

Lappeenranta-Lahti University of Technology LUT

School of Engineering Science

Degree Programme in Software Engineering

DARK PATTERNS IN UI-DESIGN AND HOW TO IDENTIFY THEM

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Lappeenranta - Lahti University of Technology LUT

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Dark Patterns in UI-Design and how to identify them Dark Patternit UI-suunnittelussa ja miten tunnistaa ne

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Tämä teos käsittelee käyttöliittymä- ja käyttökokemussuunnittelussa esiintyviä hämääviä ja epäeettisiä tekniikoita, Dark Patterneja. Näiden suunnittelussa mielessä on pistetty yrityksen tavoitteet käyttäjän tarpeiden edelle. Koska tämä on yhä yleistynyt ilmiö, tarkoituksena on tutkia dark patternien eri muotoja, mitkä niiden vaikutukset ovat, ovatko ne laillisia ja miksi niitä käytetään. Työssä käydään läpi aiempaa tutkimusta aiheesta, sekä merkataan ylös yhden nettisivun dark patternit ja löytöjen pohjalta saadaan parempi kuvan siitä, että dark pattern voi olla hankala määrittää, sillä samoja mekaniikkoja voi käyttää myös hyviin tarkoituksiin. Työn tuloksena todetaan, että nykyinen laki koskien dark patterneja on vielä alkuvaiheessa, eikä riitä vähentämään näiden käyttöä. Näiden lisäksi yleinen tietoisuus aiheesta, kyky opettaa eettisiä UX-suunnittelutekniikoita ja rohkeus lopettaa hämäävien sivustojen käyttö ovat parhaimmat tavat kamppailla tätä ilmiötä vastaan.

ABSTRACT

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Dark Patterns in UI-Design and how to identify them

Bachelor's Thesis 2021

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This thesis describes the ever more prevalent phenomenon in user interface- and user experience design, called Dark Patterns. The most common way to describe these is a UI component that is designed in a way that puts the interests of the company ahead of those of the user. To shed light on this growing issue, this thesis looks at different types of dark patterns, what effects do they have, their legality and why are they being used. Related research is used as a springboard, and an example website will be looked at to find answers to our questions. The definition of a dark pattern is found to have its problems, as they could also be used for good. It is also concluded that the current legislation against dark patterns is still in its early stages and is not enough to stop the phenomenon. Public awareness, the ability to teach good user experience design to new and old developers and the courage to stop the use of unethical websites is a much more powerful tactic to overcome this.

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LIST OF ABBREVIATIONS

UI	User Interface
UX	User Experience
EU	European Union
NCC	Norwegian Consumer Council
GDPR	General Data Protection Regulation
UCPD	Unfair Commercial Practices Directive
CCPA	California Consumer Privacy Act
UG	Ultimate Guitar

1 INTRODUCTION

1.1 Background

Marketing on the internet is not a new thing anymore. The level of competition in the market is constantly escalating and a rising number of less tech savvy people are joining the internet every day. According to Opreana and Vinerean [1] the efficiency of online marketing can be measured from Website Activity, Source and Nature of Traffic, Responses and Outcomes and Integrated Marketing Metrics, many of which depend on the stream of new customers, page views, lead-to-sale conversion rates and perhaps most importantly, revenue growth. Because of this, a new heinous design approach has taken root in User Experience and User Interface design; Dark Patterns.

A Dark Pattern is generally defined as a deceiving user interface component, designed in a way that puts the interests of the shareholder ahead of the user, to increase sales, gather user information, cause unwanted actions to occur or otherwise annoy users. The term was coined in 2010 by Harry Brignull, a user experience designer on his website “darkpatterns.org” [2]. While a common term may have been coined ten years ago, the problem has been around for longer. Thanks to the constant growth of internet communication, commerce and advertising the competition between websites and companies hosting them has increased dramatically to this day. Therefore, the concept of dark patterns and the ability to recognize them is ever more relevant and important.

A study from 2019 found that from a set of eleven thousand shopping websites 1,254 sites (~11%) used some sort of dark patterns in their site design [3]. There also was a correlation between a website’s popularity and the likelihood of dark patterns found within them. Multiple studies have tried to categorize dark patterns into specific groups, and these can be found on every type of digital platform, be it shopping websites, social media platforms, mobile apps, or video games.

In essence dark patterns are a form of marketing manipulations [4] that make use of common user behaviors and decision-making processes. As such they use similar mechanics as regular marketing manipulators. But in the digital market these strategies could be described as more heinous with more options to monitor consumers and personalize the experience directly to take advantage of trends and cognitive limitations even on individual level [5]. Digital marketing

has had it easy with legal regulations compared to its physical counterpart as it is still a very new frontier for wide-scale marketing. Regulations simply have not been able to keep up. In 1994 spending for internet marketing totaled nearly nothing but increased to over 300 million dollars in the next year and a decade later had exploded to over 500 billion [6].

1.2 Goals and Methods

The goal of this thesis is to answer the following three (3) questions:

1. What are the different types of dark patterns and when are they used?
2. How can one notice them when visiting websites?
3. Why are they still frequently used?

This will be done by analyzing previous research and findings about dark patterns. A website will then be chosen and looked thoroughly to find any possible occurrences of these patterns. The findings will be compared to the results of related research. With these conclusions will be made on the effectiveness of these design choices and how these have been able to stay like this when compared to the website's popularity and user ratings.

1.3 Thesis Structure

In chapter two the previous research about dark patterns will be presented. The concept will be examined from multiple points of view, for example user experience design, marketing and business, and psychological point of view.

In chapter three the methods used in this thesis will be discussed. These will include the reasons for choosing the specific website to be examined, and what things and attributes will be looked at and why.

In chapter four the results will be presented. These will detail the found attributes, and possibly include screenshots to clear out the findings.

In chapters five and six analysis based on the results and related research will be done. Answering presented research questions is attempted. The final conclusions will then be presented. In addition, possible future work will be pondered based on what is and is not concluded in the analysis.

2 RELATED RESEARCH

2.1 A Blurry Definition

As stated before, dark patterns are a relatively new concept. This does not however mean there is not material related to the subject in other forms. Dark patterns are different types of deceiving strategies that websites use. As such they can be identified and even put into specific groups based on their attributes. But as there are multiple types of things that could be fitted into this definition, the concept of a dark pattern is still very blurry.

A 2021 research titled “What Makes a Dark Patterns... Dark?” [7] compiled several research articles and journals about dark patterns to define it. In their findings, they grouped definitions into four groups.

1. The first set described the **characteristics** of the user interfaces that could affect users. Some described them as tricks, while others used words like “coercing, steering and deceiving”.
2. The second set described the **mechanics** with which the user was somehow deceived. These included subverting user intent, undermining user autonomy, steering, tricking, and manipulating users.
3. The third set described **the role of the user interface designers**. For example, the designer abusing their domain-specific knowledge of human behavior or simply using dark patterns to achieve a goal, perhaps from the higher-ups.
4. The fourth set described the **benefits and harms** resulting from the design, of which it was often one or the other; Benefit to a service, or harm to users.

All these were compiled from both academic and government materials. The Norwegian Consumer Council’s (NCC) definition focused more on the idea of nudging used in exploitative ways and the harms resulting from this design choice [8]. Some academic papers like the one from Bösch et al.[9] described dark patterns as a mechanic, an established solution for exploiting users. They also compared them as an opposite to anti patterns, which document a solution approach that should be avoided, because it has been proven to present a bad practice. Thus, anti patterns advocate against sub-par solutions while dark patterns do the opposite.

With a multitude of differences between analyses and their findings, the definition is still a melting pot of characteristics. The descriptions used, like a trick, seductive or malicious can be rather blurry in and of themselves. Even so, attempting to define dark patterns with many specifiers only fragments the research area [7].

2.2 Dark Pattern Categorization

As dark patterns exist in many types of websites, entertainment, and gaming platforms, they can be categorized differently, based on the examined attributes and methods. For example, Zagal et al. [10] studied dark patterns in game design. They divided related dark patterns into categories, such as Temporal-, Monetary- and Social Capital-Based Dark Patterns. These were used to list patterns such as Grinding and Playing by Appointment, which revolve around the player needing to play games constantly or at specific times. Pay to Skip, Pre-Delivered Content and Monetized Rivals revolve around the player having to pay more than they expected, maybe at unexpected moments. This could be either to make the game easier or more manageable. These also include situations where the player purchases and downloads a game, but parts of it are locked behind a paywall, making the game an incomplete package that cannot be completed by playing, but instead by spending money. “Pay to Win”-strategies, where paying players are given variety of advantages to unpaying customers, are also put under this category. Social Capital-Based Dark Patterns include patterns such as Social Pyramid Schemes, where players are rewarded for getting other people into the game, and in some cases failing to do so becomes a massive hindrance to the experience. Thus, the user-base is growing with people entrapped by the obligations to other players. Impersonation happens when the game assumes the identity of the player, either to send in-game messages to others without the user’s input, and even do out-of-game interactions, such as social media posts and sending email.

These examples provide us patterns that utilize the lack of consent on the player’s part. And these categories would not fit in all other platforms, especially since many dark patterns do not need to act without the user’s intent. Many patterns, especially in the field of marketing, rely on user’s decision-making, even though examples of consent-lacking actions do exist. On the field of marketing, dark patterns revolve more around manipulating the information available, using language, and persuasion, and on issues related to privacy. Mathur et al. [3] and Utz et al. [11] categorized dark patterns found in shopping websites and other popular websites. Categories like Sneaking, and Misdirection, had the common attribute of hiding information from the user or being covert. These included patterns such as sneaking additional products into

users' shopping carts, revealing important costs at the last minute and making continuous payments seem singular. Misdirection had patterns where language or color choices were used to influence the user, or pre-selecting more expensive options.

In a similar way to the dark patterns in game design, many patterns in shopping websites use temporal or social encouragements and restrictions to make purchases more inviting. Activity Messages and Testimonials, categorized under Social Proof, made sure to inform the user about the website activity, purchase amounts and user testimonials, often without an origin or source for their truthfulness. Product Scarcity and Urgency are also recurring pattern categories, which rely on the user thinking that lack of availability correlates with the raise in quality. [3]

Conti & Sobiesk [12] listed 11 categories, many of which focused on asymmetrical patterns, meaning patterns in which choices that benefit the service are featured more prominently compared to options that benefit the user [7]. Coercion and outright Tricks categorize patterns that lie to the user with "You've just won a contest" advertisements, require contact info before completing task, or send threatening messages to push users into specific actions. Confusion, Interruption, Obfuscation, Restricting Functionality and Distraction all feature patterns that either make wanted actions harder, more time consuming, or precarious, through strategically placed ads, color and contrast choices, confusing site navigation and omitting necessary control options.

2.3 Reasons for Their Usage

Perhaps the biggest and most obvious reason for the continuous usage of dark patterns is that they work in bringing more revenue and users to the services that utilize them, with very little drawbacks.

Dark patterns are especially useful in short term. Many designers hate using dark patterns, but they are forced to implement them by managers, who are often simply interested in few metrics, and when increasing the number of users is a priority, easy short-term solution, like collecting user emails will provide the wanted success. [13]

A/B testing is a user experience research method that presents the randomized testers with two versions of a single variable. The two versions are often referred to as a control (version A) and a treatment (version B). This is the simplest experiment setup to evaluate a factor but can be extended to multiple factors, in which case it would be referred to as A/B/n testing. [14]

Excessive A/B testing has proven that by serving variants of web pages to randomly selected subsets of users, seemingly trivial changes to design elements can result in substantial differences in user behaviors. Data-driven optimization of user interfaces has become deeply ingrained in the design process of many companies and for large services it is typical to have dozens of A/B tests running in parallel. [15]

The designing of dark patterns itself has also been somewhat commercialized. It is very easy to purchase third-party libraries like Hurrify [16] and Booster [17], both of which are popular plugins for the large e-commerce company Shopify [3]. These offer easy ways to generate stock values and countdowns, which incentivize users to purchase or access related products fast.

2.4 End User Perspective

The effects these dark patterns have on users can vary greatly. It can go from simple annoyance to useless website accounts and email spam, to even unwanted purchases and subscriptions.

In a 2020 research Maier and Harr [18] compile reactions from focus groups being exposed to dark patterns. The most common emotion expressed was annoyance. Other reactions included feeling stupid, angry, pressured, worried, and stressed. The reactions depended heavily on the experienced damage. If damage is minor, many will “just get annoyed and live with it”, because “so many [websites] do it”. Willingness to counter dark patterns is low as it requires too much effort. Patterns like Nagging or Forced Actions are much more acceptable, as they are often less dangerous and more obvious.

When encountering dark patterns, many express the sudden loss of trust in the websites and companies using these techniques. Loyal customers are always more valuable than new ones. Loyal customers are willing to pay more, engage with your brand on social media and to recommend you to their friends. Companies that use dark patterns are at a long-term competitive disadvantage against companies that don't. [13]

2.5 Legality

In 2014 the European Commission updated the old Consumer Rights Directive. This replaced the 1997 consumer rights law, which was heavily outdated, especially when considering e-commerce. Before the update, digital products and downloads has no reference in trading laws. With the new directive, dark patterns like Hidden Costs, Forced Continuity and Sneak Into Basket (dark pattern types categorized by Brignull [19]) were now made illegal. However, the

new law focused primarily on e-commerce, so dark pattern issues related to privacy, information disclosure and advertising were not affected. Since this only applied to inter-EU sales, a foreign company does not need to comply with the directive to sell in Europe. [20]

In the European Commission's "New Consumer Agenda of November 2020" [21], the Commission announced that it would update the "Unfair Commercial Practices Directive" [22] and the 2014 version of the "Consumer Rights Directive" [23] by 2022 in order to tackle online commerce practices that disregard consumer's rights. They also promised to address new challenges to product safety caused by new technologies and reinforce consumer protection in the context of digitalization of retail financial services.

The 2016 version of the Unfair Commercial Practices Directive [22] or UCPD addresses many e-commerce practices that are related to dark patterns. For example, search engines are required to clearly distinguish unnatural search results from natural ones. Natural results are the ones the user expects to get based on the ranked relevance to their search queries. Unnatural results are third party results that have been artificially promoted to the top of the results, either through paid placement or inclusion. This relates heavily on Google's actions to make advertisements progressively harder to distinguish from normal search results [24], [25].

The UCPD also prohibits misleading statements about limited availability and required traders to provide detailed lists of differences between products when showing the user comparisons between them or their prices. It also prohibits the use of fake positive reviews of products that are posted by the company and the suppression of genuine negative consumer reviews that might mislead the user.

In the State of California, the California Consumer Privacy Act (CCPA) tries to combat dark patterns. Businesses are required to disclose information on specifically what information it wants to gather from users and to whom it wants to provide it. This must be done before the point at which data collection begins, and there must be a clear opt-out included in the notice. [26]

Cookie- and consent barriers are often accused of using dark patterns such as Obstruction, Forced Action and Nagging. These barriers often appear immediately upon entering a website, and often block further access and use of the site until the user consents to all or some of the requirements. Gray et al. [27] talk about the design- and legal perspective on asking users'

consent in such ways. If the consent wall implements visual limitation that blocks access to the website until an agreement, this could violate the “freely given” stipulation in the definition of consent described in the EU’s General Data Protection Regulation Directive (GDPR) [28]. However, websites are required to be able to demonstrate consent, in a manner which is clearly distinguishable from other matters and this may potentially support the design of such interruption to the user experience.

3 RESEARCH METHOD

3.1 Case Study Theory

Data collection in this thesis will be done through a case study method. As it is rather loose and all-encompassing study method, it can highlight an individual, a group, a system etc. and be done through many different approaches. Ridder [29] divides the case study method into four design types:

- No Theory First

Case study template by Kathleen M. Eisenhardt [30]. This method focuses on capturing the richness of observations without being limited by theory. Research questions are still relevant. Previous research can guide the investigations, but no relationships between tested variables and theories are to be assumed. Data collection focuses primarily on qualitative data.

- Gaps and Holes

Case study template by Robert K. Yin [31]. This method focuses on specifying gaps or holes in existing theory to advance theoretical explanations and to answer the research questions, which are often shaped using literature to narrow the interest to a specific topic. If an extreme case is chosen to investigate a rarely observable phenomenon, purposeful sampling is done.

- Social Construction of Reality

Described by Robert E. Stake [32], this method is shaped by the interest in the case. In an intrinsic case study, the case itself is the interest. The case to be studied can already be chosen, in which case the researcher looks for specific characteristics and representativeness and generalization is not considered. In an instrumental case study, the case plays a supportive role to facilitate the understanding of a research issue. Purposive sampling leads to the phenomenon under investigation and in multiple case study, comparing cases enhances the opportunity to theorize.

- Anomalies

Represented by Michael Burawoy [33]. Case study research is guided by the anomalies that previous theory cannot explain. Anomaly does not reject theory but demonstrates that it is

incomplete. The uniqueness of the case is not prioritized, but instead social situations in which comparative strategy allows the tracing of differences across cases to external forces.

3.2 Data Collection

The case study design done in this thesis is a combination of the “Gaps and Holes” and “Social Construction of Reality” -approaches. Existing theory about dark patterns is the starting point of the case inspection. As the thesis focuses on dark patterns in general, the case is more of a vehicle to present and compare a real-world example to previous theory.

The primary method of this study is to pick apart a website of choice (explained in chapter 3.3.), look through its user interface and pick apart any occurrences of dark patterns, as described in previous chapter. The most important attributes to pick apart from all discoveries are the function, the purpose, the pattern category, the negative effects to user, how it could be made more user friendly. With each entry it is also preferable to explain the context of each entry.

The reason only one website will be investigated is that many studies related to dark patterns mostly focus on dark patterns in general with examples from all over the web, so focusing on one website may provide a new point of view. Because only one website will be investigated, it is important that it represents as many different approaches and implementations of dark patterns as possible. The website is chosen through purposeful sampling, which according to Yin [31] is done to present an uncommon phenomenon. In this case it means that the abundance of dark patterns may be larger than in most situations, but it will help shed more light on the issue.

3.3 Case Target

The website that will be studied in this case study is Ultimate Guitar, also known as Ultimate-Guitar.com (www.ultimate-guitar.com) [34]. Ultimate Guitar is a community website hosting tablatures and chord sheets for guitar, bass, and ukulele and many more instruments. It also has reviews, interviews, lessons, and a forum. It was started in 1998 by Eugeny Naidenov [35].

The mobile version of their application, Ultimate Guitar: Chords & Tabs [36] will also be looked through. This is to see if there are any distinguishing dark pattern designs that fit better based on the operating platform.

3.4 Data Analysis

Occurrences of dark patterns are found first by going through the functionalities of the system from the eyes of the user. Each occurrence is then compared with existing theory on dark patterns, their categorization, and effects on the user. The research by Mathur et al. [7] will provide a good starting point for categorizing the findings.

4 RESULTS

As discussed in previous chapters, this chapter will compile all found dark patterns in the website Ultimate Guitar [34]. While the website was looked at quite thoroughly, some aspects of the service were left uninvestigated. Most prominent of these was the cancellation of the Pro Membership, and the 7-day trial period that could be included with it. This is because many user reviews of the website claim it to be almost a scam, possibly charging you before promised, and being very hard to cancel, due to a lack of customer support. So, this part was skipped because of the possible risks.

4.1 Consent Wall

The first time you access Ultimate Guitar, the page quickly loads up a Consent Wall, that blocks the normal use of the site [Figure 1]. This is a fairly normal case of the Forced Action dark pattern these days, though in some websites the consent wall doesn't restrict the use of the website, but instead simply is somehow present maybe at the bottom of the screen. In some websites you can close the consent form, however it is often unclear what choice that action counts as.

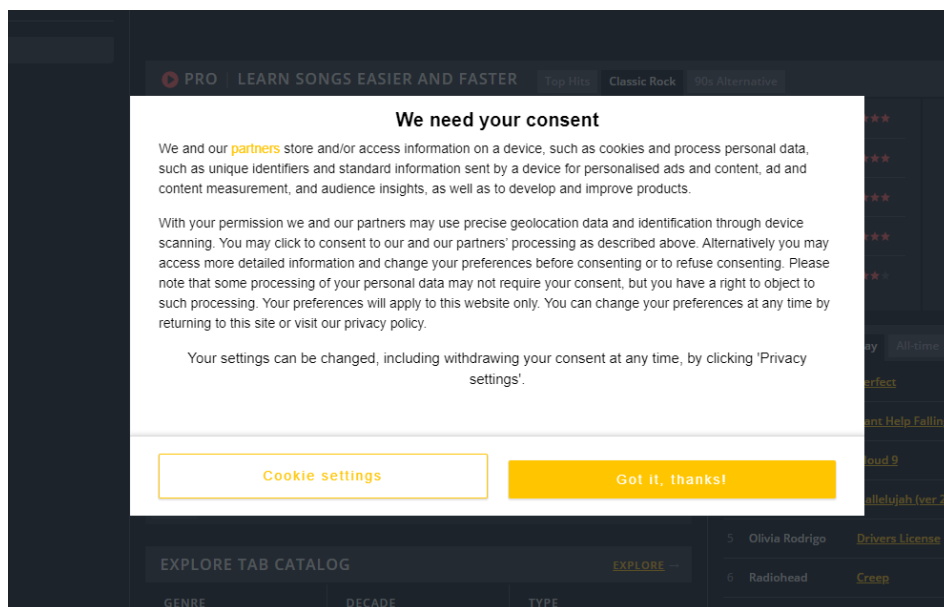
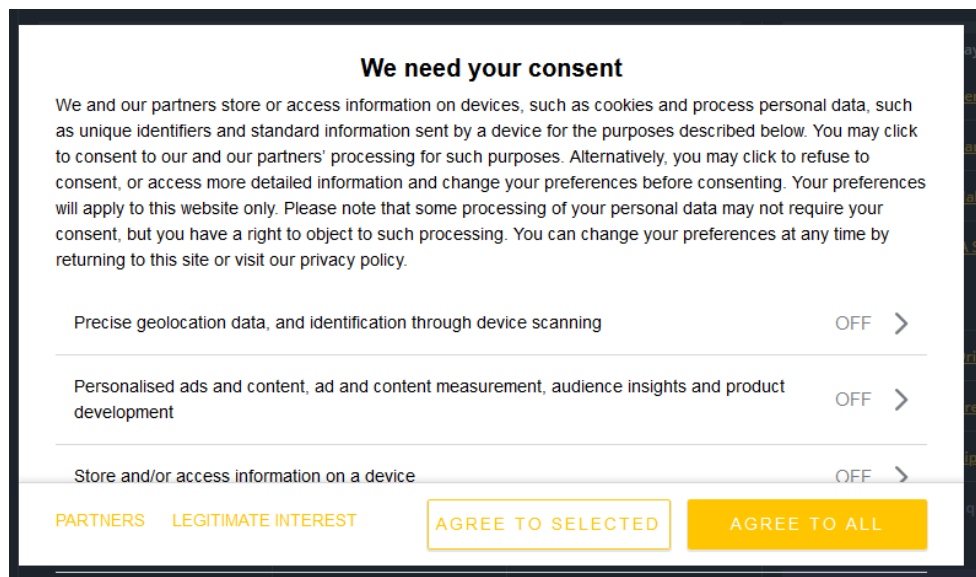


Figure 1 - Consent Wall in UG

The consent form describes the desired information and who uses them rather well and tells the user what they can do, including telling user they can choose not to consent. There are some possible problems with this form, firstly there is a lack of contrast in the white background and

yellow buttons and texts, which could be described as Obfuscation (hiding important interface elements). Especially when comparing this with the rest of the website. Some users might just notice the yellow button and click it without looking at the text. There is also no direct reject-button, instead a cookie settings button, which adds extra steps to rejecting cookies. In addition, the yellow “Got it, thanks!” is rather vague and casual for an accept button. There isn’t a direct question asking for consent before the button. The last thing before it is a statement that your settings can be changed later.



The image shows a consent form with the following elements:

- Title:** We need your consent
- Text:** We and our partners store or access information on devices, such as cookies and process personal data, such as unique identifiers and standard information sent by a device for the purposes described below. You may click to consent to our and our partners' processing for such purposes. Alternatively, you may click to refuse to consent, or access more detailed information and change your preferences before consenting. Your preferences will apply to this website only. Please note that some processing of your personal data may not require your consent, but you have a right to object to such processing. You can change your preferences at any time by returning to this site or visit our privacy policy.
- Toggle 1:** Precise geolocation data, and identification through device scanning (OFF)
- Toggle 2:** Personalised ads and content, ad and content measurement, audience insights and product development (OFF)
- Toggle 3:** Store and/or access information on a device (OFF)
- Buttons:** PARTNERS, LEGITIMATE INTEREST, AGREE TO SELECTED, AGREE TO ALL

Figure 2 - Consent Form after clicking Cookie Settings

If the user chooses Cookie Settings, the form shows more advanced options and allows further setting implementation for partners and legitimate interests [Figure 2]. The good thing is these are not auto selected for consent. On the other hand, Agree to All is still the most prominently colored button, which might nudge the user to clicking it instead.

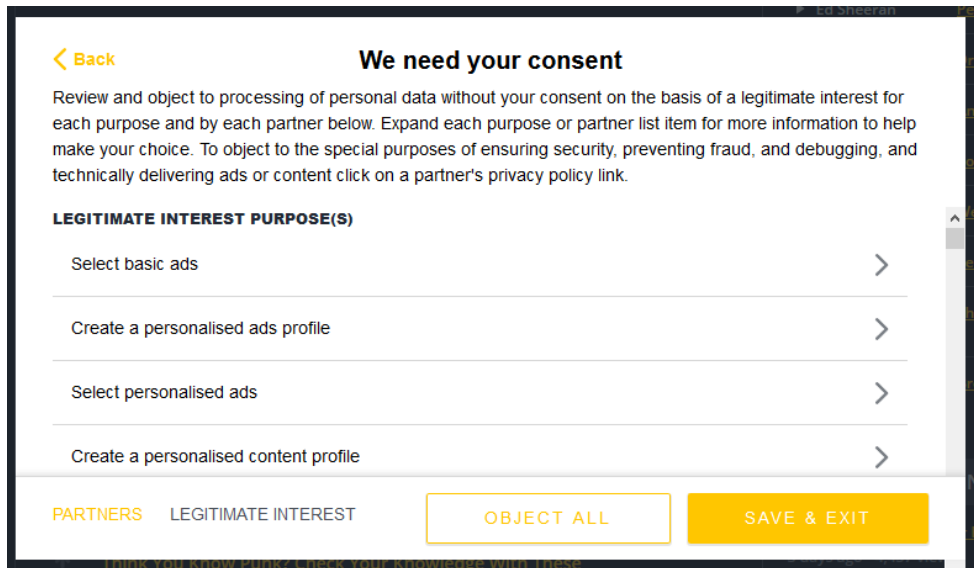


Figure 3 - Consent Form: Legitimate Interests

The Partners screen has an extensive list of third-party actors that would like to use information if given consent. These are also fortunately not auto selected. Legitimate Interests [Figure 3] instead has all options auto-selected for consent, which isn't noticeable unless each section is opened. Fortunately, there is an option to Object All, which does go in line with many legal requirements for showing a Does not Consent Button. Overall Ultimate Guitar handles the consent form quite well.

4.2 Urgency

On top of the website is a bright blue advertisement promoting a Spring Sale for Ultimate Guitar's Pro Membership [Figure 4]. Most notable thing about this promotion is the ticking clock counting down to presumably the end of the sale. When a new user enters the site, they will notice that the sale will end at exactly the end of the day. This is indeed true all the time, as the timer resets every day, and always counts down to the end of day. The season in the advertisement also changes according to the season.

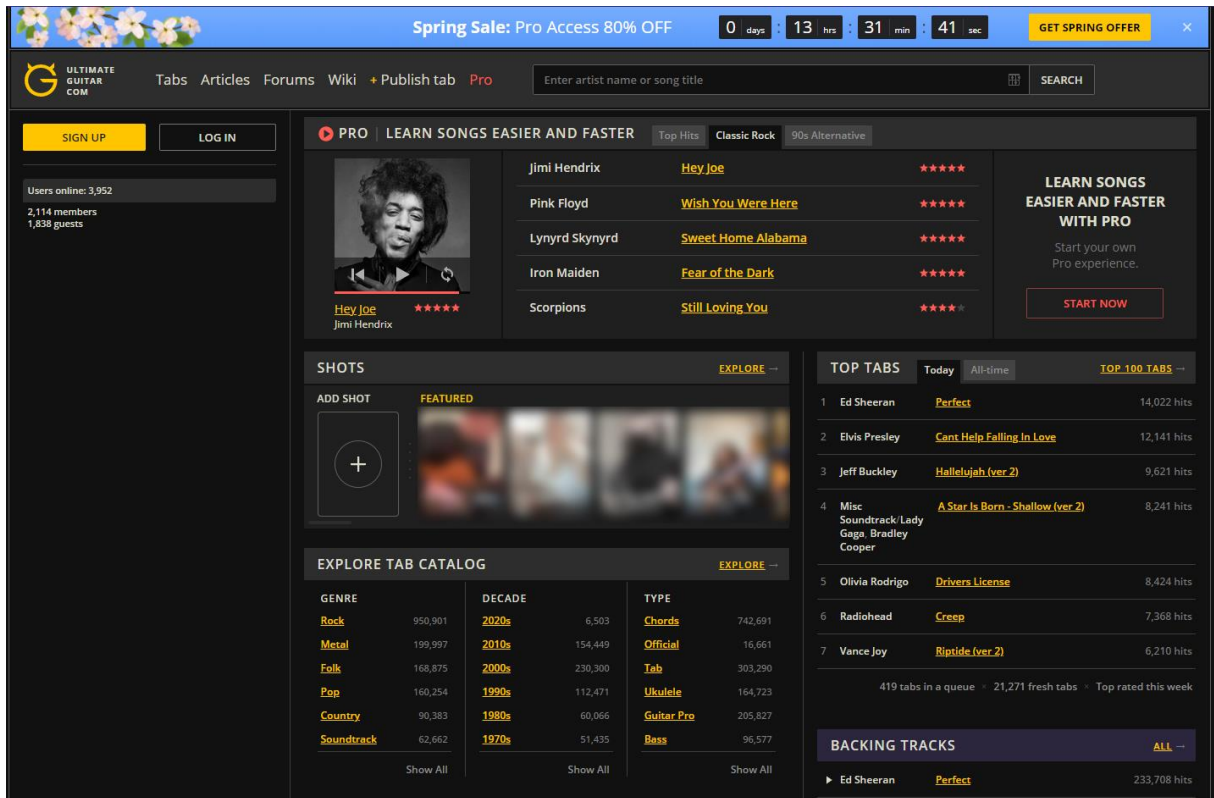


Figure 4 - Ultimate Guitar Frontpage

4.3 Activity Messages

When the user accesses the frontpage of the website, one thing the user might notice under the Sing Up -button is the number of users online [Figure 5]. This is a form of Social Proof pattern, which websites use to elicit a sense of activity, that might convince users of the website's competency. While some online stores might generate fake data, it is very unlikely that is the case here, as the data seems to be consistent upon viewing it for a time. In addition, the website does not draw much attention to this part of the screen.

In this case the purpose of this component is not necessarily to present the websites overall popularity, but instead the number of registered users or members compared to unregistered guests, to incentivize new users to create an account. This can be discerned from its placement below the login buttons.

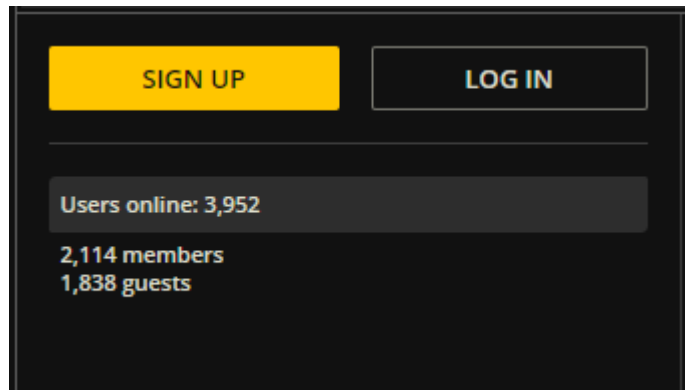


Figure 5 - Activity Messages

4.4 Disguised Ads

In the frontpage there is a component with a title “Pro | Learn Songs Easier and Faster”. This contains a few chords that can only be accessed with the Pro membership. There is also a component that looks like a video player, with a back, pause, and replay buttons. It also has a red bar that looks like a timeline, that fills automatically in about 7 seconds. One could assume this is a video or music player but in reality, this is just a link to purchase the Pro membership. The timeline itself actually controls the automatic changing of the tabs above, like “Top Hits” and “Classic Rock”, which might not be noticeable since the tabs look mostly the same.

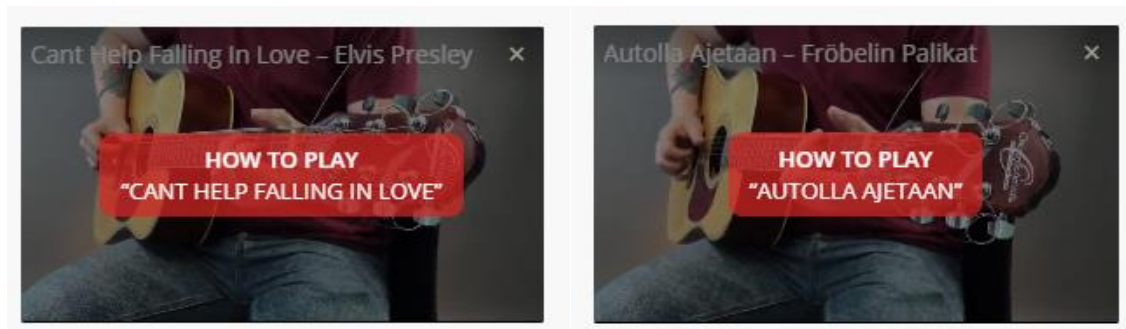
4.5 Generated Fake Content

It is important to consider how most new users find the website. Since Ultimate Guitar (UG) provides chords for a multitude of songs and instruments, most new users find the site through searching chords for a specific song. The search results then directly redirect the user to the specific chord page. Therefore, it would be advisable to make any songs chord page as high quality as possible. UG does this by putting up a mute video sample of a man playing the chosen song [Figure 6], and while hovering over it a caption “How to play {song name}” appears. [Figures 7a]. Clicking this video redirects the user to the Pro member registration. This itself is not bad, as this additional content could simply be behind a paywall.

The screenshot displays a webpage for guitar chords. At the top, it features the song title "Cant Help Falling In Love chords by Elvis Presley" and navigation options like "EDIT", "ADD TO PLAYLIST", and "FAVORITE". Below this, it lists statistics (22,210,502 views), difficulty ("intermediate"), tuning ("E A D G B E"), capo ("2nd fret"), and key ("C"). A section for "CHORDS" lists various chords with their corresponding fretboard diagrams. A "STRUMMING" section shows a pattern of downstrokes and upstrokes. A video popup is visible on the right side of the page, showing a person playing a guitar. At the bottom, there is a control bar with options for font size, chord display, simplification, autoscroll, and transposition.

Figure 6 - Chords Page with a Tutorial Video Popup

The trick is that this video is the exact same on every song you happen to go to. Only the title and caption changes. The main issue with this is that there is no way every song on the website can provide a video lesson. Still this video popup shows even on the most obscure non-English songs possible [Figure 7b]. Even if the user does not click the video, it gives the illusion of additional content being available on the site. UG also makes noticing this fake content harder for an average user, as this video popup only seems to show up on the first song you see on the website. This way the user might not get suspicious when going to other songs on the website. This is however easily noticeable when opening songs in new incognito mode pages.



(a)

(b)

Figure 7 – (a) Video Popup #1, (b) Video Popup #2

4.6 Misdirection

If one were to click many of the Pro membership advertisements, higher quality chords or many different Pro-features, the user is directed to a long page containing all the different sales and features included in the Pro membership [Figures 8 & 9].

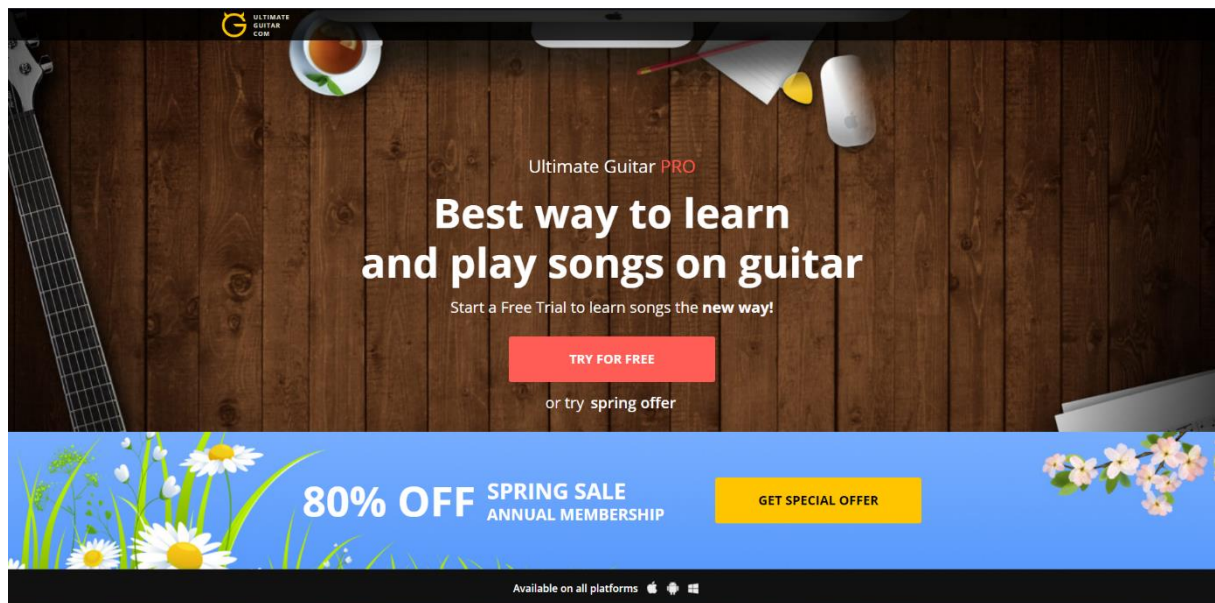


Figure 8 - Pro Membership Sale #1

The important thing to notice in this page is number of different titles. There is “Try for Free”, “Get Instant Access” and “Get Special Offer”. There are actually three different payment plans available: The normal monthly payment, 65% off annual payment, and the Spring Sale, 80% off annual payment. However, both the “Get Special Offer” and “Get Instant Access” redirect you directly to the Spring Sale Payment Method Screen [Figure 10a]. “Try for Free” instead redirects you to a Choose Your Plan Screen [Figure 10b], which tells you about the trial period in which you can cancel the membership and not get charged. But when you click “See Plans”, it directs you the next page, Spring Sale payment plan pre-selected, which does not have a trial period [Figure 11a].

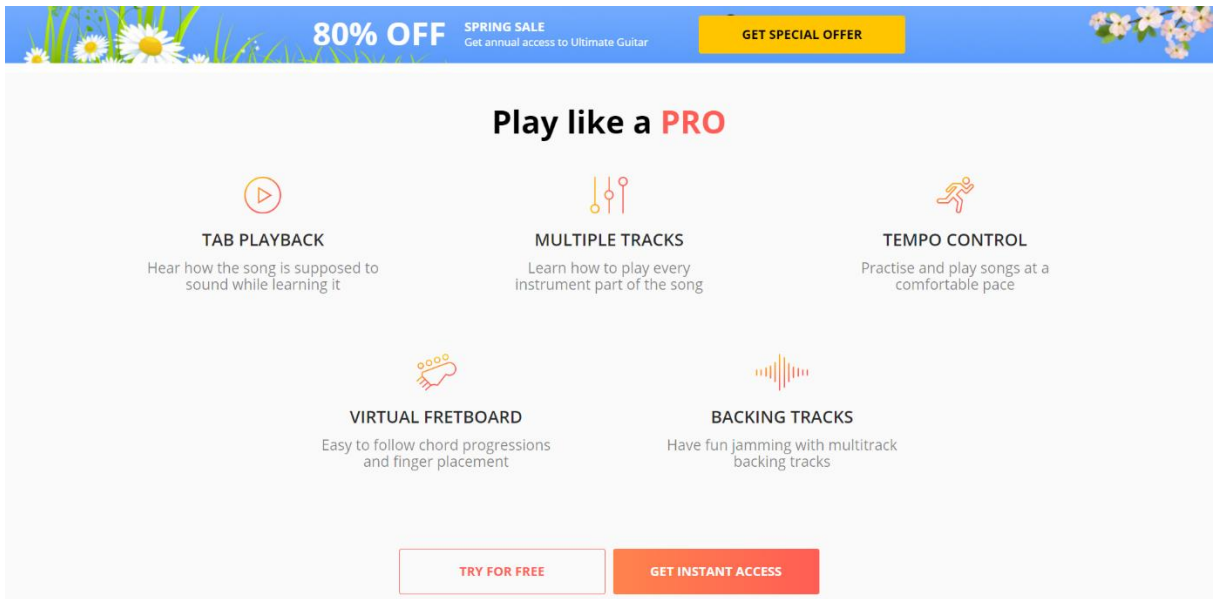
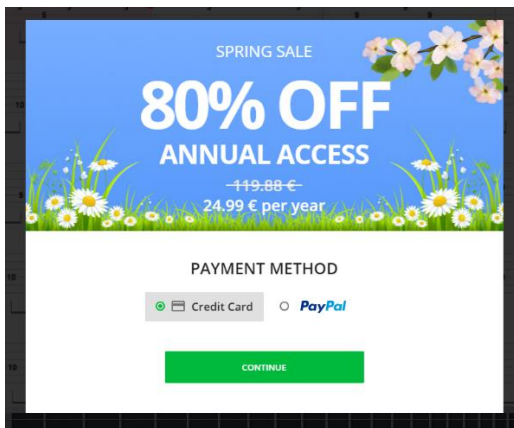
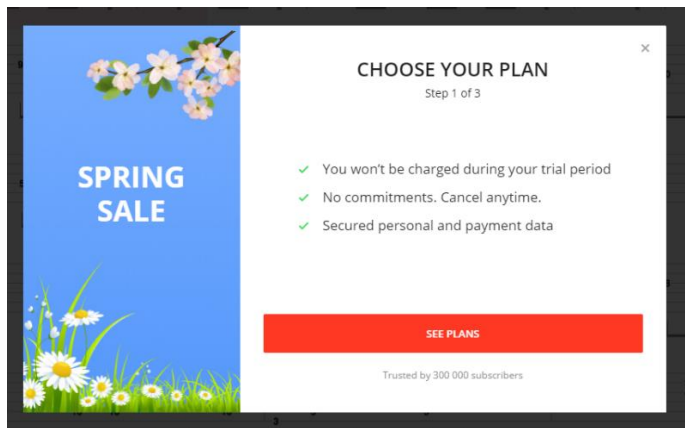


Figure 9 - Pro Membership Sale #2

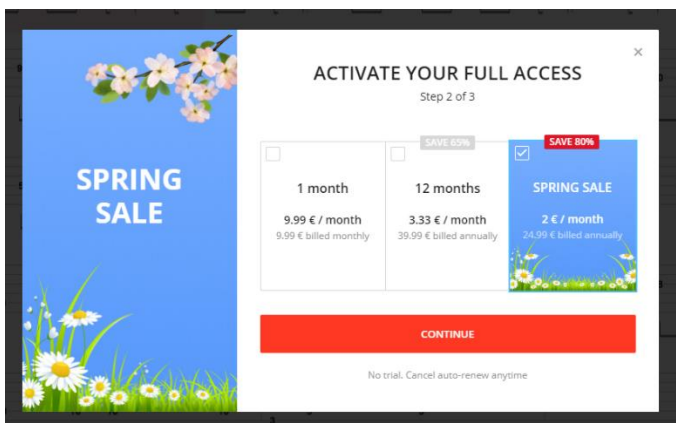


(a)

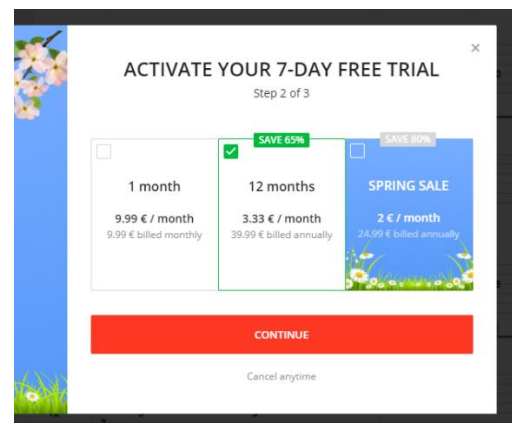


(b)

Figure 10 – (a) Payment Method Selection, (b) Payment Plan Selection



(a)



(b)

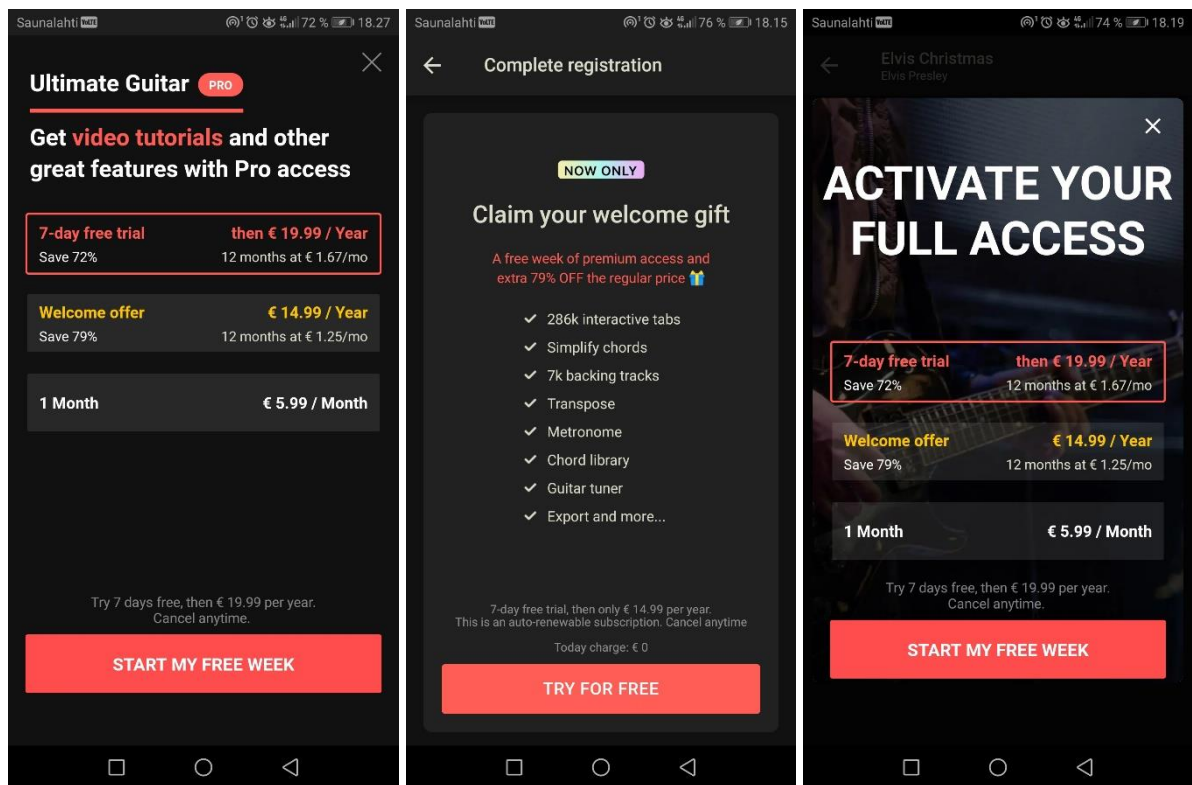
Figure 11 – Payment Plan Options: (a) Spring Sale Default; (b) One Year Plan with Trial Selected

The payment plan that has a 7 day trial period is in fact the 60% off annual payment plan [Figure 11b]. The user might notice that when the Spring Sale is selected, there is a small text under the

Continue button that says there is no trial. This manipulation of default settings has been mentioned. But in addition to this manipulation of the default value, there is also misdirection on the previous screen, to which you get by selecting “Try for Free”. The screen reinforces the promise of a free trial, while a third of the screen is filled by the Spring Sale banner. This inadvertently creates a connection between the free trial and the Spring sale in the user’s head, both of which have been heavily featured side by side everywhere on the website. So it is no wonder if the user assumes the preselected Spring Sale payment plan includes the features listed in Figure 10b.

4.7 Comparison with UG Mobile App

Overall, the mobile application of Ultimate Guitar is much more user friendly. There are no consent walls that cannot simply be closed or declined easily. Pro membership is advertised very clearly, with three payment plans [Figure 12a]. Still, there are some possibly major problems.



(a)

(b)

(c)

Figure 12 – (a) Pro Memberships, (b) Welcome Gift, (c) Occasional Pop-up

When one opens the app for the first time, there is a popup about a welcome gift, with the colorful tag “Now Only” [Figure 12b]. But in fact, this is the same welcome offer that can be purchased at any point in using the application. This is a form of the Urgency and Scarcity dark

patterns. Other than this there is also an occasional popup to purchase the Pro membership, which could be described as Nagging [Figure 12c]. Like in the desktop version, there is also a Pro popup every time you click on a pro feature, but this is to be expected.

If you compare the sales on the mobile version and the desktop version, you can see that they are indeed different, desktop having a 9,99€ monthly Pro membership, with 60% and 80% off annual payment plans. The app has a 5,99€ monthly Pro membership, with 72% and 79% off annual payment plans. This is because they are indeed different services and must be bought separately. While Ultimate Guitar does not say anywhere that these are the same service, this could still be described as a form of Misdirection, as both versions use the same name Ultimate Guitar Pro and both versions use same type of markers and colors to distinguish Pro-only chords from normal ones. In addition, both these versions use the same user accounts. So, there might be a possible case where a user might want to buy Pro on one device but because they do all their purchases on the other platform, they might purchase the other version without knowing it wouldn't qualify for the other.

5 ANALYSIS

In summary of the previous chapter, a single website, Ultimate Guitar and its mobile application were looked through in order to find clear dark patterns in their user interface. While their functionality and effects were discussed in the previous chapter, in this chapter it will be determined how well they fit into the criteria and definitions of dark patterns, especially the ones dissected in the work of Mathur et al. [7], which compiled many academic and government opinions on the nature of dark patterns.

5.1 Fitting Findings into Current Definitions

In Table 1 the dark patterns found have been fitted into dark pattern definitions defined by Mathur et al. Most of these definitions relate to at least one found pattern, which isn't really that surprising, as there are so many of these definitions, with some obvious overlap between some of them. When looking at the characteristics and mechanics of these dark patterns, Trickery, Misleading and Deception were the most prominently featured. But these are all quite similar in meaning and can be quite broad concepts.

The least prominent mechanics were Attacking and Exploiting users and pattern characterized as Malicious. The concepts of Malicious and Attacking dark patterns are described in the work of Conti & Sobiesk. Malicious techniques include for example flashing objects, animations and videos to attract users, navigation architectures that direct the user away from their desired features or forcing users to wait or watch undesired content [12]. These kinds of patterns are more popular for example in mobile game ads or websites that hosts loads of ad space, where competition between advertisers is stiff and to attract users, your advertisement needs to be more shocking than the last. Fortunately, Ultimate Guitar does not host many third-party advertisers.

Found Dark Patterns in Ultimate Guitar

		Desktop							Mobile		
		Consent Wall	Consent Buttons	Spring Sale Timer	Active User Count	Fake Video Player	Fake Tutorial Video	Payment Plan Selection	One Time Welcome Gift	Occasional Pro Popup	Two versions of Pro *
Characteristics of the User Interface	Coercive	x									
	Deceptive			x			x	x	x		x
	Malicious										
	Misleading					x	x	x	x		x
	Obnoxious	x								x	
	Seductive			x	x		x				
	Steering		x	x						x	
	Trickery			x		x	x	x	x		x
Mechanics of Effect on Users	Attack users										
	Confuse users					x					x
	Deceive users			x			x	x	x		
	Exploit users										
	Manipulate users		x	x	x						
	Mislead users			x		x	x	x	x		x
	Steer users		x	x						x	
	Subvert user intent							x			
	Subvert user preferences	x						x			
	Trick users			x		x	x	x	x		x
	Undermine user autonomy	x									
	Without user consent	x								x	
	Without user knowledge						x		x		
Role of the UI-Designers	Abuse of designer knowledge		x	x	x					x	
	Designer intent	x	x			x	x	x			
Benefits and Harm	Benefit to service	x		x	x			x	x		x
	Harm to users							x			x

Table 1 - How found dark patterns suit into established definitions groups by Mathur et al. [7] (* also part of Desktop)

5.2 Discussing the Ethics of Dark Patterns

One of the core ideas behind dark patterns is that they are used with the needs of the developers and companies to the detriment of the users.

The dark pattern with the least common attributes found was the Active User Counter, only really fitting into the category of Manipulating users. This feature does provide benefits to the service and might manipulate users into creating an account through Social Proof. But does it hinder the experience of the users? According to Maier and Harr [18] one of the most common reactions to dark patterns was annoyance. If a user signs in based on the high percentage of registered users and is unamused by the features that registration provides, does it prove that the feature is a dark pattern? These questions were also raised by Gray et al. [37] when discussing the definition of a dark pattern defined by Brignull. Which user or stakeholder interests should be kept in mind? What is the user being “tricked” into and with what motivation? And are there instances where being tricked into something is desired by the user?

UI - Component	Dark Pattern Categories	Possible Effects on Users
Cookie Selection Screen	Consent Wall, Forced Action, Obfuscation	Unintentional consent for the use of user data.
Sale Countdown	Urgency	Rushed purchase of Pro Membership without much thought.
Registered Users Counter	Social Proof	Lower threshold to creating an account.
Fake Video Player	Disguised Ads	Unintentional redirect to Pro Purchase page.
Fake Tutorial Video	Disguised Ads, Misdirection	Redirect to Pro Purchase page and wanted tutorial not actually existing.
Pro Membership Selection	Misdirection, Default Settings, Sneaking	Selecting the wrong payment plan.
One Time Welcome Gift	Scarcity, Urgency	Rushed purchase of Pro Membership without much thought.
Occasional Pro Popup	Nagging	Annoyance.
Two Versions of Pro	Misdirection	Defying of user expectations. Possible purchase of 'wrong' Pro Version.

Table 2 – Found dark patterns in Ultimate Guitar summarized

When discussing the ethics of dark patterns, concrete harm to the user, in either monetary, psychological, or security-related ways, is a clear sign of an unethical feature. Table 2 compiles the found dark pattern components in Ultimate Guitar, with the most fitting dark pattern categories, and the possible effects they have on users. Benefits to the service are not compiled, as besides from the Registered Users Counter, whose main benefit is the increase in registered users, and the Cookie Selection Screen which wants to have as many users’ consent, all the other ones were clearly meant to increase sales of the Pro membership.

The problem with many dark patterns is that their severity is sometimes only measurable in a case-by-case basis. GDPR states that silence, pre-ticked boxes, or inactivity should not therefore constitute consent. This is a good legislation against sneaky cookie-selection boxes and such, and many might claim that removing any defaults is a good thing. But there are cases where defaults can be smart. Even simple things, like when you close an unsaved project on Microsoft Word or Photoshop, you are greeted with a suggestion to save changes, with a default yes, in case the user reactively presses enter. Another example outside user experience design is the process of organ donations. Johnson and Goldstein [38] studied the organ donation process in various countries and found out that countries with an opt-out system, meaning you are presumed consenting to organ donating, had an average of 90 percent consent to donations, while countries in which you need to opt-in to donating, had around 30% or lower. Many would consider this to be ethical manipulation of a default.

The abundance of dark patterns prove that they are useful in determining user behavior patterns and developers can learn much from them. Mesibov [39] mentions that the key to learning good UX from dark patterns is implementing them to advance the user's goal. She also provides examples of dark pattern mechanics like Hidden Costs, Sneak into Basket and Friend Spam can be used for the user's benefit, like making promotional emails and messages to friends a user-focused customizable feature.

5.3 Future of Dark Patterns

As explained in an earlier chapter, the commercialization of dark patterns has had an influence in their popularity. These easy and fast solutions are surely tempting for new, maybe small development companies, or even large companies looking for a quick profit. Since there are often no strict guidelines in user experience design, many look at current examples on what works, and that can lead to the continuation of dark pattern usage. There would need to be a more active, perhaps proactive push to teach new developers about good user experience and the harms of dark patterns. This might in time shrink their popularity.

Another method would be to push more legislation concerning dark patterns. Current laws like in GDPR, UCPD and CCPA are a good sign of more attention being directed at online marketing, data security and user consent. The problem is that it is often hard to penalize companies, since these laws are still quite easy to avoid, either through subtle tricks or especially if the company isn't located in areas in which these laws are applied.

Public awareness is a huge factor in combating dark patterns and discouraging companies from using them. Some forums, social media accounts and websites have started pointing out these patterns on mass, like r/assholedesign on Reddit [40], the Twitter account of darkpatterns.org [41] and UXP2: Dark Patterns [42]. In addition to shaming companies that use dark patterns, it is also important to praise those that do not. This could be done through similar ways like forums, or by pointing out better alternatives in a bad website's reviews or in the comments of a dark pattern shaming-post. A third way is of course to get through the barrier of simply stopping the use of said websites.

5.4 Analyzing Research Questions

In chapter 1.2 three research questions were defined to be answered: What are dark patterns? How to identify them? And why are they used?

First, what are Dark Patterns? This question was answered by going through related research to find a concrete definition. It became evident that while most agreed on the general idea behind a dark pattern, that being an interface or function that uses user behavior to cause actions that are in the interests of the company providing the service as opposed to the user itself, there was variety in the specifics of the definition, for example the need for a presence of a negative effect to the user, to qualify it as a dark pattern.

This research also provided insight into the second question, that being how to identify them. Many categories these patterns have been placed in were discussed, and what characteristics features and use cases those categories had. This research was reinforced and compared by doing a case study on a particular website, that had many examples of different dark patterns. It was found that while some fit into these categories well, some did not necessarily have downsides from a user's perspective, even though aspects of dark patterns were found in them.

The third question of this thesis was about why these patterns are used, and to an extent, could the popularity of these mechanics be reduced in some way. To answer this, it was important to look at how the legislation related to dark patterns has changed in the relative short time they have been acknowledged as a problem. The end user perspective and public awareness on the issue was also prominent. It was concluded that while the public awareness is on the rise, to truly combat against the use of dark patterns, there would need to be more pushback against companies using them, and a push to encourage and teach actual developers to use more ethical development tactics in their projects.

6 CONCLUSIONS

The writing of this thesis was started in hopes of getting an understanding on the relatively new concept of dark patterns. It was important to get an idea on their specific characteristics, functions, purpose, and effects on users, in addition to knowing why these are ever more common, and what could be done to reduce them or their effects.

Dark patterns are now a relatively well understood concept with small fractures on the definition because of the differences in the characteristics, involved players or harms that are being discussed. They can take many forms and on different websites and platforms have different methods and purposes. Some do not necessarily fit into the loose definition perfectly. Dark patterns are easy to develop and provide a short burst of success, but with a growing understanding of them, it is possible to weed them out with new legislation, teaching, and firm actions by the public.

One shortcoming of this thesis may be the website chosen for searching examples, as this selection was partly done from personal experience and from little coverage it seemed to have on the internet. As such there are bound to be better examples of websites with many cases of dark patterns, if any future research would want to cover specific websites.

Another thing that future research about dark patterns could focus on, is the different approaches to generating more public knowledge on dark patterns, whether to the general public, companies, or individual developers. Are internet forums really a working method into fixing the current situation? Are other methods any better, like school courses, petitions, campaigns etc.?

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