



NUS
National University
of Singapore

Team 6:

Farid Tan B Hasyim Tan A0201611A

Iris Ee Xin Hui A0192219A

Tan Yi Jia A0201356R

Teri Aiwan Jin Min A0185228Y

Department of Communications and New Media, National University of Singapore

NM4210: Advanced User Experience Design

Dr Dennis Ang

November 12, 2021

Discover! Tanjong Pagar (Version 2)

The Tanjong Pagar neighbourhood is rich in culture and heritage unique to the area.

However, the younger generation today is increasingly unfamiliar with the urban landscape's cultural history, which presents a concern as they will soon take over efforts in the cultural and heritage preservation of the area. With the introduction of many new trendy cafés in the area, younger-generation individuals have begun frequenting the area to explore the neighbourhood for its food offerings and café aesthetics, providing an opportunity to tap into these cafe visitation and exploration habits to encourage participation in the area's culture and heritage. Hence, we have conceived of the Discover! Tanjong Pagar experience to instil within the younger generation aged 18-27 a deeper understanding and appreciation of the Tanjong Pagar neighbourhood's history and landmarks.

User Research

From the interviews conducted with key stakeholders and target users in the first iteration of this project, we discovered that the younger generation is generally not interested to learn about the heritage and culture of Singapore, and many who visit the Tanjong Pagar area do so to visit the cafés there and to take photographs with its aesthetic architecture for social media (notably Instagram). More youth have been visiting the area due to restricted travel regulations brought about by COVID-19, encouraging them to visit the area as a replacement for travel.

To build upon this research, we conducted 2 semi-structured interviews with a 24-year-old male and a 21-year-old female, and 2 cultural probes with a 19-year-old and 21-year-old female to learn more about our target users' dining out and social media habits as well as their interest in Singapore's heritage and culture. While the interviews allowed us to gain detailed and in-depth qualitative insights from our target users, cultural probes allowed participants to craft

their responses while reflecting privately on their recent experience without the interference of an interviewer, generating fresher and deeper insights into their thoughts and emotions surrounding their outing experience.

Before conducting the interviews, we prepared an interview guide (Appendix A) of questions as a base guide and asked spontaneous questions that came up based on their responses. Our cultural probes consisted of digital cards with prompts accompanied by blank spaces for participants to write responses to and insert images as well. We engaged participants who had plans to visit a café with a friend and disseminated the digital cards to them immediately after their outing via a link to Google Slides, where they were asked to fill up after the activity and the cards were to be returned to us by the end of the day. Unfortunately, we were unable to collect data for larger groups of friends due to the COVID-19 restrictions limiting social group sizes to two people. The interview guide and interview findings can be found in Appendices A to C, while the cultural probes can be found in Appendices D and E. The following are the key findings we discovered.

Dining Out Habits

We noted that participants typically walked around the area of the restaurant/café after their meals regardless of whether they are alone or in a group to explore or look for a place to have dessert. They tend to notice unique things that are not usually found in cafés. For instance. One participant noted that one of the most prominent things they noticed in a café was how they had swing seats (see Figure 1).

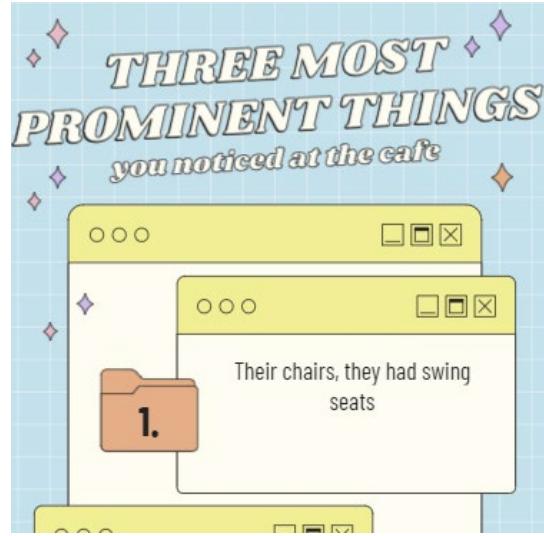


Figure 1: Cultural probe participant J noticed swing seats in the D'Good Cafe.

Social Media Habits

All our interviewees and cultural probe participants mainly use Instagram, especially for its Stories feature whereby portrait photographs or videos that are automatically hidden after 24 hours can be uploaded for limited-time sharing with their friends. Normally, they share photographs of their food (see Figure 2) and occasionally photographs of aesthetic areas and features such as murals.

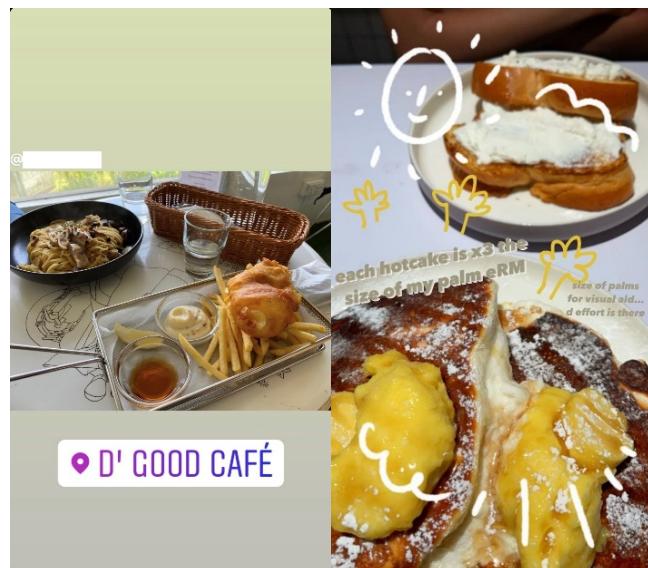


Figure 2: Instagram Stories by cultural probe participants depicting their food

Interest in Culture & Heritage

Supporting our findings from our first iteration of user research, participants were not interested and do not actively seek to learn about culture and heritage. One reason cited was that they are too focused on other forward-looking things in their life, that such past culture and heritage is not a priority. However, one participant noted that he may gain an interest in the future to pass traditions down to his children.

However, despite their lack of interest, our participants mentioned that they are receptive to organically obtained knowledge such as through bite-sized fun facts (see Table 1).

Table 1: Interviewee D's and R's responses to what they think may pique their interest in Tanjong Pagar's culture and heritage

Question	Interviewee D	Interviewee R
What do you think will intrigue you to learn more about (the culture and heritage of Tanjong Pagar)?	“If you gave me some fun facts about the place... if the fun facts to me are ‘worthy’ enough, I would probably Google it and look behind the inner backgrounds of what happened at that place.”	“... Sometimes when I actually learn something, then I’m like “Oh wow, that’s actually quite cool”. But like (it’s) usually during those random moments (when) I didn’t think (I’d) be learning (something) specifically about history... Maybe is (sic) like all these history information isn’t like shoved down our throats, so... I learn about it unknowingly but like naturally if that makes sense haha.”

Contribution to Culture & Heritage Preservation

Participants shared that they are not interested in contributing towards the preservation of such local historical culture and heritage and know little about existing efforts. One participant knew of NUS Baba house but did not know what the organisation does. This also supports our

findings from the first iteration of user research. Participants also noted that they feel unqualified to contribute as they do not know much about it in the first place.

Implications for the Design Space

From the key findings, we discovered several implications for our design space.

First, since our participants do spend time around the area after their meals either walking around leisurely or looking for a place to have a dessert or to catch up with friends, this reveals that there is potential in tapping into this habit to engage them in learning about the culture behind the place they are at. Having dessert rewards from the experience would also be in line with their existing habits.

As our participants tend to take pictures of their food while dining (see below) and share them on social media (on Instagram Stories), we can take the opportunity to design coasters that can be used as props and flat-lays for their pictures to be posted on social media, to further boost its visibility to gain the attention of our target users. One cultural probe participant remembered most prominently a unique feature of the cafe she visited (Swing Chairs at D'Good Cafe). Thus, the design for our coaster should be unique and eye-catching to not only encourage our target users to share them on social media but also make it memorable as a reminder for their experience if they take part in it.

Furthermore, since our participants mainly shared their photographs and experiences on Instagram Stories, our design should be tailored to sharing via the same function and platform. This led to some considerations, such as the overall aesthetics of the experience but also how to best utilise the Instagram Story format (e.g., we can provide an aesthetic Instagram Story filter for the experience to encourage users to take pictures of their experience and share on social media).

Finally, we should avoid aggressively forcing huge amounts of information into our target users through our design, and instead consider how to package this information in an organic, relatable and more bite-sized manner. This would also help to spark discussion, encouraging sustained engagement. Since they do not actively seek to contribute to culture and heritage, we could encourage them passively, possibly through their sharing of photographs and thoughts on social media or a way in which they could donate their voucher rewards from completing our activity towards an existing cultural preservation effort.

Building upon our design in the first iteration of this project while accounting for the design considerations from our findings, we conceived of the following design proposal.

Initial Design Proposal

The Discover! Tanjong Pagar experience is a heritage trail experience that encourages exploration of the Tanjong Pagar area and promotes organic learning about its culture and heritage by allowing participants to complete activities at the neighbourhood's landmarks. Such activities include augmented reality (AR) minigames, puzzles, and quizzes relating to the Tanjong Pagar neighbourhood's past and present and are triggered when participants reach designated checkpoints via Bluetooth and/or GPS detection with their smartphones.

Cafe patrons in the area are introduced to the experience via unique eye-catching coasters on tables in participating cafes which they can also take home as a souvenir, each displaying a map of the trail and a QR code that leads to the Discover! Tanjong Pagar web application. The completion of each activity awards participants with a stamp, and upon collecting 3 or 5 stamps they can redeem a small or big dessert reward respectively from participating cafes in the neighbourhood. To claim their rewards, they must key in a short write-up about their learning experience in the neighbourhood following the trail, after which they are rewarded with digital

vouchers that can be redeemed at participating cafes in the neighbourhood. Participants are also given a unique and aesthetic Instagram Story filter which they can use for their Instagram Story photographs to share about the experience via social media, garnering their friends' interest in the experience. This experience is captured in the design storyboard in Figure 3.

DISCOVER! TANJONG PAGAR (VERSION 2)

9



Figure 3: Design Proposal Storyboard

Feasibility of Design

To assess the feasibility of the experience proposed in our design proposal, we conducted background research on existing products and systems utilising similar technologies.

Coaster Design

For our coaster, we researched and found many possible options for the material that could be used, from paper board coasters to PVC coasters. We also found existing coasters with elaborate city map designs printed onto them, proving that it is feasible for us to include a mini-map of the Tanjong Pagar neighbourhood on the coaster. Overall, we found that multiple options were suitable for our design such as paperboard with an Art card on top and PVC coasters with UV printing due to their ability to be produced and distributed in large quantities at a relatively low cost. Furthermore, in addition to being reusable, coaster materials such as paperboard are recyclable as well. As for which material might be best, further testing is needed with each material to determine which may be the most suitable. That said, with the myriad of possibilities for coaster materials, our coaster design is feasible.

Augmented Reality Functionality

We identified AR systems within applications such as the mobile game Angry Birds AR: Isle of Pigs whereby users can fling birds onto structures superimposed onto real environments via their phone's camera. Also, the NUS AR experience application allows users to scan any NUS logo to project a 3D version of it above the logo on the phone screen.

GPS and Bluetooth Location Tracking

For the location-tracking system we intend to implement in our experience, we found similar systems in mobile applications such as Pokémon GO and Pocket Trips. These two applications utilise users' smartphone GPS systems to track their location and unlock activities

alongside other functionalities based on their location. Pocket Trips is most like our design, providing interactive virtual trails with fun activities such as photo-taking and quizzes that are triggered when users reach designated checkpoints on the trail, detected by their smartphone's location via GPS.

As for the feasibility of Bluetooth as a backup proximity checker to detect when users have reached a checkpoint, similar designs include the Singapore Government's [TraceTogether](#) technology and [Apple's iBeacon](#). These systems utilise Bluetooth to detect when users' smartphones (and by extension the users) come within a certain proximity and perform actions such as registering their entry into a location and sending tailored notifications to their devices. Unlike QR codes which would have to be placed in a prominent location to be seen by users and may disturb the visual authenticity of a landmark, a Bluetooth detection device can be hidden somewhere out of sight from the user.

To further assess the feasibility of Bluetooth and GPS systems for our design, we asked our cultural probe participants some follow-up questions regarding their phone battery life, portable power bank habits, outing duration, and GPS/Bluetooth habits to the cultural probes and asked the two participants to fill them in. This was to find out whether participants would normally have their GPS and Bluetooth turned on for the experience, and to find out whether their mobile phones would be able to last the duration of our experience noting that GPS and Bluetooth can drain phone batteries. The responses from the cultural probe participants can be found in Appendices D and E. We discovered that while participants tended not to bring portable chargers out, they normally charge their phones before the outing to ensure that they can last the duration of the outing – which includes a 30-minute to 2-hour window after their meal that they normally spend in the area. Furthermore, they normally have at least their Bluetooth on due to

the government's TraceTogether requirements. Hence, Bluetooth and GPS are viable options, and since our experience will likely last less than 30-minutes their phones should survive the experience.

Low-Fi Prototype

To facilitate user testing, we created a low-fi prototype of the web application and coaster.

Initial Coaster Design

We took inspiration from notable landmarks and shophouses in Tanjong Pagar and experimented with retro colour palettes and typefaces to design our coaster. From there, we conceived of 4 coaster design options (see Figure 4).



Figure 4: Initial Coaster designs

First Activity

Upon scanning the QR code on the coaster, users will be led to our Web Application prototype. There, they will take part in the opening activity, a minigame (see Figure 5).

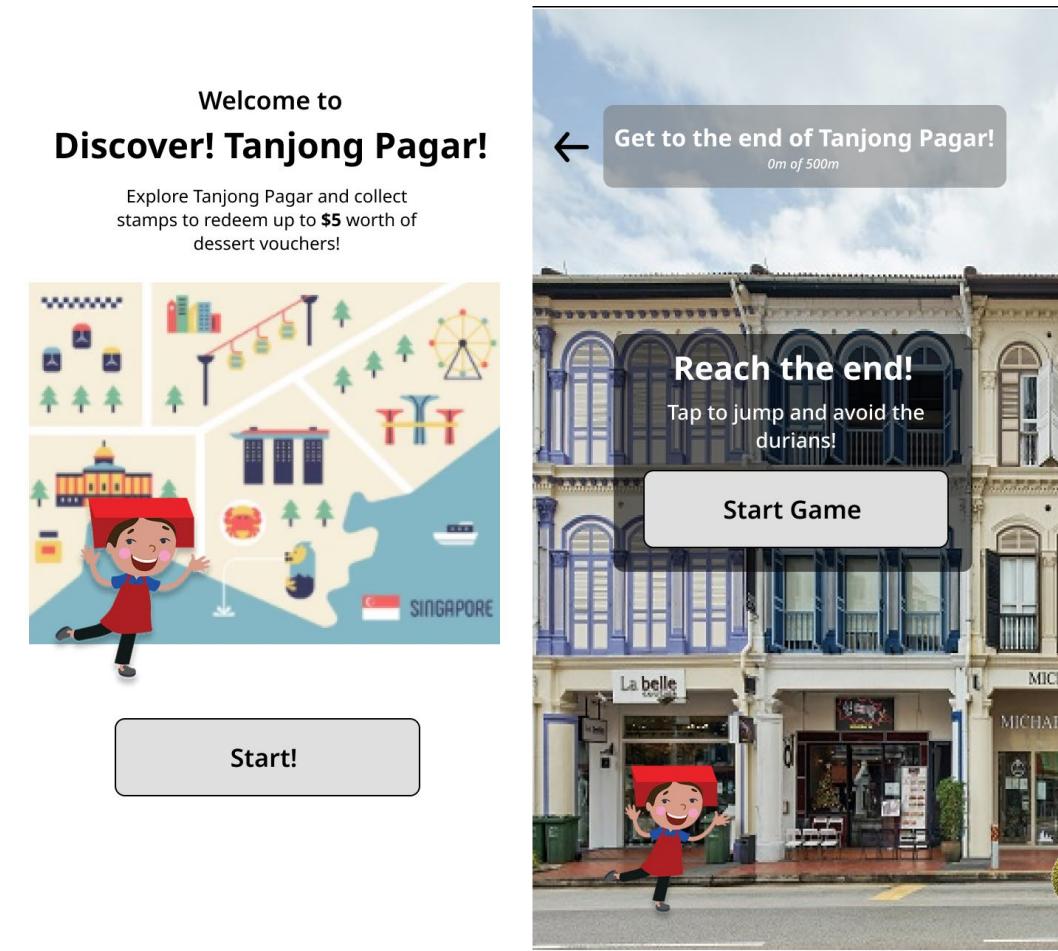


Figure 5: Welcome Screen and First Activity

The purpose of the welcome activity is to not only pique users' interest in the application but also allow them to gain their first stamp. This first stamp serves to hook users to the experience, thinking that since they've already gotten a stamp they might as well go out to get more.

Exploration Map

After completing the first activity and getting their first stamp, users will be led to the exploration map (see Figure 6).

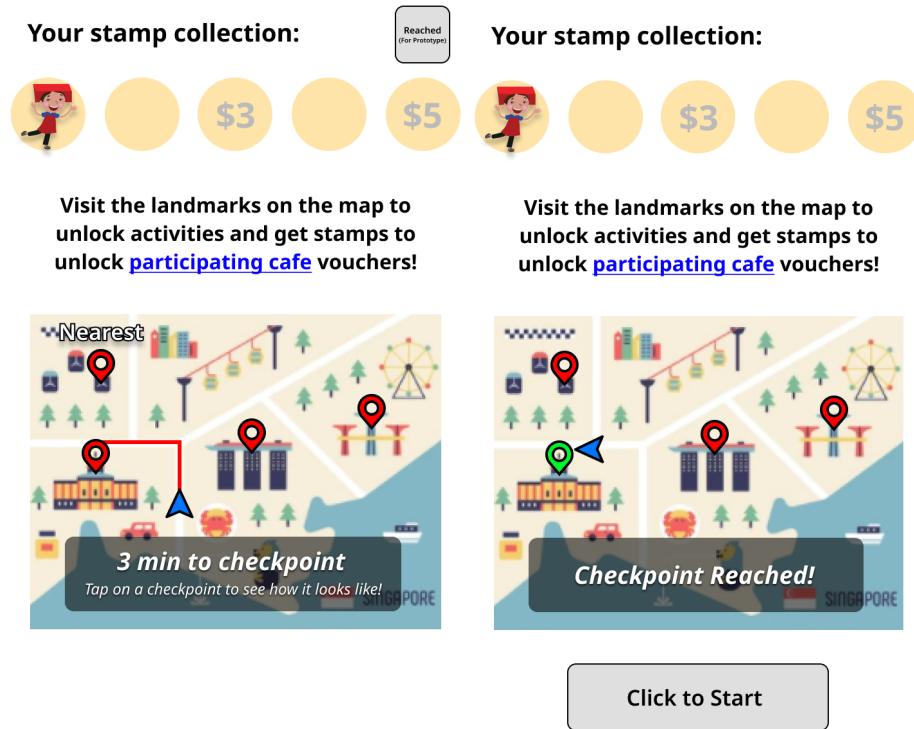


Figure 6: Exploration Map Screens

Using this map, participants can navigate their way to the different checkpoints marked with location pins to visit the different landmarks and unlock activities. Since the prototype does not support GPS functionality, we manually trigger the location activity via a small temporary button on the top right.

Activities

Activities for the low-fi prototype, though bare, show examples of what cultural games users can expect ranging from AR activities to puzzle games (see Figure 7).

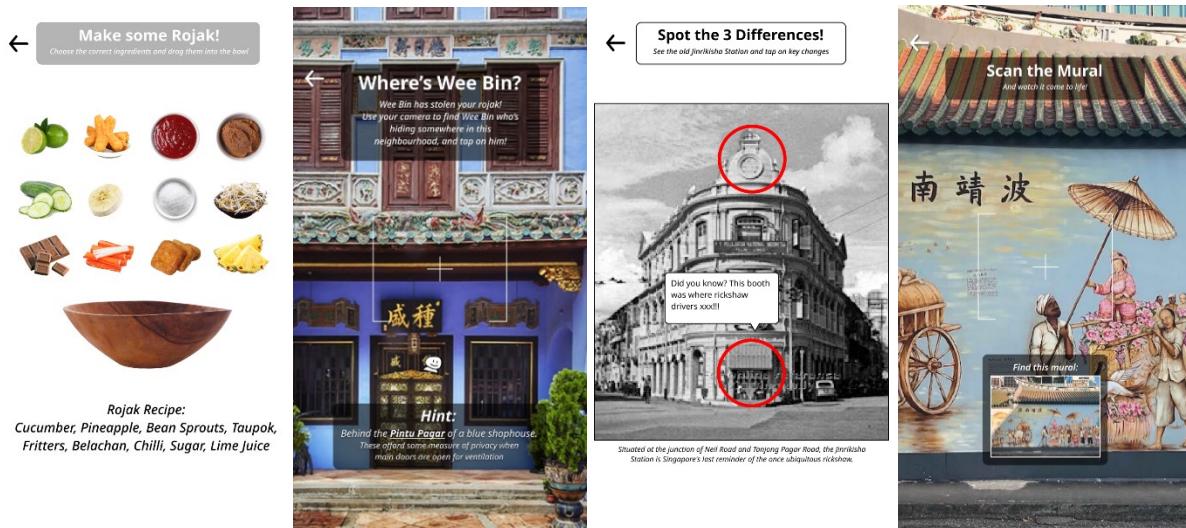


Figure 7: Activities relating to the neighbourhood's culture

Each activity is related to their respective landmark in the Tanjong Pagar neighbourhood, serving to not only encourage participants to interact with the landmark but also learn about them through the memorable activities. Upon completion of each game, participants will be presented a fun fact as well (see Figure 8). Users can also tap a “Find out more!” hyperlink for an informative pop-up telling the users more about the landmark.

Jinrikisha Station

You got all 3 differences!

Located at the junction of Neil Road and Tanjong Pagar Road, the Jinrikisha (also spelt as "Jinricksha") Station was built in 1903 and opened the following year, serving as the main depot for rickshaws.

[Find out more!](#)

[Continue](#)

Lore ipsum dolor sit amet, consectetur adipiscing elit. Nec condimentum amet, in felis morbi condimentum mattis quis elit. Praesent netus arcu vel cursus sit ultrices arcu. Eu faucibus nibh neque in. In amet, proin neque magna id volutpat cras leo. Quis neque quam egestas nisl. Ipsum ipsum faucibus quam posuere sollicitudin arcu, donec turpis.

At pellentesque ligula quam in. Odio enim pellentesque bibendum nunc sollicitudin

Figure 8: Fun facts are presented after each activity. Users can tap "Find out more!" for an informative pop-up.

Stamp Rewards

After each activity, users are awarded a stamp. Each stamp is unique to the activity that was completed (see Figure 9).

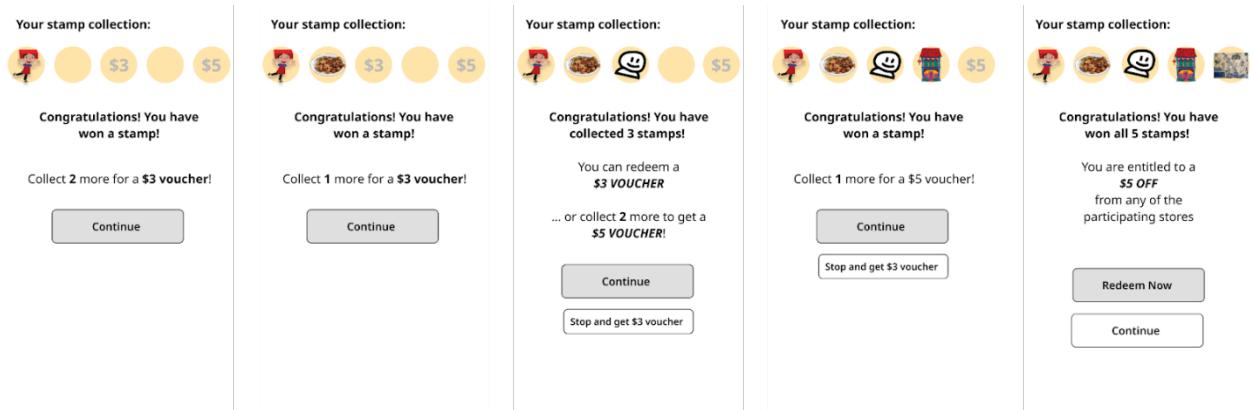


Figure 9: Users get a stamp after each activity.

After users get 3 stamps, they are given the option to stop and get the \$3 voucher, or they can continue and collect all 5 stamps for the \$5 voucher.

Redemption and Reflection

Before redeeming their voucher, users must complete a redemption form (see Figure 10).

Figure 10: Redemption form and voucher screen

The redemption form asks for users' personal information for verification purposes to ensure that they do not redeem the rewards more than once. Also, a textbox allows users to share about their experience, encouraging reflection and allowing the team to gain insights into their perspectives as well. After completing the form, they are presented with the voucher screen, and they can redeem vouchers via the QR code at participating cafés.

Instagram Filter

From the voucher screen, users can access the interactive Instagram Story filter as well (see Figure 11). This is incorporated in the Instagram application, and users will be redirected to the Instagram Stories feature with the filter loaded.



Figure 11: Interactive Instagram Story filter

In the prototype, users can drag to move an umbrella anywhere they want to on the screen. Though not an accurate representation of the final filter, we hope to be able to generate responses about what sort of filter we should design. By incorporating it directly with Instagram

Stories, we hope to make it easier for users to share their pictures there to not only publicise the neighbourhood and the experience but also generate memories surrounding the neighbourhood.

User Testing (Round 1)

We conducted user testing with 3 participants from our target user group aged between 20 to 27 via experience prototyping whereby we attempted to simulate the intended experience as clearly as possible. We observed how they interacted with the prototype and the overall experience, encouraged them to think aloud during the test, and asked questions during the experience.

For the prototype, we printed our coaster designs on paper and placed them on users' tables when they went out for a meal (see Figure 12). After users scanned the QR code on the coaster, they were led to our prototype web application to accompany the experience. Along the way, we provided contextual information and prompts to guide them along the experience to make up for the prototype's limitations. For instance, as the prototype has no location tracking capability, we had to manually trigger when users reached a location. We also printed pictures of the Tanjong Pagar landmarks to simulate the actual trail experience in Tanjong Pagar and pasted them at the mock checkpoints to allow users to better visualise the experience.

After the test, we asked participants a few questions surrounding the coaster, web application prototype, the overall experience, and the Instagram story filter. From our user testing, we gleaned the following key findings.

Coaster



Figure 12: Paper coaster prototype printouts on a café table. They can be flipped to alternate designs.

While participants noted that they would keep the coaster because it is free (except for one who said they don't use coasters), they noted that our coasters were not particularly eye-catching as many cafes have coasters as well. One even mistook the QR code on the coaster as that for the café menu, so they didn't think to scan the QR code on the coaster after ordering their food. One participant raised an interesting point that different coaster designs may work for different cafés due to the colour palette differences of each café, hence she suggested that we could implement different variations of the coasters for different cafés.

Unclear Start to the Experience

After participants finished the first game from the web application, all three were unsure of what to do after reaching the map page. Due to the nature of the first game whereby players were able to complete it while sitting down in the café, they were expecting the rest of the experience to be the same. Hence, participants thought that the instruction to "visit" the landmarks on the web application was metaphorical and that they were supposed to tap on the landmarks to visit them. They did not know that they had to physically travel to the landmarks.

Furthermore, upon finding out that they had to visit the landmarks physically, participants were inclined to immediately quit the experience with the reason that they would not just leave the café to visit the landmarks. This was because it was unclear that the rest of the experience was supposed to be done *after* the meal. After explaining this, participants were more inclined to take part in the experience. One user, therefore, suggested having a page containing instructions at the beginning to inform users what to do during the experience and what rewards they can expect as well, bringing us to our next finding.

Reward system

Most users were unsure of where they could redeem the vouchers during the experience at the beginning. This was important because they mentioned that their inclination to participate would be influenced by whether they would be keen on visiting the participating cafés in the first place.

Furthermore, one participant was confused by the layout of the stamps on the prototype, thinking they could get both the \$3 and \$5 vouchers from the experience upon completing the activities due to the way the stamp system was shown to the user (see Figure 13).



Figure 13: The stamps interface on the low-fi prototype

At the end of the experience, one participant was also confused why there was a “Continue” button after collecting all 5 stamps. The original intention of the button was to allow participants to continue exploring even after completing the experience. However, this misled him to think that there was an even bigger reward after, leading to disappointment after he discovered that there wasn’t.

Overall, all three users were inclined to continue the experience after collecting 3 stamps as they felt that the games were fast and easy to complete, hence two more games would not be too much of a hassle for them. However, they mentioned that this depends on the amount of time they had after their meal, which could be influenced by whether they had plans or not.

Map Design

Due to the design of the prototype map, it was not clear to participants that they had to physically walk to the designated checkpoints (see Figure 14). This led to them tapping on the checkpoints on the map and left them confused as to what should be done next. Participants also noted that the map did not look and feel like a real live map, which added to their confusion at the start of the experience when they didn't know they had to physically visit the checkpoints.

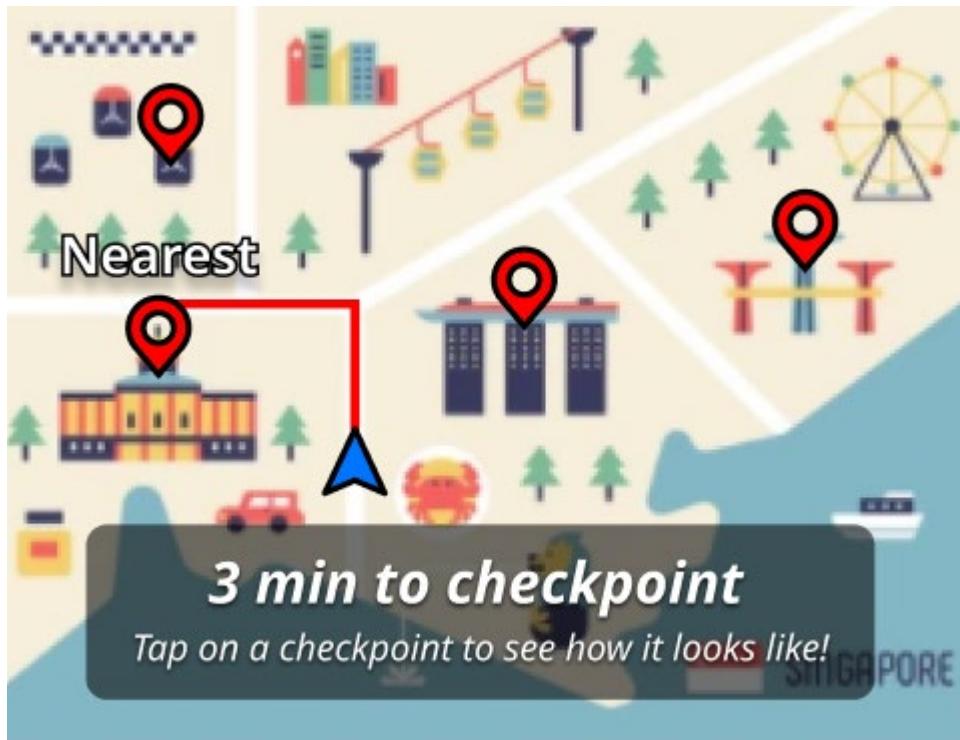


Figure 14: The "live" map presented on the low-fi prototype

Physical Exploration

Participants were generally not inclined to walk around. One mentioned that the effort to do so for him was not worth the rewards. Another participant also mentioned that she would not participate in the experience in hot weather since she would normally dress up nicely to visit cafés.

Overall, participants mentioned that they would only take part in the experience with friends and not do so alone. However, we were unable to test for a group or couple experience due to the current two-pax COVID-19 restrictions.

Activities

All three participants generally found the games and activities to be fun, though this finding may be skewed since they were friends with the testers. However, they found most of the games too easy, which made them not memorable. Furthermore, one participant noted that there was no context provided to the games, affecting their understanding of the experience. For instance, for the first activity, she did not understand why she was delivering food to a shophouse in Tanjong Pagar.

For the “Spot the Differences” activity, one participant noted that he could just randomly tap all the areas of the small mobile screen and eventually find the differences, without comparing the old building with the current one (see Figure 15).

← **Spot the 3 Differences!**
See the old Jinrikisha Station and tap on key changes



Situated at the junction of Neil Road and Tanjong Pagar Road, the Jinrikisha Station is Singapore's last reminder of the once ubiquitous rickshaw.

Figure 15: The Spot the Difference activity

Regarding the “Find Wee Bin” activity, one participant did not know that they had to tap on the character on-screen despite the text instructions. Instead, she kept moving the camera reticle over Wee Bin and was confused as to why the activity wasn’t completed (see Figure 16).

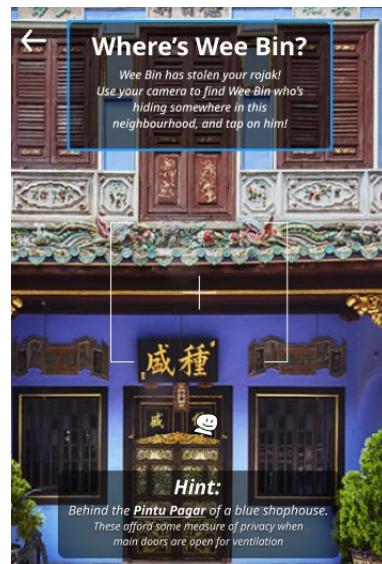


Figure 16: The Where's Wee Bin activity

Finally, one participant thoroughly enjoyed the Rojak game due to him having to shake his phone for one part of the activity. He mentioned that it was a unique and memorable interaction, saying that he would have liked to see more of such interesting interactions throughout the experience (see Figure 17).



Figure 17: The part of the Rojak game where users had to shake their phones

Overall, the participants found it difficult to visualise the AR activities through the prototype despite our simulated cameras.

Cultural Learning Ability

During our testing, we noticed that users only skimmed through the fun facts we presented. Most of them did not bother to tap “find out more” after each activity to learn more. They also did not remember most of the cultural information from the activities. One exception was the “Pintu Pagar” from the Find Wee Bin activity since they experienced some struggle finding Wee Bin and did not know that a Pintu Pagar was.

One participant mentioned that this was because the fun facts provided were not interesting enough, lacking a “wow” factor or relevance to Singapore as a whole. This led them to not being memorable and did not pique interest in participants to find out more.

Overall, the learning outcomes for each activity were not communicated. For instance, one participant noted that they did not know what to learn about the Tanjong Pagar culture from the Rojak game (the intended learning outcome was to let participants know that street hawkers who delivered food to houses were prevalent in the area in the past).

Instagram Filter

Participants were generally not inclined to use the filter in our prototype. Instead, they mentioned that they would use filters that were either aesthetic or “fun”, such as having a game within the filter or making it quirky to let them create something they can laugh at with their friends.

Overall Experience

One participant pointed out that the activities during the experience felt disjointed as a whole, causing him to be unable to remember them as everything was all over the place. Hence, he suggested that there could be a narrative throughout the experience that ties all the activities together to make the experience more memorable (see Table 2). Furthermore, by doing so, as each activity would be tied to a common narrative, he mentioned that they would be easier to recall as well.

Table 2: Participant G's reaction to the overall experience

Feature	Participant G
Overall Experience	“There’s no relation between all of (the activities), would prefer a story overall that ties everything together”

Design Implications from User Testing (Round 1)

Based on the feedback from the user testing, we decided to make the following changes to our prototype:

1. To prevent users from getting confused at the beginning, we can implement a few onboarding pages when users open the web application at the beginning explaining how the experience will work and what they can expect, including what rewards they can get and where they can redeem them.
2. Upon reaching the map screen, another prompt will appear informing users that they need to physically visit locations using the live map, with a suggested timing being *after* they have finished their meal.
3. To make the experience more cohesive, engaging, and memorable, we can consider including an overarching narrative that will tie all the different activities in the web application together.
4. As the games were found to be too easy, the overall difficulty of the games will be re-looked at to incorporate some form of struggle to make them more memorable. Also, the format of some games will be reconsidered to better facilitate cultural learning. For instance, as the ‘Spot the difference’ activity could be easily cheated by tapping all over the screen, we will reconsider this activity to see whether we can tweak it or replace it.
5. Reconsider how interesting interactions like the shaking of the Rojak game could be incorporated in other activities to make them interesting as well.
6. Re-look the first activity at the café to be presented in such a manner whereby users do not get confused from the gap between the in-café activity and the rest of the experience.
7. Refine the prototype map to make it look more like that of existing live maps (e.g., Google Maps) to fit users’ mental model of a live map
8. Find a way to present the fun facts in a manner that users are inclined to interact with them and not just skim through them.

9. Re-look our current Instagram filter idea and design it to be more fun to entice users to use it and share on their Instagram Stories.
10. Tweak the design of the coaster to inform users of what rewards they can get from scanning the QR code to entice users to scan it and differentiate it from that of a menu. We will also reconsider how to present the coaster to our target users, such as an interesting accompanying coaster holder design.
11. Add accompanying text to the “Continue” button after collecting all 5 stamps to let users know that there are no further rewards and avoid generating disappointment.

Pilot User Testing (Round 1.5)

Before conducting the second round of user testing, we conducted a round of internal pilot testing with another design team using an updated version of the prototype from the first round. In this updated version, the following changes were included in response to the design implications from the first round of user testing:

1. Inclusion of onboarding screens to explain the experience to users
2. Revamped map layout for the prototype to better simulate a live map
3. Minor wording tweaks to make the experience slightly clearer (e.g., the “Continue” button at the end was changed to “Free Roam (No More Rewards)”)

As this round of testing was conducted over Zoom, we could not simulate the whole experience and only ran through the prototype – everything else (e.g., the walking) was explained verbally. The participant from the design team was given a prototype and asked to “Share Screen” with us as she went through the application so that we could observe how she interacted with the experience. We also informed her to think aloud as she went through the

experience. Notes from the user testing can be found in Appendix J. From the pilot testing, we discovered the following key findings that were related to our new features and built upon our findings from the first round of user testing:

Tutorial Screens

The participant mentioned that the tutorial screens were clear in telling her what she could expect in the application. However, she noted some confusion from one of the screens, thinking that she could interact with one of the previews in the onboarding. Hence, we noted that we would need to reconsider the tutorial screens and avoid showcasing elements that looked like they could be interacted with in the onboarding screens.

Understanding of the Live Map

The new layout of the live map was understood by the participant, and they knew that it was supposed to simulate their location. However, she noted that she did not recognise the “current location” icon and did not know what it was supposed to do. Hence, we noted that a mini guide for the map might be useful for users.

Unclear Start

Despite the new onboarding screens and the live map, it was still not clear to the participant that the intended experience was for them to continue the activity after finishing their meal. While this may have been influenced by the online Zoom setting, we noted that we might have to find some way to make this more obvious.

Games Connection to Fun Facts

Although the participant enjoyed the Rojak game, she noted that there was no connection between the game and the fun fact that was presented. She suggested providing some context behind why the user had to deliver the rojak, such as having them imagine that they are a hawker

delivering food. Though the games were likely to be revamped, this was a potent suggestion that we would need to think of a context behind each game, which we could provide in the overarching narrative we aim to implement.

Refined Prototype

Based on the feedback from the first round of user testing and the pilot testing, we created a refined version of the prototype for another round of user testing. The key changes in this prototype from the low-fi prototype are as follows:

Onboarding Screens

Considering how most users were confused at the beginning of the experience, we added a series of onboarding screens to explain how the experience will work and what they can expect from the experience, including the rewards (see Figure 18).

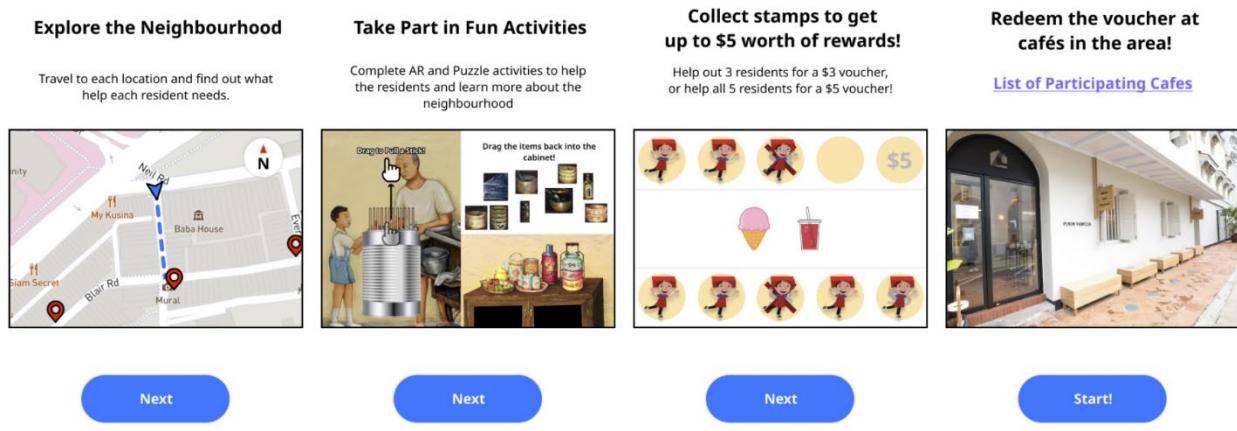


Figure 18: Onboarding Screens

Noting the finding from the pilot user testing that the pilot iteration of the onboarding screens confused users by making them think they could interact with the preview image, we changed the onboarding screen previews as well. This way, users will be able to know from the

beginning that they must physically explore the neighbourhood and what rewards they can get, preventing confusion and encouraging them to take part.

Updated Coaster Design

Noting that users were unaware of the potential rewards from the experience before scanning the coaster's QR code, we've updated the coaster design to inform target users of potential rewards to entice them to scan the QR code and find out more (see Figure 19).



Figure 19: Updated coaster designs

NPC-Driven Narrative

As a few participants felt that the experience was disjointed and thus difficult to remember, we've incorporated into the experience an overarching narrative whereby participants

are asked to help Non-Player Characters (NPCs) around the neighbourhood. From the beginning of the experience and at each checkpoint, users will get to interact with NPCs relevant to each landmark, some of whom were actual real-life people from the neighbourhood's history such as Wee Bin (see Figure 20).



Figure 20: Wee Bin, the NPC at NUS Baba House.

The NPCs provide context to each of the activities, giving users a reason to perform the tasks and thus making them easier to remember and helping users understand more about the culture. For instance, the context for an AR game whereby users must deliver satay to a house is such that they are helping a street hawker “Uncle Affiq” deliver food, educating them on the presence of street hawkers in the area in the past. The more engaging narrative experience with each landmark now includes an NPC which players can converse with. Cultural and historical information about the landmarks has been inserted into the conversations for a more organic learning experience as well instead of having users read an explicit fun fact.

Updated Activities

Noting that users found the activities to be too easy and thus unmemorable, they have been updated to be more challenging so that users experience some form of struggle when engaging with them. This was also considering how most participants learned about the Pintu Pagar from the original prototype due to their struggle to find the character at the NUS Baba House who was hiding behind one. Furthermore, the fun facts have been adjusted to be relevant to each game as well. For instance, in one of the games, users must drag unique Peranakan pottery back into their original position based on a real mural at the checkpoint (see Figure 21).

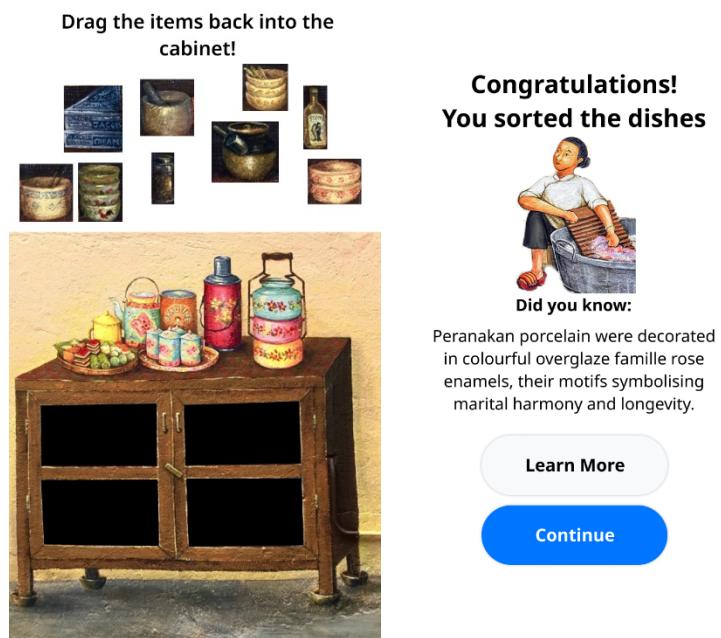


Figure 21: Updated activities and more relevant fun facts

This not only encourages interaction with the mural but also makes the experience more memorable through the struggle. The fun fact about Peranakan porcelain presented after is also relevant to the game, making it easier to remember. Hence, the games and their associated learning points can be made more memorable for the users, facilitating their learning of the neighbourhood's culture and heritage.

Revamped Map Layout

The map layout on the prototype has been revamped to better fit users' idea of a live map by taking inspiration from the popular Google Maps (see Figure 22).

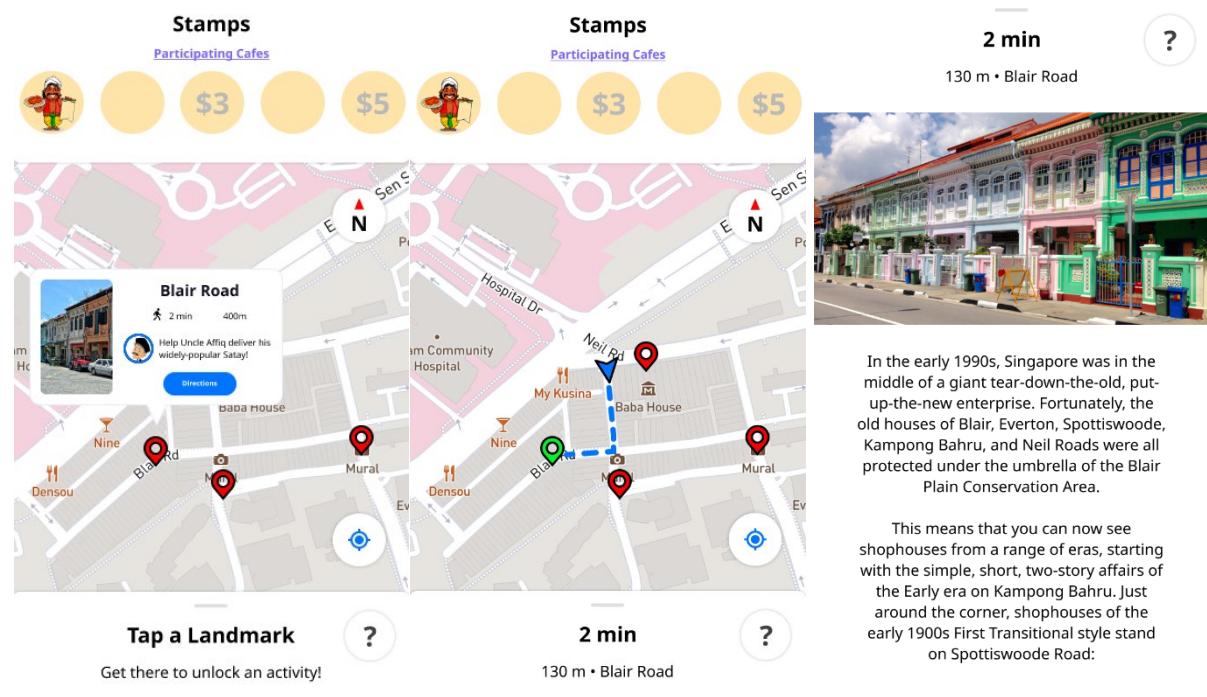


Figure 22: Revamped Map Layout

When users tap on a checkpoint, a pop-up will appear providing them with a picture of the landmark for them to recognise it before heading there. Furthermore, participants can pull up the card at the bottom to get more information about a landmark. This way, participants curious about the different landmarks in the area can learn more in between each checkpoint.

Noting that one user was unfamiliar with live maps did not understand the “current location” icon on the map, we also added a help icon (“?”) on the map that triggers an overlay with a guide explaining what each element on the map screen represents (see Figure 23).

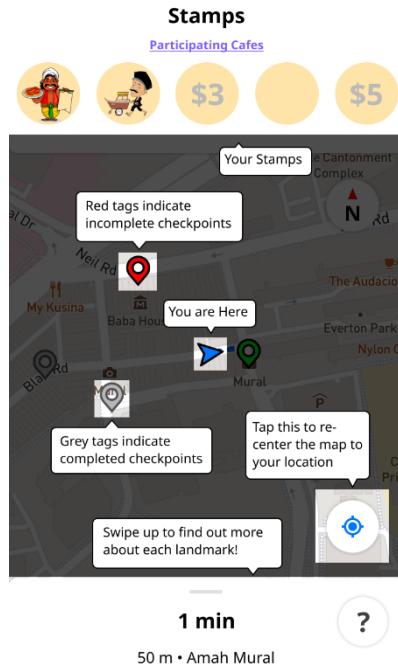


Figure 23: Map tutorial overlay triggered when tapping "?"

New Fun Instagram Filters

Noting our target users' inclination to use fun and quirky Instagram Story filters, we redesigned our filters to allow users to superimpose themselves onto the neighbourhood's unique landmarks and murals (see Figure 24).



Figure 24: New fun Instagram Story AR filters

The filters are intentionally designed to be quirky, such as the filter of the two chickens, to allow target users to have fun with their friends when playing with the filter, generating memories of the experience. Furthermore, not only are users more likely to use these filters for sharing but the unique features of the Tanjong Pagar neighbourhood are also shared, raising awareness of the area's rich culture.

User Testing (Round 2)

For this round of user testing, we engaged 3 participants from our target user group aged between 22 to 27 – one female aged 22 (J) and two males aged 22 (B) and 27 (G) respectively. G, the 27-year-old, had also been present for the first round of user testing, hence we noted that he already had existing knowledge of the experience and took his feedback with careful consideration. We conducted the user testing in the same manner as the first round of testing but with the new prototype to assess any differences in participants' responses to the new changes. The individual user testing findings can be found in appendices K to M. From the three user tests, we noted the following key findings:

Free Coaster

Overall, participants liked the coaster design and found it to be aesthetically pleasing. However, one participant did not know that he would be able to keep the coaster and thought that he would have to leave it there, thinking that cafés do not normally give coasters for free. When asked if they would keep the coaster, both J and B mentioned that they would keep it as it was free and aesthetic.

Onboarding Process

With the revamped onboarding, participants were no longer confused at the start of the experience and knew that they had to walk physically to each landmark to unlock the different

activities. G, with his prior experience, also mentioned that the flow of the web application was clearer than before with the new interaction flow.

Rewards System

Despite the additions of the new screens, one participant still thought he could claim both the \$3 and \$5 rewards at the beginning of the experience. Hence, when he reached the \$3 stamp and found out that he could not claim both, he was mildly disappointed – although he noted that it made sense.

Fun Facts

Overall, participants still did not tap on “Learn More” to find out more about the information at each checkpoint and tended to skim through the fun facts. However, as for the fun facts inserted into the conversations with the NPCs, participants took the time to read through them, revealing that inputting these facts into the conversation-like context helped participants process them better. B suggested that one thing that could encourage users to tap on the “Learn More” buttons would be to style them more prominently, like the “Continue” button.

Activities

Overall, participants found the activities to be engaging and challenging. Of all the games, they enjoyed the Rojak game most, where they had to add the correct ingredients and shake their phones to serve. This was consistent with our first user testing. However, participants' least favourite game was the Tikam game where they had to pull out two identical sticks from a tin can as they found it to be meaningless since they felt it was purely based on luck.

Inappropriateness for Older Audiences

While the two 22-year-old participants liked the prototype's design and the NPCs and gave positive feedback regarding the visual aesthetics, G – the 27-year-old – did not enjoy the

experience, thinking that the addition of the new NPCs made the experience feel more childish, which he previously mentioned from the first round of user testing that it gave the application less credibility. Thus, we've noted that not all audiences may enjoy the cartoon-like feel of the application.

Cultural Learning Ability

Despite how all the participants were not interested in the culture and heritage of the Tanjong Pagar neighbourhood, they were able to glean some takeaways about the area through the application. For instance, J mentioned that they learned more about what murals and aesthetic shophouses they could find in the area, and B understood more about the stories behind the area and learned about the Pintu Pagar.

Instagram Filters

Of all three participants, only B regularly used the Instagram Stories and filters feature. Hence, G and J were only inclined to share their experience on Instagram Stories if an incentive was offered. However, B reacted very positively toward the filters and was inclined to use the filters on Instagram because he found them to be “quite funny” (see Table 3).

Table 3: Participant B's reaction to the Instagram Story filters

Feature	Participant B
Instagram Story Filters	“Honestly, they seem quite funny if it’s supposed to work or look the way it is supposed to, so probably yes. It’s quite funny haha.”

Final Prototype

Based on our findings from the user tests, we refined our prototype into the final version, which includes the following changes:

Coaster Holder Design

We noted that while users found the coaster designs aesthetic, they did not find them noticeable in the context of a café. Furthermore, one user was also not aware that they could bring the coaster home. Hence, we conceived of a coaster holder design in the shape of a compass that will be placed on each table in cafés (see Figure 25)



Figure 25: Coaster Holder designs

Clearer stamp rewards

Upon completing an activity and getting a new stamp before the 3rd stamp, users will not only be notified of how many stamps they are from getting the \$3 reward but also how many stamps they are from getting the \$5 reward (see Figure 26).

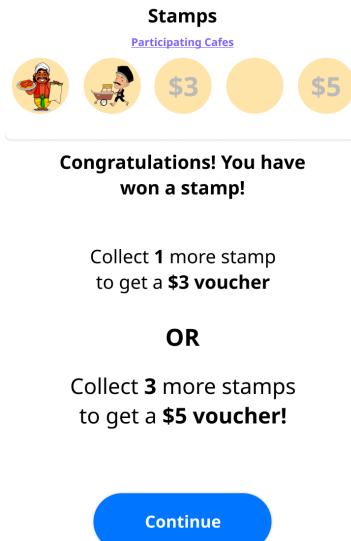


Figure 26: Updated screen for receiving stamps when participants have fewer than 3 stamps

This way, it is clear to participants that they can only receive either the \$3 or the \$5 voucher and not both each time they get a stamp. This prevents any disappointment when participants reach the \$3 stamp and realise, they cannot redeem both, generating a negative memory of the experience.

Remove Frustration from Tikam Game

Noting that the “Tries” counter from the Tikam game may have caused some frustration since the game was entirely based on luck, it has been removed and replaced with prompts telling the user what to do instead (see Figure 27).



Figure 27: The overlay text for the Tikam game now provides prompts instead of a score

We considered redesigning the game to remove the element of luck, but we felt that it would detract users from the actual game that was played in the past and potentially misinform them of how the Tikam game worked.

Re-Styling of “Learn More” Button

To encourage users to tap the “Learn More” button and find out more about each checkpoint, the button has been styled with a more contrasting colour to be made more prominent (see Figure 28).

Congratulations!
You fixed the Pintu Pagar



Did you know:

The NUS Baba House has undergone a number of remodelling works since it was built in the 1890s to restore it back into its original state.

[Learn More](#)

[Continue](#)

Figure 28: Re-styled "Learn More" button

This way, the affordance of the button is made to be more obvious, encouraging users to tap on it to find out more. Yet, it is separated from the primary “Continue” button to prevent users from accidentally tapping on it and getting annoyed

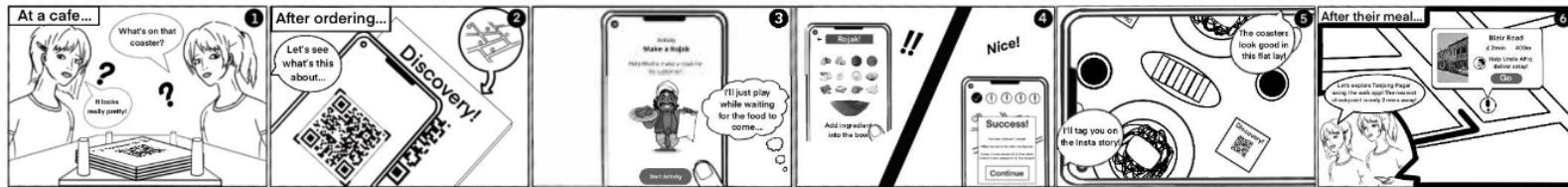
Final Design Proposal

Based on our findings from the user tests, we have refined our initial designed proposal. For improvements to our coaster, we have included rewards to entice our target audience, as well as conceptualised the coaster holder to be a compass, which is in line with the exploratory nature of the experience. The coaster holder itself is striking, given its unique concept that will stand out and attract attention to patrons in cafes instinctively. This carries the potential to galvanise feelings of butterflies in the stomach (Almqvist, 2019) and curiosity among patrons, which may translate to increased participation in the experience itself. When patrons see the coaster holder and coasters on the table in cafes, we hope to elicit feelings of surprise and anticipation, enticing them to find out more about the experience and participate in it.

For the web app itself, the Discover! Tanjong Pagar experience is still at its core a heritage trail experience that encourages exploration of the Tanjong Pagar area. As an updated feature to the previous design, the experience revolves around Non-Player Characters (NPCs) who requires the help of participants to complete their tasks. The NPCs provide a personal touch to connect with users, as well as being representative of the different cultures and heritage present in Tanjong Pagar. The activities tasked by the NPCs are the AR minigames, puzzles and quizzes as aforementioned. With these new incorporations of NPCs into the game, there will be greater engagement and focus on the content being shared. Hence, this allows for more meaningful interactions within the overall experience.

Additionally, the Instagram filters are updated to carry a more funny and comical tone. This change is concerning our user research findings that forefront more frequent usage of filters if they are humorous to users. By superimposing their faces on the respective murals, users can have a good laugh while also sharing about the location of the murals when they upload it on their Instagram Stories.

The final design storyboard can be seen in Figure 29, which now includes the NPC-driven narrative into the experience among other minor changes such as the updated Instagram Story filter experience.



Jane and her friend sit down at a cafe in Tanjong Pagar and notice a unique coaster on the table which catches their attention.

After ordering, they scan the QR code on the coaster out of curiosity.



They are taken to the Discover! Tanjong Pagar web app and are prompted to play a minigame! They decide to try it out while waiting for their food to arrive.



They complete a minigame which requires them to help Muthu to make rojak, and are awarded with a stamp!

They are invited to participate in Discover! Tanjong Pagar to explore the area while helping other NPCs to collect stamps for voucher rewards.



Their food arrives and - seeing that the coaster's design looks nice and can be part of the flatlay for a photograph - they take a photo of their food and drinks with the coaster and share it on Instagram Stories.



After their meal, the duo sets out for a leisurely walk to learn more and get more stamps for their dessert. They set our for the nearest checkpoint, Blair Road, just 2 minutes away to help the Non-Playable Character Uncle Afiq.



Upon reaching the first checkpoint, their phones vibrate - the activity is unlocked! They press start.



The duo completes the activity together, an AR game where they must deliver the satay to the respective houses in front of them, working together to identify the houses on their phones.



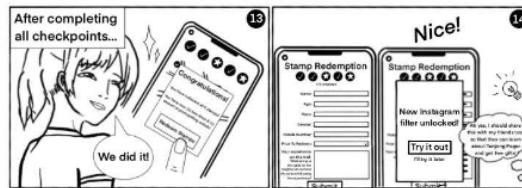
Upon completion, they get another stamp! Their playing of the game is automatically saved as an Instagram Story, so they post it on their Instagram Stories.



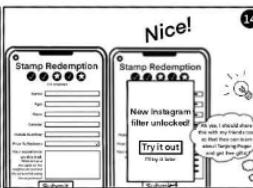
After heading to the next checkpoint and completing the activity there, they have 3 stamps! They are told they can claim a \$3 voucher, or get 2 more stamps to claim a \$5 voucher instead.



The duo moves from checkpoint to checkpoint, helping the NPCs by completing activities such as AR puzzles and minigames with relation to the culture of Tanjong Pagar.



After completing all the checkpoints and getting all 5 stamps, the app notifies the duo that they can each redeem a \$5 voucher, and the duo is delighted!



To redeem their vouchers, they share what they've learnt from the experience and their thoughts surrounding the neighbourhood from a short form. Upon redemption, the group is given an Instagram Story filter!



Excited, and since the filter is quite comical and funny, the duo takes a selfie together using the filter and they both share it on their Instagram Story.



Finally, hungry for some dessert, after the whole experience, they head over to a nearby participating cafe to redeem their dessert vouchers.



The duo spends the rest of their outing together chatting about the experience and catching up with one another over desserts and drinks.



Back home from the outing, Jane sets the coaster down on her own table for use with her drinks, reminding her of the great learning experience she had with her friend in the Tanjong Pagar neighbourhood.

Figure 29: Final design proposal storyboard

Feasibility of Design

Coaster Holder

For the compass-shaped coaster holder, materials that come under consideration include stainless steel, plastic, and even wood. Taking into consideration the number of holders required per café, the most accessible material for production would be plastic.

Additionally, with the feedback from our client, Karen, where considerations of environmental sustainability were brought into the discussion, another alternative for the coaster holder is the fact that it can be made from recyclable materials, such as old metal scraps or upcycled tins.

With regards to cost considerations, the stamping and welding of metal sheets to form the components are relatively inexpensive, costing less than a dollar per piece, taking reference from international machining and forging companies. This would also facilitate ease of production of the basic rotate-to-lift mechanism in each of the holders. That said, understanding that it is a niche design, we would need to engage container manufacturing companies to see if they can make it and better assess the feasibility of the coaster holder design.

Limitations and Future Research

One concern raised by our client, Karen, was whether F&B partners would be willing to partner with us to provide discounts via the vouchers. The idea we had in mind was that café owners may benefit from the increased traffic, and this could be a form of their contribution to corporate social responsibility as well – whereby discounts from voucher redemptions could go into tax rebates. However, to provide better insights into this, interviews and focus groups could

be conducted in future with café owners in the area to find out what would entice them to partner with us and what value or type of voucher reward is most appropriate.

Conclusion

In conclusion, the interactive user experience that we have seeks to encourage within the younger generation aged 18-27 a deeper understanding and appreciation of the Tanjong Pagar neighbourhood's history and landmarks by encouraging exploration of the area and promoting organic learning.

For future iterations of the web application, to encourage target users to return to the Tanjong Pagar neighbourhood and to keep the culture alive, new narratives and characters can be released yearly to provide users with a fresh learning experience. This also contributes to the sustainability of the experience. In addition, the experience can be expanded and/or adapted to include other urban landscapes beyond the Tanjong Pagar neighbourhood.

References

- Almqvist, A. (2019). Ways Into the Design Space of Butterflies in the Stomach. In Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (p. LBW0134). ACM. Retrieved from <https://doi.org/10.1145/3290607.3312903>
- Evokeprint Pte Ltd.*. Evokeprint. (n.d.). Retrieved from <https://www.evokeprint.com.sg/print-services/gifts/coasters>.

Appendix A

Interview Guide

Interview Objectives

To find out:

- A. What our target users normally do when going out for meals
- B. Our target users' habits when sharing content on social media and with friends
- C. How interested our target users are in Singapore's culture and heritage
- D. How willing users would be to contribute to the preservation of local historical culture and heritage

Interview Questions:

1. What our target users normally do when going out for meals

- a. How do you decide where to go for your meals?
- b. What do you normally do/notice
 - i. before meals? (before entering the restaurant upon reaching destination)
 - ii. during meals? (time from sitting down, ordering, waiting of food included)
 - iii. after meals? (after exiting restaurant)
- c. Do you normally go out for meals alone or in a group?
 - i. If in a group, how big is your group normally?
- d. Why do you normally go out for meals alone/in a group?

2. Our target users' habits when sharing content on social media and with friends

- a. What social media platforms do you usually use? Why?
- b. What do you usually use social media for?
- c. What do you usually share on social media? Can you share them?
 - i. Why do you share this on social media?
 - ii. (Take note: Any specific feature within the platform? E.g. DMs, Stories)
- d. Do you use any other platform(s) to share things with your friends?
 - i. If so, what platform(s)?
 - ii. What do you normally share?

3. How interested our target users are in Singapore's culture and heritage

- a. How interested are you to learn more about Singapore's heritage and culture?

- i. What in particular?
 - ii. Why?
- b. How interested are you to learn more about Tanjong Pagar's landmarks?
 - i. If interested,
 1. What in particular?
 2. Why?
 3. Where do you usually find such information?
 4. Do you think there are little or plenty of resources for you to find such information?
 - ii. If not interested, what do you think will intrigue you to learn more about it?
4. **How willing users would be to contribute to the preservation of local culture and heritage**
 - a. What do you think culture/heritage preservation is?
 - b. Do you know of any existing preservation efforts?
 - c. How likely are you to contribute to cultural/heritage preservation?
 - i. In what ways have/would you contribute(d)?
 - ii. What, if anything, would make you more likely to contribute?
 - iii. What barriers are there (if any) that are holding you back from contributing to cultural/heritage preservation?

Appendix B

Interview – D (Male, 24)

Links to Resources:

- A. Statement of Informed Consent
- B. Audio Recording of Interview

Interview Questions

1. What our target users normally do when going out for meals

- a. How do you decide where to go for your meals? **Ans:** Search up the place first, find where it is, look through the F&B options, filter options. Depends on the occasion. Mid-range restaurants. Don't visit cafes often.
- b. What do you normally do/notice (lesser noticing with friends)
 - i. before meals? (Before entering the restaurant upon reaching destination) **Ans:** How many people are inside the restaurant, look at the menu, miscellaneous stuff: ambience, seating arrangements, open kitchen, not much about the exterior of the place
 - ii. during meals? (Time from sitting down, ordering, waiting of food included) **Ans:** Depends on restaurants, condiments available, water, windows, staff to look out for food, what food other people are eating, while eating he is usually on his phone or talking to his friend
 - iii. after meals? (After exiting restaurant) **Ans:** walk around the area to find snacks, depends on existing plans, if in a group - depends on whether friend is available
- c. Do you normally go out for meals alone or in a group? **Ans:** Alone more often
 - i. ~~If in a group, how big is your group normally?~~
- d. Why do you normally go out for meals alone/in a group? **Ans:** Peace in being alone, more efficient, eats alone about 5 times in a week, weekends eat with family

GENERAL ANALYSIS: User does not visit Cafes often. Prefers to eat alone. **Notices surrounding lesser if he is with friends, otherwise he observes the environment around him. May walk around after meals but usually heads home after.

2. Our target users' habits when sharing content on social media and with friends

- a. What social media platforms do you usually use? Why? **Ans:** Primarily - Instagram, YouTube, Secondary - Twitter, TikTok, Facebook. YouTube - for job, long form, and better content to watch. Instagram - Platform to check out what friends are doing, to build his brand, post and look at photography.
- b. What do you usually use social media for? Entertainment (Instagram stories - Friends, YouTube - Edutainment), To build his brand

- c. What do you usually share on social media? Can you share them? **Ans: Generally, share about his life, different perspectives. Instagram - Funny moments in his life, Progress in different aspects of life**
 - i. Why do you share this on social media? **Ans: Gives other people different perspectives to provide value, inspire other people**
 - ii. (Take note: Any specific feature within the platform? E.g., DMs, Stories)
- d. Do you use any other platform(s) to share things with your friends?
 - i. If so, what platform(s)? **Ans: Telegram, Twitter, Discord**
 - ii. What do you normally share? **Ans: Telegram - Videos/links to Instagram post (memes, thought posts, photography). Varies greatly based on different friends**

GENERAL ANALYSIS: User use Instagram & YouTube most. Instagram primarily the stories function to check up on his friends. Secondary reason is for his career/build his branding. Mostly shares about his personal life, such as his progression on certain things or random stuff.

3. How interested our target users are in Singapore's culture and heritage

- a. How interested are you to learn more about Singapore's heritage and culture?
Ans: 2/5 interest
 - i. What in particular? **Ans: Took Module GES1038 - La Kopi**
 - ii. Why? **Ans: Interest in Chinese Heritage Culture, learning things that our parents went thru, which he talked to his family about after**
- b. How interested are you to learn more about Tanjong Pagar's landmarks? **Ans: No idea, had to google it. 1/5 interest**
 - i. **If interested,**
 1. **What in particular?**
 2. **Why?**
 3. **Where do you usually find such information?**
 4. **Do you think there are little or plenty of resources for you to find such information?**
 - ii. If not interested, what do you think will intrigue you to learn more about it? **Ans: If he has some knowledge of history, will do more digging. Could start with fun facts about the place -> e.g. One-minute videos by Mothership**

GENERAL ANALYSIS: User has little interest in Singapore's heritage and culture but has taken a module for Chinese Heritage Culture before as it is closer related to him, and it sparks conversations in his family. **User mentioned fun facts about a place could intrigue him to learn more about it.

4. How willing users would be to contribute to the preservation of local culture and heritage

- a. What do you think culture/heritage preservation is? **Ans: preserving the way of life of the older generation, preserving the culture identity of Singapore/not make it die out so that it's not a diluted culture without identity such as celebrating mooncake festivals, actively letting these cultures have a presence**

- b. Do you know of any existing preservation efforts? **Ans:** know there are efforts, but don't know what. Considers practicing of Public Holiday Events
- c. How likely are you to contribute to cultural/heritage preservation? **Ans:** $\frac{1}{5}$, not of interest, no passion for it. Perhaps in the future he would do so as a parent to continue traditions and cultural practices for his kids. Mode of being an adult now triumphs over everything now, too busy to focus on his future
 - i. In what ways have/would you contribute(d)?
 - ii. What, if anything, would make you more likely to contribute? **Ans:** If it's dying out, or if there's some way to invigorate that passion for it which will utilize his platform to spread it. need some external impetus/motivation
 - iii. What barriers are there (if any) that are holding you back from contributing to cultural/heritage preservation? **Ans:** Not something that helps him in any way now, not passionate about it. not well-versed in it hence unable to properly do so

GENERAL ANALYSIS: User knows what preservation is. However, is unsure of what kind of efforts are present. There is no motivation for contribution and user finds that he is not knowledgeable enough to contribute. **User mentioned that he is too preoccupied with "adulting" now to care about such preservation but would likely do so when he is older with kids.

Appendix C

Interview – R (Female, 21)

Link to Resources:

A. Statement of Informed Consent

Transcript:

1(c) & (d)

Usually with friends haha, feels too awkward if I eat out alone, like I feel judged haha. I feel just more comfortable with friends, I can talk and catch up with them and have a good time.

- Mmm, around 4 people, give and take? Small groups are better, so that its easier to plan when we can go out, and asking for tables is just nice haha.

1(a)

Well, I normally think about what I feel like eating first, like whether I want to eat western or jap food. But even then, usually I look at what's near me. Also depends on whether I have enough money and how I'm feeling haha, whether I feel like spending a lot to treat myself or just save and get cheap food.

Oh but if you're talking about planning to eat with friends right, then I usually ask in our group chat when they free then what they feel like eating first, cos like where they are coming from also matters to see how long they need to travel. Then after like finding a middle point, then we see whether there is any place that we all don't mind eating.

Eh ok but like if we want to go like café all that, then like no choice we just look at the same few areas, like Town, Bugis, Tanjong Pagar, so those are kind of restricted to there ah.

1(b)

Usually, I'll just focus on making my way straight to the restaurant cos I'll be hungry haha. Umm but I guess I do like look around the other shops or places around to walk walk or visit after we eat, especially if im early and one of the first few to arrive.

During meals, usually we look around the restaurant like especially if its very aesthetic, then I'll probably take photos of the place and the food. is more of like just ordering, eating and talking to friends, catching up with them, uh sharing funny stories, spill tea, or like talk about past stories. I also check my phone and like insta twitter from time to time haha.

After the meal usually is just walking around the mall or area, or see if anyone has any errands to run like buying presents then we'll just follow along. Really is more of just spending time together and letting our meal digest haha.

2(a)

Mainly Instagram, Twitter, TikTok. I have Facebook and Snapchat but I don't use them at all lol. Oh and YouTube also, if it's considered, just to watch videos.

2(b) & (c)

I use it for like different things though, like for Instagram, I use it to share photos, and see other people's day or lives, like low-key stalking haha. But I also share anything interesting that's happening on instastory, or anything private like my feelings or what on close friends story. Wah but ok Instagram rly got a lot [of uses]. Cos I follow some food accounts so I will see like food recommendation places to eat at. I also follow like celebrities and influencers so I keep up with them through their posts and stories.

Tiktok is where I go to destress, like I will just keep on watching all these videos for like hours, then I completely sidetrack off from work haha. I don't make my own tiktoks tho cos I cringe at myself haha, is just fun to see other people doing stupid stuff, like my brain will completely detach.

Twitter I use it to share what im thinking, like a quick short few lines just to throw out my thoughts. I also use it to find like funny memes and short tweets. Also I get a lot of news updates here surprisingly haha so I know what's going on in the world.

2(d)

Is LinkedIn considered? Haha but ya that's more for work and just liking and leaving funny serious comments on my friends' updates.

3(a)

Mmm honestly I know that like heritage and culture are very important, but I feel like I'm not really connected or like invested in it, like emotionally. I mean textbook answers yes, is important to appreciate where we came from ancestry all preservation stuff blah blah, eh but the thing is, sometimes when I actually learn something, then im like "Oh wow, that's actually quite cool", but like is usually during those random moments where I didn't think I'll be learning like specifically about history haha.

Why ah? Mmm maybe is like all these history information isn't like shoved down our throats, so is like I learn about it unknowingly but like naturally if that makes sense haha.

3(b)

Ah, actually I don't mind learning a bit about it. Like honestly the old buildings and murals are really quite interesting and aesthetic. I think they are like peranakan traditional houses, but not too sure. But yea, those look really cool, like instantly eye-catching, and even like without knowing what exactly it is, I can tell that it carries some historical significance. The murals are really pretty to look at, and ya like this combination of the 2 is perfect for places to take Insta photos haha.

But ya, I've never searched about the history of the buildings or what the murals mean haha, but if I were to do it, I'd just google it online haha. In my defense, the murals I saw show like old kampung people, so it does give a bit more context to the history haha.

I should be a lot of resources, im assuming? Haha I think online there should be a lot, but I just don't actively search for it, or at all haha.

Hmmm, honestly I think the murals and place itself is very interesting already, like it holds a lot of character. But ya, im not too sure how to intrigue me more, unless maybe like have like the history or stories of the places already put up there so is easier for people to read since its already there and like visible haha. Or like more aesthetic murals that explains the area and where people will want to take photos with it, but also still catch their attention like "Eh, why did they draw this inside also sia?" ya something like that, to push their curiosity?

4(a)

Mmm I think cultural or heritage preservation is like ensuring that like history isn't forgotten, like through like items, or people carrying their beliefs or morals.

4(b)

There was Bukit Brown cemetery, something to do with the Clementi Forest, and some Baba House thing if im not wrong? I'm not too sure about the last one but I remember getting a few emails about it in the email.

4(c)

Wah I don't think I contribute though, is this counted?? Haha

Honestly, having more interesting places, like cool artwork or like interactive fun things haha I don't know what, but ya as long as an area looks quite unique or edgy I would want to go, especially with my friends haha. Ya so maybe can like incorporate this heritage stuff like subliminally within these areas haha.

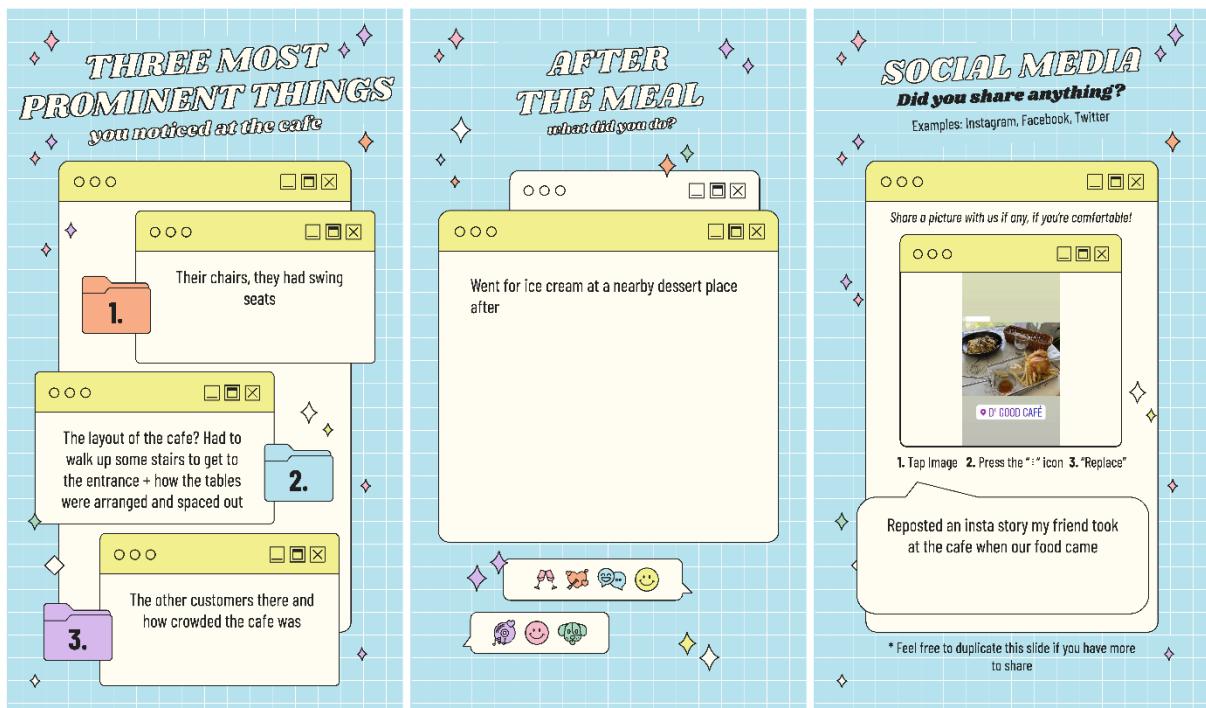
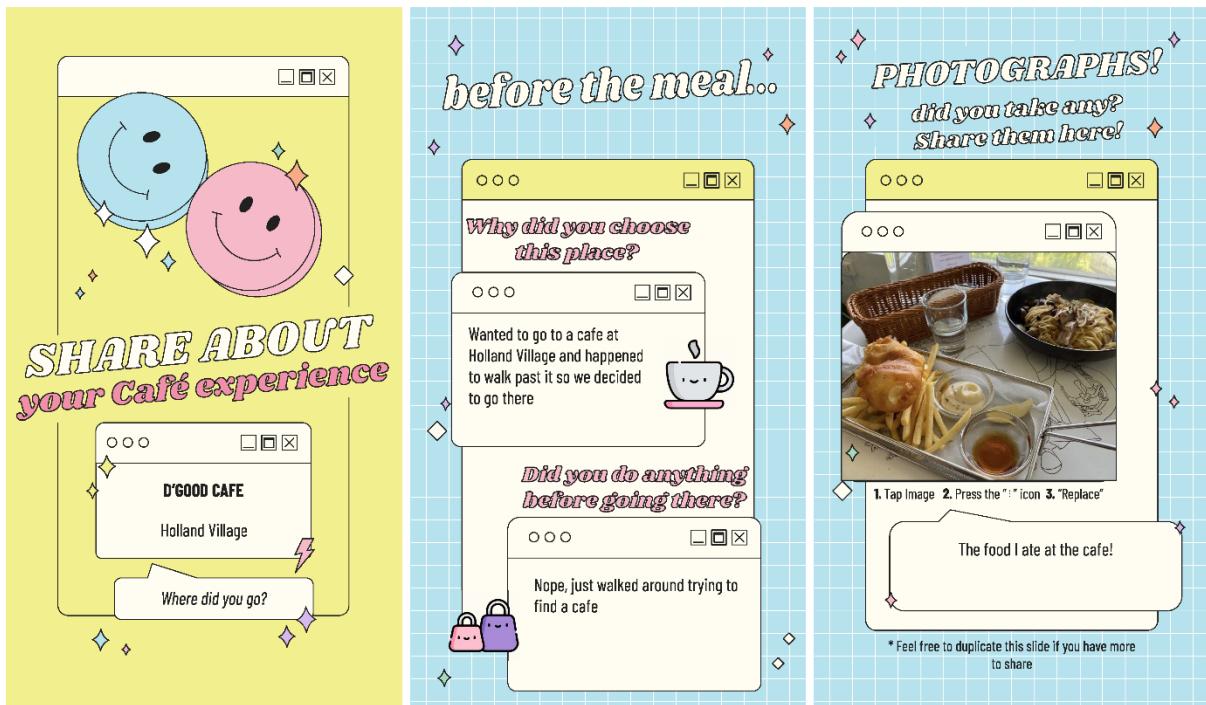
Haha I think is really like me not really seeing or understanding the full value of this like preservation, like I think is like why get stuck on the past when we are already moving forward. Like don't get me wrong, we should definitely remember and like cherish the past, but it should not stop us from moving forward ah in my opinion. So like my time and energy learning about

like this heritage or culture should be used for like whats more important to me right now, like studies haha, so its not a priority to me. But ya like I said just now, is when I learn about it unknowingly, then like got magic haha.

Appendix D

Cultural Probes – J (Female, 19)

Link: [Statement of Informed Consent](#)



The image displays three distinct slide designs, likely from a presentation titled "some follow-up questions".

Slide 1 (Left): A large speech bubble contains the text: "Catching up with my friend on how they've been and talking about our common interests". Above the speech bubble is a small icon bar with three icons: a person, a trophy, and a graduation cap.

Slide 2 (Middle): The title "some follow-up questions" is at the top. It includes a survey table for "How long was the entire outing?":

Before the Meal	During the Meal	After the Meal
NA	2 hours	2 hours

Below the table are two questions:

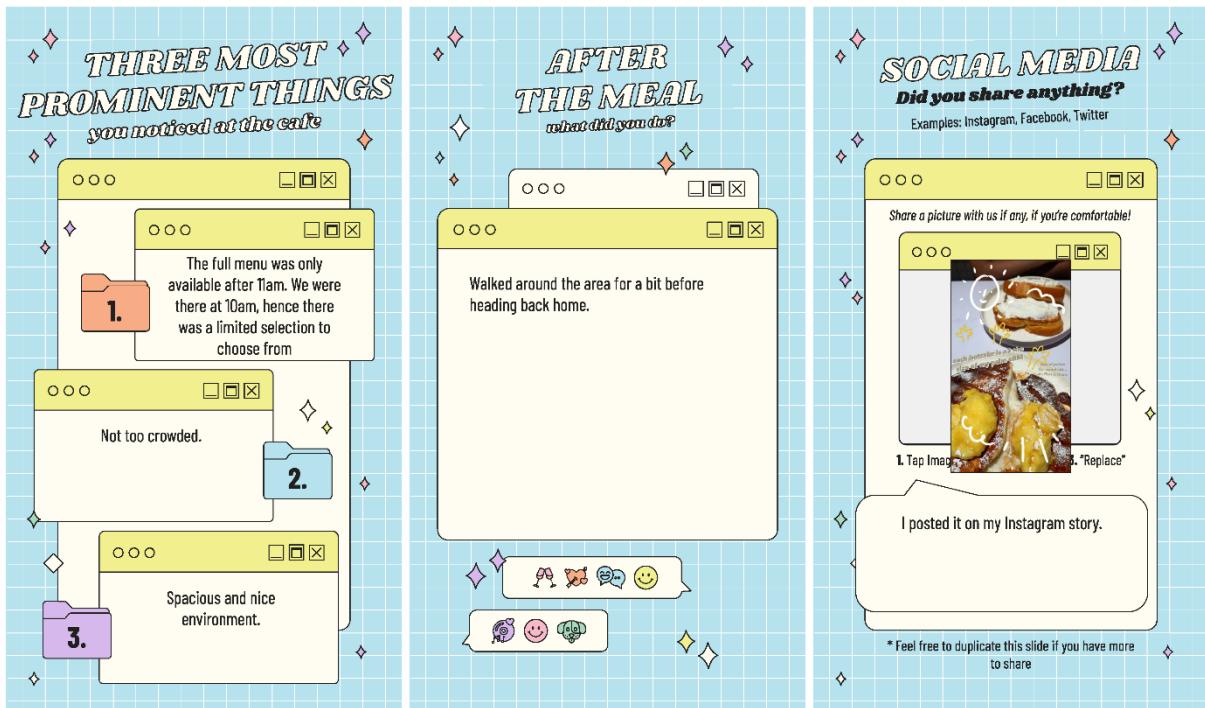
- "Did you bring a power bank? Why / Why Not?" Response: "Nope, I charged my phone before going out" (illustrated with a power bank icon).
- "Was your Bluetooth and/or GPS on? Why / Why Not?" Response: "Bluetooth was on in order to use tracetogther" (illustrated with a Bluetooth icon).

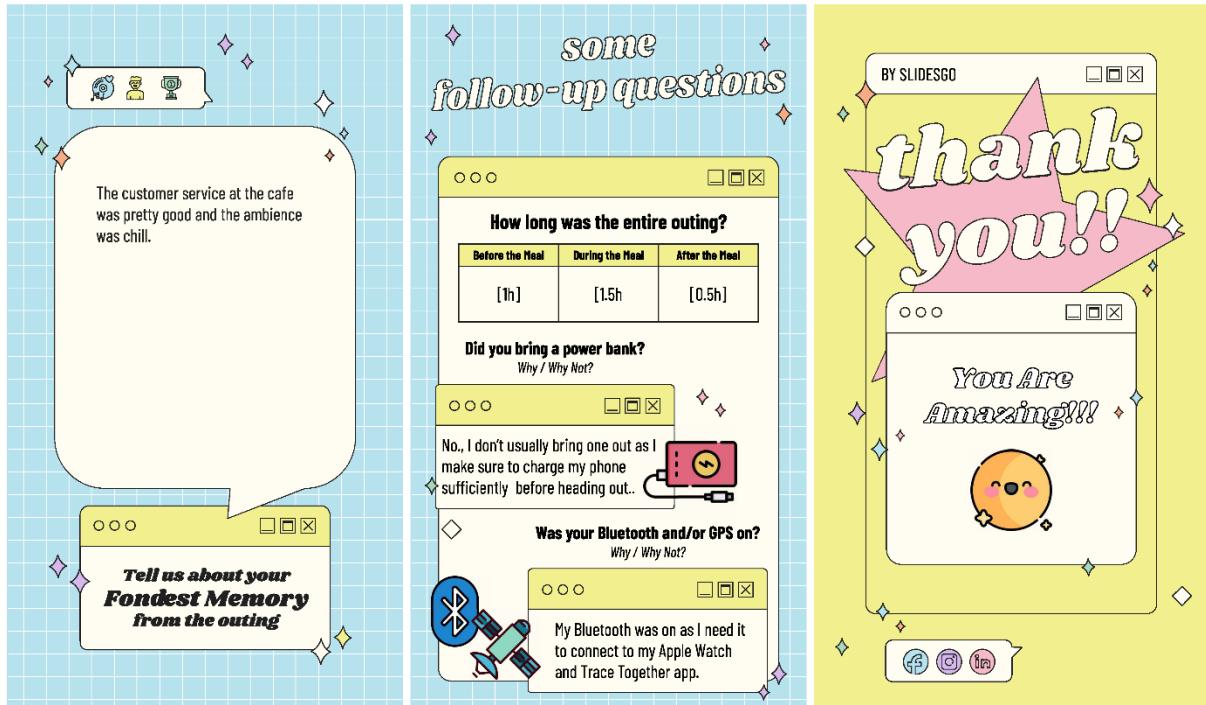
Slide 3 (Right): The title "thank you!!" is prominently displayed in a pink starburst. Below it is a smaller slide with the text "You Are Amazing!!!". An orange smiley face emoji is shown. The slide is attributed to "BY SLIDESGO".

Appendix E

Cultural Probes – C (Female, 21)

Link: [Statement of Informed Consent](#)





Appendix F

User Testing Plan (Round 1)

Method: Experience Prototyping, Wizard-of-Oz, Retrospective Think-Aloud

- Pre-Test
- Conducting the Test
- Post-Test Interview

Materials Needed:

- images of the different checkpoints to be pasted at walls at UTOWN temporarily for trail
- print coaster

Testing Guide:

-context of the experience (imagine you are visiting TP neighbourhood, explain the experience)

- descriptions during the experience (when to say what)
- what we want to observe during the experience
- follow-up questions after the experience

Before the Experience:

Context to give:

Our group has created a heritage trail experience to instil an interest within the younger generation in the culture and heritage of the Tanjong Pagar neighbourhood and to encourage them to contribute to the preservation of the area.

Imagine you are dining in a cafe e.g., Plain Vanilla in the Tanjong Pagar neighbourhood for a meal on a Saturday afternoon. After ordering your food, you take a seat at one of the tables and wait for your food. What did you notice?

When they notice the QR Code on the coaster: **ask them if they would scan it and why/why not.** (Take note of answer)

Then, prompt them to scan it.

During The Experience (Web App, after scanning coaster):

Prompts:

- Start: *Note to users that they are to voice out their thoughts throughout the experience*
The QR code leads you to a Web Application and this is what pops up.
- After completing the first game and are on the map:
Question: At this point, would you be interested in taking part in this experience?

Imagine your food arrives and you pause for now. After your meal, you can reopen the Web Application to this page.

- Map screen: *Note to users that this is showing a real map with their current location*
The map indicates that the closest checkpoint to you is at (xxx) location.
(Follow users to location, then trigger the checkpoint reached)
Bzz Bzz Your phone vibrates! (switch to Checkpoint Reached! screen)
- Rojak Game:
For this prototype, you will have to drag them in order.
- Find Wee Bin:
For this prototype, imagine it is using the camera on your phone. You will drag the picture to simulate it for now.

Question: You have collected 3 out of 5 stamps. How likely are you to continue this experience? Why or why not?

Your next location will be at ABC.

- Spot the Difference Activity:
Imagine you are standing in front of the building that appears in this screen
(Should have printed photograph of the actual building available; can paste on wall temporarily)
- Mural AR Activity
Note that the mural is actually animated with AR technology
Narration: “You are looking at Amoy Street’s Thian Hock Keng Temple, the country’s oldest Chinese one. This is a 40m-long mural by Yip Yew Chong, a name synonymous with nostalgia-tinged street art in Singapore. Complete with extracts of historical information, the images captured here showcase the myriad experiences of early Hokkien migrants.”
- IG Story Filter: *Note to users that the Web App switches to the actual Instagram app on mobile.*

What we want to observe during the experience:

- Does the user know that they will have to physically walk and find the checkpoints before their phone vibrates, indicating that they have reached the checkpoints?
- Do the users know how to navigate through the checkpoints? (which checkpoint to complete next, which checkpoints are completed/not completed)
- Are the activities intuitive enough? Can users understand the game without prompts?
- Do users read the fun facts after an activity and find it interesting?
- Any questions about the stamp collection system?
- Do users find the rewards system intuitive?
- Any questions after the experience?

Follow-up questions:**Coaster:**

- What did you notice when you entered the cafe?
- When did you notice the coaster?
- What did you notice about it?
- Any thoughts on the coaster and its design?
- Would you keep the coaster? Why/Why not?

On the Web App:

- How did you find the web app?
- Was there anything you liked about the web app?
- Did you face any difficulties on the web app?
- Was anything confusing for you on the web app?
- Do you have any suggestions for the web app?

General:

- Was the experience enjoyable?
- Would you participate alone or with friends? Why?
- Was the experience easy to follow?
- Would you recommend the experience to your friends?
- Any feedback/areas of improvement?

On culture of neighbourhood:

- After this experience, how interested are you in the culture and heritage of the Tanjong Pagar neighbourhood on a scale of 1 to 10? Why?
- Did you learn more about the culture and heritage of the Tanjong Pagar neighbourhood?
 - If yes, what did you learn?
- On a scale of 1 to 10, how appreciative are you of the culture of this area?
- On a scale of 1 to 10, how willing are you to contribute to the preservation of the neighbourhood?

On IG filter:

- Do you usually use IG filters?
- What kinds of filters do you use?
- How likely are you to use the IG filter at the end?
- Will you use a customized filter?
- What will make you download and use such filters?
- How likely are you to share an Insta Story of yourself using this filter. Why?

Appendix G

User Testing (Round 1) – S (Female, 20)

Link: [Statement of Informed Consent](#)

Before the Experience:

Context to give:

Our group has created a heritage trail experience to instil an interest within the younger generation in the culture and heritage of the Tanjong Pagar neighbourhood and to encourage them to contribute to the preservation of the area.

Imagine you are dining in a cafe e.g. Plain Vanilla in the Tanjong Pagar neighbourhood for a meal on a Saturday afternoon. After ordering your food, you take a seat at one of the tables and wait for your food. What did you notice?

When they notice the QR Code on the coaster: **ask them if they would scan it and why/why not.** (Take note of answer)

- Confused it for the menu

Then, prompt them to scan it.

During The Experience (Web App, after scanning coaster):

Prompts:

- Start: *Note to users that they are to voice out their thoughts throughout the experience*
The QR code leads you to a Web Application and this is what pops up.
- After completing the first game and are on the map:
Question: At this point, would you be interested in taking part in this experience?
 - Don't understand what's going on, what to do (need somenotif to walk to checkpoint)
 - Very confused, wasn't sure needed to actually go there until some prompting (map doesn't look like a live map?)
 - She thought she was playing a game: she thought the whole experience would be similar to the first Activity which set the tone

Imagine your food arrives and you pause for now. After your meal, you can reopen the Web Application to this page.

- Map screen: *Note to users that this is showing a real map with their current location*
The map indicates that the closest checkpoint to you is at (xxx) location.
(Follow users to location, then trigger the checkpoint reached)
Bzz Bzz Your phone vibrates! (switch to Checkpoint Reached! screen)

- Rojak Game:
For this prototype, you will have to drag them in order.
 - Trouble dragging via prototype, object too small

- Find Wee Bin:
For this prototype, imagine it is using the camera on your phone. You will drag the picture to simulate it for now.
 - Confused by camera reticle about need to tap on wee bin

Question: You have collected 3 out of 5 stamps. How likely are you to continue this experience? Why or why not?

 - Depends on whether I have time for this

Your next location will be at ABC.

- Spot the Difference Activity:
Imagine you are standing in front of the building that appears in this screen
(Should have printed photographs of the actual building available; can paste on the wall temporarily)

- Mural AR Activity

Note that the mural is actually animated with AR technology

Narration: “You are looking at Amoy Street’s Thian, a name synonymous with nostalgia-tinged street art in Singapore. Complete with extracts of historical information, the images captured here showcase the myriad experiences of early Hokkien migrants.”

Keng Temple, the country’s oldest Chinese one. This is a 40m-long mural by [Yip Yew Chong](#), a name synonymous with nostalgia-tinged street art in Singapore. Complete with extracts of historical information, the images captured here showcase the myriad experiences of early Hokkien migrants.”

- IG Story Filter: *Note to users that the Web App switches to the actual Instagram app on mobile.*

What we want to observe during the experience:

1. Does the user know that they will have to physically walk and find the checkpoints before their phone vibrates, indicating that they have reached the checkpoints?
2. Do the users know how to navigate through the checkpoints? (which checkpoint to complete next, which checkpoints are completed/not completed)
3. Are the activities intuitive enough? Can users understand the game without prompts?
4. Do users read the fun facts after the activities and find them interesting?
5. Any questions about the stamp collection system?
6. Do users find the rewards system intuitive?
7. Any questions after the experience?

Follow-up questions:

Coaster:

What did you notice when you entered the cafe?

1. When did you notice the coaster?
 - a. It's literally on the table
 - b. Wouldn't really notice it; thinks its quite common
2. What did you notice about it?
3. Any thoughts on the coaster and its design?
 - a. I actually thought it was for the menu, so since I already ordered my food I didn't think to scan it
1. Would you keep the coaster? Why/Why not?
 - a. Yes. It's free!

On the Web App:

1. How did you find the web app?
2. Was there anything you liked about the web app?
 - a. The money vouchers
 - b. Looks quite cute, interesting, and fun
3. Did you face any difficulties with the web app?
 - a.
4. Was anything confusing for you on the web app?
5. Do you have any suggestions for the web app?
 - a. Items should be aligned
 - b. Map display was too unrealistic
 - c. Didn't really know that the intended experience was to go after finishing the meal; no available visual feedback
1. Not sure what to do when presented with the map interface

General:

1. Was the experience enjoyable?
 - a. Would definitely not participate on a hot day
 - b. Especially since would normally dress up for a cafe date
 - c. Not inclined to participate initially
 - d. Would be more inclined if the vouchers are for interested cafes
2. Would you participate alone or with friends? Why?
 - a. Friends; very sad to walk around yourself
3. Was the experience easy to follow?
 - a. Yes, not bad, 6/10
4. Would you recommend the experience to your friends?
 - a. No. Not something I would normally share, wouldn't travel there specifically to do this
5. Any feedback/areas of improvement?
 - a. Instead of mixing a rojak for the activity, why not have an AR experience where you can see hawkers cooking on the street instead?

On culture of neighbourhood:

1. After this experience, how interested are you in the culture and heritage of the Tanjong Pagar neighbourhood on a scale of 1 to 10? Why?
 - a. 2. They're cool facts, but why should I know about these?

2. Did you learn more about the culture and heritage of the Tanjong Pagar neighbourhood?
 - a. If yes, what did you learn?
 - i. I learnt that there are differences in the building from past to present
 - ii. I just have bad memory
3. On a scale of 1 to 10, how appreciative are you of the culture of this area?
 - a. She asks: Which culture? (In General)
 - b. 6/10. I love the food
 - c. On the note of culture, would link it more to the food culture more than the history of Tanjong Pagar. Why live in the past? Why not just build upon this food culture
4. On a scale of 1 to 10, how willing are you to contribute to the preservation of the neighbourhood?
 - a. I have no idea what contribution is
 - b. 4/10. Depends on my mood.

On IG filter:

1. Do you usually use IG filters?
 - a. Used to but not now coz I'm going for natural looks
2. What kinds of filters do you use?
 - a. Funny filters, nice aesthetic filters
3. How likely are you to use the IG filter at the end?
 - a. Would play with the filter. If it's funny enough I would post
 - b. Maybe can have a filter where we can be riding on the trishaw

Appendix H

User Testing (Round 1) – R (Male, 25)

Link: Statement of Informed Consent

Before the Experience:

Context to give:

Our group has created a heritage trail experience to instil an interest within the younger generation in the culture and heritage of the Tanjong Pagar neighbourhood and to encourage them to contribute to the preservation of the area.

Imagine you are dining in a cafe e.g. Plain Vanilla in the Tanjong Pagar neighbourhood for a meal on a Saturday afternoon. After ordering your food, you take a seat at one of the tables and wait for your food. What did you notice?

When they notice the QR Code on the coaster: **ask them if they would scan it and why/why not.** (Take note of answer)

- Scanned the qr code since he was confused

Then, prompt them to scan it.

During The Experience (Web App, after scanning coaster):

Prompts:

- Start: *Note to users that they are to voice out their thoughts throughout the experience*
The QR code leads you to a Web Application and this is what pops up.

- After completing the first game and are on the map:

Question: At this point, would you be interested in taking part in this experience?
Unsure abt what he was supposed to do

1. Actually you can put like a tutorial at the start
2. But ya I got nothing better to do now, so why not?

Imagine your food arrives and you pause for now. After your meal, you can reopen the Web Application to this page.

2. Oh so I pause it ah
3. So I actually need to like physically walk around?

- Map screen: *Note to users that this is showing a real map with their current location*
The map indicates that the closest checkpoint to you is at (xxx) location.
(Follow users to location, then trigger the checkpoint reached)

Bzz Bzz Your phone vibrates! (switch to Checkpoint Reached! screen)

- Rojak Game:
For this prototype, you will have to drag them in order.
- 4. Wah must shake shake ah
- 5. Haha this one quite fun
- Find Wee Bin:
For this prototype, imagine it is using the camera on your phone. You will drag the picture to simulate it for now.
What is this pintu pagar
Oh is that it
I think if u want to make it harder, then can have like more of these fake ppl but wearing different traditional outfits
Question: You have collected 3 out of 5 stamps. How likely are you to continue this experience? Why or why not?
Can la, 2 more only. But the places are near right? Okok.

Your next location will be at ABC.

- Spot the Difference Activity:
Imagine you are standing in front of the building that appears in this screen
(Should have printed photographs of the actual building available; can paste on the wall temporarily)
Might as well I just tap everywhere on the screen right haha since its so small
Ya this one is too easy, I don't like this one
- Mural AR Activity
Note that the mural is actually animated with AR technology
Narration: "You are looking at Amoy Street's Thian Hock Keng Temple, the country's oldest Chinese one. This is a 40m-long mural by Yip Yew Chong, a name synonymous with nostalgia-tinged street art in Singapore. Complete with extracts of historical information, the images captured here showcase the myriad experiences of early Hokkien migrants."
A bit hard to imagine ah
Wah ok the text no need talk so long haha, I want to explore the mural myself to see see
- IG Story Filter: *Note to users that the Web App switches to the actual Instagram app on mobile.*

What we want to observe during the experience:

5. Does the user know that they will have to physically walk and find the checkpoints before their phone vibrates, indicating that they have reached the checkpoints?
6. Do the users know how to navigate through the checkpoints? (which checkpoint to complete next, which checkpoints are completed/not completed)
7. Are the activities intuitive enough? Can users understand the game without prompts?
8. Do users read the fun facts after the activities and find them interesting?
9. Any questions about the stamp collection system?
10. Do users find the rewards system intuitive?
11. Any questions after the experience?

Follow-up questions:

Coaster:

What did you notice when you entered the cafe?

12. When did you notice the coaster?

a. **Immediately when entered**

The coaster is quite nice

13. What did you notice about it?

The coaster is quite nice

But I quite confused at first, like why got QR code

14. Any thoughts on the coaster and its design?

15. Would you keep the coaster? Why/Why not?

Yes. It's free, of course I take!

On the Web App:

16. How did you find the web app?

A bit confusing at first, like I don't really know what to do.

17. Was there anything you liked about the web app?

18. Did you face any difficulties with the web app?

No clear instructions at first

19. Was anything confusing for you on the web app?

Ya, I didn't know that I needed to actually walk around

20. Do you have any suggestions for the web app?

Can give a starting tutorial

General:

21. Was the experience enjoyable?

Ok la quite fun

22. Would you participate alone or with friends? Why?

Friends; if not very weird haha

23. Was the experience easy to follow?

Yes, not bad

24. Would you recommend the experience to your friends?

No. The vouchers like too little.

25. Any feedback/areas of improvement?

The feedback form a bit sian to fill up at the end ah, very tired already still need think.

Also like I want to see which cafes I can use the voucher on, cos if don't have nice ones then I wont take part

On culture of neighbourhood:

26. After this experience, how interested are you in the culture and heritage of the Tanjong Pagar neighbourhood on a scale of 1 to 10? Why?

3 I guess, but I think no point haha

27. Did you learn more about the culture and heritage of the Tanjong Pagar neighbourhood? If yes, what did you learn?

Pintu pagar lol

And satay

But ya honestly, im just doing for the vouchers only, so is like very incentive heavy.

Maybe if got more money then got more reason to actually pay more attention haha

28. On a scale of 1 to 10, how appreciative are you of the culture of this area?

5. Idk haha I just like the area, like nice.

But ya, im just not invested. Why must be stuck in the past?

29. On a scale of 1 to 10, how willing are you to contribute to the preservation of the neighbourhood?

Uh, I really think I don't, so 1.

On IG filter:

30. Do you usually use IG filters?

Yes

31. What kinds of filters do you use?

Funny and cute

32. How likely are you to use the IG filter at the end?

I would just try it out, but ill only post if its funny or cute

This current one is quite basic ah so I wont share

But yall can do like the squid games filter those kind will be very fun

Appendix I

User Testing (Round 1) – G (Male, 27)

Link: [Statement of Informed Consent](#)

Observation:

Coaster:

- Prefer Bottom left coaster design
- First noticed the 'Discover Tanjong Pagar' wording
- Then noticed the QR code

Web Application:

- Read the description
- Skimmed through the fun fact
- Initial thoughts: The reward was not enticing enough to continue the game, seemed too far, not worth the time
- Visit is not clear whether to physically walk there, seems to click on the location on map only
- Rojak game: Unclear what door is since it was on second level
- Wee Bin Game: Didn't know what a pintu pagar was
- Would continue for \$5 since it's just 2 more only
- Unclear whether to redeem or continue - continue seems like there was more to do
- Clicked on participating outlets
- Won't really use IG filter - but if get something in return then he might
- Did not click find out more at all
- fun facts were not interesting at all
- End thoughts: no relation between all of them, prefers a story overall that ties everything together

What we want to observe during the experience:

1. Does the user know that they will have to physically walk and find the checkpoints before their phone vibrates, indicating that they have reached the checkpoints?
Ans: didnt know had to physically walk, only click on the map to view
2. Do the users know how to navigate through the checkpoints? (which checkpoint to complete next, which checkpoints are completed/not completed)
Ans: Intuitive to choose the landmarks or just follow the route
1. Are the activities intuitive enough? Can users understand the game without prompts?
Ans: Games are all intuitive, except for choosing the blue doors
2. Do users read the fun facts after an activity and find it interesting?
Ans: Only the ones at the end page, not find out more. Some are interesting. Information was not informative enough.
3. Any questions about the stamp collection system?

Ans: Nope

4. Do users find the rewards system intuitive?

Ans: Last part with regards to redeem or continue was confusing

5. Any questions after the experience?

Ans: Felt like the whole experience and effort was not worth it for \$5. Not interested in heritage at all hence resulted in skimming through it. If it was an amazing hunt game with hints to digest information for finding the next checkpoint. Have a small prize group or one big game with a grand prize like sqkii hunt. If it's too easy people can discuss online and tell others the hint for it. Could be a Singapore hunt, one for Tanjong Pagar, next for Singapore River

Follow-up questions:

Coaster:

1. What did you notice when you entered the cafe?

Ans: The tables

2. When did you notice the coaster?

Ans: Coaster would not be noticed first. Suggest to put the coaster right in front of the table or seat, forcing the customer to pick it up

3. What did you notice about it?

Ans: Noticed the design and then the discover tanjong pagar words

4. Any thoughts on the coaster and its design?

Ans: Scan me for more rewards. QR not sure what is the purpose,

5. Would you keep the coaster? Why/Why not?

Ans: No. No use for a coaster at home. Unless it's sort of a collectible

On the Web App:

1. How did you find the web app?

Ans: Simple enough and intuitive

2. Was there anything you liked about the web app?

Ans: Its simplicity

3. Did you face any difficulties on the web app?

Ans: no

4. Was anything confusing for you on the web app?

Ans: no

5. Do you have any suggestions for the web app?

Ans: Set up seems too cartoonish and has no credibility

General:

1. Was the experience enjoyable?

Ans: Soso for \$5

2. Would you participate alone or with friends? Why?

Ans: With friends. Just doesn't make sense to do it alone and go through all the trouble for \$5

3. Was the experience easy to follow?

Ans: Yes

6. Would you recommend the experience to your friends?

Ans: yes if the prize pool was bigger

7. Any feedback/areas of improvement?

Ans: see above

On culture of neighbourhood:

1. After this experience, how interested are you in the culture and heritage of the Tanjong Pagar neighbourhood on a scale of 1 to 10? Why?

Ans: 0. nothing interesting

2. Did you learn more about the culture and heritage of the Tanjong Pagar neighbourhood? If yes, what did you learn?

Ans: Information just didn't value add to any interest or knowledge. No wow factor or something he didn't know. e.g., the wee bin game, how did he add value to Singapore? only know he is a rich tycoon. Can include things like the Malay soldier who fought for Singapore in WW2 etc

8. On a scale of 1 to 10, how appreciative are you of the culture of this area?

Ans: 0

9. On a scale of 1 to 10, how willing are you to contribute to the preservation of the neighbourhood?

Ans: 6. These are heritage which makes Singapore unique, wouldn't want it to go away completely and just be in photos. Just need some motivation to partake in it.

On IG filter:

1. Do you usually use IG filters?

Ans: No

2. What kinds of filters do you use?

Ans: None

3. How likely are you to use the IG filter at the end?

Ans: Not likely

4. Will you use a customized filter?

Ans: If it's super nice

5. What will make you download and use such filters?

Ans: Only if its super nice

6. How likely are you to share an Insta Story of yourself using this filter. Why?

Ans: Unlikely.

Appendix J

Pilot User Testing (Round 1.5)

PRE-MEAL

Onboarding

- Clear, tells her what she can expect in the app
- Thought that she could click the “tap to jump”

First Game

- Note: She tapped on the durian
- [Unclear about the context]
- Not sure how she interacted with the heritage, unless it's the items she is jumping over → no significance of the items bc it's just durian
- She will click find out more

Understanding of the Map

- Think she is supposed to click on one of the red points
- She did not read the last lines of the Visit landmarks pop-up → *can highlight certain parts of the screen as a form of feedback for users when they click on diff functions*
- Couldn't recognize the icons for user's location → *Can handle via tutorial screen*

Not clear that she was supposed to pause after first game and finish after her meal

- Thought that she was supposed to and could continue on to the other landmarks → *can create a separate screen to make it clearer*

POST-MEAL

Would she continue with the experience

- Don't mind walking around after meal to digest food, so she would continue after her meal

Rojak Game

- Did not click items in order at first
- Did not drag items at first
- Learnt about the ingredients in the rojak and the fun facts at the end
- [Delivery] Kept dragging across the screen even though it was at the end of the photo
- Overall, enjoyed the part where she dragged ingredients in the bowl, fun and finding the house was quite fun
- There was no connection from the game to the fun fact
- [Suggestion] Can provide context to the delivery of rojak and why users would deliver the rojak e.g. Imagine you are a hawker and you are delivering the food

Wee Bin

- Kept clicking on the Hint
- Forgot the name of the structure (Pintu Pagar) but remembered that the structure provided some privacy
- Found the activity quite easy, since he stands out
- [Suggestions] Making it more challenging would make it more memorable
- Remembers Wee Bin as a tycoon (his background)
- Was clicking on the fun fact, BUT NOTHING POPPED OUT

Rewards:

- Will continue the experience after 3, since there is only 2 stops left

Spot the Difference:

- When the person selects the differences, the speech bubbles go away after they click, and hence is unsure that she can remember. She feels like she should remember the fun facts in the speech bubbles
 - If it's there, then it should mean that it's important
 - The fun fact disappears and there's no way to recall
 - Would have forgotten the earlier facts
- Quite memorable since you are interacting with the place and can discuss with your friends
- Clicked on the find out more button again

AR Mural:

- Quickly breezed through the “The Mural’s magic fades”
- A good wrap up to the whole experience → more relaxing activity, something to watch and enjoy with sounds, and can learn something from it
- But forgot about the fun fact: Forgot who made the mural

End Reward Screen:

- Did not click the participating outlet button to see → Screen at the beginning to make it clear which outlets are participating
- Will click the IG filter to check it out

IG Filter:

- Doesn't usually use Instagram, but will use a filter if she uses the IG story function

Other considerations:

- Asked if she will be able to pause and come back and go through the experience again

Overall:

- Easy to follow through out
- Icon for users' location → not easily recognised that its her current location
- Very clear which buttons she had to click, the flow was smooth

Coaster designs:

- Preference: Bottom left (red and yellow)
- Top Right: Old school retro vibes (Kong Guan biscuit??)
- Also preferred the fun fonts → more eye-catching

Appendix K

User Testing (Round 2) – J (Female, 22)

Link: [Statement of Informed Consent](#)

Before the Experience:

Context to give:

Our group has created a heritage trail experience to instill an interest within the younger generation in the culture and heritage of the Tanjong Pagar neighborhood and to encourage them to contribute to the preservation of the area.

Imagine you are dining in a cafe e.g. Plain Vanilla in the Tanjong Pagar neighborhood for a meal on a Saturday afternoon. After ordering your food, you take a seat at one of the tables and wait for your food. What do you notice?

When they see the coaster:

Ask them what would they do upon analyzing the coaster

If participant does not scan the QR code:

- Did you notice the QR Code? Why did you not try to scan it?
Yes. I will scan it if im interested in discovering more about the Tanjong Pagar area.
- *proceed to prompt them to do so after*

During The Experience (Web App, after scanning QR code):

You are to voice out your thoughts including the actions you are making throughout this experience. I will prompt you when necessary, continue the experience on your own if I don't do so.

After scanning: I am interested because I saw that I can win up to \$5 worth of dessert vouchers.

Prompts:

- Start: The QR code leads you to a Web Application and this is what pops up. You are about to embark on The Tanjong Pagar Mystery game! Just follow the instructions on the screen.
- *First game impression: the rojak game is cute.*
- After the first game: **At this point, would you be interested in continuing this experience?**

Why/Why not?

Yes. Cos i want to earn the \$5 voucher and the game seems easy and fun to do.

- Our food has just arrived! What will you do now?
 - If participant tries to continue the game:
 - *Observe what they do and lead them to close the app if needed.*

Observation: She quickly tapped on the screen at the map page cos she said she was trying to try her luck to see if the games can be completed on the phone while sitting down without the need to physically walk to the places.

I think if I need to physically travel to different places, I will not take part in this.

- Now we have finished our meal, let's go.
 - *Lead participant to stand up and walk out*

- *Observe if the participant takes the coaster with them. Ask them why they did/did not take it.*
- The coaster is nice, i like it. I will keep the coaster cos it is free.
- Let's reopen the web application just now. What do you think we should do now? .
 - *If participant does not know what to do/is confused:*
 - Let's follow the map and walk to the checkpoint on the screen
 - *Lead the participant to walk*
- BzzBzz Oh! Your phone is vibrating, let's check your phone. (*click on participant's phone screen*)
- *Repeat above steps for all checkpoints*
- AR Game: Imagine you are using your phone camera to view what's on the screen now, but since this is a prototype, please use your fingers to scroll the screen while you move your phone.
- Reward Screen: Imagine you're in Tanjong Pagar. Will you use the vouchers now or save it for later? Where would you go to use it?

If it is cafes like Plain Vanilla, i will use it now. But depends on which outlet also, but if its near me around the area, i will use it now.

I will continue to \$5 instead of stopping at \$3, cos i want to earn a bigger reward.

Observation: For Info cards on the map screen: he clicked very briefly and quickly, did not really read the information.

Observation for Pintu Pagar game - She said that it was hard to maneuver and fix the door, took a while to figure it out, and to drag it successfully.

Observation for Tinkat game – She randomly tapped screen, saw the words ‘Tries: 1’ at the top of the screen and didn’t know what to do next. Only managed to ‘win’ after 3 tries.

What we want to observe during the experience:

- Is the onboarding experience clear and intuitive? (e.g. welcome and instructions screen)
Yes. The dragging of the items are a bit hard at times.
- Does the user know that they will have to physically walk to the different locations?
(Answered above)

12. Are the activities intuitive enough? Can users understand the game without prompts?

Yes.

13. Do users read the fun facts and find it interesting?

Not really. I just want to click and get to the game. I wont click find out more.

14. Any questions about the rewards system?

No.

15. Any questions after the experience?

No. Not very interested in the culture. Maybe it's more for tourists.

Follow-up questions:

Coaster:

16. What did you notice about the coaster?
17. Any thoughts on the coaster and its design?
The coaster is nice.
18. Would you keep the coaster? Why/Why not?

Yes. If I see it on the table and its free I will bring it home.

On the Web App:

19. Games:

- Were the games easy to play?
Yes. But the dragging part abit hard; and the tinkat game took a while haha
- Did you learn more about the culture and heritage of the Tanjong Pagar neighbourhood?
 - If yes, what did you learn?
Yes. The shophouses has mural paintings, but I can't really remember the details. I learn more about the shophouses and murals there, that such things exist at Tanjong Pagar.
 - Are you more interested in the culture and heritage of the Tanjong Pagar neighbourhood?
 - Why/Why not?
○ No, because i go there many times just to eat the food there, and I walk past so many times to know that there are shophouses and murals there already.

20. IG filter:

- Do you usually use IG filters? No.
- If so, what kind of filters and why so?
- How likely are you to share an Insta Story of yourself using the IG filter at the end? Why?
I will not, unless there is an incentive, like more value for the vouchers or free cafe food.

21. Did you face any difficulties on the web app? No.

22. Was there anything you liked about the web app?

Yes, it was interactive and there is a storyline!

General:

23. Was the experience enjoyable?

Not really. I'm there for the voucher, its like doing a survey, so I wouldn't say it's enjoyable.

24. Was the experience easy to follow? Yes

25. Would you participate alone or with friends? Why? Alone. Very rare to find friends to do this with me, they rather not take the voucher if i have to walk around. Its just \$5. If its \$20 then maybe my friends would do also. But then again its abit weird to do alone.

26. Would you recommend the experience to your friends? No.

27. Any suggestions/feedback/areas of improvement? No, but maybe not have a drag function, maybe can tap instead, cos it is abit hard to drag.

Appendix L

User Testing (Round 2) – G (Male, 27)

**Note that this is the same user from Round 1 of User Testing*

Link: [Statement of Informed Consent](#)

Observation:

Coaster:

- QR Code
- Will Scan the QR Code if waiting and not doing anything else

Web Application:

- Noticed the \$5 first, and will continue
- Read through the dialogue
- Read through the end fact
- Would continue after the first game
- Will close the screen upon food arrives but continues to see the task first
- Screen is clear on travelling to the actual place
- Will not continue after reading that need to travel for \$3
- Will see what's the participating cafe, to check if anything catches his eye
- Not sure if can choose which landmark to go
- Will read the info on the road
- Noted there should be a back button for the dialogue
- Continue for \$5 Voucher
- Will use vouchers now, view participating cafes and decide
- Overall thoughts: Skipped through all the dialogue, still feels very scattered, doesn't seem like a full story. The NPC made it feel more childish

Follow Up Questions:

Coaster:

1. What did you notice about the coaster?
 - QR Code
2. Any thoughts on the coaster and its design?
 - Straightforward
3. Would you keep the coaster? Why/Why not?
 - Not really, but might if I'm a cheapo and if the design is very nice

On the Web App:

4. Games:
 - Were the games easy to play?
 - Yes, just the prototype is buggy

- Did you learn more about the culture and heritage of the Tanjong Pagar neighbourhood?
 - If yes, what did you learn?
 - **No, skipped through everything**
- Are you more interested in the culture and heritage of the Tanjong Pagar neighbourhood?
 - Why/Why not?
 - **No, did not find the information interesting or useful**

Appendix M

User Testing (Round 2) – B (Male, 22)

Link: Statement of Informed Consent

Refined Testing Guide:

Before the Experience:

Context to give:

Our group has created a heritage trail experience to instill an interest within the younger generation in the culture and heritage of the Tanjong Pagar neighborhood and to encourage them to contribute to the preservation of the area.

Imagine you are dining in a cafe e.g. Plain Vanilla in the Tanjong Pagar neighborhood for a meal on a Saturday afternoon. After ordering your food, you take a seat at one of the tables and wait for your food. What do you notice?

When they see the coaster:

Ask them what would they do upon analyzing the coaster

If participant does not scan the QR code:

Did you notice the QR Code? Why did you not try to scan it?

proceed to prompt them to do so after

- Noticed the coaster.
- “The coaster is quite nice”
- Scanned the QR code with no prompt.

During The Experience (Web App, after scanning QR code):

You are to voice out your thoughts including the actions you are making throughout this experience. I will prompt you when necessary, continue the experience on your own if I don't do so.

Prompts:

Start: The QR code leads you to a Web Application and this is what pops up. You are about to embark on The Tanjong Pagar Mystery game! Just follow the instructions on the screen.

First Game:

After the first game: At this point, would you be interested in continuing this experience?
Why/Why not?

- “The vibes very cute haha”

- [ROJAK] “This game is quite fun”
- “So, I need to physically walk ah? Is it very far?”
- “Oh, ok so it’s very nearby, right? Then I’ll continue, as long as I have no plans.”
- “Yes, I will continue, since I can get the voucher, which I’ll probably use it immediately haha.”

Our food has just arrived! What will you do now?

If participant tries to continue the game:

Observe what they do and lead them to close the app if needed.

Now we have finished our meal, let’s go.

Lead participant to stand up and walk out

Observe if the participant takes the coaster with them. Ask them why they did/did not take it.

- “Oh, I didn’t know that I can actually take the coaster. I thought I could only scan the QR code.”
- “Usually, cafes don’t give their coasters for free, especially since the coaster is nice also, so I didn’t think I could take it.”
- “Now knowing that it’s free, of course I will take it haha”

Let’s reopen the web application just now. What do you think we should do now? .

- He kept on pressing the question mark

If participant does not know what to do/is confused:

Let’s follow the map and walk to the checkpoint on the screen

Lead the participant to walk

BzzBzz Oh! Your phone is vibrating, let’s check your phone. (click on participant’s phone screen)

Repeat above steps for all checkpoints

AR Game: Imagine you are using your phone camera to view what’s on the screen now, but since this is a prototype, please use your fingers to scroll the screen while you move your phone.

Reward Screen: Imagine you’re in Tanjong Pagar. Will you use the vouchers now or save it for later? Where would you go to use it?

- “I would use it probably immediately, as long as the participating cafes are good.”
- Only skimmed through the info cards, nor pressed the learn more
- Puzzle: The pieces can be arranged neater in the beginning, since it’s quite difficult to view the orientation and how each piece looks like.
- Tikam: Did not like this game. Feels very meaningless, since the game already says it will give unlimited tries until they win.
-

What we want to observe during the experience:

Is the onboarding experience clear and intuitive? (e.g. welcome and instructions screen)

- Yes

- Does the user know that they will have to physically walk to the different locations?
- Not immediately, but eventually
 - Are the activities intuitive enough? Can users understand the game without prompts?
 - Yes
 - Do users read the fun facts and find it interesting?
 - Reads, but doesn't necessarily find them fun or particularly interesting.
 - "I think most of these I already know"
 - Any questions about the rewards system?
 - "I thought I could collect both, but the app explains it clearer later. A bit disappointing, but makes sense I guess"
 - Any questions after the experience?

Follow-up questions

Coaster:

What did you notice about the coaster?

- "I really like the colour, and the QR code."
- Any thoughts on the coaster and its design?
- "I think it's nice, but I don't think it'll fit in every café."
- Would you keep the coaster? Why/Why not?
- "Yes. It's nice and free, so why not"

On the Web App:

Games:

Were the games easy to play?

- "Yes, but some were quite challenging, like the puzzle one. But it is quite fun."
- Did you learn more about the culture and heritage of the Tanjong Pagar neighbourhood?
- If yes, what did you learn?
- "I would say a bit, but not a lot. Like I really like the murals and some of the backstories and pintu pagar. But for some is already common information I think, like rojak."
- Are you more interested in the culture and heritage of the Tanjong Pagar neighbourhood?
- Why/Why not?
- "Not really. I mean I know more about it now, but interest, then probably not. I'm more interested in the vouchers and food haha."

IG filter:

Do you usually use IG filters?

If so, what kind of filters and why so?

- "I do only if it's something cool or funny."
- "Aesthetic places or those funny games with my friends."

How likely are you to share an Insta Story of yourself using the IG filter at the end?

Why?

- "Honestly, they seem quite funny if it's supposed to work or look the way it is supposed to, so probably yes. It's quite funny haha."

Did you face any difficulties on the web app?

Was there anything you liked about the web app?

•

General:

Was the experience enjoyable?

- “I would say so. I’m not really interested in history, so it feels a bit whatever, but some games were quite fun.”

Was the experience easy to follow?

- “Yes, seems very straightforward actually.”

Would you participate alone or with friends? Why?

- “Probably with friends. That way I don’t feel so awkward alone and we can get more vouchers to use at separate times haha.”

Would you recommend the experience to your friends?

- “Probably not to be honest. Only if I’m actually at TP and have nothing to do then I’ll do it. But I won’t go out of my way to purposely go to TP to do this then eat at a café, no.”

Any suggestions/feedback/areas of improvement?