

Heuristic Evaluation of [LangVRse]

(Your TA will remove your names before the document is given to the project team. Throughout the report, use these letters to identify yourselves.)

1. Problem/Prototype Description

[Insert one sentence description of the project idea and UI you are evaluating.]

We evaluated the medium-fi prototype of LangVRse, which is a VR application that seeks to provide an encouraging and immersive experience of language learning for all individuals regardless of learning and cultural background, by transporting its users to different countries and facilitating conversations.

2. Violations Found

1. H1: Visibility of System Status / Severity 2 / Found by: A, B

- During an adventure, users cannot see how far along they have made in completing all of the necessary actions, and how many more steps are needed to complete the adventure.
- *Suggested Fix:* Add a progress bar as part of the screen to show users how far along they are in the adventure.

2. H1: Visibility of System Status / Severity 3 / Found by: A, B, C

- During the points in the adventure when a user is supposed to speak, there is no indication that shows that the user's speech is being picked up by the application. For example, the "What would you like to order" screen asks the user to order and then click "continue". There is no confirmation or feedback that the order has been heard.
- *Suggested Fix:* Add an animated visual representation that shows the user when their audio is being picked up by the application; for example, include a microphone that is filled in at different heights based on the user's speech volume, or a sequence of lines to indicate the speech-to-text functionality is working. Add a screen in between that gives user feedback and transcribes order speech to text so that they know what has been heard correctly and what must be repeated.

3. H1: Visibility of System Status / Severity 1 / Found by: C

- On the screen saying "Do you want to save your progress?" (Note: this screen is not linked to the actual prototype but is among the screens in the Figma layouts), the user is asked if they want to "save their progress", but there is no indication of how much progress the user has made; it may be confusing/frustrating for the user to have no gauge on their progress in the particular setting.
- *Suggested Fix:* Add a progress percentage indicating how far along the user is in that particular setting on the save screen.

4. H2: Match between System & World / Severity 3 / Found by: A, B, C

- The icon to switch between Spanish and English is a filled-in circle with the letter “i” in the middle. However, this looks like an “info” icon, so users may intuitively think that clicking it will provide more information about the page they are on or about the application, rather than functionality to switch between languages.
 - *Suggested Fix:* Use a globe icon instead of the info icon.
- 5. H2: Match between System & World / Severity 2 / Found by: A**
- In the “Your Stats” page, there is a “Your Breakdown” chart but it is unclear how the chart is created, and whether it is based on completion of successful runs at a single location or if it is an aggregated stats breakdown.
 - *Suggested Fix:* Make it clearer how this breakdown is determined, and potentially also move it to a separate stats page that the user can view from either the home page or as an icon on the existing top left bar.
- 6. H2: Match between System & World / Severity 1 / Found by: A**
- In the “Your Stats” page, there is a part of the page that says “Achievements” with achievement icon images in different colors. However, while users may recognize them as some sort of achievement, it is unclear what kinds of achievements they represent exactly and whether the colors are potentially significant in some way, especially as there is no label to indicate what the achievements are for.
 - *Suggested Fix:* Add a label and a short description to each achievement icon.
- 7. H2: Match between System & World / Severity 2 / Found by: A**
- In the “Your Breakdown” chart on the “Your Stats” page, the categories represented by “Read”, “Write”, and “Speak” are intuitive as are typical areas for language learners to grow in, but users may not know what the “Culture” point of the diamond represents.
 - *Suggested Fix:* Elucidate what is meant or represented by the “Culture” part of the diamond.
- 8. H2: Match between System and the Real World / Severity 3 / Found by: B, C**
- The wording of “Click again to go back and continue” on the “where do you want to go screen” is vague (what does “go back” and “continue” mean?). Users may not find these instructions descriptive or intuitive.
 - *Suggested Fix:* Change the text to “Click to change language to Spanish and continue with the adventure.”
- 9. H3: User Control & Freedom / Severity 3 / Found by: A, B, C**
- In the linked prototype, it is not possible for users to save the game until they successfully finish the entire adventure at a given location. This means if they are unable to finish the entire run for an adventure, they would have to restart again from the beginning the next time they come back to it.
 - *Suggested Fix:* Add a button that allows users to save their progress as they are navigating activities in a location during an adventure.
- 10. H3: User Control & Freedom / Severity 3 / Found by: A**
- There is no Logout button for the application. There are only Back buttons from a single screen to the previous one, and a Home icon.

- *Suggested Fix:* Add a method for users to log out of their account in the application, such as by going in the Settings icon.
- 11. H3: User Control & Freedom / Severity 3 / Found by: C**
 - During the writing exercise, users could make an error during writing and should have the option to clear their writing upon starting.
 - *Suggested Fix:* Add a “clear” functionality (i.e. in the style many e-signature softwares utilize).
- 12. H3: User Control and Freedom / Severity 4 / Found by: B**
 - After saving, on the “Looks like you’ve finished playing” screen, there are no buttons to go back to the home screen and restart the program. The user might feel frustrated if they want to play again.
 - *Suggested Fix:* Add “Go back to home button on this screen.
- 13. H3: User Control and Freedom / Severity 2 / Found by: A, B, C**
 - “Back button” is not available when I switch the language to English. This might confuse the reader and would mean extra clicks if they were lost, switched to English for guidance, and want to go back.
 - *Suggested Fix:* Add “back button” even when the language is in English.
- 14. H3: User Control and Freedom / Severity 0 / Found by: C**
 - Could potentially be a prototyping technicality, but the user should have the ability to navigate backwards while the language is switched to English as well. This feature icon seems to go away on the interface when the language is switched to English:
 - *Suggested Fix:* add button and functionality for navigating backwards when language is switched to English
- 15. H4: Consistency & Standards / Severity 1 / Found by: A**
 - The Back button is on the bottom right corner of most of the screens, but is on the bottom left corner of the cafe view in Spanish.
 - *Suggested Fix:* Choose either the bottom left or bottom right corner to put the Back button, and keep that as the consistent position for the Back button for all screens that include it.
- 16. H4: Consistency & Standards / Severity 1 / Found by: A**
 - When being given the order number in the cafe, the Spanish version says we are “*número cinco*,” while the English version uses the digit “#5” to describe the order number, which feels inconsistent.
 - *Suggested Fix:* When describing the order number, it can either both be described with both the written-out version in the language and the digit, for example in the format “order number five (5)” or “*número cinco* (5),” or both use only the written-out version or only the digit.
- 17. H4: Consistency & Standards / Severity 1 / Found by: C**
 - The “Pick an adventure” underlined text is lowercase while all previous screens with similar instructional text are all uppercase.
 - *Suggested Fix:* change to uppercase for consistency
- 18. H4: Consistency & Standards / Severity 1 / Found by: A**

- In the screen that shows the current language/country, there is a “Resume” button which skips the screens for choosing the language/country, and directly leads to the Choose Location screen. However, labeling the button as “Resume” may not be entirely intuitive, as it may also lead users to think that it serves the same function as the Back button.
- *Suggested Fix:* Change the terminology of “Resume” to “Start!” so that it is consistent with the “Start!” button on the Choose Language screen.

19. H4: Consistency & Standards / Severity 1 / Found by: A

- After providing a recommendation to the other person in the cafe for what to order, the Spanish version of the recommendation page leads to an English “Congratulations” page.
- *Suggested Fix:* Make the Spanish version of a page lead to a Spanish version of the subsequent page (or more generally, keep the language for the pages being navigated to be consistent).

20. H4: Consistency & Standards / Severity 1 / Found by: A

- On the “Where do you want to go?” page, it says “Visiting” and then the country name. However, users may get confused because the title of the page asks where they would like to go, yet the term “Visiting” suggests that they have already selected a location, so the term may be ambiguous about what the user is supposed to choose if it suggests that they already are visiting some place.
- *Suggested Fix:* Instead of using the word “Visiting,” try phrasing like “Selected Country” to be more consistent with existing terminology, or in the title question itself say something along the lines of “Where would you like to visit in Mexico?”

21. H4: Consistency & Standards / Severity 1 / Found by: A

- When the user receives their order in the cafe, they are holding one item—specifically, a cup. However, given that the prompt was to decide on 3 things to order and moreover they may not have chosen to get a drink at all, showing the single cup is inconsistent with the order prompt.
- *Suggested Fix:* The user could be asked in the initial deciding step to select the 3 items they want to order in addition to saying it aloud, and later at the order pickup stage, the application can accurately show the 3 items based on the user’s selected order.

22. H4: Consistency & Standards / Severity 1 / Found by: C

- Clickable versus non-clickable components look the same; this leads to confusion about whether something is clickable versus if it is an instruction. For example, the “Look to the right” instruction uses the same component as the “continue” button, while only the latter is a clickable.
- *Suggested Fix:* Use a differently formatted component for non-clickable features.

23. H4: Consistency & Standards / Severity 1 / Found by: A

- After the user has placed and received their order, Langu says “Let’s recap!” However, the button to click on the page says “write” which is not quite the same as recapping; if the user sees the prompt “recap,” they may think that this is a

recap relating to speech or recognition of words/phrases because those are the actions they have just done.

- *Suggested Fix:* Use different phrasing instead of “recap”, which may be ambiguous in terms of the method that a recap would be done (e.g. speech, reading, writing). A specific idea is to provide different buttons leading to separate pages for practicing saying vs. reading vs. writing the words they should have just learned.

24. H5: Error prevention / Severity 2 / Found by: C

- When being asked whether the user wants to save their progress, if the user selects “No” there should be confirmation, including a more detailed explanation of what this entails.
- *Suggested Fix:* pop-up “Are you sure?” box with blurb underneath explaining that not saving means the user will lose their progress from this session and not be able to resume from the same spot.

25. H6: Recognition not Recall / Severity 1 / Found by: A

- Once a user has begun an adventure (for example, when they are in the cafe), there is no way for the user to see again what location or country on the map they are currently at. If the user does not quite remember what location they selected in the beginning, they cannot review where they are.
- *Suggested Fix:* Add a map icon that users can click in order to get a view of their current location and be reminded of where they are.

26. H6 Recognition Rather than Recall / Severity 2 / Found by: B, C

- During the “say your order aloud” screen, the menu is no longer accessible to the user; the user has to memorize their entire order, which is uncharacteristic of a real-life ordering experience. This might overload the user.
- *Suggested Fix:* Add a “notes/my order” section where they can drag the items from the menu/type notes. Keep this section visible on the order screen.

27. H6 Recognition Rather than Recall / Severity 2 / Found by: C

- During the “listen for your order number” screen, the user is briefly told their order number and then can no longer access this if they forget, which is uncharacteristic of a real-life ordering experience. If the user forgets their number, they must navigate back to the original ordering screen.
- *Suggested Fix:* have the user “hold” a receipt containing the order number for ease of reference.

28. H6: Recognition not Recall / Severity 0 / Found by: A

- On the “Where do you want to go?” page, users must click the Back button in order to change the language and country. However, users may not find it obvious what a Back button there will navigate to, and may not remember that it was after they had selected the language and country.
- *Suggested Fix:* Take out the Back button on this page, and add a button that is clear to users that it’s what they should press to change the language or country.

29. H7 Flexibility and efficiency of use / Severity 2 / Found by: C

- During the user's second time through, there can be an option to skip certain tasks or navigate to the task of interest; this is more efficient for the experienced user who wants to gain more practice for a certain skill.
- *Suggested Fix:* add a "skip" feature for each task, or have a navigation bar that the user can click through to choose the task of interest.

30. H8: Aesthetic & Minimalist Design / Severity 2 / Found by: A

- In the "Your Stats" page, the design of the Activity Log graph is confusing and may make it difficult for users to immediately parse what exactly it is showing. For example, the numbers are unconventionally ordered vertically with a single digit on each row, each of the words for the days of the week split into 3 rows, the word "Monday" overlaps with "0", and there are blue dots above the blue line. Also, there is no indication of what the numbers (presumably percentages) and the line corresponds to in terms of activity.
- *Suggested Fix:* Redesign the Activity Log graph so the axes are clearer to read, make it clearer what the percentages are relative to, and explain what the blue dots in addition to the blue line mean.

31. H8: Aesthetic & Minimalist Design / Severity 2 / Found by: A

- Between the page that says "Decide on 3 things to order" and the actual ordering page where users can say their order aloud, there is an intermediate page saying "Order". However, it feels like an unnecessary extra step in the ordering process.
- *Suggested Fix:* Take out the intermediate "Order" page, and after the user has decided on their items to order, have the user go directly to the page where they can place their order.

32. H8: Aesthetic and Minimalist Design / Severity 3 / Found by: B

- When the user switches to English, all clickable buttons on English pages are still on the screen but are not clickable (required switching back to Spanish). The user might be frustrated as they look like buttons but are not clickable.
- *Suggested Fix:* If the buttons are not intended to be clickable when in English, change the style of the buttons to indicate that they are not clickable (e.g. gray out the button).

33. H8: Aesthetic & Minimalist Design / Severity 3 / Found by: A, C

- On the Welcome page, there is a "Continue Last Session" button, in addition to a list of continuing/existing users. However, users logging back in would presumably select their respective account, which should already save their last session, so it is unclear what user account the "Continue Last Session" button would lead to and whether it is really necessary.
- *Suggested Fix:* Take out the "Continue Last Session" button, and have the view of Current Language/Country as the next page after users select their account under "Continuing User".

34. H8: Aesthetic & Minimalist Design / Severity 1 / Found by: C

- On the "where do you want to go?" screen, the map is slightly too detailed; there is value in having a map that shows relative location of major cities, but smaller cities and topography is too much information that is distracting.

- *Suggested Fix:* use a map that is solid colored, with major cities only

35. H8: Aesthetic and Minimalist Design / Severity 1 / Found by: B

- It might be unclear for a user what the “volume/speaker” icon does (and it is currently not clickable) . Does it adjust the volume? Maybe this is a “setting”. The user might be confused when clicking on settings and not seeing that option there.
- *Suggested Fix:* Remove volume icon from the main interface and add it to the setting page (after clicking settings icon)

36. H8: Aesthetic & Minimalist Design / Severity 3 / Found by: A, C

- After the users have completed an adventure, it navigates users to a page titled “Your Stats”; however, the page is very busy, and also shows a 2x2 grid of Next Steps which are not stats, unlike the page’s title suggests.
- *Suggested Fix:* After users complete an adventure, change the following page to be titled “Next Steps” and only show a short list of selections for what users do next. One of those selections can be to then navigate to a separate View Stats page, which could be viewable by the user from either the home page or as an icon on the top left bar. The Activity Log, Your Breakdown, and Achievements parts of the current “Your Stats” page can be moved to that new page.

37. H8: Aesthetic & Minimalist Design / Severity 2 / Found by: A

- Under “Next Steps” on the “Your Stats” page, there are four selections for what users can choose to do next. However, it is not immediately clear what the difference is between selecting “Choose a new adventure” versus “Choose a new country/language”.
- *Suggested Fix:* Take out the “Choose a new country” and “Choose a new language” buttons as part of the next steps selections, and keep the “Choose a new adventure” button and “Save and exit the game” buttons.

38. H8: Aesthetic & Minimalist Design / Severity 0 / Found by: A

- In the screen that shows the current language/country, there are two different buttons to Change Language and Change Country, but the Change Country button leads to the same page as the Change Language button, except page for Change Country shows both the “Choose a Language” and “Choose a Country” options (while Change Language leads to only seeing “Choose a Language” at first, and then after selecting a language, users can also see “Choose a Country”). However, this layout feels a bit redundant.
- *Suggested Fix:* Either have two completely distinct screens, one for choosing a language and another for choosing a country, or have a single button that leads to a screen to change the language and country settings.

39. H9: Recognize, Diagnose and Recover from Errors / Severity 2 / Found by: B

- When the user incorrectly responds to “Is this your order number”, the error message shows it is very brief and does not constructively suggest a solution or give them a hint. The user might not know what they got wrong or how to improve.

- *Suggested Fix:* Understandably, giving the user the answer wouldn't make sense, but maybe the screen could say something like "Try again" and show a list of other numbers (including the correct one) in the language in hopes of having the user remember.

40. H10: Help and documentation / Severity 2 / Found by: A, B, C

- There are no FAQ or help resources when the adventure is in session. Users may need to reference instructions again amidst the adventure and have no way to do so without navigating back and forth.
- *Suggested Fix:* Add a button like "Settings" but for "FAQ".

41. H10: Help & Documentation / Severity 2 / Found by: A

- There is no initial tutorial to help guide first-time users in using the application, and Langu is also never introduced to the user.
- *Suggested Fix:* Add a quick (skippable) tutorial to guide users through the application screens if they are new, and Langu could be introduced in the beginning of the tutorial. The tutorial can also be added as a side icon or in the settings in case users want to refer back to it again.

42. H11: Accessible / Severity 1 / Found by: A

- During the cafe adventure, it is only possible to write down what was previously learned at one point in the adventure. However, the user is unable to practice writing at any other time before or after that exact point in the adventure. Some users who practice language effectively by writing and may find it helpful if they could access a notepad at any point in the adventure.
- *Suggested Fix:* Add a notepad icon to the screen so that the user can pull it up whenever they want to practice writing something down, throughout the adventure.

43. H11: Accessible / Severity 0 / Found by: C

- The text spacing on the "Welcome" screen is not intuitive, which leads to a crowded look
- *Suggested Fix:* Have the "new user" and "continuing user" components in the same blurb and "continue last session" in a separate one with different formatting.

44. H12: Fairness and inclusion / Severity 4 / Found by: A, B, C

- The "switch between languages" component defaults to English, which is unhelpful to non-native English speaking populations. Users might feel like the design is not meant for them and their goals (learning a language without any experience)
- *Suggested Fix:* First option in the app setup should be to choose the main language used by the user.

45. H12: Fairness and Inclusion / Severity 3 / Found by: B

- Setup page does not have an option to indicate the level of experience which can cause users to be confused and make mistakes, especially when the instructions are in the language they are trying to learn. The users might not feel like they can use the app if they are beginners.

- *Suggested Fix:* Add “level” selector in the setup and have the activities be customized based on their past experience with the language or indicate the difficulty of each adventure.

46. H12: Fairness & Inclusion / Severity 2 / Found by: A

- In the Cafe Activity Listen Success and Writing screens, there is a view of a hand holding a coffee cup or a pencil. The skin tone of the hand is light, but users may not identify with that skin color.
- *Suggested Fix:* Allow users to be able to customize their own character in the application, including skin tone.

47. H13: Value Alignment / Severity 1 / Found by: A

- While the application’s values strive towards equity and inclusion, it is not clear how the languages offered, countries available, and locations explorable in this application will be selected and whether or how it will be done in an equitable and inclusive manner.
- *Suggested Fix:* Adding an About page or a statement that clearly describes the decisions behind the selected languages, countries, and specific locations (perhaps trying to cover the most commonly spoken languages first).

48. S4: Start and Stop Conversations / Severity 2 / Found by: B

- Currently if the user does not “talk” for a certain period of time, Langu does not intervene to help/end the conversation. The user might feel lost if Langu doesn’t help after a period of silence.
- *Suggested Fix:* Have Langu intervene and assist the User if they do not respond to the prompt in a given time period

49. S17: Allow users to exit from errors or a mistaken conversation / Severity 2 / Found by: B

- Currently the user cannot stop the conversation or go home by saying “Stop” (or similar). This might make the user feel like they can’t stop the adventure in the middle of a conversation.
- *Suggested Fix:* Add an option for the user to stop the interaction by saying it verbally.

[...create your numbered list of violations here]

{EXAMPLE:} H4: Consistency & Standards / Severity 3 / Found by: A, C, D

- The interface used the string “Save” on the first screen for saving the user’s profile, but used the string “Update” on the second screen. Users may be confused by this different terminology for the same function.
- Fix: Use the same string on each screen.

3. Summary of Violations

Category	# Viol. (sev 0)	# Viol. (sev 1)	# Viol. (sev 2)	# Viol. (sev 3)	# Viol. (sev 4)	# Viol. (total)
H1: Visibility of Status	0	1	1	1	0	3

H2: Match Sys & World	0	1	2	2	0	5
H3: User Control	1	0	1	3	1	6
H4: Consistency & Standards	0	9	0	0	0	9
H5: Error Prevention	0	0	1	0	0	1
H6: Recognition not Recall	1	1	2	0	0	4
H7: Efficiency of Use	0	0	1	0	0	1
H8: Minimalist Design	1	2	3	3	0	9
H9: Help Users with Errors	0	0	1	0	0	1
H10: Help & Documentation	0	0	2	0	0	2
H11: Accessible	1	1	0	0	0	2
H12: Fairness & Inclusion	0	0	1	1	1	3
H13: Value Alignment	0	1	0	0	0	1
S4: Start and Stop Conversations	0	0	1	0	0	1
S17: Allows users to exit from errors or a mistaken conversation	0	0	1	0	0	1
Total Violations by Severity	4	16	17	10	2	49

Note: check your answer for the green box by making sure the sum of the last column is equal to the sum of the last row (not including the green box)

4. Evaluation Statistics

Severity / Evaluator	Evaluator A	Evaluator B	Evaluator C
Sev. 0	50%	0%	50%
Sev. 1	69%	6%	25%
Sev. 2	59%	35%	35%
Sev. 3	60%	60%	70%
Sev. 4	50%	100%	50%
Total (sevs. 3 & 4)	58%	67%	67%
Total (all severity levels)	61%	33%	41%

*Note that the bottom rows are *not* calculated by adding the numbers above it.

5. Summary Recommendations

[merge the general recommendations you made here]

Great job with simulating a VR application using Figma for your Medium-Fidelity Prototype! Creating an immersive VR experience in a generally static prototype platform like Figma is definitely challenging but we thought your team had an aesthetic design that helped transport us to a location in Mexico! For our feedback in reference to Nielsen's Thirteen Usability Heuristics, we observed further attention to consistency and detail, as well as clearer process flows, as the greatest areas of improvement. The heuristics with greater numbers of more severe violations are H3: User Control & Freedom, H8: Aesthetic & Minimalist Design, and H12: Fairness & Inclusion.

To go into more specifics, adding functionality in the application for saving progress, logging out, and going to another adventure after completing one adventure would be important to create a smoother, more connected user experience. Moreover, the speaking and listening components seem to be ambiguous as to when the user is supposed to be speaking versus listening. Some simple audio progress bars and a speaking indicator should be easy fixes for this. Additionally, it can be helpful to give the user more freedom in certain activities; for example, in the writing activity, it can be frustrating for the user to write something that they did not mean to write and not have the ability to alter it once it's down. This can be expected to be the case often with users learning to write in new languages, so this is an important feature to include. Allowing the user multiple attempts by implementing a "clear" feature provides the user with flexibility of rewriting and comfort of not being afraid to mess up writing in a language that is likely to feel unfamiliar to them.

In addition, especially given that this a foreign language learning software, equity/inclusion are factors of greatest importance; the current language toggle feature seems like it automatically switches between English and the language being learned, but allowing the user to first choose

a default language (their native language) is important, as the audience engaging with the app cannot always be expected to be native English speakers. Moreover, as an app meant to help users learn new languages, the overall interface and experience seems more geared towards users who have some level of experience. We thought that by adding a “level of experience” to the setup and having many activities and adventures for all levels would be very helpful in covering the entire flow of learning a language (learning basic words and later becoming fluent and comfortable in a new environment).

In addition to the 13 heuristics above, we had a tangential discussion about potential privacy concerns. For example, we noticed that the cafe scene shows a view of an actual image in a cafe. Although this helps give the user a realistic impression and immersive feeling for the location they have selected, we wondered how your team intends to get these pictures for locations that are in different countries, since the cafe view is currently from Stanford and not Mexico City, and an important part of your values is inclusion which seems tied to being representative of places the application is trying to portray. Another thought regarding the cafe images was that there are real people who were photographed, and while some of them are replaced by cartoons, many others are not. It is possible to see many of the individuals' faces, and from a privacy angle we were interested to know if the team might consider blurring out faces; it might be something to think about.

Overall, great work! This is a great starting point for your final product, and we're looking forward to seeing how LangVRse develops even further!

Severity Ratings

- 0 - not a usability problem
- 1 - cosmetic problem
- 2 - minor usability problem
- 3 - major usability problem; important to fix
- 4 - usability catastrophe; imperative to fix

Heuristics

H1: Visibility of System Status

- Keep users informed about what is going on

H2: Match Between System & Real World

- Speak the users' language
- Follow real world conventions

H3: User Control & Freedom

- "Exits" for mistaken choices, undo, redo
- Don't force down fixed paths

H4: Consistency & Standards

- Words, actions, and UI elements should be consistent across the entire platform
- Follow platform and industry conventions

H5: Error Prevention

- Minimize error-prone conditions
- Remove memory burdens, support undoing, and warn your users when necessary

H6: Recognition Rather Than Recall

- Make objects, actions, options, & directions visible or easily retrievable

H7: Flexibility & Efficiency of Use

- Accelerators for experts (e.g., gestures, keyboard shortcuts)
- Allow users to tailor frequent actions (e.g., macros)

H8: Aesthetic & Minimalist Design

- No irrelevant information. Focus on the essentials.

H9: Help Users Recognize, Diagnose, & Recover from Errors

- Error messages in plain language
- Precisely indicate the problem
- Constructively suggest a solution

H10: Help & Documentation

- Easy to search
- Focused on the user's task
- List concrete steps to carry out
- Not too large

H11: Accessible

- Users can interact with the system using alternative input methods.
- Content is legible with distinguishable contrast and text size.
- Key information is upfront and not nested for screen readers.

- Purely visual or auditory content has text-based alternatives for users with low vision and low hearing.

H12: Fairness and Inclusion

- Users shouldn't feel that the design is not made for them.
- The design should meet all users' needs equally and prevent the reproduction of pre-existing inequities.
- It should not create additional burdens for members of disadvantaged populations.

H13: Value Alignment

- The design should encode values that users can understand and relate to.
- Conflicting collateral values should not emerge when the user interacts with the product.
- Encoded values should match users' values in a broad set of use-contexts.