirety. You can obtain the rough plans via the following [Link](#)<sup>4</sup>. The detailed or fine plans will be prepared immediately after the 2nd DiDaT Stakeholder Conference. They serve as a basis for the chapters of the White Book on vulnerability spaces. The detailed plans will be made available on the IASS DiDaT homepage.

#### Stephan Noller DiDaT Co-Head of Economy and Markus Beckedahl Co-Head of Civil Society

We would also like to announce that we have been able to convince Stephan **Noller**, Ubirch, Deputy President of the Digital Industry Association, to complement the management quartet together with **Markus Beckedahl** (DiDaT Head of Civil Society). We have thus been able to achieve equal representation from science and practice on all levels.

#### New members in the DiDaT project team /BackOffice

The DiDaT team has already arranged itself as "BackOffice" at the BTU in Cottbus. Under the direction of Dirk Marx (project coordinator DiDaT-BTU), Larissa Kätker and Marcel Mönch will be working on the project from now on. Both have several years of professional experience as well as a degree in Business Administration & Business Psychology (B.Sc.). Together with Verena van Zyl-Bulitta, who is accompanying the parallel research project at the IASS, the project will officially continue with a new team with immediate effect: You can reach us at

LarissaChristin.Kaetker@b-tu.de

Marcel.Moench@b-tu.de

Dirk.Marx@b-tu.de, +49 (0) 355 69 3139

as well as directly +49 (0) 162 9703766.

The team is rounded off by another member who can contribute to the field of transdisciplinary methods, Paul Honoré Takam. His task is to support the groups in scenario construction and the application of knowledge integration methods.

#### New DiDaT Website

[www.didat.eu/](http://www.didat.eu/)

<http://www.didat.eu/startseite.html>

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<sup>4</sup> <https://www-docs.b-tu.de/fg-umweltrecht/public/Foresik/DiDaT-Gobplaene-Dezember-2019.pdf>

## Events

### 2<sup>nd</sup> DiDaT-Stakeholder Conference on 22nd January

The 2nd DiDaT Stakeholder Conference on January 22, 2020, at Fraunhofer-FOKUS (Institute for Open Communication Systems, Kaiserin-Augusta-Allee 31, 10589 Berlin) is the central milestone of the project. At the 2nd Stakeholder Conference, the detailed plans for the vulnerability areas were presented, discussed and adopted (see photo). This section was added after January 20<sup>th</sup>, 2020.



### 3rd DiDaT-Stakeholder Conference on 23<sup>rd</sup> June

The next DiDaT Stakeholder Conference will take place on 23. June 2020 and just as the 2<sup>nd</sup> DiDaT-Stakeholder Conference takes place at Fraunhofer FOKUS.

### February: The Digital Transformation of Societies: Addressing Technological Disruption

<https://aaas.confex.com/aaas/2020/meetingapp.cgi/Session/24373>

### Method Tool

A software tool for formative scenario analysis and multi-criteria evaluation by stakeholder groups will be developed for problem structuring. This is

the FSA × MCA tool. The tool supports the transdisciplinary process and in-depth research. This assessment can be applied in small stakeholder groups for intuitive scenarios and measure preferences and the relative degree of agreement between the groups. The processing of the methods with the FSA × MCA tool was already applied in VS04 (agriculture).

A **workshop introducing this tool** will be offered to the facilitators after the 2<sup>nd</sup> Stakeholder Conference.

## Project Blockchain-sustainable

We would like to point out a stakeholder dialogue project the content of which is related to DiDaT. The project "**Sustainability for Distributed Ledger Technologies & Smart Contracts**" poses similar questions to DiDaT with the mission to communicate the technical, ethical and political aspects for sustainable design of the blockchain technology. Not only the ecological effects of Distributed Ledger Technology (DLT), blockchain architecture and digital smart contracts, which are often highlighted in public discourse, are addressed, but also social, economic and cultural effects on society and the living environment, which are relevant from a holistic sustainability perspective. There was a need for such a project as so far, the discussions have been rather scattered. The project is hosted by the **business association e5** and funded by the Federal Environment Agency and the Federal Ministry for the Environment. A representative of DiDaT also took part in a first stakeholder conference called "**Politics of Blockchain**", which brought together both scientists and practitioners in Offenbach in October 2019. The project leader, Julio Lambing, is, in turn, a facilitator for the DiDaT vulnerability space VS06.

More information here:

<https://www.blockchain-nachhaltig.de/>

## Publications

All working groups of the different VSs must refer in the White Book to the most important/relevant scientific literature related to the subject area and the (transdisciplinary) methodology. In this small list you will find information on books, articles or web pages that are relevant for all or individual VSs. Many of the references come from participants of the DiDaT project.

Büchi, M., Festic, N., Michael Latzer, M. (2019). **Digital Overuse and Subjective Well-Being in a Digitized Society**, Social Media + Society, Volume: 5 Issue: 4, <https://journals.sagepub.com/doi/full/10.1177/2056305119886031>

Helbing, D. (Ed.) (2019), **Towards Digital Enlightenment - Essays on the Dark and Light Sides of the Digital Revolution**, Springer, Cham <https://doi.org/10.1007/978-3-319-90869-4>, Online ISBN 978-3-319-90869-4, <https://link.springer.com/book/10.1007/978-3-319-90869-4>

Kaye, D. **Speech police - The Global Struggle to Govern the Internet**, <https://www.das-netz.de/publikationen/speech-police-global-struggle-govern-internet>, <https://globalreports.columbia.edu/books/speech-police/>

Montag, C., Ebstein, R., Jawinski, P., Markett, S. (2019). **Molecular genetics in psychology and personality neuroscience: On candidate genes, genome wide scans, and new research strategies**, <https://osf.io/ndz5u>

Peterka-Bonetta, J., Sindermann, C., Sha, P., Zhou, M., Montag, C. (2019). **The relationship between Internet Use Disorder, depression and burnout among Chinese**

**and German college students**, <https://www.sciencedirect.com/science/article/abs/pii/S0306460318303162>, <https://doi.org/10.1016/j.addbeh.2018.08.011>

A method for dealing with unseens in organizations: Scholz, R. W., Czichos, R., Parycek, P., & Lampoltshammer, T. J. (2020). **Organizational vulnerability of digital threats: A first validation of an assessment method**. European Journal of Operational Research, 282, 627-643. <https://www.sciencedirect.com/science/article/pii/S037722171930760X>

The publication of the **South American Expert Roundtable** on Unintended Side Effects of the Digital Transformation. This is a parallel event to the European Expert Roundtable (2017) from which the project DiDaT emerged:

Viale Pereira, G., Estevez, E., Cardona, D., Chesñevar, C., Collazzo-Yelpo, P., Cunha, M. A., ... Scholz, R. W. (2020). Sustainability, 12, 718. <https://www.mdpi.com/2071-1050/12/2/718>

Woopan, C., Jannes, M. (Hrsg.) (2019). **Roboter in der Gesellschaft - Technische Möglichkeiten und menschliche Verantwortung**, <https://www.springer.com/gp/book/9783662577646>

## 6. Socially robust orientations as a result of DiDaT

Roland W. Scholz

**Preliminary remark:** this article deals with the scientific discussion of transdisciplinarity and the question of what the results and effects of transdisciplinary processes are.

The previous newsletters (NL) of the DiDaT project referred to different conceptual foci. NL 01 was dedicated to the concept of the methodology of transdisciplinarity. In NL 02 the term vulnerability was presented and discussed. In the present newsletter, we deal in more depth with socially robust orientation. Socially robust orientations are understood as a product, i.e. as the result of a transdisciplinary project. A major goal of the DiDaT project is a white book on the responsible use of digital data. The chapters of the white book contain 7 +/- 2 socially robust guidelines for dealing with the unintended or socially undesirable side effects of the use of digital data. Against this background, I would like to discuss the concept and origin of the term socially robust orientations as an important concept of transdisciplinarity.

### The origin and development of the concept of transdisciplinarity

The Zurich 2000 Conference *Transdisciplinarity: Joint problem solving among science, technology, and society - An effective way for managing complexity* (Klein et al., 2001; Scholz, Häberli, Bill, & Welti, 2000) can be considered the starting point of a discussion of the theoretical discussion and practice of transdisciplinarity. In their contribution, *The Potential of Transdisciplinarity*, the philosopher of science Anthony Gibbons and the scientific researcher Helga Nowotny explain at this conference that transdisciplinarity is more than just another discipline or another facet of science.

The term transdisciplinarity already plays a central role in the groundbreaking book *The new production of knowledge: The dynamics of science in contemporary science* (Gibbons et al., 1994). In this book, the Mode 2 concept was used to point out

the interweaving of industrial research, development (i.e., "industry") and "multistakeholder ... skills and expertise" (Gibbons & Nowotny, 2001, p. 69) and research at universities. "*Mode 2 science*" refers to a new form of contextualization of research into social, technological and economic challenges, which became increasingly important in the second half of the twentieth century.

Following a transformative sustainability study on the Klettgau region: *responsible use of soil* introduced at the ETH Zurich, I proposed the concept of mutual learning (see Scholz, 1999, p. 8) as an essential process characteristic of transdisciplinary projects. Mutual learning comprises at its core a common (1) definition, (2) representation and (3) transformation of the scientists and practitioners involved in the transdisciplinary process (Scholz, 2000).

### Socially robust orientations vs. socially robust solutions

From the experience with a large number of transdisciplinary processes, it became clear that in transdisciplinary processes the subject matter is the mutual learning between science and practice and not (solely) the ("industrial or societal") solution of a specific problem in practice. Mutual learning leads to a "capacity building" of the practitioners. The learning process should help the practitioners to better cope with the real, complex problem. Which decision is made - for example, on responsible land use or censorship of social media - is by no means the subject of a transdisciplinary process. The final decisions are made by the responsible (i.e., legally and/or democratically legitimized) practitioners, considering the democratic and legal responsibilities, as well as the circumstances, contexts, requirements, and risks existing at the time of the decision.

In this respect, it is reasonable to speak of *socially robust orientations* (for dealing with real-world

problems) instead of *socially robust solutions*. On the science side, transdisciplinary processes serve, among other things, to structure the complexity of real, relevant social challenges in such a way that scientific knowledge can be used and developed for sustainable handling of these challenges.

In the first year (2020) of the DiDaT project, we will thus be dealing with the development of socially robust orientations. In the second year (2021), however, we want to deal with concrete questions of practice in the transdisciplinarity laboratories (Td-Labs). For example, in the vulnerability space *VS03 SME, Digitalization and Digital Data, solutions for the responsible handling of data* will be developed for specific companies (i.e. in the context of case studies) together with entrepreneurs and representatives from the field. In this context, I propose to speak of *transdisciplinary action research*.

### Definition

We speak of socially robust orientations when knowledge for sustainable action is created for a (complex) socially relevant problem in a transdisciplinary process,

- [**knowledge integration**] which is based on the integration or the setting in relation of profound experiential wisdom and theoretically consistent and comprehensively empirically validated academic rigor; we also speak here of a triangulation of «**modes of epistemics**»
- [**Scientific compatibility/justification**], if all statements correspond scientifically to the state of accepted scientific knowledge (text-book state of the art).<sup>5</sup>
- [**General comprehensibility**], if it is comprehensible for everyone and its basic features are comprehensible. This means that the pre-

requisites, assumptions and the basics of deriving a socially robust orientation can be understood "in principle" and then subsequently implemented.

- [Disclosing the foundations and limits of knowledge] this relates to that not only the uncertainties (which are usually represented by probabilities) are made the subject of the discussion related to the meaningfulness of statements and orientations, but also ignorance and the limits of knowledge are appropriately communicated. Especially in complex situations, there are a large number of gaps in knowledge and subjective assumptions that arise when deriving any socially robust orientation or statement. It, therefore, corresponds to an honest and upright/of integrity scientific behavior (in the sense of "honest knowledge brokering" (Pielke Jr., 2007) that this ignorance is communicated as far as possible. In this way, we are open and transparent about what knowledge has been included in the derivation of the orientations and in what form by whom. This leads to the last point,
- [Communication of the boundary conditions of the study], if the prerequisites and boundary conditions (i.e. the time, the persons, the financial effort, who are the financial sponsors, etc.) are appropriately communicated.

A detailed discussion and embedding of "socially robust orientations" can be found in chapter 15 of the book *Environmental Literacy: From Knowledge to Decisions* (Scholz, 2011, pp. 378-379).

### What does "socially robust" mean?

Some words to explain the term "robust": in decision theory we find a number of complementary pairs of terms which help to better organize the structure of a decision situation. These include

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<sup>5</sup> This means, for example, that core statements on the state or dynamics of system variables or on the relationships of system variables or subsystems should - as far as possible - be scientifically substantiated and referenced.

cost vs. benefit, risk vs. opportunity, vulnerability vs. resilience, but also sensitivity vs. robustness.

The term sensitivity (i.e., also the complementary term *robustness*) is found in a widely used definition of risk (Paustenbach, 2002; Scholz, Blumer, & Brand, 2012). *Risk* can be defined as a function of *sensitivity* and *exposure* to (randomly occurring) negative events. *Sensitivity* can be, for example, the extent of damage or the susceptibility of an actor resulting from false statements/understatements in cyberbullying. The (technical) term *exposure* is used in risk research to describe the probability of an event resulting in negative consequences (i.e. someone becoming the subject of cyberbullying).

An orientation is therefore socially *robust* if events occur in the future that call into question the conditions and/or the mechanisms of action that can be taken for certain measures, suggestions for improvement, interventions, etc. (a house is robust if it remains standing even if an unforeseen earthquake occurs).

*Socially robust* in this context means that an orientation for decision-makers, those affected or other actors remains valid even if the situation changes somewhat, new knowledge emerges, daily political preferences change, etc.

### Social robustness of orientations as central elements of vulnerability management in DiDaT

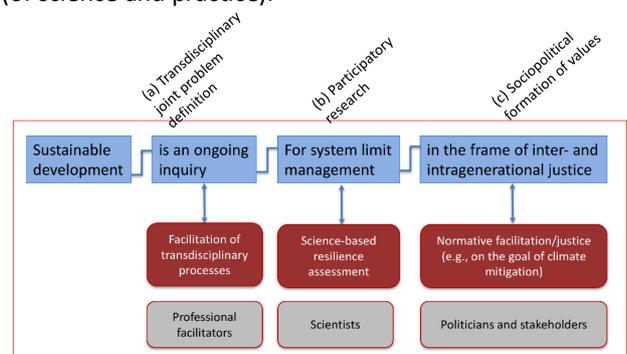
In the DiDaT project, the negative effects of unseens (this is an acronym for unintended and unwanted side effects) of the use of digital data on sensitive stakeholder groups or subsystems in Germany are presented. The *vulnerability* (*v*) that is caused by an unseen results from the interaction of the *risk* (*r*) caused by an unseen and *adaptive capacity* (*ac*). Formally we write:

$$v = f(r, ac).^6$$

<sup>6</sup> Vulnerability can be defined qualitatively and quantitatively, like risk and adaptive capacity. A quantitative approach can

*Socially robust orientations* and *resilience management* are central instruments of sustainability management. I would like to describe this using a *systemic definition of sustainability*. Laws et al. define systemic sustainability as an ongoing search (by science and practice, see (a) in Figure 3) to avoid the collapse of value-laden, worthy of preservation and/or functionally important systems (see "*system limit management*", see (b) which are important for achieving important (*normative*) goals (see (c)). Normative goals could be, for example, inter- and intra-generational justice (agreed at the Sustainability Convention in Rio 1992). Furthermore, the preservation of democracy is also one such goal. This is of importance, for example, in the *DiDaT Vulnerability Space VS05 Social Media and their Effects on Individuals*. Here, socially robust orientations for the preservation of democracy, i.e. measures to prevent the loss/promote the capability for democracy, are to be developed.

**Figure 3:** Systemic sustainability as an ongoing search (of science and practice).



I would like to note that I understand the "*ongoing inquiry*" (see (a)) as a joint process of science and practice, to which science must make a major contribution through the resilience assessment, while the identification of normative objectives is the central task of social, democratic learning processes. Branches of science such as ethics, philosophy or transdisciplinary processes can contribute

be found in Scholz, Czichos, Parycek und Lampoltshammer (2020).

here. The normative objectives (c) are, however, the subject of social processes as a whole.

Thus socially robust orientations are an essential instrument of vulnerability and resilience research. They are an essential tool for sustainability management. This is important because socially robust orientations are the result of transdisciplinary processes that are intended to contribute to a transformation towards sustainability.

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## 7. Socially robust orientations (SRO) of vulnerability spaces (VS)

### Operating instructions: Methodical use of the work results from the initiation and the main phase for the preparation of guidelines

Roland W. Scholz

The rough concepts presented on 25 June 2019 were fundamentally revised. The VS teams discussed the detailed feedback received in July 2019. The rough and detailed plans are available for the 2nd DiDaT Stakeholder Conference as a presentation for further process steps and a final evaluation in the following form:

1. the description of the **object of investigation** of the VS and its **system boundaries** has been made. Answers to the following questions were provided:
  - How is the object of investigation defined? e.g. "health" or "SME"
  - Which thematic delimitation was made in the study? e.g. "agriculture, digitalization, and digital data"
2. the definition of the **guiding question** has been completed and will receive its final corrections and confirmation at the 2nd DiDaT Stakeholder Conference. The leading question is answered: Which contents and target values represent the objectives of the VSs?
  - Procedure during the Stakeholder Conference on 22 January 2020:
    - Presentation of the **guiding question** by the VS to the stakeholders
    - Resolution of the key question by the stakeholders of the VSs
    - Proposal for a definition of the White Book
    - Plenum of the 3rd Stakeholder Conference (Reaching a consensus)
3. the construction of the **Unseens X Stakeholder table** serves to answer the following questions:
  - Which unseens are presented by the VR
  - How extensively do the VS team and the stakeholders want to revise the developed unseens?
    - Format: Conference Dialogue

- Tips: minor shortenings/additions/changes/refinements/understandable classifications and abbreviations

Expected results (**22.01.2020**):

Discussion on the orientation of the guidelines. Selection of the most important unseens for which an orientation is to be formulated as a priority. **Proposal: Formation of small groups** of 2-4 persons each to work out an Unseen in order to discuss the set of elaborated Unseen x orientations at the group meeting between the 2nd and 3rd stakeholder conference in the VS working group

**February-May 2020:** Concretization of the White Book

Experience with a large number of transdisciplinary processes has shown that **mutual learning between science and practice** constitutes the core of these processes and enables practitioners to better deal with concrete complex problems. Through mutual learning, science is enabled to generate knowledge that helps society to better deal with relevant challenges.

#### Development of the Unseens to socially robust orientations (SRO)

Already the 2nd bulletin (see Table 2) clearly showed how the SROs can be derived in a similar way in all VSs. The work in VR03 - SMEs and digitalization has shown that when formulating SROs in relation to a specific Unseen, clarity on the goals that are sought to be achieved is necessary. The formulation of objectives is the task of a broad social discourse and hence not primarily the subject of a transdisciplinary process. In addition, for some Unseens there exist "relevant or pertinent goals". For example, in the case of "endangering democracy through the use of social media", the

"preservation of the capability for democracy" is an undoubtedly "socially legitimated/accepted" goal to which an orientation can refer.

Against this background, we have inserted a further column (4<sup>th</sup> objectives) in Table 2 and have also included short titles with some explanatory keywords.

**Table 2:** Unseens x orientations Table: From unseens, causes and measures to socially robust orientations. Illustrated by an example from the vulnerability space VS03 SME.

	1. Unseens (only the "negative undesirable consequences" are considered)	2. Causes/ Causalities/ development processes of the Unseens	3. Measures of possible socio-technical innovations for mitigation	4. Goals / objectives	5. Socially robust orientations for dealing with unseens
1	New/other employee qualifications required (also in IT system houses)	<ul style="list-style-type: none"> <li>• Changing employee roles</li> <li>• Business models of system houses are becoming dysfunctional: Too little consulting</li> <li>• Often too little digital maturity in the system houses</li> <li>• Competition for IT specialists</li> </ul>	<ul style="list-style-type: none"> <li>• Digitalization strategies</li> <li>• Redesign of structures and processes</li> <li>• New vision of the IT areas</li> <li>• Sustainable transformation processes</li> <li>• Internal Business Consultants</li> <li>• Staff training</li> <li>• Agile and individual guidance</li> </ul>	<ul style="list-style-type: none"> <li>• Creating digital readiness for (almost) all employees of SMEs</li> <li>• Developing employees' knowledge of what digital knowledge they need to acquire</li> <li>• Companies and public authorities must offer appropriate support programs</li> </ul>	<ul style="list-style-type: none"> <li>• Consulting offensive for SMEs</li> <li>• Regional networks of SMEs</li> <li>• System house networks</li> </ul>

**Column 1: Unseens**

The unseens were described individually in the DiDaT detailed plans (and to some extent already in the rough plans) of the vulnerability spaces (and - if possible - referenced with literature). The rough and detailed plans can be found on the DiDaT homepage (<https://www.iass-potsdam.de/en/research/didat>).

**Column 2: Main and causal factors**

Factors that are considered to be causal for the development process of the individual Unseens. The description should be given in keywords if possible

and sorted according to the priority of the responsible/causing party.

**Column 3: Measures**

The sequence of measures for handling / mitigation (column 3) is based on the causes shown in column 2.

**Column 4: Goals / objectives**

Column 4 should indicate which objectives (target dimensions) are to be achieved by the measures.

**Column 5: Socially robust orientations**

Listing of the socially robust orientations for dealing with the unseens.

## Box 2: *The basic syllogistic structure*

### To explain the syllogistic structure of socially robust orientations in the project DiDaT

Socially robust orientations (SRO) are causal statements (causal structure) that indicate which **socio-technological innovations** (see column 3) are needed to **achieve a goal (Z)**.

A goal is a socially normative quantity (we assume that society wants **Z**)

#### Example of a goal:

One of the goals  $Z_1$  would be in VS 05 - Social Media: the (strengthening of) the democratic capacity of citizens.

This objective **Z** is to be considered in connection with an unseen (such as **Z**) that is described as relevant for the vulnerability space

A causal statement is an **if-then statement**. In the simplest case, the causal statement indicates that

under certain conditions/premises,  $\mathbf{V} = \{V_1, \dots, V_k, V_{k+1}, \dots, V_K\}$   
 when applying  $\mathbf{I} = \{I_1, \dots, I_l, V_{l+1}, \dots, V_L\}$   
 target **Z** is achieved.

A causal statement always assumes the validity of the prerequisites.

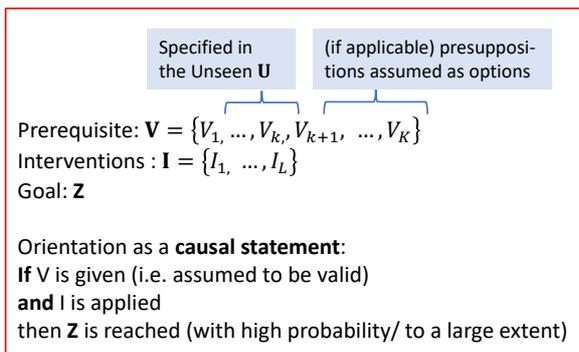
In the case of the Unseens, it will only be known in a few cases which goals society is really striving for.

In some cases, however, such as democracy as a goal, this is largely given, as one can refer to the Basic Law of Germany here.

If there is no definite clarity about the goals, causal statements for different goals (such as  $Z^*, Z^{**}, Z^{***}$ ) can be formulated successively.

An essential part of the prerequisite is usually described via the *Unseen*, **U**.

However, additional prerequisites can also be inserted.



### Schematic representation of the (simple) syllogistic structure of socially robust structures

#### Example of a goal and subsequent syllogistic analysis:

A goal  $Z_1$  in VS 07 - Cybercrime e.g. the successful digital trace analysis.

This goal **Z** is to be considered in connection with an Unseen ( for example  $U_1$ ).

A goal  $Z_1$  in VS 01 - Mobility is e.g. the control decision of a vehicle by AI.

This goal **Z** is to be considered in connection with an Unseen ( for example  $U_2$ ).

A goal  $Z_1$  in VR 02 - Health is, for example, the use of patient data.

This goal **Z** is to be considered in connection with an Unseen (such as  $U_3$ )

## Methodical guidance on the use of the stakeholder cross-tabulation

Somewhat surprisingly, the revision of the rough plans caused more effort and problems than expected. An apparently more difficult problem was to construct the table of unseens and stakeholders. In the course of the initiation phase and the development of the methodology to be followed by all VSs, it turned out that the list of unseens is the backbone of the project work.

The function of the Unseen stakeholder cross-table is primarily to identify the stakeholder groups that are associated with the effects of the undesirable and unintended consequences of the respective Unseen. A common approach (see Table 3) is to distinguish between the causers, the affected parties and central groups involved in the regulatory process. However, other subgroups of stakeholders (e.g. subdivided according to areas of knowledge) can also be chosen.

The table is used to select six representatives of stakeholder groups (eligible parties) per vulnerability space. There are two things to consider. The representatives of the stakeholder groups should

- adequately cover practical knowledge (connected with the answer to the guiding question) and
- constitute a balanced representation of the spectrum of interests.

The first of these two aspects represents the knowledge dimension and can be described as a functionalist perspective. The second aspect is related to the democratic perspective (all important interest groups should be adequately represented). When selecting representatives, it is likely that individual representatives will be able to represent several interest groups. This should be discussed with the selected representatives and should then be maintained throughout the process of drafting the chapters of the White Book. Further details on this point are given in Box 3 (at the end of the text).

**Table 3: Unseen-Stakeholder-Cross table** (extracts from vulnerability space VS03: SME, digitization and digital data)

Unseens (Unintended side effects in the use of digital data)		Roles		
		„Originator/ Causer“	„Persons concerned“	„Problem solvers / regulators“
1	Economic optimization to the disadvantage of ecological functions			
2	Employment and diversity of actors in rural areas			
3	Market concentration / data rights			
4	Knowledge loss (to be explained further)			
5	Full automation (dependence and manipulability)			
6	Loss of added value through high transparency			
7	Food security / safety			
Requirements for representatives of stakeholder groups in DiDaT		„Sum“ X1 – X5 Product suppliers	„Sum“ Z1 – Z5 Product users	„Sum“ Y1 – Y5 Product Assessor

Secondly, the list of unseens is the starting point for the construction of the (socially robust) orientations in the White Book. Methodologically, the following approach is to be followed:

**Table 4:** Table „ From unseens to socially robust orientations “ (**Unseens-Orientations Table**)

	1. Unseens  (The "negative undesirable consequences" are dealt with here)	2. Causes / causalities / development processes of the Unseens	3. Possible socio-technological innovations for mitigation	4. Socially robust orientations for dealing with unseens
1	Economic optimization to the disadvantage of ecological functions			
5	....			
7	Food security			

### Box 3: *Thoughts on the selection of stakeholder groups*

A major challenge of DiDaT is to have a balanced spectrum of representatives available on both the practical and the scientific side, who adequately represent the interests and knowledge perspectives. In order to ensure this and not to distort the White Book's orientations in terms of knowledge or values, so-called "**Unseens x Stakeholder tables**" have been created in all vulnerability spaces. These should make it comprehensible which perspectives are directly represented in the project. In DiDaT, the Unseens refer to (unintended side) effects and consequences of the use of digital data that are **assessed as negative**.

The identification, description, and analysis of these unseens is thus based on normative aspects. Of course, it must be considered that what is considered negative by one side can be seen as positive by the other side. In order to pragmatically identify the essential unseens here, the working groups were asked in a first step to limit themselves to **effects** of digitization that led to **disadvantages/negative changes** in **sensitive stakeholder groups or in sensitive subsystems of the Federal Republic of Germany**. In this initial identification of unseens, it is not expected that relevant stakeholder groups will be fully covered, as the focus here is solely on the impact. Therefore, a second step is carried out. Here it is possible to list for each Unseen the **people affected**, the **causes/causers** relevant for the stakeholder groups (so-called **regulators**). In this step, however, other perspectives than affected parties, causers and regulators can also be considered. For example, an approach can be chosen that focuses on the stakeholder groups with the most comprehensive knowledge or the strongest interests. A distinction must be made between a functionalist knowledge and competence-based approach and a democratic, interest-based approach (Mielke, Vermaßen, & Ellenbeck, 2017; Mielke, Vermassen, Ellenbeck, Milan, & Jaeger, 2016).

**In DiDaT the interest-related perspectives should be in the foreground.** In principle, based on the list of Unseens, the same consideration must also be given to the representation of areas of knowledge. In order to increase the reliability and balance (of the interests of the stakeholder groups) in the Unseens x Stakeholder table, it makes sense to have the selection of the stakeholder groups to be considered carried out by representatives of different stakeholder groups or to carry out a discursive process to determine the respective stakeholder groups. The working groups for the vulnerability space are challenged with the preparation of the detailed plan to check which stakeholder groups can represent the practitioners already involved in the process and to which stakeholder groups additional representatives from practice should be identified. The selection of stakeholders will be presented at the second stakeholder conference, discussed in the plenum and then adjusted if necessary on the basis of the recommendations of the steering board and the management of DiDaT.

#### References:

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### Digital Data as a Subject of a Transdisciplinary Process (DiDaT)

Institute for Advanced Sustainability Studies Potsdam (IASS)  
e.V. Berliner Strasse 130  
14467 Potsdam  
Tel: +49 (0) 331-28822-300

Fax: +49 (0) 331-28822-310

E-mail: [media@iass-potsdam.de](mailto:media@iass-potsdam.de) [www.iass-potsdam.de](http://www.iass-potsdam.de)

Authors:

Roland W. Scholz, Verena H. van Zyl-Bulitta, Dirk Marx, Markus Beckedahl, Stephan Noller, Ortwin Renn

Contact:

Ortwin Renn: [Ortwin.Renn@iass-potsdam.de](mailto:Ortwin.Renn@iass-potsdam.de)  
Roland W. Scholz: [scholzr@emeritus.ethz.ch](mailto:scholzr@emeritus.ethz.ch) or [Roland.Scholz@donau-uni.ac.at](mailto:Roland.Scholz@donau-uni.ac.at) or [Roland.Scholz@iass-potsdam.de](mailto:Roland.Scholz@iass-potsdam.de)

Verena van Zyl-Bulitta: [vzb@iass-potsdam.de](mailto:vzb@iass-potsdam.de)

ViSdP:

Prof. Dr. Ortwin Renn,  
authorised to represent the institute