Grounded Theory and Coding Guidelines for Annotating Accessibility Issues

This document outlines the coding guidelines for annotating end-user feedback regarding Accessibility Issues. It also provides instructions for categorizing these issues into five distinct types. Each category is clearly defined and illustrated with examples from the dataset, ensuring consistent and accurate annotation.

1. Non-Accessibility-Related Issues (NO)

Definition:
The "Non-Accessibility-Related Issues" (NO) category encompasses problems that affect the general user experience but are not specifically related to accessibility barriers. These issues include bugs, performance-related problems, payment errors, feature requests, or complaints about customer service. While these concerns can affect the app's functionality or performance, they do not involve making the app usable for individuals with disabilities.

Characteristics:

1. **General User Interface Problems**
   These reviews describe issues with the app's responsiveness, such as slow loading times, crashing, or freezing. However, these problems are not related to accessibility features like screen reader compatibility or ease of navigation for people with disabilities. For example, a user might complain about how long it takes for an app to load or how frequently it crashes, but they do not mention any specific barriers to using the app with assistive technologies.
2. **Feature Requests or Complaints About Functionalities**
   These are issues related to the app's performance or features, but they do not address usability for users with disabilities. A user may suggest a new feature or complain about an existing one, but the request doesn't focus on accessibility. For example, a user might request the addition of a new function or complain about an existing feature, such as a messaging tool that is slow, but their feedback does not mention whether it is accessible to people using screen readers or other assistive technologies.
3. **Operational and Payment-Related Issues**
   These problems relate to the app's operational aspects, such as difficulties with payment processing, subscription renewals, or general bugs in the app's functions. These issues may affect users' ability to make purchases or manage their subscriptions but do not concern accessibility. An example might be a user complaining that they were charged for a subscription but never received the service they paid for, or having trouble with an automatic payment being charged incorrectly.

Impact:
Although these issues are not directly related to accessibility, they can still significantly impact the overall user experience. Addressing these problems is important because they can lead to user frustration, dissatisfaction, or even abandonment of the app. These types of issues, though not related to accessibility, affect a wide range of users, including those with disabilities.

Resolving them is crucial for maintaining a positive user experience and preventing user attrition.

Examples from Dataset:

1. "This is probably the sixth time my bubble day has reset after an update. I have to reselect my voucher every time. I should have had over a day, but I'm at it again. It's so frustrating, and I've had the same idol bubble for at least two years. In that time, it has reset my day counter at least six times. It makes me want to get rid of the app, but the point is to support the artist. It's just hard to support the artist when I'm paying all this money but can't send more than 15-20 characters. After two years, I also have JYP Bubble, and it reset once because I couldn't pay on time. I don't even use or update JYP Bubble, but it never has problems like LYSN. When will this be fixed? Two years and this glitch is still not fixed!"
2. "LYSN Bubble has automatically charged me USD every month since September. However, I have not received any bubble messages from SM artist Lucas Wong since then. There's also no word on when he will return. Why does this app keep charging me? Also, racism, abuse, and harassment are seen on the WayV community page, and LYSN and SM Entertainment are allowing it. This app was supposed to be a place to communicate with idols and fans, but some have misused it against Lucas of WayV."
3. "I downloaded this app thinking it was going to be a regular app. An hour passed, and I didn't really know how to use it, so I deleted it without realizing I hadn't logged out of the account. A year later, I received an email asking for my personal information and address, saying they would hack me. I'm writing this to warn people not to download this app, thinking you're actually texting a famous person. In reality, you're texting someone who's not them. Please don't download. I wish this app had never existed."
4. "This app continues to allow targeted harassment and bullying. It hosts a toxic, unsafe environment without any consequence or action to correct such behavior. It continues to let users engage in such behavior. The app is also very slow and always times out. I'm never able to send comments or posts. I absolutely do not recommend using LYSN."
5. "I'm genuinely baffled by the way this app not only promotes threats to the artist but also has personal information leaked that could harm not only them but their whole family. This app is full of toxic people who only want to harm others, and such an app should not exist. It gives bullies a platform to harass and gives them the power to harm human life. I am deeply disappointed by the lack of management and believe this app should be shut down."

2. Accessibility-Related Issues (YES)

Definition:
This category encompasses all issues that directly impact the app's usability for users with disabilities. These barriers prevent individuals from interacting with the app in ways that meet their specific needs, making it difficult or impossible for users to access content, engage with app features, or achieve their goals. Accessibility-related issues are critical because they hinder app usage for a significant segment of the population, particularly for those with visual, auditory, or motor disabilities.

Key Characteristics:

- **Failure to Meet Accessibility Standards**
  The app may not comply with established accessibility guidelines, such as the Web Content Accessibility Guidelines (WCAG), which provide standards for creating accessible digital content. Non-compliance makes it difficult for users with disabilities to navigate the app effectively.
- **Inaccessibility of Key Features**
  Essential features such as messaging, browsing, and content interaction may not be accessible to users with various disabilities. For example, visual elements may not have adequate descriptions for screen readers, or touch targets may be too small for users with motor impairments.
- **Exclusion of Assistive Technology Users**
  Problems arise when the app is incompatible with assistive technologies such as screen readers, voice controls, or magnification tools. If the app does not interact properly with these technologies, it becomes unusable for individuals who rely on them.

Impact:
Accessibility-related issues have a direct and significant impact on users with disabilities. These barriers create exclusion, preventing individuals from fully engaging with the app, completing essential tasks, or accessing its core functionalities. Addressing these issues is crucial to ensure the app is usable for all, including people with disabilities. Unlike non-accessibility issues, these barriers directly affect the app's effectiveness for an important segment of its user base.

Examples from Dataset:

1. "When I originally joined the LYSN app, I expected to have a good time interacting with my favorite K-pop group, EXO. LYSN claims that bullying and harassment of artists will not be tolerated, but they have not enforced this policy in recent months. Since Kim Jongdae announced his engagement, antis have relentlessly spammed EXO's community board, petitioning for him to leave the group and leaving violent threats for him and his family. Despite this, LYSN has allowed these toxic individuals to remain on the platform. These harassers are able to interact with other artists, like Kai, while continuing to post abusive content. It’s unacceptable that LYSN allows this behavior to persist."
2. "Despite the company’s policy stating that they will not tolerate offensive comments or bullying, this app is filled with harassment targeting EXO’s Chen. Since his marriage announcement, a small group of fans has harassed him through the LYSN app, leaving hateful comments like how he should leave EXO or that they won’t support the group as long as he’s in it. Despite these abusive comments, LYSN has done nothing to remove the posts or the users responsible. This is deeply disappointing, and it makes me question the app’s commitment to its own policies."
3. "At first, I was excited about downloading the app because I support several artists. However, I found that one of the communities was flooded with death threats, racism, bullying, and degrading comments, not just towards the artists but also towards fans who support them. I reported these individuals multiple times, but no action was taken. It’s been over a month, and I’m still seeing the same people leaving toxic comments. It’s

becoming emotionally draining, and I've stopped using the app altogether because it negatively affected my mental and physical health. The app needs to enforce its policies and create a healthier environment for fans."

4. "One of the artists on your platform has been receiving death threats and harassment due to false information. His personal details were also leaked on your platform. This is a serious violation of privacy. The platform's guidelines clearly prohibit such actions, but LYSN has failed to take action, allowing users to engage in criminal behavior by threatening and leaking personal information. If I could rate this app honestly, I would give it a zero for its negligence in protecting users' rights and failing to implement the necessary actions to address such violations."

3. Types of Accessibility Issues

Once accessibility issues have been identified as a critical concern, they can be categorized into distinct types. Each type represents specific challenges that users with disabilities may face when interacting with the app. These issues are identified through a careful analysis of user reviews, complaints, and accessibility audits, which highlight recurring patterns of problems.

3.1. UI Accessibility Issues (UI)

Definition: UI accessibility issues refer to problems in the app's visual and structural design that create barriers for users, particularly those with visual impairments or cognitive disabilities. These problems impact how users interact with the app, making it difficult or impossible to use essential features effectively. Such issues often arise from poor design decisions, such as small or unclear text, unresponsive buttons, or improper layout, which hinder users' ability to navigate or complete tasks.

Key Characteristics:

- **Poor Visual Layout:** The interface design may be unclear or cluttered, such as overlapping text or icons, which makes it difficult for users to navigate and complete tasks.
- **Small or Inaccessible Buttons:** Buttons, links, and other interactive elements may be too small, hard to click, or poorly positioned for users with visual impairments or motor difficulties.
- **Unresponsive Design:** Elements like buttons or links fail to respond to user input, causing frustration and making it impossible for users to interact with the app effectively.
- **Inconsistent Layout Across Devices:** The app may fail to adjust correctly to different screen sizes or orientations, creating navigation challenges for users with varying accessibility needs.
- **Font Size Issues:** Fonts may be too small for users to read comfortably, especially those with visual impairments. Lack of customization options for font size adds to this issue.

Impact: UI accessibility issues can significantly hinder the app's functionality, especially for users with disabilities. These issues make it difficult or even impossible for users to engage with the app's core features, ultimately leading to a poor user experience. If left unaddressed, such problems can exclude a segment of the user base, affecting their ability to perform essential tasks, and may also result in frustration and abandonment of the app.

Examples from the dataset:

1. **Example 1 (UX issues):**
    - "It is a very cute and fun app. I downloaded it when it first came out as an EXO-L, but I haven't used it much until recently. There are many features I like, such as the translation button to communicate with fans in different languages. However, when making a new post, I can't see what I'm typing because the space between the title field and the keyboard is extremely small. Every time I type, the text moves up and down, making it difficult to see and edit. Notifications are also often delayed by a few minutes, which defeats their purpose. Lastly, the 'Ace' fanclub creates a division among fans, and I've noticed a lack of action taken against bullying or toxic behavior by some users."
2. **Example 2 (Small buttons, screen size issues):**
    - "This app is frustrating to use. The layout is confusing, and many buttons are so small that I have to zoom in to click them, which is inconvenient. The interface also doesn't adjust well to different screen sizes, and I often find myself having to scroll endlessly to find important features. As someone with limited vision, I rely on larger text and clearer icons, but this app doesn't provide that. It makes using the app feel like a challenge, rather than an enjoyable experience."
3. **Example 3 (Crashes, small fonts, unresponsive buttons):**
    - "The app crashes frequently when I try to upload a new post or interact with content. I also find that the fonts are too small to read comfortably, and I can't adjust them in settings. When I try to interact with other users, the buttons are unresponsive, or the app takes too long to react. I've reported the issues to support, but nothing has changed. It's especially difficult for me as someone with motor impairments because sometimes the buttons require multiple taps before they work."

3.2. Navigation and Interaction Issues (NAV)

Definition: This category addresses barriers in the app's navigation and interactive elements that hinder users from completing tasks or accessing content. Such barriers are particularly impactful for individuals with motor impairments, cognitive disabilities, or limited dexterity. These issues can arise when interactive elements like buttons, controls, or menus are poorly designed, unresponsive, or difficult to use.

Key Characteristics:

- **Complex Navigation:** The app may have complicated or poorly structured navigation, making it difficult for users to find or access important features or content.
- Unclear or Missing Labels: Interactive elements such as buttons, links, or images may lack descriptive labels, making it difficult for users to understand their function.
- **Inaccessible Input Controls:** Small buttons, complex gestures, or overly precise actions may create difficulty for users with motor impairments or those using assistive technologies.
- **Unresponsive Elements:** Buttons, links, or other controls that do not respond when tapped, clicked, or interacted with can create frustration for users, making it impossible to complete tasks.

Impact: Navigation and interaction issues significantly reduce the usability of the app. Users may become frustrated, abandon tasks, or even stop using the app entirely if they cannot easily interact with it. These issues are especially problematic for users with disabilities who may rely on assistive technologies to interact with the app.

Examples from Dataset:

1. **Example 1 (Complex Navigation):**
    - "The app has a confusing layout, making it difficult to find key features. After joining a fan community, I expected to easily access my favorite artist's posts, but I kept getting lost in different sections of the app. The navigation structure isn't intuitive, and I often had to retrace my steps to reach important content."
2. **Example 2 (Unclear Labels):**
    - "I couldn't understand the function of some buttons because they had no labels, just icons. When trying to send a message, I accidentally tapped the wrong button multiple times because there was no clear indication of what it did. It would help if buttons had text or tooltips explaining their purpose."
3. **Example 3 (Inaccessible Input Controls):**
    - "The app's text input field is too small, especially when typing on a smartphone. It's difficult to see what I'm typing, and I often miss key presses. The app could be more accessible if the text box was larger and responsive to screen size, making typing easier."
4. **Example 4 (Navigation Complexity with Multiple Taps):**
    - "To find new content or reply to posts, I had to go through multiple screens and taps. It would be more user-friendly if there was a streamlined navigation system that allowed quicker access to frequently used features."

3.3. Compatibility with Assistive Technologies Issues (CAT)

Definition: This category refers to how well the app integrates with assistive technologies such as screen readers, voice control systems, or switch devices. Apps that do not support these technologies create barriers for users who rely on them to interact with the app, limiting access and usability for individuals with disabilities.

Key Characteristics:

- **Screen Reader Incompatibility:** The app may not be readable or navigable using screen readers, which are essential for users who are blind or visually impaired.
- **Voice Control Issues:** The app may not support voice control commands, which are crucial for users with motor impairments or those who cannot interact with a touch interface.
- **Inadequate Keyboard Navigation:** The app may fail to support keyboard navigation, which is critical for users with limited mobility.
- **Poor Translation/Language Barriers:** The app's language features may fail to translate content accurately, preventing meaningful communication for users who rely on assistive technologies for understanding content.

Impact: When an app fails to integrate well with assistive technologies, it becomes difficult or impossible to use for a large segment of the population, particularly individuals with disabilities. This exclusion significantly reduces the app's inclusivity, limiting engagement for users who depend on these tools for interaction.

Examples from Dataset:

1. **Example 1 (Screen Reader Incompatibility):**
    - "I tried using a screen reader with this app, but it simply doesn’t work. The text is not properly announced, and I can't navigate to the different sections. As someone who is blind, this makes the app completely unusable for me. It would be great if the app could better integrate with screen readers to ensure full accessibility."
2. **Example 2 (Voice Control Issues):**
    - "This app does not respond to voice control commands, which is frustrating since I rely on voice commands due to my limited dexterity. I cannot complete simple tasks like sending a message or browsing content without touch gestures. Voice support would make a huge difference for users like me."
3. **Example 3 (Inadequate Keyboard Navigation):**
    - "As someone with limited mobility, I rely on keyboard navigation, but this app doesn't support it properly. I can't navigate easily between elements, and it’s frustrating when the app doesn't respond to basic keyboard inputs. Please consider improving support for keyboard navigation."
4. **Example 4 (Translation Issues Impacting Assistive Tech Users):**
    - "I’ve encountered problems with the app’s translation feature. It’s not just inaccurate; sometimes, the app gives me a translation that doesn't make sense at all. This is especially problematic because I use a screen reader, and when the translation doesn’t match up, I can’t rely on it for communication. The system needs a significant upgrade to make translations accurate and usable for everyone."

3.4. Audio and Visual Accessibility issues(AUDIOVISUAL)

Definition:
This category focuses on the accessibility of content that involves sensory features, such as audio and visual media. This includes the absence of essential features like captions, transcriptions, or audio descriptions, which make it difficult for users with sensory impairments (e.g., deafness, blindness, or low vision) to fully engage with media content.

Key Characteristics:

- **No Captions or Subtitles:** Video or audio content may lack captions or subtitles, making it inaccessible for users who are deaf or hard of hearing.
- **Lack of Audio Descriptions:** Visual content such as videos or images may not have audio descriptions, which are essential for users who are blind or have low vision.
- **Harmful Visual Content:** Certain visual elements (e.g., flashing images) may trigger seizures in users with photosensitive epilepsy.
- **No Alternative Text for Images:** Some apps may fail to provide alternative text for images, making it hard for screen readers to describe content to users who are blind or have low vision.

Impact:
The lack of audiovisual accessibility features severely limits the ability of users who are deaf, hard of hearing, blind, or have other sensory impairments to engage with the app. These gaps create significant barriers for users who rely on these accessibility features to interact with and enjoy content.

Examples from Dataset (Placeholder Examples):

1. **Example 1 (No Captions/Subtitles for Video Content):**
    - "I tried watching a video on the app, but there are no captions or subtitles. As a deaf user, this makes it impossible for me to understand the content. Subtitles are a basic necessity for accessibility, and it's disappointing that they are not included in this app. Please add captions to make this app usable for people like me."
2. **Example 2 (Lack of Audio Descriptions):**
    - "I was excited to watch a video on this app, but there were no audio descriptions available. I am blind, so I rely on audio descriptions to understand what's happening on screen. The app needs to include this feature to be accessible to visually impaired users."
3. **Example 3 (Flashing Images):**
    - "While using this app, I noticed several flashing images. As someone with photosensitive epilepsy, this triggered a seizure, which was very dangerous. The app should include a warning about flashing images or provide an option to disable them. This could prevent harm to users like me."
4. **Example 4 (No Alt Text for Images):**
    - "There are many images on the app, but none of them have alternative text for screen readers. I rely on screen readers, and this omission makes it extremely

difficult for me to understand the images. The app should add alt text to all images to improve accessibility for blind users."

3.5. Input and Control Issues (INPUT)

Definition:
This category addresses accessibility issues related to how users input data and control the app. Such issues typically affect users with motor impairments, limited dexterity, or cognitive disabilities who have trouble using traditional input methods, such as touch screens, keyboards, or mice. These users may face difficulties in interacting with app elements that require precision or extended input.

Key Characteristics:

- **Difficult or Unresponsive Input:** Users may struggle with buttons, forms, or sliders that are unresponsive or poorly designed, preventing smooth interactions.
- **Limited Input Methods:** The app may only support one type of input (e.g., touch), without offering alternatives such as voice control, adaptive input devices, or switch devices.
- **Character Limits:** Restrictions on text input, such as character limits in fields, can be especially problematic for users who need more space to express themselves or those using assistive technologies to input text.
- **Complex Navigation:** Some apps may require complex or precise actions (e.g., drag-and-drop or multi-touch gestures) that are difficult for users with motor impairments or limited dexterity.

Impact:
For users with motor impairments or those who rely on alternative input methods, these barriers make it difficult or even impossible to complete basic tasks, such as filling out forms, navigating menus, or interacting with app content. Input and control issues hinder users' ability to navigate, communicate, or interact with the app effectively, leading to a frustrating and inaccessible experience.

Examples from Dataset:

1. **Example 1 (Character Limits on Text Input):**
   "I see many star reviews of people saying they are only doing it because Jisung said to show love to the app, but if I am being honest, it is not very good for international fans. There is still a character limit for text. I cannot even type half a sentence before I hit the limit, and obviously, the screenshot-disabling function is annoying. I understand that all message content from an artist is paid content, but paying for Bubble, in general, is already ridiculous. The app basically is like a free platform like Instagram, Twitter, and the web, just disguised as a messaging app, not to mention some community boards are

just straight-up toxic and sometimes have bullying and harassment comments on there. If we are going to rate this app, we should be honest about it."

- **Issue:** Character limit in text fields creates barriers for users trying to express themselves fully. This is particularly challenging for users with communication difficulties who may need more space.

2. **Example 2 (Unresponsive Verification Process):**
   "I tried many times to register, but the app never sent me the verification code. Please can you fix this issue?"
   - **Issue:** The failure of the verification process to send codes can block users from accessing the app. This can be especially frustrating for users who may have limited dexterity or are using assistive technologies for registration.
3. **Example 3 (Issues with Account Creation):**
   "I am from Mexico, and I have been trying to get a code for the past few days,but I cant geta code. thus, I cant create an account."
   - **Issue:** Users encountering issues with account creation due to input difficulties or unresponsive systems face significant barriers, making it impossible to proceed. This can be exacerbated for users with motor impairments or those relying on adaptive devices.
4. **Example 4 (Unresponsive Login and Registration Process):**
   "When I register my number, I do not receive a code. I have tried so many times. Please fix it."
   "I have tried so many times to send my number and email, but I still have no code. Please help."
   - **Issue:** Unresponsive input fields for registration and login prevent users from completing necessary actions. This might affect users with motor impairments who struggle with repetitive actions or keyboard input.
5. **Example 5 (Unresponsive Content Viewing):**
   "I can download it, but I cannot log in to view it. This is terrible; solve it now."
   - **Issue:** The failure of the app to allow content viewing after downloading is an issue related to interaction difficulties, particularly for users who depend on voice commands or adaptive input methods. These users might find it difficult to troubleshoot unresponsive apps.