



Study:

# Platform Compliance

Case studies on manipulative tricks in the design of interfaces and processes

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**Austrian Federal  
Ministry**

**Austrian Federal Ministry**  
Labour, Social Affairs, Health and Consumer  
Protection

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# Contents

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1	Introduction	6
2	Dark patterns	7
2.1	History of development	7
2.2	Definition(s)	10
2.3	Regulatory framework	12
2.4	Survey	16
3	Online shopping & dark patterns	18
3.1	Case Study ‘Temu’	18
3.1.1	Documentation	18
3.1.2	Analysis	26
3.2	Case Study “SHEIN”	29
3.2.1	Documentation	29
3.2.2	Analysis	34
4	flight bookings & dark patterns	36
4.1	Case Study “Ryan Air”	36
4.1.1	Documentation	36
4.1.2	Analysis	45
	Case Study “Austrian Airlines”	49
4.2.1	Documentation	49
	Analysis	52
	Case Study “Wizz Air”	52
4.3.1	Documentation	52
4.3.2	Analysis	57
	Case Study “Opodo”	60
4.4.1	Documentation	60
4.4.2	Analysis	65
5	registration processes on social media	68
5.1	TikTok Case Study	70
5.1.1	Documentation	70
5.1.2	Analysis	73
	Case Study “Instagram”	75
5.2.1	Documentation	75
5.2.2	Analysis	79
5.3	Excursion: Meta consent or pay model	79
6	Tools	82
6.1	Prevention of tracking & exclusion of cookie banners	82
6.2	Disguising advertising and recommendations	85
6.3	Hiding & highlighting of dark patterns	87
6.4	Detection and documentation of infringements	88
6.5	Cricks in the automated detection of dark patterns	90

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7	Conclusions	92
8	sources	96
8.1	References	96
8.2	Table of Figures	99
9	Technical Annex	101
	Description of tool development	101
	Comparison of the complexity of Appium and Selenium for Mobile Web Monitoring	105

## ***Disclaimer***

The analyses presented in this document are based on research into individual economic operators within the framework of the KIRAS service PCS. They reflect the consensus reached by the authors of this report in their interpretation of the recently adopted provisions of the Digital Services Act DSA, the Digital Markets Act DMA and the GDPR on the matters under investigation. The points of view set out in this document do not prejudice the assessment by the legal institutions, which must be carried out on a case-by-case basis. Particular attention should be paid to the fact that documented practices may change, which is why each screenshot is accompanied by a date.

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## Summary

### PCS – Platform Compliance Study

**Study authors:** Louise Beltzung, Julia Krickl, Irem Hölzl, Andrew Lindley

Version 1.0 – 30 September 2024

**Background** – On 17 February 2024, the Digital Services Act (DSA) entered into force across the European Union. This study examines in particular the prohibition of behavioural advertising for minors and the prohibition of dark patterns under Regulation (EU) 2022/2065, also referring to the Digital Markets Act (DMA), the General Data Protection Regulation (GDPR) and the UCPD.

**Objective of the study** – The main objectives of the study are: (1) inventory of dark patterns in the field of e-commerce and flight bookings, (2) documentation and analysis of registration processes on social media, (3) study of technical possibilities to detect, monitor and document dark patterns.

**Methodology** – (1) Survey: Tool-based collection and documentation of dark patterns from selected economic operators. (2) Analysis: Legal assessment of the documented dark patterns. (3) Development: Produce a blueprint for a monitoring tool that is also applicable to apps of online marketplaces.

**Results** – (1) Challenges for consumer protection: Difficulty in classifying dark patterns within the legal framework; Demarcation of marketing practices. (2) Uncertainty about the applicable legal provisions.

**Benefits of the study** – (1) The widespread criticism of dark patterns in e-commerce helps to better understand consumer problems. (2) valuable insights into the classification and possible enforcement of consumer protection.

**Limitations of the study** – (1) Focus: The study focuses on individual case studies, illustrating but not providing a comprehensive overview of consumers' online life. It is not a quantitative survey; (2) Legal uncertainty: So far, there is little practical legislation on dark patterns, which has been enforced by the courts; the legal classification was cautious and must be seen in its limited scope.

**Conclusion** – The present study shows that the implementation of the new rules of the DSA in consumer protection is challenging. The identification and legal classification of dark patterns is complex, but the study offers valuable approaches and tools to support consumer enforcement.

**Keywords:** Dark patterns, behavioural advertising

## Summary

### PCs – Platform Compliance Study

**Authors:** Louise Beltzung, Julia Krickl, Irem Hölzl, Andrew Lindley

Version 1.0 – 30 September 2024

**Background** - On 17 February 2024, the Digital Services Act (DSA) entering into force across the European Union. This study examines in particular the ban on behavioural advertising to minors and the ban on dark patterns under Regulation (EU) 2022/2065.

**Objective of the study** - The study has the following main objectives: (1) To take stock of the implementation of the ban on behavioural advertising to minors on social media. (2) To collect and analyse current examples of dark patterns in online shopping and flight bookings in Austria. (3) The investigation of the technical possibilities for recognising and monitoring dark patterns.

**Methodology** - (1) Survey: Tool-supported survey and documentation of dark patterns among selected economic actors. (2) Analysis: Legal assessment of the documented dark patterns. (3) Development: Creation of a blueprint for a monitoring tool that can therefore be used for online marketplace apps.

**Results** - (1) Challenges for consumer protection: Difficulty of categorising dark patterns within the legal framework; difference from marketing practices. (2) Uncertainty about the applicable legal provisions.

**Benefits of the study** - (1) The comprehensive criticism of dark patterns in online retail helps to better understand consumer problems. (2) Valuable insights into the categorisation and possible legal enforcement in consumer protection.

**Limitations of the study** - (1) Focus: The study focused on individual case studies and Serves as an illustration, but not as a comprehensive overview of consumers' everyday online lives. It is not a quantitative survey; the legal categorisation was carried out cautiously and must be seen in its limited scope. (2) Legal uncertainty: To date, there is little practical legislation on dark patterns that has been enforced in court.

**Conclusion** - This study shows that the implementation of the new DSA regulations in consumer protection is challenging. The identification and legal categorisation of dark patterns is complex, yet the study offers valuable approaches and tools to support enforcement in consumer protection.

**Keywords:** Dark patterns, behavioural advertising

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# 1 Introduction

On 17 February 2024, the Digital Services Act (DSA) entered into force directly across the European Union. Among the many topics covered by Regulation (EU) 2022/2065, this study report focuses in particular **on banning dark patterns** and **prohibiting behavioural advertising against minors**. The DSA is aimed at digital service providers and is a key piece of legislation in the European Union regulating the activities of platforms, alongside the Digital Markets Act (DMA).

Against the background of this new legal framework, this study report presents a number of case studies. Dark patterns were investigated on e-commerce platforms and in the flight booking processes of airlines and holiday platforms. As access to the examination of compliance with the prohibition of behavioural advertising, the design of registration processes for minors was examined on two social media platforms (TikTok, Instagram) for dark patterns.

The DSA is aimed at online platforms, in particular Very Large Online Platforms (VLOPs), but dark patterns are also prohibited under other legal regimes. In this respect, it was decided to collect dark patterns also on websites of online shops and other companies in order to meet the objective of the study that documentation and analysis of examples contribute to a better understanding of the phenomenon.

The study report begins by classifying the phenomenon of dark patterns in terms of legislative history, definitions of terms and the legal framework, as well as a presentation of the approach to the survey (**Chapter 2 dark patterns**). The case studies are then analysed along three themes (**Chapter 3 Online Shopping & Dark Patterns**, **Chapter 4 Flight Booking & Dark Patterns** and **Chapter 5 Registration Processes on Social Media**). Following the survey results, tools are presented that can help to reduce the exposure of consumers and consumer protection stakeholders to dark patterns and to identify and document them accordingly (**Chapter 6 Tools**). The conclusions set out recommendations for consumer protection and provide an outlook on outstanding issues (**Chapter 7 Conclusions**).

## 2 Dark patterns

In some cases, our attention is in the shadow, which influences our decisions online: Sometimes it is details such as the colour design of an option or the tone of a text in the ordering process; sometimes simply the simple *feeling* is a particularly good or even urgent offer. What guides consumers' eyes and influences their choices is in some cases subtle.

This is not new, but: Digitalisation has led to a professionalisation of the abnormalisation of practices and increased their effectiveness. The UX designer Harry Brignull therefore re-introduced the concept of dark patterns in 2010, creating a debate that is still ongoing. He criticised his peers' 'tricks' for engaging users on websites or apps through the design of website elements on actions they do not cover.<sup>1</sup> Subsequently, this term described and criticised a number of practices aimed at manipulating users' decisions in an unintentional or contrary to their interests **through the design of websites and processes**. To date, the definition of dark patterns has been the subject of scientific debate, and dark patterns are understood to be very different practices – from criticism of misleading formulating of texts, towards an suggestive colouring of options – and their use is also very different in different stages of consumer online processes.

In the following chapter, we therefore first describe the history of the practices regrouped under the term 'dark patterns'. Some of the practices criticised, such as hidden costs, are well-established issues in consumer protection, and the mechanisms behind dark patterns have also been examined in the context of behavioural economics since the 1970s. The historical look shows what is 'new' about dark patterns and how they can be derived from long-term commercial practices, digital marketing methods, developments in user experience design and behavioural economics. (**Chapter 2.1.**)

The term 'dark patterns' has been incorporated into the legal subject and at the same time the definition of the term is still under discussion, including in scientific terms – the term has its strengths on the one hand and its weaknesses on the other hand are the fact that it is sometimes difficult to understand, what is already dark patterns and where there is a legitimate commercial interest in the sense of marketing, for example. (**Chapter 2.2.**)

Irrespective of these conceptual challenges, practices that are considered to be dark patterns are already indirectly prohibited or restricted by various legal documents; the Digital Services Act (DSA) and the Digital Markets Act (DMA) have also for the first time designated them as prohibited practices – **Chapter 2.3** introduces this legal framework in the European Union and Austria. **Chapter 2.4.** explains the methodological approach of the case studies, which are presented in detail from Chapter 3 onwards.

### 2.1 History of development

Dark patterns are partly based on e-commerce practices that have been in use for years.<sup>2</sup> In addition, the effectiveness of dark patterns can be attributed to psychology findings on how the exploitation of the intuitive kind of information is perceived and processed quickly. In the following, the insight into individual disciplines or trends from which dark patterns have emerged is intended to help characterise and demystify the phenomenon.

#### System 1 and System 2

Popularised in the early 2010s by Nobel Prize laureate and researcher of behavioural psychology Daniel Kahnemann, it is assumed that thinking and reasoning are based on two different cognitive systems.<sup>3</sup> A distinction is made between the intuitive, automatic and unconscious system-1 and the more

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1(Brignull, 2010)

2(OECD, 2022), P. 11

3(Kahneman, 2011)

demanding system 2 process.<sup>4</sup>

For example, when a user creates a new account on a website, he/she will be asked to agree to the terms and conditions, as well as the data protection rules. These conditions are easily accepted by the vast majority of users, but never read – they are usually agreed quickly, intuitively and automatically. This is an example of a system 1 thinking process that is automatic and unconscious, without much active reflection. This contrasts with the so-called ‘system 2 think’. If a user takes time and is struggling to read carefully the entire texts of the general terms and conditions, as well as the data protection provisions, and to assess whether the terms are to be agreed, it uses the system 2 thinking process. This process is controlled and conscious and therefore involves a certain cognitive effort. This makes the system 2-think more cumbersome than the intuitive system 1 process. System 2 thinks are therefore based on a balanced, demanding decision-making process leading to a slower implementation of the intended behaviour.<sup>5</sup>

### Behavioural economics and cognitive shortcuts

This understanding of thinking and processing processes in human perception is one of the insights of behavioural economics. From the 1970s onwards, economics, later behavioural economics, sought explanations for irrational decisions. Traditional economic models could not explain certain patterns of behaviour of people who were observed in their daily lives.<sup>6</sup>

In the classical economic theory, more decisions are better for the rational agent of the Homo oeconomicus, because it consistently weighs costs and benefits over time and acts in a rational way. Economic behaviour here changed the assumptions about the homo oeconomicus. Moving away from this understanding of knowledge of certain irrationalities in human behaviour, the Homo oeconomicus model changed over reference variables.

Many options and a high value of those options do not necessarily improve a person’s situation. Rather, depending on the situation, there is an optimal number of choices that maximise the individual’s welfare in economic terms. If this limit is exceeded, the welfare curve starts to decrease steadily.

This is due to the limited cognitive capacity of humans, a certain paralysis in decision-making, as well as a reduction in the satisfaction of decisions with excessively many options. The more options, the higher the likelihood that a better one could have been, what is the phenomenon of the ‘Paradox of Choice’. Any additional option also increases opportunity costs, i.e. the cost of unexploited opportunities.

In addition, too many options are accompanied by excessive expectations.<sup>7</sup> When all these considerations are combined, it becomes clear that behavioural economics are based on a different human image that corresponds to a ‘real’ human being rather than that of the classic economic theory. The cognitive shortcuts thus discovered made the observed irrational behaviour of many people not only explainable but also predictable.

### Nudges

On this basis, the concept of nudges was developed, psychological tricks which were originally intended to guide individuals into socially desirable behaviour. Nudges are based on the principles of behavioural economy and use cognitive biases to guide decisions in a certain direction without limiting choice.<sup>8</sup> 910 The standard work on the subject is ‘nudge’ by Richard Thaler (2017 Nobel Prize winner) and Cass

4(Bösch et al., 2016)

5(Bösch et al., 2016)

6(Holle, 2019)

7(Holle, 2019)

8(Thaler, 2018; Thaler & Sunstein, 2009)

9(Thaler & Sunstein, 2009)

10 (Thaler, 2017) Online: <https://www.nobelprize.org/prizes/economic-sciences/2017/thaler/facts/>



Sunstein (2009).<sup>10</sup>[bookmark9](#) In 'Nudge', contrary to the theory of classical economic theory, human behaviour can only be controlled by means of price mechanisms or bids and bans, stressing that there are multiple tools to steer and influence human behaviour.

'Nudges' may positively influence certain behaviour without coercion.'<sup>11</sup>

Research on psychological acronyms or biases was not driven by marketing, but aimed to steer citizens' behaviour towards minimising negative externalities, for example on issues such as organ donation. It was only later that nudges were discovered for their use in marketing, as tools that are available inexpensively available and easy to implement.<sup>12</sup>

Since then, Thaler et al. has already distanced itself from the negative use of techniques and popularisation of the term 'sludge'.<sup>13</sup> Sludges describe manipulative nudges that are used against the best interest of consumers – this also means dark patterns.

#### Traditional sales tricks in e-commerce

The development and spread of dark patterns is due to the increasing digitalisation of marketing and e-commerce developments.

For example, when looking at price strategies that have been used for some time in the sale of stationary retail outlets, it becomes clear that these also use subtle tricks to sell products better. One example is pricing according to a certain pattern to make it somewhat more favourable (e.g.: EUR 1.99, EUR 599, EUR 2.999.99, comparison with the EIA), but also the arrangement and presentation of certain products for marketing purposes (lower products not at the same level). These are practices that are accepted by consumers.

#### Spam – the first dark patterns

This, combined with the increasing significance of digital marketing methods used in spam, especially in the early 2000s, has contributed significantly to the spread of dark patterns.<sup>14</sup> A prominent example of this is the Free Mail Provider Hotmail. The company automatically has the footer of each e-mail as early as 1996: "*Get your free e-mail with Hotmail*" added, a marketing strategy that has helped the company get viral growth.<sup>15</sup> For these and similar methods, some of the limits of legality have been stretched: For example, services such as LinkedIn used their users' contact books and automatically invited them to use the service. In LinkedIn's case, this led to a 'class action lawsuit', which the company lost.<sup>16</sup>

#### A/B Tests and dark patterns

A growth accelerator for the spread of dark patterns was the growing importance of the digital world. E-commerce, as well as the promotion of products, made use of strategies that were not traditionally available to offline trade: 1. The principle of behavioural change by nudges and psychological tricks, as described above, and 2. A/B Testing.

With the help of A/B testing, various forms of presentation of websites could be played on to a battle of thousands of people. For example, UX designers discovered that even trivial changes in the website design, such as changing a button colour or placing it, can lead to substantial changes in user behaviour. The idea of data-driven optimisation of user interfaces is now firmly anchored in the design processes of many companies. For this reason, the widespread use of A/B tests is considered to be a key element of the phenomenon of dark patterns.

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11(Holle, 2019)

12(Holle, 2019)

13(Thaler, 2018)

14(Narayanan et al., 2020)

15(Murray, 2023)

16(Narayanan et al., 2020) and (Strange, 2015)

The ageing or growing importance of the online economy or e-commerce shifted the focus from online services from mere growth to actual revenues. In order to create this shift from attention to turnover, companies increasingly relied on behavioural influences, sometimes in a way that influenced the autonomy of consumers or their informed decision-making capacity. In particular, A/B testing and the design of user interfaces were used for this purpose. In some cases, these were optimised versions of tricks used for a long time in retail, but in others they were completely new.

## 2.2 Definition(s)

In 2010, the categorisation of Harry Brignull initially included the following categories:<sup>17</sup>

- **Comparison Prevention:** The prevention of settlements
- **Confirm shaming:** The push for adoption
- **Disguised Ads:** Hidden or disguised advertising
- **Fake scarcity:** Fictitious scarcity
- **Fake social proof:** Fictitious social pressure
- **Fake urgency:** Fictitious need for time or urgency
- **Forced action:** Forced acts
- **Hard to cancel:** Difficult to reverse or cancel
- **Hidden costs:** Hidden charges
- **Hidden subscription:** Hidden subscription
- **Nagging:** Repeated calls
- **Obstruction:** Disability
- **Preselection:** Preselection
- **Sneaking:** Crane in the basket
- **Trick wording:** Catching or trick issues
- **Visual interference:** Visual disorder

Building on these initial category reflections, dark patterns have been continually collected and expanded to taxonomy unwanted practices. A large part of the first academic work on the topic focused on working on the definition of dark patterns on the basis of examples or on comparing different category systems. Well-known work was written by Mathur et al., Bösch et al., Gray et al., Luguri and Strahilevitz, among others.<sup>18</sup> Differences in approaches are, for example, when the way in which design decisions are taken is distinguished on the basis of the way in which they are made, as in Gray et al.:<sup>19</sup>

- **Exploitation perceptual vulnerabilities:** Exploitation of perception weaknesses
- **Exploitation vulnerabilities in comprehension:** Exploiting weaknesses in understanding
- **Exploitation vulnerabilities in decision making:** Exploiting weaknesses in decision-making
- **Exploitation expectations:** Exploitation of expectations
- **Resource depletion and pressure:** Depletion of resources and pressure
- **Forcing and blocking:** Forcing and blocking
- **Exploitation emotional vulnerabilities:** Exploitation of emotional vulnerabilities
- **Exploitation addiction:** Exploiting dependencies

Scientific surveys on dark patterns have sometimes been carried out in relation to specific thematic areas, such as gaming or privacy. Academic literature has repeatedly pointed out that there is no

<sup>17</sup> (Brignull, 2022) Types of deceptive pattern, online: <https://www.deceptive.design/types> (accessed 12/03/2024)

<sup>18</sup>(Bösch et al., 2016; Gray et al., 2018; Luguri & Strahilevitz, 2021; Mathur et al., 2019)

<sup>19</sup>(Gray et al., 2018)

sufficient definition of what constitutes dark patterns – the question ‘when exactly a user interface design becomes a dark pattern’ is in any case a difficult issue for some of the practices criticised. Caragay et al. (2024) talk about a recent change in the knowledge-based approach from descriptive taxonomies to thinking about mechanisms behind dark patterns.<sup>20</sup>

In 2022, the OECD published a comprehensive report on digital patterns. It identifies the following difficulties in defining dark patterns: (1) overly narrow definitions are not suitable for a rapidly changing field, (2) definitions along the user’s detriment face the difficulty to define it, (3) the use of the term ‘deceptive’ is criticised as reductive because some, but not all, dark patterns actually deceive consumers (e.g. nagging), (4) the focus on user interface obscures dark patterns that relate more to the design of processes (e.g. obstacles to terminating contracts).

In this sense, the OECD Committee on Consumer Policy established a working definition of dark patterns, which covers the collected practices that were known at the time of publication:

*“Dark commercial patterns are business practices employing elements of digital choice architecture, in particular in online user interfaces, that subvert or impair consumer autonomy, decision-making or choice. They often deceive, coerce or manipulate consumers and are likely to cause direct or indirect consumer detriment in various ways, though it may be difficult or impossible to measure such detriment in many instances.”*<sup>21</sup>

The term ‘dark patterns’ has now been incorporated into EU legislation by the DSA, but many researchers now move away from Harry Brignull himself, including the ‘inventor’ of the term. In his 2023 book ‘Deceptive patterns: Exposing the Tricks Tech Companies use to Control You’, he introduces the term ‘deceptive design’ as a substitute. Deceptive design, translated literally as ‘deceptive design’ techniques more extensively. In ‘Deceptive Patterns’, Brignull in turn works with taxonomies of dark patterns that put manipulative user interface and user experiencedesign concepts into other and sometimes more categories. This concept is also favoured by others, such as the World Wide Web Foundation.<sup>22</sup>

However, accesses may also be found which seek to define dark patterns not so much by describing undesirable practices, but as deviations from normal practices. In this sense, Caragay et al. (2024) – they criticise that it is difficult for UX designers to work on dark patterns, especially in view of sometimes difficult demarcations – for example: When does Nagging start? Referring to Mathur et al., they stress that dark patterns are created by changes in the standard decision-making architecture. But what is considered to be a standard designstructure for the design of a website or the design of a process?

Instead of looking for a uniform representation of all standard decisions, the authors propose to map current practices and compare them with the over-average, usual user expectations. Your proposed approach avoids the difficulty of exploring the psychological mechanisms of action of practices by considering a design to be a dark pattern when it deviates from standard expectations and is against the interests of users. Standards should be developed along concepts, e.g. the concept of user registration could be discussed – how is this done by stakeholders and how this matches user expectations. The advantage of this method would be that if a deviation from expectations, concepts could be criticised more directly and proposals for revision would become clear. It is interesting, but not yet in the present

<sup>20</sup>(Caragay et al., 2024)

<sup>21</sup> (OECD, 2022), p. 5, Own non-exhaustive translation:

*“Dark commercial patterns are commercial practices that use elements of the digital decision-making architecture, in particular in online interfaces, that undermine or impair consumer autonomy, decision-making or choice. They often deceive, force or manipulate consumers, causing direct or indirect disadvantages to them, even if in many cases it is difficult or impossible to measure such disadvantages.”*

<sup>22</sup>(Tech Policy Design Lab – Deceptive Design, O.J.)

case, to consider linking such considerations to consumer guides.

## 2.3 Regulatory framework

Since 2010, a taxonomy of dark patterns has been developing, defining different practices. These are described with varying degrees of precision and often difficult to distinguish. To date, more than 1000 dark patterns have been documented, partly by users and partly scientifically. However, the legal assessment of dark patterns is different: Although the term is now used in the Digital Services Act (DSA), it remains unclear which specific practices are covered. In addition, some practices referred to as dark patterns may already be considered unlawful under existing laws such as the GDPR.

Below is an outline of the current legal treatment of the issue, focusing on the legal acts relevant to the study, in particular the Unfair Commercial Practices Directive (UCPD) and the DSA, rather than the GDPR. Given the early stage of the use of the term in the legal field, there is not enough enforcement material to define a legal concept of dark patterns that could already be worked on. It is to be expected that consideration will take place and become apparent where the case-law goes hand in hand with the scientific and activist debate on concepts.

### Dark patterns and GDPR

Dark patterns influence consumers' ability to make a transactional decision that they would not have taken otherwise. When designing dark patterns, users' personal data are often used to better understand user behaviour and effectively influence their decision-making process. Therefore, although the Unfair Commercial Practices Directive (UCPD)<sup>23</sup> and the General Data Protection Regulation (GDPR) do not<sup>24</sup> yet contain a specific definition of dark patterns, the design and consequences of the use of dark patterns by online platforms require a fair and data protection assessment.

The present survey based on case studies does not concern dark patterns of possible infringements within the meaning of the GDPR and, accordingly, does not address existing legal assessments in this area, including in particular the 2022 Guidelines of the European Data Protection Board (EDPB). The EDPB has<sup>25</sup> already compiled in its Guidelines 03/2022 a list of practices that are often observed as manipulative design patterns on social media platforms and may also constitute a violation of the GDPR. A similar approach is needed for further design patterns that can be considered as dark patterns and thus misleading or aggressive commercial practices within the meaning of the UCPD.

### Dark patterns and the UCPD

The term 'dark patterns' was not mentioned even after the revision of the UCPD by the Modernisation Directive (EU) 2019/2161. This has also been confirmed by the European Commission in its guidance on the interpretation of the UCPD, but at the same time pointed out that, irrespective of its classification, the UCPD applies to all 'unfair commercial practices' that meet the conditions of the material scope of the Directive. When dark patterns are used in business-to-consumer relationships, the Directive can be used in addition to other instruments of the EU legal framework (e.g. GDPR) to challenge the fairness of

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<sup>23</sup>Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC of the European Parliament and of the Council and Regulation (EC) No 2006/2004 of the European Parliament and of the Council ('Unfair Commercial Practices Directive')

<sup>24</sup>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 (Basic Data Protection Regulation)

<sup>25</sup>(European Data Protection Board, 2022) Guidelines 3/2022 on dark patterns in social media platform interfaces: How to recognise and avoid them.

such practices.<sup>26</sup>

### Dark patterns and DSA

The use of dark patterns has been widespread in online environments for years. Nevertheless, the Digital Services Act (DSA) is the first European law to legally define this phenomenon and explicitly prohibit its use. Under Article 25(1) of the DSA, *providers of online platforms may not design, organise or operate their online interfaces in such a way as to deceive, manipulate or otherwise significantly impair or hinder the ability of the recipients of the service to make free and informed decisions*. Recital 67 defines dark patterns and explains them using examples. As such, dark patterns are *practices that have the object or effect of significantly distorting or impairing the ability of users to make an autonomous and informed choice or decision. Such practices can be used to persuade users to engage in unwanted behaviour or decisions that have negative consequences for them*. According to that definition, it must be understood that the boundary between a permitted design pattern and a dark pattern is crossed when the practice applied significantly influences the decision-making capacity of users in order to control their behaviour and induce them to take an unintended decision with negative consequences for them. To this end, the following practices are listed as examples in the recital:

- Repeated requests from users to make a selection, even though it has already been made.
- Much more cumbersome procedure for cancelling a service than for registering.
- Making certain choices more difficult or time-consuming than others.
- Disproportionally making it difficult to discontinue a purchase or to log out of a specific online platform.
- Empower consumers to conclude distance contracts with traders and mislead users by initiating decisions on transactions.
- Unduly influencing users' decision-making through default settings that are very difficult to change, thereby distorting and impairing the autonomy, decision-making or choices of users.

The DSA also provides that this prohibition on the use of dark patterns does not apply to practices covered by the UCPD or the GDPR (Article 25(2) DSA). In other words: The provision of the DSA only applies if the commercial practice in question is not already covered by the UCPD or the GDPR. This leads to a legal ambiguity, as the practices listed in the recital can also be considered as misleading or aggressive commercial practices within the meaning of the UCPD. Under Article 6 of the UCPD, commercial practices are misleading if they contain false or false information or are otherwise likely to deceive the average consumer and thereby cause him to make a purchase decision that he would not have taken otherwise.

Similarly, under Article 7 of the UCPD, a commercial practice is to be regarded as misleading if, in a specific case, taking into account all the factual circumstances and the limitations of the communication medium, it omits material information which the average consumer needs, depending on the context, to take an informed transactional decision and which therefore causes or is likely to cause the average consumer to take a transactional decision that he would not have taken otherwise.

This raises the question when an online platform falling within the scope of the DSA uses dark patterns to influence the decision-making freedom of its users and to induce them to take a transactional decision, which sanctions and enforcement regime would apply to this practice. Under the provisions of the DSA, it is first necessary to examine whether the UCPD applies to the practice. There is therefore a risk that Article 25(2) of the DSA will make enforcement more difficult. In addition, this could lead to the DSA authorities also having to carry out an assessment under fair and data protection law, without being

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Commission<sup>26</sup> Guidelines on the interpretation and application of Directive 2005/29/EC concerning unfair business-to-consumer commercial practices in the internal market, OJ 2021 C 526/1, point 4.2.7

responsible for these areas.

### DSA and DMA for “gatekeepers”

On 6 September 2023, the European Commission appointed six gatekeepers under the Digital Markets Act (DMA): Alphabet, Amazon, Apple, ByteDance, Meta, and Microsoft. In total, 22 core platform services have been designated to be offered by these gatekeepers. These include social networks such as TikTok, Facebook, Instagram, YouTube and LinkedIn.<sup>27</sup> As a gatekeeper under the DMA, if an undertaking has a significant influence on the internal market, it will provide a core platform service that serves as an important gateway for business users to reach end users and enjoys or is likely to enjoy an entrenched and durable position in its activities in the near future.<sup>28</sup>

Gatekeepers process personal data of end users for the purpose of providing online advertising. In addition, third parties using the gatekeeper platform also provide the gatekeepers with personal data of their own end users to benefit from the platform services. This gives gatekeepers a potential market advantage as their business model is data-based. Therefore, the DMA requires gatekeepers to obtain the consent of end users under the GDPR to process personal data for their data-driven commercial practices and limits the legal bases on which they can rely. Consequently, gatekeepers should allow end users to freely decide whether to accept such data processing and opt-in practices by offering a less personalised but equivalent alternative, without making the use of the core service of the platform or specific functionalities conditional on the consent of the end-user. To this end, in addition to consent under the DSA, Article 6(1)(c), (d) and (e) GDPR and not Article 6(1)(b) and (f) GDPR could also be used as the legal basis for the processing.

If the user’s consent is required for data processing, consent must comply with the conditions of the GDPR.<sup>29</sup> Gatekeepers must inform end users about the consequences of non-consent. In order to remain freely consent, they must offer a less personalised but equivalent alternative, without making the use of the core service of the platform or specific functionalities conditional on the consent of the end-user.<sup>30</sup>

The Digital Services Act (DSA) focuses more on online content regulation and concerns more social media platforms. The regulation already applies to ‘very large online platforms’ (VLOPs). LinkedIn, Facebook, Instagram, TikTok, YouTube, Snapchat and X are referred to as VLOPs under the DSA.<sup>31</sup> There are some overlaps between undertakings referred to as gatekeepers under the DMA and VLOPs under the DSA. Companies subject to both laws must comply with both rules. Under Article 28 of the DSA, providers of online platforms may not display on their interface advertising based on profiling, within the meaning of the GDPR, using personal data of the user, provided that they have reasonable assurance that the user concerned is a minor. Furthermore, advertising based on ‘profiling’ of ‘special category’ data within the meaning of the GDPR is prohibited under the DSA.<sup>32</sup> The DSA introduces transparency requirements for advertisements displayed on all online platforms, as well as additional transparency requirements and requirements to carry out a risk assessment of potential systemic risks for VLOPs. VLOPs are also required under the DSA to create and make publicly available a repository for the entire period during which they display advertisements and for one year after the advertisement was last displayed on their online interfaces. That repository contains information such as the content of the advertisement, the natural or legal person on whose behalf the advertisement was placed, the period

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27 (European Commission, [2024a](https://digital-markets-act.ec.europa.eu/gatekeepers_en))[https://digital-markets-act.ec.europa.eu/gatekeepers\\_en](https://digital-markets-act.ec.europa.eu/gatekeepers_en)

28Section 3(1) of the Digital Markets Act

29Recital 36 Digital Markets Act

30Recital 37 Digital Markets Act

31 (European Commission, 2024a, [2024c](https://digital-strategy.ec.europa.eu/en/policies/list-designated-vlops-and-vloses))<https://digital-strategy.ec.europa.eu/en/policies/list-designated-vlops-and-vloses>

32Section 26(3) Digital Services Act

during which the advertisement was placed, whether the advertisement was intended for one or more specific groups of users and the total number of users reached.<sup>33</sup>

### Consumer guides

Different consumer models are used as a benchmark for assessing the impact of commercial practices in the UCPD: (1) the so-called average consumer, (2) the vulnerable consumer. <sup>34</sup>

### The average consumer

The UCPD considers the ‘average consumer’ as a benchmark for assessing the impact of a commercial practice. This concept was developed by the CJEU before the adoption of the UCPD (in C-210/96 – Gut Springenheide and Tusky/Director of the district of Steinfurt) and was subsequently codified by the UCPD. According to that provision, an average consumer is to be understood as a person who is observant in an appropriate situation. The average consumer within the meaning of the UCPD is always able to obtain the available information and to act reasonably on that basis.<sup>35</sup> Due to specific interests, certain consumers may have specific knowledge and characteristics that an average consumer may not necessarily have. Therefore, according to the Commission’s guidance on the interpretation and application of Directive 2005/29/EC, the specific interests of certain groups of consumers have a direct impact on the assessment of the impact of a commercial practice. If no specific group of consumers can be identified, the notional general consumer should be the basis for the assessment. For example, in the context of misleading advertising of baby nappies, where a link has been established between allergies and the nappies of the trader concerned, a national court has:

Average consumers consider parents of young children who do not have specific knowledge of allergies.<sup>36</sup>

It is also possible that different groups of consumers may be affected by the same commercial practice. For example, there may be an average consumer targeted by the practice and at the same time the practice may target a group of vulnerable consumers. In principle, the assessment should take into account the consumers who have actually been achieved by the practice, regardless of whether they are the consumers that the trader intended to achieve.

### Vision of the vulnerable consumer

The UCPD is based on the idea that consumers belonging to one of the categories listed in Article 5(3) should be afforded a higher level of protection than the ‘average consumer’ referred to in Article 5(2). This article classifies consumers as vulnerable solely because of their ‘intellectual or physical infirmity, age or credulity’. The term ‘light faith’ is used in the context of consumer groups that tend to believe more easily certain claims. The purpose of the term is to protect the members of a group who, for any reason, are particularly vulnerable to the influence of certain commercial practices. In theory, any consumer may belong to this group.<sup>37</sup>

In line with the position taken by the European Commission in the Guidelines on the interpretation and application of Directive 2005/29/EC, the notion of vulnerability in the UCPD is dynamic and situational,

<sup>33</sup>Section 39 Digital Services Act

<sup>34</sup>Judgment of the Court of Justice of 16 July 1998, Gut Springenheide and Tusky v Oberkreisdirektor des Kreiss Steinfurt – Amt für Lebensmittelüberwachung, C-210/96, ECLI:EU:C:1998:369, paragraph 31

<sup>35</sup>The Commission’s guidance on the interpretation and application of Directive 2005/29/EC concerning unfair business-to-consumer commercial practices in the Single Market, OJ 2021 C 526/1, under 2.5 Average consumers

<sup>36</sup>Decision of the Marknadsdomstolen of 4 July 2012

<sup>37</sup>Commission Guidelines on the interpretation and application of Directive 2005/29/EC concerning unfair business-to-consumer commercial practices in the internal market, OJ 2021 C 526/1, point 2.6 Vulnerable consumers

meaning that a consumer may be vulnerable in a particular situation, but not in another situation. For example, certain consumers may be particularly vulnerable to personalised persuasion practices in a digital environment, while this is not the case in a shop or other offline environment.<sup>38</sup> In order to ensure a consumer-friendly and modern approach, the concept of vulnerability should be reconsidered, as the increasing collection of personal data from consumers in the use of online services and developments in the area of dark patterns make consumers more vulnerable.

## 2.4 Survey

The survey focuses on three very different areas for dark patterns. (1) The two online shopping case studies concern the two flatshapers Temu and SHEIN. Both providers were declared by the European Commission in 2024 as Very Large Online Platform (VLOP) under the DSA; Temu in May 2024, SHEIN at the end of April 2024. (2) Four case studies have been carried out on the subject of flight bookings – this area is relevant because it could well illustrate the difficulty of assessing dark patterns in processes and many complaints from consumers, such as additional services booked, could be a consequence of dark patterns. The flight booking processes at Ryanair Air, Austrian Airlines, Wizz Air and Opodo are therefore documented by way of example and analysed in a comparative manner with regard to their design. (3) Finally, the issue of behavioural advertising on social media was addressed by analysing the registration processes on TikTok and Instagram – here too, dark patterns are used.

The question of whether flight booking platforms are to be regarded as online platforms within the meaning of the DSA is not easy to answer. Under Article 3(i) of the DSA, an ‘online platform’ is a hosting service which, at the request of a user, stores and disseminates information to the public, provided that that activity is not merely a minor and purely ancillary function of another service or a minor function of the main service which, for objective and technical reasons, cannot be used without that other service, and the integration of the ancillary or insignificant function with the other service is not intended to circumvent the applicability of that regulation. It is unclear to what extent these booking platforms store and publish the data and information generated by their users. Therefore, the use of dark patterns by these companies can only be assessed under the UCPD and GDPR.

For example, online platforms can include digital marketplaces such as Amazon or social media networks such as Instagram. These are examined in more detail in **Chapter 5 Registration processes on social media**. For the review and documentation of the standard privacy settings of various VLOPs (Very Large Online Platforms) such as Google, Meta and TikTok, the study obtained a test smartphone. This test device was set up for a 16-year-old person (Anna) with the date of birth 1.3.2008. This means that the person has not yet reached the age of majority. This profile, which was stored in the system settings of the smartphone (Apple ID), subsequently opened various online accounts and documented their default settings. The smartphone used is an Apple SE with an Austrian prepaid SIM card.

The survey is not entirely in the sense of being entitled to statements about onlineshopping in Austria or even flight bookings as a whole – case study cases have been sought as an example to highlight similarities and differences in the design of website design and processes.

In addition, the analysis differs with two entries. It was decided to<sup>39</sup> work with the updated taxonomy of Harry Brignull’s dark patterns to identify possible non-compliances. At the same time, from a legal perspective, it is not yet possible to describe all the dark patterns that are considered as such according to the Taxonomy as practices that are legally prohibited under the DSA. There is currently no case-law for this – and the legal assessments are therefore listed separately below and use only selected

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Commission<sup>38</sup> Guidelines on the interpretation and application of Directive 2005/29/EC concerning unfair business-to-consumer commercial practices in the internal market, OJ 2021 C 526/1, point 4.2.7 on dark patterns

<sup>39</sup> (Brignull, 2022), online: <https://www.deceptive.design/types> (18/06/2024).



terminology of dark patterns. Nevertheless, the decision was taken to identify dark patterns in a broad sense, which can serve as a possible starting point for legal considerations and measures.

#### List of dark patterns collected

A number of design decisions (dark patterns), inspired by Brignull's extended taxonomy, are mentioned below.<sup>40</sup> All these dark patterns were found during the survey and documented in the following chapters:

- **Bait-and-switch:** Also known as Lockbirdtrick, e.g. applying for a "Free" offer which turns out to be paid.
- **Comparison Prevention and Exploiting Vulnerabilities in Budgeting:** Preventing comparisons or preventing mental budgeting, e.g. by preventing price comparisons or using uncomparable tariff packages.
- **Confirm Shaming and Emotional Stirring:** Urging to accept emotional messages or tampering, e.g. using tendentious formulations and inciting feelings of shame or guilt.
- **Deliberate Misdirection and tagging:** Intentional misguidance, e.g. beautiful design of buttons, rejection not in the form of a button, but only as a link.
- **Disguised Ads:** Hidden or disguised advertising, e.g. about offers that turn out to be product advertising.
- **Fake Scarcity:** Fictitious scarcity, e.g. via ads suggesting that many people are looking at an offer.
- **Fake Social Proof:** Fictitious social pressure, e.g. via the Claim that thousands of others have bought this product.
- **Fake Urgency:** Fictitious need for time or urgency, e.g. Countdown Timer or time-limited offers.
- **Forced Action:** Forced acts, e.g. when a trial only involves: a declaration can be continued.
- **Hard to Cancel:** Somewhat difficult to reverse or cancel, e.g. making it difficult to delete a user account.
- **Hidden Costs:** Hidden costs, e.g. "free" Products that are not available.
- **Hidden Subscription:** Hidden subscription, e.g. via club Memberships where it is unclear that they are Abos.
- **Nagging:** Repeated requests, e.g. through repeated enquiries as to whether to book an additional service.
- **Obstruction and Visual Interference:** Disability or visual disorder, e.g. through the repeated interruption of a booking process, or the repeated appearance of a pop-up window.
- **Preselection:** Pre-selection, e.g. to receive a newsletter.
- **Privacy Zuckering:** Mechanisms used by users to disclose private data incite, e.g. by repeatedly requesting private information or asking repeated questions about the sharing of personal contacts.
- **Sneaking:** Blurred in the basket, e.g. via the automatic selection of premium membership, when booking a flight.
- **Trick Wording:** Catching or trick questions, e.g. on the confusing formulation of contractual terms.

### 3 Online shopping & dark patterns

Online commerce has experienced an unprecedented upturn in recent years and nowadays it is vital to think away from everyday life. Consumers can now order a variety of products conveniently from home, be it clothing, electronics, household goods or food. Online shopping platforms such as Temu and SHEIN offer an impressive variety of products and use modern technologies to continuously improve the shopping experience. At the same time, the competitive conditions in online trade have worsened, not least due to the emergence of many new entrants and the progress of digitalisation.

However, these developments are also accompanied by a worrying trend: the application of manipulative design strategies: Dark patterns. The most common dark patterns used in online shopping include fake countdown timers, intrusive pop-up windows and fake social proofs. Despite the numerous regulatory measures taken by the European Union in recent years to improve the protection of consumers in the digital sphere, such as information obligations and transparency requirements, this analysis also shows the widespread use of dark patterns, leading to unexpected costs, disappointing expectations and confusion for consumers.

The study examined in more detail the websites of the following providers: Fabletics, helloFresh, Mr. Gugu, Donner.de, Barfoots Roeck, Zalando, Recentia.at, eis.at, Temu and SHEIN. All these websites found dark patterns and documented using the 'Eagle' open source tool. In detail, the two of these providers are analysed as case studies, SHEIN and Temu, which have also been officially classified as VLOP (Verly Large Online Platform) by the European Commission recently (April and May 2024 respectively).<sup>41</sup>

The two Chinese companies SHEIN and Temu are characterised by partly similar tactics in the design of their websites and advertising. Many dark patterns were found in both suppliers, including time pressure elements such as countdowns and timers, numerous pop-ups (nagging, obstruction) and wide-ranging promotion of discounts. There are some suspicions of Bait-and-Switch offers, also referred to as 'lock birds' where a advertised discount cannot actually be honoured, or leads to unintentional consequences for consumers.

In the following, the suppliers Temu and SHEIN are examined in more detail and the documented user interface and user experience decisions of the providers are analysed in a second step. The analysis shows that a certain overload with offers, colours, pop-ups and other elements has become the normality on these platforms.

#### 3.1 Case Study 'Temu'

Temu, an emerging Chinese e-commerce giant, has also been active in Austria for some time and has attracted increasing attention from aggressive advertising strategies, which are particularly present on social media. As a subsidiary of PDD Holdings Inc., which also operates the well-known platform <sup>41</sup>Pinduoduo (PDD Holdings), Temu quickly also established itself on the European market, including through its wide range of products, ranging from electronics to fashion and household goods.

The group criticises the group for aggressive pricing strategies consisting of rebates, special offers and promotions. The group relies on highly localised advertising and social media and influencer marketing and pursues ambitious growth plans in the European e-commerce market through these strategies.

##### 3.1.1 Documentation

**Documentation basis:** Screenshots of [the website https://www temu.com/](https://www temu.com/) of 7.5.2024 and October and

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(European Commission, 2024b)

July 2023. Please note that the website and app are regularly modified and that the examples should only be used with a reference to date.

Opening Temu's website is characterised by many different visual stimuli. Part of Temu works with countdowns (free mailing, which is limited in time) and special offers such as Black Friday (see Figure 1). It is advertised with high discounts, up to minus 90 %.

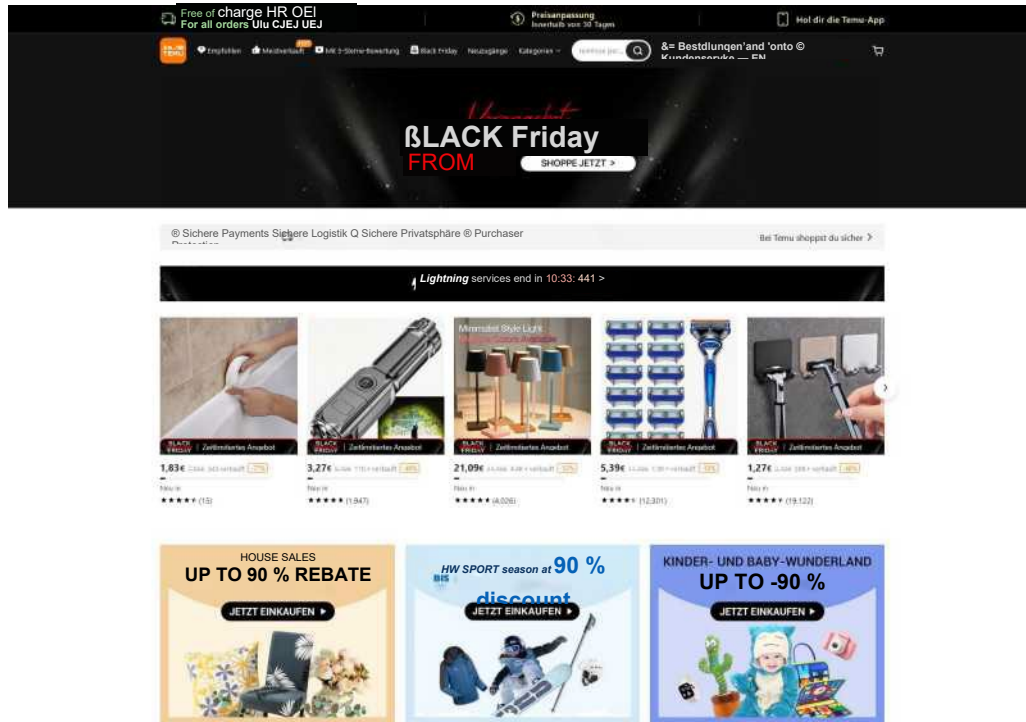


Chart 1: The homepage of Temu.com (screenshot, 30.10.2023).

In October 2023, the study documented some advertisements from Temu Austria, which advertised free products. Numerous free-of-charge products have been advertised on various social media platforms (only advertisements on Facebook and Instagram were documented in this study). As of June 2024, more than 42.000 advertisements from Temu Austria have been documented in the Meta Advertising Library.

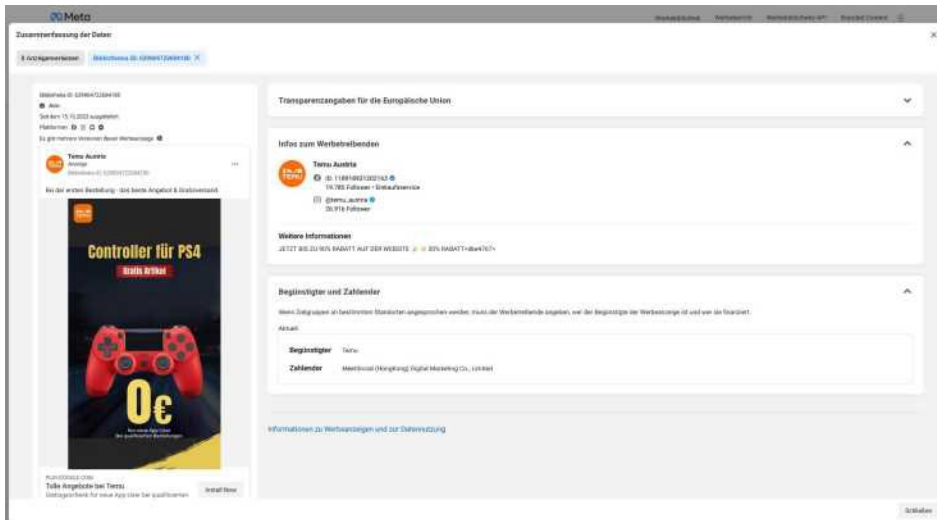


Chart 2. Advertisement for PS4 controllers, Temu Austria (Screenshot, 16.10.2023).

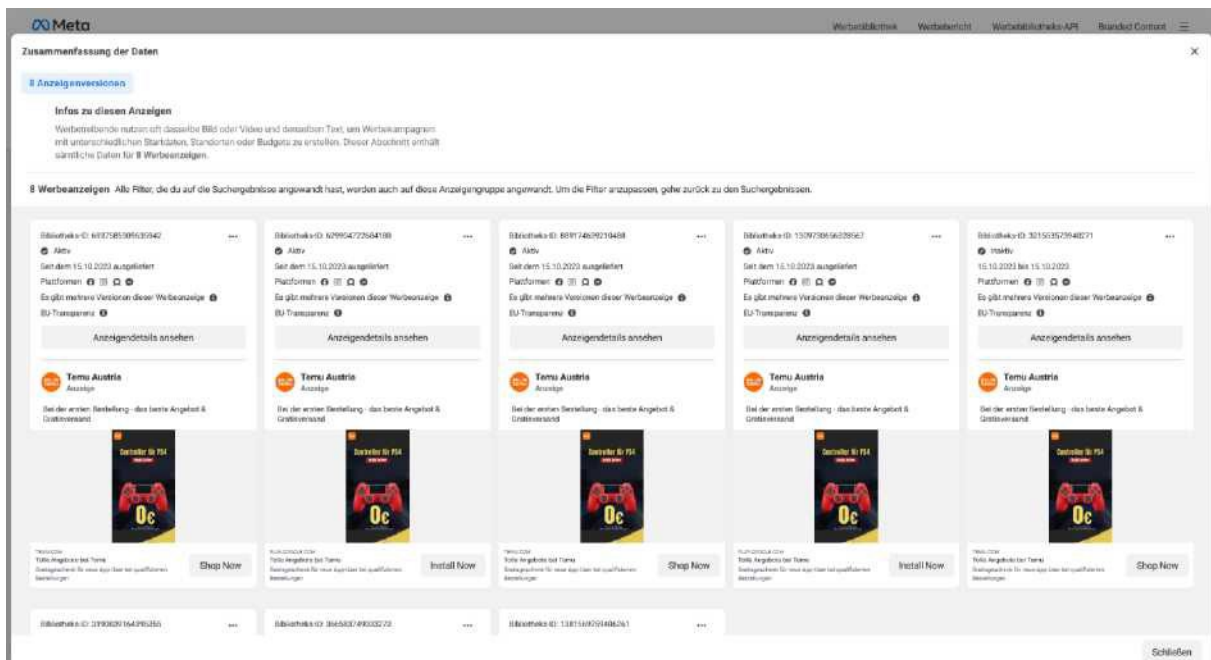


Figure3: Same promotional souvenir with slightly modified texts (Screenshot, 16.10.2023).

What was advertised as a free product in the advertisement turned out to be an advertisement for a prize game after Klick: On the target page, read “Toller discount, Temu offers you a special discount”. To access the special discount, one should scan a QR code leading to the download of the Temu app. Thus, when clicking on the ads, they were not redirected to the product and, even after downloading the app, landed users on a general homepage and the product of the advertisement could not be found.

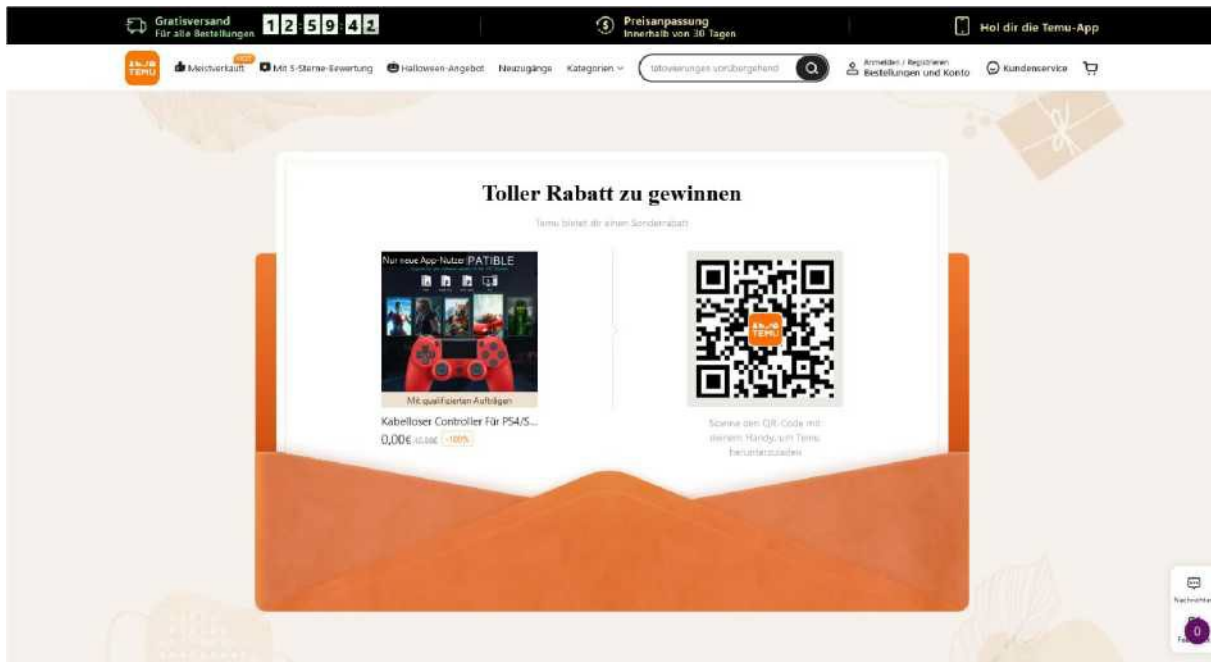


Chart 4: To win discount, Temu app (Screenshot, 16.10.2023).

Temu also uses numerous countdowns to encourage consumers to make quick purchases. In the case documented here, three countdowns are listed on one page, two refer to a temporary offer for free shipping, another to vouchers if ordered within the next 23 hours.

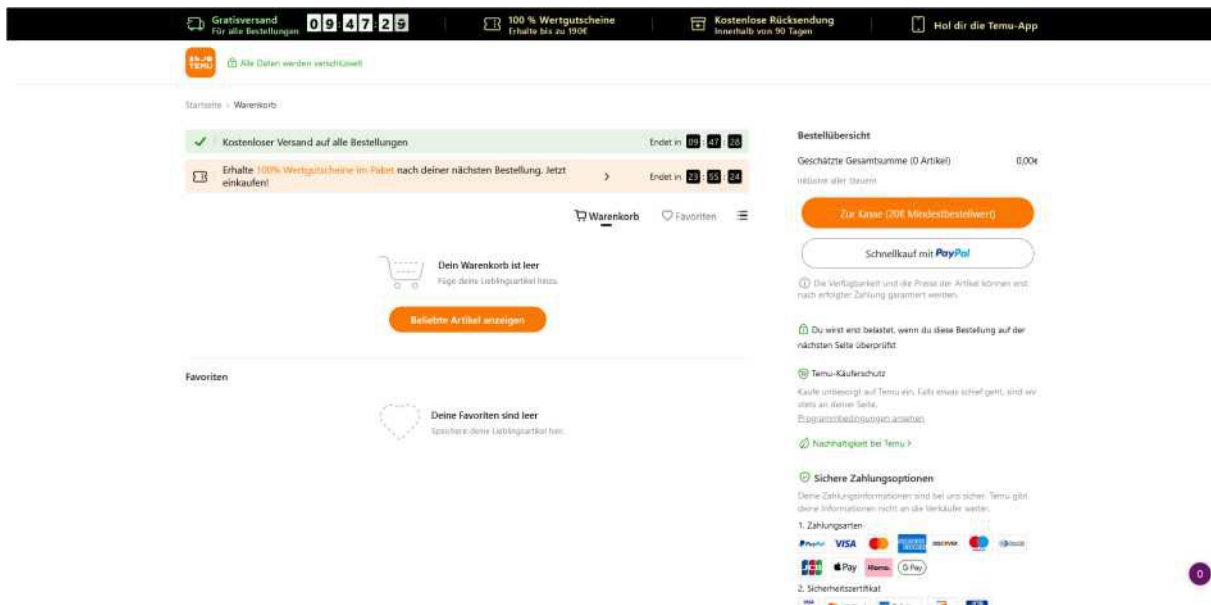


Chart 5: Countdowns on Temu (Screenshot, 9.11.2023).

Shortages are also displayed elsewhere on Temu’s website, including availability displays, which are also used in combination with countdown timers. The example below shows that the

‘Flashing displays’ are marked with a timer. It also indicates how many thousands of units of the product have already been sold.

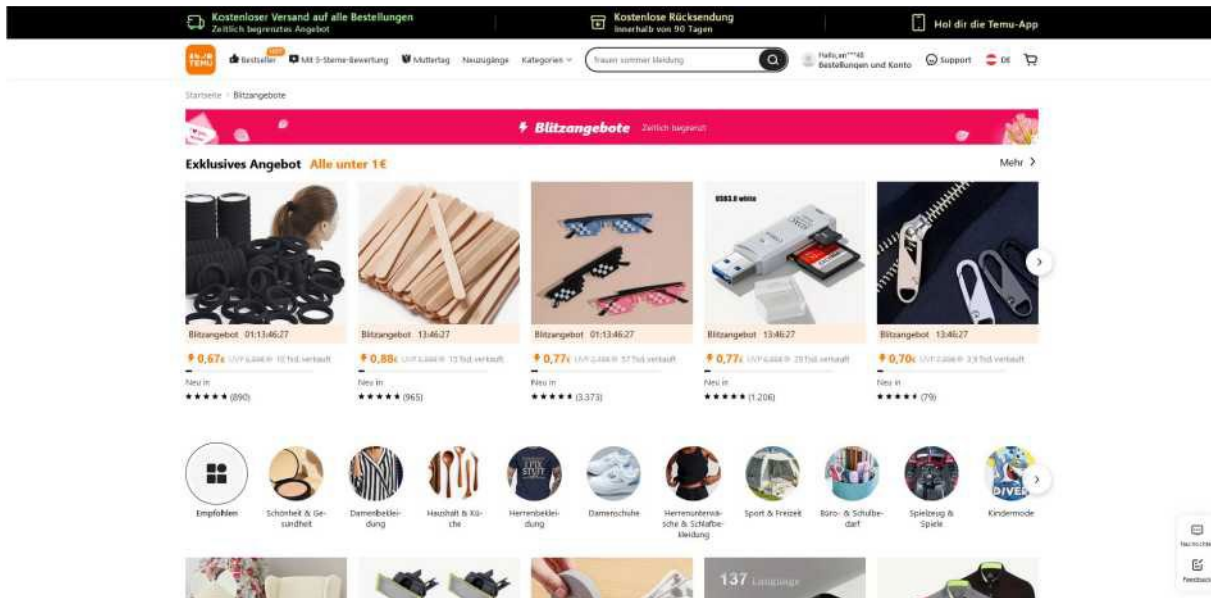
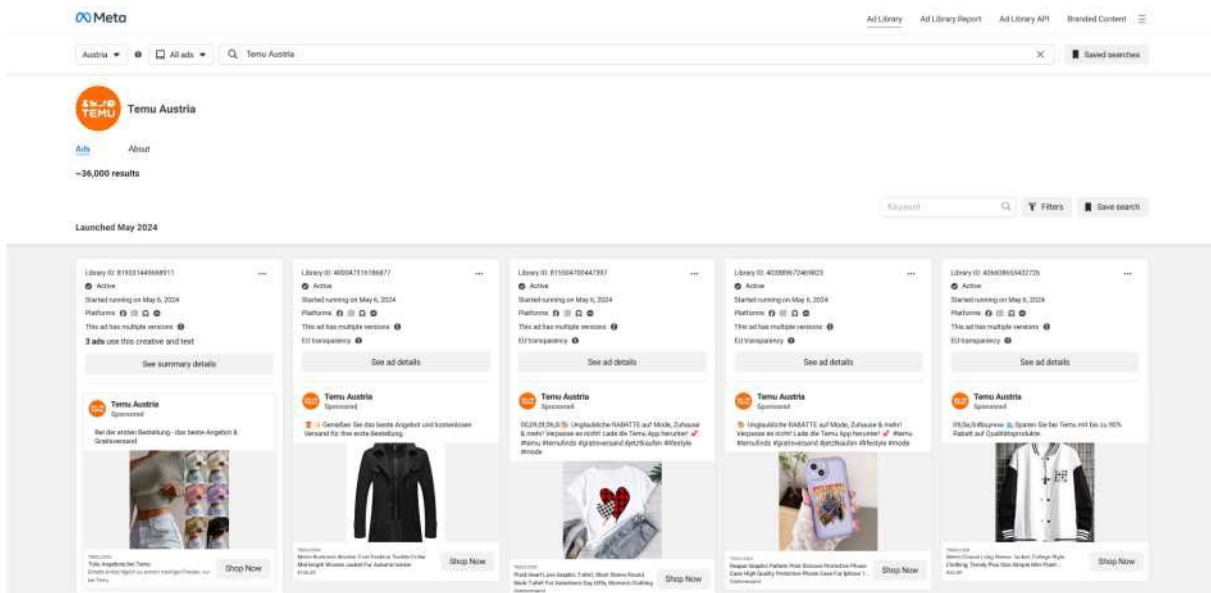


Chart 6: Countdowns and scarcity displays on Temu (Screenshot, 7.5.2024).

### Advertising

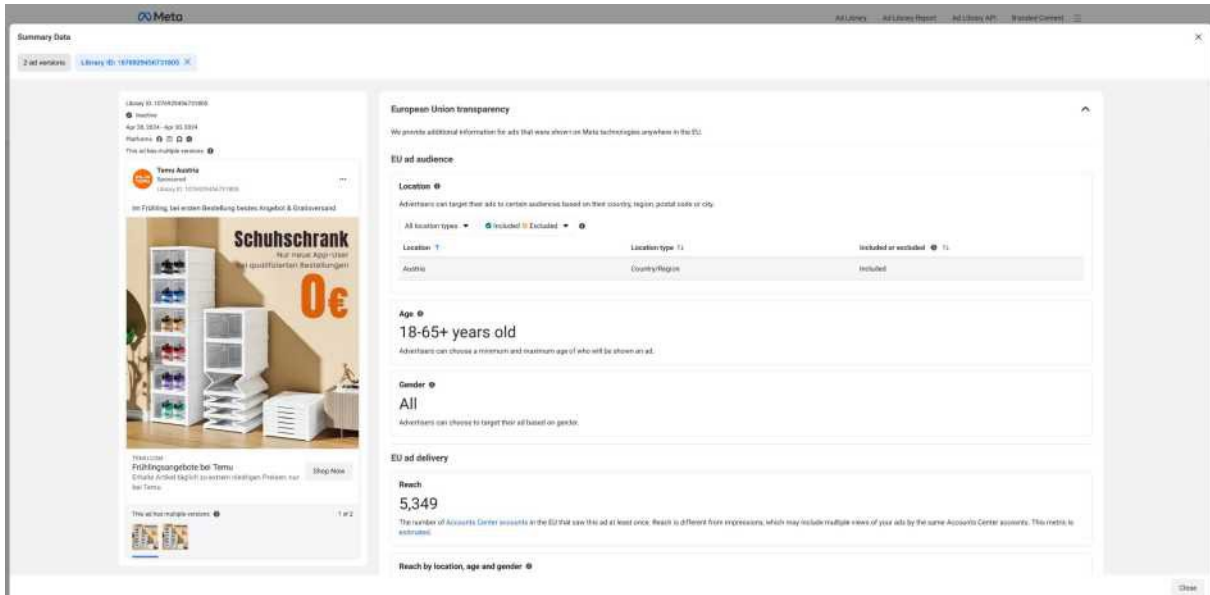
As of 7 May 2024, 36.000 results can be found in the Meta Advertising Library on Temu Austria – the official channel of Temu for Austria. As of June 2024, it is already over 42.000. This figure shows the company’s extensive online advertising strategy.



Graph 7: Meta Advertising Library, Temu Austria (Screenshot, 7.5.2024).

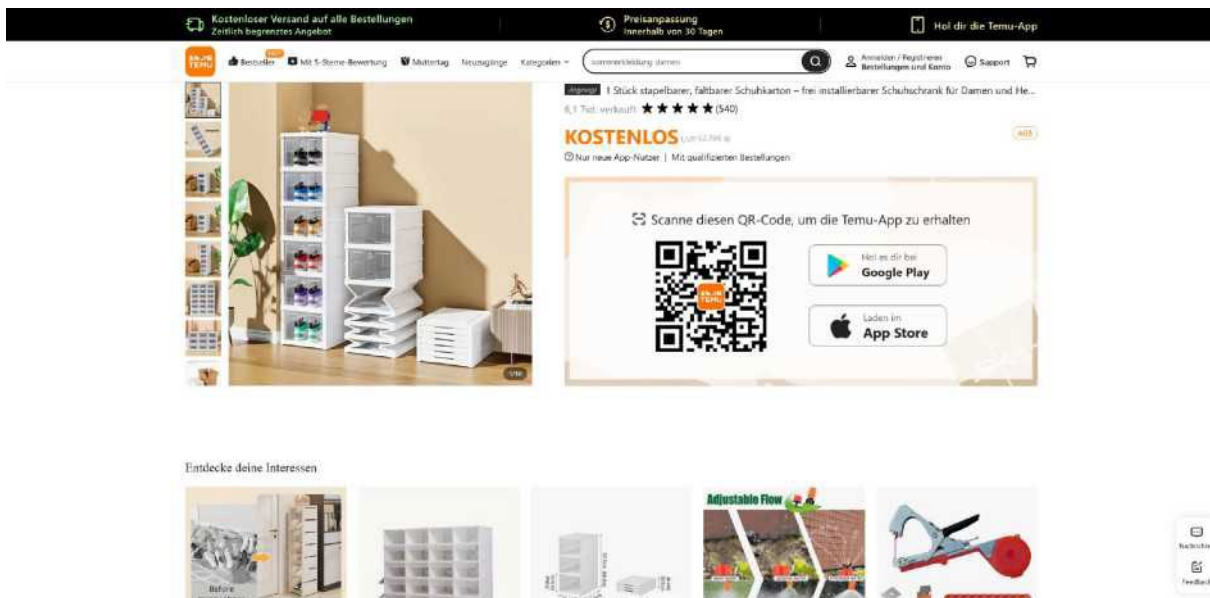
In some cases, ‘free’ products are advertised, as in this April 2024 advertisement. When registering as a Temu customer or downloading the Temu app, newcomers are promised numerous benefits, such as free products.

The promotional activities cover the entire European area, but only the advertising relevant to Austria was documented in the context of this study.



Graph 8: Temu advertisement, 'free product' (Screenshot, 7 May 2024).

When clicking on the ads that advertise free products or on Facebook, you will be redirected to a page inviting you to scan a QR code and download the Temu app. However, once the app has been downloaded, the allegedly free offer is no longer available or can no longer be found.



Graph 9: Temu Website (Screenshot, 7 May 2024).

This promotional activity was already noticed in July 2023, and in June 2024 there were still numerous advertisements that advertised free (EUR 0) products.

Temu promoted the download of the Temu app on Instagram and Facebook. The advertising documented here took the form of a wheel of luck, in which one could play a discount. In addition, Timer was used to highlight the limited availability of the offer. When testing the wheel of luck, you had to turn a few times to the maximum discount of -94 % (see Fig. 10-12).

Graph 12: Temu Instagram Advertising (Screenshot, 18 July 2023).



Graph 10: Temu Game, Advertising on Instagram (Screenshot, 18 July 2023).



Graph 11: Temu Game on Instagram (Screenshot, 18 July 2023).



Once the discount was received, a pop-up with the text 'Exclusive rebate – 94 %' was also displayed in the pop-up. As a user, only the 'received in the app' option had the only button that was available and highlighted in orange. If this was not the case, one would have had to close the whole page (X to the right of the white pop-up in the picture). These steps are documented in Figures 10-12.

This type of advertisement is highly reminiscent of gambling. An '100 % chance of winning' is advertised under the wheel of happiness. In any case, one can win, the question is only how much the discount you will enjoy. Scarcity is also used as a tactic, with 'How to try your last chance' in Figure 11, the advertisement pushes the user to act. As is clear from Figure 12, the

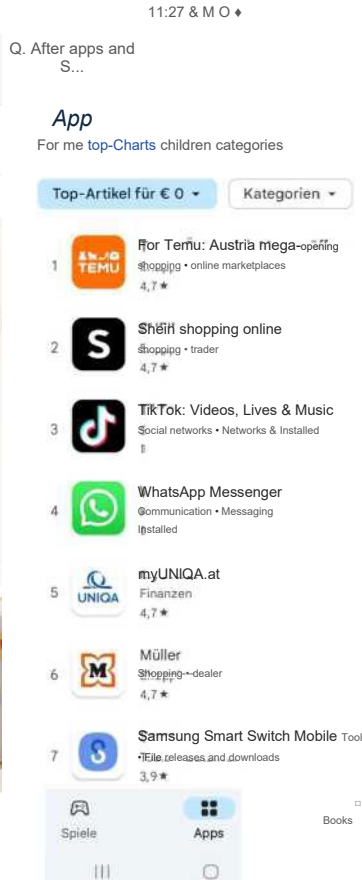


But only further action by the user, in which the application is downloaded.

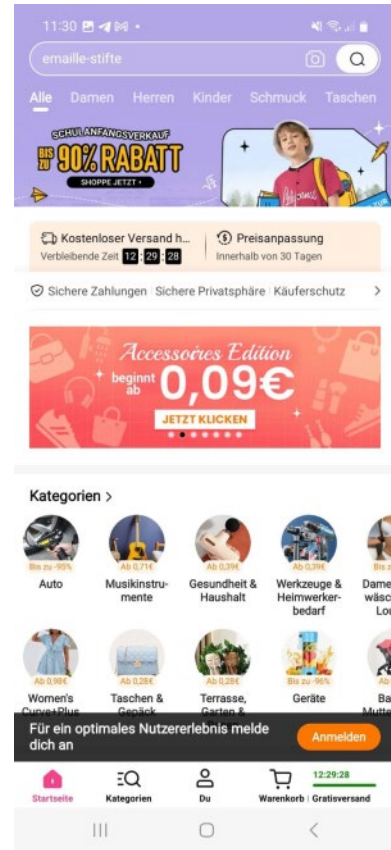


Graph 13: Temu mobile Website, 18 July 2023).

Temu mobile (screenshot;

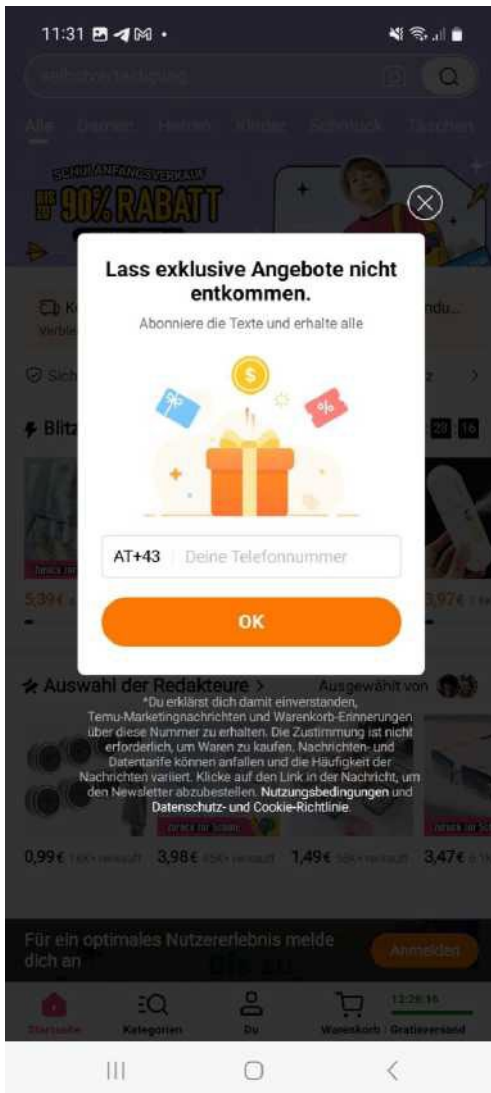


Graph 14: App Store Temu—(screenshot, 18 July 2023).



Graph 15: Temu App home page after download (Screenshot, 18 July 2023).

By clicking on ‘received in the app’, you were redirected to the mobile version of the Temu website (see Figure 13). Then, as a user, you had to click again on ‘received in the app’ in order to obtain the -94 % discount on the product (in this case, block storage boxes) (Fig. 13). In a further step, the app store was redirected to the app store and the Temu app had to be downloaded in order to obtain the discount (Fig. 14). If this happened, the offer and the offer at -94 % discount were no longer possible to find (Figure 15).



Graph 16: Pop-Ups in Temu app (Screenshot, 18 July 2023).

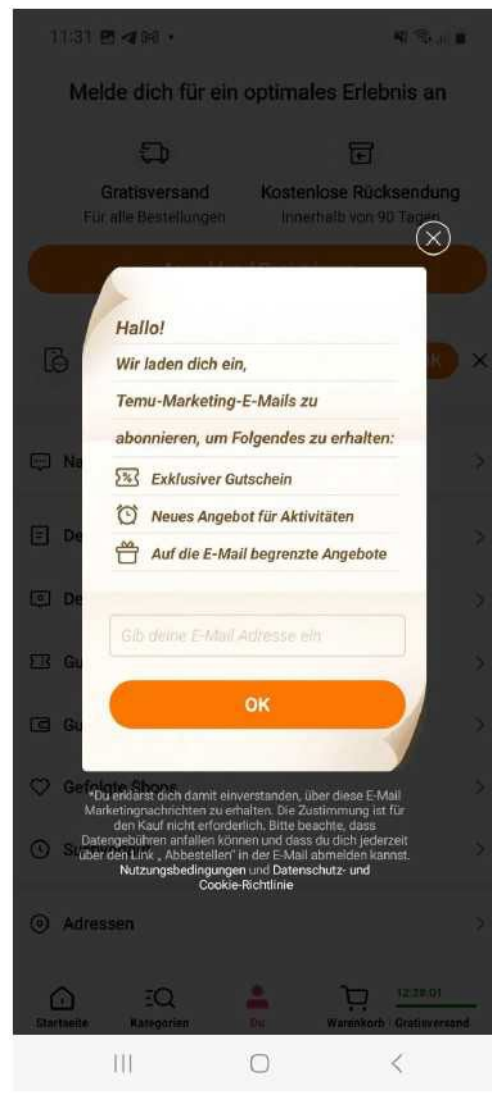


Figure 17: Pop-Ups in Temu app (Screenshot, 18 July 2023).

After downloading and installing the Temu app, numerous pop-ups were displayed to advertise other ‘exclusive offers’ when users divulge their data, such as the telephone number. In addition, the Temu Marketing emails were advertised in a dedicated pop-up: If users agree to Temu’s newsletter, they would receive exclusive vouchers, new and limited offers reserved only for newsletter subscribers.

### 3.1.2 Analysis

In summary, the analysis shows that Temu’s website, but also the group’s advertising strategy, uses aggressive marketing and a large number of dark patterns to encourage customers to buy.

Temu advertises on social media with allegedly free products. After clicking on the ad, it becomes clear that it is advertising for a lottery; to take part, however, consumers need to download the Temu app. This practice can be described as a **‘bait-and-switch’**, which promotes an attractive offer that does not actually exist. This leads to disappointing expectations, as the products advertised as free of charge are not really available or easily findable.

An invitation to purchase a product at a certain price and the subsequent refusal to show the advertised product to the consumer or to accept orders for it, with the intention of selling another

product instead ('bait and switch'), is considered a misleading commercial practice in accordance with point 6 of Annex I to the UCPD. Although there is no direct intention to sell another product, consumers are encouraged to take part in a lottery which is intended to encourage them to purchase other products on the platform. The question therefore remains whether such a practice falls within the scope of that legislation. If the dark pattern used does not fall within the scope of the UCPD, it could be considered inadmissible under Article 25 DSA.

After clicking on an ad, consumers are asked to download the Temu app to obtain alleged discounts or free products. However, these offers are often impossible to find after installation. This strategy falls under **Forced Action**, as consumers are forced to do an unwanted action (download of the app) in order to be able to perceive the advertised offer. In addition, advertising for free products is a **Disguised Ad**, i.e. a hidden advertisement for downloading the Temu app. Temu also uses numerous countdown timers and scarcity indicators to create the impression of **urgency** and limited availability (**fake Urgency, Fake Scarcity**). These elements are present on different pages of the website and suggest that offers are only available for a short period of time. These dark patterns exploit the psychological phenomenon of loss aversion in which consumers make a quick purchase decision for fear of missing an offer. This is problematic if the actual availability of the offers is not available, which can hardly be judged without looking behind the scenes.

The incorrect claim that the product will only be available for a very limited period of time or for a very limited period of time under certain conditions to induce consumers to make an immediate decision, so that they have neither the time nor the possibility to make an informed decision, is considered a misleading commercial practice under point 7 of Annex I to the UCPD. The use of design features, such as false countdowns or false statements about the limited availability of the product, could therefore constitute a misleading commercial practice within the meaning of point 7 of Annex I to the UCPD. Again, if the dark pattern used does not fall within the scope of the UCPD, it could be prohibited under Article 25 DSA.

Hidden costs and confusing prices are also used: Advertisements advertise products that can no longer be found after the app has been installed. For example, even after clicking on 'free' offers, consumers are encouraged to perceive and purchase the many low-cost offers on Temu. However, the promise of free products is not met. This type of advertising can be classified as '**Hidden Costs**' and '**Sneak into basket**', where additional costs or conditions are only disclosed in the course of the purchase process. According to point 20 of Annex I to the UCPD, a commercial practice is considered to be misleading when a product is described as 'free', 'free', 'free' or similar, even though the consumer has to bear costs other than those unavoidable in responding to the commercial practice and collecting or delivering the good.

After downloading the Temu app, consumers face numerous pop-ups asking them to share their personal data and sign up for the newsletter in order to obtain further exclusive offers (obstruction, **Visual Interference, Nagging, Forced Action**). For example, consumers are repeatedly pushed to act that they may not have intended. For this commercial practice, the question arises as to which regulation is to be applied. Consent to receive newsletters in order to receive exclusive offers could raise the question of whether this is covered by the GDPR ban on tying. However, this question is primarily concerned with the lawfulness of processing in relation to individual natural persons. The question is therefore whether the mere implementation of that design may also be declared inadmissible within the meaning of the GDPR. In the event that the GDPR is not applicable in that regard, that dark pattern may be prohibited under Article 25 of the DSA.

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In various advertisements (Fig..10-12.), Temu also relies on elements known from online gambling. It uses **gamification** mechanisms to keep users interacting with the advertising element. The tendency to use casino or gambling elements is becoming increasingly visible in other areas of the digital world, such as online gaming, which primarily targets children and adolescents. Elements such as these attract and have an increased impact on vulnerable target groups in particular. If these offers are then combined with **'bait and switch'** or **'lockbird tactics'**, potentially vulnerable target groups will be encouraged to download apps and spend money that would otherwise not have been spent.

The question is whether the use of gambling elements can be classified as an aggressive commercial practice. A commercial practice is regarded as aggressive if, in the specific case, taking into account all the factual circumstances, it significantly impairs or is likely to significantly impair the average consumer's freedom of choice or conduct with regard to the product by harassment, coercion, including the use of physical force, or by undue influence, and is thereby actually or is likely to cause the average consumer to take a transactional decision that he would not have taken otherwise (Article 8 of the UCPD). The question is whether the use of gambling elements can be classified as an aggressive commercial practice. In this context, only the **'unlawful influence'** scenario can be considered: In that case, if the UCPD does not apply, the dark pattern used could be classified as inadmissible under Article 25 DSA.

### 3.2 Case Study “SHEIN”

Shein is caused by the extensive and additive use of dark patterns. These are constantly changing – the group adapts its online offers not only to seasons, but also to new rules. In the course of the documentation, some presentations have changed fundamentally and these changes are subsequently listed and discussed. There are still many dark patterns on SHEIN, in particular the excessive use of pop-ups, discounts and gamification elements, which specifically concern SHEIN’s loyalty and VIP programmes.

#### 3.2.1 Documentation

**Documentation basis:** Screenshots of the website <https://de.SHEIN.com/> of 18 and 11 June 2024 and October, respectively November 2022 and 2023. Please note that the website and app are regularly modified and that the examples should only be used with a reference to date. When retrieving the German-language website of SHEIN ([de.SHEIN.com](https://de.SHEIN.com/)), a pop-up will appear to draw attention to discount campaigns, as well as when the app is registered or downloaded.



Figure 18: SHEIN.com website (screenshot, 18.10.2022).

The comparison of a screenshot of the SHEIN.com/de Website in October 2022 and June 2024 shows: Both sides are overloaded with information, images and various pop-ups. While registration was still advertised on the page in October 2022, it is the download of the SHEIN app in June 2024, which is advertised with various benefits such as free dispatch and return.

In both cases (Fig. 18 and Figure 19), it is not easy to see how the pop-up window can be removed. There is only one button with the inscription “JETZT SHALL” underneath a small box “accepts” which also refers to the cookies used – there is no equally visible opt-out option for consumers.

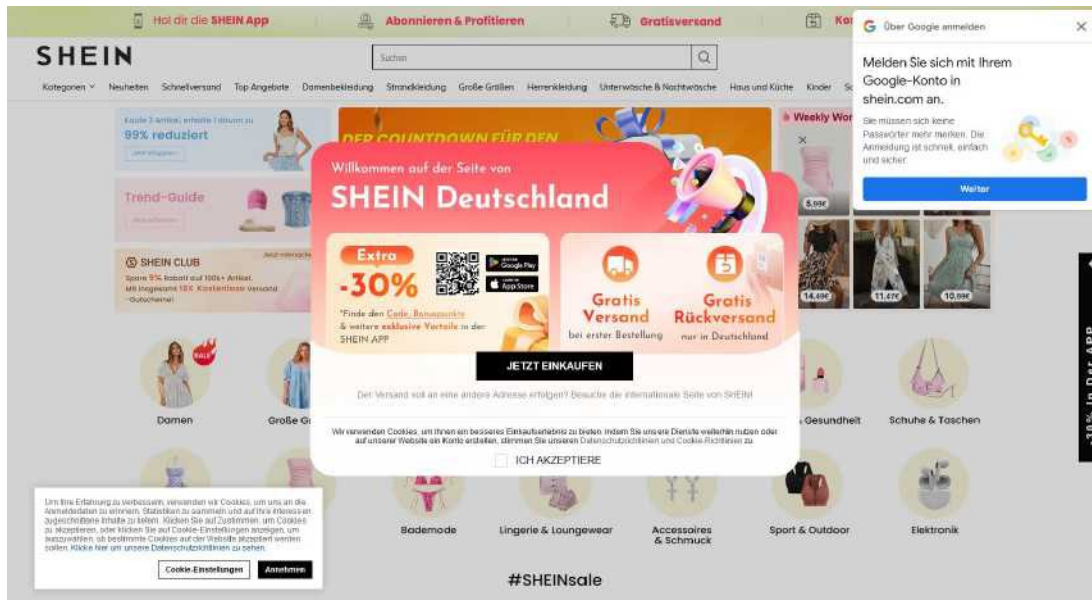


Figure 19: SHEIN.com website with pop-up to app (Screenshot, 11/06/2024).

After clicking on the “YOUTH SHALL” button, there will be another pop-up window entitled “Special offers for you only”. It advertises a 30 % discount, which is available with a 15-hour countdown. In addition, if they buy more than EUR 19 (20 % discount), more than EUR 59 (25 % discount) or more than EUR 119 (30 % discount) – this is also subject to a time limit, “takes into 1 day(s)”. At the bottom of the pop-up, there is only one black button with the inscription ‘Sammeln Alle’ – an animated white hand displays on this button to highlight the desired action of the click. This pop-up could be clicked away, via a small X icon on the right of the pop-up, which is visually very unobtrusive and therefore hardly visible.

By clicking on the button “Sammeln Alle”, another pop-up will appear for registration with SHEIN CLUB. You can register with the email address or via Google account or Facebook account. The previously displayed rebates and coupons can only be used upon registration or registration.

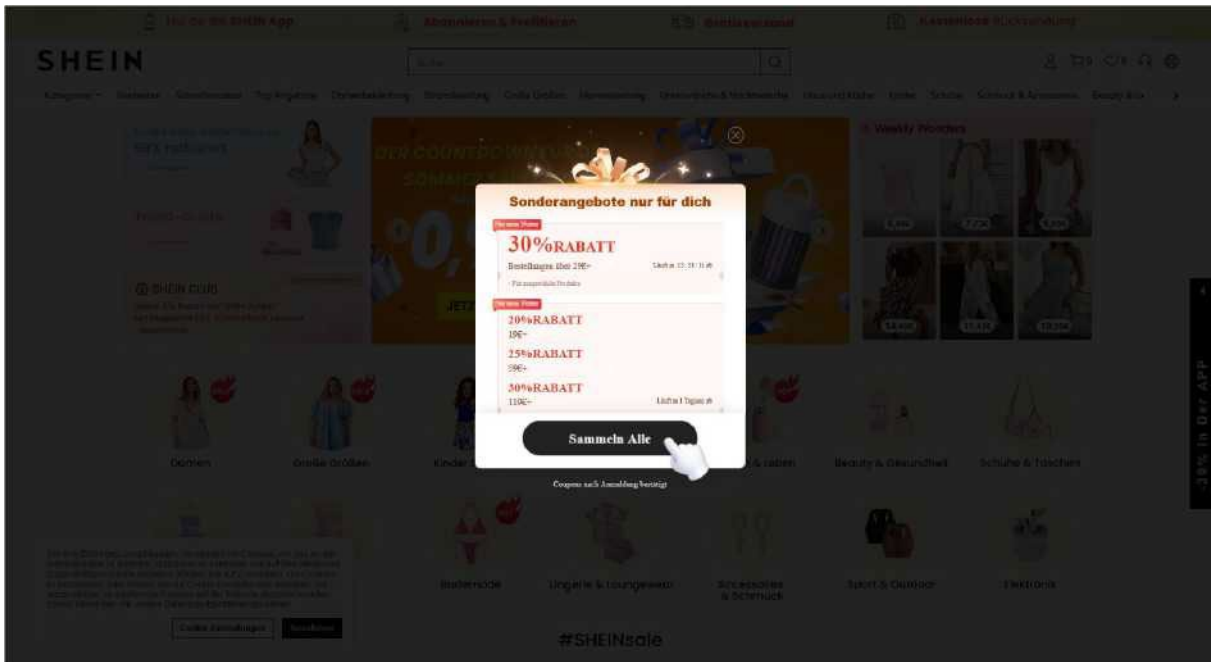


Figure 20: Pop-up ‘Special offers for you only’ (Screenshot, 11 June 2024).

For Shein documentation in 2022, the reception of the newsletter is pre-selected when registering with SHEIN, and this is no longer the case in 2024 (see Figure 18 vs. Figure 19). The registration took place in 2022 in one step and in 2024 the registration was split into two steps (pop-up).

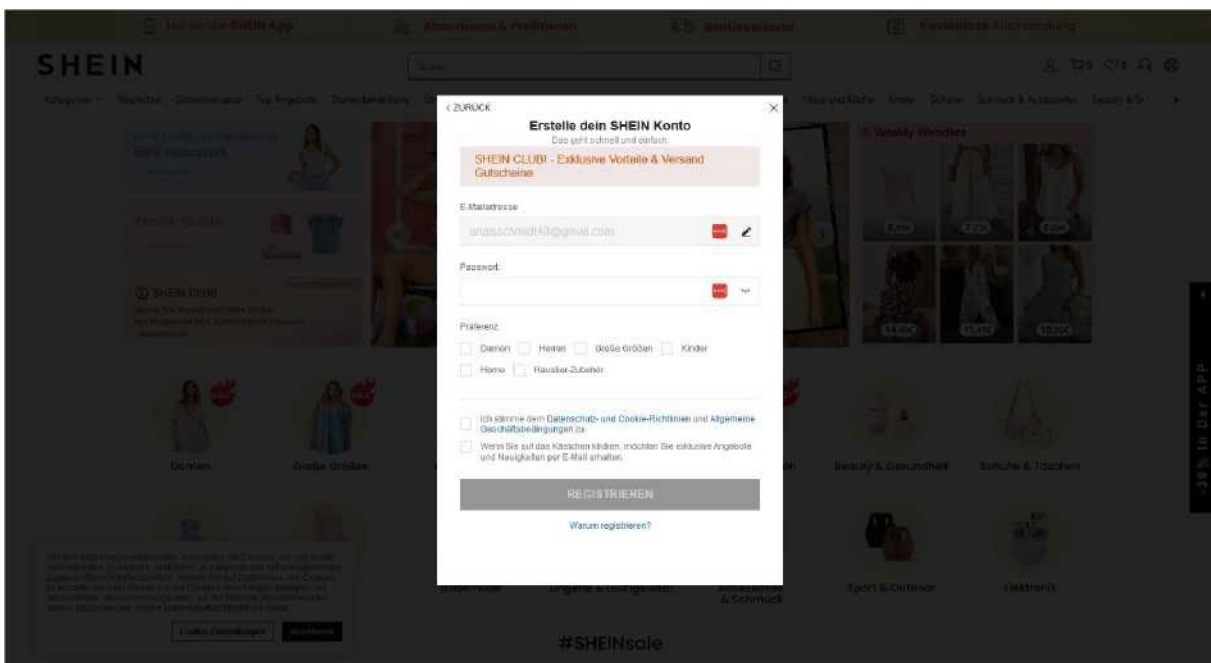


Figure 21: Pop-Up for registration with SHEIN (Screenshot, 11.6.2024).

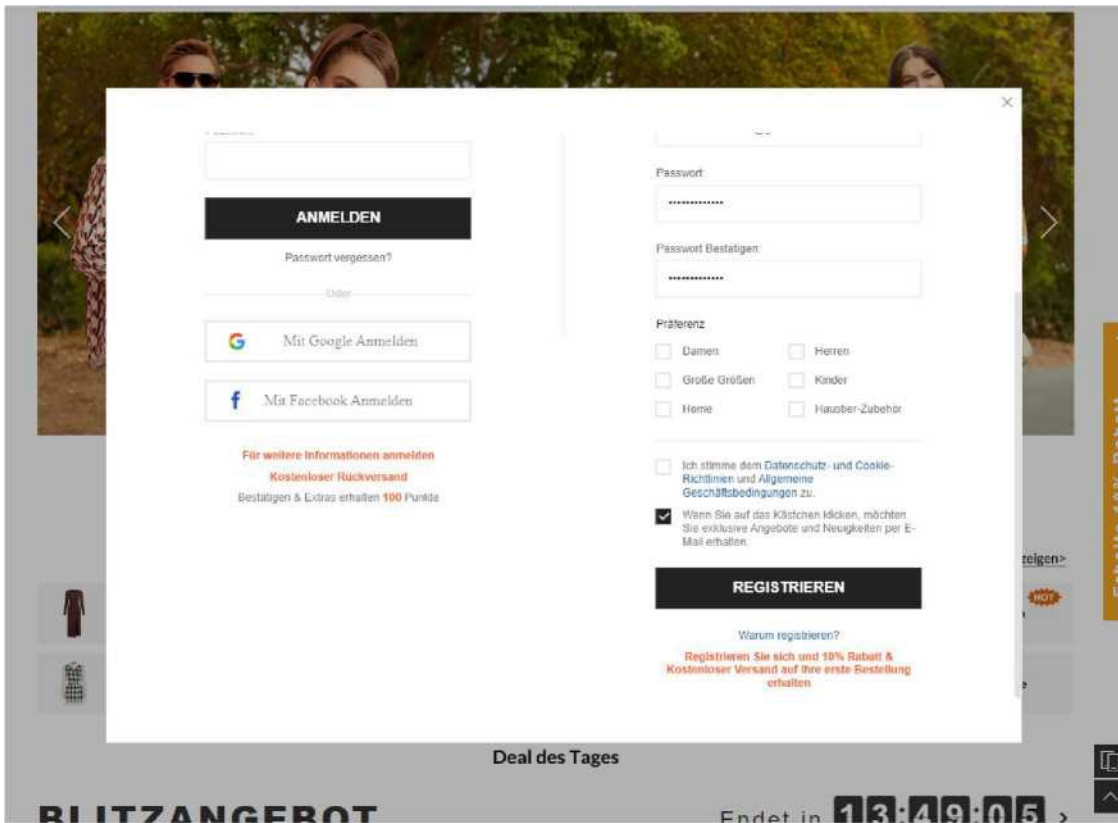


Figure 22: Pop-Up for registration with SHEIN (Screenshot, 18.10.2022).

It promotes discounts and benefits for registration with SHEIN. The SHEIN website also promotes numerous pop-ups for benefits and special offers. The visual design of the page adapts to seasons, seasons, cultural events, but also in its graph. At all times, there is #SHEINsale, i.e. certain products are always subsidised.

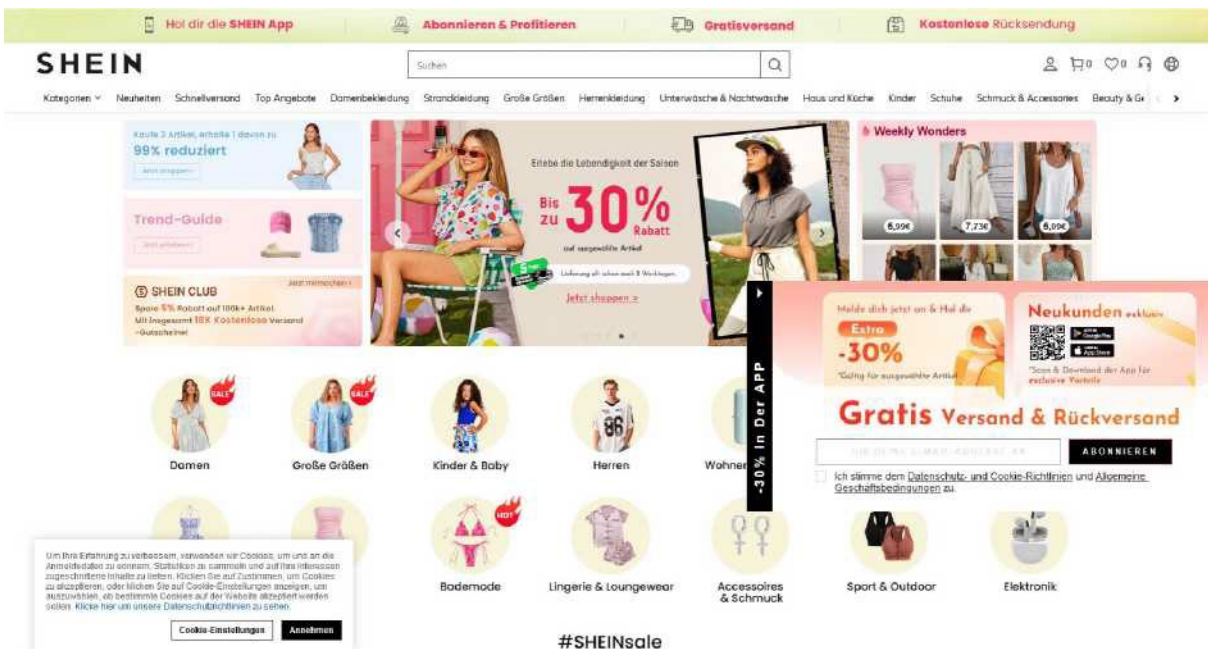


Figure 23: Homepage of de.SHEIN.com (screenshot, 11 June 2024).



In mid-June 2024, SHEIN advertised ‘Experienced the liveliness of the season. Up to 30 % rebate’. A number of products were fitted with a flameful ‘SALE’ icon. Under the term ‘Weekly

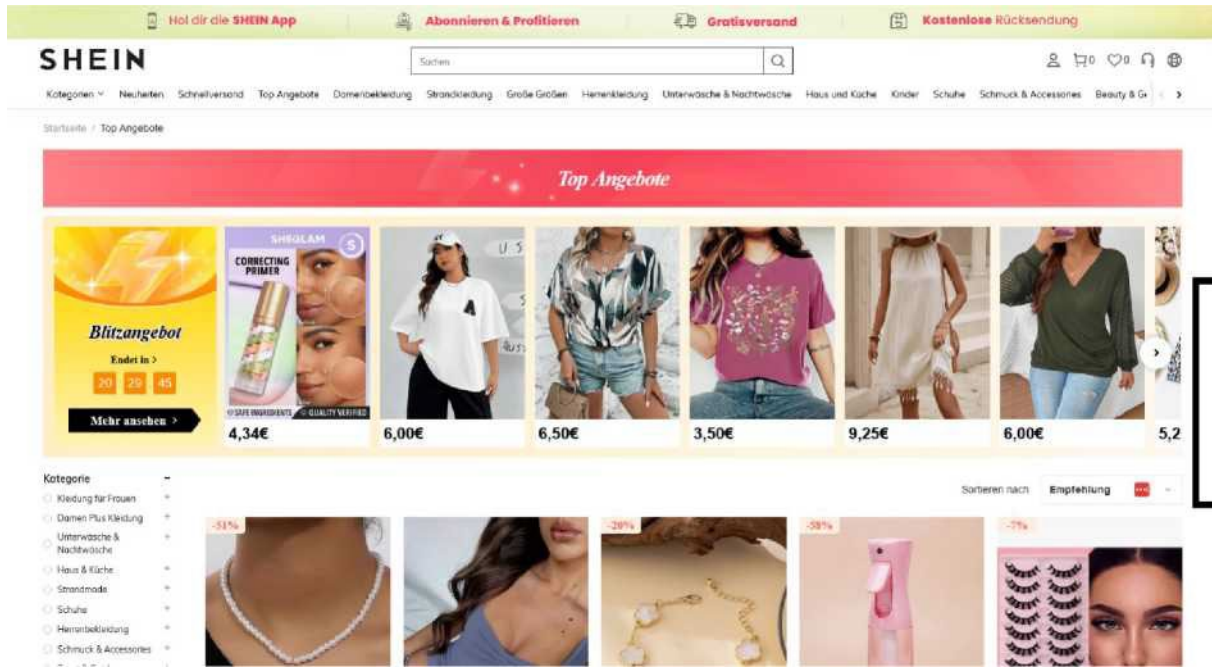


Figure 24: Overview of SHEIN lightning offers (screenshot, 11 June 2024).

Wonders’, some products are offered at a particularly low price. Shein also uses numerous

The lightning offers are advertised more intensively, with a time limit. By clicking on ‘View more’, elements will be added to underline the urgency of the tender: The countdown is further displayed, in addition the discount is displayed for each product (yellow icon with flash and percentage of discount) and how much of the product has already been sold.

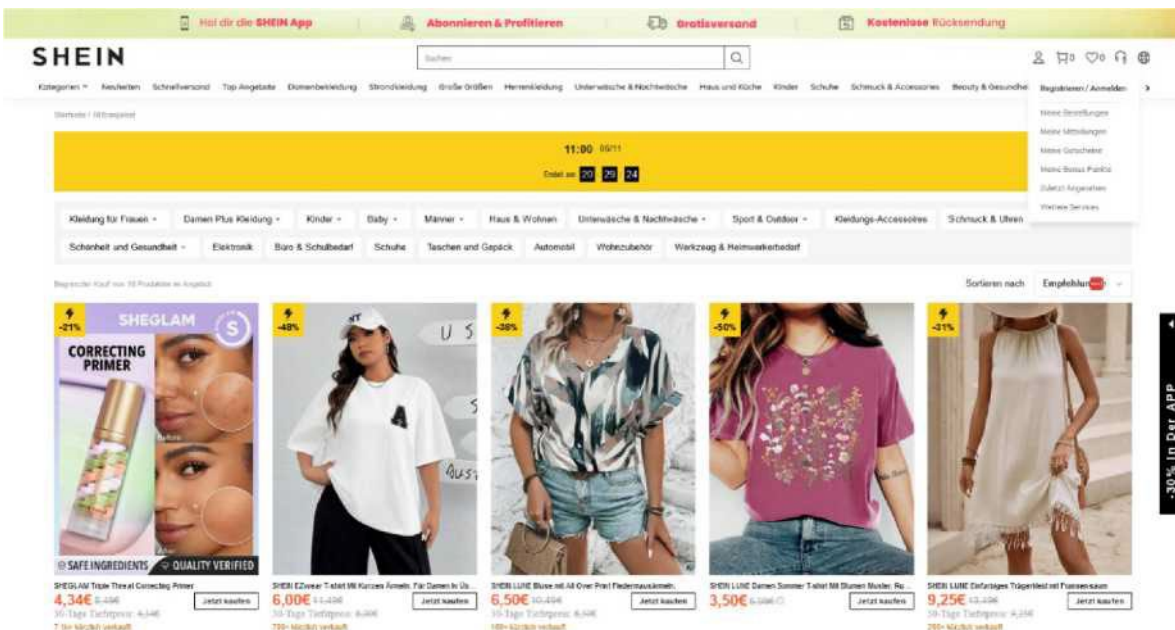


Figure 25: SHEIN's flash offers (screenshot, 11 June 2024).

Shein also advertises members with specific benefits for the SHEIN Club: There are sub-groups here. The SHEIN community is divided into the SHEIN Club, SHEIN Saver, and SHEIN VIP. These clubs, with the exception of SHEIN VIP, are subscription models where discounts and benefits are linked to membership fees.

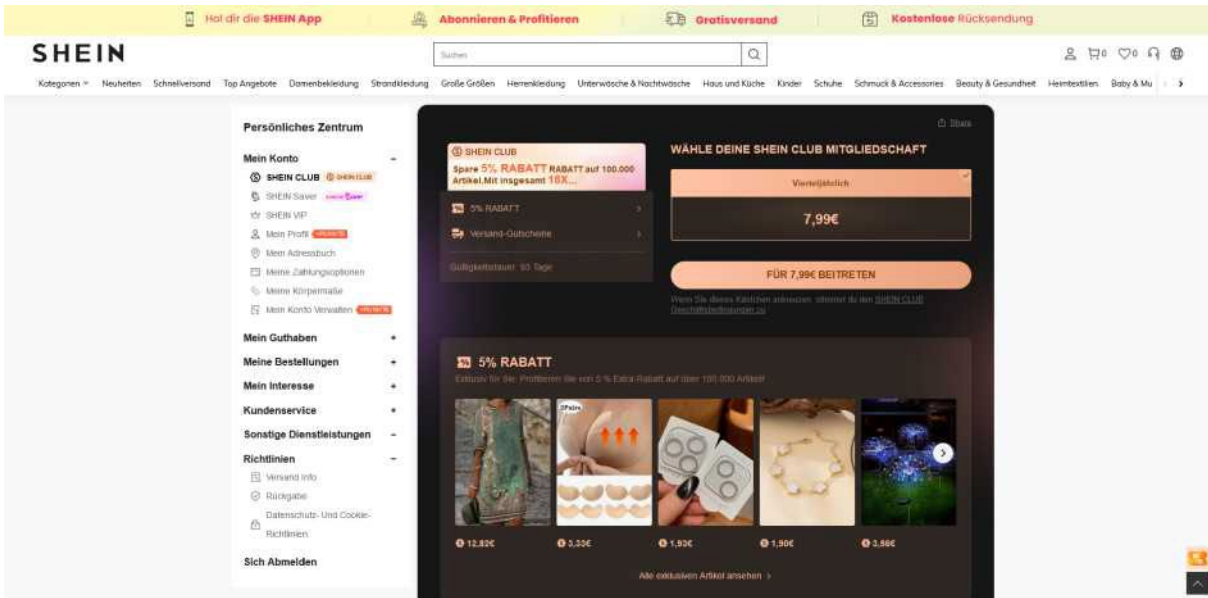


Figure 26: Page of SHEIN CLUB (screenshot, 18 June 2024).

Membership of SHEIN CLUB costs EUR 7.99 quarterly, i.e. EUR 31.96 per year. You can join the SHEIN Saver Club for EUR 7.90. Only the SHEIN VIP Club is free of charge, this is a reward system, the more SHEIN buys from SHEIN, the more benefits are given to SHEIN VIP members.

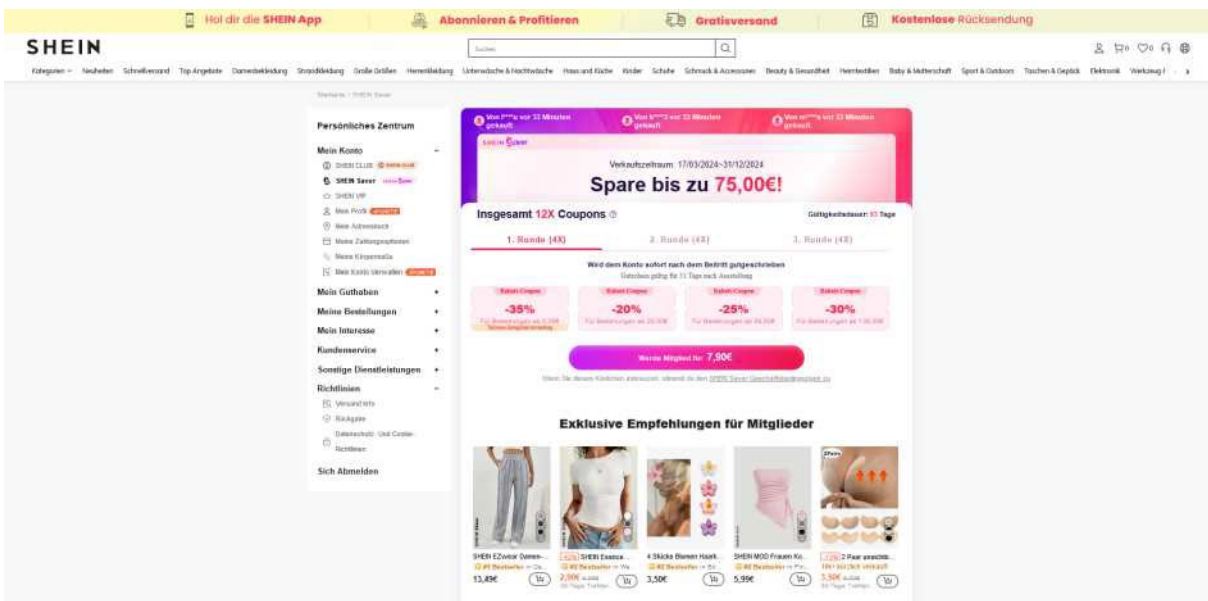


Figure 27: SHEIN Saver Club page (screenshot, 18 June 2024).

### 3.2.2 Analysis

The SHEIN website is an example of the use of dark patterns, but also some difficulties in defining boundaries. Numerous pop-up windows or hard-to-remote pop-up windows, many countdown times and time limits to push consumers to make quick decisions, social proof ads,

difficult opt-out options and subscription models, some of which are advertised using gamification, have been documented.

Each time the website is viewed, a pop-up window draws attention to discount actions linked to the registration or download of the app. There is only one clearly recognisable button with the inscription “JETZT SHALL” while the option to close the pop-up is hardly visible. This strategy uses the dark pattern called **Forced Action**: Users are urged to carry out an action (in this case, click on the button) without rejecting the action (**forcedaction, deliberate Misdirection**). Making certain choices more difficult or time-consuming than others constitutes a dark pattern within the meaning of recital 67 DSA. Therefore, the use of this dark pattern could be prohibited under Article 25 DSA.

The numerous discounts and special offers on SHEIN are often accompanied by countdown timers suggesting **urgency** in time (**fake Urgency**). For example, a 30 % discount is only offered for 15 hours. The suggested urgency is a fundamental principle of SHEIN – as an example of the pop-up with discount offers at the first call on the page, we found that countdowns were timed until midnight, but not with a daily discount but an indication of hours (15 hours, 17 hours, 6 hours). No differences were found in countdowns when cookies were deleted or other users launched the website (**Visual Interference, Urgency**).

In other words: Once a countdown has expired, a new countdown will be launched, so consumers will be under constant resale stress as soon as they buy on the SHEIN website. This form of use of countdown time takes advantage of the psychological tendency of loss-aversion – consumers are not aware of the actual availability of these services, or may not know that the same urgency is suggested every day by apparently limited offers. The use of a false countdown could constitute a misleading commercial practice within the meaning of point 7 of Annex I to the UCPD. This dark pattern may also be prohibited under Article 25 DSA if the UCPD is not applicable in this respect.

The same is true of the Social Proof advertisements. Shein indicates how much of a product has already been sold – instead of using percentages as in 2022, absolute product sales figures are given in 2024. To highlight offers, it will show how many products have already been sold (**fake Social Proof, Fake Scarcity**). However, this figure cannot be classified by the consumer without any context. Even assuming that these figures are correct, it remains unclear to what period and what stocks they relate to (Austria, German-speaking region, Europe, worldwide?).

The use of visual incentives, such as flamey ‘SALE’ icons and flashing icons, underlines that products are highly popular and scarcely available – again, it is unclear whether this is the case or is only used as dark patterns to get a quick purchase.

The pop-up windows displayed when viewing the page do not provide an easily recognisable opt-out option for consumers and the closing of the windows is intentionally made more difficult (**forcedaction, deliberate Misdirection, Nagging, obstruction**). This can lead to involuntary consent from users and may breach the GDPR, which requires clear and easily accessible opt-out options. Such a lack of transparency and freedom of choice could be legally problematic.

The SHEIN community’s reward **programmes use gamification elements** to bind users. Various club models offer discounts on membership fees, while the SHEIN VIP Club is a reward system based on the volume of purchases. Gamification can motivate users to make repeated purchases to obtain rewards. The associated subscription models (SHEIN CLUB) could act as disguised cost traps, especially if the information on the costs and conditions of membership is not presented in a clear and transparent manner (**Hidden Costs, Hidden Subscription**).

## 4 flight bookings & dark patterns

Those who do not want to make a journey themselves can use booking portals – from the flight, accommodation, car rental, travel insurance to activities, everything can be booked on a train. Not only booking portals, but also many airlines themselves no longer sell only air tickets, but also offer Kombi offers for which they rely on different other providers. These digital changes are accompanied by a heightened competitive situation between suppliers, characterised, among other things, by the emergence of low-cost airlines, from booking portals to comparison platforms to monitor prices.

In response to these changes in market conditions, the numerous regulatory efforts of the European Union, for example, in which numerous information requirements have been adopted to better protect consumers, can be understood. (e.g. package travel regulation) Some competition law decisions (see Booking.com cases) have also positively influenced the field (including price and offer design). In addition, it is now possible to report dark patterns in this field via the DSA.

The analysis of complaints in the area of travel bookings at the Internet Ombudsperson shows that they do not arrive under the term ‘dark patterns’. The problems consumers face with digitally booked travel (or travel components) include unexpected costs, disappointing expectations of booked services, problems with flight shifts or cancellations. However, some of these are the consequences of practices that can be classified as dark patterns, as will be explained in more detail below.

The dark patterns documented here range from the visual prominence of an option in terms of ‘visual interference’, to exploitation of cognitive weaknesses in budgeting (‘exploiting vulnerabilities in budgeting’ and ‘comparison prevention’), to pushing consumers to a certain choice through ‘nagging’, visually preventing the continuation of the booking process through pop-ups and other disruptive elements (‘obstruction’), non-comparability, and forced continuation of ‘forced action’.

When booking seats, low-cost airlines, in particular, try to charge for extras. The analysis documented a large number of dark patterns aimed at guiding customer decision-making, including repeated searches in the booking process, ‘nagging’, ‘preselection’, ‘confirmshaming’, ‘obstruction’, ‘trickwording’, ‘comparison prevention’ and ‘hard to Cancel’.

In all the cases examined, there is an additional possibility to pay for a seat reservation at the choice, but there are large differences in the wording and presentation of the offer. In principle, it can be assumed that consumers assume that the booking of a flight includes a seat – in contrast, for example, the booking of a train ticket. However, this certainty is called into question to varying degrees by types of ‘trickwording’ & ‘confirmshaming’. Wording used for the additional service of a paid choice of seating: ‘Reserved seating’ (Ryan Air), ‘Seating reservation’ (Austrian Airlines), ‘Seating Selection’ (Wizz), ‘Select your seats’ (Opodo).

It should be noted that booking a flight without additional service is a hurdle. If consumers are practised and routined, this hurdle to avoid additional costs is easier, and it is questionable how overwhelmed booking processes are remote from technology or vulnerable consumers.

### 4.1 Case Study “Ryan Air”

#### 4.1.1 Documentation

**Documentation basis:** Screenshots of the booking process of 17 April 2024 and October, and September 2023 respectively. Please note that the booking process is regularly changed and that the examples should only be used with reference to date.

The first step in Ryanair’s booking process is the selection of outward and return flights, which are individually priced – at that time there is no information on what is included in this price. In the second step, four packages are presented – the fare displayed in step one is from the ‘Basic’ category – the cheapest option. Three other tariffs are listed – ‘Regular’, ‘Plus’ and ‘Flexi Plus’.

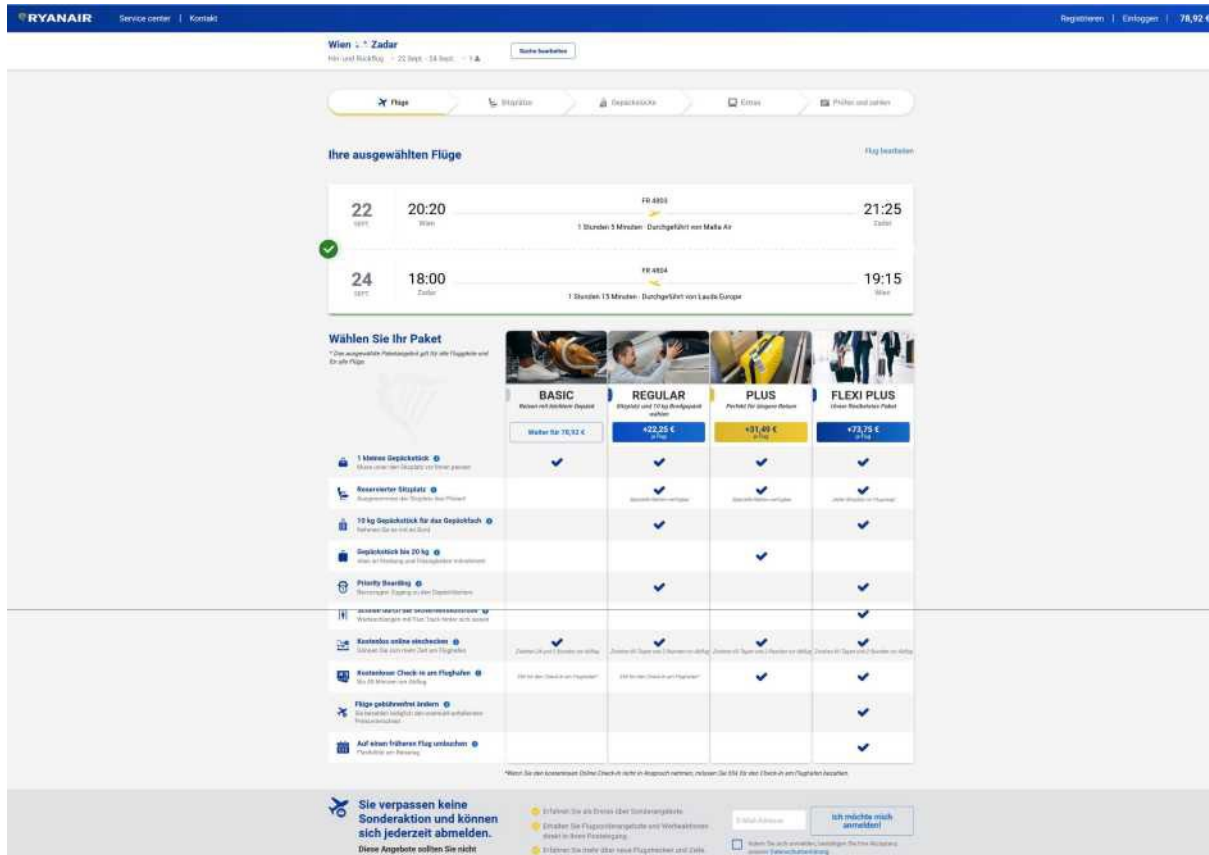


Figure 28: Ryanair tariffs (screenshot, 17 April 2024).

The options are presented in a tabular format. It is striking in **visual design** that, although there is no pre-selection, the previously chosen fare from step 1 is partly exaggerated. Of the three other tariffs, the plus tariff is highlighted in yellow, while the ‘Regular’ and ‘Flexi Plus’ tariffs are in blue. In **the Wording**, the line ‘reserved seating’, which is not ticked for the basic tariff, is marked.



Figure 29: Ryanair Air: Price presentation of tariffs (screenshot, 17 April 2024)

When presenting **prices**, it is striking that only the cheapest fare shows the total sum, and the other fares are quantified only in terms of their mark-up per flight. It follows that the cheapest tariff (Basic) is the highest (EUR 78.92). For the other three fares, mention is made of the surcharge per flight, which is added to the basic fare – no total can be seen.

Choice of fare

If the basic tariff is selected, a pop-up window will appear with the title “The Regular Tariff is ideal for your journey”. In the pop-up window, there is a table comparing the tariffs ‘Basic’ and ‘Regular’. It is important to note that: Only if

the ‘Basic’ tariff is selected, there is such a pop-up, and the choice for any other option directs the user to the next booking step.

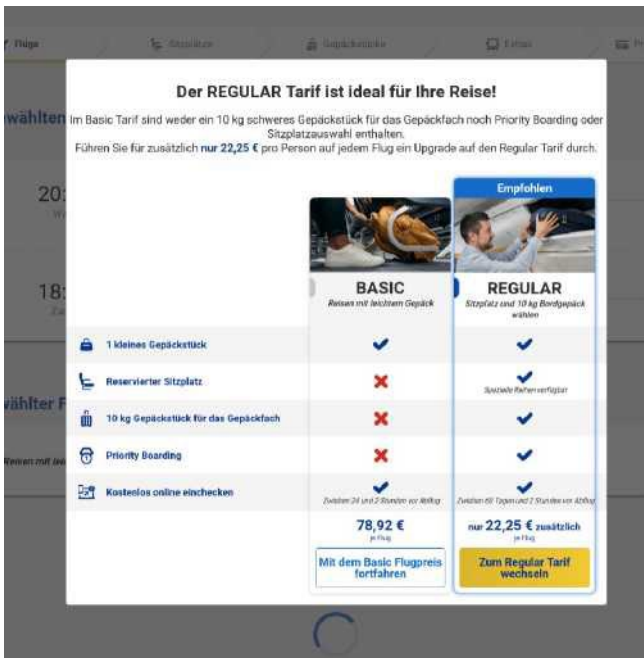


Figure 30: Ryanair Pop-Up when selecting the basic tariff. (Screenshot, 17 April 2024).

**Visual description** of the pop-up: The pop-up table is visually different from the table comparing all tariffs. By contrast, in addition to the ticks (these symbolised services included), there are also red crosses – including the lines ‘reserved seating’, ‘10 kg luggage’ and ‘Priority boarding’. The “regulatory tariff” is visually highlighted as if it were a pre-selection – that is not the case. The button to select ‘Basic’ is excavated, while the button for ‘Regular’ is yellow.

**Wordings:** The “Regular Tarif” is entitled “Recommended”.

**Option:** Once a tariff is chosen (regardless of which one) is followed by a page requiring a login or registration, it can also be overlooked (‘login later’) and come to a page where a seat can be reserved.

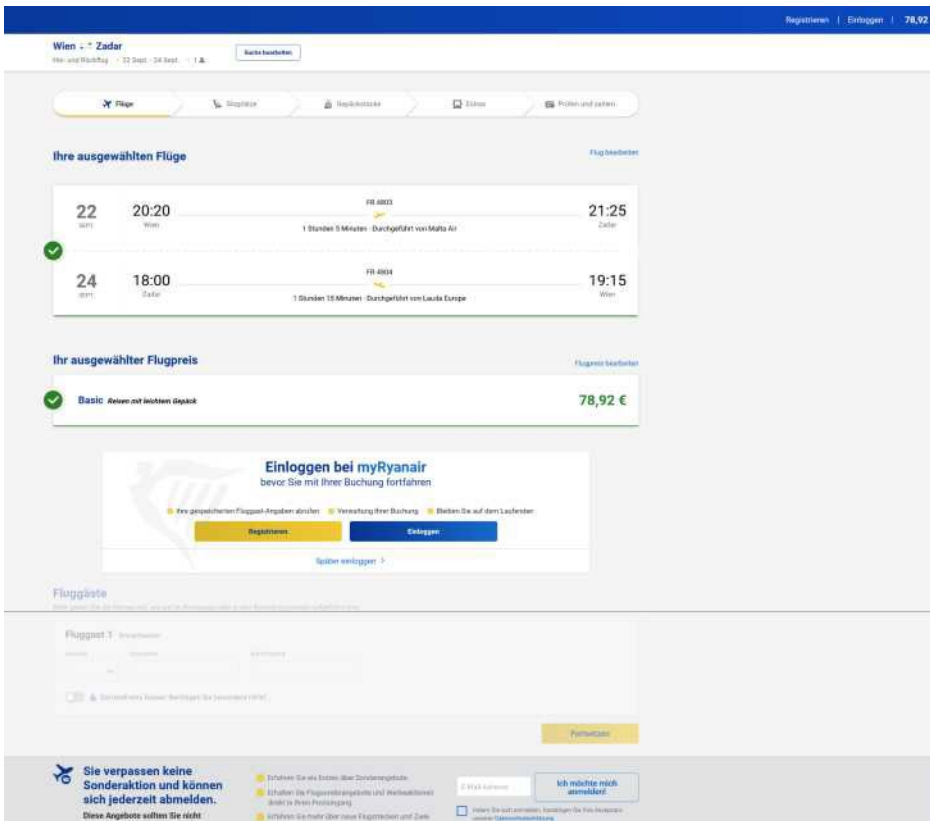


Figure 31: Ryanair's total price. (Screenshot, 17 April 2024).

### Choice of seat reservation

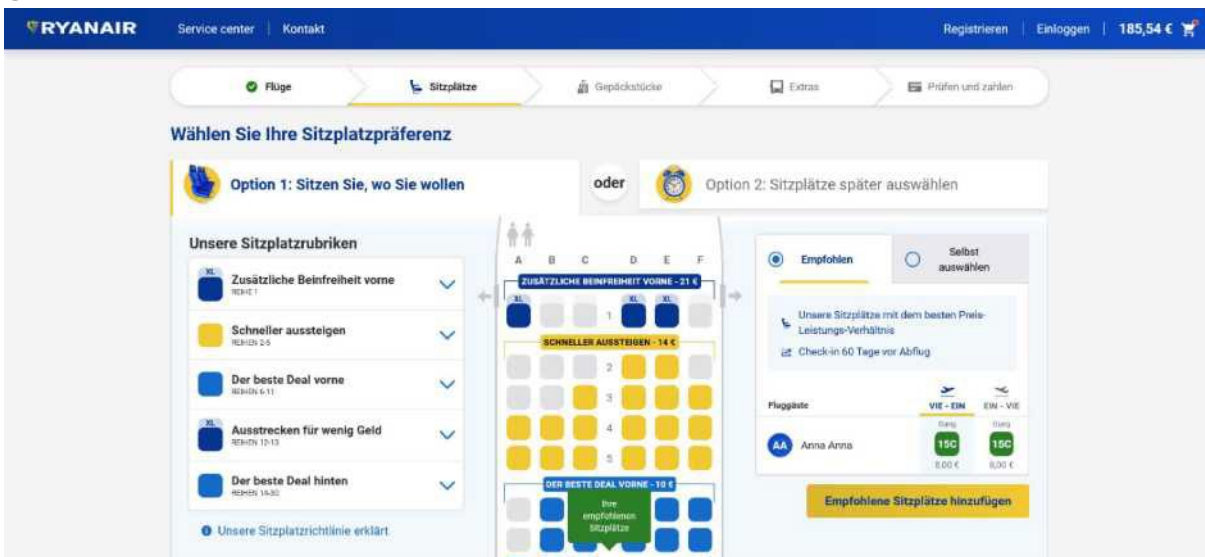


Figure 32: Ryanair seat selection (screenshot, 17 April 2024).

**Costs:** Seat reservations cost EUR 8-21 per seating position per flight. At this point in the booking process, the price (entire) at the right and upper edge of the screen is displayed next to the basket.

**Preselection:** When selecting the basic tariffs, there is a pre-selection – leading to different seating categories in the test. One pre-selection

“Recommended” of the most favourable seat category (“The best deal at the rear”, EUR 8) and one of the second most favourable seating category (“The best deal front”, EUR 10). The pre-selection concerns both flights and can be reconfirmed with a button “Add recommended seats” highlighted in yellow – there is no other button giving an alternative option to progress in the booking process. There are two refined options to be pre-selected. At the top, next to the title “Option 1: Seat where you want”, the ‘Option 2: Select seats at a later stage’. In the “Recommended” pre-selection, an excavated button “Select yourself”.

**What happens by clicking on “Select yourself”:** The seat reservations per flight may be selected in the five categories themselves.

**What happens by clicking on “Option 2”:** A page will appear with a banner entitled ‘Before you continue without a seat, we will inform you about the following’. The information that there will in any case be a seat reservation is given in smaller characters in the subheading – “[...] we will assign you randomly a seating position”. Three information is shared with users: (1) Avoid one seat in the centre’, (2) Seat availability’, (3) Currently best price.

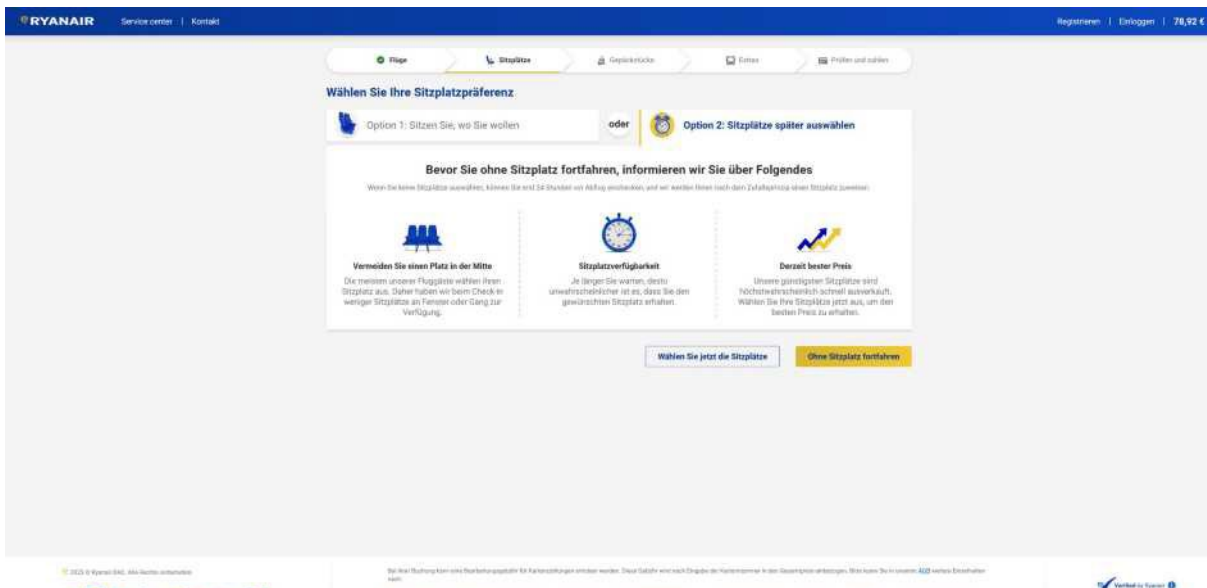


Figure 33: Ryanair seat selection – Option 2 (screenshot, 17 April 2024).

The two buttons of the page are visually different. In yellow, there is a button “To continue without a seating position” and the second button “Choose the seats now” is a back button for seating selection.

**What happens by clicking on ‘More away from a seat’:** A pop-up window will appear with the title “You have chosen random seating”. The two buttons are clearly distinguishable visually. In yellow and blue, ‘Choose the seats now’ suggests a pre-selection (wrongly) and is a simple back button for the seat selection function. Alternatively, ‘continue random allocation’ is not designed as a button, but as a link in bold and blue. After clicking on “Pursue random allocation”, the process is closed.



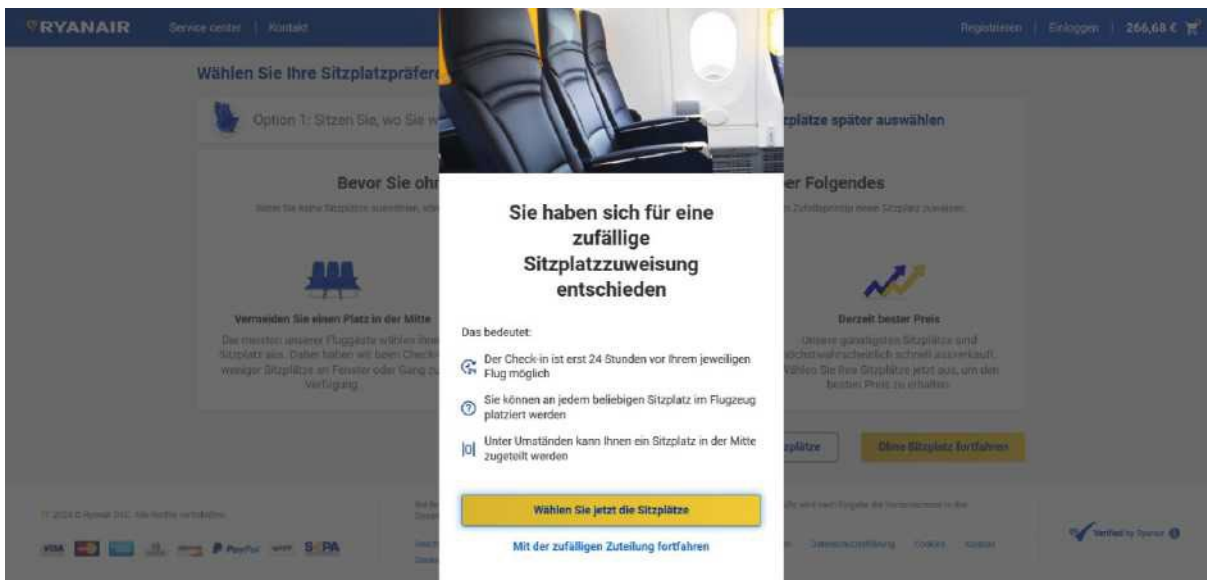


Figure 34: Ryanair seated Pop-Up (screenshot, 17 April 2024).

### Mistakes in seat reservation to the detriment of consumers:

Chooses one seat for each flight (See Step 1 of the seat selection: ‘Option 1: If you want to seat’ – button “Select yourself”), but decides to proceed without a seat reservation, the selection will only be corrected for the last flight selected. At the end of the booking process, it appears that a seat is still reserved – there is no technical possibility for seats already selected to be allocated entirely free and thus free of charge.

Baggage selection:

**Case 1:** In the first step, the ‘Basic’ tariff was chosen, which only includes a small hand luggage (Rucksack size). After the optional, paid seating choice, a further check on baggage requests is carried out despite the decision already taken. If the ‘Basic’ tariff is selected, no baggage option is pre-selected.

**Follow up on the basic tariff:** As nothing is preselected, this means: In order to follow up on the decision already taken in the basic tariff, it is necessary to click on ‘Only one small bag’ separately. The consumer confirms that the decision already taken is accompanied by a pop-up with a red warning sign that warns against additional costs in case of non-respect of the choice of luggage. Thereafter, the booking process can be continued by ‘continuing’.

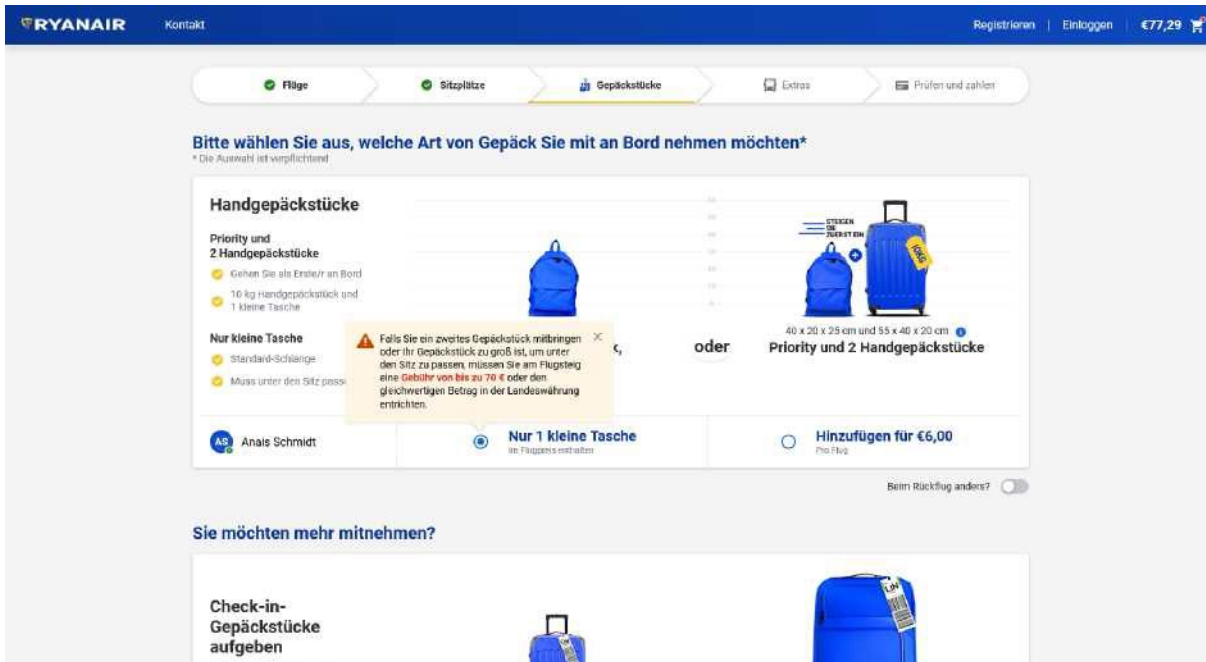


Figure 35: Ryanair baggage selection (screenshot, 17.10.2023).

**Case 2 – Selection Regular Tariff:** When the regular tariff is selected, two items of hand luggage are included (Rucksack and 10 kg). In this respect, the difference with Basic in terms of baggage selection after seat reservation does not require a decision to be confirmed again, but only an extension is possible. At the end of the page, a button is “continued”.

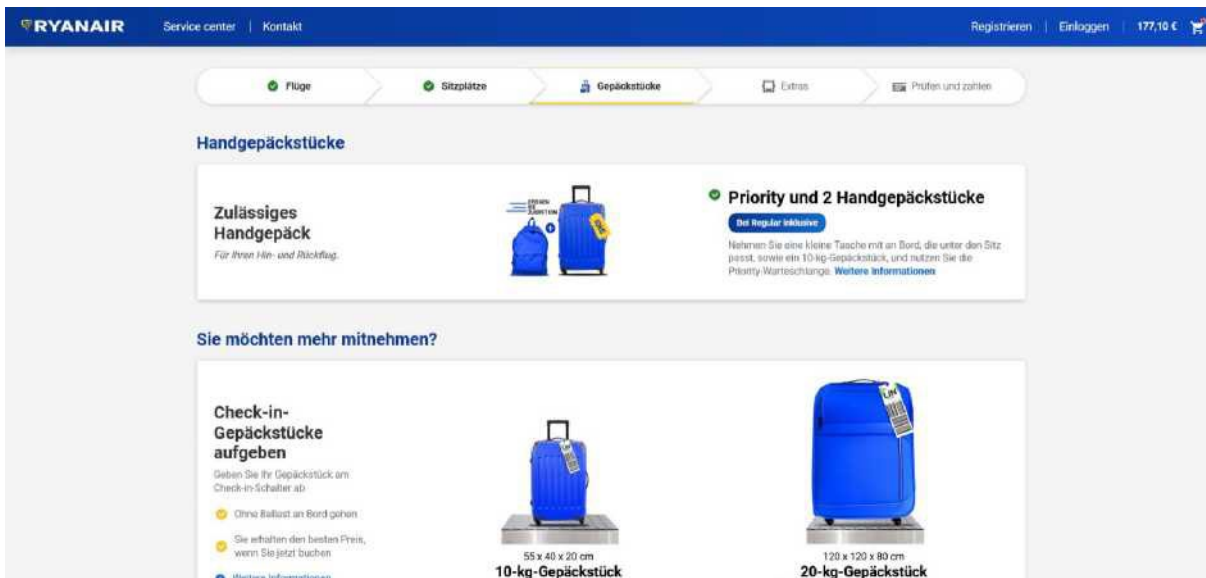


Figure 36: Ryanair luggage at the Regular Tariff (screenshot, 17.10.2023).

**Case 3 – Selection plus tariff:** If the Plus tariff is selected, one item of hand luggage (rucksack) and a delivery baggage (20 kg) are included. In the baggage step, the consumer is asked again before the decision has already been made with the question

‘Please select which type of luggage you would like to take on board?’ There is no pre-selection – in grey script it is indicated under “only 1 small bag” that this option is included in the air fare. A pre-selection is made for 20 kg of baggage with the words ‘1 bag at Plus inclusive’, deposited in yellow.

**Case 4 – Selection of tariff Flexi Plus:** When selecting the ‘Flexi Plus’ tariff, two items of hand luggage are included. This does not need to be confirmed again, but luggage can still be added for delivery at a surcharge.

Thus, cases 1 (Basic Tariff) and 3 (Plustarif) and Case 2 (Regular Tariff) and Case 4 (Flexi Plus Tariff) were similar in the design of baggage selection.

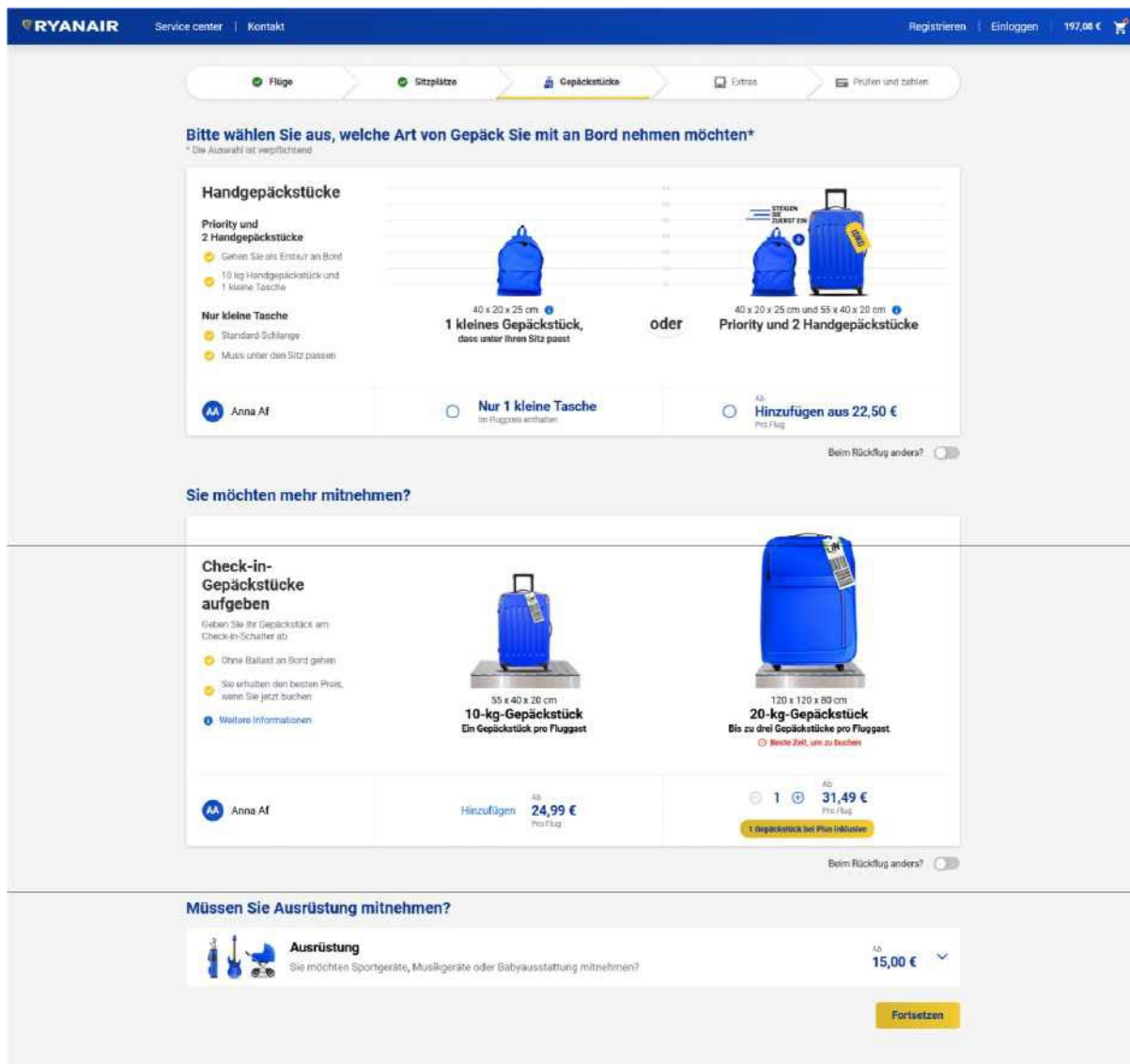


Figure 37: Ryanair luggage at plus fare (screenshot, 17 April 2024).

Additional insurance service

In the penultimate step of the ‘Extras’ booking process, travel insurance is offered. **Three options** are offered – one ‘standard’, ‘insurance plus’ and one ‘annual insurance’. When we do not select any additional services and click on “continue”, a pop-up window is created.

**RYANAIR** Service center Kontakt Registrieren Einloggen 232,47 €

Vorausbezahlte Gutschrift: Mehr bekommen, weniger bezahlen  
Wenn Sie Flugtickets auf unserem Bordmagazin, darunter Geschenke, Spielzeug und Getränke, und kaufen Sie mit dem Pre-paid-Gutschein mehr für weniger.

**Lassen Sie sich von unerwarteten Ereignissen nicht aus der Ruhe bringen**

Die meisten Menschen fügen Reisen wie der Ihren eine **Reiseversicherung hinzu**.

Bei uns sind Sie bestens aufgehoben:

- Medizinische Ausgaben
- Verlust von persönlichem Besitz
- Reiserücktritt

**BLEIB GESCHÜTZT**

**REISEVERSICHERUNG**  
Unbesorgtheit, dass du auf deiner Reise versichert bist.

ab **22,29 €**  
Pro Person

**Versicherung hinzufügen**

[Danke, nein](#)

Bei einer Buchung kann eine Bearbeitungsgebühr für die Buchungsänderung entstehen. Diese hängt von der Anzahl der Änderungen ab. Die Versicherungskosten sind in der Preisübersicht aufgeführt. Bitte lesen Sie die Allgemeinen Geschäftsbedingungen durch.

Figure 38: Ryanair Pop-Up Insurance (Screenshot, 17 April 2024).

**Wordings:** Under the title ‘Do not rest out of unexpected events’, travel insurance is advertised with the indication ‘most people add travel like your travel insurance’.

**Visual:** There is only one button “Add insurance” which is yellow. Underneath, the text ‘Danke, No’ is placed as a link, in blue.

**Costs:** Reference is made to the standard rate of the insurance, i.e. the cheapest available option.

Click on ‘Add insurance’ during the pop-up to select the insurance packages and can choose from the three options (partly from only two of the three because no annual insurance can be selected). The more expensive insurance plus visually highlighted.

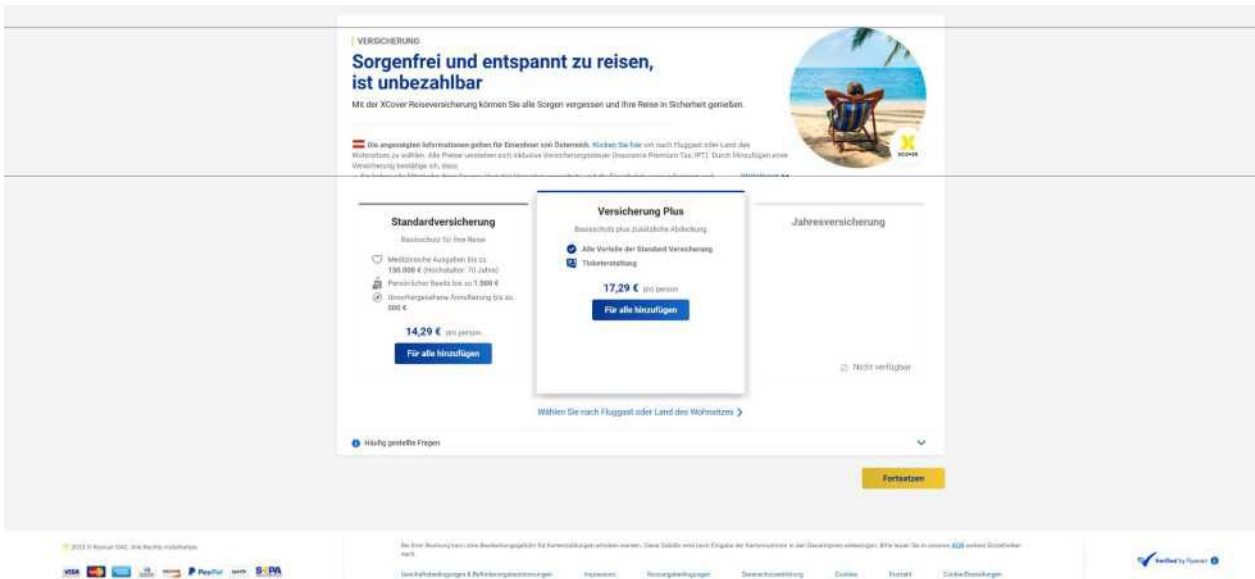


Figure 39: Ryanair Versicherungen (screenshot, 4 September 2023).

### Accounting process Closure

On the last page of the booking process, there is a pre-selection of an abos concerning Ryanair's advertising, which must be removed in order not to receive any marketing communications from the company in the form of email, SMS or pushnotifications. The Wording: "Ryanair subscribers will have early access to exclusive discounts on flights and products, as well as up-to-date information on new destinations offered only through marketing communications. If you do not wish to receive these offers by email, SMS or push notification, please remove the tick in this field."

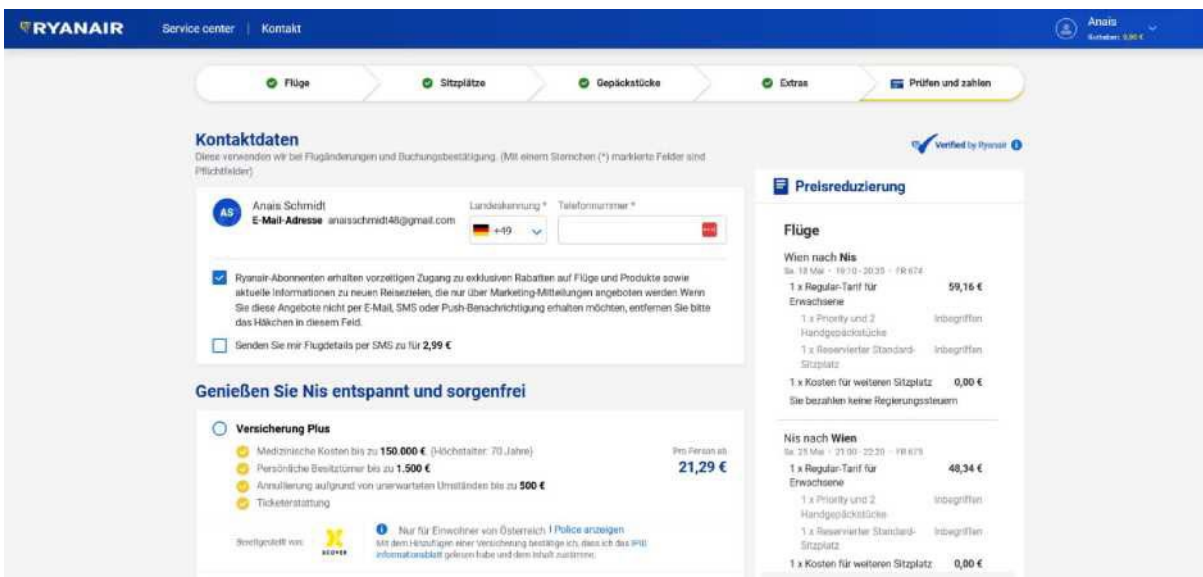


Figure 40: Ryanair pre-select newsletters and notifications (screenshot, 17 April 2024).

### 4.1.2 Analysis

#### Ryanair – opaque tariff packages

Tariff packages are a limited pre-selection of Kombi offers – ideally they redouble complexity by summarising obvious good options. However, the comparison of Ryanair Air's tariffs leads to the following conclusion: The packages are not used for consumers.

There is no option for hand luggage (10 kg) and surrender baggage in any of the tariff packages

offered. The option of a cabin baggage flight shall be made on a regular basis in the first selection, but more expensive by means of a paid seating option than if the top-up for a cabin baggage is paid on the basis of the cheapest basic fare option. In other words: The two fares for cabin baggage flight tickets, cabin baggage flight tickets and hand baggage tickets are not pre-arranged options in the booking process. They can be assembled, then they represent more favourable options than the ‘Price Comparison Prevention’ (**Price Comparison Prevention**) tariffs.

The individual packages, including services, are presented below as variables to illustrate the complexity of the selection process or the impossibility of comparing prices for consumers. The prices of the variables vary per flight, so no general statement can be made here. The prices quoted refer to an example of a flight from Vienna airport. The choice of tariffs is designed so that an overview of costs and price comparisons are not possible during the booking process.

Tariff Table – Comparison

Basic Tariff (T <sub>Basic</sub> )	G <sub>kl</sub> , S <sub>random</sub>	EUR 152,90
Basic plus surcharge for cabin baggage	G <sub>kl</sub> , G <sub>Hand</sub> , S <sub>random</sub> , incl. P <sub>priority</sub>	EUR 193,90
Basic plus surcharge for cabin and delivery luggage	G <sub>kl</sub> , G <sub>hand</sub> , G <sub>grCheck</sub> , P <sub>priority</sub>	EUR 247,38
Regular Tariff (T <sub>Reg</sub> )	G <sub>kl</sub> , G <sub>Hand</sub> , S <sub>rear</sub> , P <sub>priority</sub>	EUR 213,90
Regular plus surcharge for delivery luggage	G <sub>kl</sub> , G <sub>Hand</sub> , G <sub>grCheck</sub> , S <sub>rear</sub> , P <sub>priority</sub>	EUR 267,38
Basic plus surcharge for Regular Services	G <sub>kl</sub> , G <sub>Hand</sub> , S <sub>rear</sub> , P <sub>priority</sub>	EUR 213,90
Plus tariff (T <sub>+</sub> )	G <sub>kl</sub> , G <sub>grCheck</sub> , S <sub>rear</sub>	EUR 226,38
Plus additional tariff for small hand luggage	G <sub>kl</sub> , G <sub>Hand</sub> , G <sub>grCheck</sub> , S <sub>at the rear</sub> incl. P <sub>priority</sub>	EUR 267,38
Basic plus surcharges for Plus Tariff Services	G <sub>kl</sub> , G <sub>grCheck</sub> , S <sub>rear</sub>	EUR 226,38
Flexi Plus Tariff (T <sub>Flex</sub> ) cannot be upgraded on this service.	G <sub>kl</sub> , G <sub>Hand</sub> , S <sub>All</sub> , F <sub>ast Track</sub> , P <sub>riority</sub>	EUR 344,30

Table 1 Comparison of tariff packages with freely compiled supplementary service packages. <sup>42</sup>

<sup>42</sup> The following abbreviations have been used: Basic Tariff (T<sub>Basic</sub>), Regular Tariff (T<sub>Reg</sub>), Plus Tariff (T<sub>Plus</sub>), Flexi Plus Tariff (T<sub>Flex</sub>). As regards seating positions: Seating position ‘Additional leg freedom

### Ryanair – additional services

For example, the first neutral comparability of the offers made by the low-cost airline Ryanair first uses a neutral presentation in tabular form of the services to be booked, where no blue hook can be seen under the phrase ‘reserved seat’ for one of the four fares offered. This can be classified as the dark pattern ‘**TrickWording**’, as booking a flight in any case guarantees a seat. This is questioned by the presentation in the table of the missing hook (see Figure 28). If the cheapest fare is nevertheless chosen at this point and therefore the additional service of a desired seating position is waived, the UX design will change to this indication. A pop-up interrupts the process to again contrast the basic and regular tariffs with other design decisions – this is referred to as deliberate **Misdirection** or **tagging**. Instead of a missing blue hook, a red cross appears under the words ‘reserved seat’ at the basic tariff, suggesting that no seating is reserved (see Fig. 32-34). This can be defined as ‘**sneaking**’ in which a user pushes to make a decision in the form of misleading or false facts. In this case, the graphical emphasis of a ‘red cross’ with the word ‘reserved seat’ is

played by the fact that the choice of the most advantageous fare also suggests a choice for a non-seat flight (**deliberate Misdirection, Sneaking, Trick Wording**).

If the decision does not keep a paid seat reservation, users will see one page with two options, the second displayed is 'Before you continue without a seat...' and will be accompanied by three advices (see Figure 33). The choice of "going without a seat" erroneously suggests that a flight without a seat would be booked. The advice can also be described as suggestive: The first suggestion "Do not have a place in the centre" suggests that without an additional reservation purchased, a place in the centre could be likely. The second proposal, entitled 'Seating availability', suggests that late reservation could lead to a seat availability problem. 'Currently best price' indicates that the cheapest seats are quickly sold out or become more expensive at a later stage – according to our notes, the prices of the seat categories do not change, but this needs to be examined further (**Trick Wording, Confirm Shaming**). Two buttons on this page are visually different and conceptual. In yellow, there is a button "To continue without a seat",

front': EUR 21 ( $S_{leg}$ ), seating 'Further disembarkation': EUR 14 ( $S_{exit}$ ), seated "The best deal at the front": EUR 8-10 ( $S_{front}$ ), seating 'The best deal at the rear': EUR 8 ( $S_{rear}$ ), seating 'exit for little money': EUR 15 ( $S_{xl}$ ), seating 'Select later – select automatically': EUR 0 ( $S_{random}$ ). With regard to luggage: 1 small bag/bag (passed under the seating position, 40x20x25cm): EUR 0 ( $G_{kl}$ ), 2 hand luggage items (1 small bag and 1 cabin luggage case, 10 kg, 55x40x20cm): from EUR 10 ( $G_{hand}$ ), 10 kg bag (55x40x20cm, check-in bag): from EUR 10 ( $G_{check}$ ), 20 kg bag (120x120x80cm, check-in baggage): from EUR 19.90 ( $G_{grcheck}$ ), insurance variables: Insurance Standard: from EUR 12.90 (variable) ( $V_{stand}$ ), insurance plus: from XXX ( $V_{+}$ ), annual insurance: from XXX ( $V_{year}$ ), variables Priority: Almost Track Security Control: from EUR 6 ( $P_{security}$ ), priority boarding: from EUR 6 ( $P_{priority}$ )

the second button "Select now the seats" is a back button for seating selection. There is no neutral wording such as 'further' – this is a tendentious formulation that can be classified as 'confirmshaming' and 'tagging' (**deliberate Misdirection, Tagging, Confirmshaming, Trick Wording**).

If customers continue without a paid seat reservation, they will be confronted with a pop-up that calls into question once again the decision taken several times (see Figure 34, **Nagging, obstruction**). The language used in the pop-up suggests to customers that it is to your detriment not to make a paid seat reservation (**confirmshaming**). Attention is drawn to the drawbacks such as 'Check-In is only possible 24 hours before the flight'; 'They may be positioned in any seating position in the aircraft', etc. In addition, the button design, as well as unattended seat reservation, is tendencies: "Choose the seats now" is designed as a yellow button with blue, a design that suggests pre-selection (**tagging, deliberate Misdirection**). This button is a simple 'back button' that again leads to the paid seating choice. If you want to keep the decision not to make a paid reservation, you need to click on a blue link under the button that is not marked or highlighted as a button.

For Ryanair, when selecting the basic tariff, a warning indicates that no additional baggage has been booked. In this case, only a small handbag (no cabin bags) may be carried (see Figure 35). The description of this option could be described as "**Confirm Shaming**" as the options are described as "Only one small bag" – this option is chosen to indicate possible additional costs at the airport. All instructions and wording are tailored to encourage travellers to book an additional item of hand luggage for a surcharge.

If no insurance is chosen at Ryanair Air, a pop-up will rethink the decision. The Wording can be classified as a dark pattern "**Fake Social Proof**": "Most people add travel like your travel insurance".

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In addition, there is only one button on this page with the text 'Add insurance' – in order to stay in the decision already made, users must click on the text below 'Think, No', which is set as a link and visually absconded (see Figure 38) (Nagging, **deliberate Misdirection, Fake Social Proof, Confirm Shaming**). In addition, the reception of the newsletter or marketing messages at the end of the booking is pre-selected (see Fig. 40, **Preselection**).

**Legal classification:** A commercial practice is regarded as aggressive if, in the specific case, taking into account all the factual circumstances, it significantly impairs or is likely to significantly impair the average consumer's freedom of choice or conduct with regard to the product by undue influence and actually or is likely to cause him to take a transactional decision that he would not have taken otherwise (Article 8 of the UCPD). It is therefore questionable whether the use of dark patterns identified in this analysis can be classified as undue influence under Article 8 of the UCPD.



## 4.2 Case Study “Austrian Airlines”

### 4.2.1 Documentation

**Documentation basis:** Screenshots of the booking process of 18 April 2024. Please note that the booking process is regularly changed and that the examples should only be used with reference to date.

#### Choice of fare

In the booking process, a selection of individually priced flights is displayed on the basis of a date. This is followed by a selection by time. When choosing the time, there are, at first glance, two tariffs for choice – ‘Economy’ and ‘Business’. Clicking on each of these tariffs leads to further options.

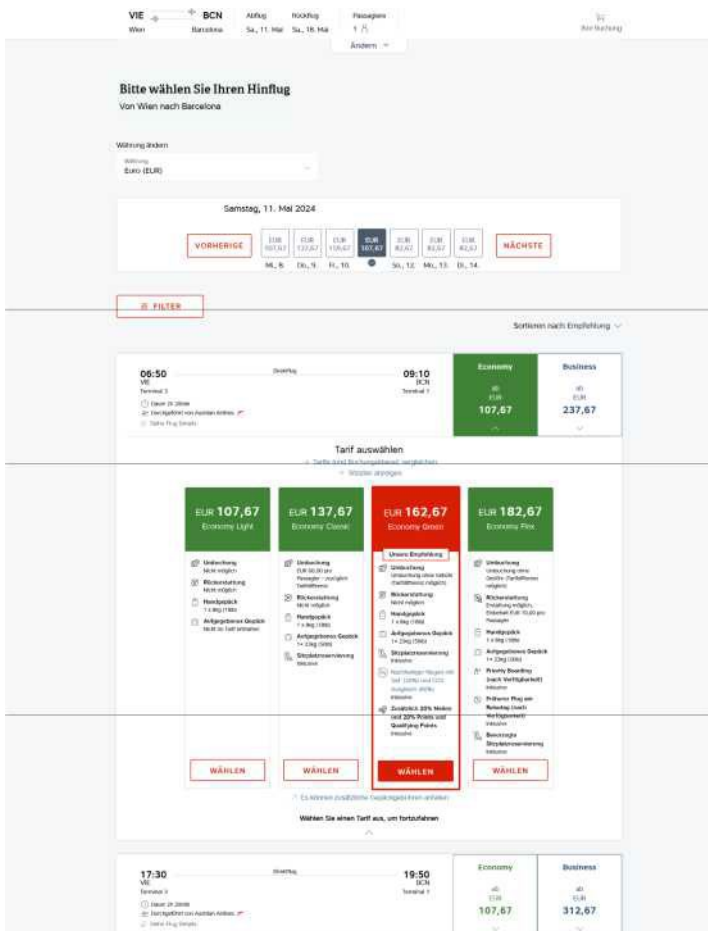


Figure 41: Austrian fares Economy (Screenshot, 18 April 2024).

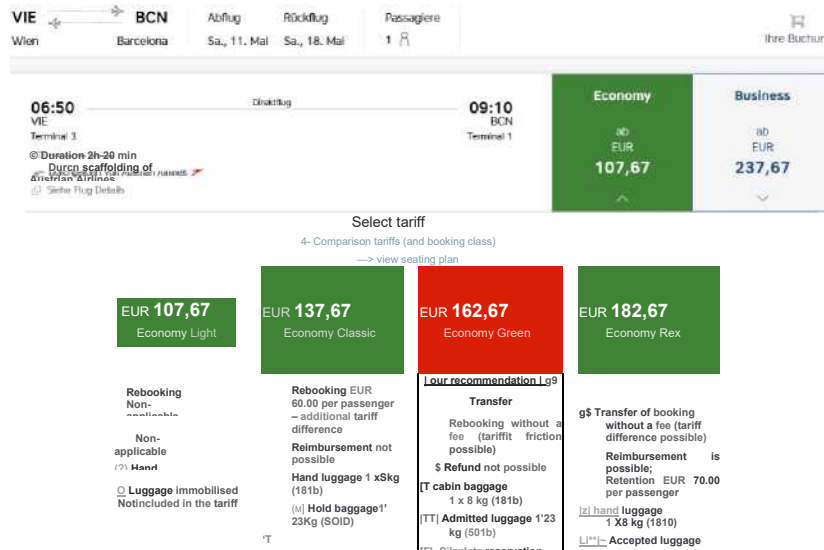


Figure 42: Austrian fares prices (Screenshot, 18 April 2024).

**Visual:** These options are listed in parallel with the total price. Again, there is no pre-selection but a visual prominence of an option ('Economy Green') with the signature 'Our recommendation' suggesting a pre-selection. The Economy Green Tariff is also given the label 'Our recommendation'. The buttons are designed in the same way. Similarly, there are business sub-categories, of which the 'ecological' variant 'Business Green' is highlighted and recommended.



Figure 43: Austrian Business Tariffs (Screenshot, 18 April 2024).

**Luggage:** All economy options include hand luggage and the indication 'seat reservation inclusive' is missing only for 'Economy Light'. Economy Light does not mention "seat reservation inclusive", but it is not highlighted as missing and no uncertainty is generated. All Economy Options except Light also include delivery luggage.

<b>VIE</b> Vienna	<b>BCN</b> Barcelona	Takeoff SA., 11 May Sa., 18. Once	Inbound 1	Passengers	R Your booking
----------------------	-------------------------	--------------------------------------	--------------	------------	-------------------

<b>EUR 107,67</b>	<b>EUR 137,67</b>		<b>EUR 162,67</b>
-------------------	-------------------	--	-------------------

<b>Rebooking</b> Non- applicable Q Hand Accepted luggage Not included in the	<b>g® Rebooking EUR</b> 60,00 per passenger – see fare difference <b>Refund</b> Non- applicable [2] <b>Hand baggage</b> 1 x 8 kg (18 lb) [R-] <b>Dispatched luggage</b> 1 x 23 kg (50 lb) TV, seat reservation including	<b>g-p transfer</b> Rebooking without a fee (Tarifdifferenz möglich) <b>PGF reimbursement</b> Non- applicable <b>g Cabin baggage</b> 1 x 8 kg (18 lb) <b>EU Passd luggage</b> 1 x 23 kg (50 lb) Seat reservation Included More sustainable flying with SAF (20 %) and CO2 compensation (80 %) Additional 20 % miles and 20 % points and Qualifying Points included	<b>g® Transfer of booking without a fee (tariff difference möglich)</b> <b>Refund</b> Retention EUR 70,00 per Passenger <b>Hand luggage</b> 1 x 8 kg (18 lb) Stacked luggage 1 x 23 kg iso B <sup>1</sup> Priority Boarding (according to availability) inclusive Q Previous flight on Availability) inclusive Preferential seating including
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<b>WÄHLEN</b>	<b>WÄHLEN</b>	<b>WÄHLEN</b>	<b>CHOOSE</b>
---------------	---------------	---------------	---------------

Figure 44: Austrian Economy Awards Included Services (Screenshot, 18 April 2024).

If the cheapest option is chosen (Economy Light), there are no further requests to change the decision to add luggage or insurance, or a paid seating choice. This possibility appears to be intrusive, once the passenger data have been provided.

### Price presentation and price comparison

The price comparison shows that booking seats and luggage for delivery in addition to the cheapest overall fare is more expensive than the option initially chosen. Economy Light fare (including hand luggage) costs EUR 123,67, economy classic fare (including hand luggage, job luggage and seating:  $G_{Hand} + G_{grCheck+} + S_{free}$ ) EUR 153,67. However, if you add to the cheapest economy light fare (EUR 123,67) an extra luggage (EUR 30) and a freely chosen seat (EUR 16), the extra cost is above EUR 46, i.e. a total price of EUR 169,67. This is EUR 16 more than if the customers had initially chosen the economy price.

In the economy tariff group, the economy green tariff (EUR 173,67) is EUR 50 more expensive than the cheapest economy light tariff (EUR 123,67), the same price difference exists in the business tariff group between the cheapest business tariff (Business Saver) and the business green tariff (423,67 vs EUR 473,67, difference EUR 50).

**Zusätzliche Dienstleistungen**

**Gepäck**  
ab EUR 30,00

Von Wien nach Barcelona  
1 Handgepäck,  
kein aufgegebenes Gepäck

Von Barcelona nach Wien  
1 Handgepäck,  
kein aufgegebenes Gepäck

**GEPÄCK HINZUFÜGEN**

**Sitze**  
Wählen Sie jetzt Ihre bevorzugten Sitzplätze aus:  
ab EUR 16,00

**WÄHLEN SIE IHREN SITZPLATZ AUS**

**Nachhaltiger fliegen**

Figure 45: Austrian additional seating and luggage services (screenshot 18 April 2024).

## Analysis

Austrian Airlines' choice of fares first shows the cheapest fare in economy class and the cheapest business class tariff. By clicking on Economy or Business, the different tariff options are displayed in the tariff group. For both tariff groups, the 'green' tariffs are visually highlighted (**targeted Misdirection, Tagging**).

It should be noted that, in Austrian, the tariff option Economy Classic is cheaper for customers than the additional services (1 additional consignment luggage and manual seating choice) to be added at a later stage, adding additional consignment luggage and a seat, extra costs of EUR 16 than if the customers had initially chosen the economy price (**Comparison Prevention**).

**Legal assessment:** In order to improve transparency and to be able to make a more informed choice when booking, it would be useful for consumers to receive specific information on the cost of additional services when choosing the tariff option.

In the case of Austrian Airlines, it is already transparent from the beginning of the process, in so far as it is stated along the four packages that a seat reservation is included from the basic tariff (in 3 of the 4 tariffs). Although there is no indication of the seating position in the cheapest economy light tariff (e.g. random seat allocation), there is no confusing wording that could suggest that this is a non-seat booking. Subsequently, even if the cheapest option (Economy Light) is selected, there will be no further invitations to book a paid seat selection. This possibility appears for the first time after the passenger data has been entered (no pop-up, intrusive).

Only Austrian Airlines is involved in the additional selection of hold baggage without recognisable nagging or confirm haming. When selecting additional services, there is an option to book additional batches of baggage. The option is simple in colour and customers are not forced to book additional services (see Figure 45).

Nor is there any specific reference to the booking of insurance; all additional services were advertised in a similar way to additional seat reservations or additional luggage (see Figure 45).

## Case Study "Wizz Air"

### 4.3.1 Documentation

**Documentation basis:** Screenshots of the booking process of 18 April 2024 and 3 May 2024. It should be noted that the booking process is regularly changed and that the examples should only be used with a reference to date.

The booking process from Wizz Air starts with a desired date followed by a possible selection of flights with time. The price quoted is a 'normal price' and a cheaper 'Wizz discount club' price per flight. An overview of the price composition on the left-hand side of the website provides an overview of the costs of the selected services.

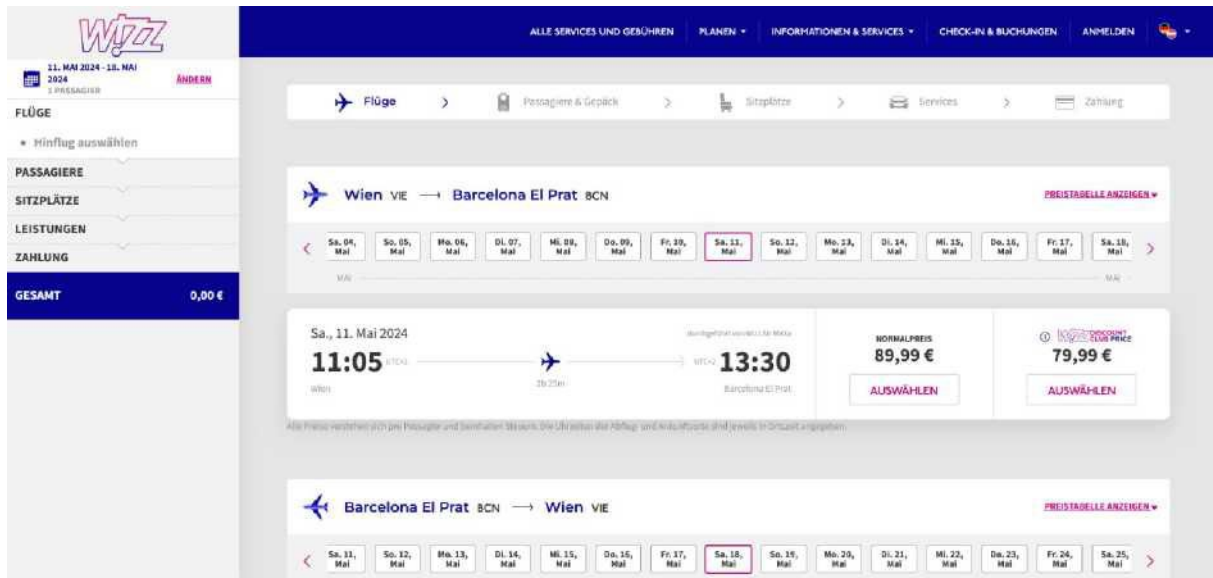


Figure 46. Wizzair flight selection (screenshot, 18 April 2024).

If the standard price is chosen, an overview of three tariff packages appears: “All Drin & Voll Flexibel”, “Packen & Savings” and “Simple Travel”. Visually, the standard price is grooved and the button is not coloured either. The total price is indicated at the standard price, while the other two packages are indicated with the price mark-up per flight.

The screenshot shows the Wizz Air booking interface for a flight from Wien to Jerusalem on May 12, 2024. The total price is 134,99 €. The flight schedule shows a departure at 22:15 and an arrival at 03:45. Three fare packages are presented:

- ALLES DRIN & VOLL FLEXIBEL (Wizz Plus):** +99,80 € per passenger. Includes:
  - Kostenloses Handgepäckstück (10 kg + 10 x 20 x 30 cm)
  - Kostenlose Auswahl von Premium- oder normalen Sitzplätzen
  - Aufgabengepäckstück 32 kg
  - Kostenloser Check-in am Schalter und online bis zu 30 Tage vor dem Abflug
  - 20 kg Trolleytaschen an Bord
  - Online-Flugänderung ohne Gebühr für Flugänderungen
  - Rückerstattung auf Wizz Account
- PACKEN UND SPAREN (Wizz Go):** +64,68 € per passenger. Includes:
  - Kostenloses Handgepäckstück (10 kg + 10 x 20 x 30 cm)
  - Kostenlose normale Sitzplatzauswahl, ausgenommen Vorplätze in der ersten Klasse und andere Sitzplätze mit zusätzlicher Bezahlung
  - 20 kg Aufgabengepäckstück
  - Kostenloser Check-in am Schalter und online bis zu 30 Tage vor dem Abflug
- SCHNELLES REISEN (Wizz Smart):** +52,80 € per passenger. Includes:
  - Kostenloses Handgepäckstück (10 kg + 10 x 20 x 30 cm)
  - Kostenlose normale Sitzplatzauswahl, ausgenommen Vorplätze in der ersten Klasse und andere Sitzplätze mit zusätzlicher Bezahlung
  - 20 kg Trolleytaschen an Bord
  - Online-Check-In bis zu 30 Tage vor dem Abflug
  - Bevorzugter Eintrag per Boarding

Figure 47: Selection of WizzAir air fares (screenshot, 3 May 2024).

The procedure for selecting the 'Wizz Discount Club' prize is similar. The fare appears under the wording 'Simple Travel' and 'Basic', and again the two other fares are indicated not with a total price, but with the mark-up on the price. The fare must be selected for the outward and return flights.

A comparison between Figure 47 and Figure 48 shows the rapid changes in website design. There are approximately two weeks between the documentation of the two screenshots, but the presentation of the tariff packages has changed significantly.

The screenshot shows the Wizz Air booking interface for a flight from Wien to Barcelona El Prat on May 11, 2024. The total price is 89,99 €. The flight schedule shows a departure at 11:05 and an arrival at 13:30. Three fare packages are presented:

- ALLES DRIN & VOLL FLEXIBEL (Wizz Plus):** +106,13 € per passenger. Includes:
  - Aufgabengepäckstück 32 kg
  - Kostenlose Auswahl von Premium- oder normalen Sitzplätzen
  - Kostenloses Handgepäckstück und Rollkoffer an Bord
  - Online-Flugänderung ohne Gebühr für Flugänderungen
  - Rückerstattung auf Wizz Account
- PACKEN & SPAREN (Wizz Go):** +58,16 € per passenger. Includes:
  - Aufgabengepäckstück 20 kg
  - Freie Sitzplatzauswahl
  - Kostenloses Handgepäckstück und Rollkoffer an Bord
  - Bevorzugter Check-in und Boarding
- EINFACH REISEN (Basic):** Weiter für 89,99 € per passenger. Includes:
  - Kostenloses Handgepäckstück
  - Kostenloser Online-Check-In zwischen 24 und 3 Stunden vor der Abreise. Der Check-in am Flughafen kostet 40 €.

Figure 48: Wizz tariff selection (screenshot, 18 April 2024).

## Seat selection

After the choice of fares per flight, seats are selected.

The screenshot shows the Wizz Air booking process. On the left, flight details are listed:
 

- FLÜGE** (Flights): 129,98 €
- Flight 11: WIENNA – BARCELONA EL PRAT (13.04.2024 - 16.04.2024)
- Flight 18: BARCELONA EL PRAT – WIENNA (17.04.2024 - 18.04.2024)
- Passenger: ANNA AF
- Overall price: EUR 129,88

 On the right, a message box states:
 

- SEATS RECOMMENDED BY WIZZ AIR**
- PLEASE select one option below
- SITZPLÄTZE SPÄTER WÄHLEN** (Select seats later):
  - Wenn Sie keine Sitzplätze auswählen, erfolgt die Zuteilung beim Check-in nach dem Zufallsprinzip.
  - Sie können später teurer werden.
  - Einer der verbleibenden Sitzplätze wird Ihnen zugewiesen, Kinder bekommen ohne Aufpreis einen Sitzplatz neben der Begleitperson.
  - Sie können erst 24 Stunden vor dem Abflug einchecken.
- WEITER** (Next)

Figure 49: Wizz seat selection (screenshot, 18 April 2024).

The option “Seating places recommended by Wizz Air” is highlighted (folded) on the right side. If you do not want to pay for the seat selection, the option “Select later” remains. It shall bear the following information: ‘If you do not select seats, the allocation will be

The screenshot shows the Wizz Air seat selection interface with recommended seats. On the left, flight details are listed:
 

- FLÜGE** (Flights): 129,98 €
- Flight 11: WIEN – BARCELONA EL PRAT (11.05.2024 - 13.05.2024)
- Flight 18: BARCELONA EL PRAT – WIEN (14.05.2024 - 16.05.2024)
- Passenger: ANNA AF
- Overall price: EUR 129,98

 In the center, a seat map shows the cabin layout with seats numbered 1-8 in each row.
 On the right, a message box states:
 

- VON WIZZ AIR EMPFOHLENE SITZPLÄTZE** (Wizz Air recommended seats):
  - Sie können alle Sitzplätze mit einem Klick auswählen.
  - Von Wizz Air empfohlener Sitzplatzvorschlag
  - Check-in 30 Tage vor dem Abflug
- WIEN - BARCELONA EL PRAT**: ANNA AF 14A 14,00 €
- BARCELONA EL PRAT - WIEN**: ANNA AF 14C 13,00 €
- GESAMT: 2 Sitzplatz/Sitzplätze** 27,00 €
- WÄHLEN SIE JETZT IHRE SITZPLÄTZE** (Select your seats now)

Figure 50: Wizz Recommended seat selection (screenshot, 18 April 2024). random at check-in’.

### Wizz Club Abo Model

**Wizz Club:** once the flights, login, seat and insurance options have been selected, one page comes to the Wizz Discount Club. This page promotes the Wizz Discount Club, an Abo model. Visually, the button is at the bottom of the page – there is only one button with the inscription “will become a member”. If you do not want to become a member of the Wizz Discount Club, there is a link at the bottom of the page “No, I don’t want to save EUR 20” to see it, but must be scrolled at the end of the page.

Membership costs EUR 39.99 per year. The Wizz Discount Club is advertised with ‘JETZT SPAREN: EUR 20’ of which is in small but bold characters ‘The annual amount for membership is EUR 39.90’. Rebates are also listed on the right-hand side of a blue box, with EUR 10 for members and EUR 5 for return baggage. However, it is unclear where the rebate has been or will be applied. Apart from the small textual reference, it is not clear that there will be an annual cost of more than EUR 30 and that a subscription will be concluded here. Consumers do not have an overview of the total cost of subscription.

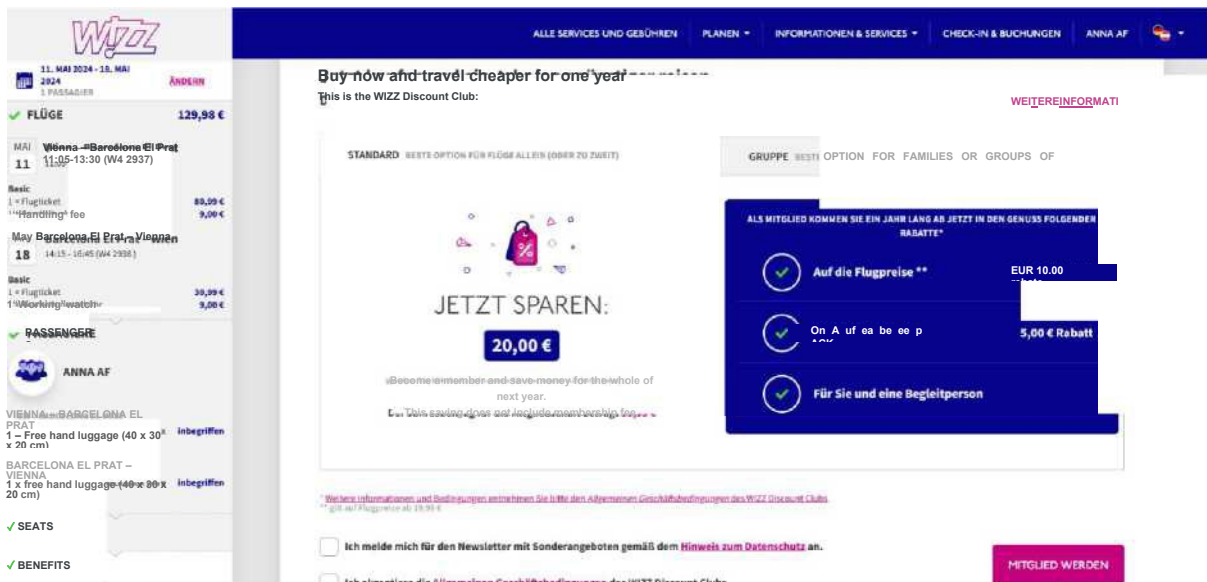


Figure 51: Wizz display Wizz Discount Club “Wizz become member” (Screenshot, 18/04/2024).



The screenshot displays the Wizz Air website interface. On the left, flight details for a round trip from Wien to Barcelona El Prat are shown, including flight numbers, times, and prices. The main content area features a large banner for the Wizz Discount Club, offering a 20,00 € discount. Below the banner, there are three checkboxes for opting out: 'Ich melde mich für den Newsletter mit Sonderangeboten gemäß dem Hinweis zum Datenschutz an.', 'Ich akzeptiere die Allgemeinen Geschäftsbedingungen des Wizz Discount Clubs.', and 'NEIN, ICH MÖCHTE NICHT 20,00€ SPAREN.' A 'MITGLIED WERDEN' button is also visible.

Figure 52: Wizz Discount Club – difficult opt-out (screenshot, 18 April 2024).

Wizz Air also offers numerous additional services. It can be booked by Wizz Priority (Priority Check-in and Hand Luggage) via auto-check-in (an automatic check-in through the system, 50 hours before departure), check-in at the airport, parking at the airport, airport transfer, security Fast Track, rental weighing, exclusive lounge access up to travel insurance. The wording is neutral here, only individual additional services are marked with a banner in dark blue and the heading 'Recommendation'.

The screenshot displays the Wizz Air website interface for additional services. The left sidebar shows flight details for a round trip from Wien to Tirana. The main content area features a large banner for Wizz Priority, offering benefits like 'Beneath the first on board' and 'Hand luggage (max. 40 x 30 x 20 cm) free of charge'. Below the banner, there are two checkboxes for opting out: 'Ich melde mich für den Newsletter mit Sonderangeboten gemäß dem Hinweis zum Datenschutz an.' and 'Ich akzeptiere die Allgemeinen Geschäftsbedingungen des Wizz Discount Clubs.' A 'MITGLIED WERDEN' button is also visible.

Figure 53: Wizz Air additional services (screenshot, 3 May 2024).

### 4.3.2 Analysis

Nagging for the selection of the Wizz Discount Club

If you bore a flight at Wizz Air, you have the option to choose the standard price, which is more expensive by EUR 10, or the discounted Wizz discount club. In the first step, if the more expensive standard price option is chosen, the first one is asked whether to select an

additional tariff package. The choice is between the 'Everything drin & Flexible', 'Packing and Saving' and 'Quality Travel', all of which are highlighted in colour. If you do not choose these packages, there will be an excavated button labelled as "Further for EUR 45.99". This process is repeated in the selection of the return flight. This type of booking process can be **described** as nagging, as customers have to always opt out of the Wizz Abomodel of the Wizz Discount Club as well as the more expensive tariff packages. It also prevents a transparent comparison of prices (**Comparison Prevention, Nagging**).

Even later in the booking process, customers are again asked to become members of the Discount Club, in the form of an advertising page. The buttons on the Wizz Air Discount Club advertising page are biased (**tagging, deliberate Misdirection**). Only one button is listed, it is pink and is labelled 'MITGLIED WERDEN'. If customers do not want to become a member, there is no apparent alternative at first sight. In order not to become a member, it is necessary to scroll at the end of the page, where there is an invisible link in pink on the stands 'NO, SHALL NOT YOUTH EUR 20.00 SPAREN'. The emotionally biased formulation can be **classified as** "confirm Shaming" and the processes are biased (**confirm Shaming, deliberate Misdirection**). By clicking on the link, you will be redirected to the payment page.

#### Trickwording and confirmshaming in the selection of seats

If the original decision is retained and no tariffs or additional services are chosen, an advertising page for the Wizz Discount Club appears after the choice of seats. The whole page is used to apply for the subscription, without clearly indicating that the discount club is an underwriting model. **TrickWording and Confirm Shaming tactics** are used to motivate customers to graduate. It advertises words such as "JETZT SPAREN", "buy now and travel for a year", "as a member, they will benefit from the following rebates for one year from now". The discounts are in fact EUR 10 discount on the fare and EUR 5 discount on take-over luggage. Membership costs EUR 39.99 per year. When comparing the costs of membership (39.99) of savings (15.00), it is made clear that at least three journeys via Wizz Air would have to be booked and that the costs of the subscription would be amortised (**Trick Wording, Confirm Shaming, Comparison Prevention, Hidden Costs**).

The design of Wizz Air's baggage selection is opaque with regard to price options for very similar services (10 kg of return baggage versus 10 kg of cabin baggage)(**comparison prevention**). If customers do not choose a tariff package that includes a piece of hand or task luggage, hand and task luggage may be booked later. However, there are significant price differences here. For example, on a flight from Vienna to Tirana, a 10 kg check-in baggage costs EUR 12.95 for the outward flight and EUR 10 for the return flight, which gives a total surcharge of EUR 22.95 for a 10 kg baggage. However, if the customer chooses the option of an additional 10 kg of hand luggage (same size, same weight as the return baggage) instead of the return baggage, this option costs EUR 23.84 per flight, resulting in a total surcharge of EUR 47.68. The only advantage for travellers is 'Priority Boarding and Priority Check-in', which does not require the check-in, as it is additional hand luggage, not job baggage. Pricing is not intuitive here and thus prevents mental budgeting that is understandable to customers (**comparison prevention**).

In the case of Wizz Air, the tender for a paid seat selection is clearly worded as 'seat selection'. A dark pattern will only be used later in the booking process: In the remainder of the booking process, one page appears again for the choice of seats subject to payment. It is highlighted (folded) on the right-hand side of a tab with 'Seating places recommended by Wizz Air'. Despite the previous decision against the additional service, users must again

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make the decision with the following information: 'If you do not select seats, the allocation will be random at the checkin' (**NAgging**).

Wizz Air had no separate dark patterns when booking additional services such as insurance, but only had to be confirmed that they wanted to travel without travel insurance. Certain services have been highlighted as a 'recommendation', which can also be considered as a promotional activity.

**Legal classification:** The use of 'nagging' in the selection of the 'Wizz Discount Club' and '**Trickwording**' and '**Confirmshaming**' in the choice of seats actually or is likely to cause consumers to take a transactional decision that they would not have taken otherwise. The question therefore arises as to whether the use of those dark patterns is to be regarded as an aggressive commercial practice on the basis of undue influence within the meaning of Article 8 of the UCPD.

## Case Study “Opodo”

### 4.4.1 Documentation

**Documentation basis:** Screenshots of the booking process of 18 April 2024 and preliminary searches in April 2023. Please note that the booking process is regularly changed and that the examples should only be used with reference to date.

The flight booking at Opodo is similar to the other examples, with the selection of the desired flight data and the time of the flight. A price is displayed at this stage, but it is only the ‘prime price’ – a reduced price associated with a subscription. There is no indication of the price of the flight without abo.

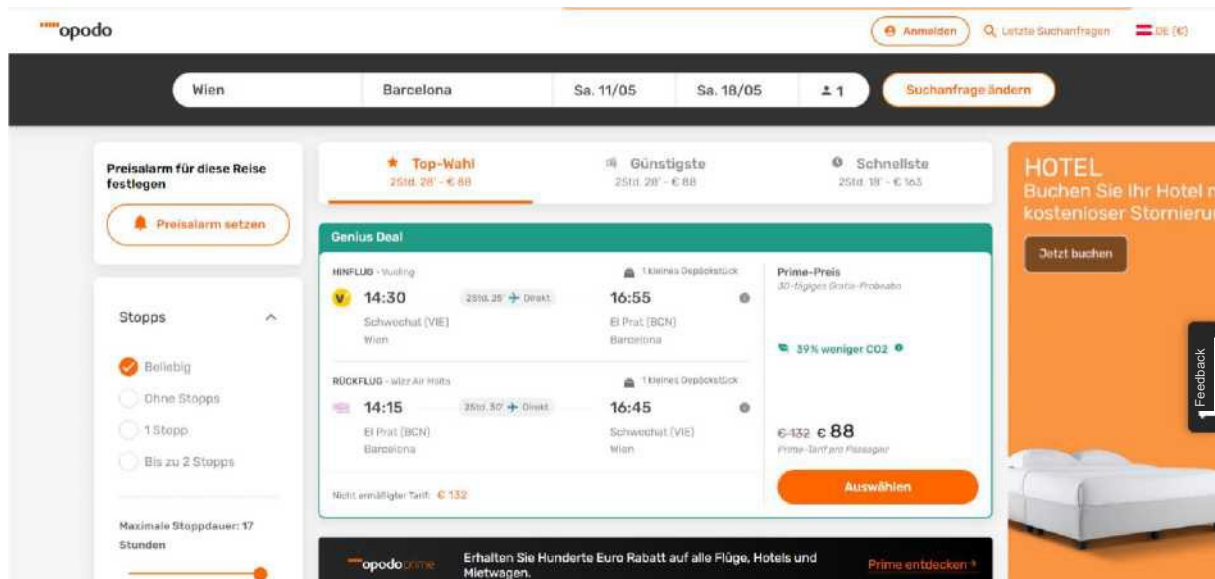


Figure 54: Opodo’s first view of the prize, Prime-Deal. (Screenshot, 18 April 2024).

In addition to the flights to be selected, there is one button, coloured orange, with the text 'Select'. At first sight, it does not appear that this is a decision for an Abo. To switch to the regular price, click on the digit on the left of the window. The words 'Non-reduced tariff: EUR 132'. In this case, the non-reduced fare, i.e. the fare without subscription, is EUR 44 more expensive than the flight including abo.

**Get hundreds of euros discount on all flights, hotels and cars.**



**Opodo**

**Discover Prime'**

Figure 55: Opodo non-reduced tariff. (Screenshot, 18 April 2024).

If a user chooses the prime prize (select button), it goes as usual. Until the end, there is no succinct indication that a subscription will be concluded and under what conditions. Only the breakdown of costs is marked on the right: ‘Free Probabo’ with a price of EUR 0.

### Supplements

- Travel with Basie Support

#### ~Opodo 11

Standard price EUR	131.59
Prime rebate —EUR	44.80
Free probeabo EUR	0.00

**Total price** EUR86.79

Taxes and payment charges included

>✓ Flexible travel data added ©

Figure 56: Opodo Price Breakdown (Screenshot, 18.4.2024).

### Choice of seating position

The decision not to select an extra seat for a fee will result in a pop-up entitled ‘Window or gear?’ and two buttons: ‘Continuously without a seat’ or ‘Select seating position’. In colour, the button ‘Nurther without a seat’ is highlighted.

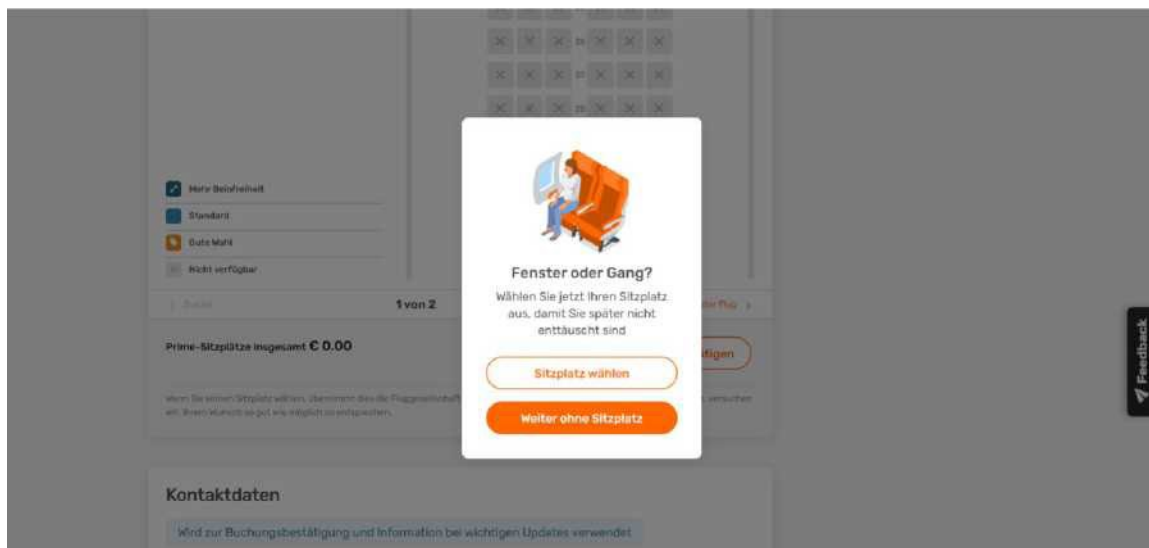


Figure 57: Opodo – Pop-Up “Further without a seat”. (Screenshot, 18 April 2024).

### Customer service as an additional service

In the booking process, users are asked which customer servicepackage they want to use. Three tariffs are available: 'Basic support', 'Standard support' and 'Premium support'. If a user selects the basic support, a pop-up that challenges this decision will follow: "Is basic support sufficient?".

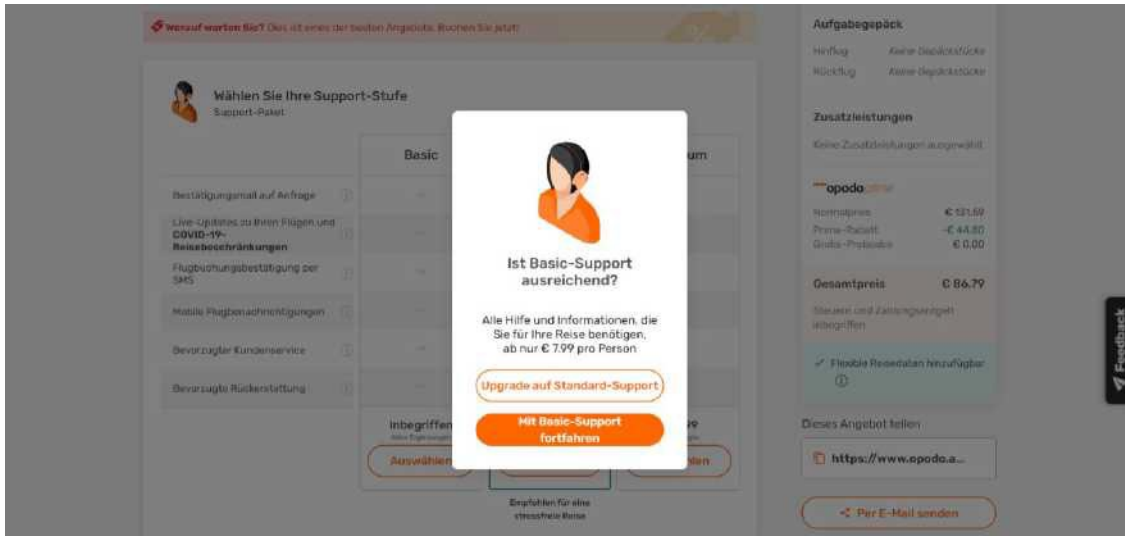


Figure 58: Opodo, pop-up with demand for customer service (Screenshot, 18 April 2024).

### Opodo Prime

It is only after these steps (inquiries about additional services such as support, insurance, etc.) that the information on Prime Plus, Opodo's subscription model, appears before payment, when clicking on 'Further'.[Insurance\(g.\)](#)

All premiums include insurance tax;

#### Prime Plus Prime



**Opodo Prime**

30 days free sample: can be terminated online at any time

#### Reduced Prime Tariff +EUR 0,00

Pay less today and save hundreds of euros on all flights, hotels and cars

VIP customer support: We accept almost every call within 60 seconds

\*S Today, Prime tests free of charge for 30 days. Cancel online at any time or stay for EUR 89.99 per year

#### Discover Prime

By signing in, you can cancel the **General Terms and Conditions** at any time by clicking on "To cancel my subscription" in your account. It seems that you already have an Opodo>Account Would you want **to register?**

#### Non-reduced tariff + EUR 44.80

Full tariff without prime\* discount

**Go to payment**

*Figure 59: Opodo Prime pre-purchase advertisement (Screenshot, 18 April 2024).*

The prime subscription must be selected again and/or selected. It is possible to choose between two subscription models, in addition to Prime Plus, and Prime – both for the time being free of charge, after one month, the cost is EUR 89 and EUR 99 per year, respectively.

None of the Abos is pre-selected, but the descriptions of the abos are conclusive. Formulations such as 'reduced prime tariff', '30-day free sample at any time online', 'grand! You will receive a 30-day free sample for Prime, and "+ 0.000" with neutral to negative descriptions. In the case of non-selection of Prime or Prime Plus, only the words 'non-reduced tariff' and '+ 44.80' are used.

If costs are broken down, the non-reduced tariff is nevertheless cheaper, as the subscription costs of EUR 89 and EUR 99 respectively are not included as part of the total price.



Prime Plus Prime



Opodo Prime

30 days free sample: can be terminated online at any time

• Reduced prime tariff + C0.00

- Pay less today and save hundreds of euros on all flights, hotels and cars
- Share your travel discounts with up to 9 friends
- VIP customer support: We accept almost every call within 60 seconds
- You can cancel flights booked at the end of the free sample for any reason and will be refunded immediately in the form of a credit note.
- Now test Prime free for 30 days. Cancel online at any time or stay for EUR 99.99 per year

Discover Prime

Q Greatness! You will receive a 30-day free sample for Prime.

By signing in, you can cancel the General Terms and Conditions SI e at any time by clicking on "Cend my subscription" in your account. It seems that you already have an Opodo account! Want to register

Non-reduced tariff 4-C 44,80

Full tariff without prime rebate

Now test Prime 30 days free of charge. Cancel online at any time.

Order Prime for a fee

And continue with payment transactions

Figure 60: Opodo Prime Display – Button solution (Screenshot, 18.4.2024).

When selecting the subscription model, in this example 'Prime Plus', clicking on the orange coloured button with the inscription 'Order for a fee' leads to payment. The button solution is correctly implemented here, although the total price (costs including subscription costs) is also not included.

On the pay side, there is a further decision or demand. In addition, a flexible fare is offered, allowing flights to change their dates. Two buttons appear, on the left a decent button in white with the words 'buy now' with the original price. To the right, an orange button, which is more visually visible, with the words 'Option for change of date' and a more expensive price (EUR 104,75 instead of EUR 86.79).

Pay safely

Your payment is 100 % sure  
31 % cheaper than the average price!

Booking and payment information

I have read and accepted the Opodo All business [conditionandthe tariffrulesof the company](#) and, if applicable [for my booking, the conditionsfor insurance for flexible travel data](#).

Your payment information is stored securely to facilitate the management of bookings and the renewal of membership. You can manage your payment information under 'My Account'.

For more information on how to manage your payment information, please visit [our client centre](#) and our [therefore](#).



Figure 61: Book additional service, change of date option (Screenshot, 18.4.2024).

### 4.4.2 Analysis

It is difficult for Opodo to book a flight without a subscription. Consumers are put in a variety of visual stumbling blocks (obstruction, nagging)to encourage them to become Opodo Prime members (Opodo Abo Model). In particular, the 'selection' button, which selects a flight and

leads to the further steps in the booking process, is striking. If the user clicks on this button, which at first sight is the only way to proceed with the booking process, the prime subscription is automatically selected (**Hidden Subscription, Hidden Costs**).

The air fare, or the total price of the trip, is then shown only including the prime discount, but the breakdown of the total price does not include the cost of the subscription (**Hidden Costs**). The fact that you sign up for a subscription will only become apparent in the final step before the accounts are closed. The last option is the choice between Prime Plus or Prime Subscription. In this selection, customers are confronted with ‘**confirm Shaming**’ and tendentious formulations. The Abo models are described in floral terms such as ‘reduced prime tariff’, ‘pay less today and save hundreds of euros’, ‘15-day free sample: can be terminated online at any time’. Even when selecting the subscription models, the total price of the trip, which is always visible at the right edge of the screen, is not updated (**Hidden Costs**).

The EUR 84.99 cost of the subscription (Prime Plus) if it is not terminated after 15 days does not appear at any time (**Hidden Costs, Hidden Subscription**). To do so, consumers need to read the small print in the description of Prime Plus and Prime Abo. If the 14-day notice period is not met (cancellation must reach Opodo 24 hours before the deadline), the subscription is concluded for one year and invoiced under the billing dates indicated for the flight booking. If the subscription is not terminated after one year, the subscription is extended for an indefinite period (see Opodo AGB Prime).<sup>43</sup>

Opodo also uses **Confirm Shaming, which does not select paid seats**. A pop-up appears here and interrupts the booking process with the suggestive question: “Window or gear? Now choose your seat so that you are not disappointed later’ (**Confirm Shaming**). Underneath, two buttons appear, in white, orange, ‘Select seat’ and only in orange ‘Next without a seat’. The wording itself suggests that, in the case of ‘north without a seat’, a flight is booked where no seat is guaranteed, which is not in line with the facts (**Trick Wording**). The graphic design of the buttons contrasts with the intention that can be assumed behind this wording, since the option ‘Next without a seat’ is visually highlighted. Once a trip without supplementary insurance is required via Opodo, a pop-up indicates that no insurance has been selected (**Nagging**). In addition, the pop-up text ‘**Confirm Shaming**’ uses suggestive wording to encourage travellers to take out insurance: “Do not take unnecessary risks! Reassure your journey!”

**Legal assessment: In this case, the** existence of a particular price advantage depends on consumers taking a subscription. However, this is not clearly communicated to consumers until the last step before the closure of the accounts. The design techniques used are therefore manipulative in that they are likely to mislead consumers as to the actual price of booking and the existence of a price advantage. The design and use of dark patterns could therefore be regarded as a misleading commercial practice within the meaning of Article 7(2) of the UCPD. In addition, the emotional messages can lead consumers to make business decisions that they would not have taken otherwise. When using such design techniques, operators must therefore ensure that consumers are at the same time informed of what risks they would have to assume without insurance or what specific benefits they would have from taking out insurance. When choosing the seating position, the option ‘Next without a seat’ must also be designed in such a way as to give consumers a clear understanding of the consequences of their choice. Without this information, it is not

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<sup>43</sup> Opodo Prime [AGB](https://www.opodo.at/prime/agb-uebersicht/), <https://www.opodo.at/prime/agb-uebersicht/>

possible for consumers to make an informed transactional decision. For this reason, the design used could be regarded as a misleading commercial practice within the meaning of Article 7(1) of the UCPD. In that regard, there is also a recent decision of the OGH, which, following an action brought by the Chambers of Labour, ruled that the paid Opodo-Prime membership when booking a trip is invalid. Consumers can therefore claim back money for membership.<sup>44</sup>

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<sup>44</sup>(Chamber of Labour, 2024)

## 5 registration processes on social media

Social media platforms play a central role as facilitators of digital user experience. They have long been more than apps to get in touch with others. Their recommender systems create tailor-made experiences; they shape what news users read, but also what consumption decisions they make; to do so, they use their users' data. Where should the regulatory lever be based on the fact that it is precisely this type of data-based, personalised experience, which also constitutes the irritation of social media, that is not eradicated?

Privacy settings are an important lever in strengthening user rights. Madejski et al. noted that users' perceived privacy settings often do not match the actual settings.<sup>45</sup> In addition, the first privacy settings used by users when registering on social media platforms are often crucial to the level of protection of their personal data.<sup>46</sup> However, there are concerns about the effectiveness of these settings, as users may not fully understand their impact.<sup>47</sup> It is therefore important that social media platforms provide clear and user-friendly privacy settings to ensure that users can make informed decisions about their privacy. The settings are often not changed, even when the user account is in existence, so settings when a new account is registered is a powerful lever that significantly influences future user experiments in terms of privacy and personalisation.<sup>48</sup>

With the entry into force of various regulations (DSA, DMA, GDPR), the legal framework was drawn here. The **Digital Markets Act (DMA)** defines a '**gatekeeper**' where it has a significant influence on the internal market, provides a core platform service that serves as an important gateway for business users to reach end users, and has an entrenched and durable position in its operations, or it is foreseeable that it will enjoy such a position in the near future.<sup>49</sup> On 6 September 2023, the European Commission appointed six gatekeepers under the Digital Markets Act: Alphabet, Amazon, Apple, ByteDance, Meta, and Microsoft. A total of 22 core platform services offered by these gatekeepers have been designated. These include social networks such as TikTok, Facebook, Instagram, YouTube and LinkedIn.<sup>50</sup>

Gatekeepers process personal data of end users for the purpose of providing online advertising. In addition, third parties using the gatekeeper platform also provide the gatekeepers with personal data of their own end users to benefit from the platform services. This gives gatekeepers a potential market advantage as their business model is data-based. Therefore, the DMA requires gatekeepers to obtain the consent of end users under the GDPR to process personal data for their data-driven commercial practices and limits the legal bases on which they can rely. Consequently, gatekeepers should allow end users to freely decide whether to accept such data processing and opt-in practices by offering a less personalised but equivalent alternative, without making the use of the core service of the platform or specific functionalities conditional on end-users' consent. To this end, in addition to consent under the DSA, Article 6(1)(c), (d) and (e) GDPR and not Article 6(1)(b) and (f) GDPR could also be used as the legal basis for the processing.

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45(Madejski et al., 2012)

46(Litt, 2013)

47(Burkell et al., 2013)

48(Princi & Krämer, 2020; Sangeeta, 2015)

49Section 3(1) of the Digital Markets Act

50 (European Commission, 2024a), see also: [https://digital-markets-act.ec.europa.eu/gatekeepers\\_en](https://digital-markets-act.ec.europa.eu/gatekeepers_en)

If the consent of end-users is required for data processing, consent must comply with the conditions of the GDPR.<sup>51</sup> Gatekeepers must inform end users about the consequences of non-consent. For consent to remain free, they need to offer a less personalised but equivalent alternative without making the use of the core service of the platform or specific functionalities conditional on end-users' consent.<sup>52</sup>

The **Digital Services Act (DSA)** focuses more on online content regulation. The regulation already applies to 'very large online platforms' (VLOPs). LinkedIn, Facebook, Instagram, TikTok, YouTube, Snapchat and X; these are referred to as VLOPs under the DSA.<sup>53</sup> There are some overlaps between undertakings referred to as gatekeepers under the DMA and VLOPs under the DSA. Companies subject to both laws must comply with both rules. Under Article 28 of the DSA, providers of online platforms may not display on their interface advertising based on profiling, within the meaning of the GDPR, using end-users' personal data, provided that they have reasonable assurance that the person concerned is a minor. Furthermore, advertising based on 'profiling' of 'special category' data within the meaning of the GDPR is prohibited under the DSA.<sup>54</sup> The DSA introduces transparency requirements for advertisements displayed on all online platforms, as well as additional transparency requirements and requirements to carry out a risk assessment of potential systemic risks for VLOPs. VLOPs are also required under the DSA to keep an archive for the entire period during which they display advertisements and for one year after the advertisement was last displayed on their online

Create interfaces and make them publicly available. That repository contains information such as the content of the advertisement, the natural or legal person on whose behalf the advertisement was placed, the period during which the advertisement was placed, whether the advertisement was intended for one or more specific groups of users and the total number of users reached.<sup>55</sup>

The following two case studies review how users are informed about their rights when registering a new user account – in the case of a 16-year-old user – in the light of the current legal framework outlined in advance. As far as personalisation is concerned, there have been some improvements in the past year, so users can currently partially determine the intensity of personalisation and the personal data that may be accessed for advertising purposes. However, in view of the need to negotiate between users who, on the one hand, wish to be authorised to manage their personal information as accurately as possible and, on the other hand, have an interest in obtaining user experiments that are as relevant to them as possible – with the interests of platforms and advertisers working on them – the question arises: How are these processes designed and can they find dark patterns? This was the reason for TikTok and Instagram: Is personalised advertising being issued despite the ban? Are the profiles created automatically public or private? Are dark patterns used to guide user decisions into business interests?

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51Recital 36 Digital Markets Act

52Recital 37 Digital Markets Act

53(European Commission, 2024c)

54Section 26(3) Digital Services Act

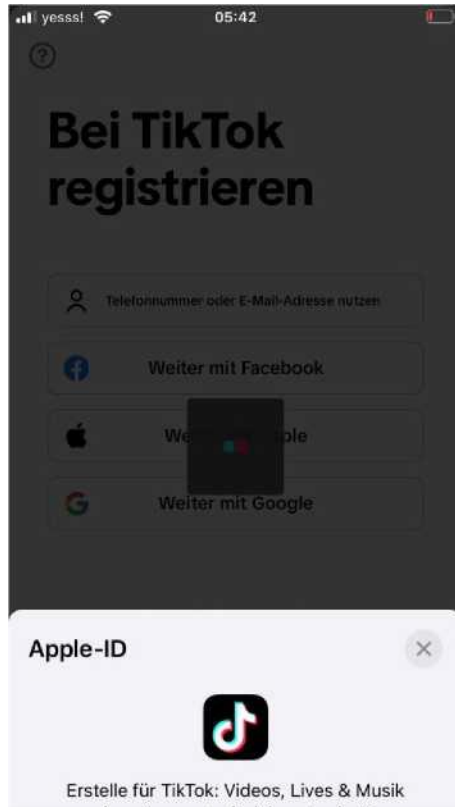
55Section 39 Digital Services Act

## 5.1 TikTok Case Study

### 5.1.1 Documentation

**Documentation basis:** Screenshots from the registration process on TikTok (date: 2 April 2024). An iPhone was used for this purpose and attention was paid to the age of the user (date of birth on 1 March 2008).

After downloading the TikTok app from the Apple App store, registration will follow. An



account can be created by using your own phone number or e-mail address. The option to register via Google, Facebook (Meta) or Apple ID is also available. As the Apple ID was already placed on the device and the information that the user of the smartphone is 16 years old has already been filed, the option 'Register with Apple ID' was chosen.

After registration, TikTok was informed that the content would be personalised on the basis of one's own behaviour (content viewed) (Fig. 63.).

In the next step, it was asked whether users would like to see personalised advertising or general advertising. Both options were designed in the same way, a score 'possibly less

relevant' was found in Wording (Figure 64).

Figure 62: Log in to TikTok with Apple ID (screenshot, 2.4.2024).

I YESS!

05:45

## Swipe up

Videos will be personalised for you on the basis of the content you look at



Figure 63: Information on personalisation, TikTok (screenshot, 2 April 2024).

This is an opt-in that should not be possible in this form for a minor (simulated user under the age of 18), as the DSA prohibits personalised advertising for minors in the European Union.

**Personalised advertising:** The displayed ads will be personalised on TikTok based on your activities. We also use third-party data, but only if you have activated the tracking on your device.

**General displays:** The advertising you see may be less relevant for you.

### Choose how to advertise displays

Allow us to use your data to help you show relevant advertising so that TikTok remains free of charge. Discover more. In our You can also read a privacy statement: we use and protect your data.

#### Personalised advertising

The displayed ads will be personalised on TikTok based on your activities. We also use third-party data, but only if you have activated the tracking on your device.

Selections

#### General ads

The advertising you see may be less relevant for you.

Selections

You can do so in your 'display' settings update at any time.

Figure 64: 'Select as advertised', TikTok (screenshot, 2.4.2024).

"ii YESSS! 10:38 B  
& Show  
Managed the ads you are watching  
Manage 3 conclusions  
Change the factors used to personalise the displayed displays.  
£ Stummation of advertising media Stumms of ads of certain advertising media that have recently displayed advertisements on TikTok.  
Share feedback  
Give us your feedback on advertisements that generated interactions or on purchases due to ads  
Manage data used for display personalisation  
Personalised advertising  
If this option is activated, you will use personalised advertising based on your activities in TikTok and the data we have received from third parties. If you do not act on this attitude, you will still see adverts that may not be relevant to you. Please note that your personalised advertisement is not based on the tracking of your activities through the data received from third parties, if you have deactivated the tracking in your device settings, but this setting at TikTok

Also in case of re-examination: The advertisements on TikTok are also personalised with an indication of the age below the age of 18.

These settings can be changed under 'Settings'>'Display'.

When opening the app, TikTok asks to have access to the user's contacts: "TikTok wants to access your contacts. Synchronise your contacts to easily find people you know from TikTok. Your contacts will only be used to connect you with friends."

Figure 65: Settings to display on TikTok, User Profile Anna (Screenshot, 2.4.2024).

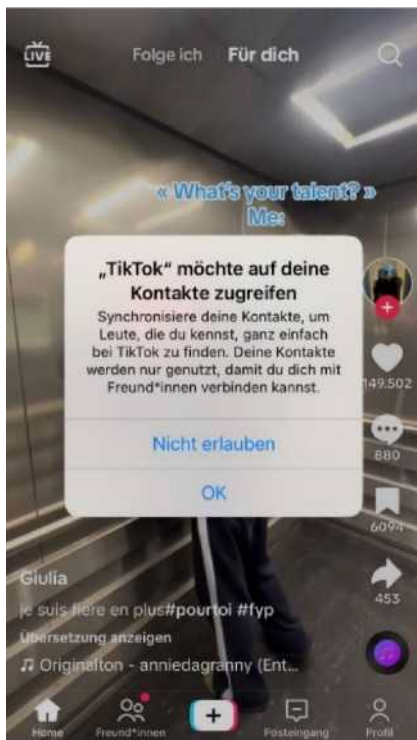


Figure 66: Pop-up on TikTok (Screenshot, 2.4.2024).



Figure 67: Pop-up on TikTok (Screenshot, 2.4.2024).



|| YESSS! 10:36  
& Privacy

The privacy settings at TikTok are set in a standardised open way.

Private account

With a private account, only authorised users can follow you and watch your videos. This does not affect existing followers.

Findability  
Activity status

If this setting is activated, you and the followers you also follow will see the activity status of the other. You will only see the activity status of the other if you have both activated this setting.

Standardised, each new TikTok account is public. If one wants to have a private profile, including as a minor, such as Testpersona Anna, this needs to be changed manually.

Suggest to others your account

The own profile of other contacts is also proposed by automated means. For example, the TikTok profile is easy to find for others.

Contacts and Facebook  
Synchronise friends

Your own profile is thus proposed to your own contacts, Facebook friends and people who open links or send you.

Location services

Managed the location data that TikTok uses to personalise your experience

By default, all comments can be seen by anyone under one's own or foreign videos, or all users of TikTok can comment under any video without

Interactions

Figure 68 Privacy settings TikTok – Private account restriction. (screenshot, 2.4.2024).

If the test user Anna is tagged (marked) in another video, it is possible from all accounts, whether Anna is linked to the profile she has flagged or not. Standardised 'Stitches' (quote a video/video response to a previously posted video) are also possible, regardless of whether Anna is connected to the profile or not.

5.1.2 Analysis

The analysis of the documented registration process on TikTok reveals several problematic aspects that constitute both dark patterns and possible infringements within the meaning of the Digital Services Act (DSA). In particular, the documented handling of child users is critical, as they are a particularly vulnerable group.

In the registration process, TikTok offers various methods that can also be used for age verification, including the use of the Apple ID, where the age is already deposited. In this case, a minor was registered (date of birth 1.3.2008, User-Name Anna). TikTok seems to cover age, but no sufficiently specific protective measures are implemented. A key point here is to present the options for

|| YESSS! 10:37  
& browse before your account

Contacts

Suggest your contact(s) in your account. For this setting, you need to add a phone number, add an email address or synchronise your contacts.

Friends of Facebook

Suggest your Facebook friends in your account. For this setting, you need to connect to a Facebook account.

People who open links or send you

Suggest in your account persons who have sent you links or opened links that you sent them. This includes links to TikTok content shared outside TikTok.

Figure 69: Suggest others in your account Pre, TikTok (Screenshot, 2.4.2024).

personalised advertising. EU rules, in particular the DSA, prohibit personalised advertising for minors. However, TikTok offers the possibility to choose between personalised and general advertising, including for Testpersona Anna, who indicated her age at 16 (Fig. 64, Figure 65). Although the formulation of the options does not contain obvious dark patterns, the existence of this choice for minors is a clear violation of the DSA. Personalised advertising should not be an option for minors.

TikTok also uses very open privacy settings by default: This concerns standardised public profiles, automated synchronisation of contacts and automatic profile proposals (Fig. 68, Figure 69). New accounts are by default public, which is particularly problematic for underage users (**preselection**). Visibility needs to be manually switched to private, which many minors may not do. The default settings, which most users maintain and do not change manually or retrospectively, give a lot to the user behaviour of the individual. In a second test, an account was created with a 13-year-old tester. Here, TikTok offered a number of educational videos that users could have seen. In addition, the profile of the 13-year-old persona was automatically privateised and all other share functions such as proposing the profile were switched off in a standardised manner.

TikTok requests access to the contacts every time the app is opened (Fig. 66, Figure 67). This practice could be seen as a dark pattern, as it induces users to disclose more personal data than necessary (**privacy Zuckering, Nagging, obstruction**). Profiles are also automatically proposed to other contacts and Facebook friends, significantly increasing the visibility and findability of their own profile.

The standard configuration allows unrestricted interactions with the user's own profile and content, including comments and markings by unknown persons. These default settings are of particular concern for child users, as they may endanger their security and privacy.

In addition, TikTok's default settings show a clear trend of openness, contrary to the principle of data minimisation. Minors users are often unaware of the reach of their data release and the associated risks. This practice can be seen as a manipulative design that leads users to disclose more personal information than they intend to do (**privacy Zuckering**).

The registration process and standardised settings at TikTok show clear indications of the use of dark patterns, in particular through non-transparent and open default settings and the provision of personalised advertising for minors. These practices are contrary to the requirements of the DSA and GDPR, which aim to ensure the protection of the privacy and data of users, in particular minors.

## Case Study “Instagram”

### 5.2.1 Documentation

**Documentation basis:** Documented was the Instagram Registration process (2.4.2024) – an iPhone was used for this purpose and attention was paid to the age of a minor (date of birth 1 March 2008).

After downloading and opening for the first time the Instagram app is first asked for the consent for third-party cookies. ‘Allow the use of cookies by Instagram?’ – here Meta specifies that content and advertising are offered and personalised via cookies ‘(if we show you)’.

The design of the buttons is suggestive in colour: the ‘allow all cookies’ button is in a light and visually more visible blue, the ‘Optional Cookies Reject’ button in unobtrusive light grey. Instagram’s terms of use must be approved for the use of the app.

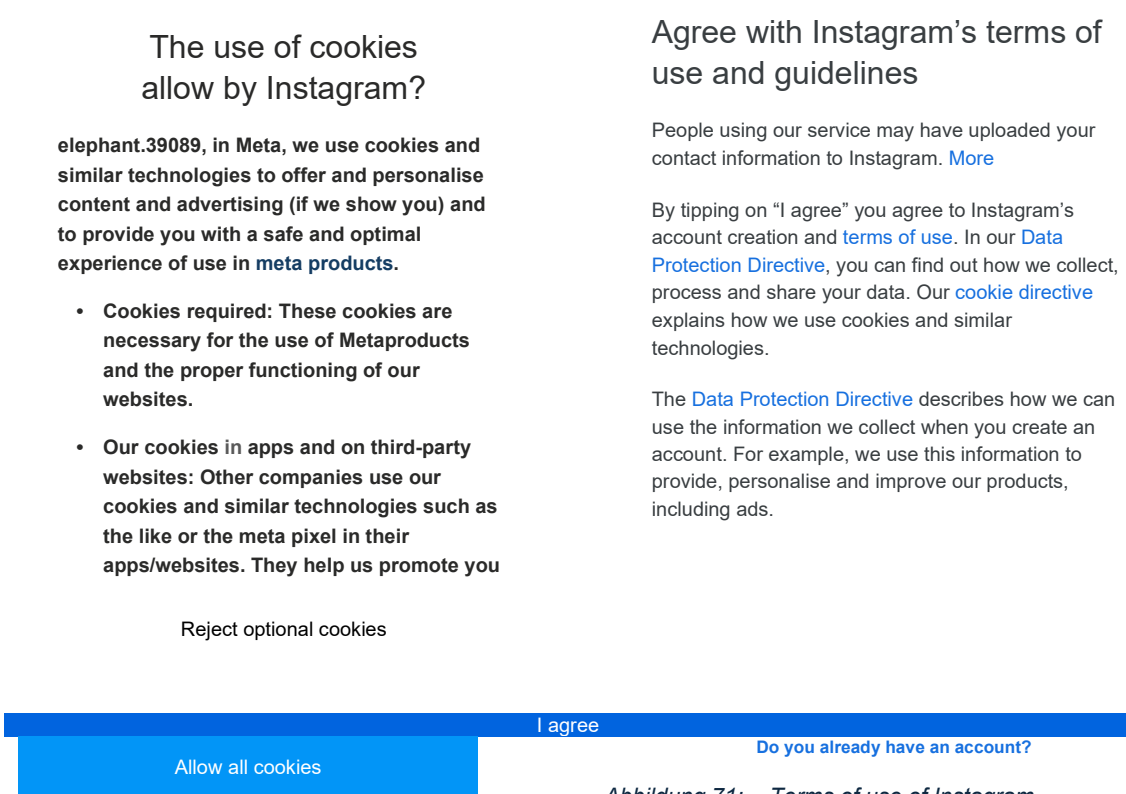


Abbildung 70: Use of cookies on Instagram (screenshot, 2.4.2024).

Abbildung 71: Terms of use of Instagram (Screenshot, 2 April 2024).

**Instagram joins  
Friends even more fun.  
Let's get in touch  
synchronise them to:  
find.**

If you have access to your contacts  
let's get better  
Provide service.

We use your contacts to help you  
connect with people you know and  
recommend things that matter to  
you.

Your contacts will then be  
continuously synchronised and  
stored securely on our servers.

In the settings, you can deactivate  
the synchronisation at any time.  
[More Info](#)

Weiter

Figure 72: Contact request synchronise Instagram (screenshot, 2.4.2024).

Instagram also uses suggestive wording when synchronising contacts. "Instagram is even more fun with friends. Let your contacts synchronise to find them.' The app then asks for access to the contacts stored on the smartphone.

The buttons to confirm or refuse access to one's contacts are neutral. The "do not allow" option is the first one.

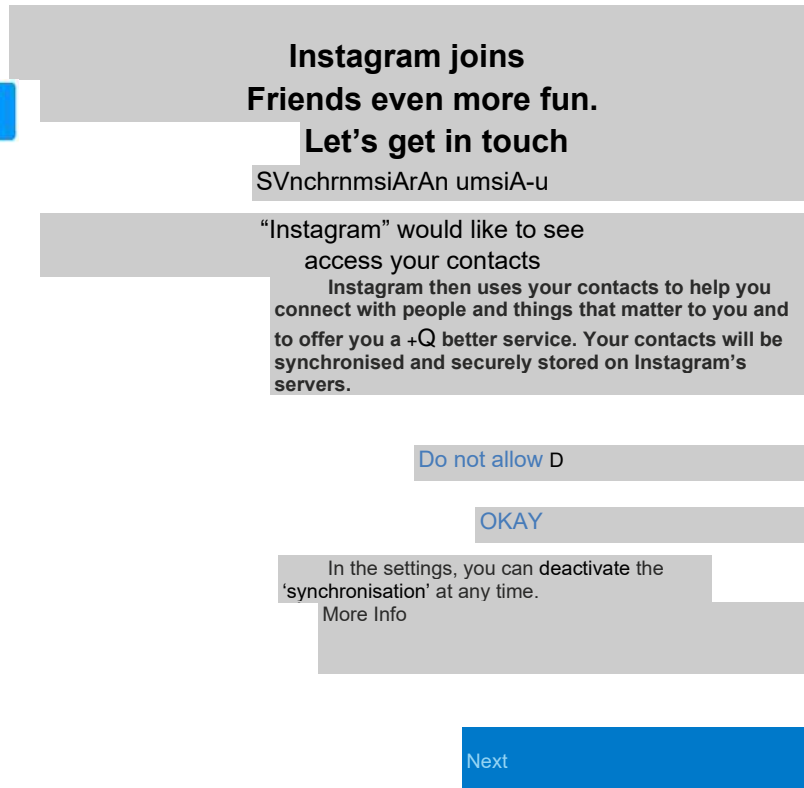


Figure 73: Access to Instagram Pop-Up contacts (screenshot, 2.4.2024).

### Account privacy

Determine who can see what you share. You can do so at any time in the settings amend.

Q Private  
Only accounts that you confirm can see your photos and videos.

(2) Public  
Everyone can see your photos and videos.

The next step in the registration is the identification of the account type. Here, users have to decide whether they prefer a public or private social media profile. Both options are presented as equivalent and the private Instagram profile is pre-selected upon registration.

The choice between private and public profiles is explained sober: "Private – only accounts you confirm can see your photos and videos" vs. "Public – Everyone can see your photos and videos".



Figure 74: Privacy account Instagram settings (screenshot, 2.4.2024).

In the next step, the Instagram app asks to allow notifications. Different designs are used, under the heading 'Activate notifications', the 'activating' button is in blue, the link to skip the activation is not a button but a non-coloured link below it. The opt-out is therefore not designed as a button.

•The YESSS! 01:59 ' &AMP;

### Activate notifications

Always keep up to date with who follow you or comment on your contributions and mark 'Like'.

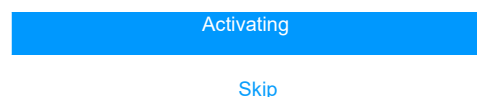
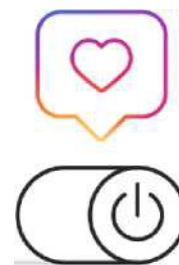


Figure 75: Enable notifications, Instagram (screenshot, 2.4.2024).

00 Meta

Now in the Accounts Overview

So that you have your account information and —settings towards meta-technologies such as: See Facebook and Instagram more easily you can keep your Account settings now in the Manage account overview. [More Info](#)

@ Accounts and Profiles

(PED Personal Details

(0) Password and security

|\_ your information and permissions

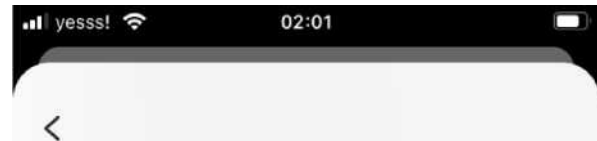
[g] Advertising preferences

Finally, further information is provided in the form of an account overview, and further recruitments and changes in the recruitments made can be made. For example, personal information, passwords, security settings, but also advertising preferences can be changed.

Clicking on the advertising preferences will make it clear, in the case of our test person Anna, that they cannot be changed or specifically recruited as Anna is under the age of 18.



Figure 76: Instagram settings (screenshot, 2.4.2024).



Advertising preferences

Advertising preferences are not available to you because we are currently not playing advertising to people under the age of 18 in your region.

Figure 77: Instagram advertising preferences (screenshot, 2 April 2024).

## 5.2.2 Analysis

The documented registration process on Instagram differs significantly from that in TikTok. Although Meta relies on some suggestive design elements, principles such as no personalised advertising for minors are taken seriously.

At the start of the registration process, the user is asked to consent to the use of third-party cookies. The design of the choices is suggestive: The button 'allow all cookies' is in a conspicuous blue, while the button 'Reject Optional Cookies' is in a less conspicuous light grey. This colour differentiation is a classic dark pattern aimed at encouraging users to consent to all cookies (**deliberate Misdirection, tagging**).

The same is true of the approval of the terms and conditions of use. While this is mandatory, it would be desirable to increase transparency and clarity as to what exactly these conditions include and what data processing practices are associated with. Especially for child users.

In the question on synchronisation of contacts, Instagram uses suggestive formulations to encourage users to synchronise their contacts: "Instagram is even more fun with friends. Let your contacts synchronise to find them."**(Confirmshaming, Emotional Stirring, PrivacyZuckering)** This wording aims to convince users to give access to their contacts. The buttons to confirm or refuse access are designed in a neutral way, with "do not allow" as the first. This reduces the impression of a dark pattern in this step, but suggesting wording remains problematic.

On the positive side, Instagram offers a clear choice between a public and a private profile. Both options are presented on an equal footing, with the private profile pre-selected. This is positive as it promotes privacy. The differences between the two types of account are clearly explained, which contributes to transparency and helps users to make informed decisions.

The request to allow notifications is again suggestive. The 'Activate' button is in blue, while the link to skip the activation is not highlighted in colour and is only presented as a text link below the button. This is another example of a dark pattern aimed at encouraging users to activate notifications (**deliberate Misdirection, nagging**).

After registration, users will be informed about other setting options, including personal details, passwords, security settings and advertising preferences. In the case of test person Anna, the advertising preferences cannot be changed or specifically recruited, in line with the DSA, which prohibits personalised advertising for minors. This shows that Instagram meets the legal requirements in this respect.

The registration process on Instagram shows both positive and negative aspects with regard to dark patterns and compliance with the DSA: The clear presentation of the account types and the default setting of a private profile are positive in terms of data protection and security. Moreover, the restriction of advertising preferences for minors is in line with the legal requirements.

The use of suggestive formulations and visual prominences when agreeing to cookies and notifications are examples of dark patterns that aim to persuade users to make decisions that may not be in their best interest. This is contrary to the principles of transparency and informed consent.

## 5.3 Excursion: Meta consent or pay model

In 2019, the Federal Cartel Office prohibited Facebook from combining user data from

various sources. In its press release, the Bundeskartellamt stated that, according to Facebook’s terms of service, users could only use the social network on the condition that Facebook also collects data about users outside the Facebook page on the internet or in smartphone apps and assigns them to the Facebook account.<sup>56</sup> That processing was carried out with the intention of being able to display targeted advertising to the users. In this case Meta took action against the Bundeskartellamt and the CJEU finally ruled that consent to data processing, in particular when required as a condition for the use of a service, is lawful only if it is freely given.<sup>57</sup>

Due to Meta’s dominant position, the consent obtained in this case cannot be considered as freely obtained. In doing so, the company responded to the CJEU judgment of July 2023 by implementing a ‘Consent or Pay’ model. Under this model, users have the choice either to agree to tracking for targeted advertising and to continue using the services free of charge or to pay an annual fee and not to be tracked.<sup>58</sup>

On 17 January 2024, the Dutch SA, which also acted on behalf of the Norwegian SA and the DE SA (Hamburger), requested an opinion from the EDPB on “Consent or Pay” models. The request concerns the circumstances in which large onlineplatforms that attract a large number of users in the European Economic Area can apply ‘consent or pay’ models for behavioural advertising that meet the requirement of effective and, in particular, free consent. The requesting authorities also pointed out that:

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<sup>56</sup>(Federal Cartel Office, 2019)

<sup>57</sup>CJEU C-252/21 Meta v Bundeskartellamt

<sup>58</sup> (NOYB, 2024) <https://noyb.eu/de/pay-or-okay-explained-why-more-and-more-websites-make-you-pay-your-privacy>



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that this question should be answered in the light of the judgment of the CJEU in Case C-252/21.

In its Opinion, the EDPB defined ‘Consent or Pay’ models as models where a controller offers data subjects the choice between at least two options to access an online service offered by the controller. The data subject may consent to the processing of his or her personal data for a specific purpose or may choose to pay a fee and access the online service without his or her personal data being processed for that purpose. 59 The EDPB Opinion focuses on models where consent is given to the processing of personal data for behavioural advertising purposes. In its opinion, the EDPB noted that ‘consent or pay’ models do not, in principle, comply with the requirements of the GDPR. In the EDPB’s view, the choice between consenting to the use of one’s own data for advertising purposes and the possibility to pay for access to a service does not constitute sufficient freedom of choice and is therefore contrary to the principle of free consent. This opinion encourages the major platforms to develop alternative models. Industry should consider other monetisation options and offer a third option to users, which remains free of charge but includes, for example, a different form of advertising involving less (or no) processing of personal data.

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59(European Data Protection Board, 2024) Opinion 08/2024 on Valid Consent in the Context of Consent or Pay Models Implemented by Large Online Platforms, Adopted on 17 April 2024

## 6 Tools

The PCS project collected and analysed tools to detect, block and document dark patterns. The aim was to obtain an overview of the tools already available, including their functioning and development potential. The aim of the project was to evaluate the extent to which suitable tools are already available on the market to facilitate monitoring from the point of view of consumer protection.

The tools that can also be recommended to consumers to avoid some dark patterns on websites are documented below.

### 6.1 Prevention of tracking & exclusion of cookie banners

The following tools prevent tracking cookies, third party cookies and other personalisation attempts, thereby also protecting against personalised dark patterns.

<b>Name</b>	<b>CookieBlock</b>
	Free
<b>Target</b>	Automated refusal of cookies
<b>Description</b>	The tool developed by ETH Zurich uses machine learning and blocks all cookies on the visited pages. Users can choose which cookies they want to block, so the extension browser avoids the individual clicking of cookie banners on each new website.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://chrome.google.com/webstore/detail/cookieblock/fbhiolckidkciamgcobpelcpcelckgnol?hl=de">https://chrome.google.com/webstore/detail/cookieblock/fbhiolckidkciamgcobpelcpcelckgnol?hl=de</a>

<b>Name</b>	<b>Ghostery</b>
	Free version available
<b>Target</b>	Prevent personalised tracking
<b>Description</b>	The tool detects and prevents websites trying to install third-party cookies. The tracking of search queries in search engines can be <u>stopped</u> ( <a href="https://whotracks.me/">https://whotracks.me/</a> ) and there is also a search engine without tracking. ( <a href="https://glowstery.com/">https://glowstery.com/</a> ) Ghostery applications thus offer enhanced tracking protection than, for example, a cookie block.
<b>Application</b>	Browser extension, website, search engine
<b>Link</b>	<a href="http://www.ghostery.com">www.ghostery.com</a>

<b>Name</b>	<b>Privacy Badger</b>
	Free
<b>Target</b>	Prevent personalised tracking
<b>Description</b>	Privacy Badger is a browser extension developed by EFF (Electronic Frontier Foundation). The 'algorithmic tracker blocker' Privacy Badger does not work with block lists but automatically recognises and learns to block trackers.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://privacybadger.org/">https://privacybadger.org/</a>

<b>Name</b>	<b>Tracking Exposed</b>
	Free
<b>Target</b>	Make personalised tracking on various social networks visible as a data structure.
<b>Description</b>	The tool does not prevent tracking, but makes it visible to users. This is done by collecting and visualising user tracking data and presenting the information collected. The data will be used for the Tracking Exposed research projects. The service is available for TikTok, YouTube, Facebook, Pornhub.
<b>Application</b>	Browser extension, website service
<b>Link</b>	<a href="https://tracking.exposed/">https://tracking.exposed/</a>

<b>Name</b>	<b>I Don't Care About Cookies</b>
	Free
<b>Target</b>	Preventing 'clicking' to reject or accept cookie banners.
<b>Description</b>	This browser extension removes cookie warnings from almost all websites, thus saving unnecessary clicks. It usually blocks or hides the cookie. Should the functionality of the website so require, the extension automatically accepts the cookiesdirective. In doing so, it can either accept all types of cookies or only the most necessary – depending on what is technically easier to implement. It is important to note that this extension does not delete cookies.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://www.i-dont-care-about-cookies.eu/de">https://www.i-dont-care-about-cookies.eu/de</a>

<b>Name</b>	<b>Nerve protectors</b>
	Free
<b>Target</b>	Blockage of pop-ups, including cookie banners
<b>Description</b>	In order to limit the interruptions of cookie banners, the Verbraucherzentrale Bayern offers the browser extension 'Nervenschoner', which successfully suppresses most banners.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://www.verbraucherzentrale-bayern.de/nervenschoner">https://www.verbraucherzentrale-bayern.de/nervenschoner</a>

<b>Name</b>	<b>Super Agent</b>
	Free
<b>Target</b>	Blocking of cookie banners
<b>Description</b>	The Super Agent fills in cookie consent forms based on user preferences. Users decide if and how they want to be tracked and ensure that their options are applied automatically and without any effort. Optional cookies are divided into three categories: Advertising, function and performance. Cookies that do not clearly belong to any of these categories will be automatically rejected.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://chrome.google.com/webstore/detail/super-agent-automatic/COO/neooppigbkahqfdhbbbhcccgpimeaafi">https://chrome.google.com/webstore/detail/super-agent-automatic/COO/neooppigbkahqfdhbbbhcccgpimeaafi</a>

<b>Name</b>	<b>Hush</b>
	Free
<b>Target</b>	Cookie blockers
<b>Description</b>	Blocks the invitation to accept cookies and invasive tracking in Safari on Mac, iPhone and iPad.
<b>Application</b>	App for iOs (Apple devices)
<b>Link</b>	<a href="https://oblador.github.io/hush/">https://oblador.github.io/hush/</a>

<b>Name</b>	<b>Datacentrics</b>
	Free test version
<b>Target</b>	Data protection audit for websites
<b>Description</b>	Does a website comply with data protection requirements? With the data protection audit, users verify the use and risk level of your website with regard to first-party and third-party cookies as well as third-party requests.
<b>Application</b>	Website, web service
<b>Link</b>	<a href="https://usercentrics.com/de/data-privacy-audit/">https://usercentrics.com/de/data-privacy-audit/</a>

## 6.2 Disguising advertising and recommendations

<b>Name</b>	<b>AdAnalyst</b>
	Free
<b>Target</b>	Visualising the personalisation of advertisements on Facebook
<b>Description</b>	The tool is for Facebook and shows consumers which ads are tailored to them, who or which groups see the same advertisement, and what information the company has about one. In doing so, the development team hopes for more transparency in Facebook advertising. It is the result of research projects. Its functionality is still limited outside the US.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://adanalyst.mpi-sws.org">https://adanalyst.mpi-sws.org</a>

<b>Name</b>	<b>AdAway</b>
	Free
<b>Target</b>	Advertising blocker for Android
<b>Description</b>	AdAway is an open source advertising blocker for Android using the hosts file. It cannot be downloaded in official stores.
<b>Application</b>	App
<b>Link</b>	<a href="https://adaway.org/">https://adaway.org/</a>

<b>Name</b>	<b>YouChoose.ai</b>
	Free
<b>Target</b>	Disguising advertising and algorithmic recommendations
<b>Description</b>	The tool hides recommended videos that are displayed on YouTube next to the just played video. The aim is to bypass YouTube's recommender system.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="http://www.youchoose.ai">www.youchoose.ai</a>

<b>Name</b>	<b>Consent blocker</b>
	Free
<b>Target</b>	Blockage of Google Consent (ad blocker)
<b>Description</b>	An advertising blocker for consent, previously known as Google Consent. Blocks consent dialogues either by inserting the consent cookies/storage elements or by blocking requests to the consent managementplatform.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://addons.mozilla.org/de/firefox/addon/google-consent/">https://addons.mozilla.org/de/firefox/addon/google-consent/</a>

<b>Name</b>	<b>Blockada</b>
	Free
<b>Target</b>	Blocking advertising
<b>Description</b>	Blokada is an advertising blocker and the privacy app for Android and iOS. It is supported and actively developed by the open source community.
<b>Application</b>	App
<b>Link</b>	<a href="https://blokada.org">https://blokada.org</a>

### 6.3 Hiding & highlighting of dark patterns

<b>Name</b>	<b>Dark patterns recognition (Insite)</b>
	Free
<b>Target</b>	Highlighting dark patterns on online shops
<b>Description</b>	Detecting and highlighting dark patterns on shopping websites, with a statement on the identified dark patterns as a pop-up.
<b>Application</b>	GitHub Repository/Extension
<b>Link</b>	<a href="https://github.com/NicholasTung/dark-patterns-recognition#dark-Patterns%20Recognition%20Insite">https://github.com/NicholasTung/dark-patterns-recognition#dark-Patterns Recognition Insite</a>

<b>Name</b>	<b>Dark patterns</b>
	Free
<b>Target</b>	Highlighting dark patterns previously reported
<b>Description</b>	This browser extension is still in the beta phase and has so far only limited data. The aim is to use a growing database to mark more dark patterns previously reported by users.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://chromewebstore.google.com/detail/dark-Patterns/mmodaifhembdmcgcmjlfceflekmkoc?pli=1">https://chromewebstore.google.com/detail/dark-Patterns/mmodaifhembdmcgcmjlfceflekmkoc?pli=1</a>

<b>Name</b>	<b>AppGenie/Grease Droid</b>
	Free
<b>Target</b>	Tool box for modifying apps
<b>Description</b>	A community-driven framework to modify apps to remove dark patterns. It should also allow non-experts to selectively deactivate dark patterns in apps. The framework is only applicable to Android apps and requires considerable technical expertise to be implementable.
<b>Application</b>	GitHub Repository
<b>Link</b>	<a href="https://github.com/OxfordHCC/greasedroid">https://github.com/OxfordHCC/greasedroid</a> <a href="https://arxiv.org/abs/2102.11819">https://arxiv.org/abs/2102.11819</a>

<b>Name</b>	<b>DapDe Pattern Highlighter</b>
	Free
<b>Target</b>	Highlights dark patterns
<b>Description</b>	This tool, developed as part of a research project, works in a similar way to an advertising blocker, but highlights dark patterns rather than blocking them. The aim is to contribute to awareness raising. In addition, information about these dark patterns is linked.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://github.com/Dapde/Pattern-Highlighter">https://github.com/Dapde/Pattern-Highlighter</a>

<b>Name</b>	<b>Trick Question Detection</b>
	Free
<b>Target</b>	Detection of catch questions
<b>Description</b>	Algorithm for detecting the dark pattern of the 'catch question' on websites. This project was developed as part of a Bachelor's degree and is published for developers.
<b>Application</b>	GitHub code
<b>Link</b>	<a href="https://github.com/xrenegade100/trick-question-detection">https://github.com/xrenegade100/trick-question-detection</a>

## 6.4 Detection and documentation of infringements

<b>Name</b>	<b>Crawler: Dark patterns at Scale: Findings from a Crawl of 11K Shopping Websites</b>
	Free
<b>Target</b>	Webscraping & Documentation of dark patterns
<b>Description</b>	Publication of the data and code for the research paper "Dark patterns at Scale: Findings from a Crawl of 11K Shopping Websites'.
<b>Application</b>	Webscraping tool/GitHub
<b>Link</b>	<a href="https://github.com/aruneshmathur/dark-patterns">https://github.com/aruneshmathur/dark-patterns</a>



<b>Name</b>	<b>Cookie Dialogue Compliance (formerly dark patterns project)</b>
	Free
<b>Target</b>	Registration of number of clicks for rejection of cookie banners
<b>Description</b>	This tool captures how many clicks are needed to refuse cookies on a website. This tool has been developed for the “Cookie Dialogue Compliance” project and is useful for technical documentation. It is not intended for end-users. The solution consists of a chromium extension and a PHP backend using the fat-free framework.
<b>Application</b>	Chrome, GitHub
<b>Link</b>	<a href="https://github.com/koenberkhout/dark-patterns-project">https://github.com/koenberkhout/dark-patterns-project</a>

<b>Name</b>	<b>Distill.io</b>
	Free
<b>Target</b>	Documentation of changes on websites
<b>Description</b>	Clear listing of changes on websites. Whole pages or parts of a website can be selected. The interval in which changes are tested and documented can be set from 5 seconds to several days. Different actions can be triggered in case of changes, e.g. email or SMSmessages, local pop-ups or audio sounds. Browser extension allows for comprehensive monitoring and works well unless web-related blocking prevents it.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://github.com/koenberkhout/dark-patterns-project">https://github.com/koenberkhout/dark-patterns-project</a>

<b>Name</b>	<b>ShareX</b>
	Free
<b>Target</b>	Documentation
<b>Description</b>	ShareX is an open source tool for screenshots, screencasts and files sharing. It allows the recording and editing of screenshots, the recording of screen videos and the easy upload and sharing of files. The tool supports many cloud services, offers extensive automation options and is highly adaptable. Users can seamlessly integrate their recordings and files into their preferred cloudmemory (e.g. dropbox) and receive release links.
<b>Application</b>	Desktop Tool
<b>Link</b>	<a href="https://getsharex.com/">https://getsharex.com/</a>

<b>Name</b>	<b>AWESOME screenshot</b>
	Free
<b>Target</b>	Documentation
<b>Description</b>	AWESOME screenshot is a tool for capturing and editing screenshots and screen videos. It offers features such as capturing entire websites or selected areas. In addition, it allows the recording of videos on screen with or without audio. The created screenshots and videos can be uploaded directly to the cloud and easily shared. The tool is available as an extension browser and supports both Chrome and Firefox.
<b>Application</b>	Browser extension
<b>Link</b>	<a href="https://www.awesomescreenshot.com/">https://www.awesomescreenshot.com/</a>

<b>Name</b>	<b>Nimbus</b>
	Free
<b>Target</b>	Website documentation
<b>Description</b>	<b>Nimbus</b> is a tool for screenshots and viewing, available as browser extension and standalone software. It allows the recording and editing of screenshots and the recording of screen videos with audio. Users can comment on their recordings and store or share them directly in the cloud. Nimbus supports integrations with Google Drive and Dropbox and is available for various operating systems and browsers.
<b>Application</b>	Browser extension, software
<b>Link</b>	<a href="https://addons.mozilla.org/en-GB/firefox/addon/nimbus-screenshot/?src=search">https://addons.mozilla.org/en-GB/firefox/addon/nimbus-screenshot/?src=search</a>

## 6.5 Challenges in the automated detection of dark patterns

Automated detection of dark patterns on websites and apps is challenging. The term covers a variety of practices that are fundamentally different from each other, both typologically and in their technical implementation.<sup>60</sup> For example, other technical approaches are needed to investigate a countdown for authenticity, or to assess the text of a button solution for possible manipulations. In order to develop a comprehensive detector for dark patterns, it would be necessary to design a system capable of analysing different elements on a website and in an app (i.e. fixed elements and process structures). The methods necessary for this include those for extracting the content, followed by text analysis to detect manipulative formu, as well as algorithms to check interactions to document unfair processes.<sup>61</sup> The automatic removal of dark patterns requires clear definitions of unique characteristics that can be used to identify and assess unique dark patterns such as ‘hard to

<sup>60</sup>(Gray et al., 2023; Kitkowska, 2023; Luguri & Strahilevitz, 2021; Mathur et al., 2021)

<sup>61</sup>Cf. (Kocyigit et al., 2023; Kodandaram et al., 2023; Raju et al., 2022)

cancel'.<sup>62</sup>

The problem is that, at first sight, only some dark patterns can be identified as clearly illegal. In most cases, a distinction needs to be made between aggressive design and clear infringements of consumer protection laws, which requires a balancing of arguments and does not allow a clear decision to be made solely on the basis of design recognition.<sup>63</sup> While a countdown can technically easily be identified as genuine or fake, it is already more difficult to use automated methods to consider whether a termination process is unnecessarily complicated. Assessing whether a text is too manipulative also requires more interpretation than a simple 1-0 machine solution.<sup>64</sup> This would require advanced AI technologies that can carry out semantic analysis and contextual assessments. However, in order to train such algorithms, appropriate training data from law enforcement would be needed. However, given the novelty of the phenomenon in this domain, there is not a sufficient set of data.

In addition, dark patterns are also used in the design of processes.<sup>65</sup> This would require a solution that plays through processes – which is also very burdensome. The OECD reports that scientific projects aimed at automated detection can only take into account limited elements of dark patterns.<sup>66</sup> The topic could be more comprehensive, but this would require the implementation of automation and simulation technologies capable of replicating user interactions and systematically assessing user experience.<sup>67</sup> Such technologies would need to take into account not only the technical aspects, but also the psychological impact on users.<sup>68</sup> But how can such technological solutions be developed if this requires a programmatic understanding of the vulnerability of users, which is not only descriptive but also influenced in situ and individually?

In addition, websites and apps often change their structure or technically block crawling, which is a heavy burden for developers, as each change requires appropriate adaptations. Another technical requirement would therefore be the development of adaptive crawling and parsing mechanisms, which can adapt dynamically to structural changes.<sup>69</sup>

The development of a blueprint for a tool was therefore challenging, and the technical description of the process can be found in the annex to this study (see **9 Technical Annex**).

In conclusion, the development of technical tools for automated detection of dark patterns on websites and apps is an extremely complex task. The variety of practices and their different technical implementations make it very difficult to achieve uniform recognition. In addition, precise definitions and extensive training data are essential to carry out the necessary semantic and contextual analyses necessary to correctly identify dark patterns. Despite these significant challenges, there are already some tools on the market that are able to detect certain aspects of dark patterns and thus provide a tangible facilitation of work. Some of these tools have been presented in the previous chapters and have also been tested in the project framework.

Herausgestochen is in any case the Open Source Tool Eagle, which was also used intensively by the project team when collecting potential infringements (see Chapters 3, 4, 5).<sup>70</sup>

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62(Mathur et al., 2021)

63(Baroni et al., 2021; Kitkowska, 2023; Luguri & Strahilevitz, 2021; SHI et al., 2024)

64(Kodandaram et al., 2023; SHI et al., 2024)

65(Gray et al., 2018; Kuklenko, 2024; Tiangpanich & Nimkoompai, 2022)

66(OECD, 2022), P. 11

67(Ellwanger et al., 2017; Li et al., 2024; Souza et al., 2019)

68(Distler, 2021)

69(Liu et al., 2011)

70 Eagle, online: <https://en.eagle.cool/>

## 7 Conclusions

This study illustrates the complexity of the implementation of the ban on dark patterns, while at the same time illustrating the timeliness of the issue and possible approaches to consumer protection. In summary, these are:

- Use dark patterns **taxonomies to protect consumers**: The dynamism around dark patterns' taxonomies extended by a part of the public and academia can be seen as a strength to identify possible infringements under the UCPD and DSA and also to respond to new phenomena of design of decision-making architectures on websites and platforms.
- **Define dark patterns for enforcement**: However, the existing taxonomies are only partially suitable for the definition of dark patterns for law enforcement. The implementation of the proposal of the European Consumer Protection Authority (BEUC) to list Dark Patterns in the Annex to the UCPD would in any case require further definitional work. Dark patterns must be well distinguished from legitimate marketing measures. Alternatively, there are proposals to define dark patterns as deviations from design standards, which could also be appropriate.
- **Clarification of the application of legal subject matter**: A matter to be dealt with as a matter of urgency in order to protect the consumer is the question of which law is to be applied. This concerns the substitution of Article 25 DSA by the UCPD and GDPR (Article 25(2) DSA) and the right to exist under Article 25 DSA and is essential for successful enforcement of the law.
- **Discuss the future of dark patterns and needs about the vision of the vulnerable consumer**: The future also brings with it technological changes which suggest that some rules could not work in their intended sense, such as the prohibition of behavioural advertising, and that account must also be taken of the increased effectiveness of dark patterns. The vision of vulnerable consumers in the digital age must therefore be discussed.
- **Ban dark patterns also away from platforms**: Given that dark patterns appear not only on platforms but as a more general internet phenomenon, the DSA ban on dark patterns is to be welcomed, but it would be welcome to consider extensions to address these practices also in other areas of the digital space.

### Use dark patterns taxonomies for consumer protection

The definition of dark patterns remains dynamic and is constantly evolving, both scientifically and through internet communities. These resulting comprehensive taxonomies allow for a more precise identification of practices. Harry Brignull's Deceptive Design website (formerly dark patterns) collects exemplary problems under the 'Hall of Shame' title, with references to international media reports.<sup>71</sup> The European Consumer Protection Authority BEUC is calling for the creation of a central database, to be developed under the coordination of the European Commission, towards the website organised by Brignull. The database should capture national decisions by public authorities and civil courts on dark patterns in order to create transparency and improve law enforcement.

It should be noted that the term dark patterns is a good way to draw media attention to problematic industry practices, but this is primarily an illustration of possible infringements – for example, a dark pattern such as 'Roach Motel' (Cakerlaken Hotel) can explain in a simple way for consumers what the problem of hard-to-cannate newsletters is about subscriptions.

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71 (Brignull, 2024) <https://www.deceptive.design/hall-of-shame> (accessed 18/06/2024)

Critics note, however, that some practices can only be described as dark patterns in certain contexts or under certain prefixes of consumer attitudes. The same element could therefore be classified differently depending on the consumer's intention. For instance: Recommending products along the past purchase history may result in someone spending more than intended in an online shop – but the same element can also be desired by consumers, similar to an advisory service in a residential shop. Similarly, the question is whether a car play of videos should be classified as dark patterns. It can also be discussed whether if one button is made more prominent than the other in one process, one company argues this with the majority preferred option, this can be assessed in the sense of a dark pattern. Dark patterns, which consist of showing how many hotel rooms are still free or how long a discount remains, can also be interpreted as elements in the interest of consumers.<sup>72</sup>

### Define dark patterns for enforcement

Consumer protection organisations such as BEUC (European Consumer Organisation) demand that some dark patterns be prohibited directly in the Annex to the UCPD, such as the development of emotional pressure 'confirmshaming'. However,<sup>73</sup> this would require more precise definitions that can be distinguished from each other and from other legitimate practices.

When is a process or design element already to be banned as dark patterns? Recommendations based on purchase history illustrate the ambivalence between legitimate/manipulative practices or practices desired/undesirable by consumers. Some proposals aim to differentiate dark patterns and marketing according to their objectives: While marketing aimed at changing consumers' preferences, dark patterns aimed at manipulating them.<sup>74</sup> Some suggest to look at the assessment along the impact on consumers (thresholds), for example by taking consumers' expectations as a cross-check. For example, if the creation of a customer account requires the disclosure of excessive data and the consent to unsolicited communications, this is contrary to consumers' expectations and thus constitutes a disproportionate approach. BEUC also stresses the importance of integrating behavioural research findings more into law enforcement activities. In this sense, their call to oblige companies to disclose any information about behavioral experiments carried out to optimise the design of a website should also be seen.<sup>75</sup>

What law/s should that court apply? The substitution of Article 25 DSA by the UCPD and the GDPR (Article 25(2) DSA) – the question of the *raison d'être* of Article 25 DSA

In the case of dark patterns, some consider that the application of the DSA is still unclear: How will the DSA be applied, given that the DSA, as a *lex specifica*, refers to the UWG as a *lex generalis*? There is a clear lack of a congruent interpretation of the current rules and the individual provisions provide a 'pointilistic picture' rather than a coordinated approach. He describes *the 'European Union standards relating to dark patterns as unharmonised'*.<sup>76</sup>

According to Article 25(2) DSA, the prohibition on the use of dark patterns laid down in that Article does not apply to practices covered by the UCPD or the GDPR. This means that the DSA rules only apply if the commercial practice applied cannot already be subsumed under the UCPD or the GDPR. In particular, given the broad scope of the UCPD, the question arises as to how effective and meaningful this prohibition will be in practice. On the contrary, Article 25(2) of the DSA could make enforcement

<sup>72</sup>(OECD, 2022), P. 15

<sup>73</sup>(BEUC, 2022b)

<sup>74</sup>(Luguri & Strahilevitz, 2021)

<sup>75</sup>(BEUC, 2022b, 2022a, 2023)

<sup>76</sup>(Handig, 2023) p. 203

more difficult. This could lead to DSA authorities also having to examine fair and data protection law without being competent in these areas. In addition, in civil association proceedings, traders may raise an objection that their conduct must be examined in accordance with requirements of fair trading law or data protection law and thus rely on the exclusion from Article 25 of the DSA. Care should therefore be taken in civil proceedings. In the case of certain design tricks, it will be advisable to base a possible application for an injunction against the practice, on the one hand, under the respective national implementing law of the UCPD (in Austria, the Federal Act against Unfair Competition 1984 – UWG) and, on the other hand, under Article 25 DSA.

### The need to discuss the vision of the vulnerable consumer

Understanding the vision of vulnerable consumers in the digital environment is a problem that goes far beyond the study theme, but is also relevant for dark patterns and behavioural advertising. In the digital environment, traders can gain much more knowledge about consumers than in brick-and-mortar shops by collecting personal data, but also by analysing behavioural or contextual information. Persuasion methods can be perfected accordingly, either because there is more data (individually and aggregated), or because methods such as A/B tests allow a high degree of adaptation, but can also be much easier and better targeted to improve the effectiveness of their practices. Companies will continue to use these practices unless enforcement of consumer rights or social sanctions can slow down these developments.

The use of the techniques mentioned above gives traders a significant advantage in implementing successful commercial practices online. Dark patterns are partly the result of these developments – and accordingly, from a consumer protection perspective, there is a need to better and more effectively protect consumers from these commercial practices. How can this work on the basis of a changed consumer model? The position of the European Commission in the Guidelines on the interpretation and application of Directive 2005/29/EC is that the concept of vulnerability in the UCPD must be interpreted in a dynamic and situation-dependent manner.<sup>77</sup> This approach to situational, digital vulnerability is in part at odds with fixed, predefined groups of vulnerable consumers who are particularly vulnerable in the digital sphere.<sup>78</sup> This is the case for children and minors, but also for much more diverse groups, which are less easily definable but also identifiable.

In order to take a consumer-friendly and up-to-date approach, it is therefore necessary to rethink the concepts of ‘average consumer’ and ‘vulnerability’ in order to better understand the challenges of the digital environment for consumers and thus to better assess the impact of commercial practices on the average consumer in the digital environment. This definition is particularly sensitive, as consumers and citizens are becoming ever more convergent – participation in public life, online and offline is hardly possible without consumption. Every social media login will inevitably turn citizens into consumers, from advertising, from targeted, personalised content. If consumers are defined online as citizens and recognise that their vulnerability is necessarily due to the unequal distribution of power between platforms and individuals, stronger safeguards against manipulative design such as dark patterns could be more easily justified and enforced.

### Extension of the ban on dark patterns

The ban on dark patterns under the Digital Services Act (DSA) is a welcome step, given that dark

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Commission<sup>77</sup> Guidelines on the interpretation and application of Directive 2005/29/EC concerning unfair business-to-consumer commercial practices in the internal market, OJ 2021 C 526/1, point 4.2.7 on dark patterns

<sup>78</sup>(BEUC, 2022b; Helberger et al., 2024)

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patterns appear not only on specific platforms but as a general phenomenon online. However, it would also be useful to consider enlargements in order to effectively counter these practices in other areas of the online world. One possibility would be to either regulate or prohibit these practices by extending the blacklist in Annex I to the UCPD, or to create a new regime to better protect consumers from manipulative design practices through such platforms.

To sum up, protecting consumers from dark patterns is a continuous challenge that requires a more precise legal framework and greater consideration of behavioural knowledge. Only an updated consumer model and improved legislative measures can effectively counter manipulative practices in the digital environment. This also implies the need to reassess the concepts of ‘average consumer’ and ‘vulnerability’ in the context of digital consumption in order to adequately reflect the real challenges and risks. Incorporating evidence from behavioural research and creating clear legal definitions and sanctions are key factors to protect consumers’ rights and interests in the digital age.

## 8 sources

### 8.1 References

- Chamber of Labour. (2024, April 15). *WG Success: Zocke for Opodo travel booking will become Riegel put forward!* OTS.at.  
[https://www.ots.at/presseaussendung/OTS\\_20240415\\_OTS0020/ak-erfolg-abzocke-bei-opodo-reisebuchung-wird-riegel-vorgeschoben](https://www.ots.at/presseaussendung/OTS_20240415_OTS0020/ak-erfolg-abzocke-bei-opodo-reisebuchung-wird-riegel-vorgeschoben)
- Baroni, L.A., Puska, A.A., de Castro Salgado, L.C., & Pereira, R. (2021). Dark patterns: Towards a Socio-technical Approach. *Proceedings of the XX Brazilian Symposium on Human Factors in Computing Systems*, 1-7.  
<https://doi.org/10.1145/3472301.3484336>
- Beltzung, L., Lindley, A., Rieß, E., Krickl, J., Srdjan Stevanetic, & Vignoli, M. (2021). *Behind Amazon.de's scenes An analysis of Amazon's marketplace mechanisms. Study with quantitative survey carried out for the Vienna Chamber of Labour.* <https://doi.org/10.13140/RG.2.2.22830.23367>
- BEUC. (2022a). *BEUC Comments on the EDPB Guidelines on Dark Patterns in Social Media Platform Interfaces.* Der Europäische Verbraucherverband. [https://www.edpb.europa.eu/our-work-tools/documents/public-consultations/2022/guidelines-32022-dark-patterns-social-media\\_en](https://www.edpb.europa.eu/our-work-tools/documents/public-consultations/2022/guidelines-32022-dark-patterns-social-media_en)
- BEUC. (2022b). *Dark patterns AND THE EU CONSUMER LAW ACQUIS – Recommendations for better enforcement and reform.* The European Consumer Organisation.  
[https://www.beuc.eu/sites/default/files/publications/beuc-x-2022-013\\_dark\\_patters\\_paper.pdf](https://www.beuc.eu/sites/default/files/publications/beuc-x-2022-013_dark_patters_paper.pdf)
- BEUC. (2023). *Towards EUROPEAN DIGITAL Fairness BEUC framing response paper for the REFIT consultation.* The European Consumer Organisation.  
[https://www.beuc.eu/sites/default/files/publications/BEUC-X-2023-020\\_Consultation\\_paper\\_REFIT\\_consumer\\_law\\_digital\\_fairness.pdf](https://www.beuc.eu/sites/default/files/publications/BEUC-X-2023-020_Consultation_paper_REFIT_consumer_law_digital_fairness.pdf)
- Bösch, C., Erb, B., Kargl, F., Kopp, H., & Pfattheicher, p. (2016). Tabs from the dark Side: Privacy Dark Strategies and Privacy Dark Patterns. *Proceedings on Privacy Enhancing Technologies*; 2016(4), 237–254.  
<https://doi.org/10.1515/popets-2016-0038>
- Brignull, H. (2010, July 8). *Dark patterns: Dirty tricks designers use to make people do Stuff.* 90 Percent Of Everything.  
<https://www.90percentofeverything.com/2010/07/08/dark-patterns-dirty-tricks-designers-use-to-make-people-do-stuff/>
- Brignull, H. (2022). Types of Deceptive Design. *Deceptive Design.* <https://www.deceptive.design/types>
- Brignull, H. (2024). *Deceptive Patterns-Hall of Shame.* Deceptive patterns.  
<https://www.deceptive.design/hall-of-shame>
- Federal Cartel Office. (2019, February 7). *Bundeskartellamt prohibits Facebook from combining user data from various sources.* Federal Cartel Office.  
[https://www.bundeskartellamt.de/SharedDocs/Meldung/DE/Pressemitteilung/2019/07\\_02\\_2019\\_Facebook.html](https://www.bundeskartellamt.de/SharedDocs/Meldung/DE/Pressemitteilung/2019/07_02_2019_Facebook.html)
- Burkell, J., Fortier, A., Wong, L., & Simpson, J. (2013). The View From Here: User-centred perspectives on Social Network Privacy. *FIMs Publications.* <https://ir.lib.uwo.ca/fimspub/25>
- Caragay, E., Xiong, K., Zong, J., & Jackson, D. (2024). Beyond dark patterns: A Concept-Based Framework for Ethical Software Design. *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 1- 16. <https://doi.org/10.1145/3613904.3642781>
- Distler, V. (2021). *The Experience of Security in Human Computer Interactions: Understanding Security Perceptions Through the Concept of User Experience.* [Faculty of Humanities, Education and Social Sciences: Behavioural and Cognitive Sciences]. University of Luxembourg.
- Ellwanger, C., Silva, R.P. da, & Rocha, R.A. da. (2017). Modelagem sistêmica e simulação: Estratégia de gestão no Processo de Projeto para a Experiência do Usuário (UXD). *Gestão & Produção*, 25(4), 659–670.  
<https://doi.org/10.1590/0104-530x3604-16>



- The European Commission. (2024a, May). *DMA designated gatekeeper*. [https://digital-markets-act.ec.europa.eu/gatekeepers\\_en](https://digital-markets-act.ec.europa.eu/gatekeepers_en)
- The European Commission. (2024b, May 31). *DSA: Commission designates Temu as VLOP* [text]. European Commission – European Commission. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_24\\_3047](https://ec.europa.eu/commission/presscorner/detail/en/ip_24_3047)
- The European Commission. (2024c, June 13). *Supervision of the designated very large online platforms and search engines under DSA | Shaping Europe's digital future*. <https://digital-strategy.ec.europa.eu/en/policies/list-designated-VLOPs-and-VLOSEs>
- European Data Protection Board. (2024). *Opinion 08/2024 on Valid Consent in the Context of Consent or Pay Models Implemented by Large Online Platforms*. [https://www.edpb.europa.eu/system/files/2024-04/edpb\\_opinion\\_202408\\_consentorpay\\_en.pdf](https://www.edpb.europa.eu/system/files/2024-04/edpb_opinion_202408_consentorpay_en.pdf)
- European Data Protection Board, E. (2022). *Guidelines 3/2022 on dark patterns in social media platform interfaces: How to recognise and avoid them*.
- Gray, C.M., Kou, Y., Battles, B., Hoggatt, J., & Toombs, A.L. (2018). The Dark (Patterns) Side of UX Design. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*; 1-14. <https://doi.org/10.1145/3173574.3174108>
- Gray, C.M., Santos, C., & Bielova, N. (2023). Towards a Preliminary Ontology of Dark Patterns Knowledge. *Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems*; 1-9. <https://doi.org/10.1145/3544549.3585676>
- Handig, C. (2023). Dark patterns in focus. New EU standards for manipulative designs of digital user interfaces. *ÖBI*, 60(5/2023), 199.
- Helberger, N., Kas, B., Micklitz, H.-W., Namysłowska, M., Naudts, L., Rott, P., Sax, M., & Veale, M. (2024). *Digital Fairness for Consumers* (BEUC Report, p. 280) [https://www.beuc.eu/sites/default/files/publications/BEUC-X-2024-032\\_Digital\\_fairness\\_for\\_consumers\\_Report.pdf](https://www.beuc.eu/sites/default/files/publications/BEUC-X-2024-032_Digital_fairness_for_consumers_Report.pdf)
- Holle, V. von. (2019). *An economic revolution: How behavioural economics change the world*. Springer publisher.
- Kahneman, D. (2011). *Thinking, FAST AND SLOW*. Macmillan.
- Kitkowska, A. (2023). The Hows and whys of dark patterns: Categorisations and Privacy. In N. Gerber, A. Stöver, & K. Marky (Hrsg.), *Human Factors in Privacy Research* (S. 173-198). Springer International Publishing. [https://doi.org/10.1007/978-3-031-28643-8\\_9](https://doi.org/10.1007/978-3-031-28643-8_9)
- Kocyigit, E., Rossi, A., & Lenzini, G. (2023). Towards Assessing Features of Dark Patterns in Cookie Consent Processes. In F. Bieker, J. Meyer, S. Pape, I. Schiering, & A. Weich (eds.), *Privacy and Identity Management* (vol. 671, pp.165-183). Springer Nature Switzerland. [https://doi.org/10.1007/978-3-031-31971-6\\_13](https://doi.org/10.1007/978-3-031-31971-6_13)
- Kodandaram, S.R., Sunkara, M., Jayarathna, S., & Ashok, V. (2023). Detecting Deceptive Dark Platforms Web Advertisements for Blind Screen-Reader Users. *Journal of Imaging*, 9(11), 239th <https://doi.org/10.3390/jimaging9110239>
- Kuklenko, P. (2024). *The Role of Dark Design Patterns in Online Consumer Manipulation: A Critical Study with Emphasis on Video Game Monetisation*. [Degree Thesis]. Arcada University of Applied Sciences: Online Media.
- Li, X., Zheng, H., Chen, J., Zong, Y., & Yu, L. (2024). User Interaction Interface Design and Innovation Based on Artificial Intelligence Technology. *Journal of Theory and Practice of Engineering Science*, 4(03), 1-8 [https://doi.org/10.53469/jtpes.2024.04\(03.01\)](https://doi.org/10.53469/jtpes.2024.04(03.01))
- Suffered, E. (2013). Understanding social network site users' privacy tool use. *Computers in Humane Behavior*, 29(4), 1649-1656.

- <https://doi.org/10.1016/j.chb.2013.01.049>
- Liu, J., Jiang, L., Wu, Z., & Zheng, Q. (2011). Deep Web adaptive crawling based on minimum executable pattern. *Journal of Intelligent Information Systems*, 36(2), 197- 215. <https://doi.org/10.1007/s10844-010-0124-5>
- Luguri, J., & Strahilevitz, L.J. (2021). Shining a light on dark patterns. *Journal of Legal Analysis*, 13(1), 43– 109. <https://doi.org/10.1093/jla/laaa006>
- Madejski, M., Johnson, M., & Bellovin, S.M. (2012). A study of privacy settings errors in an online social network. *2012 IEEE International Conference on Pervasive Computing and Communications Workshops*; 340-345. <https://doi.org/10.1109/PerComW.2012.6197507>
- Mathur, A., Acar, G., Friedman, M.J., Lucherini, E., Mayer, J., Chetty, M., & Narayanan, A. (2019). Dark patterns at Scale: Findings from a Crawl of 11K Shopping Websites. *Proceedings of the ACM on Human Computer Interaction*, 3(CSCW), 1- 32. <https://doi.org/10.1145/3359183>
- Mathur, A., Kshirsagar, M., & Mayer, J. (2021). What Makes a dark patterns... Dark?: Design Attributes, Normative Considerations, and Measurement Methods. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1- 18. <https://doi.org/10.1145/3411764.3445610>
- Murray, D. (2023, January 9). *The Unknown Story of How Hotmail grew to 12 million users in 1.5 Years*. The Marketing Millennials. <https://themarketingmillennials.com/articles/2023-01-09/the-unknown-story-of-how-hotmail-grew-to-12-million-users-in-1-5-years/>
- Narayanan, A., Mathur, A., Chetty, M., & Kshirsagar, M. (2020). *Dark Past, Present, and Future*. 18( 2) <https://queue.acm.org/detail.cfm?id=3400901>
- net. (2018). *Price.Value*. netidee. <https://www.netidee.at/preiswert>
- NOYB. (2024, April 9). “Pay or Okay” says: How do websites force you to pay for privacy, <https://noyb.eu/de/pay-or-okay-explained-why-more-and-more-websites-make-you-pay-your-privacy>
- OECD. (2022). *Dark commercial patterns | en* | OECD. <https://www.oecd.org/digital/dark-commercial-patterns-44f5e846-en.htm>
- Princi, E., & Krämer, N. (2020). *I Spy with my Little Sensor Eye-Effect of Data-Tracking and Convenience on the Intention to Use Smart Technology*. 1- 10 <https://doi.org/10.24251/HICSS.2020.171>
- Raju, S.H., Waris, S.F., Adinarayna, S., Jadala, V.C., & Rao, G.S. (2022). Smart Dark Pattern Detection: Making Aware of Misleading Patterns Through the Intended App. In S. Shakya, V.E. Balas, S. Kamolphiwong, & K.-L. Du (eds), *sentimental Analysis and Deep Learning*, Vol. 1408, pp. 933-947. Springer Singapore. [https://doi.org/10.1007/978-981-16-5157-1\\_72](https://doi.org/10.1007/978-981-16-5157-1_72)
- Sangeeta, R. (2015). A Comprehensive Study on Providing Services based on User Interest in Online Social Networks. *Engineering Technology*, 6(05).
- SHI, Z., Sun, R., Chen, J., Sun, J., & Xue, M. (2024). The Invisible Game on the Internet: A Case Study of Decoding Deceptive Patterns. *Companion Proceedings of the ACM on Web Conference 2024*, 521-524. <https://doi.org/10.1145/3589335.3651571>
- Souza, K.E.S., Seruffo, M.C.R., De Mello, H. D., Souza, D. D. S., & Vellasco, M.M.B. R. (2019). User Experience Evaluation Using Mouse Tracking and Artificial Intelligence. *IEEE Access*; 7, 96506 – 96515. <https://doi.org/10.1109/ACCESS.2019.2927860>
- STRANGE, A. (2015, October 3). *LinkedIn pays big after class action lawsuit over user emails*. Mashable <https://mashable.com/archive/linkedin-class-action>
- Tech Policy Design Lab-Deceptive Design*. (o.m.). Accessed 13 May 2024, from <https://techlab.webfoundation.org/deceptive-design/overview>
- Thaler, R. H. (2017). *Facts*. NobelPrize.org. NobelPrize.Org. <https://www.nobelprize.org/prizes/economic-sciences/2017/thaler/facts/>
- Thaler, R. H. (2018). Nudge, not sludge. *Science*, 361(6401), 431 -431

<https://doi.org/10.1126/science.aau9241>

Thaler, R.H., & Sunstein, C.R. (2009). *Nudge: Improving decisions about health, wealth, and happiness*. Penguin.

Tiangpanich, P., & Nimkoompai, A. (2022). An Analysis of Differences between Dark Pattern and Anti-Patterns to Increase Efficiency Application Design. *2022 7th International Conference on Business and Industrial Research (ICBIR)*, 416- 421  
<https://doi.org/10.1109/ICBIR54589.2022.9786470>

## 8.2 Table of Figures

1	Introduction	6
2	Dark patterns	7
2.1	History of development	7
2.2	Definition(s)	10
2.3	Regulatory framework	12
2.4	Survey	16
3	Online shopping & dark patterns	18
3.1	Case Study ‘Temu’	18
3.1.1	Documentation	18
3.1.2	Analysis	26
3.2	Case Study “SHEIN”	29
3.2.1	Documentation	29
3.2.2	Analysis	34
4	flight bookings & dark patterns	36
4.1	Case Study “Ryan Air”	36
4.1.1	Documentation	36
4.1.2	Analysis	45
	Case Study “Austrian Airlines”	49
4.2.1	Documentation	49
	Analysis	52
	Case Study “Wizz Air”	52
4.3.1	Documentation	52
4.3.2	Analysis	57
	Case Study “Opodo”	60
4.4.1	Documentation	60
4.4.2	Analysis	65
5	registration processes on social media	68
5.1	TikTok Case Study	70
5.1.1	Documentation	70
5.1.2	Analysis	73

---

Case Study “Instagram”	75
5.2.1 Documentation	75
5.2.2 Analysis	79
5.3 Excursion: Meta consent or pay model	79
6 Tools	82
6.1 Prevention of tracking & exclusion of cookie banners	82
6.2 Disguising advertising and recommendations	85
6.3 Hiding & highlighting of dark patterns	87
6.4 Detection and documentation of infringements	88
6.5 Cricks in the automated detection of dark patterns	90
7 Conclusions	92
8 sources	96
8.1 References	96
8.2 Table of Figures	99
9 Technical Annex	101
■ .1 description of tool development	101
Comparison of the complexity of Appium and Selenium for Mobile Web Monitoring	105

## 9 Technical Annex

### 9.1 description of tool development

As stated in this study report, dark patterns are sometimes used to design processes, which in some cases requires solutions where processes are played by automated means. The automation and simulation technology needed for this reason must be able to replicate user interaction.

The PCS implementation presented on the basis of the Appium Framework aims to extract data from mobile apps. This is a proof-of-concept demonstrating implementation on the basis of a specific use case. The development of a proof-of-concept serves to assess and estimate the underlying technology stack and the functional and non-functional processes required for that purpose.



Figure 78: A schematic overview of the PCS focus of the components used to achieve prototypic data collection on the basis of the Appium Framework.

#### Processdefinition

Ideally, the procedure starts with a test case description defined by the stakeholder. This includes the description of requirements, the definition of the behavior and the definition of the behaviour to be observed in text form, as well as illustrative screenshots. It is essential to ensure a precise delimitation of the test case. This includes a precise description of the pre- and post-conditions of the behaviour to be observed, as well as possible variations. This information must then be translated into a technical app analysis, agent definition, app-UI interaction and measurement control. Ideally, the process definition is developed in a joint workshop and an accompanying test case recording is also carried out directly in appium.

The test case may be recorded in appium by using the apparatus recorder. After the installation of the Appium Desktop, the Appium Server will be launched and an Inspector Session will be initiated. For this purpose, the 'desired capabilities' are indicated, an existing, suitable test environment is selected and the spot is launched. Interaction with the application takes place directly on the emulator or real device. The user action, such as tipping on buttons, text input, scrolling behaviour and other user actions, will be recorded. While interacting with the app, Appium records the actions and automatically generates the corresponding test script, which is then created in the preferred programming language (e.g. Java, Python, JavaScript). The subsequent addition of assertions or logic ensures a complete picture of the test case. The Appium Recorder is a useful tool for recording test cases and transferring them to automated testing. It supports the development of consistent and accurate test scripts in cooperation with stakeholders, with the test case description being developed in an interactive manner.

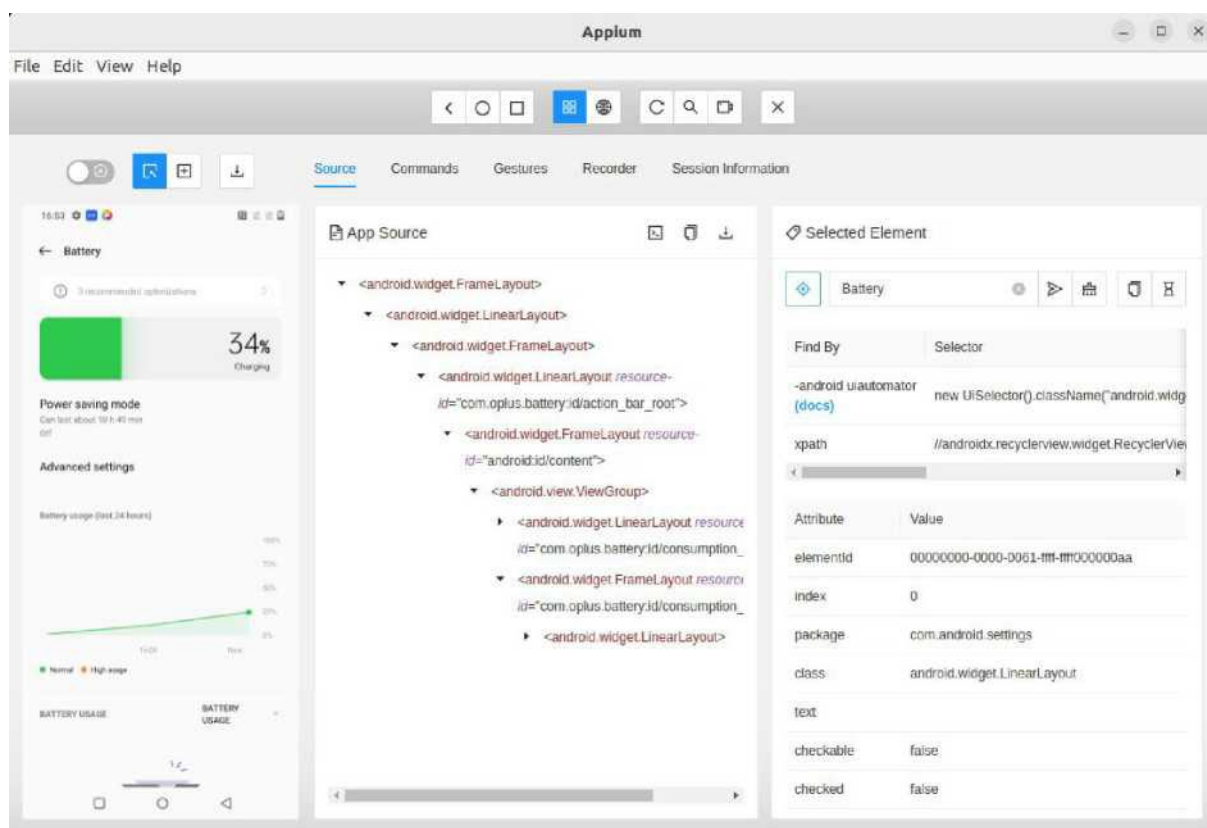


Figure 79: Extract from the App Inspector to analyse the structure & UI elements of the app.

The test case recorded in PCS includes the login of an existing Temu user to the app. Subsequently, 'Assertions' for the presence of countdown timers were selected by way of example in the UI and defined using the Appium Inspector XPath terms, which make it possible to define all visible values of countdown time. All the countdown timers on the product start page, which could be found under double scrolling and reloading of the page, as well as their values at the time of measurement, product ID and the product title were therefore read out.

The Appium Inspector is a tool of the Appium Framework used to inspect and interact with the user interface elements of a mobile application. It covers the structure of the application, the location of elements and the efficient preparation of test cases. The main functions and uses of Appium Inspectors are set out below:

- 10 **Element inspection and attribute display:** The App Inspector allows browsing and inspecting the hierarchy of user upper surface elements of a mobile application. This includes all UI elements such as buttons, text fields, labels, etc. For each selected UI element, the Appium Inspector shall display all relevant attributes, such as ID, class, text, position, size and other characteristics. This information is crucial to correctly identify, address and read the elements in the test case.
- 11 **Automated generation:** The App Inspector generates automatic XPath expressions and other locators, such as ID, Name or Accessibility ID, that can be used in test cases to uniquely identify the elements or to play back all elements with certain properties.
- 12 **The possibility to organise interactive sessions:** This allows the application to be inspected in real time. This implies that the app can be searched, clicked and other actions taken to monitor the reaction of the elements.
- 13 **Screenshot and source code display:** The fourth function of the App Inspector includes the creation and display of screenshots of the current view of the application and the possibility to search the source code of a page.

In the area of operation in question, which required the translation of the expert's request definition and

app analysis in order to produce appropriate measurement and test scripts for the use case, the Appium Inspector has proven to be a worthwhile and indispensable tool. In addition, during the BlackBox data collection, it was possible to quickly reactivate structural changes in the application in order to ascertain whether UI elements have actually changed or whether it is a debugging problem in the test case execution.

## Commissioning

Appium allows launching and interacting with both emulators and real devices for automated processes in mobile applications. The provision of Android emulators and/or real devices is the basis of the provision to perform an apparatus test case. To realise the PCS prototype, the Open Source Framework Appium, Android Studio and Google Android SDK tools were configured in an 'Oracle Virtual Box' (Ubuntu 22.04 LTS). The Android emulators (AVDs) were translated with the AVD manager of Android Studio. The emulators can be launched via Android Studio or directly via the command line (`$ Emulator -avd &lt;name_of_your_AvD>`). Alternatively, the emulator may also be directly referenced via Appium by indicating the 'desired capabilities' configuration.

The installation of Android real devices requires activating the developer mode and active USB debugging on the target device, as well as a USB connection (and driver installation) on the host computer. Appium can check that the device is correctly detected. ADB is a versatile tool that can be used in combination with apps to provide additional control and debugging possibilities, such as (`adb install /path/to/your/app.apk`) to install an app or (`adb shell am start -n &lt;package_name>/&lt;activity_name>`) to start a specific activity. The use of ADB in appium scripts is very useful, as ADB commands can be executed directly from Appium test scripts to achieve more complex test scenarios in particular. For example, in the PCS application case, Temu APK was provided directly via `adb install` on the terminal to be able to test it in different versions.

The following difficulties were encountered in the implementation process: Android runs in VirtualBox, but only as x86 Build of Android and not as a native ARM Build. Due to the absence of an ARM processor emulation by Virtual Box, compatibility with Android apps is compromised. The performance of the Android emulators provided in Virtual Box proved to be insufficient. The situation persisted even after an upgrade to Virtual Box 7 with hardware emulation support on Intel processors with 'Nested VT-x' support activated. Subsequently, the Android X86 emulator project was attempted to connect as a stand-alone VM to the Android SDK tools via a network bridge. This attempt also had to be considered unfeasible due to the lack of community support and the advanced age of the project (2022).

Finally, as a solution, a OnePlus 7T with a generic Android driver was connected to the host system as an Android real device and made available to the virtual system ADB via the USB VirtualBox controller.

## Device Library and Variations

Under this nomenclature, two concepts have been grouped together to ensure a controlled experiment set-up: (1) the management of existing dedicated equipment and emulators and (2) the selection and assignment of variations and capabilities used in an application cycle. Examples include:

**Personas:** The provision of persona (consisting of username and password, app code scripts for login to the application to be tested). Personas may also have an existing order history or personal characteristics such as name, age, etc., which are deposited in the customer account and made available to the application.

**Location:** Displaying a location in app allows to change the geo-fishing location of the mobile device or emulator while the data collection is carried out. This is particularly beneficial for

testing functions that depend on location services, such as location-based notifications.

**App reset:** App reset determines whether data such as existing logins are deleted between appium sessions. This functionality depends on the configuration and the device/emulator used. Appium offers different configurations to control the condition of a device.

**ENC.fullReset:** This functionality ensures that the app is uninstalled and re-installed installed and all app data deleted. This means that existing logins and other data will be deleted.

**noReset :** This functionality ensures that app data (existing logins and other data) are maintained between sessions.

Persona: A	Location: X	App Reset: fullReset
Persona: B	Location: X	App Reset: NoReset
Persona: No	Location: off	App Reset: fullReset

Another variation in the interpretation and interpretation of nudging specifically on mobile devices, namely the analysis of push notifications (message content, frequency, etc.), was evaluated. However, due to the lack of support for the Appium Framework, this could not be achieved. In order to receive push notifications on an Android device, several conditions must first be met: Activation of the alert function, installation of Google play services, activation of Google play services, existing data connection. In addition, the app to be examined must be installed and active on the device. Push notifications are usually not possible when the app is uninstalled, the device is in Sleep mode or certain power management functions are activated. On Android, a possible workaround of the missing app API support can be to open the notification bar and check notifications directly. On the other hand, iOS requires additional steps and possibly third-partylibraries. As the analysis of push messages requires an indefinitely waiting instance of the test script and there is also a lack of appium API support, this feature has not been implemented.

### Agents

An agent in 'Persona noin', 'Location off' and 'App fullReset' is used as a baseline to measure data. Other instances can be combined at will and added via the Device Library with a clear ID, so that they are available again in future submissions. The deployment of agents involves modifying the test script to take into account the defined variations (e.g. app UI Login in advance, locating) and provides the required code in the test script. Agents are assigned to a specific emulator or device, so that data measurement with real device took place in an immediate sequence, but never at the same time.

### Process control and data measurement

Process control defines a clear "command line interface" in which agents are used at regular intervals to measure data. The extracted measurement data shall be delivered in a uniform CSV interface. Middleware incorporates flow control functions and allows, for example, timing of processes.

Two other tools have proven to be particularly useful in the context of prototyping: (1) app doctor, a tool to ensure a correct environment, and (2) the Appium Compatibility Builder, a tool that helps developers and testers to test mobile applications on different platforms.

The **Appium Compatibility Builder** offers the following main functions:

1. **Test compatibility:** It helps ensure that the tests performed on both iOS and Android platforms



are compatible by making the necessary adaptations and configurations.

2. **Configuration management:** The tool simplifies the configuration of the test environment and the management of the different parameters needed to perform tests on different devices and operating system versions.
3. **Support for automation:** It supports the automation of the test process by generating and adapting scripts, which can then be performed by appium.
4. **Error diagnosis:** By providing detailed protocols and reports, the Appium Compatibility Builder helps to diagnose compatibility issues and errors that may occur during the test process.

Overall, the Appium Compatibility Builder aims to improve the efficiency and reliability of the testing process for mobile applications by creating a single and compatible testing environment.

**The results of the monitoring of the use case of countdown time on Temu over a one-month observation period show:**

- (1) The selection-app-UI element initially chosen had to be adjusted four times during the investigation period, as the countdown timers in the app were continuously modified and new presentation variants were found, which is a major problem of the Black Box reverse data collection. In addition (2) the data analysis showed that the products presented varied widely on the home page, so that only a few overlapping measurement data for the respective countdown time of a specific product were present in the measurement data. (3) The technology stack proved to be unreliable and therefore a manual intervention/restart was required several times.

## 9.2 Comparison of the complexity of Appium and Selenium for Mobile Web Monitoring

Overall, due to the diversity and complexity of mobile platforms and the need to manage different tools and configurations, the app stack is much more complex than the selenium stack, which focuses on web browser-only interactions.

- Appium: Developed for automation of mobile applications (iOS and Android), including native, hybrid and mobile web applications.
- Selenium: Developed to automate web applications on desktop browsers.

**In setup and configuration:** Appium requires the installation of *Node.js* and *NPM*. Android SDK and AVD (Android Virtual Device) managers (or Xcode and Xcode Command Line Tools on iOS) are needed to provide the mobile platforms. Apps shall be launched to accept testing requirements, emulators and physical devices shall be configured and provided. ADB is necessary to interact with Android devices. 'Desired Capabilities' shall be defined specifically for each test execution, e.g.

B. *platformName*, *deviceName*, *app*. Selenium, on the other hand, requires only the installation of the selenium WebDriver libraries for the desired programming language. The drivers for the specific browser shall be downloaded and configured.

**For testing scripting,** appium test scripts must be specifically adapted to mobile flatshades, with element location based on mobile UI elements (e.g. Accessibility IDs or XPath), additional skills are provided by automators such as UiAutomator2 or XCUITest. The UiAutomator2 Driver is part of the Appium's mobile test automation tool. It works under the W3C WebDriver Protocol with several customised extensions to cover operational system specific scenarios. For example, the UiAutomator2 Driver forwards most commands to the UiAutomator2 Server, which uses Google's UiAutomator Framework in the background. Some commands are sent *directly to appium adb* and other helpers based on the Android platform tools. Selenium, on the other hand, focuses on web elements and browser interactions (e.g. CSS selectors, XPath) in the test scripts and provides standardised element localisation

methods (e.g. *find\_element\_by\_id*)

**Debugging tools** shall list the App Inspector, an UI tool to interact and inspect UI elements and create XPath selectors. ADB acts as a commandline tool to interact with Android devices (e.g. installing apps, setting sites). Selenium offers browser developer tools and selenium-DIE tools to inspect web elements and simple UI-based test recording.

**In terms of maintenance and scalability**, app has a much higher degree of complexity due to the diversity of supported mobile platforms, Android operating system versions and device configurations. Scalability in particular typically requires special setups, as well as

Use mobile devices or cloud services. Selenium, on the other hand, stands out with much easier maintenance, as the test environments are more consistent and less variable. Selenium Grid allows testing on multiple browsers and machines at the same time.

**Definition** of the app components and their interplay:

- **Client libraries:** Test developers write tests in a preferred programming language and use the Appium Client libraries to communicate with the Appium server.
- **Appium server:** The server receives the requests and forwards them to the automation frameworks (e.g. UIAutomator2, XCUITest).
- **Automation Frameworks:** These frameworks interact directly with the mobile applications and carry out the test actions.
- **Apparatus and emulators:** The tests shall be carried out on physical devices or emulators that replicate the environment of the end-users.
- **Additional tools:** Tools such as ADB and Xcode CLI tools support the interaction and management of test equipment.

## Summary – Conclusions

The appium technology stack is multi-layered and encompasses a variety of different components, all of which need to work together to enable mobile automation tests across platforms. From the base platform Node.js to the central app server to specific automation frameworks and additional tools. The complexity of this stack requires a good understanding of the different components and their interaction in order to produce and perform effective and reliable tests.

App is characterised by a significantly higher initial effort to implement an information monitoring tool in mobile apps due to the need to install and configure mobile SDKs, emulators/real devices and additional tools. Where different platforms, devices and operating system versions are relevant, the degree of complexity increases. Test designs shall be specific to mobile UI elements and interactions.

On the other hand, selenium requires a comparatively low initial effort in the installation of WebDriver libraries and browser facilitators. Web applications are generally more consistent across platforms, facilitating test development and maintenance, and simplified testing scripting is demonstrated by standardised web elements and browser interactions.

Overall, due to the diversity and complexity of mobile platforms and the need to manage different tools and configurations, the app stack is much more complex than the selenium stack, so that the monitoring of mobile information-mining websites and the provision of the data base for analysing and evidence-based detection of dark patterns, where possible over mobile apps, should be preferred. This is supported by lower expenditure and costs for the necessary implementation of new agents, the integration of new features, easier adaptation of the process and interaction monitoring when new platforms are introduced, as well as significantly lower costs for the long-term maintenance and operation of such a tool.

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While PCS developed a Proof-of-Concept for structured data collection in mobile apps using the Framework App and its application was successfully shown on the Dark Patterns Use Case of the Countdown Timer in the Temu App, tools such as selenium offer a much more manageable and leaner technology stack suitable for monitoring and data extraction from mobile websites. This was successfully used, for example, in the netidee research project 'price.wert'<sup>79</sup> and also in the implementation of the largest German-language data-based study on Amazon.de.<sup>80</sup>

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<sup>79</sup>(netidee, 2018)

<sup>80</sup>(Beltzung et al., 2021)

## Disclaimer

### **PCs – Platform Compliance Study**

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