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What if data protection regulators embraced foresight and speculative design?

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Abstract: Due to rapid technological advancements and the growing "datafication" of our societies, individuals' privacy constitutes an increasingly explored speculative space for regulators, researchers, practitioners, designers and artists. This article reports two experiences at a national and an international data protection authority (i.e., the Commission Nationale de l'Informatique et des Libertés - CNIL - and the European Data Protection Supervisor - EDPS - respectively), where foresight methods and speculative design are employed in policy-making with the goal of anticipating technological trends, their implications for society and their impact on regulations, as well as the effects of existing and upcoming laws on emerging technologies. Such initiatives can enhance strategic proactive abilities, raise public awareness of privacy issues and engender a participatory approach to the design of policies. They can also inspire the research, education and practice of legal design.

Keywords: Legal Design; Speculative design; Foresight; Desirable futures; Data protection; Policy-making

1. Introduction

> "We can't predict the future, but[...] it is fruitful to imagine what might be possible" (Ryan, 2019, p. 47).

Over the past few years, legal design has emerged as a field of research and practice where design methods are applied to solve or prevent legal problems (LeDA, 2018). The main approach driving legal design interventions is represented by design thinking. Despite its growing popularity and the ground-breaking intake provided to the traditional practice of law, design thinking does not fully exhaust the spectrum of relationships between law and design (Perry-Kessaris, 2021; Le Gall, 2021). Beyond the user-centred, utilitarian interpretation of design thinking as a problem-solving strategy, there are other "spaces" within the field of legal design where design practices can bring a meaningful contribution to legal studies and policy-making. It is the case of so-called "projective design" approaches

that thrive on the designer's visions of the socio-cultural environment and that have been used to support systemic reasoning, rather than to design functional legal products or services (Le Gall, 2021; Perry-Kessaris, 2021) in the view of market commercialization.

Among such approaches figures speculative design, which is characterised by the use of fictional prototypes to develop and present plausible futures (Auger, 2013). More specifically, speculative design is "commonly presented as near- or far-term 'what if' artefacts and scenarios that seek popular reflection and debate about the extent to which sociomaterial or sociotechnical futures and alternatives it presents are desirable or not" (Tharp and Tharp, 2018, p. 86). This use of design can open new perspectives on the "wicked problems of the world" (Dunne & Raby, 2013, p. 2). In this sense, such an approach can raise awareness on pressing societal issues and bolster agency over transformation, through imagination, critical thinking and, why not, irony. Within the field of speculative design, an additional practice that deserves discussion is design fiction. It is often used in relation to the world of science and technology to imagine not only alternative visions of the future but also of the present (Tharp and Tharp, 2018, p. 87). As main instruments, design fiction relies on narrative tools, such as short stories, videos, comics, and pastiches of academic works.

Design's anticipatory logic is shared with another relevant approach emerging in the public policy practice, i.e., foresight (Kimbell and Vesnić-Alujević, 2020). Foresight studies are commonly understood as the process of systemic inquiry into the future (Reger, 2001). Their tools, such as scenarios and horizon scanning, are meant to analyse relevant information, trends, and ideas, and gather evidence on "how the future could unfold" to support "strategic thinking and decision-making" by policy-makers (Habegger, 2010, p. 50). As pointed out by Kimbell and Vesnić-Alujević (2020, p. 96), "approaches associated with foresight and design produce a capacity for these [*future*] uncertainties to be made visible and graspable, with the potential to open up participation and reflexivity in discussions about public policy issues and anticipate ways to address them, beyond public administrations".

Such a speculative, anticipatory perspective can represent a valuable tool to elaborate desirable policies and discuss their implications in areas that are particularly exposed to technological innovation and disruption, such as data protection. On the one hand, people, objects, and practices are increasingly transformed into digital data (the so-called "datafication", Southertorn, 2020) that are used at a massive scale for a number of purposes: from advancements in healthcare and environment protection to invasive forms of surveillance and microtargeting. On the other hand, the fast pace of innovation does not coincide with the snail pace of regulation which tends to be reactive to challenges arising from uncertainty (Fiesler, 2021) and is thus not always able to timely prevent negative consequences for individuals' fundamental freedoms. This is why an informed proactive approach becomes necessary within this context: prefiguring emerging technologies and their complex legal, ethical and societal implications through tangible fictional artefacts can help relevant stakeholders to explore such issues, devise alternative scenarios, challenge

narrow assumptions, preconceptions and givens (Dunne & Raby, 2013), and make policy interventions to address future developments of data-driven technologies and steer them towards desirable futures (Auger, 2013).

In this paper, we discuss two paradigmatic examples of foresight and speculative design methods applied to data protection 'anticipatory' policy-making. After an overview of foresight studies and speculative design examples in the development of technologies and in policy-making, we introduce two case studies. The first case study concerns a foresight project started recently at the European Data Protection Supervisor (EDPS) and is meant to explore the future implications of emerging technologies and guide their development towards desirable outcomes. The second case study regards the endeavours of the French Data Protection Authority (the Commission Nationale de l'Informatique et des Libertés, CNIL) that has integrated design fiction tools into their foresight activities to plan for future scenarios and promote awareness about risks and opportunities of the data-driven economy. We then discuss how such experiences can contribute to the definition of legal design.

2. Speculation, technology development and privacy

2.1 The need for foresight and speculation in technology development

Much past design practice has not ventured into exploring the social, cultural, and ethical implications of the technological products it creates and makes consumable (Dunne, 2005). In times when technological development devoid of any ethical and social dimension is increasingly criticised while responsible innovation is becoming an institutionalised area of research and practice (Genus and Inskandarova, 2018), the critical and anticipatory function of speculative design seems particularly enticing. All sectors of society are increasingly aware that digital technologies do not only uncover exciting opportunities for humanity, but they can aggravate inequalities, foster capitalist domination, and implement ubiquitous surveillance to the exclusive benefit of a handful of people (Huberman, 2021).

In Western civilizations, the future identifies with technological progress (Blauvelt, 2019) which is increasingly data-driven and regulated. New technologies are first introduced and then debated, if at all (Tharp and Tharp, 2018) because they are based on market-driven forces that suffer from a short-term vision. The exposure of harmful effects of technology design choices over millions of people worldwide, data misuse scandals (e.g., that of Cambridge Analytica, see Isaak & Hanna, 2018) and the public remorse of designers and developers about the addictive products and functionalities they have contributed to creating (e.g., the Center for Humane Technology) clearly exemplify the need for anticipation capacities to adjust behaviour in the present and thus better address future problems (Poli, 2010).

Foresight studies and speculative design practices provide the methods to explore both desirable and undesirable futures, anticipate their implications and strategically prepare for

them. Design speculations can challenge established ideas and values, debunk undisputed myths associated with new technologies (such as technosolutionism and technopositivism), and engender alternative worldviews (Ryan, 2019). Imaginations can be made visible and tangible when transformed into explorable artefacts that evoke (not necessarily positive) emotions, shift perspectives, and encourage the exchange of ideas (Perry-Kessaris, 2021). Objects that act as "intellectual prostheses'' can communicate ideas and stimulate reflection by challenging the audience to find messages and meanings (Tharp and Tharp, 2018, p. 7). By proposing alternative ways of thinking and producing, people engaging in speculation aim at interacting with the present to better inform the future (Ryan, 2019) and vice versa. For instance, the consequences of certain choices can be imagined as a means to drive responsible innovation and open up new opportunities that are freed from current social constraints (Hiesinger et al., 2019).

2.2 (Re-)imagining our privacy futures (or the present?)

Various speculative approaches can help us re-imagine and re-write our data-driven futures with a stronger agency. In an ever-increasing "datafied" society, many creatives resort to speculation to reflect on the implications of certain emerging technologies on privacy and imagine countersurveillance solutions. For example, designer Bernd Hopfengaertner developed six video scenarios imagining a dystopian future (or at least it was so in 2009 when the project was launched) where data from facial micro expressions are automatically collected and used for making decisions about humans or influence their behaviours, from buying a teapot through alternative forms of couple's therapy to dynamic billboards that change advertisements depending on consumer expressions. One of these scenarios ("Muscle exercise") presents a system that trains humans to control their facial micro expressions and "game" the system (Dunne and Raby, 2013, p. 38-39).

More recently, designer Adam Harvey created inventive camouflaging prototypes to confuse image processing AI and disrupt facial recognition, for instance, CV Dazzle (Hiesinger et al., 2019, p. 32) and HyperFace. This work then converged into the Exposing AI project that provides a search engine to check if a person's Flickr photos have been unwittingly scraped to train facial recognition algorithms, a practice that has been heavily fined by the data protection watchdogs in Italy (Garante Privacy, 2022) and UK (Information Commissioner Office, 2021). Similarly, the ZXX typeface by Sang Mun is a freely downloadable typeface that results unreadable to optical character recognition scanners (Hiesinger et al., 2019, p. 196) and is meant to stave off undesired monitoring and censorship over online communication (Mun, 2013). These are uses of design for political and social provocation with the practical implication of raising awareness of the public and policy-makers about surveillance.

In a comparable provocative work, artist and biohacker Heather Dewey-Hagborg anticipated the potential of genetic surveillance. In the Stranger Vision project, the artist generated 3D-printed models of people based on the DNA extracted from samples (e.g., chewing gums, cigarette butts, etc.) she collected in the streets of New York (Hiesinger et al., 2019, p. 188).

The 2012 project was meant to draw attention to the developing technology of forensic DNA phenotyping, which became a reality two years later and to discuss why it is unreliable in criminal investigations. The artist also created speculative antisurveillance products inspired by existing digital privacy-enhancing applications: for example, DNA spoofing that scrambles, and thereby anonymizes, genetic material and Invisible, composed of 2 sprays, one that erases the traces of one's own DNA and one that mixes it with DNA noise. Advertised as fully-functional commercialised products on the website of an imaginary biotechnology company, such prototypes transpassed the wall of fiction to become, like real products, publicly covered in newspapers.

With the aim of countering omnipresent people analytics in professional environments, Connivence, a non-existent company set in 2027, offers digital products meant to distort and falsify data to escape, circumvent or respond to managerial surveillance. For instance, "present.ia" creates video and audio deepfakes to mimic the employee's presence while working remotely, while "panoptiCo" allows employees and syndicates to oversee managers' behaviours by providing metrics (e.g., in terms of productivity, leadership, ethics, etc.) and thus have a stronger power in negotiations. These and the other products, in reality imagined by the studio Design Friction, are part of a realm that is not that imaginary, quite the contrary: they are inscribed in a fairly plausible world. Such a gist of irony emerges in other fictional creative works. Inspired by the annoying design of cookie consent management banners, various video games have been developed, such as "Cookie policy speed run" and "Terms and conditions". Although they materialise a humoristic critic, they are also so plausible that they can be used for purposeful training of online users against manipulative interfaces.

This non-exhaustive list of provocative prototypes (i.e., "provotypes") is meant to raise awareness of modern data practices, criticise them as they encroach upon dystopian scenarios and offer provocative solutions that, in some cases, could also be adopted for real.

3. Applications of foresight and speculative design in policy-making

Whilst the adoption of speculative design in policy-making is relatively recent, foresight is an established anticipatory method used by many institutions to deal with rising levels of complexity and uncertainty (Kimbell, 2019) to analyse trends, drivers, and scenarios; and to produce roadmaps and policy recommendations (Popper, 2008). The OECD, for instance, resorts to scenario building and other methods of horizon scanning (Havas & Weber, 2017) to explore long-term projections and predict the impact, analyse the risks and strategize decisions about climate, energy and new technologies. UNESCO draws on foresight to "better understand, anticipate, and imagine the futures of knowledge and learning", including the impact of technologies on society, politics, economy and culture. Under the von der Leyen presidency, the European Commission aims to strengthen "its culture of preparedness and evidence-based anticipatory policy-making" by embracing strategic foresight to inform new regulatory initiatives and to review existing ones. In their Strategic

Foresight Report 2021 (European Commission, 2021), great relevance is given to emerging technologies, as well as to their risks and social implications. Such importance is reflected in the EU Digital Strategy and related policy initiatives (e.g., the proposed Data Governance Act, Artificial Intelligence Regulation, etc.). In the UK, future studies are an integral part of evidence-based policy-making to support a strategic long-term vision.

Anticipatory governance (Fuerth, 2009) can additionally resort to speculative design to better exercise foresight, e.g., by visualising multiple possible outcomes (Kimbell, 2019). It acknowledges that dealing with change in this highly uncertain, complex time needs hybrid approaches (Pinto & Medina, 2020), imagination and comprehensive perspectives, rather than relying only on logical, linear processing (Buehring & Bishop, 2020). This is why foresight and design can fruitfully complement each other: whereas "foresight provides a future context for design, design embodies ideas and concepts by visualising alternative and desirable futures for foresight" (Buehring & Bishop, 2020, p. 410).

While foresight methods create systemic knowledge with the functional aim of enabling organisations' strategic decision-making, design fictions entail a provocative, critical aspect. The weird ordinariness of the "provotypes" easily evokes alternatives to our everyday life (Kaspert et al., 2017) and can thus be experienced rather subjectively. That said, both disciplines contribute to develop, discuss and present desirable (or undesirable) futures (Auger, 2013) through speculative exercises, starting from a problematization of issues (Kimbell, 2019) that is an analysis, and sometimes a critique, of the present. This approach can help various stakeholders to explore the future implications of policy initiatives in creative manners (Darby et al., 2015: Hagan, 2021) and can contribute to experimenting policy ideas before their large-scale application.

For example, McNealy, Jen and Nguyen (2022) explored visual prototyping with a number of policy-makers, engineers, product managers and designers to future-proof three US privacy bills. Through the prototypes, they unveiled questions, challenges and opportunities with the intent of addressing the gap between a policy's goal and its implementation and to prevent its failure. When combined with participatory approaches, policy-making can become a collective practice where the publics become co-researchers in the exploration of the issue and co-designers in the anticipation of policy solutions and their consequences (Kimbell, 2019). For instance, the pilot project ProtoPolicy (Darby et al., 2015) engaged relevant communities to respond to the UK's "Ageing in Place" policy agenda through the co-creation of design fictions (e.g., a self-administered euthanasia wearable). The outcomes were then presented, not without challenges, to civil servants and MPs as input for evidence-based policy-making. Similar initiatives are becoming popular also at smaller scales, for instance to counter what is often framed as an inevitable "highly technologised, datafied and surveillant future" (Bayne & Gallagher, 2021, p. 607). In the next two sections, we will introduce the two case scenarios of foresight (Section 4) and speculative design (Section 5) adopted by policy-makers in the data protection field.

4. Monitoring the future at the European Data Protection Supervisor

4.1. Background and motivation

In the international arena, the EDPS is one of the few personal data protection authorities to use foresight and future studies to attend to its mission. The EDPS is responsible for ensuring that the fundamental rights and freedoms of individuals, in particular their right to data protection, are respected by the European Union institutions and bodies (EUIs) as set forth by Regulation 2018/1725. Accordingly, the EDPS must "monitor relevant developments, insofar as they have an impact on the protection of personal data, in particular the development of information and communication technologies". In fact, the EDPS has always been a leading institution concerning technological monitoring, as testified with many initiatives.

The first pillar of its Strategy 2020-2024 is dedicated to foresight to "closely examine both the potential risks and opportunities offered by technological advances, understand the possibilities of new technologies and, at the same time, encourage the integration of data protection by design and data protection by default in the innovation process". The EDPS intends to foster an evidence-based dialogue on intrusive, emerging or simply hypothetical practices and to alert EUIs when the use of a technology does not respect the fundamental rights of personal data protection. Thanks to its independence from other powers, the EDPS primarily aims at working in an anticipatory manner to participate in the data protection community more effectively and avoid wasting useful resources by raising the readiness of its teams, the national data protection authorities (DPAs) and the general public concerning upcoming technological, regulatory and socio-economic developments.

4.2. Foresight activity: the data protection technology sonar

For these purposes, the EDPS has started a project dedicated to the identification of emerging technologies in a short time window of one year, guided by the need of an immediate return onto the technological preparedness of the teams involved when briefings are requested or dedicated meetings occur. Thus, the EDPS developed an inclusive and agile process that leverages on the diversified backgrounds and experiences of the officers and tangentially aims to increase internal collaborations. Thanks to small and measurable actions, the EDPS envisages to acquire foresight capacities and knowledge, ultimately to evolve toward a new way of thinking. Such an agile and collaborative approach required the creation of an interdisciplinary team (I.e., the "EDPS Trend Taskforce") composed of experts in technology, law and policy from various units and headed by a Trend Coordinator.

The Taskforce applies a tailored methodology called "Data Protection Technology Sonar", illustrated in Figure 1. The first step consists of a monitoring activity (i.e., the initial scouting) carried out by the Trend Coordinator. Thanks to a qualitative and quantitative approach based on data analysis of reports, researches and patents, the Coordinator identifies a series of weak

signals and a set of emerging technologies with a high impact on personal data protection and fundamental rights.

Figure 1. A diagram illustrating the five steps of the EDPS's foresight method.

During phase two, the Trend Taskforce organises a collective brainstorming session. The group discusses and then agrees on a plausible future scenario using a tailored horizon scanning approach (European Commission, 2015) aiming at understanding the various driving forces of change and their interactions. Then, the group selects the five technologies considered as most impactful in the upcoming year (2022), such as digital therapeutics and central bank digital currencies. Finally, each technology is assigned to a Trend Champion, i.e., components of the taskforce that volunteered to author a report dedicated to that technology. The Champions constitute a unique reference point for both internal and external stakeholders that intend to build their capacities or discuss policies that intersect with that specific technology.

The third phase of "collective review" consists in a presentation of the outcomes and a group brainstorming meant to improve the previous outcomes, avoid any shortcoming or bias in the analysis and gain execution speed. During the fourth phase, the Trend Coordinator reviews the contents, publishes the outputs on the EDPS website and launches a series of internal and external promotional and advocacy activities, like presentations at working groups, meetings with companies and keynote speeches at conferences. In the last phase (i.e., "continuous monitoring"), Trend Champions continue to oversee the developments of the technology assigned to them so that they can promptly update the published reports.

4.3 Feedback and future work

This methodology has been deployed for the first time in 2021 and the second phase is starting at the moment of writing. The outputs are publicly available on the Techsonar page of the EDPS website. Within the EDPS, the demand for foresight competencies is increasing and various units have requested to start similar exercises in different areas. Furthermore, many of the technologies identified so far have already required several report updates, a sign that they are evolving rapidly and should be thus closely monitored. In the next iteration, the initial

scouting phase will be informed with an additional quantitative approach to obtain a more comprehensive overview of the technologies. Moreover, success KPIs will be defined in order to understand eventual pitfalls, both in the process and in the output.

5. Foresight and design fiction at the French Data Protection Authority

Foresight approaches play a crucial role in a wider process of innovation activities meant to enable the CNIL to be prepared for future policy challenges. They also allow other stakeholders (e.g., companies, citizens, lawmakers, etc.) to be aware of the risks and opportunities derived from the use of certain technologies and services.

The CNIL is mainly composed of lawyers and engineers, but an interdisciplinary Innovation and Foresight team was created in 2011 to help the organisation to anticipate issues related to data protection and new technology uses. One of the team's missions is to facilitate analyses that stretch beyond merely legal and technical aspects to touch upon ethical, social, societal, economic dimensions, and can be integrated into the CNIL's decisions and publications. The team is multidisciplinary and is composed of experts in digital humanities (e.g., political science, sociology, economy, design, etc.) and engineering. The team produces foresight reports, articles, blog posts, and carry out empirical studies. It also participates in the general activities of the CNIL alongside lawyers and technologists to issue guidelines and opinions. In order to achieve its mission, the Innovation and Foresight team needs to act proactively, i.e., before the adoption or widespread use of a technology, and collaborates closely with various actors of the innovation ecosystems, i.e., research laboratories, companies, startups, NGOs and civil society. As a part of its foresight toolbox, the CNIL integrates design fiction and speculative design methods in their toolbox to support more traditional foresight analysis techniques.

5.1 Why does the foresight unit of a data protection authority resort to design fiction?

The use of design fiction at CNIL is an integral part of a broader framework that employs a multidisciplinary approach to address the major ethical, legal and technological issues associated with data protection. The objective is to provide knowledge and inspiration both internally and externally. Hence the CNIL needs to develop a broad warning system (or futures watch) to be able to spot heavy trends, as well as weak signals ("seed events"), to "find the sign, minuscule in current dimensions but immense in virtual consequences, announcing a technical, economic or social transformation" (Massé, 1962, our translation).

In parallel to factual analyses of the issues in a specific sector, future speculations can recur to fictional artefacts that depart from the reality of existing, directly identifiable cases. This makes it easier to ask questions, without acknowledging, but rather challenging, what exists and what is plausible: the boundaries between the fictional, the plausible and the real are often blurred in privacy and technological innovation. The fictional artefacts allow

individuals to more intuitively grasp the possible evolution of regulations, different practices, and even legislative frameworks, following a method that could be compared to a backcasting technique. Backcasting (Robinson, 1990) is a planning method that starts with defining a desirable future and then works backwards to identify policies and programs that will connect that specified future to the present - most of the time, those that will protect us from dystopias.

5.2 Methods for the generation of design fiction artefacts

Figure 2. This design fiction artefact illustrates a speculative 2032, when the public authorities of a paternalistic state use tactics to interfere in the daily lives of the most "unmanageable" citizens. This example shows an extract from a (still confidential) presentation for the Government about a new misinformation campaign meant to support facial recognition. The promotion of a fake viral quote intends to nudge citizens to abandon the strategies they employ to fool facial recognition. Translation of the French text: plan of virtuous disinformation (2033-2034) / Reinforce facial recognition. The observation: Citizens invest massively in solutions that disrupt our facial recognition capacity. The proposal: A false viral citation to make citizens diminish their anti-facial recognition behaviours. "The truth is that it's not necessary to dissimulate oneself. Facial recognition has never been put in place because we did not have the means to. But we politicians could not acknowledge it. We let people believe that everything is working, but 99% of the time they are fake CCTVs." General Thuilliers, prior director of the Digital Intelligence service (March 2032).

In addition to a classic monitoring of the sector's news, fictional works (e.g., movies, novels, comics, art installations, etc.) can inspire anticipation and foresight. The idea is to search for elements that could be related to the topic of study and gather insights deserving a deeper investigation. This activity can be done with relevant experts in-house or with the help of external contributors, such as when an open call for "fragments for the future" was

launched in September 2020. Responding participants (i.e., Casus Ludi, Chronos and the Plurality University Network) were asked to explore and share imaginations from fictional works relating to how life and data protection could be like in 2030. These visions of future possibilities were rather meant to hint to plural imaginaries that cover different aspects (e.g., rural world vs. urban world). The fragments, i.e., significant excerpts from complete works, served as material for the production of design fiction artefacts by the Innovation and Foresight team (Figures 2 and 3). Such a collection was then analysed and published in a report (Courmont et al., 2021).

Figure 3. This design fiction illustrates a speculative 2032, when people's reputation is "data-driven" and provides access to jobs and services. This design fiction is an ad for the "Bonaloi insurance" company: its latest offer proposes to index one's behaviour on that of a K-Pop idol to boost one's reputation and thereby benefit from insurance rate discounts. Translation of the French text: Exclusive offer. Model yourself on Seong-Jin Lee, K-Pop Idol PurpleR3D. Index REP on 01/01/2032 850 +. Follow her actions…Vegetarian, non-smoker; helmet use on the micro-scooter; associative commitment; Up-to-date profile management. Benefit from advantages! Healthcare; transport; pension; savings. Consult with our agents and find all our modelling offers on bonaloi.fr/modelage. Offer subject to conditions until 30/06/2033.

These types of activities serve as a source of inspiration in other projects. For example, in 2017 a workshop on smart cities (Chatellier et al., 2017) challenged participants to co-create 2026 urban services (Figure 4). The Innovation and Foresight team invited smart city and data experts who were not necessarily well-versed in data protection laws to imagine different scenarios from a description of the city of the future and the technologies that could be employed. The objective was to unleash the imagination from existing regulations and constraints to project oneself as entrepreneur or service provider in this imaginary city. The ultimate goal was to reflect on the public policy interventions that need to be devised in such a context. The fragments of fiction inspired the workshop and were used in combination with design participatory methodologies, e.g., canvas to foster creativity.

Figure 4. This fragment of fiction was used in a workshop where the participants had to prototype an imaginary service in "The city as an experience". The questions that were raised were: How could technologies modify the perception of the city? How might public services become more responsive and reliable? What would be the business models to improve the user experience? Translation of the French text: Dystopian inspirations - science-fiction. 1. The isolation caused by the ultra-personal assistant of the movie "Her" (Spike Jonze, 2013). 2. The possibility of being blocked by all citizens thanks to Virtual Reality in "Black Mirror - White Christmas" (Carl Tibbetts, 2014).

The scenarios hosting the design fictions originate from the documentation on prospective trends and weak signals and the identified fragments of imaginary. These can serve to upset expectations, highlight new uses of technologies, unexpected socio-technical phenomena, or ruptures in systems of values and politics and thereby inspire the conception of new scenarios. This is where design fiction artefacts (e.g., fake advertisements, fake press articles, posters or digital objects) enable people to see and experience everyday life in speculative "after worlds" through the materialisation of issues and controversies with the goal of creating discomfort, i.e., a moment when we no longer know where the border between reality and imagination lies, and to encourage everyone to question issues of data protection.

5.3 Towards operational forward-looking recommendations

The use of design fictions fulfils three complementary functions: "to explore new territories, to simulate situations and their developments, and finally to encourage exchange" (Kaplan, 2019), with or within the various stakeholders, including data protection authorities. The Innovation and Foresight team uses this material to feed their proposals of operational foresight recommendations. As an example, following the above-mentioned project on smart cities (Chatellier et al., 2017) describing how the digital city's new services increasingly rely on personal data that is collected and processed for commercial ends by private actors, the CNIL's team developed a matrix of four scenarios that imagined and explored different data use cases that could restore the balance between public and private spheres while respecting the rights and interests of organizations and individuals. This matrix was later used as a tool to facilitate discussion in a working group organized by the government on the future of digital regulation. In 2019, following the publication of another report that included design fictions (Chatellier et al., 2019), the Innovation and Foresight team made the recommendation to bring UX and UI design expertise more directly into the activities of the data protection authorities, including for enforcement purposes. In 2021, following the design fictions based in 2032 described above, some recommendations were made to encourage the creation of data intermediaries (e.g., trade unions, associations, open source communities) to help the collective management of data subjects' rights. Although such recommendations are not always the direct outcome of a speculative exercise, design fictions play a paramount role in the thinking process and lead to the formulation of such recommendations. A speculative attitude could prove helpful to other stakeholders: for example Data Protection Officers could engage employees in awareness campaigns and data protection compliance procedures in a more fruitful manner.

6. Discussion

As mentioned in Section 3, policy-makers have been embracing foresight and speculative design methods to pursue some of their institutional goals. In sectors particularly exposed to technological changes, the "anticipation" of certain scenarios has been adopted as a strategy to support future-proof regulation. In this paper we have presented two ways in which supervisory authorities have embraced such proactive approaches to enhance data protection *by* design, *through* design.

The EDPS' case is based on established foresight methods like horizon scanning and desk-based research on factual data. Such methods aim to provide evidence-based insights and focus on the monitoring of the evolution of emerging technologies. The second initiative is developed by the CNIL that recognizes the legitimacy of design fiction, among other foresight methods, as a rhetorical tool to stimulate critical thinking and long-term impact. In this case, there is no pretence to only rely on factual data, therefore fictional and artistic works are embraced, nor to draw conclusions that can be generalised. Even if scenarios are inspired by a variety of works, including mass culture productions spanning from the less to the more (or even un-) likely, such an approach does not aim to forecast but rather to

explore the open, plural nature of futures. The goal is to question the status quo of data protection, digging into its nature and shortcomings, to spark debate on controversial practices and to prefigure policy actions (Tsekleves et al., 2020). What can we learn from these experiences? And what are the implications for legal design as a field of research and practice?

First, these examples contribute to a broader understanding of the relationship between law and design. Legal design, understood as an umbrella term including applications of design in the legal domain (from contract design, to access to justice and policy-making), reaches beyond the problem-based approach predominant in the design thinking discourse (Hagan, 2020, p. 9; Haapio, Barton and Compagnucci, 2021; Le Gall, 2021). For instance, a forward-looking dimension, inherited from proactive law, is a core component of legal design since its first conceptualisations (Berger-Walliser, Barton & Haapio, 2017; Rossi & Haapio, 2021) and closely recalls the ability to identify and address risks in the development of technologies early on. A proactive approach is also the foundation of privacy by design (Cavoukian 2009), which has been codified in Europe as data protection by design in Article 25 of the General Data Protection Regulation.[1]

Speculative methods, including dystopias, can expand the problem-solving/ problem-preventing dimension, by offering an additional set of tools to question the legal status quo, explore possible interventions, and create desirable futures, including policies. As shown in the case of the CNIL, speculative design can enable data protection authorities and other actors of the data economy to devise strategies for data protection by design and orient their compliance efforts beyond a close timeframe, even before certain technologies arise or are adopted on a large scale. In this sense, both foresight and speculative design can be used as structured strategies to support proactive and creative thinking of experts, practitioners and policy-makers.

Second, such approaches can be helpful to pursue another crucial institutional goal of supervisory authorities, i.e., increase public awareness about privacy and data protection. Certain debates about the future of privacy and technological advancements have conquered the mainstream culture, for instance with the popular TV series “Black Mirror” (directed by Charlie Brooker, 2011-14) that explores plausible near-futures that act as cautionary tales; or with the science fiction series “The One” (directed by Howard Overman, 2021) that explores a world of genetic determinism and sensitive data misuse. Based on speculative methods, such as scenarios and worldbuilding, this provocative entertainment (Baumer et al. 2020) is reportedly used in education to create and sharpen the legal and ethical foresight abilities (“the legal imagination”) of future lawyers (Fiesler, 2021) and technology developers (Thornley et al., 2021). Speculative activities also hold a great value for researchers as they could help to visualise, concretize and experience in a plurality of

[1] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)

scenarios the future privacy implications of academic and industrial research in the domains of computer science, data science, engineering and bioinformatics.

Although such fictions can contribute to elicit reflection and debate among the general public, they do not automatically enhance the agency of non-expert audiences over drafting and enforcement of regulations nor the control over privacy-invasive technologies. Instead, similarly to enduring data protection and cybersecurity programs through virtual reality and other embodied experiences (Jin et al., 2018), tangible future fictions that embed the consequences of technology mishandling or data misuse may engender an augmented sense of agency and accountability among data processing key players (like developers, researchers, but also DPOs, CEOs, etc.) (Rossi et al., 2022) and enhance the proactive effect of privacy measures. We intend to carry out further research in this respect to find out whether such hypotheses can prove true in academia.

Third, speculative design methods may be a tool for policy-makers to broaden public participation (Darby et al., 2015), reach those at the margin of decision-making and democratically co-create the world we want to live in (Dunne & Raby, 2013), on which traditionally only a handful of powerful actors have a say behind closed doors. Questioning the official future (Inayatullah, 2006) and using counter-narratives can strengthen the sense of control that people have (or feel they have) against what are presented as inevitable trajectories ("future imperatives") (Bayne & Gallagher, 2021). Future work may want to compare whether such a sense of agency clearly emerges from the DPAs' speculative experiences and can contribute to inclusive governance forms.

This aspect introduces a highly debated theme, i.e., the evaluation of design interventions. Legal design has built its mantra on evidence-based methods and decisions. What kind of criteria should be applied to gauge speculative designs and foresight? In the ProtoPolicy project, Darby et al. (2015) have identified methodological challenges related to validity and reliability, for example the small sample size of participants and the collection of meaningful data to appropriately answer research questions and translate the findings into evidence, as "imagining is very subjective". Moreover, they highlight that speculative approaches do not have the legitimacy of other practices traditionally considered in policy-making. Baumer et al. (2020) argued that design fiction produces various kinds of knowledge and should therefore be evaluated accordingly through different frames. Future directions of research need to explore whether it is truly necessary to evaluate the impact of speculative design in policy-making and other applications, and if so, according to which criteria.

7. Conclusion

This article represents a first step towards a better understanding of how foresight and speculation can contribute to data protection policy-making. It is encouraging to learn that supervisory authorities increasingly acknowledge the potential of such disciplines to enhance their anticipatory decision-making. An open question concerns to what extent foresight studies and speculative design can be fully employed in (legal) design practice,

research and education. But as "[a]ll acts of design are themselves small acts of future-making" (Blauvelt, 2019, p. 90), similarly policy-making, research and education initiatives are small acts of future-making. And the future is yet to be written.

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8. References

Auger, J. (2013). Speculative design: crafting the speculation. Digital Creativity, 24(1), 11-35.

Baumer, E. P. S., Blythe, M., & Tanenbaum, T. J. (2020). Evaluating Design Fiction: The Right Tool for the Job. Proceedings of the 2020 ACM Designing Interactive Systems Conference, 1901–1913. https://doi.org/10.1145/3357236.3395464

Bayne, S., & Gallagher, M. (2021). Near Future Teaching: Practice, policy and digital education futures. Policy Futures in Education, 19(5), 607-625.

Berger-Walliser, G., Barton, T. D., & Haapio, H. (2017). From visualization to legal design: A collaborative and creative process. *Am. Bus. LJ*, *54*, 347.

Blauvelt, A. (2019). Defuturing the Image of the Future. In Hiesinger, K. B., Millar Fisher, M., Byrne, E., López-Pastor, M. B., & Ryan, Z. (Eds.), *Designs for Different Futures* (pp. 41-47). Philadelphia PA: Yale University Press.

Buehring, Joern & Bishop, Peter C. (2020). Foresight and Design: New Support for Strategic Decision Making | Elsevier Enhanced Reader. She Ji: The Journal of Design, Economics, and Innovation, 6(3), 408–432. https://doi.org/10.1016/j.sheji.2020.07.002

Cavoukian, A. (2009). Privacy by design: The 7 foundational principles. *Information and privacy commissioner of Ontario, Canada*, *5*, 12.

Chatellier, Régis, Delcroix, Geoffrey, Desbiey, Olivier, Five by Five, & Usbek et Rica. (2017). Voyage au centre de la ville de demain. LINC-CNIL. https://linc.cnil.fr/sites/default/files/atoms/files/voyage_au_centre_de_la_ville_de_demain.pdf Last accessed: 8 April 2022.

Chatellier, R., Delcroix, G., Hary, E., & Girard- Chanudet, C. (2019). Shaping choices in the digital world. From dark patterns to data protection: The influence of ux/ui design on user empowerment. CNIL-LINC. https://linc.cnil.fr/sites/default/files/atoms/files/cnil_ip_report_06_shaping_choices_in_the_digital_world.pdf. Last accessed: 8 April 2022.

Courmont, Antoine, Chatellier, Régis, Biéri, Martin, Casus Ludi, Chronos, & Kaplan, Daniel. (2021). Protéger la vie privée en 2030—Une exploration prospective et spéculative. CNIL-LINC. https://linc.cnil.fr/sites/default/files/atoms/files/linc_proteger_la_vie_privee_en_2030_-_une_exploration_prospective_et_speculative.pdf. Last accessed: 8 April 2022.

Darby, A., Whicher, A., Tsekleves, E., & Turner, N. (2015). ProtoPolicy Design Report. Using Design Fiction to Negotiate Political Questions (p. 38). Arts and Humanities Research Council. Available at: http://imagination.lancaster.ac.uk/wp-content/uploads/2020/02/protopolicy_design_report_print.pdf

Dunagan, J., Draudt, A., Hadley, J. J., Hogan, R., Murray, L., Stock, G., & West, J. R. (2019). Strategic foresight studio: A first-hand account of an experiential futures course. *Journal of Futures Studies*, 23(3), 57-74.

Dunne, A. (2005). Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design. Cambridge, MA: MIT Press.

Dunne, A., & Raby, F. (2013). Speculative everything: design, fiction, and social dreaming. MA: MIT press.

European Commission (2015). Models of horizon scanning: How to integrate horizon scanning into European research and innovation policies.

European Commission. (2021). 2021 Strategic Foresight Report. The EU's capacity and freedom to act. European Commission. Available at: https://ec.europa.eu/info/sites/default/files/strategic_foresight_report_2021_en.pdf

Fiesler, C. (2021). Innovating like an Optimist, Preparing like a Pessimist: Ethical Speculation and the Legal Imagination. Colorado Technology Law Journal, 19(1), 1–18.

Fuerth, L. S. (2009). Foresight and anticipatory governance. Foresight. https://doi.org/10.1108/14636680910982412

Garante Privacy per la Protezione dei Dati Personali. (2022, March 9). Riconoscimento facciale: Il Garante privacy sanziona Clearview per 20 milioni di euro. Vietato l'uso dei dati biometrici e il monitoraggio degli italiani. Available online at: https://www.garanteprivacy.it:443/home/docweb/-/docweb-display/docweb/9751323. Last accessed: 8 April 2022.

Genus, A., & Iskandarova, M. (2018). Responsible innovation: Its institutionalisation and a critique. Technological Forecasting and Social Change, 128, 1–9. https://doi.org/10.1016/j.techfore.2017.09.029

Habegger, B. (2010). Strategic foresight in public policy: Reviewing the experiences of the UK, Singapore, and the Netherlands. *Futures*, *42*(1), 49-58.

Haapio, H., Barton, T. D., & Compagnucci, M. C. (2021). Legal design for the common good: proactive legal care by design. In *Legal Design*. Edward Elgar Publishing.

Hagan, M. (2020). Legal design as a thing: A theory of change and a set of methods to craft a human-centered legal system. *Design Issues*, *36*(3), 3-15.

Hagan, M. (2021). Prototyping for policy. In *Legal Design*. Edward Elgar Publishing.

Havas, A., & Weber, Matthias. (2017). The role of foresight in shaping the next production revolution. In The Next Production Revolution: Implications for Governments and Business. Organisation for Economic Co-operation and Development.

Hiesinger, K. B., Millar Fisher, M., Byrne, E., López-Pastor, M. B., & Ryan, Z. (2019). Designs for Different Futures. Philadelphia PA: Yale University Press.

Huberman, J. (2021). A single narrative will not do: Capitalism in the digital age. Reviews in Anthropology, 50(3–4), 60–79. https://doi.org/10.1080/00938157.2021.2006889

Inayatullah, S. (2006). Anticipatory action learning: Theory and practice. Futures, 38(6), 656–666. https://doi.org/10.1016/j.futures.2005.10.003

Information Commissioner Office. (2021, December 1). ICO issues provisional view to fine Clearview AI Inc over £17 million. ICO. Available at: https://ico.org.uk/about-the-ico/news-and-events/news-and-blogs/2021/11/ico-issues-provisional-view-to-fine-clearview-ai-inc-over-17-million/. Last accessed: 8 April 2022.

International Energy Agency. Organization for Economic Cooperation and Development. (2004). Energy to 2050: Scenarios for a Sustainable Future. International Energy Agency. Organization for

Economic Cooperation and Development. Available at: https://read.oecd-ilibrary.org/energy/energy-to-2050-scenarios-for-a-sustainable-future_9789264019058-en

Isaak, J., & Hanna, M. J. (2018). User data privacy: Facebook, Cambridge Analytica, and privacy protection. Computer, 51(8), 56–59.

Jin, G., Tu, M., Kim, T.-H., Heffron, J., & White, J. (2018). Game based Cybersecurity Training for High School Students. Proceedings of the 49th ACM Technical Symposium on Computer Science Education, 68–73. https://doi.org/10.1145/3159450.3159591

Kerspern, B., Hary, E., & Lippera, L. (2017). ProtoPolicy, le Design Fiction comme modalité de négociation des transformations sociopolitiques. Sciences du Design, 5(1), 103–113.

Kimbell, L. (2019). What If There Were More Policy Futures Studios?. Journal of Futures Studies, 23(4), 129-136.

Kimbell, L., & Vesnić-Alujević, L. (2020). After the toolkit: Anticipatory logics and the future of government. Policy Design and Practice, 3(2), 95-108.

LeDa. (2018). Legal Design Manifesto, at <https://www.legaldesignalliance.org>

Le Gall, A. (2021). Legal Design Beyond Design Thinking: Processes and Effects of the Four Spaces of Design Practices for the Legal Field. In Ducato, R. & Strowel, A. (Eds.) *Legal Design Perspectives Theoretical and Practical Insights from the Field* (pp. 27-70). Milan: Ledizioni. ISBN print: 9788855265669.

Massé, P. (1962). Planification et prévision. La Table ronde, n° 177, octobre 1962.

McNealy, J. E., Jen, D., & Nguyen, S. (2022). Prototyping policy: Visualizing impact for better regulation. Convergence, 28(1), 109–126. https://doi.org/10.1177/13548565211069875

Mun, S. (2013, June 20). Making Democracy Legible: A Defiant Typeface. The Gradient. Available at: https://walkerart.org/magazine/sang-mun-defiant-typeface-nsa-privacy

OECD. (2017). The Next Production Revolution: Implications for Governments and Business. Organisation for Economic Co-operation and Development. Available at: https://www.oecd-ilibrary.org/science-and-technology/the-next-production-revolution_9789264271036-en

Perry-Kessaris, A. (2019). Legal Design for Practice, Activism, Policy, and Research. *Journal of Law and Society*, *46*(2), 185-210.

Perry-Kessaris, A. (2021), Doing Socio-legal Research in a Design Mode. Routledge.

Pinto, J. P., & Medina, J. (2020). Hybrid processes for a new era of strategic foresight. Foresight, 22(3), 287–307. https://doi.org/10.1108/FS-05-2019-0041

Poli, R. (2010). The many aspects of anticipation. Foresight, 12(3), 7–17. https://doi.org/10.1108/14636681011049839

Popper, R. (2008). How are foresight methods selected? Foresight, 10(6), 62–89. https://doi.org/10.1108/14636680810918586

Reger, G. (2001). Technology Foresight in Companies: From an Indicator to a Network and Process Perspective. Technology Analysis & Strategic Management, 13(4), 533–553. https://doi.org/10.1080/09537320127286

Robinson, J. B. (1990). Futures under glass: A recipe for people who hate to predict. Futures, 22(8), 820–842. https://doi.org/10.1016/0016-3287(90)90018-D

Rossi, A., & Haapio, H. (2021). Proactive Legal Design for Health Data Sharing Based on Smart Contracts. In Smart Contracts: Technological, Business and Legal Perspectives (Marcelo Corrales, Mark Fenwick and Stefan Wrbka, pp. 101–122). Hart Publishing.

Rossi, Arianna, Kumari, Archana, & Lenzini, Gabriele. (2022). Unwinding a Legal and Ethical Ariadne's Thread out of the Twitter's Scraping Maze. In Privacy Symposium 2022—Data Protection Law

International Convergence and Compliance with Innovative Technologies (DPLICIT) (Sebastien Ziegler, Adrian Quesada Rodriguez and Stefan Schiffner). Springer Nature.

Ryan, Z. (2019). The Design Imagination. In Hiesinger, K. B., Millar Fisher, M., Byrne, E., López-Pastor, M. B., & Ryan, Z. (Eds.), *Designs for Different Future*s (pp. 41-47). Philadelphia PA: Yale University Press.

Southerton, C. (2020). Datafication. In L. A. Schintler & C. L. McNeely (Eds.), *Encyclopedia of Big Data* (pp. 1–4). Springer International Publishing. https://doi.org/10.1007/978-3-319-32001-4_332-1

Tharp, B. M., & Tharp, S. M. (2018). Discursive design: critical, speculative, and alternative things. MA: MIT Press.

Thornley, C., McLoughlin, S., & Murnane, S. (2021). 'At the round earth's imagined corners': The power of Science Fiction to enrich ethical knowledge creation for responsible innovation. Proceedings of 22nd European Conference on Knowledge Management, ECKM 2021.

Tonkinwise, C. (2014). Design Away: Unmaking Things. In Yelavich, S. & Adams, B. (Eds.), *Design as Future-Making*. New York: Bloomsbury Academic.

Tonkinwise, C. (2015). Just design: being dogmatic about defining speculative critical design future fiction. *Experimental thinking/design practices*. Brisbane: Griffith University Art Gallery.

Tsekleves, E., Darby, A., Lee, C. A. L., & Yong, M. H. (2020). The Little Book of Speculative Design for Policy-makers.

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