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1. Strive for Consistency

- ✓ The term "Back" is used quite consistently used throughout the design.
- ✓ Search bar is almost always at the top of the screen, with the exception of the Welcome Page.
- ✓ Information of each room/store in Figure 1 is consistently labelled within the boundary of the walls.
- In Figure 4, we introduce a new term "Exit" instead of "Back".
- In Figure 5, we have both a "Back" button and a "X" button in the top right.

2. Cater to Universal Usability

- In Figure 1, we should use internationally recognized symbols for the Elevator, Stairs and Entrances symbol.
- We currently do not support different routes for users (wheel chair friendly, least walking etc). For example, an elderly user might opt for the least walking route even if it takes a longer time.
- We should not enforce logging in ("Log in Page"), but instead offer it as an optional functionality while still allowing any user without an account to use the application.
- We can consider including a text-to-speech button in "Search Location" for disabled users.
- We can consider including more advanced search options (building name, floor, date-time to travel).
- We can have a simple tutorial (i.e. a gesture prompt) for novice users if they linger for too long on a screen that requires input, such as Figure 2 (back to 2-D) and Figure 1 (gestures to navigate).

3. Offer Informative Feedback

- ✓ Unfavouriting an item changes the heart immediately from uncoloured to coloured.
- When a user searches a location and enters Figure 1, we should immediately provide more helpful information such as the user's current orientation and the time to travel.

4. Design Dialog to Yield Closure

- ✓ Assuming the favourites list updates upon user successfully editing information and returning to Figure 4, it yields closure for user as they are immediately informed of the completion of the task.

5. Permit Easy Reversal of Actions

- ✓ Users can favourite and unfavourite searches.
- ✓ There is a back button, or a toggling button for every view (except "Welcome Page").
- ✓ The "X" in the search bar in Figure 1 allows users to quickly undo their search.
- From the storyboard there is no way to return to "Welcome Page". We can consider dropping the page altogether and launch either from "Search Location" or Figure 1.
- In Figure 1, Users cannot re-access the Level Indicator after closing it.
- In Figure 4, the user cannot return from "Edit Name" to the original Edit popup.

6. Support Internal Locus of Control

- ✓ The use of distinct menu buttons gives easy and obvious access to necessary information for users. It can however be improved and suggestions will be made throughout this document.
- The Welcome Page is tedious and prevents users who might want to get an at-a-glance understanding of their location first. For example, to find the nearest toilet at a glance.
- In Figure 1, we should only show either 3-D or 2-D button. A 2-D view does not need to be able to select the 2-D button (likewise for a 3-D view). Currently it can be confusing for users.
- In Figure 1, we can allow the users to zoom in and out of the map, giving them more control.
- In Figure 2, there are two arrows that both serves the same purpose of showing the direction to head towards. It is unnecessary and can be surprising or even confusing for the user.
- In Figure 2, users might want to see necessary information like the entire sequence and not only the top 2-3 steps. We can accommodate this by placing the list of steps in a drawer.

- Similar to the above point, in Figure 2 we should let them swipe to see further down the navigational path (i.e. traverse down with Google Street View) as it is a necessary information for users.
- In Figure 3, we should consider placing the back button at the top left as this is a more familiar interface for users, in line with the general consensus in design (Google Chrome, MS Word etc).
- Many users will consider the opening hours to be important information. As such, we should include it in Figure 1 as well and make it readily accessible and noticeable for users.
- Figure 5 should not have both an exit (X) and back button as both serves the same purpose.

7. Reduce Short-term Memory Load

- ✓ The menu only contains 7 buttons which fits into the 7+/-2 rule of thumb. However, it can be improved and suggestions will be made throughout the document.
- In Figure 1, we can reduce the number of buttons in the menu bar, as currently it can be intimidating.
  - We can instead use a drawer to store buttons to reduce the clutter.
  - More commonly used buttons like the Re-Calibration button should still be shown outside of the drawer as it should be highly visible and easy to access.
- Currently Figure 3, 4 and 5 has many screen transitions and pop-ups. This can be exhausting for users to keep track of which step they are on. We can tackle this by encouraging the usage of gestures.
  - At Figure 4, we can encourage the deletion of Favourites by introducing a coloured-heart beside the location name. Pressing the heart removes the place from the Favourite List.
  - At Figure 4, we can allow users to edit the text directly on the page (less screen/popup) by swiping left on the entry they wish to edit.

8. Prevent Errors

- Our application currently allows for the user to search for places in various buildings. However, our application does not seem to have the capability to do outdoor-to-indoor navigation, thus a user in *Building A* searching for a shop in *Building E* will not be able to get directions there. Since Figure 1 is the immediate transition from "Search Location" a likely bug would occur at this point. As such I would propose to either to
  - Limit the user to only be able to search within their own building or
  - Do not immediately state the navigational directions to the place (add a "Map View" screen prior to Figure 1). This allows users to search other buildings.
- To further reduce the chance of cross-building searching errors, the user should also be made aware of their current location (i.e. Vivo City or Jurong Point Mall). This can be considered a necessary information for many users, and thus doing so Supports the Internal Locus of Control as well.

9. Additional Comments

- ✓ I really liked the idea of using AR to give directions to the user. Perhaps one concern is the usability, as it would imply a user would have to hold out his phone and look at the screen while navigating.
- I placed this here as it supports the Internal Locus of Control by eliminating tedious actions and also supports Reducing the short-term memory load by reducing the number of points of access that a user has to remember.
  - With the current design the point of access for navigating to a place would be the 1) Welcome Page, 2) Search Bar, 3) Favourites Menu and 4) Recent Menu. It can be confusing for a user to remember four different access point. Instead we can try doing the following
    - At "Search Location" page we can have two tabs – "Recent" and "Favourites".
    - The user first lands in the "Recent" tab.
    - The user can select the "Favourites" tab to swap to view their Favourite List.
    - Should a user begin typing they will then be given the suggestions much like "Search Location" Lo-Fi page.
- It would be necessary to include some way of viewing multi-level traversing direction.
- In the Welcome Page there is a greyed-out box that seems to cater to Preventing Errors, but I am not sure what error it is preventing and thus am not sure if I should've considered it an implementation.