Overview (Qiuyue)

- Brief description of system to be built

  We are planning to build a messaging / broadcasting app a ski lounge could use to inform its residents about current events that also incorporates a “check in” system for visitors to report their visiting time.

- Key purposes (What problems does it solve? Why should it exist?)

  - Lack of official communication between the ski lodge and the visitors
    Our app allows for the administration of ski lodges and its visitors easy communication with each other.
  - COVID and crowd dispersing
    With a check in feature, visitors could try to space out their check in time to avoid crowding. This is especially important in the time of COVID. Also, the lodge can know when to expect a large group of people and prepare for the potential surge.

- Deficiencies of existing solutions (if they exist, and if not, why you suspect not)

  The current solution is twitter and the website. The website has a lot of information listed but lacks interaction with visitors. Twitter can be used to interact with visitors, but most people do not check twitter regularly. There is so far no solution for spacing out the crowd because there has not been a need for it until the pandemic.

Conceptual Design (Qiuyue)

Elaborate the concepts in your conceptual sketch into a full conceptual design, giving for each of the key concepts:

- The name of the concept
    1. Admin Broadcast
    2. Visitor check in

- The concept's purpose
    1. Broadcasting:
       Allowing effective, efficient, and timely communication between Admin and Visitor
    2. Check in:
       Allowing visitors more power to spread themselves across time periods and achieving better crowd control

- The structure, expressed as an abstract data model
  There are two kinds of users for our app: the Admin and the Visitor. The app's database will be storing announcements from admins, comments from users, as well as check-in time data.

- The behavior, expressed as the actions and their effects on the data model
  An admin user will be able to make and modify announcements as well as to view the check-in times and visitor's comments.
  An visitor user will be able to view announcements, as well as input check-in time and comments.

- The operational principle: one or more archetypal scenarios
  There could be emergency situations happening at the resort, like an avalanche or a COVID outbreak. This would be considered an atypical situation, and the admin side could choose to engage in "Emergency Mode", which takes away the comment section and check-in times and use the entire app to display the important announcement in large fonts.

Wireframes (Guang)

You're asked to describe the key concepts of your planned user interface by giving a collection of wireframe sketches. These should be organized around your key concepts similar to what you did for A4. Each wireframe sketch should be a sketch of a screen that shows clearly what elements there are. It should be clear how transitions occur from one wireframe to another, and what each element is for. Comments or explanations can be provided as separate notes (making their connection to the elements clear).

You can prepare this wireframe by hand, in a drawing tool, or in a specialized wireframing app.

Link! https://www.figma.com/file/clElhngn7wCUu5hqM1wgQn/draft-2-full-design?node-id=0%3A1

Design Commentary (Kevin)

As you work on your design, you will have considered many tricky questions, and will have made decisions between alternatives, sometimes making a tradeoff choosing one imperfect solution over another. This section of your design document brings together all the insights you have gleaned about your design -- why did you settle on the design that you did? It can be presented as a collection of footnotes on the rest of the design document, or as its own free standing text. But however it is expressed, it should discuss substantive and interesting questions, and will be a significant influence on the grade you receive for your design. The prompts you were given in the individual assignments should be helpful to you in determining what kinds of issues to address here.

As always, we encourage you to give a title to each design issue that identifies the problem, and names for each option considered. This is very challenging, but it's a great way to help you focus and ensure that your commentary is well organized and substantive.

There were a few design decisions that we made to reach our final design.

1. How should businesses be displayed to users in the app?

In our broadcasting app, we needed a way to display all businesses in the Alta area for users to see reports for. We decided to go with a classic list of all businesses on the left side of the page (see wireframe) because of the fact that there are not that many companies in Alta, Utah. The businesses are ordered by relative distance to allow the user to scroll less - the assumption being that they would probably be near the business they wanted to get information on. The obvious limitation with this choice is that in the worst case scenario, the user will have to scroll to the bottom of the list to find the business that they are looking for. We have mitigated this limitation by including a search bar in the final product to allow for quicker access. Although we won't have filters for users to explore similar businesses, we feel that what we have currently is enough value for Alta.

Alternatives Considered: One alternative we considered was a map approach. Similar to Google Maps, we thought of displaying businesses on a map for users to click on and view reports for. We decided not to go with this alternative mainly because we thought that it was largely unnecessary and that a simple list would accomplish the same task with less things to look at (e.g. roads, landmarks, and other features on a map).

2. Who can see which users are checking in at a certain time?

Since our app's purpose is to alert users about current events, we also added a feature for users to check in to see how the general population of users is doing. In the wireframe, there is a bar graph displaying how many people checked in at which time. While it is important for users to maybe see if their friends or family is safe/checked in, we ultimately decided to only allow admins to see who checked in at certain times. For users, they will only see the numbers. The limitation with this approach is that users will no longer be able to see how other users, who

may be their friends or family, are doing or if they have checked in. We do believe that the upside in protecting people's privacy outweighs these potential drawbacks.

Alternatives Considered: As alluded to earlier, the obvious alternative is to let all users (including the admins) see which specific users are checking in at a certain time. We believe that protection of privacy would be important to our users, which is why we limited the viewing to only admins.

3. Who is allowed to broadcast an event for a business?

For our app, we want to alert users about events that could affect them. Since the alerts can be publicly seen and sometimes be sent as push notifications to users, users that possess the ability to broadcast events have a lot of power. We decided to only let admins broadcast in order to reduce the amount of unwanted spam/fraud messages. Unfortunately, this decision comes at the limitation of slowing down actual reports of events from users. For example, if there was a situation at the ski resort, a user cannot immediately broadcast it. Instead, they would first have to comment on the website or alert an admin before the admin could broadcast the message. This delay could be annoying to a lot of users and even be a dealbreaker for time sensitive events. Despite these drawbacks, we think that reducing the amount of spam/fraud messages is necessary.

Alternatives Considered: As said earlier, we thought of allowing every user to report events to address time-sensitive events. The limitation is that some messages could be spam/fraud. Another alternative would be to only let users report and then have admins vet the reports. We thought that this would be the worst alternative because having only admins report would serve the same purpose without as many complications.

4. How can users interact with the broadcast app?

Since we decided to only allow admins to broadcast events, we wanted a way for users to interact with the app to make it more community-based. We decided that one way to accomplish this was to allow users to comment on each report. Users would be able to give their reactions, feedback, or any other information they wanted. The admins can then respond to these comments if they want to. This comment feature could serve as a quick way of getting questions answered. The limitation with this approach is that commenting wouldn't give the same amount of publicity that a report would. Thus, it would not be ideal for users that wanted to convey information in a time-sensitive matter.

Alternatives Considered: One alternative we thought of was to simply do some kind of voting system (upvote/downvote) for users to interact with. We thought that this approach was too limited and overdone, so we decided on doing comments instead.

Ethics Protocol Analysis (Tiffany)

You should create an ethics protocol analysis for your project, with discussion of three value-laden design decisions. An explanation of analysis with the ethics protocol and examples is here. You should address every point outlined in the example in a concise and thoughtful way, and you will be asked to update the protocol for the submission of MVP and Finished Product with changes you've made to the protocol after having iterated on your design.

An updated version of the protocol with one additional design decision (4 total), as well as enumeration of changes made to the original protocol after having iterated on your design.

*No major changes to original protocol; just added design decisions to make 4 total.

1. Envision possible futures
    a. Imagined future #1:
        i. No one visits Alta this winter. No one uses our app. Everyone is sad :(
    b. Imagined future #2:
        i. A lot of people visit Alta this winter. Too many people use our app and it crashes. Everyone is sad :(
    c. Imagined future #3:
        i. Hackers get a hold of our app and flood it with spam, so people can't get up-to-date information nor check-in (or see accurate check-in times/occupancy) to resorts. Everyone is sad :(
    d. Imagined future #4:
        i. COVID-19 becomes more of an issue as more people visit Alta. This results in the need to limit the amount of people who visit the ski resorts at a time. The ski lodges limit hours of operation and capacity at certain times to reflect that and broadcast that information on their business pages. People see this and understand. Everyone is satisfied :)
2. Identify stakeholders
    a. Alta citizens
    b. Alta visitors (skiers mostly)
    c. People of different ages
    d. Non-smartphone users
    e. Smartphone users
    f. Small businesses
3. Identify values at play
    a. Outcome lens
        i. In what ways does what you're making turn out better or worse for your stakeholders?
    b. Process lens
        i. How did the process treat stakeholders?
    c. Structure lens
        i. How are the outcomes distributed among different stakeholders? What are the differences in how different stakeholders were treated by the process?
4. Identify value-laden design choices
    a. Design question 1: Who can see which users are checking in at a certain time?
        i. Possible choice 1: Users can see all other users checking in at certain times.

1. Values promoted
    a. Outcome lens: Users can see how busy the business is, and businesses (admin users) can see who is checking in.
2. Values demoted
    a. Outcome lens: Bad actors may use this information to target certain people whom they know are at a business at a certain time.
    b. Process lens: Users did not consent to having this information displayed to other users. It compromises privacy.
    c. Structure lens: This information may become overwhelming on certain pages, especially for smartphone users. It would render the page harder to read.

ii. Possible choice 2: All users cannot see who is checking in at certain times, only the numbers.
1. Values promoted
    a. Outcome lens: Users can see how busy the business is.
    b. Structure lens: This information is easier to see at a glance, so both smartphone users and non-smartphone users can get the information they want.
2. Values demoted
    a. Outcome lens: Businesses (admin users) can't see who is checking in.

iii. Possible choice 3: Admin users can see who is checking into their business, but other users can only see numbers.
1. Values promoted
    a. Outcome lens: Users can see how busy the business is, and admin users can check who checked in for business purposes.
    b. Structure lens: Helps both customers and business owners (admin).
2. Values demoted
    a. Process lens: Users may not want this information displayed, even to admin users.

b. Design question 2: How should businesses be displayed to users in the app?
i. Possible choice 1: Businesses displayed on a map according to location.
1. Values promoted
    a. Outcome lens: Users can see where businesses are and use the map to travel there, probably prioritizing nearer businesses.
2. Values demoted
    a. Structure lens: This information may become overwhelming, especially for smartphone users.

ii. Possible choice 2: Businesses displayed as a list on the left side of the page, ordered by relative distance to the user.
1. Values promoted
    a. Outcome lens: The user gets the important information in a simple manner, and they would probably want to connect with businesses they are near.
2. Values demoted

            a. Structure lens: The user would need a different app (e.g. Google Maps) to navigate to the business, which may be tedious for smartphone users.

c. Design question 3: Who is allowed to report/broadcast an event for a business?
    i. Possible choice 1: Every user can report to address time-sensitive events.
        1. Values promoted
            a. Outcome lens: Users can report any important event they encounter and alert others about such events in a timely manner.
        2. Values demoted
            a. Outcome lens: Bad actors can send spam/fraud reports, flooding notifications/pages and preventing users from seeing important information.
    ii. Possible choice 2: Users can report, and admin users vet the reports.
        1. Values promoted
            a. Outcome lens: Users can alert others about events, and admin users can filter the reports to make sure only important ones go through.
        2. Values demoted
            a. Structure lens: This process can become rather complicated and overwhelm admin users if many users are sending in reports.
    iii. Possible choice 3: Only admin users can report for their businesses.
        1. Values promoted
            a. Outcome lens: Admin users would be in control of important reports for their businesses and send major alerts to their customers.
        2. Values demoted
            a. Structure lens: Users would not be able to send reports in a timely manner and must comment or directly alert admin users to send the broadcast.

d. Design question 4: How can users interact with the broadcast app? / How can users interact with businesses besides check-in?
    i. Possible choice 1: Users can upvote/downvote the broadcast
        1. Values promoted
            a. Outcome lens: Users can let admin users know how they feel about the broadcast in a simple and straightforward manner.
        2. Values demoted
            a. Structure lens: Users are very limited on how they can communicate with / respond to the businesses.
    ii. Possible choice 2: Users can comment on the business page (not necessarily about the broadcast) and admin users can respond to the comments.
        1. Values promoted
            a. Outcome lens: Users can comment on the report and give general feedback about the business or ask questions.
            b. Process lens: Users can feel like their thoughts will be heard by the businesses, and this allows good (relatively) direct communication between business and customer.
        2. Values demoted

        a. Outcome lens: Bad actors may use this feature to spam comments.
        b. Structure lens: User comments will not have as much priority as admin broadcasts, which would be an issue for users who want to report time-sensitive information.
5. Choose and justify
    a. Choice 1: Admin users can see who is checking into their business, but other users can only see numbers.
        i. Allows businesses to use check-in as a reservation system as well.
        ii. Businesses can check who checked-in or made a reservation when in order to confirm identity.
        iii. Users can see at a glance how busy the business is.
        iv. Users don't have to worry about their information being displayed to other users that may use it harmfully.
        v. Admin users are verified by the city government to be owners of the businesses they claim ownership of.
    b. Choice 2: Businesses displayed as a list on the left side of the page, ordered by relative distance to the user
        i. Not that many businesses in Alta; can see them all relatively at a glance.
        ii. Simple and allows focus on information and communication from the businesses.
        iii. Navigation to the business can be done using other apps that already handle that well.
    c. Choice 3: Only admin users can report/broadcast for their businesses.
        i. Best for limiting spam/fraud reports, which would defeat the purpose of important broadcasts on major and time-sensitive events.
        ii. Simpler and more direct than having admin users vet reports.
        iii. Users can attempt to alert admin users about situations using comments (or in person).
    d. Choice 4: Users can comment on the business page (not necessarily about the broadcast) and admin users can respond to the comments.
        i. Users can comment on the report.
        ii. Users can give general feedback about the business or ask questions.
        iii. Users can feel like their thoughts will be heard by the businesses.
        iv. Good (relatively) direct communication between business and customer.
        v. Businesses will have good engagement with customers.
6. Build

A section on what changes you made to address the review / suggested changes from your mentors reviewed it and suggested changes, plus any other changes you made.

An explanation for how your UI fulfills each of Nielsen's Usability Heuristics or why the heuristic is not applicable to your app

1. Fitt's Law
    - The top menu bar and the left sidebar have large buttons for users to click on.
2. Speak the User's language
    - Simple , minimalistic user interface for skiers, who might not be technology savvy or own a smart device.
3. Consistent Naming & Icons
    - Every comment and sign in slot are the same format
4. Information Scent
    - In the user settings page, the placeholder text (e.g. Username in change username or Password in change password) provides a hint on what kind of information to enter in each field.
5. Follow Conventions
    - Log in and settings are located in the top right corner, like most apps.
6. Show Location & Structure
    a. To change user settings, a user has to be on their settings. The convention of a user settings page to have a list of fields to change (e.g. sign out button and change username button) provides context to the user that they are located in their account. The structure makes it easy to know whether the user is in their settings page.
7. Accelerators
    - All the features are accessible on the home screen.
8. Keep Paths Short
    - The redirection is minimized, for example, a user can access their feed, user settings, and other things with one click in the top bar.
9. Undo & Cancel
    - User can change their username and delete their account after they are finished with their skiing season
10. Perceptual Fusion
    - While the comments can't be ordered (they are ordered from oldest to newest for now), the check-ins do list in time. In the future, we can add sorting to allow people to view by other means (e.g. sort by descending count).
11. Gestalt Principle of Grouping
    - Using the main page as an example, all of the locations are on the left side and the navigation buttons on the top
12. Recognition vs. Recall
    - Intuitive navigation between different features of the app on the home screen.
13. Anticipation & Context
    - When a user clicks check in, an alert pops up telling them that they have successfully checked in. They can then exit out of the alert and go back to the main page. This alert gives them context that the server has successfully processed the request.

Any additional significant design decisions you made when implementing your app. As with the assignments, produce a short and compelling title that summarizes each design question you addressed and detail the alternatives that were considered.

1. Displaying username with the comments
    a. Instead of having the user-posted-comments being displayed anonymously, the comment section will include the user name with every comment.
    b. The goal is to attempt to reduce the amount of troll comments. Also, since user names are set by the user when they register for an account, they can still have some level of anonymity depending on the user name they choose.