

Creating Better-Informed Consumers and Reducing Dark Pattern Tendencies Through Improved Terms of Service Solutions

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Abstract

In Terms of Service (ToS) contracts for software applications, there are widespread and increasing uses of “dark patterns” and other subtly manipulative techniques that are categorized as deceptive marketing, which violates FTC Act’s commerce rules. Our focus is on the technological factors of UI (user interface) on current contracts. We propose a remedy of industry-set and best-practice guidelines under federal supervision, which can help establish enforceable industry standards without chilling innovation. The only way to support a user’s rights to privacy protection and transparency would be to create a set of guidelines and a model UI for usability and clarity that regulate UIs and potential dark patterns to ensure that a user is giving fully-informed consent through the ToS. Our solution is a set of guidelines with a model prototype UI that balances the needs of the major stakeholders: the government, the users, and the companies.

Introduction

The Google Play store released over 1.25 million apps in 2016, with the iOS App Store close behind, with just over 1 million apps released [1]. It’s no surprise that the average American is agreeing to more Terms of Service (ToS) contracts than ever—reading through every digital contract that the average user agrees to would take almost 250 hours every year [2]. It should also be no surprise that most, if not all, of these digital contracts go unread. Studies have shown, again and again, that we will blindly agree to relinquish our first-born child[3], to scrape chewing gum off sidewalks [4], and even to give up our immortal soul [5].

The widespread and increasing use of “dark patterns” [6] and other techniques of subtly manipulating consumers into unintentional choices, while purchasing products or agreeing to Terms of Service (ToS) contracts, violates commerce rules of the FTC Act against deceptive marketing. Abuses happen when companies employ dark patterns, or UIs

specifically designed to trick users into making choices against their best interests. Dark patterns can influence users by obscuring information, presenting information misleadingly, or simply using subtle cues to bias users towards certain options. With a plethora of dark patterns emerging in the UIs of many ToS contracts that users see today, it becomes increasingly more difficult to avoid getting tricked by unscrupulous companies and websites.

While current judicial precedents have deemed regular ToS as enforceable because they are usually both clearly presented and explicitly agreed to by users (Schnabel v. Trilegiant Corp), the government does little to ensure that users are not being manipulated into agreeing by UIs [7]. The OECD recommendations [8], FTC’s privacy notice proposal, Consumer Privacy Bill of Rights [9], and FIPPs, all stress the importance of users not only giving consent but giving unbiased, fully informed consent for their data to be used. The only way to support the user’s rights to privacy protection and transparency would be to bring regulations on ToS into alignment with these directives, namely by regulating UIs and dark patterns to ensure that a user giving consent means that they are giving fully informed consent.

The government, the users, and the companies are all major stakeholders in this issue. Of course, it would be exceedingly difficult to develop a strategy that would satisfy all the stakeholders in this issue. Our solution seeks to find the best compromise between these parties by raising awareness for the content and meaning of ToS contracts through creating guidelines for interfaces that are more intuitive and clear to navigate without limiting companies too strictly. After all, Terms of Service contracts are a necessary step for companies to explain their services and for users to understand their rights. Specifically, we propose a set of guidelines for usability and transparency, and we have designed a model UI that reflects these guidelines. We believe that our prototype will protect the users, but at the same time,

will not impinge on the ability of companies to innovate, so long as they are not employing any misleading UI designs. The prototype will also make it more straightforward for the government to evaluate ToS contracts and decide whether or not they are constitutional or enforceable.

In this paper, we propose a novel design that we have implemented to increase user interaction and comprehension of ToS contracts, which has the potential to help establish enforceable industry standards without chilling innovation. These standards, moreover, can be aligned with both European OECD standards and US policies laid out by the FTC privacy notice proposal, the Consumer Privacy Bill of Rights, and FIPPS. Finally, we analyze the results of our preliminary user testing and offer suggestions for next steps in the design, as well as future work in this area.

Methods

Experimental Design

In our study, we wanted to compare the effectiveness of communication between our prototype Terms of Service layout (Fig 1) and the standard layout of a Terms of Service contract (Fig 2). With the two Terms of Services compared next to each other by being tested on the same research participants in randomized order, we were able to collect both quantitative and qualitative feedback. For the quantitative feedback, we sought to test for the following two specific measures of effective communication: the length of time it took to read through each Terms of Service, and the comprehensibility of the main points communicated in the Terms of Service. We averaged the amount of time it took the research participants to read and complete signing the Terms of Services for the former, and for the latter, we asked research participants specific questions following the completion of the Terms of Service agreement about the big ideas being conveyed.

UI Design

The new UI was designed based on the two themes mentioned previously. To minimize length, the ToS was compartmentalized into three main sections, each containing 8-12 subsections. Rather than presenting the user with the entire text at once, the first page displayed three red buttons, each representing one of the three main sections: Overview of Services, Disclaimers & Liabilities, and Privacy & Copyright (Fig 1a). After clicking on a section button, the user was taken to the corresponding section page,

consisting of 8-12 buttons, each representing the related subsections, as well as an “I commit” button at the bottom of the page (Fig 1b). Hovering over a subsection button would display a “TL;DR” tooltip summarizing the subsection using simple and clear language (Fig 1b). Clicking the subsection button would take the user to the corresponding subsection page, which displayed the actual text of the subsection as found in the ToS (Fig 1c). Once the user was done browsing the subsections they were interested in, they could click the “I commit” button to be taken back to the first page.

Interactivity was also built into the UI. As mentioned previously, the three main section buttons were red upon opening the ToS. After entering a section and clicking “I commit”, the user would be returned to the first page, where the button corresponding to the section they had just committed to would turn green. All users quickly realized that they had to view and commit to each main section in order to turn all three buttons green, upon which the “I agree” button would appear at the bottom of the main page (Fig 1d).

User Testing

Participants (n=26) consisted of college-aged students. For the purpose of an unbiased study, we informed the participants that there were several parts to the study, and that in order to progress onto the main section requiring software engagement, they needed to complete specific actions for the two Terms of Services first in order to provide “informed consent”. All participants were informed that they would be participating in a study on user interaction with the popular puzzle game “Candy Crush”. In order to reach the game page, participants first had to navigate the ToS interface to give their “informed consent” to participate in the study. The purpose of this deception was to minimize the risk of any observer effects, ensuring that the participants would not change the way they interacted with the ToS in response to their awareness of being observed.

Group A (n=13) were given the modified UI described in the previous section. Group B (n=13) were given a “standard” UI, consisting of a text box containing the entire ToS (17 pages) with “agree” and “disagree” buttons at the bottom. Each participant’s screen was recorded via Quicktime for the duration of the study in order to calculate the time they spent on the ToS screen. After they agreed to the ToS and completed the Candy Crush game, participants were given a short quiz on the content of the ToS for a quantitative measure of their understanding.

Qualitative questions were also asked regarding the UI they saw, including what they liked and didn't like, as well as their opinions on what would increase comprehension and readability.

Results

There was a significant increase in interaction time with the ToS as measured by time spent on the ToS screen for participants receiving the modified UI (Group A). These participants spent an average of 24.38 ± 7.23 seconds on the ToS screen, compared to 2.67 ± 1.76 seconds for those who received the traditional UI (Group B).

The keystroke-level model (KLM) was used to estimate the execution time required by each UI. This was a necessary step in order to separate the time participants spent on clicking or moving the mouse from the time they spent actually reading and comprehending the material presented on the page. KLM consists of several operators used to model the actions necessary to complete a task on a computer interface [10]. The estimated time taken to perform each operation is determined from experimental data. To estimate the total execution time of a task, the component operators are determined and their corresponding times are summed. For our purposes, only clicking (K), pointing (P), and mental preparation (M) operators were necessary, as we were specifically measuring the minimum number of actions necessary in order to agree to the ToS. All other actions (i.e. scrolling, hovering over subsections, and visiting subsection pages) were considered to be interactions with the ToS that assisted in comprehension, and were not included.

For the traditional UI, participants only needed to point their mouse towards the "I agree" button and click, generating a sequence of PK. Mental preparation (M) operators were added in front of all P operators according to standard heuristics [11]. An M operator was not added in front of the K operator in this instance since the K was immediately preceded by a P, and a PK is generally considered as a single cognitive unit. The final KLM sequence for the traditional UI was defined as MPK.

The modified UI involved three identical subsequences for agreeing to each of the three ToS sections. For each section, participants needed to point and click on the section button, and then point and click to the "I commit" button. After committing to all three sections, the participant had to point and click to the final "I agree" button on the main page in

order to complete the task. The final KLM sequence for the modified UI was thus defined as $(MPKMPK)^*3+MPK$.

Standard estimates of operator times allocate 0.2 seconds for K, 1.1 seconds for P, and 1.35 seconds for M [11]. Using these estimates gives a total execution time of 2.65 seconds for the traditional UI and 18.55 seconds for the modified UI. Testing revealed that participants in Group B spent an average of 2.67 seconds on the ToS, giving them just 0.02 seconds to read the text on the screen. Group A participants spent 24.38 seconds on the ToS, giving them an average of 5.83 seconds to interact with the ToS. This extra time translated into increased understanding of the ToS, with Group A participants scoring significantly higher on the comprehension quiz, earning 6.69 ± 1.18 out of 9 total points, compared to 4.15 ± 1.82 for Group B.

Discussion

These results confirm findings from past experiments regarding the effects of gamification on user interaction. Specifically, the introduction of design elements commonly found in games, such as progress bars, rewards, and feedback, tend to support user engagement and quality of activity. [12] [13] By adding tooltips with plain-English explanations of the contract and marking visited sections of the contract green, our slight gamification modifications resulted in significant increases in both interaction time and comprehension of the ToS.

Based on these results, we believe additional investigation into areas such as gamification and user interactions would be highly beneficial to further increasing comprehension of ToS contracts. Though our design demonstrated significant increases in understanding, the average comprehension (74%) still remains low. In particular, supplementary research on the effects of design choices such as color and font is necessary to determine the optimal combination of such choices to generate the most user interaction.

Conclusion

Here we demonstrate the first instance of a ToS interface designed to both increase user interaction as well as comprehension. This study showed that while Terms of Services are generally viewed as lengthy, difficult to comprehend, and tedious to read, there are specific recommendations that have been proven to improve the comprehensibility of the legal document both on a high-level main idea scale, and also on the level of detailed and specific wording. The recommended solution is a model prototype UI

template for Terms of Services that increases the engagement levels of young millennials and older Generation Z along with readability. With this upcoming digitally-native generation of consumers interested in learning more about their internet privacy rights, a massive influx of internet based services, and the government's increased role of internet regulation, we believe our Terms of Service guidelines and prototype are immediately useful for implementation, as well as paving the way for future innovation in UI design, gamification, and interactivity.

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Figure 1a. The first page of our UI, before any sections of the ToS has been visited. **Figure 1b.** The subsection page seen by the user after they select one of the three sections on the first page. Mousing over one of the subsections allows a tooltip to appear, explaining the contents of the subsection in plain English. **Figure 1c.** This screen appears when the user selects one of the subsection screens, and displays the full text of the ToS corresponding to that subsection. **Figure 1d.** After visiting each of the three main sections, the “Ready!” button appears, allowing the user to agree to the contract and bringing them to the Candy Crush game.

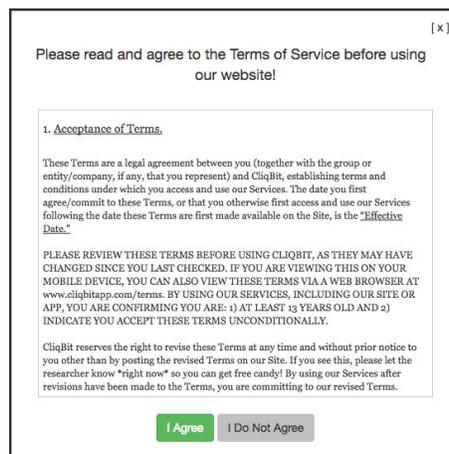


Figure 2. A standard Terms of Service contract layout. All of the text is on one page. The user must scroll down to read each subsequent page of text. After clicking the “I Agree” button, the user is brought to the Candy Crush game.