Privacy Compliance for Esports Leagues

CS 3750: Deliverable #4

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Project Description:

Esports leagues utilize large quantities of data from their players, often forgoing privacy when developing individual agreements. However, new data privacy regulations are being passed as players are beginning to form player associations. Hence, noncompliance with pertinent regulations can incur costs of billions of dollars. Nonetheless, privacy compliance is a nuanced, multi-faceted issue. The complexity of compliance limits the growth of esports leagues and businesses, prevents players from controlling their data, and prevents professionals from implementing systematic changes. Verify Privacy, our proposed system, aims to facilitate transparency and privacy compliance. This app enables esports employees, players, and other trusted parties to analyze the privacy ramifications of league operations by providing recommendations, compliance checklists, and other ancillary information. Privacy compliance for esports can be divided into three major categories of tasks: compliance direction, violation detection, and information analysis that are entirely dependent on the results of each other. These three tasks answer three questions respectively:

1. Compliance direction: What needs to be done to comply with privacy laws?
2. Violation detection: Are there any privacy violations within the league currently?
3. Information analysis: What data is being collected and how is it used?

Evaluation Methodology:

*Design and Prototype Overview***:**

Our system is designed to guide esports employees to make the optimal choice and to let players (and trusted parties) know about the consequences of each choice in

accordance with our usability requirements. Verify Privacy designates each user as a player, esports employee, or trusted party, affording them more personalized and effective services. Once registered, different buttons with different services are displayed on the screen. These services include compliance checklists, compliance reports, recommendations, player data flows, and other supporting features. Verify Privacy is the first app geared towards esports privacy compliance; it is also one of the few privacy services that prioritizes clarity and convenience.

The most important factors influencing the design of Verify Privacy were effectiveness and intuitiveness. Throughout the creation of the interface, emphasis was consistently placed on prioritizing the comprehensibility of the design above comprehensiveness or other factors. The prototype is a Google Slides document with multiple screenshots of the app that exploits the linkability of slides to simulate the experience of clicking a button. The screenshots of the Verify Privacy interface were generated using FluidUI. Not only is this a very close mimicry of an actual app, but it facilitates fast revisions. This current prototype does not cover all the potential use cases for compliance direction, information analysis, and violation detection as these cases are both quite broad and require much more extensive research into present privacy issues. Henceforth, the design was formed from a series of scenarios.

Requirements Summary:

The system must be able to complete compliance direction, violation detection, and information analysis in order to fulfill its mission of facilitating privacy compliance for esports leagues. Thus, the key requirements are that Verify Privacy:

1. Ensures that a league knows what privacy laws they must comply with

2. Informs league employees, minimally, of steps for compliance

3. Alerts users of potential compliance violations

4. Allows players to understand what information is being collected from them and where that is being sent

5. Informs users of the consequences of each of their decisions

6. Does not require extensive experience in privacy or league operations

7. Can be easily accessed and used at various locations

8. Is intuitive and not highly cognitively demanding

Usability Criteria

        To make the requirements more concrete, we formulated a set of usability criteria. This criteria directly links to the multiple study measures.

➔ For compliance direction, information analysis, and violation detection, a majority of users only deviated by three clicks at most from the optimal number of clicks

  ◆ For compliance direction tasks, a majority of users rated their confidence in their decisions at least a four out of seven

  ◆ For information analysis and violation detection tasks, a majority of users rated their resulting understanding at least a five out of seven

➔ A majority of users considered Verify Privacy to be at most a four out of seven when rating the interface's cognitive demand, pacing, and required effort

➔ At least seventy percent of users were able to complete their given task

➔ A majority of users responded with positive feedback regarding the intuitiveness, convenience, and clarity of Verify Privacy

➔ Users with little to no background knowledge provided ratings within thirty percent of users with background knowledge

Overall Methodology

With our prototype of Verify Privacy, we conducted three field observations of various users. Three esports employees, players, and trusted parties were recruited to perform a given task on the prototype over Zoom. The participants answered pre-session and post-session questionnaires after being presented with a specific scenario; these questionnaires collected data necessary to evaluate the prototype against the designed usability criteria. The participants were given scenarios commensurate with their background in order to accurately model real-world situations. Furthermore, they provided feedback on the ease and comfort of use, effectiveness, and lucidity of the interface throughout the session verbally or visually. Each participant was only asked to model one scenario in order to increase the veracity of results related to prior knowledge and cognitive workload. The overall procedure for the sessions were:

1. Schedule a Zoom call with the participant

2. Conduct a pre-session questionnaire that ascertains their background knowledge

3. Provide them with their scenario

4. Share the prototype

5. Observe them as they attempt to complete the task using the prototype

6. Wait for them to finish or for thirty minutes to pass

7. Deliver a post-session questionnaire

8. Organize observations from the session

Pre-Session Questionnaire

Our evaluation system included a pre-session questionnaire for the user to complete before beginning their prescribed task, so that we could collect information about their background and expertise in order to properly analyze their performance against our expectations. The reasoning was that wanted to ensure Verify Privacy can be utilized by those with little to no background knowledge in privacy or league operations. The pre-session questionnaire is (Likert scale requested):

1. How often do you play video games?

2. How often do you play video games in a team setting?

3. How familiar are you with esports?

4. How familiar are you with the various privacy laws an esports team may have to comply with?

5. How familiar are you with services an esports team may use?

6. How confident do you feel in your ability to locate information regarding privacy laws an esports team may have to comply with?

7. How confident do you feel in your ability to verify the privacy of an application?

8. How familiar are you with current esports team management software that is available?

9. Are you currently or have you ever been in charge of managing any team? (Y/N)

10. Are you currently or have you ever been part of a professional esports team? (Y/N)

Scenario 1: Compliance Direction

As previously stated, there are three major categories of tasks Verify Privacy is expected to complete: compliance direction, violation detection, and information analysis. We developed multiple scenarios for each of these tasks to be performed by esports employees or players. A league manager was presented with the script below describing one of the designed scenarios.

You are a league manager of a new league in California. You are looking for a private, secure way to talk to your players. Ideally, you want the ability to create group chats, call, videocall, and share information through files, maps, and other media formats. However, the priority is a messaging system.

The shared Google Slides document will act as the app for you. Click on the buttons you believe will bring you closer to accomplishing your task. Feel free to express yourself and your thoughts as you are working on your task. Let us know when you believe you have reached your conclusion.

This task addresses the requirements of ensuring that a league is aware of privacy laws to comply with, informing league employees of the steps to compliance, alerting league managers of potential violations, and informing users of the consequences of their actions. With regards to usability, the optimal number of clicks for this was six. Ideally, users would have been equipped with enough information to make a confident, clear decision about messaging, but not enough to significantly

increase the cognitive demand, pacing, and required effort, and decrease the convenience of Verify Privacy.

Scenario 2: Violation Detection

A user completed the task given the script below:

You are the parent of an up-and-coming player in an esports league in Illinois. Recently, you have become quite concerned about the privacy practices of the league. You've learned as much as you could about the league prior to downloading Verify Privacy, but you want an expert privacy analysis of the league.

The shared Google Slides document will act as the app for you. Click on the buttons you believe will bring you closer to accomplishing your task. Feel free to express yourself and your thoughts as you are working on your task. Let us know when you believe you have reached your conclusion.

This task is most directly linked to the requirement of Verify Privacy being able to alert users of potential privacy violations. Optimally, this task would require seven clicks. It should not be cognitive demanding, especially on the privacy side due to the background of the participant.

Scenario 3: Information Analysis

A user completed the task given the script below:

You are an up-and-coming player in a new esports league in California. As your league is new, your league manager wants to put the word out to the world about you and some of the other new players, so they have decided to draft up some biographies to post on your league's affiliated websites and social media platforms. However, you want to make sure that you have not been sharing any personal or sensitive information that the league manager could use in this biography. Essentially, you would like to see which of your data and information your league manager has access to.

The shared Google Slides document will act as the app for you. Click on the buttons you believe will bring you closer to accomplishing your task. Feel free to express yourself and your thoughts as you are working on your task. Let us know when you believe you have reached your conclusion.

This task addresses the requirements of allowing players to understand what information is being collected from them, and not requiring extensive experience in privacy or league operations. Furthermore, the optimal number of clicks was five.

Study Measures

During the observation session, we collected the results of the pre-session survey, actions undertaken by the participant during the task, feedback given by the participant during the task, and the results of a post-session survey. With regards to the actions undertaken by the participant, this is focused upon deviations from the optimal

path. Observable behaviors in relation to the system are recorded anecdotally in our team's notes as another qualitative measure, in addition to the user's out-loud commentary/feedback. The post-session questionnaire incorporates an adapted NASA TLX in order to gauge the workload of the system. It directly attaches to the aforementioned usability criteria. The survey is as follows (note that participants are asked to respond from 1 to 7):

1. (NASA TLX) How mentally demanding was the task?

2. (NASA TLX) How hurried or rushed was the pace of the task?

3. (NASA TLX) How successful were you in accomplishing your task?

4. (NASA TLX) How hard did you have to work to accomplish your level of performance?

5. (NASA TLX) How insecure, discouraged, irritated, stressed, and annoyed were you while attempting to complete the given task?

6. Answer this question only if you had a compliance direction task. How confident are you in your decision?

7. Answer this question only if you had a compliance direction task. How much did you feel over informed by Verify Privacy?

8. Answer this question only if you had a compliance direction task. How much did you feel under informed by Verify Privacy?

9. Answer this question only if you had a violation detection task. How hard did you have to work to understand what the violation was?

10. Answer this question only if you had an information analysis task. How well do you think you can articulate what is being collected from you and where it is going?

11. How confident are you in the ease of fulfilling privacy compliance?

12. How much did your prior knowledge of privacy and esports (if any) assist you?

13. How convenient did you feel Verify Privacy made privacy compliance?

Evaluation Results:

User 1:

The first user was an aspiring league manager, leading us to provide them with the compliance direction scenario. This user was tasked with determining a privacy-preserving messaging system. Their pre-session results were as follows:

1. How often do you play video games? 6 (out of 7)

2. How often do you play video games in a team setting? 6

3. How familiar are you with esports? 7

4. How familiar are you with the various privacy laws an esports team may have to comply with? 2

5. How familiar are you with services an esports team may use? 6

6. How confident do you feel in your ability to locate information regarding privacy laws an esports team may have to comply with? 2

7. How confident do you feel in your ability to verify the privacy of an application? 0

8. How familiar are you with current esports team management software that is available? 7

9. Are you currently or have you ever been in charge of managing any team? Yes

10. Are you currently or have you ever been part of a professional esports team? Yes

Evidently, this user was quite familiar with the world of esports, but not with the realm of privacy. The user completed the task in nine clicks, three more than the optimal number of six. Some of the verbal feedback given by the user was:

- "Hmmm"
- "Uhhhhh"
- "Pretty design"
- "Okay, that makes sense"
- "Wow, that took longer than expected"
- "There's so many options!"

Their post-session questionnaire is as follows:

1. (NASA TLX) How mentally demanding was the task? 6
2. (NASA TLX) How hurried or rushed was the pace of the task? 2
3. (NASA TLX) How successful were you in accomplishing your task? 7
4. (NASA TLX) How hard did you have to work to accomplish your level of performance? 5
5. (NASA TLX) How insecure, discouraged, irritated, stressed, and annoyed were you while attempting to complete the given task? 3
6. Answer this question only if you had a compliance direction task. How confident are you in your decision? 6
7. Answer this question only if you had a compliance direction task. How much did you feel over informed by Verify Privacy? 3

8. Answer this question only if you had a compliance direction task. How much did you feel under informed by Verify Privacy? 3

9. Answer this question only if you had a violation detection task. How hard did you have to work to understand what the violation was? N/A

10. Answer this question only if you had an information analysis task. How well do you think you can articulate what is being collected from you and where it is going? N/A

11. How confident are you in the ease of fulfilling privacy compliance? 4

12. How much did your prior knowledge of privacy and esports (if any) assist you? 3

13. How convenient did you feel Verify Privacy made privacy compliance? 5

User 2:

The second user, the parent of a player, completed a violation detection task using the Verify Privacy interface prototype. They had little experience in either esports or privacy. Their pre-session questionnaire read as follows:

1. How often do you play video games? 2

2. How often do you play video games in a team setting? 2

3. How familiar are you with esports? 2

4. How familiar are you with the various privacy laws an esports team may have to comply with? 2

5. How familiar are you with services an esports team may use? 2

6. How confident do you feel in your ability to locate information regarding privacy laws an esports team may have to comply with? 2

7. How confident do you feel in your ability to verify the privacy of an application? 0

8. How familiar are you with current esports team management software that is available? 0

9. Are you currently or have you ever been in charge of managing any team? No

10. Are you currently or have you ever been part of a professional esports team? No

The user completed their task in seven clicks- no deviation from the optimal number of clicks. Some of the feedback the user gave during the session included:

- "This is quite clean"

- "Very minimalistic"

- "I wish there was something that lets you remember where you can go back"

- "Maybe a progress bar or something would help"

- "Privacy doesn't seem difficult."

- "All of this privacy stuff is quite interesting"

Their post-session questionnaire is as follows:

1. (NASA TLX) How mentally demanding was the task? 4

2. (NASA TLX) How hurried or rushed was the pace of the task? 2

3. (NASA TLX) How successful were you in accomplishing your task? 7

4. (NASA TLX) How hard did you have to work to accomplish your level of performance? 4

5. (NASA TLX) How insecure, discouraged, irritated, stressed, and annoyed were you while attempting to complete the given task? 1

6. Answer this question only if you had a compliance direction task. How confident are you in your decision? N/A

7. Answer this question only if you had a compliance direction task. How much did you feel over informed by Verify Privacy? N/A

8. Answer this question only if you had a compliance direction task. How much did you feel under informed by Verify Privacy? N/A

9. Answer this question only if you had a violation detection task. How hard did you have to work to understand what the violation was? 2

10. Answer this question only if you had an information analysis task. How well do you think you can articulate what is being collected from you and where it is going? N/A

11. How confident are you in the ease of fulfilling privacy compliance? 7

12. How much did your prior knowledge of privacy and esports (if any) assist you? 3

13. How convenient did you feel Verify Privacy made privacy compliance? 7

User 3:

The third user, a player, completed an information analysis task, and was much more informed than the other two users. Their pre-session questionnaire read as:

1. How often do you play video games? 7

2. How often do you play video games in a team setting? 7

3. How familiar are you with esports? 7

4. How familiar are you with the various privacy laws an esports team may have to comply with? 5

5. How familiar are you with services an esports team may use? 7

6. How confident do you feel in your ability to locate information regarding privacy laws an esports team may have to comply with? 7

7. How confident do you feel in your ability to verify the privacy of an application? 5

8. How familiar are you with current esports team management software that is available? 7

9. Are you currently or have you ever been in charge of managing any team? No

10. Are you currently or have you ever been part of a professional esports team? Yes

The user completed their task in eight clicks- three deviations from the optimal number of clicks. Some of the feedback the user gave during the session included:

- "This is quite long. There's too much stuff to click through."

- "This is kind of boring. I'd rather play a game instead."

- "At least, this is pretty. I guess it gets the job done."

- "Hey. I changed my mind. This is super clear. I really like this."

The user's post-session questionnaire read as follows:

1. (NASA TLX) How mentally demanding was the task? 5

2. (NASA TLX) How hurried or rushed was the pace of the task? 2

3. (NASA TLX) How successful were you in accomplishing your task? 7

4. (NASA TLX) How hard did you have to work to accomplish your level of performance? 5

5. (NASA TLX) How insecure, discouraged, irritated, stressed, and annoyed were you while attempting to complete the given task? 5

6. Answer this question only if you had a compliance direction task. How confident are you in your decision? N/A

7. Answer this question only if you had a compliance direction task. How much did you feel over informed by Verify Privacy? N/A

8. Answer this question only if you had a compliance direction task. How much did you feel under informed by Verify Privacy? N/A

9. Answer this question only if you had a violation detection task. How hard did you have to work to understand what the violation was? N/A

10. Answer this question only if you had an information analysis task. How well do you think you can articulate what is being collected from you and where it is going? 7

11. How confident are you in the ease of fulfilling privacy compliance? 7

12. How much did your prior knowledge of privacy and esports (if any) assist you? 1

13. How convenient did you feel Verify Privacy made privacy compliance? 7

Discussion:

Evaluation Analysis

Verify Privacy achieved its goal of lucidity independent of background knowledge, but can still use improvements reducing the cognitive overload of the system. In relation to the usability criteria, Verify Privacy had mostly positive results.

- For compliance direction, information analysis, and violation detection, a majority of users did only deviate by three clicks at most from the optimal number of clicks
    - For compliance direction, the user did rate their confidence at least a four
    - For information analysis and violation detection, the users did rate their understanding at least a five
- All of the users rated the cognitive demand of Verify Privacy higher than the maximum of a four established in the usability criteria
- All of the users were able to complete their required task

- There was no marginal difference between users with and without background knowledge in esports and privacy
- Users had positive feedback for the app in every aspect aside from the cognitive workload mandated by its usage

The results indicate that our app had succeeded in nearly every aspect of our usability criteria except for cognitive overhead. Throughout our design, we had emphasized lucidity and effectiveness (even as early as the brainstorming stage as will be discussed in "Lessons Learned"). Our tasks take multiple clicks to accomplish as we opted for a more minimalist design. To improve the cognitive workload of the app, Verify Privacy needs a revised task analysis; perhaps, more buttons can be placed on a single screen. A faster organization of information is clearly pertinent. Furthermore, graphics might augment the buttons, requiring less reading throughout.

During the testing process, we added more screenshots on information presentation (the screenshots of Verify Privacy's explanations) as our initial prototype did not elicit enough data without them. Our evaluation methodology was quite thorough. However, the situation related to COVID-19 limited our capacity to test more participants; optimally, we would have attempted at least twelve unique scenarios.

If we had more time, additional changes we could make to the UI would be to create multiple mockups for our screens that were heavy with text. These would be the screens pertaining to descriptions of the various laws the users of our system would care the most about. We could do a little more research into apps that allow users to read large chunks of text and try to find inspiration in those. We could also look into specific design guidelines like Google's Material Design or Apple's Human Interface guidelines

and try to create our designs following these. These guidelines could provide us some direction in creating our designs and ensure that we are creating designs that are best for the user.

Lessons Learned:

The most compelling component of our experience was discovering the incorrect assumptions we held about users prior to evaluation techniques. Initially, we discussed a system that would involve privacy professionals as well as other parties. Our interviews proved us wrong. Most privacy professionals agreed that a shared system would be of little utility across the board. This was further reinforced by our design alternatives. We were choosing between The Walled Garden, Push for Privacy, and Verify Privacy. The Walled Garden originally seemed most advantageous. It would abstract away all technical considerations of compliance and equip users with all the services necessary. Nevertheless, users greatly preferred guidance over tooling. They wanted to learn more about privacy; many stated that they believed that it would better prepare them in a rapidly changing landscape and the concepts would be transferable to other domains. With regards to our evaluation results, we most likely overcorrected for lucidity and effectiveness during our prototype design. To elaborate, we placed very little buttons on a screen at a time, increasing the number of clicks. Our reasoning was that presenting a user with far too many options at one time would confuse them. However, there exists a balance between reducing the cognitive overhead caused by a single view or moment and reducing the cognitive overhead of the entire experience. Finding this balance is key to making effective interfaces.