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Dark Patterns: Regulating Digital Design

How digital design practices undermine public policy efforts & how governments and regulators can respond

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Executive Summary

How easy it is to order a book on an online shop's website, how intuitive maps or navigation services are to use in everyday life, or how laborious it is to set up a customer account for a car-sharing service, these features and 'user flows' have become incredibly important to the every customer. Today, the "user friendliness" of a digital platform or service can therefore have a significant influence on how well a product sells or what market share it gains. Therefore, not only operators of large online platforms, but also companies in more traditional sectors of the economy are increasing investments into designing websites, apps or software in such a way that they can be used easily, intuitively and as time-saving as possible.

This approach to product design is called user-centered design (UX design) and is based on the observations of how people interact with digital products, developing prototypes and testing them in experiments. These methods are not only used to improve the user-friendliness of digital interfaces but also to improve certain performance indicators which are relevant to the business – whether it is raising the number of users who register as new customers, increasing the sales volume per user or encouraging as many users as possible to share personal data.

UX design as well as intensive testing and optimization of user interfaces has become a standard in today's digital product development as well as an important growth-driver for many companies. However, this development also has a side effect: Since companies and users can have conflicting interests and needs with regard to the design of digital products or services, digital design practices which cause problems or even harm for users are spreading.

Examples of problematic design choices include warnings and countdowns that create time pressure in online shops, the design of settings-windows that make it difficult for users to activate data protection settings, or website architectures that make it extremely time-consuming to delete an account. These examples are called "dark patterns", "Deceptive Design" or "Unethical Design" and are defined as design practices which, intentionally or intentionally, influence people to their disadvantage and potentially manipulate users in their behaviour or decisions.

Most dark patterns are soft forms of influence, which hardly lead to significant disadvantages or damages for consumers and in many cases represent

acceptable forms of sales practices. However, there are also dark patterns which can lead to unintended costs, users unknowingly agreeing to deactivate privacy protections or curbing consumer rights. Because dark patterns can be highly effective in influencing user behavior and are widespread, they have not only became a problem for consumers in everyday digital life but also a challenge for policy makers:

1. Dark patterns are amplifying the erosion of privacy as digital surfaces are often designed to encourage users to share as much personal data as possible. At the same time, specific design choices make it more difficult to protect personal data. In addition, especially in Europe, dark patterns systematically weaken the European Union's privacy regulations because they undermine the principle of individual consent.

2. Dark patterns have become a challenge for consumer protection, as certain design practices mislead users or manipulate them into taking certain purchasing decisions. dark patterns have so far been studied and recognized as a widespread problem mainly in the e-commerce sector, but can potentially occur whenever something is sold or contracts are concluded. They can be found in computer games with payment elements, on travel portals, in the customer portals of telecommunications providers or on the booking websites of airlines.

3. Problematic design practices also represent a challenge for social-media and platform regulation. One example is the "Netzwerkdurchsetzungsgesetz" (NetzDG) – a German law which came into force in 2017 and required large social networks, among other things, to offer a form to flag and report unlawful content. In some cases, however, providers with millions of users took design decisions which made it hard for users to find and report offensive content, considerably reducing the regulatory effect of the NetzDG. Similar problems could occur in the future if governments seek to compel online operators to make algorithms more transparent for users, label online advertisement or include data portability options.

4. Whether dominant market players can gain a relevant advantage over competitors by means of manipulative or misleading design tactics is an open question. However it is becoming increasingly clear that product and interface design is a relevant issue in digital market competition which requires more attention from researchers and regulators. In some cases competition authorities already started to react and launched investigations into design practices deployed by large online operators.

Dark patterns also pose a challenge for the protection of minors, because children and adolescents are particularly vulnerable but still use the same user interfaces as adults.

In order to reduce the use and proliferation of problematic design practices, it is necessary that companies take greater account of consumer interests and rights when designing digital services and platforms. This will not happen by itself. Policy makers and governments need to respond by first and foremost making sure that severe forms of dark patterns are being sanctioned. Currently, this his is barely happening. Regulators and other relevant organisations should begin to launch investigations, start proceedings or initiate legal action against operators who use design practices that have a significant negative impact on a large number of people or which considerably undermine existing laws or regulations.

To start taking action against severe forms of dark patterns, no new legislation or amendments to existing laws are needed initially. Instead, data protection authorities, youth protection authorities, consumer protection agencies or even competition authorities should begin to test which existing fields of law can be applied to deceptive or manipulative design practices and as well as used as a basis to launch complaints or start litigation. Ideally, design practices and their negative impact on users should be put at the centre of proceedings or court cases in order to set precedents as well as raise awareness for harmful design techniques. Sanctioning severe uses of dark patterns would require the provision of financial resources for regulatory bodies or consumer protection organizations.

Besides starting to apply and enforce existing laws policy makers should recognize that digital product design is a new and increasingly important regulatory field which governments should build up expertise for. This is a crucial step since other legislative processes and regulatory projects are due in the coming years, in which the importance of the design of digital platforms and services should be taken into account. Expertise is also needed to enable regulators to discuss solutions with companies on an equal footing and to develop effective, practical and create countermeasures themselves.

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Introduction

For more than a decade, internet researchers, digital designers and data protection experts have investigated and discussed the power of digital design and the way user interfaces can be used to influence people behaviour and choices in their daily digital life. Although harmful design practices – whether they are called "dark patterns", "deceptive design" or "unethical design" – have become a mass phenomenon in the digital world, policy makers, governments and regulators so far have underrated the importance of this phenomenon.

In this paper, we explain why dark patterns – and thus digital product design in general – represents an increasingly important challenge for policy makers and why a systematic approach to push back severe forms of deceptive or manipulative design practices is crucial for a functioning digital marketplace. Chapter One provides a brief history of how interface design of apps, platforms or online services became a common business strategy to boost revenue or market share. Chapter Two explains how dark patterns can be defined, why and where they are being deployed and how they can be so effective in influencing behavior. Chapter Three summarizes the challenges that follow for governments and public authorities in a number of policy domains. In chapter Four we discuss how policy makers can react.

1. How user-centred design became a driver for growth in the digital economy

Whether it is sales talk with a customer, the packaging of a product or the shelf of store – companies have always planned and optimized the interaction with their customers with much detail and at great expanse. With more and more online consumption, physical contact between consumers and companies has become less important. Instead, digital user interfaces are increasingly being used as a form of interaction between companies and consumers. In Germany, every day millions of people visit websites or apps of online retailers, video streaming providers or social media companies.

How successful companies are in optimizing the „design" of these digital products and their surfaces is of enormous importance in a digitized economy. How easy it is to find and order the right book on a retailer's website, how intuitively a map or navigation service can be used in everyday life, or how laborious it is to set up a customer account in order to use a product, can have a strong influence on whether a person chooses a particular offer or how often she or he uses a service or product. In recent years, more and more companies worldwide have invested in systematically designing websites, apps or digital products in such a way that searches, payment transactions or registrations only take a few seconds and are as easy to handle as possible.

The development of digital products that are easy, intuitive and pleasant to use is costly. This is because it is necessary to observe the behavior of users in detail, develop design prototypes, test them in experiments and implement certain standards. This discipline known as user-experience design was coined in the 1990s by the cognitive scientist and design researcher Don Norman. Today, UX design is a central part of the development of digital products and has become a strongly growing professional field in its own right. The work of UX designers is somewhat comparable but slightly different to the traditional creative work of early software designers like digital graphic designers or website designers. Although these professionals can also be UX designers, UX designers focus on studying the interaction between humans and computers, which then translates research into design and architecture to build products. UX or UI (User Interface Design) design has become a personnel- and cost-intensive part of business. According to industry sources, in 2019 UX designers were among the second most sought-after digital, mar-

keting and creative professionals in the US.[1] Overall, the demand for person-nel at the intersection of digital technologies and design has increased by 250 percent over the last 10 years.[2]

Those who early on recognized the business value of research-driven and user-oriented design and also made significant investments were primarily the large US Internet companies including Twitter, Facebook, AirBnB, Google, Paypal or Amazon. In the first year of its founding, Amazon – compared to it's advertisement spending – invested a hundred times more into optimi-zing the design of it's shopping platform to make it as easy as possible for users to register, find and buy products.[3] In retrospect, Facebook and AirBnB executives themselves attribute their rapid growth in part to the elaborately designed products and user interfaces, which were much more attractive to users than those of the competition.[4] This also applies to advertising-finan-ced business models of social media platforms or the search engine Google. UX/UI design also plays an important role here, as user-centered design can significantly contribute to the fact that people return to a website over and over again and spend more time on a platform – which in turn generates hig-her advertisement revenues. Overall, user-centered design therefore played a central role early on in the product and business development of the US Internet industry, which was also reflected in the large number of designers employed. This trend has continued. In the case of the the company Uber, the

1 Lisa Jewell, "Want a career in UX? Why now is the time to make the move", *UX Design Institute*, 10. Oktober 2019, https://www.uxdesigninstitute.com/blog/want-a-career-in-ux/; Janet Six, „Establishing a UX Budget", *UX matters*, 22. Mai 2017, https://www.uxmatters.com/mt/archives/2017/05/establishing-a-ux-budget.php.

2 Robert Kett, „College of Engineering and College of Environmental Design launch new Master of Design program", *Berkeley Engineering*, 25. Juni 2019, https://engineering.berkeley.edu/2019/06/college-engineering-and-college-environmental-design-launch-new-master-design-program.

3 Andrew Kucheriavy, „Good UX Is Good Business: How To Reap Its Benefits", *Forbes*, 19. November 2015 , https://www.forbes.com/sites/forbestechcouncil/2015/11/19/good-ux-is-good-business-how-to-reap-its-benefits/#13c2ff304e51.

4 Diana Srinivasan, „The antitrust Case against Facebook: A Monopolist's Journey Towards Pervasive Surveillance in Spite of Consumers' Preference for Privacy", Berkeley Business Law Journal, Vol. 16:1, 2019, S. 53, https://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1139&context=bblj;
FirstRoundCapital, „How design thinking transformed Airbnb from failing startup to billion-dollar business", YouTube, 01. Mai 2013, https://www.youtube.com/watch?v=RUEjYswwWPY&feature=youtu.be.

ratio between the number of employed programmers and designers today is 8:1.[5]

Facebook, Google, LinkedIn and others were also so successful in designing their products because they systematically tested individual elements of their platforms or products in experiments and optimized them on the basis of the data obtained. The so-called „A/B testing" became an integral part of their product design and optimization.[6] A/B testing is about testing different design variants of an user interface, a navigation menu or even a specific button with a sufficient number of users. The aim is to find out which design decision leads to which change in behaviour – whether it is to determine which website structure, colour design or choice of words are particularly effective in improving user-friendliness, increasing the time users spend on the site, or simply generating more clicks.[7]

In this way it is possible to continuously optimize all the individual parts of a product or service. Users usually do not notice when they participate in A/B tests, because website elements are changed during normal operation and only for a limited number of users. Unlike in the physical world, where research on customer behavior is costly, for example, the conversion of the sales floor of a supermarket, digital A/B testing can be implemented quickly, cost-effectively and automated. The idea of lab-like user experiments for design purposes was not new, but US internet companies professionalized and automated the methodology, applied it on an industrial scale[8] and today even offer A/B testing as a service to other comapnies. Booking.com, a platform for hotel bookings, says it conducts about 1,000 parallel user experiments with different target groups in different areas of the platform at any given time, for example to achieve higher sales.[9] With regard to their com-

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5 Dyan Field, „6 major tech companies have doubled their design hiring goals in last half decade", *TechCrunch*, 31. Mai 2017, https://techcrunch.com/2017/05/31/here-are-some-reasons-behind-techs-design-shortage/?guccounter=1.

6 Carmel DeAmicis, „'The Decade of Design': How the last 10 years transformed design's role in tech", *Figma*, 16. Dezember 2019, https://www.figma.com/blog/the-rise-of-ux-ui-design-a-decade-in-reflection/.

7 The blog Goodui.org collects, explains and archives examples of conducted A/B tests of large Internet platforms.

8 Ron Kohavi et al., „Online Controlled Experiments at Large Scale", *Proceedings of the 19th ACM SIGKDD international conference on Knowledge discovery and data mining (KDD '13)*, 2013, https://exp-platform.com/Documents/2013%20controlledExperimentsAtScale.pdf.

9 Nicola Donovan, „The role of experimentation at Booking.com", *Booking.com Partner Hub*, 16. August 2019, https://partner.booking.com/en-gb/click-magazine/role-experimentation-bookingcom.

petitors, companies do not disclose which goals are to be achieved with the many optimization experiments.

Today, UX/UI design and A/B testing is not only used by the major US Internet platforms. Across more and more industries, UX design is seen by managers as an approach to improve market shares, increase sales or reduce costs. This no longer only the case in companies that traditionally interact with their customers almost exclusively via digital channels, such as online retailers, search and comparison portals, software manufacturers or gaming providers. Banks, insurance companies, car manufacturers or the media and entertainment industry are also beginning to invest in the design and optimization of their digital channels and products.[10] This trend will continue as internet users get used to increasingly easy and intuitive interfaces[11] and avoid products with a low level of „usability". Worldwide, the pressure on companies to invest in user-centric design has increased.[12]

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10 Gjoko Muratovski, „Paradigm Shift: Report on the New Role of Design in Business and Society", In: *She Ji: The Journal of Design, Economics, and Innovation*, Vol. 1:2, 24. November 2014, p. 121, https://reader.elsevier.com/reader/sd/pii/S2405872615300265?token=CDED AA0F3AF34D80EDE361478E85222602BAC89259FECD7D84661E5723F0B47D1D791C38649 99D330FC254B63362D78F.

11 Carmel DeAmicis, „'The Decade of Design': How the last 10 years transformed design's role in tech", Figma, 16. Dezember 2019, https://www.figma.com/blog/the-rise-of-ux-ui-design-a-decade-in-reflection/.

12 Daniel Rosenberg, „The business of UX strategy", In: *Interactions Magazine*, Vol. 25:2, Februar 2018, p. 29, https://dl.acm.org/citation.cfm?id=3181372.

2. What are dark patterns?

UX design and A/B testing has become an irreplaceable tool for the digital economy to attract new customers, develop new products and increase sales. This applies not only to large internet platforms, but also to more and more companies in traditional industries. The ability to optimize websites, apps or software interfaces to make digital products or services easy to use is not only a growth driver for the online economy, but also benefits consumers. Advances in UX design over the last decade have made it possible to create user interfaces that enable people of almost all ages to operate complex software and hardware.

However, the intensive commercial use of UX design and A/B testing also has a negative side effect: as digital products are increasingly optimized to quickly attract as many customers as possible, increase sales or maximize the time spent on platform, this has also led to the proliferation of surfaces that, from the company's point of view, serve their purpose, but at the same time bring disadvantages for consumers. This is mainly because the interests of companies and their customers are not always identical. If, for example, a social media provider tries to design the registration path for new users in such a way that it only takes seconds to set up a new account while giving consent to share as much data as possible for advertising purposes, this is a successful design for acquiring new customers from the provider's point of view. For consumers, this same design could mean that it becomes harder to deactivate privacy-intrusive features such as facial recognition. Another example would be an online shop with a design optimized to push users into making purchasing decisions as quickly as possible.

If design practices are used on websites or in apps that influence people's behaviour or decisions in such a way that they lead to disadvantages – whether because they make users spend more money than they intended or make it more difficult to protect personal data – they are called „dark patterns", „deceptive design" or „unethical design". A Dark Pattern can be a visually hidden button leading to a free service or a flashy warning notice and countdown warning that an offer expires. Dark patterns do not always have to refer to individual design elements. It can also be entire website architectures or combinations of different design patterns where, for example, a cancellation option is hardly to be found and thus complicates the cancellation process.

dark patterns are based on an enormous number of different mechanisms of influence. These have been described and classified in detail by legal scholars, computer scientists and design experts for years.[13] For example, one of the most common types is called „obstruction", and includes all forms of digital design that create unnecessary hurdles and thus discourage people from certain actions. These include not only complicated termination procedures, but also graphical representations of different price models, which make it difficult for people to compare offers. Payment models in which money must first be exchanged for an artificial currency are also part of this.

Types of Dark Pattern (overview by Jamie Luguri & Lior Jacob Strahilevitz)[14]

Mechanism	Variant	Description
Nagging		Repeated requests to do something firm prefers.
Social Proof	Activity messages	Misleading notice about other consumers' actions
	Testimonials	Misleading statements from customers
Obstruction	Roach Motel	Asymmetry between signing up and canceling
	Price Comparison Prevention	Frustrates comparison shopping.
	Intermediate Currency	Purchases in virtual currency to obscure cost

13 Jamie Luguri/Lior Strahilevitz, „Shining a Light on dark patterns", *U of Chicago, Public Law Working Paper No. 719, University of Chicago Coase-Sandor Institute for Law & Economics Research Paper No. 879*, 07. August 2019, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3431205;
Christoph Bösch/Benjamin Erb/Frank Kargl/Henning Kopp/Stefan Pfattheicher, „Tales from the Dark Side: Privacy Dark Strategies and Privacy dark patterns", In: *Proceedings on Privacy Enhancing Technologies*, Vol. 4, 2016, https://petsymposium.org/2016/files/papers/Tales_from_the_Dark_Side__Privacy_Dark_Strategies_and_Privacy_Dark_Patterns.pdf.

14 Jamie Luguri/Lior Strahilevitz, „Shining a Light on dark patterns", *U of Chicago, Public Law Working Paper No. 719, University of Chicago Coase-Sandor Institute for Law & Economics Research Paper No. 879*, 07. August 2019, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3431205;

Sneaking	Sneak into basket	Item consumer did not add is in cart
	Hidden costs	Costs obscured / disclosed late in transaction
	Hidden subscription / forced continuity	Unanticipated / undesired automatic renewal
	Bait & Switch	Customer sold something other than what's originally advertised
Interface Interference	Hidden information / aesthetic manipulation / false hierarchy	Important information visually obscured
	Preselection	Firm-friendly default is preselected
	Toying with emotion	Emotionally manipulative framing
	Trick questions	Intentional or obvious ambiguity
	Disguised Ad	Consumer induced to click on something that isn't apparent ad
	Confirmshaming	Choice framed in way that seems dishonest / stupid
Forced Action	Forced Registration	Consumer tricked into thinking registration necessary
Urgency	Countdown timer	Opportunity ends soon with blatant visual cue
	Limited time message	Opportunity ends soon

Another frequently used pattern is called „forced registration"[15]. In this process, users are forced to set up a customer account or disclose extensive personal data, although this is not required for a product or an online service. An example of this would be an online shop for concert tickets, where purchases are only possible by opening a customer account, or an online retailer, where it is only possible to create a customer account if users accept to receive promotional emails, which they can only unsubscribe from at a later date. There will never be a complete list of different mechanisms of

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15 Christoph Bösch/Benjamin Erb/Frank Kargl/Henning Kopp/Stefan Pfattheicher, „Tales from the Dark Side: Privacy Dark Strategies and Privacy dark patterns", In: *Proceedings on Privacy Enhancing Technologies*, Vol. 4, 2016, p. 249, https://petsymposium.org/2016/files/papers/Tales_from_the_Dark_Side__Privacy_Dark_Strategies_and_Privacy_Dark_Patterns.pdf.

influence, as new forms are constantly emerging with constantly changing surfaces and technologies. With the increasingly commercial use of speech assistants such as Siri, Alexa or Bixby, for example, it can be assumed that audio or speech dark patterns will increasingly appear in the next few years.

The influence that companies with UI/UX-based design practices can exert on user behavior is well known in the digital economy as well as among academic researchers. However it still underestimated by policy makers and the general public. A representative study published in 2019 by the US researchers Jamie Luguri & Lior Jacob Strahilevitz compared how people reacted to regular and extremely optimized user designs. The optimized design quadrupled the probability that users subscribed to a service they were offered. A study by a research group from the Ruhr University Bochum and the University of Michigan tested different design variants of a cookie window under real-life conditions with 37,000 users. The Dark Pattern version resulted in about 30% of mobile users choosing the lowest available privacy option. Only 0.1% of users made the same decision when they used a privacy-friendly cookie window. In another experiment, test persons were asked to cancel their own user account at the online department store Amazon. The design of the website caused many to give up, develop strong negative emotions and feel manipulated.[16]

There are several reasons why dark patterns can be a highly effective tool of influence. An important factor is the everyday life of the consumer today. In the digital world, each person is constantly using a multitude of changing apps, online services or devices from different providers. As a result, every person has to process an enormous flood of information every day and make a large number of decisions regarding general terms and conditions, data protection agreements or other contracts. The consequence is that there is hardly any time for informed decisions, and problematic design practices are not consciously perceived or tolerated.

Another reason for the effectiveness of dark patterns is that some design techniques exploit the way cognitive processes work. Since the 1950s, behavioural economists and cognitive psychologists have been investigating how the brain processes information and how this systematically leads to irrational decisions or errors in judgement. An example of these effects, known as

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16 Lili Láng/Paula Dana Pudane, „Deceptive Interfaces: A case study on Amazon's account deletion navigation and its effects on user experience", *Jönköping University School of Engineering*, März 2019, http://www.diva-portal.se/smash/get/diva2:1315156/FULLTEXT01. pdf.

cognitive biases,[17] is the tendency of a person to ignore all information rather than filter out relevant content when faced with a bulk of information. This is important, for example, when users are given the opportunity to set privacy settings themselves. However, if the setting options are very extensive and not clearly presented, people tend not to make any decisions at all regarding the use of personal data.

The phenomenon of dark patterns is not a marketing or sales trick of just a few providers, but a mass phenomenon of the digital world, which scientists are only just beginning to quantify. A study published in 2019 by researchers at Princeton University and the University of Chicago suggests that[18] up to 11% of the world's most visited shopping sites could use design tactics to push or deceive users to make unintended and potentially harmful decisions. Dark patterns are not limited to individual industries and can potentially be found in any digital surface which is used to sign a contract, share personal data or pay for a service. They can be found on social media platforms, in operating systems of computers and smartphones, search engines, online banking services, career portals, smart TV software, hotel booking platforms, computer games or websites of internet providers.

dark patterns are not a new phenomenon. Companies have always tried to influence the behaviour of their customers through certain language, the interior design of shops or the design of packaging. In contrast to conventional marketing and sales methods however, digital surfaces can be shaped and modified to a much greater extent. Digital influence tools can also be used and tested for their effect in a much more accurate, faster and cost-effective manner. Today, online retailers use thousands of experiments, some of which are automated, to test which variants of their digital interfaces have the desired effect on the behavior of their customers and adjust the design of their shops or advertising measures accordingly. This is no longer a cost-intensive, technically demanding method that only large platforms such as Google or Facebook can master, but rather techniques that are being used by more and more companies and industries.

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17 Siehe: Alessandro Acquisti et al., „Nudges for Privacy and Security: Understanding and Assisting Users' Choices Online", In: ACM Computing Surveys, Vol. 50:3 , August 2017, https://www.ftc.gov/system/files/documents/public_comments/2017/11/00031-141888.pdf.

18 Arunesh Mathur et al., „dark patterns at Scale: Findings from a Crawl of 11K Shopping Websites", In: *Proceedings of the ACM Human-Computer Interaction*, Vol. 3:CSCW, Article 81, November 2019, https://arxiv.org/pdf/1907.07032.pdf.

How can dark patterns be defined?

For the question of whether a certain design constitutes a dark pattern, it is initially irrelevant whether the design pattern is an intentional manipulation attempt, an accident or a technical necessity. Instead, a dark pattern is generally referred to whenever certain design practices have the effect of promoting certain behavior or choices which disadvantage users.

A simple example would be a video platform that users can join with a paid account as well as with a free account with limited options. If a new, not yet registered person visits the website, both options are offered on the landing page. However, the button for the free option is placed far down at the bottom of the page. Additionally, the button contains a smaller font and is colored in such a way that it hardly stands out from the background. In this case, one would speak of a dark pattern because, firstly, creative means are used which draw the attention of the users to the option with costs and hide the free option.

It is known from user research that certain design patterns, such as the positioning of the button at the bottom of the page and the low colour contrast to the background, are effective means to promote a certain user behaviour. The second criterion - the negative consequences of influence for the users - is also given here: Since it can be assumed that the majority of new customers at least want to have the option of deciding whether they want to use the video platform free of charge with limited functionality or spend money on full use, but the design makes a decision difficult or in some cases impossible, this has negative consequences for the decision-making ability of users.

Even this simple, still comparatively unambiguous example shows that a clear, systematic differentiation and evaluation of when a surface design is a dark pattern and when it is not, can be difficult and ambiguous in practice. The challenge is to determine whether a particular design favours a particular behaviour in the first place, and if so, whether this is done at a relevant strength and intensity. In the case of a barely visible, hidden button, the question can still be easily answered. However, it already becomes more difficult if a button is only partially hidden compared to another option. The same applies to other mechanisms of influence, the effect of which is also difficult to assess in practice, for example in the case of linguistic-emotional formulations, notifications about the behaviour of other users or design

patterns that build up time pressure.

A second challenge when defining dark patterns is the question of whether the influence is actually detrimental to users, and if so, to what extent. This question can also be difficult to answer, as different users can have different interests. A design can be advantageous for one user, but problematic for another user. This can also occur with various forms of influence - be it in the design of price comparisons, default settings or mandatory registrations.

It also becomes clear that, by definition, dark patterns apply to an enormous number of design practices in the digital and analogue world, whereby there can be various gradations. It always depends on how strongly an interface design urges users to behave in a certain way and how great the resulting disadvantages for consumers are. Many of the dark patterns that occur in practice are „soft" and isolated forms of influence, often representing acceptable marketing practices of a company. Although they can be annoying for users, they are at the same time associated with comparatively manageable disadvantages or damage for consumers. For example, certain language such as „Do you really want to do without discount campaigns and vouchers?" or a hard-to-find „unsubscribe button" in an advertising email can be counted as dark patterns. However, there are also extremely problematic dark patterns that combine many different techniques of influencing and cause people to have difficulties in cancelling expensive subscriptions or contracts, for example, and thus incur financial losses. When these practices are used by providers with millions of users, the problem is exacerbated.

3. Why digital design is a challenge for politics and society

Impact on data protection

Many of the most frequently used online services and apps in Europe are based on advertising or data-driven business models. As the collection of personal data is relevant to more and more business models, digital interfaces are optimized to influence users to share as much data as possible with companies. At the same time, design practices are used which make it more difficult to protect personal data.

Dark patterns pose a particular problem for European data protection law. The General Data Protection Regulation (GDPR) is based in part on the fact

that for each individual app and each digital service, users decide by so-called „consent" how much data they are willing to share with a company for which purposes. Therefore, certain design practices are often used to precisely influence this decision in the interest of data-using companies. The consequence is the proliferation of consent designs which systematically promote low data protection standards. In May 2018, the Norwegian Consumer Council, a Norwegian government agency and consumer protection organisation, examined the design of the consent procedures of Google, Facebook and Microsoft, three of the most important online service providers in Europe.[19] The report showed that Google, Facebook and - to a lesser extent - Microsoft used a design that, through a combination of pre-selected settings, misleading language, hiding privacy-friendly options and time pressure, urged users to accept the lowest possible privacy settings. The report also showed that test users, for example, needed 30-40 clicks to delete the location data recorded by the provider. In view of the number of users of Google, Facebook and Microsoft in Europe, such practices can lead to millions of people unintentionally or unknowingly disabling or lowering privacy settings.

Problematic design practices are also used in particular in connection with so-called „cookie banners" with which news sites and many other online services obtain the permission of their users to record their surfing behaviour. With the data obtained in this way, extensive, individual profiles can be created and passed on to third parties in the digital advertising industry. A research group at the University of Bochum examined the design of cookie banners on 6,000 popular websites within the European Union at the end of 2018. The results of the study showed that 57 percent of the sites investigated used design elements to encourage users to agree to the data collection and profiling as much as possible. This can be done by highlighting individual buttons, hiding advanced settings or certain presets.[20] Dark patterns are therefore not only a problem for the DSVGO, but also for the ePrivacy directive.

Impact on the consumer protection

In addition to collecting personal data, the design of digital interfaces can also be aimed at increasing sales or attracting new customers. Since consu-

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19 Forbrukerrådet, „Deceived by Design: How tech companies use dark patterns to discourage us from exercising our rights to privacy", 27. Juni 2018, https://fil.forbrukerradet. no/wp-content/uploads/2018/06/2018-06-27-deceived-by-design-final.pdf.

20 Christine Utz/Martin Degeling/Sascha Fahl/Florian Schaub/Thorsten Holz, „(Un)informed Consent: Studying GDPR Consent Notices in the Field", *Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security (CCS '19)*, November 2019, https:// dl.acm.org/doi/10.1145/3319535.3354212.

mer interests are not always taken into account, there is an increasing proliferation of websites and apps that use design practices that weaken consumers, restrict their rights or influence purchasing behaviour to the disfavor of consumers. Design practices of this kind are a widespread problem in the e-commerce sector. This is because retail companies design and optimize the interface design of their shops or platforms with the aim of increasing measurable key figures. These include, for example, the number of newsletter subscriptions, the increase in the average order value, the bounce rate after something has been placed in the shopping cart or the registration of new customer accounts. For this purpose, shopping baskets, individual steps of ordering processes or price displays are redesigned and tested until increases of certain values are achieved.

The consequence of these changes in favour of the seller/company can be, for example, that additional costs are only displayed in the last step of the ordering process, countdown timers that simulate the end of an offer or page elements that warn of the sale of a product by indicating the number of other currently active interested parties. A prominent negative example is the travel booking platform Booking.com, which is one of the most used websites in the EU with a market share of over 60 percent. The EU Commission had required Booking.com to refrain from using certain design techniques in the future, as was announced in December 2019.[21] Among other things, the platform used a bundle of design elements that put customers under considerable time pressure, hid costs or visually blurred the difference between sponsored and non-sponsored content.

A machine and in part manual analysis of the 11,000 English-language shopping websites most visited each month showed that problematic design practices were widespread, especially among online retailers with high user numbers.[22] However, dark patterns are not only a problem for consumer protection in the e-commerce sector, but potentially everywhere where sales are made or contracts concluded. Manipulative design practices can therefore be found in computer games with payment elements, on travel portals, in the customer portals of telecommunications providers or on the booking websites of airlines.

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21 Pressemitteilung der Europäischen Kommission, „Booking.com commits to align practices presenting offers and prices with EU law following EU action", *Europäische Kommission*, 20. Dezember 2019, https://ec.europa.eu/commission/presscorner/detail/en/ip_19_6812.

22 Arunesh Mathur et al., „dark patterns at Scale: Findings from a Crawl of 11K Shopping Websites", *Princeton WebTAP*, 2019, https://webtransparency.cs.princeton.edu/dark-patterns/.

Challenge for media and platform regulation

In recent years, governments in Europe have been increasingly busy adapting existing laws to changing technological and social developments or creating new regulations for the digital space to protect people or provide a framework for economic developments. This is particular the case for the growing field of digital media and platform regulation. However policies focusing on algorithmic accountability, hate speech or disinformation on social media still almost never adress design aspects. This can lead to new laws becoming less effective since dark patterns can undermine regulatory attempts.

How important it can be to address interface design in social media regulation showed the case of the German Government which in 2017 introduced a law ("NetzDG") that forced social media companies to delete extreme forms of hate speech within 24 hours as well as introduce a process for users to flag harmful content. At first glance, all platforms complied. Youtube and Twitter introduced a button to report hate speech which was easy to find. In contrast, the reporting function on Facebook was so user-unfriendly that it was hard to find requiring step-by-step tutorials to report harmful content.[23] The consequences of these dark patterns on Facebook, which were made possible by the lack of design guidelines or guidelines from the legislator and the authorities, are significant: In 2018, Facebook users:in only 1704 reported problematic content, while Youtube received 214,827 complaints and Twitter 264,816.

Similar problems could also arise in future attempts at regulation. One example is the planned regulation of online tracking under the Telemediengesetz, which could in future oblige website operators to let users decide whether or not they agree to tracking and profiling for advertising purposes when using so-called cookie banners. Even if consent became mandatory and privacy protections would be tightened on paper, the actual design of the consent would still have considerable influence on how well users are protected. This is a challenge not only relevant to the Telemediengesetz but also for future regulatory initiatives aimed at political advertising or data portability.

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23 Netzwelt/Maurice Ballein, „Facebook: How to report illegal content", *NETZWELT*, 07 February 2019, https://www.netzwelt.de/anleitung/163253-facebook-so-meldet-illegale-inhalte.html.

Competitive and macroeconomic aspects

Online retailers such as Amazon or operating systems such as Android are of great importance for the entire digital economy because of their enormous number of users and their role as platforms. The question of whether and what relevance it has for economic competition when important or even dominant market players use manipulative design practices is increasingly raised in the course of the fundamental discussions[24] on how competition policy can respond to the challenges of digital markets. The question arises, for example, whether certain design practices constitute an abuse of market power or lead to market participants gaining an undue advantage over competitors or harming them. Examples would be interface designs that make it difficult for people to cancel or take their own data with them without sufficient reason, registration procedures that urge users to agree to the commercial use of their data or unfair representations of comparisons of offers.

One competition authority that already took action against the use of dark patterns was the Italian competition authority Autorità garante della concorrenza e del mercato. In 2018,[25] it imposed a fine on Facebook for using aggressive design practices in the registration process for new users. In 2017, the European Commission analysed design decisions as part of proceedings[26] against Google in 2017. The platform operator had given its own product „Google Shopping" an unlawful advantage in its search engine by visually prominently placing results of its own price comparison service at the top of the page in regular search queries. In 2019, the Australian competition authority also took action against Google for misleading user interface design. The subject of the complaint was the design of the registration path within the Android operating system for new users.

Even if competition authorities have so far only occasionally dealt with the significance of design decisions of app stores, website architectures of large platforms or user interfaces of devices sold by the billions, it can be expected that this will change in the coming years.

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24 Stigler Center for the Study of the Economy and the State, „Stigler Committee on Digital Platforms: Final Report", 2019, p. 12 &, https://www.publicknowledge.org/wp-content/uploads/2019/09/Stigler-Committee-on-Digital-Platforms-Final-Report.pdf.

25 https://www.europeandatajournalism.eu/eng/News/Data-news/Dark-patterns-born-to-mislead

26 https://ec.europa.eu/germany/news/eu-kommission-verh%C3%A4ngt-geldbu%C3%9Fe-von-242-milliarden-euro-gegen-google_de

Interface design & protection of minors

Problematic design practices that negatively influence people's purchasing behaviour or the protection of their privacy are widespread and have an impact. This poses a particular challenge for the protection of minors, because children and young people are particularly vulnerable but still use the same user interfaces as adults.

In addition, young people and children use mobile devices such as smartphones and tablets. As they have only limited financial resources, they make particularly frequent use of the apps available free of charge for this purpose[27], whose underlying business models are partly based on the use or sale of personal data or monetary payments within an app. These include social media apps, mobile games and other free applications. Overall, this increases the likelihood that they will come into contact with problematic design practices.

The negative effects of manipulative design techniques were recently pointed out by the UK's national data protection authority. In January 2020, it published guidelines for the protection of minors online, which, among other things,[28] urge providers not to use design techniques that encourage minors to lower privacy settings.

4. How policy makers and regulators can react

With the growth of the digital economy, more and more companies and consumers are interacting with each other via digital interfaces. It is in the interest of companies to influence the behaviour or decisions of their customers - also with the help of digital design tools. Therefore, dark patterns should not be understood as „tricks" or „unethical behaviour" of individual companies, but as a fundamental phenomenon. Many dark patterns are reasonable forms of influence, often representing reasonable product design

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27 Janet Read, „Creating a Framework to Support the Critical Consideration of Dark Design Aspects in Free-to-Play Apps", *Conference Paper: The Interaction Design and Children*, Juni 2019, https://www.researchgate.net/publication/333630257_Creating_a_Framework_to_Support_the_Critical_Consideration_of_Dark_Design_Aspects_in_Free-to-Play_Apps.

28 Information Commissioner's Office, „13. Nudge techniques" https://ico.org.uk/for-organisations/guide-to-data-protection/key-data-protection-themes/age-appropriate-design-a-code-of-practice-for-online-services/13-nudge-techniques/.

or marketing decisions that do not require a reaction from government and authorities.

Nevertheless, policy makers and regulators should begin to take action against serious forms and cases of dark patterns - i.e. against design practices that have a significantly negative effect on a large number of users or that lead to existing laws being systematically undermined in areas like data protection, consumer protection or the protection of minors. This has hardly happened so far which contributes to the situation that there are almost no sanctions for dark pattern behavior as well as an insufficient awareness of the problem within companies. Users themselves have only limited possibilities to protect themselves, since dark patterns are often not recognized consciously or tolerated as a common business practice. In many cases users also tolerate dark patterns because a change of provider is not possible or would require a disproportionate effort.

Enforcement of existing laws

Regulatory authorities and other relevant organisations should therefore actively pursue complaints, proceedings or litigation against providers whose design practices have significant negative effects in the area of data protection, consumer protection, protection of minors or other relevant fields. In a first step, this requires no new or additional legislation. Laws regulating or prohibiting certain forms of influence already exist in part. However, they are still only rarely applied to digital design choices[29]. Exceptions are, for example, a case already concluded by the French data protection authority CNIL[30] or an ongoing court case[31] of the Federation of German Consumer Organisations (Verbraucherzentrale Bundesverbande) at the Berlin Regional

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29 Midas Nouwens/Ilaria Liccardi/Michael Veale/David Karger/Lalana Kagal, „dark patterns after the GDPR: Scraping Consent Pop-ups and Demonstrating their Influence", *Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '20)*, April 2020, https://arxiv.org/pdf/2001.02479.pdf;
Federico Caruso, „Dark patterns: born to mislead", *European Data Journalism Network*, 13. November 2013, https://www.europeandatajournalism.eu/eng/News/Data-news/Dark-patterns-born-to-mislead;
Finn Myrstad, „Let´s call a spade a spade: abuse of power in the digital economy must end", *The European Consumer Organisation*, 12. November 2019, https://www.beuc.eu/blog/lets-call-a-spade-a-spade-abuse-of-power-in-the-digital-economy-must-end/.

30 Thomas Hanke/Christof Kerkmann/Dietmar Neuerer, „Google must pay record fine for data protection violations in Europe", *Handelsblatt*, 21 January 2019, https://www.handelsblatt.com/unternehmen/it-medien/dsgvo-google-muss-rekordstrafe-wegen-datenschutzverstoessen-in-europa-zahlen/23892332.html.

31 Heiko Dünkel, „Has consent expired?", PinG, April 16, 2019, https://www.pingdigital.de/blog/2019/04/16/hat-die-einwilligung-ausgedient/1668.

Court[32], which is part of a concerted action by various European consumer protection organisations.

Regulatory and consumer protection organisations should examine and test which existing laws are suitable for tackling extreme forms of problematic design practices and gain experience and set precedents with individual procedures. In this context, enforcement should be tested in different fields of law – also in order to identify strengths and weaknesses of various legal approaches. This concerns both national and European legislation. In addition to the DSVGO and the ePrivacy Regulation, the EU Directive on Unfair Commercial Practices, the EU Consumer Rights Directive, European Competition Law, German Civil Law (BGB) or the Telemediengesetz (TMG) are discussed as options by legal experts and IT lawyers.

In the case of an active approach against individual providers, it would also be helpful not only to treat dark patterns and the digital manipulation of users as part of a larger procedure, but also to place them at the centre of individual investigations, complaints or lawsuits in order to create public awareness for the problem. This concerns not only businesses and consumers, but also courts, which are increasingly involved in relevant proceedings. Ideally, authorities and other relevant organisations should join forces and act in a coordinated manner.

Overall, tackling the problem of dark patterns will require financial resources. If data protection authorities, consumer protection groups or other relevant actors are to become active with appropriate procedures or court cases, this requires additional resources so that other important regulatory tasks in the digital world are not neglected.

Building expertise in government and authorities

An active enforcement of existing laws and regulations by public authorities and other organisations is a necessary step to push back against unfair design practices and influence industry behavior. At the same time, policy makers should recognize that digital product design is a new and increasingly important regulatory area for which policy makers and regulators need expertise. Digital design is much more than just the "graphic design" of a service and can have a significant impact on how millions of people behave or

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32 BEUC News, „GDPR complaints against Google's deceptive practices to track user location", 27. November 2018, *The European Consumer Organisation*, https://www.beuc. eu/press-media/news-events/gdpr-complaints-against-google%E2%80%99s-deceptive-practices-track-user-location.

make decisions. Today, the design of a popular shopping app is comparable to the architecture of a department store through which millions of people move every day. The places where doors are installed, where stairs lead to or how steep they are determines to a large extent how people move and behave. Unlike a real building, digital constructions can be converted unnoticed during operation with little effort. It is possible to test again and again which conversions are best suited to achieve a certain change in human behaviour.

Governments and regulators should pay close attention to the design or „architecture" of digital products and interfaces, as further regulations for the digital space will be developed in the coming years in order to protect people or set a framework for economic developments. The importance and potential impact of digital product design should be taken into account. Expertise is also needed to enable regulators to discuss solutions with companies on more equal terms and to develop effective regulation.

There are already authorities in Europe that have experience with societal and regulatory aspects of digital design. One example is Forbrukerrådet, the Norwegian consumer protection organisation and government agency, which has conducted and published its own research on dark patterns that have been taken up and used by consumer protectionists, data protectionists, civil society groups and the media worldwide.[33] Today the authority has a small but specialized team with extensive experience in dealing with dark pattern practices.

Another pioneer is the French national data protection authority CNIL, which began years ago to address the privacy challenges of digital product design and develop initial strategies.[34] The CNIL is currently – amongst others – working together with UX designers within the industry in order to raise awareness for the problem. In addition, the authority develops design examples and prototypes for fair design in the field of cookie banners.[35]

In Germany, too, ministries and regulatory bodies would not have to start from scratch. Problematic design practices are an old and well-known pro-

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33 Forbrukerrådet, „Dark patterns", *Forbrukerrådet*, https://www.forbrukerradet.no/dark-patterns/.

34 Régis Chatellier/Geoffrey Delcroix/Estelle Hary/Camille Girard-Chanudet, „Shaping Choices in the Digital World: From dark patterns to data protection: the influence of ux/ui design on user empowerment", Januar 2019, *CNIL IP Reorts No. 06*, https://www.cnil.fr/sites/default/files/atoms/files/cnil_ip_report_06_shaping_choices_in_the_digital_world.pdf.

35 https://www.cnil.fr/en/cnil-launches-public-consultation-its-draft-recommendation-cookies-and-other-trackers

blem, especially for data and consumer protection organizations. They already have valuable experience that can be put to good use. So far, however, this expertise is scattered, only exists in isolated cases and is hardly used or developed systematically.

Building up the necessary knowledge and experience to take action against deceptive design practices generates costs and ties up resources. At the same time, in the public sector it can take years to set up organizational structures. It should therefore be avoided that each authority builds capacity individually, as is the case in the area of cyber-security in Germany.[36] Instead, they should cooperate and create flexible and temporary structures that do not take years to set up. For example, youth, data and consumer protection organisations and possibly competition authorities could set up a joint unit for digital design research and regulatory action.

This approach would also make sense because dark patterns can often constitute violations of data protection, consumer protection and competition law at the same time. Such a unit could be composed of digital product and interface designers, lawyers, IT researchers and experts from the respective authorities. It would help the authorities involved to build up expertise and promote cooperation. At the same time, it could advise ministries on the development of new regulatory projects involving digital user interfaces. One example is the planned amendment to the protection of minors by the Federal Ministry of Family Affairs, which is intended to oblige platforms and other online providers to introduce new reporting systems, labelling requirements or setting options for users. The success of the planned measures will also depend on how companies design them during implementation. Another option would be to set up such a unit across several European countries – not only because this would mean a further reduction in costs, but also because more and more online providers and services are being offered throughout Europe.

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36 Sven Herpig/Kira Messing, „Zuständigkeiten und Aufgaben in der deutschen Cyber-Sicherheitspolitik, 07. November 2019, https://www.stiftung-nv.de/de/publikation/zustaendigkeiten-und-aufgaben-der-deutschen-cyber-sicherheitspolitik.

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