

Full Design

After completing the conceptual sketch, you'll work on the detailed design, which you will record in a single integrated design document. This document should include:

- [Overview](#)
- [Conceptual Design](#)
- [Wireframes](#)
- [Design Commentary](#)
- [Ethics Protocol Analysis](#)

Throughout the design document, you should try hard to be as clear and succinct as possible. You will be penalized for including irrelevant points, for repeating yourself, for saying things in text that are already said in diagrams, and for lack of structure. Feel free to use a tabular form when appropriate: it can be a very helpful way to organize your thoughts.

Every team member should participate in the work behind each section of the design document. The writeup, however, will be divided up, with each section led by (and explicitly attributed to) a single author.

Overview - Shariqah

- **Description:** Scope is a crowd-sourced app that communicates to what extent a business is taking necessary safety precautions during COVID-19, creating peace of mind for prospective customers. It will include a map and descriptions of different businesses in Cambridge, MA.

- **Key purposes:**

- Leave Your House During a Pandemic

- This app will make people more comfortable leaving their house and going to different businesses during the current pandemic.*

- There is currently a lot of variation with how much different people are following safety guidelines recommended by health professionals when going to public areas during the COVID-19 pandemic. So naturally, some people are hesitant to go to different businesses because they are unsure whether the business is enforcing the necessary safety standards. Many people are struggling with not being able to leave their homes, so we would like to provide a way for people to feel more comfortable leaving their homes and live their lives as safely and as happily as possible. In addition, many businesses have changed the way they offer their services (such as take-out only instead of in-person dining) as well as their hours. This app will keep up-to-date information about businesses during these unique circumstances.

- Hold Businesses Accountable

- Scope will encourage businesses to follow COVID safety guidelines.*

- Although local and state governments are creating certain restrictions, such requiring all citizens to wear masks in public, they are limited in how much they can enforce these restrictions. Many businesses still do not enforce these restrictions in their businesses, making some of their customers uncomfortable. By publicly displaying how well businesses are following guidelines in

our app, the city and customers can easily look at this information and take any necessary actions. In addition, businesses will have an incentive to make sure they are following the rules.

Increase Revenue for Businesses

Our app will attract customers to businesses that are following COVID guidelines.

Due to the safety risk of leaving your home and going into the public, many people are not going to businesses as much as they did pre-pandemic. So, many businesses, especially smaller businesses, are struggling to stay afloat nowadays. By proving to potential customers that there is minimal risk in visiting their businesses through Scope, businesses can attract more customers and improve revenue.

- **Deficiencies:** Common apps for searching and rating businesses such as Yelp and googles don't take into account COVID guidelines, and focus on general opinion about the business instead. In addition, the Cambridge dataset on businesses during the current pandemic only focuses on how open a business is, but does not include information about how well that business is performing in the context of COVID. There is also no way to hold a business accountable if they are not following the rules or give customers the opportunity to provide feedback to these businesses.

Conceptual Design - Sam

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

- The name of the concept
- The concept's purpose
- The structure, expressed as an abstract data model
- The behavior, expressed as the actions and their effects on the data model
- The operational principle: one or more archetypal scenarios

Your conceptual design should include comments to explain any unusual or potentially confusing elements.

- Metrics
 - Purpose: indicate what covid guidelines a business is following and includes an overall score that represents how well a given business is following that metric
 - Structure: business → metric, metric → guideline, metric → confirms, metric → denies
 - Actions:
 - Create(guidance,business):creates a metric containing guidance for business
 - Update(old_metric, new_guideline): updates old_metric with new guideline
 - Delete(metric): delete a metric
 - Confirm(metric, customer): customers say business is successfully following metric
 - Deny(metric, customer): customers say business is unsuccessfully following metric
 - Unconfirm(metric, customer): customer removes their confirm
 - Undeny(metric, customer): customer removes their deny
 - Operational principle:

- After create(guideline,business), the new metric will be in business.metrics
 - After update(old_metric, new_guideline) new_guideline will be in business.metrics and old_metric will not be in business.metrics
 - After delete(metric), metric will not be in business.metrics
 - confirm(metric,customer) increments the number of confirms associated with a business' metric and adjusts overall score accordingly.
 - unconfirm(metric,customer,business) decrements the number of confirms associated with a business' metric and adjusts overall score accordingly.
 - deny(metric,customer) increments the number of denys associated with a business' metric and adjusts overall score accordingly.
 - Undeny(metric,customer) decrements the number of denys associated with a business' metric and adjusts overall score accordingly.
- Comments
 - Purpose: customers communication with a business
 - Structure: customer !----> comment ----> !business
 - Actions:
 - create(customer, business, comment_content): comment is created for business by customer
 - update(comment, new_content): comment content is updated with new content
 - delete(comment): comment is deleted
 - Operational principle:
 - After create(customer, business, comment) comment is in business's comments
 - After delete(comment) comment is removed from business's comments
- Statuses
 - Purpose:indicate at what capacity a business is open (take-out only, outdoor seating, etc)
 - Structure: status !<---business
 - Actions:
 - create(status_content,business): creates a status with status_content for business
 - update(business, new_status): updates business's status to new_status
 - Operational principle:
 - If a business updates their status from A to B then that business will be removed from set A, and added to set B
 - If a business creates a status A then business.status = A

Wireframes - Noah

You're asked to describe your planned user interface by giving a collection of wireframe sketches. Each of these 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. Expect to have between 3 and 10 wireframes.

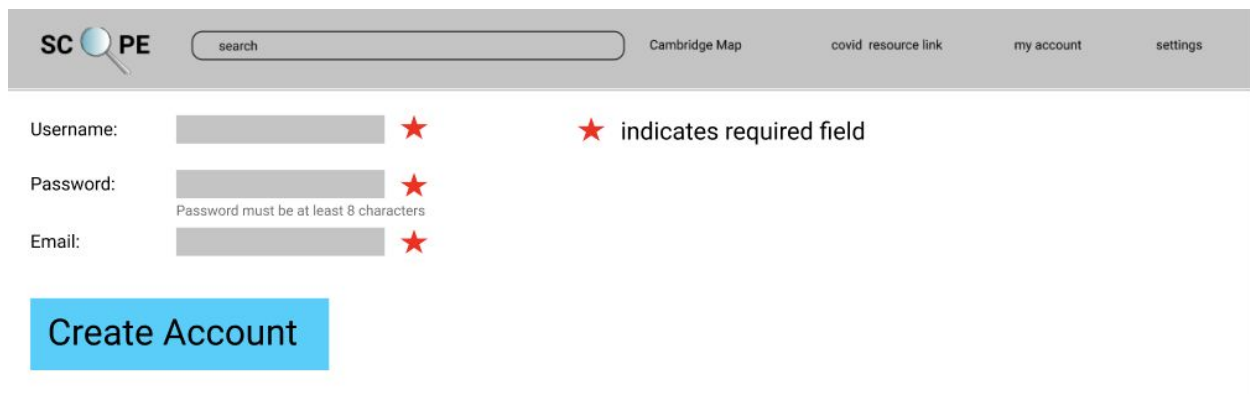
Navigation bar:

This will make it easier for users to navigate between pages. Found on every page at the top of the screen. Cambridge map will take users to the Cambridge map page. Covid resource link will take users to the city of cambridge sites covid resource page. Account link will take users to their account page. Settings page will take users to a page where they can make edits to their account/profile. Entering something into the search bar will search through existing business and show results on the home page.



Create account page:

This page allows users to create a new account for Scope. The red stars indicate the required fields and clicking "create account" submits their account.

A wireframe for a 'Create Account' page. It features the same navigation bar as the previous wireframe. Below the navigation bar, there are three input fields: 'Username:', 'Password:', and 'Email:'. Each field has a red star icon to its right, indicating it is a required field. Below the 'Password:' field, there is a text hint that says 'Password must be at least 8 characters'. To the right of the stars, there is a text label: '★ indicates required field'. At the bottom of the form is a large blue button with the text 'Create Account' in white.

Create business page:

The create business page is meant for business owners to list their business on scope. Clicking the add metric button creates a dropdown menu for them to select an additional metric to display on our page from a preset list. They can take this action as many times as they want until they have selected all possible metrics. The status part of the form will only allow selecting of one status which they can change later. The hours part has seven sliders they can use to create different hours for each day of the week. Business type, like status, only allows for one selection but can be edited after a business has been submitted using the edit business page.

SC PE

search

Cambridge Map

covid resource link

my account

settings

Company name:

★

★ indicates required field

Password:

★

Password must be at least 8 characters

Description:

Required metrics:

Masks worn correctly in store

Store capacity limited

Social distancing required in store

Additional metrics:

+ Add Metric

Status

in store ☐

curbside ☐

closed ☐

★

Email:

★

Phone Number:

Image:

Add Attachment

Hours

Monday:

Tuesday:

Wednesday:

Thursday:

Friday:

Saturday:

Sunday:

Business type:

☐ Restaurant

☐ Convenient store ★

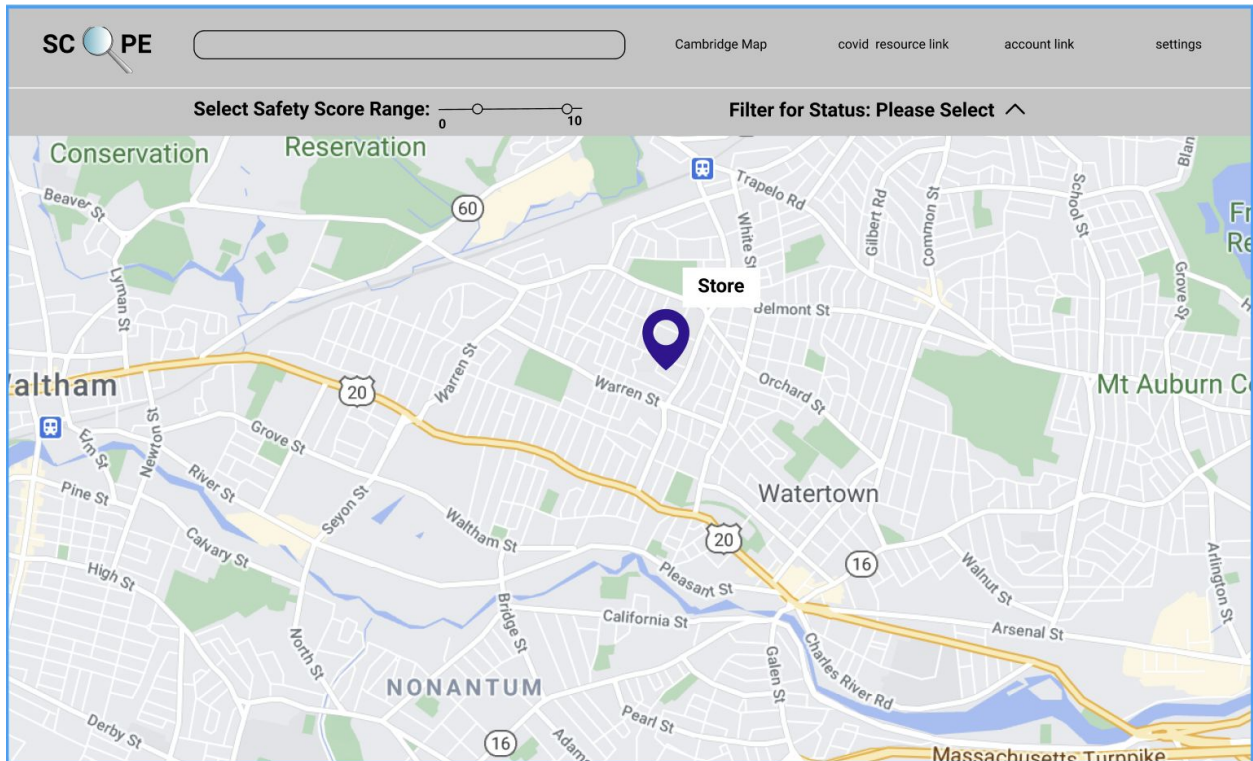
☐ Grocery

☐ Other

SUBMIT



Cambridge Map Page:

This page allows users to see where different businesses are located. Businesses are represented on the map by markers. Hovering over a marker will display the store name. Clicking on markers will take users to that business's profile.



Home Page:

This page shows a summary of what different businesses are available to the user. Selecting the arrow next to the filter for status will allow the user to filter business listings for specific status such as take out only or in store. Selecting the store name will take users to that business's profile.

<div> <div>SC PE</div> <div>search</div> <div>Cambridge Map</div> <div>covid resource link</div> <div>account link</div> <div>settings</div> </div>			
Sort from High to Low: <input type="checkbox"/>		Filter for Status: Please Select ^	
	Store 1 We serve good food	Safety score: 45% Take-out only	<i>Type: Restaurant</i> <i>Distance: .1 mi</i> <i>Hours today: 9am - 5pm</i>
	Store 2 We sell cool things	Safety score: 85% In-store	<i>Type: Clothing</i> <i>Distance: .2 mi</i> <i>Hours today: 9am - 5pm</i>

Business profile page:

This page shows the user more details about the business and its metrics. Users can alternate between the comment section and the metrics section using the tabs, and businesses can choose to edit their profiles from this page when they're logged in.

SC

PE

search

Cambridge Map


covid resource link

my account

settings

Edit Profile

Business Name Safety rating: 80%



Status: Curbside pickup

Hours: 7am-7pm

Address: 77 Massachusetts Avenue

Phone number: (617) 420-6969

Metrics

Comments

Required by City:

Requires masks

Confirm ☒ 12

Deny ☒ 3

Social Distancing

Confirm ☒ 25

Deny ☒ 13

Additional Measures:

Hand Sanitizer Stations

Confirm ☒ 15

Deny ☒ 5

SC

PE

search


Cambridge Map

covid resource link

my account

settings

Business Name Safety rating: 80%



Status: Curbside pickup

Hours: 7am-7pm

Address: 77 Massachusetts Avenue

Phone number: (617) 420-6969

Metrics

Comments

User1: This is user1 asking a question about the covid policies at this business.**Business Name:** Hi user1, this is the business answering your question!**User2:** I also have a question, ???? Thanks

Reply to this comment here! This will only be visible to the business

Reply

Add a new comment

Type a new comment here! This will only be visible to customers.

Reply

Owners of a business will have the option to edit any of their company information after clicking edit while on their “my account” page.

SCOPE search Cambridge Map covid resource link my account settings

Business Name Safety rating: 80%

Status:

Hours:

Address:

Phone:

Metrics Comments

Required by City:

Requires masks	Confirm ✓ 12
	Deny ✗ 3

Social Distancing

	Confirm ✓ 25
	Deny ✗ 13

Additional Measures:

Hand Sanitizer Stations	Confirm ✓ 15
	Deny ✗ 5

Add a metric:

Design Commentary - Kylie

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.

1. Metrics are the Core of Scope

In designing our app, we wanted to ensure that we are focusing on a sole purpose that would provide a unique service that is not already widely available. We decided that this purpose is providing customers an efficient and effective way to evaluate different businesses and to what extent they are following

COVID safety guidelines, which they can do with our metrics concept. With this purpose in mind, we tried to design the app so that it was not just another map app, like Google Maps. This meant making our home page a list of businesses, where each listing has a summary of the given business that includes a name, description, and overall score of how that business is performing. An alternative design that we considered was keeping the map on our home page so that the user could see the relative location of the businesses as well as their listings. But, we decided that having the map is not as much of a priority as the listings, since location is not as relevant when evaluating different businesses in the context of COVID, especially in a smaller city like Cambridge. In promoting our purpose, we also focused our energy in designing a fleshed out evaluation process with our metrics, as seen through our other design decisions.

2. Businesses would be held accountable by ratings determined by customers rather than the city.

We decided that the way businesses would be held accountable for not following Cambridge city COVID guidelines by averaging the ratings taken from customers and allowing customers to see these ratings and filter for businesses by their ratings. This incentivizes businesses to follow guidelines while still allowing businesses with low ratings to increase their ratings overtime. Customers at the same time can find out how other customers felt about businesses handling of COVID. Alternatively, we considered having a violation system. A violation would be if businesses received a certain number of denies they would be automatically reported to the city. However, we felt that it would be difficult to determine what a fair threshold to report businesses, certain groups could be disproportionately affected by this process, and customers abusing the metric system could unfairly affect businesses without an avenue for businesses to challenge violations.

3. To not include comfort rating

In our original plan for scope, we had chosen to have a comfort rating associated with each business. The rating was going to be determined by users of the app after visiting a store. We decided to get rid of this feature because the number would not necessarily have anything to do with COVID. There are countless other reasons why someone may not feel comfortable in a store such as store location or racial biases. While this information is still important, we did not feel like it was part of what our COVID-centric map should include. Instead to convey this information we opted to calculate a numerical score based solely off of the metrics themselves. This will give a more objective measure than a user just saying on a scale from one to ten how comfortable they were in the store.

4. Confirm and deny rather than a scale or number rating

We chose to allow users to confirm or deny whether a business was following a metric because that hopefully makes the businesses feedback very objective. The purpose of the metrics were just to see whether or not a business was actually following them and we think a confirm or deny system is the best way to do this. The alternative we considered was to have a sliding scale from like one to ten for users to say how well a business followed a metric. We thought

that this was too subjective as a “seven” to one person might be completely different than a “seven” for another person. Ideally with the confirm/deny system every user would answer the metric in the same manner.

5. Give businesses a list of preset metrics to choose from

We chose to create a list of preset metrics based on CDC guidelines for preventing the spread of COVID-19. The alternative we considered was allowing businesses to add custom metrics, but we realized that there aren't very many different procedures that can be followed to protect against COVID-19, so we thought this was the best way to include all of them without leaving room for businesses to add metrics that are unrelated to COVID-19 safety. We also realized this would give a sense of consistency to the metrics, whereas if businesses could create their own metrics, the wording could be different for two metrics that mean the same thing (for example, one business could say “provides hand sanitizer” whereas another might say “hand sanitizer stations”), and some phrasing might be unclear (in the previous example, a business could simply say “sanitizer”). This decision also allows us to store less information in our databases, because this way the name/meaning of each metric only needs to be stored once, rather than saving every variation of phrasing that businesses might use if they added their own.

6. Remove green and red color coding of pins on map

Originally, we had considered using green and red color coding of the pins on our map to represent whether a business had a high safety rating or not. However, we chose to remove the color coding from the design and replace it with the functionality to filter businesses based on their rating. This gives the customers more freedom to decide their own boundaries and limits to what safety rating is high enough for them to feel comfortable at a business, rather than us determining the cutoff for “safe” and “unsafe” and providing customers with a false sense of security by giving a business a green pin when it's possible that our cutoff doesn't meet that customer's personal standards. Another reason we chose filtering instead of color-coded pins is that if customers were to see an area on the map covered with green pins, they might decide to go browse that area for businesses rather than choosing a specific business to go to based on its safety rating. This could cause many customers to flock to certain areas at the same time, which would overwhelm the businesses in that area and be unsafe for the crowds of customers as well. Filtering based on safety ratings would show users the businesses with the highest safety ratings all across Cambridge, and allow them to choose between all of them, without the eye-catching effect of a mass of green pins on the map. In addition, filtering is more accessible to people with colorblindness or other vision impairments.

Ethics Protocol Analysis - Shariqah

Imagined Futures

Imagined Future #1: Scope is released. Within several months many cambridge businesses and cambridge residents have created accounts and regularly use the application. Scope has helped encourage cambridge residents to use the services of local business while feeling safe, ask business questions specific to covid, and gives them a means to call out businesses that fail to meet covid guidelines. Scope also helps local businesses increase their number of customers following the pandemic and receive constructive feedback from customers on how to improve their safety procedures or address questions regarding existing safety procedures. The city has a way to keep businesses accountable by looking at business ratings on Scope.

Imagined Future #2: Scope is released. Bad actors can use the app to slander businesses who actually are following safety protocols. Minority owned and/or smaller businesses are disproportionately affected. In order to avoid the bad press or unfair treatment, businesses remove their profiles. Businesses ratings are not accurate so users no longer trust the app.

Stakeholders

- Cambridge Business owners
- Businesses outside of cambridge
- Cambridge city officials
- Federal and state officials
- Cambridge residents
- People of color
- People who are part of a minority group
- Elderly people
- Young people
- Smartphone users
- Non smartphone users
- Scope users
- Non scope users
- Large businesses
- Small businesses
- Workers in cambridge businesses

Identify Values

- Outcome
- Process
- Structure

Value-Laden Design Decisions

- How are businesses evaluated for how well they are following COVID-19 safety protocols?

Possible Choice	Values promoted?	Values demoted?
Have users provide an overall	Process: easy for users to give	Structure: business led by

rating of how comfortable they were visiting this business	and understand feedback about a business	minority groups or in certain areas of city lose revenue Outcome: ratings are more subjective
Allow businesses to add arbitrary metrics (not from a preset list)	Process: allows businesses the freedom to choose whatever metrics they prefer	Outcome: businesses promote metrics that are irrelevant to COVID and/or contradictory to COVID guidelines Structure: businesses that don't add certain custom metrics could be penalized even though they're following the rules
Certified users determine the overall rating	Outcome: more vetting against users with bad intentions against a business	Structure: gives more of a voice to groups with more privilege in society Process: less opinions are taken into account in final evaluation
Only allow businesses to add metrics from a preset list	Outcome: businesses can only promote metrics that are relevant to COVID Process: metrics are consistent across the board Structure: all businesses are evaluated equally	

- How are businesses held accountable for how well they are enforcing COVID-19 safety protocols?

Possible Choice	Values promoted?	Values demoted?
Automatically notify city if businesses are not following the rules	Outcome: city can easily be notified if a business is not following the rules	Process: Bad actors can be really detrimental to businesses Structure: could disproportionately affect businesses with fewer resources
Show how often users agree/disagree that a business is following a given rule	Process: all customers can give feedback about a given business Outcome: businesses do not face drastic punishments and can easily recover if a given metric has a lot of "disagrees"	Structure: could disproportionately affect certain businesses as a result of customers biases

- How do we inform customers of their business options?

Possible Choice	Values promoted?	Values demoted?
Color-coded map based on how well the business is following rules	Process: easy to quickly find business that are following the rules	Outcome: users choose to congregate in areas where the business have better colors Structure: areas with lower amounts of businesses will appear to have more bad colors than that of high numbers of business
Business listings with the option to filter based on a rating that is displayed on the listing	Process: easy to quickly find business that are following the rules Outcome: less likely to congregate based on location of good businesses Structure: each business is evaluated individually rather than by location or proximity to other businesses	

Choose & Justify

- How are businesses evaluated for how well they are following COVID-19 safety protocols?
 - Choice: Only allow businesses to add metrics from a preset list to evaluate in the most objective and equal way.
- How are businesses held accountable for how well they are enforcing COVID-19 safety protocols?
 - Choice: Show how often users agree/disagree that a business is following a given rule so that all users can provide input while still allowing businesses to easily improve their circumstances.
- How do we inform customers of their business options?
 - Choice: Business listings with the option to filter based on a rating that is displayed on the listing so that customers can evaluate business in a more case-by-case manner.