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VIRT-EU

Values and ethics in Innovation for Responsible Technology in Europe

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Enabling responsible ICT-related research and innovation

Deliverable 6.1

PESIA Scenarios

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Project Consortium

Beneficiary no.	Beneficiary name	Short name
1 (Coordinator)	IT University of Copenhagen	ITU
2	London School of Economics	LSE
3	Uppsala Universitet	UU
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5	Copenhagen Institute of Interaction Design	CIID
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Dissemination Level

PU	Public	
CO	Confidential, only for members of the consortium (including the Commission Services)	X
EU-RES	Classified Information: RESTREINT UE (Commission Decision 2005/444/EC)	
EU-CON	Classified Information: CONFIDENTIEL UE (Commission Decision 2005/444/EC)	
EU-SEC	Classified Information: SECRET UE (Commission Decision 2005/444/EC)	

Dissemination Type

R	Document, report	
DEM	Demonstrator, pilot, prototype	**X**
DEC	Websites, patent filling, videos, etc.	
O	Other	
ETHICS	Ethics requirement	

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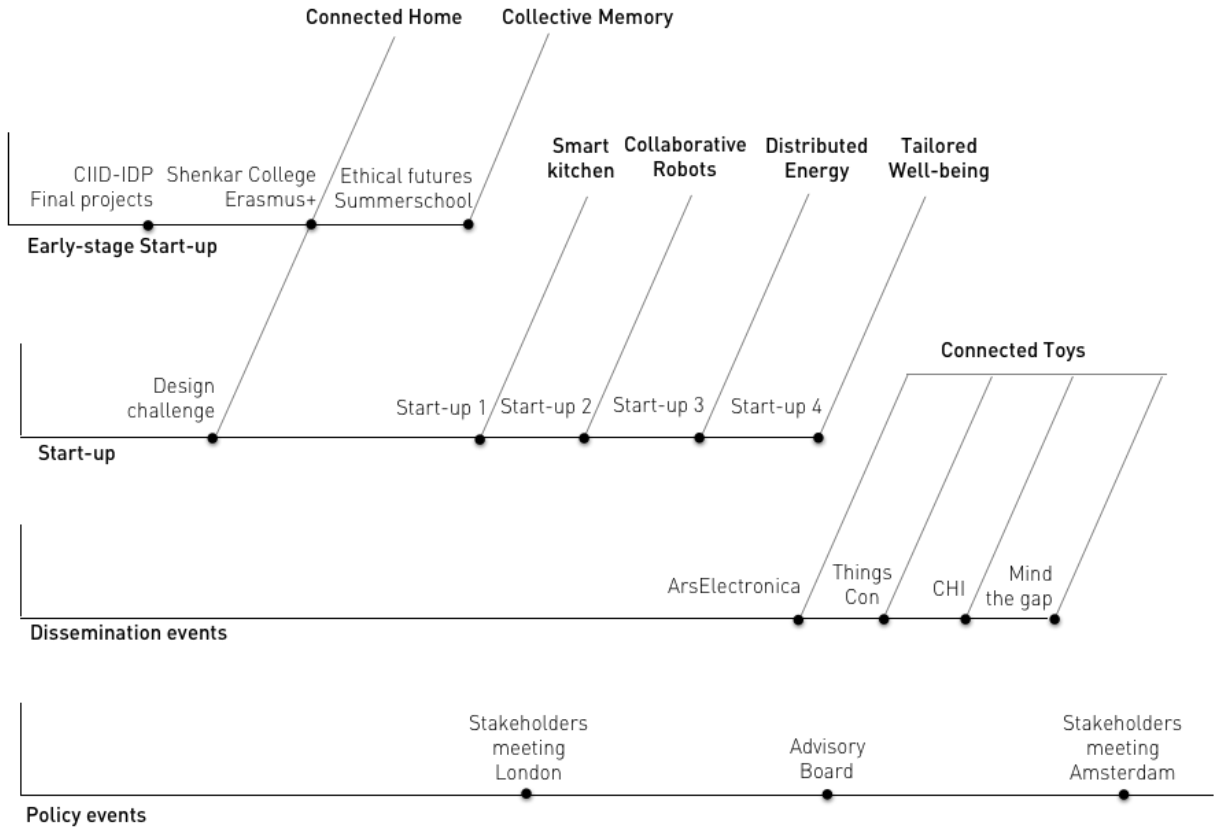
Executive summary

In deliverable D6.1 we present the prototyping process as well as the three versions of Tools and structural flows that we designed and tested. The focus of that deliverable is on the framework, the process, the design principles and the prototypes. This deliverable instead describes the activities carried out from the point of view of the stakeholders involved, the situation, the goals of the sessions and the topics covered. We focus on the use and contextualization of the PESIA questions.

This deliverable documents the activity carried out from August 2018 until August 2019. It describes the different communities and contexts reached by CIID and the whole partnership where tools, flow and ethical framework were used and presented in different ways to spark the conversation, support ethical reflection and facilitate the dialogue.

1. Scenarios overview



2. Dissemination & Policy events

In between the first project activity, devoted to research and co-creative exploration with different communities of developers and stakeholders, and the second part of development and test with start-ups, a "simulation" experience has been designed and shown around at different dissemination events i.e. ArsElectronica, CHI and ThingsCon. This experience already includes many aspects and ingredients that were eventually integrated or inspired parts of the operative tools for start-ups (Iteration #1) such as the concept of dilemmas to simulate unforeseen problems, the gap as a misalignment between values and actions or the speculation on unexpected consequences. Furthermore, in designing the experience, we found ways to make tangible the ethical theories that our partners at LSE and ITU identified as integral to developers of IOT.

Bear + co. is a fictitious immersion into the world of being part of an IOT start-up. We invited visitors to join the company, and put them through various ethical approaches as they become part of the company. First they must state their values - what they will bring to the company and care most about; this aligns with the theory of virtue ethics. Then, we test those values through different scenarios and problems that are unexpected and don't have easy answers, an experience that aligns with the capabilities approach and care ethics.
After a "worker" finishes, our software program compares the values they stated on their punchcard - the things they think make Bear and co. a Good Company, with the decisions they actually made. Sometimes there will be a misalignment - a tension - between the values they stated and the choices they made. As aligns with the care ethics principles, we treat this misalignment as simply room for improvement.

Thus Bear + Co. is an exhibition to immerse visitors in stating, reflecting upon and integrating ethics into their design process as they build new connected devices. As it can be difficult to grasp the concept of VIRTEU, and it's accompanying ethical theories, Bear + Co. is an experience designed to encapsulate and make some of VIRTEU's research more tangible. While it is a fictitious company, it is based on a real-life story of a product/company that went under because of major security / data protection problems. The experience was conceived for creators of IOT, specifically designers and developers in IOT start-ups - and meant to be a warming up kind of tool to start thinking about ethics in relation to creating connected devices.

Ethics is difficult work, critical questioning of assumptions, and requires practice. Through Bear + Co. and other supporting tools that we have been designing, we aim to give companies a way to try out and rehearse their ethical viewpoints such that when a dilemma actually comes your way, you are more prepared to handle it. While the Bear + Co. dilemmas are fictional, they are based on realistic facts and pressures that could be applied to many IOT start-ups.

The Bear + Co. story especially hits upon system-level structural constraints (political, economic, social, ecological, legal structures) within which IOT operates. While these structures are typically considered high-level and irrelevant to designers or developers who are meant to focus entirely on the product itself, in fact, in the small companies and start-ups that VIRTEU has been researching, the designers and developers are responsible for considering impacts on high and low levels. Furthermore, often the designer or developer in a small start-up is also the CEO, and / or they are often in charge of decisions that would in fact impact the product's development on a systemic level. We designed the Bear + Co. experience to try to pull creators out of the technical or design details that they are dealing with on a day to day basis and begin to exercise their speculative muscles about what kind of situations might occur.

More information and video at https://www.virteu-235.com/workshops/2018/10/4/bear-amp-co

The two stakeholders meetings are documented in Deliverable 5.4. Documentation of the dissemination events is collected in "Annex I - Dissemination events"

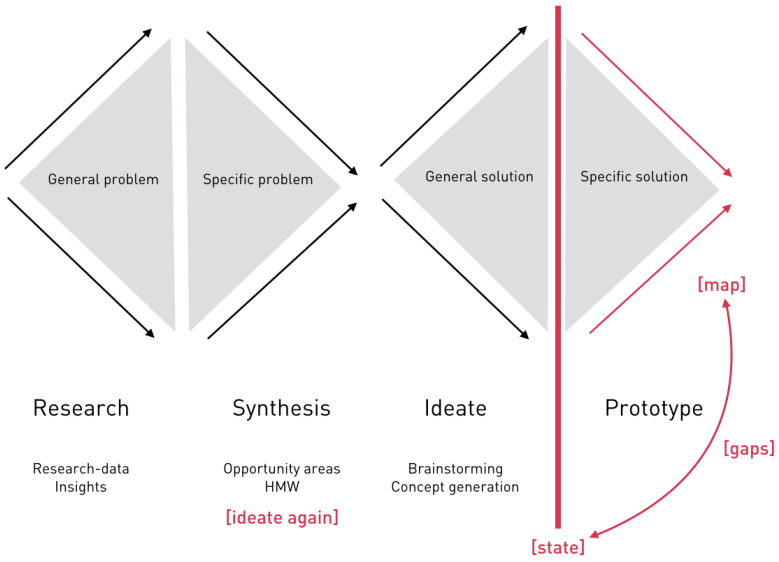
3. Early-stage Start-ups

We had the opportunity to test our tools, already conceived for start-ups, in a semi-fictional situation meaning that the students were designing and pitching a connected device as part of their training and not as real start-up. We chose to test our tools in this context in order to be able to quickly and with low-fidelity understand how well they functioned, even if the students are not necessarily the exact target for our final tools.

With the first group of students, at CIID's full-time education program, we integrated some of our tools while they were in the process of designing a capstone project. The students used our product mapping tool and tried to connect their product map with the values that support that product's conceptualisation. They also used our speculative scenario template to record possible positive, negative and unexpected outcomes of what would happen if their product were wildly successful and everyone in the world had their product. In this workshop, we found that in terms of the mapping and values tools, many students simply did not have a clear enough understanding of the potential technical options for their capstone project. These students are interaction designers, and many are accustomed to creating an idea through prototypes and giving the appearance of the idea working. Thus their education did not yet cover the gap between what they imagine and how it would actually be achieved through technical means, nor the analysis of that myriad of technical means in terms of their ethical impacts. This learning has been passed to the education team at CIID to integrate into the curriculum. On the other hand, the

speculative scenarios tool uncovered several unexpected potentials of the products the students were designing. The shift in perspective helped several students to understand potential weaknesses and identify aspects to re-design accordingly.

With the second group of students, from Shenkar College, we tried to integrate the tools into a design sprint in the context of the "connected home". Our goal was to understand at what point of the design process it would be beneficial to introduce "ethical friction" and how.



We therefore tested our tools in combination with the double-diamond process (UK Design Council):

- interrupting their ideation flow to ask them to articulate their values in relation to the product they were beginning to envision,
- letting them map the solution envisaged in terms of its technical implementation as well as data flow, structural assumptions around storage of data, the contexts of use, and more
- suggesting potential gaps between the values they had articulated and the system they were beginning to design based on the PESIA framework
- facilitating their speculation on the possible impacts of their design and assessment of different design or technical options through considering alignment with values as opposed to solely considering alignment with design principles or feasibility

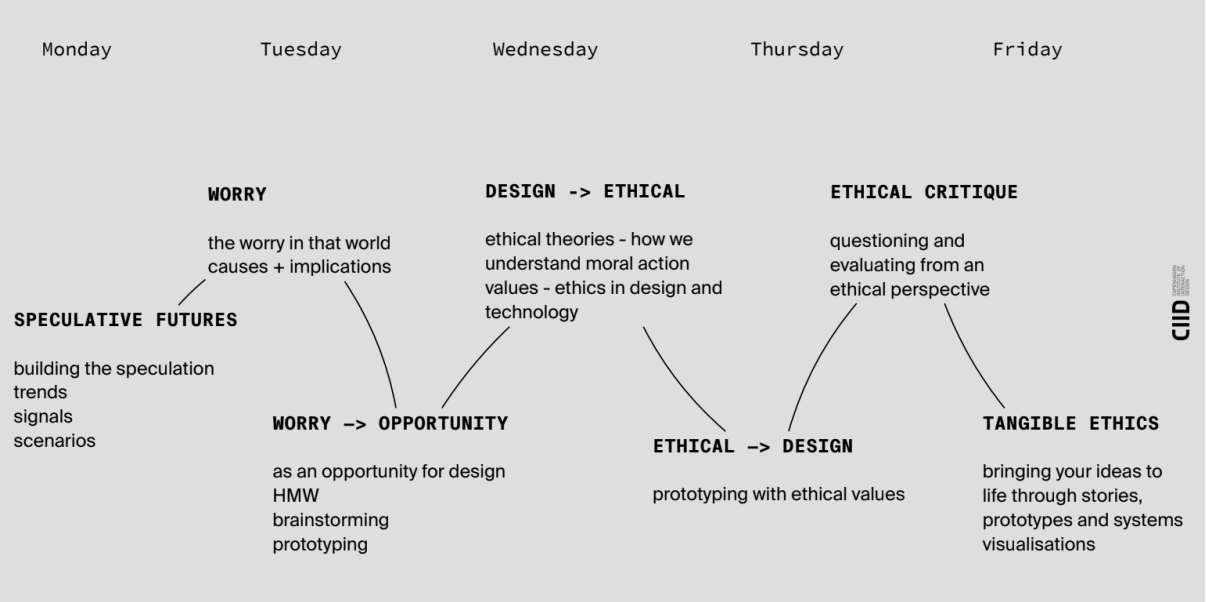
The three groups of students (each group was composed of 3-4 individuals) went through the same flow using the tools: STATE, MAP, GAPS, STEER, SHARE (Iteration #2).

The students were enthusiastic about the introduction of ethical reflection and they said it helped them to think deeper about the impacts and features of their Design Concept. The questions that we introduced from PESIA were integral to their re-considering their assumptions around the value of "wellbeing" and how well they were or were not designing for wellbeing, for example. At the same time, it was difficult for the students to understand how "Ethics" was part of the tools they were using, as we (as discussed with VIRTEU partners) to this point have not been highlighting the word or theories of ethics, though it is assuredly foundational to the tools. This decision is purposeful, yet needs to be reconsidered as we are now at the point of designing the tools' package and therefore also uncovering the need for a more satisfying and overt acknowledgement of "I have now started to learn Ethics." Furthermore, as the tools were integrated at such an early stage of the ideation processes, and together with many other tools and structures for design thinking, the students were overwhelmed by the amount of conceptual work they had to do. It is clear that at least some of the tools are more relevant, actionable and possible to incorporate at a later stage of the design process where the product concept is

significantly clearer and a more comprehensive team has been gathered. While it some found the tools useful, still, their reflections and ethical reasoning led only to some shallow adjustments. We made some hypotheses about the reasons for that:

- the ethical tools were introduced after the research and ideation activity and they were therefore subjected to the previous mindset.
- the students were not developers and they didn't have a deep understanding about the device they were designing.

The topic of the following educational workshop **"Designing Ethical Futures"** was geared towards futurescaping and speculation, where we tested the outcome of a speculative exercise around ethics where we provided material to the participants to support their work of questioning the futures of connected devices.



The process started with a day of speculation where 20 students were provided with Scenarios and Trends to build their own Story in the context of "Memory in the future". This was the base for the following speculative design activity focused on designing barriers, envisaged on a bowtie diagramme, against the issue they "worry" about.

During the following 3 days the same ethical tools were used: STATE, MAP, GAPS, STEER (Iteration #2).

From the observation of these two experiences we found that the requirement of committing to changes in the Map was crucial, and that the PESIA questions were productive even though they were either generic or seemingly not completely tuned to a product. The PESIA questions gave credibility to the tools overall, and the questions were difficult to a) identify and b) assess without the use of the accompanying series of tools (some before and some after). Furthermore, interestingly, the scenario from which the Designing Ethical Futures students began (rather than a design brief, for example), and the prompt of "Highlight what you are worried about" rather than "Identify the problem", allowed for a more meaningful and complex process of finding the area and the issues for which the students needed to design.

The experiences presented in this chapter are documented in "Annex I - Early-stage Start-ups".

4. Start-ups

In the end, as real potential users of our tools, we worked with 3 start-ups operating in different verticals and at different levels of maturity:

- Start-up 1, an start-up operating in the field of advanced robotic solutions for industrial manufacturing, providing robot integration services.
- Start-up 2, a mature start-up providing prepaid solar energy systems to off-grid, low-income households and businesses in developing countries through small-scale mobile repayments.
- Start-up 3, an start-up providing a service that helps people change their mindset around their habits. Consisting of a wearable wristband and a nudging messaging service, It enables self-insight and the skills for lasting change.

The start-ups went through a 3-hour-long process of using the tools of: STATE, MAP, GAPS, STEER and SHARE (Iteration #2 and #3).

With the 3rd start-up we redesigned the exercise towards exploring ethical theories more directly, and we expanded the MAP tool (Iteration #3)

Annex I - Dissemination events

Documentation of the dissemination events
https://owncloud.itu.dk/index.php/s/KL0mQUamx09n4Ns

Annex II - Early-stage Start-ups

Documentation of the facilitation tool used during the workshops
https://owncloud.itu.dk/index.php/s/tXqb65gTrRAf1yh

Annex III - Start-ups

Documentation of the tools tested
https://owncloud.itu.dk/index.php/s/60awiuOgb8wTz0t