



Vaccine Credentials Design Criteria

Version 1.1, 03.Sep.2021

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This report outlines possible use cases and designs for vaccine credential mobile services.

Information and regulations regarding COVID-19 may have changed from the time of this report's release.
Please adhere to WHO, CDC, state, and federal guidelines when designing a vaccine credential app.

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Design Criteria for a Vaccine Credential Mobile App

This report is a living document.

As changes in state and federal regulations come into effect, the information in this report will change.

Future revisions will include a more exhaustive use case service blueprint with potential third party integrations and paper credential use cases.

Why is a vaccine credential important?

Vaccine credentials were first used during the Small Pox outbreak as a criteria for entering countries during international travel.¹ With the outbreak of COVID-19, many countries and states enforce mask wearing, yielding positive results.² Vaccine credentials are the next line of defense for containing the outbreak of COVID-19.

It is important to note that vaccination is one part of the holistic effort to control the spread of COVID-19. Symptom screening and Covid-19 tests still play a valuable role in controlling the spread. Features such as symptom monitoring and test results were also examined in the literature review.

Vaccine recipients already get a vaccination card.

Why can't those be used as credentials?

Vaccination cards can be easily falsified. Furthermore, a vaccination card differs from a paper credential in that a paper credential can contain a picture and corresponding QR code for the vaccinated human.

Some legislators claim that vaccine credentials are a violation of liberties.

The vaccine is considered safe and is a strong avenue to achieving herd immunity.³ However, vaccine credentials should not bar access from essential spaces such as grocery stores or healthcare facilities. In non-essential recreational spaces, the vaccine credential can be a temporary option to ensure that public spaces are as safe as possible until herd immunity is achieved.⁴

¹Ada Lovelace Institute, *The history and uses of vaccine passports and COVID status apps* February 2021

² Jeremy Howard, *An evidence review of face masks against COVID-19*, San Francisco: Proceedings of the National Academy of Science of the United States of America, January 2021

³<https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/is-the-covid19-vaccine-safe>

⁴<https://www.statnews.com/2021/04/01/resistance-vaccine-passports/>

Contents and Planned Revisions

This report contains the following:

1. Literature Review - Vaccine Credential Mobile Applications - page 4

Many organizations have their own vaccine credential app. A literature review was performed of the apps currently in development. New apps emerge weekly.

2. Literature Review - Paper Credentials - page 17

In order to serve populations that do not have access to smart phones, or do not feel comfortable using smartphones, organizations are developing a paper version of credentials. A literature review was performed of credentials that are known to be in development.

3. Use Cases - page 23

How people use vaccine credential services is useful in developing software, user experiences, and policy. Detailing how and what people do (or need to do) in specific environments shows product and policy teams how to better approach and think about creating digital services.

4. User Survey and Interview Results - page 26

A survey was conducted to better understand user's interactions with mobile ticketing and mobile wallets. These two applications most closely resemble the use cases and interactions required for a vaccine credential app. Three additional users were interviewed further on their interactions with Covid-19 symptom checker apps in addition to mobile ticketing and mobile wallets.

5. Paper Credential Design Criteria - page 32

Recommended features of a paper credential.

6. Mobile Application Design Criteria - page 34

Recommended features of a vaccine credential app.

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Literature Review

Vaccine Credential Mobile Applications

This literature review contains vaccine credential apps and health passports that are currently released or in development. A few applications that did not explicitly include vaccine credentials were still included if they were related to immunization or health passports.

Review Criteria

Open or Closed: Is this app code and design open source?

Vaccine Credentials: App contains a vaccine credential verification system.

COVID-19 Test Results: Does the app also display COVID-19 test results?

Symptom Screener: Does the app prompt you to screen for symptoms?

Features: A list of all available app features.

Status: Is the app currently in development? Has it been released to the public or to the necessary healthcare institutions?

	Open-Source	Vaccine Credentials	COVID-19 Test Results	Symptom Screener	Released to Public
UBirch		✓	✓		✓
CommonPass		✓	✓		
Digital Health Pass		✓	✓		
IATA Travel Pass		✓	✓		
HealthCheck			✓		
CanImmunize					✓
VaxiGlobal		✓			✓
Accredify	✓	✓	✓		✓
Clear		✓	✓	✓	✓
Boost 19	✓			✓	
VC Wallet		✓*			✓

Digital Corona Test Certificate

UBirch

Open or Closed

Closed

Vaccine Credentials

Yes

COVID-19 Test Results

Yes

Symptom Screener

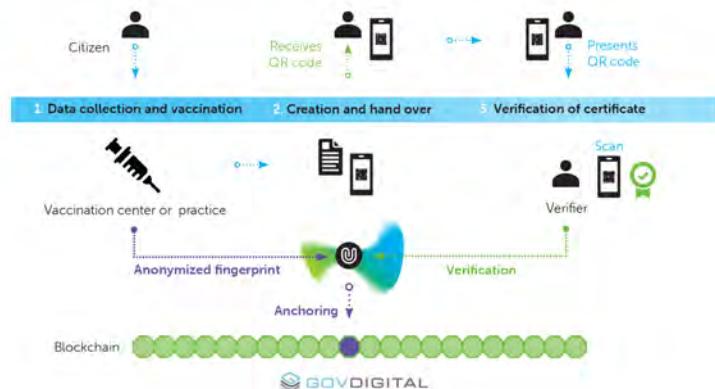
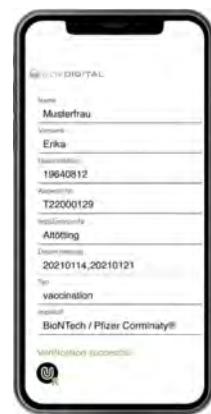
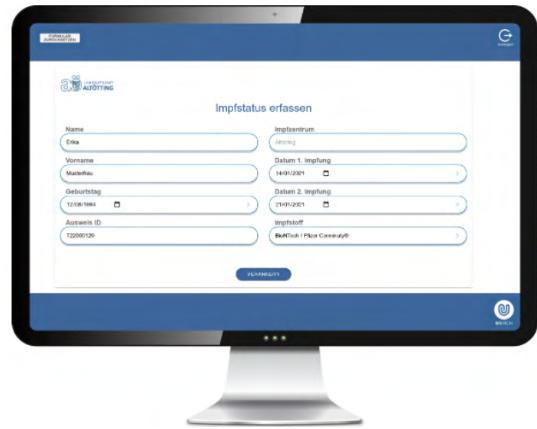
No

Features

- COVID-19 vaccination is entered in patient data management system. This system links to the credential app.
- A QR code is produced which can be printed out or displayed on a phone
- System can be integrated into IATA travel pass or most other international tracking apps

Status

Released



Source

<https://ubirch.de/en/digital-vaccination-certificate>

CommonPass

Open or Closed

Closed

Vaccine Credentials

Yes

COVID-19 Test Results

Yes

Symptom Screener

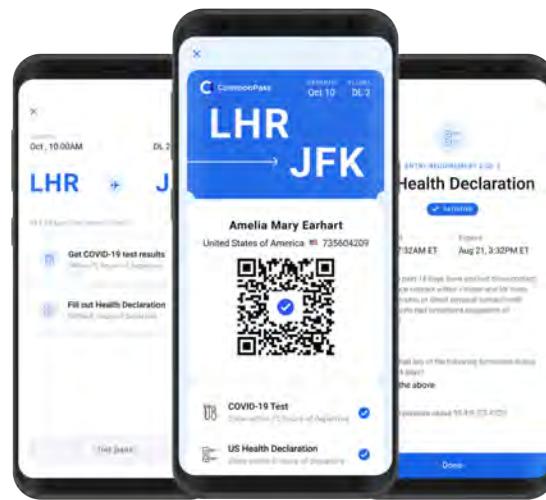
No

Features

- Shows entry requirements based on itinerary
- Traveler must complete required health declarations
- Pass generated when requirements are satisfied
- Can access labs and vaccination records

Status

Not yet released to the public



Sources

<https://commonpass.org/>

<https://static1.squarespace.com/static/5ed685211872ca0609188980/t/5fdb699f8ee41b79ce846897/1606248871413/CommonTrust+Network+Overview+-+11.16.2020+%283%29.pdf>

Digital Health Pass

IBM



Open or Closed

Closed

Vaccine Credentials

Yes

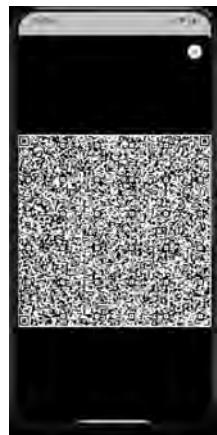
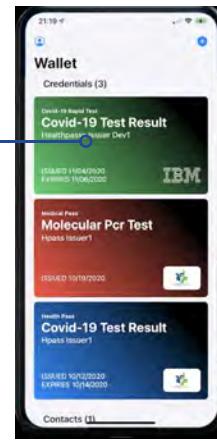
COVID-19 Test Results

Yes

Symptom Screener

No

Passes are separated based on which organization needs those credentials



Features

- Issuing organization generates a verifiable credential and sends it to individual
- Individual loads credential onto their phone
- Passes are separated based on which organization needs those credentials
- Powered by blockchain technology



Status

Not yet released to the public

Source

<https://www.ibm.com/products/digital-health-pass>

IATA Travel Pass

Open or Closed

Closed

Vaccine Credentials

Yes

COVID-19 Test Results

Yes

Symptom Screener

No

Features

- Display info on the travel requirements for user's desired destination
- Helps users locate COVID-19 testing centers
- Users can verify that they have the appropriate information in accordance to their destination's regulations

Status

Not yet released to the public



Source

<https://www.iata.org/en/programs/passenger/travel-pass/>

HealthCheck

SAFE Health Systems

Open or Closed

Closed

Vaccine Credentials

No, but it appears that this can be integrated into the system.

COVID-19 Test Results

Yes

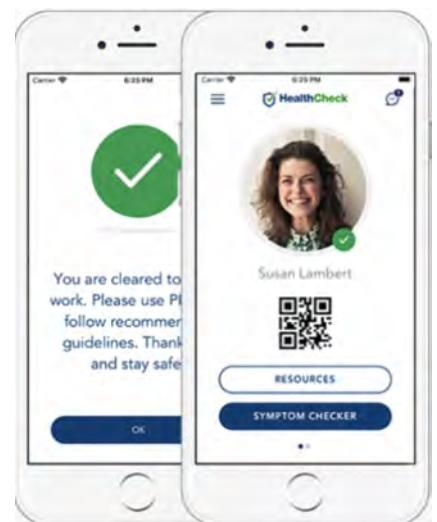


Symptom Screener

No

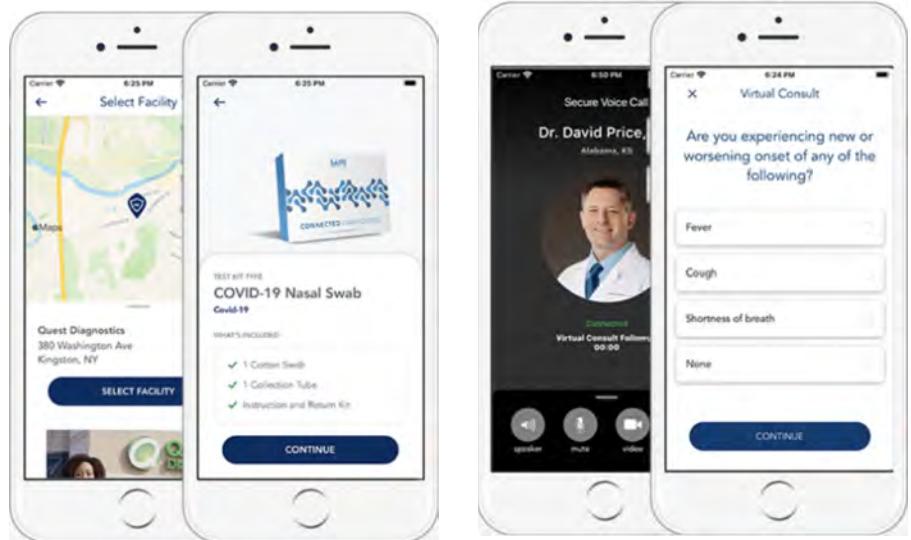
Features

- Display info on the travel requirements for user's desired destination
- Helps users locate COVID-19 testing centers
- Users can verify that they have the appropriate information in accordance to their destination's regulations
- order a COVID-19 test kit



Status

Unclear, it may be available for healthcare providers but the app hasn't been released to the public.



Source

<https://healthcheck.com/>

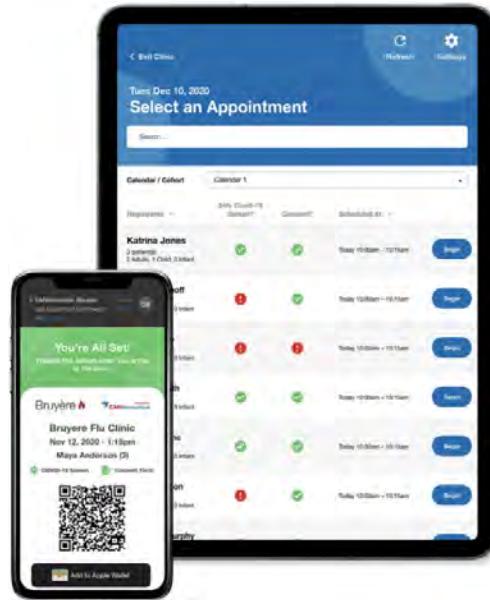
CANImmunize

Public Health Agency of Canada

This app has a sister app: ClinicFlow. ClinicFlow is used by hospitals and clinic staff to schedule appointments and screen for COVID-19. It integrates with CANImmunize to store vaccination records.

Open or Closed

Closed



Vaccine Credentials

Undetermined. The system stores vaccination information, but doesn't explicitly mention it's for credential purposes.

COVID-19 Test Results

No

Symptom Screener

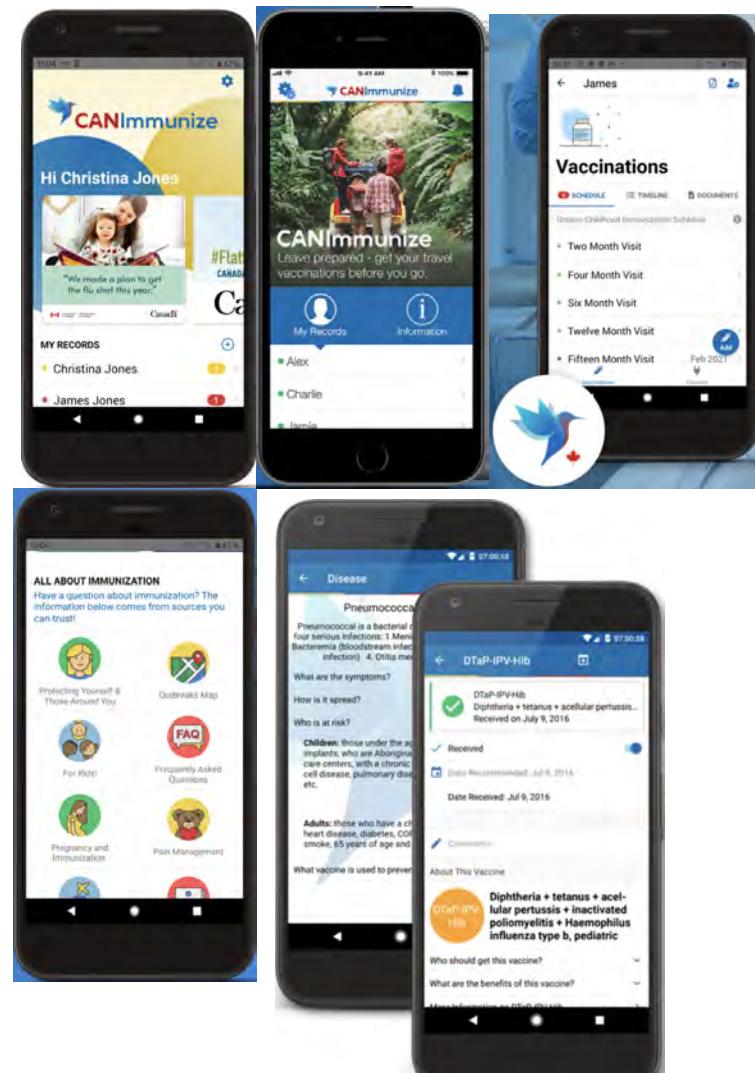
No

Features

- Covid-19 screening
- Store vaccination records
- Records for everyone in the family on one account
- Vaccine reminders
- Information about vaccine
- Learn about disease outbreaks in your area

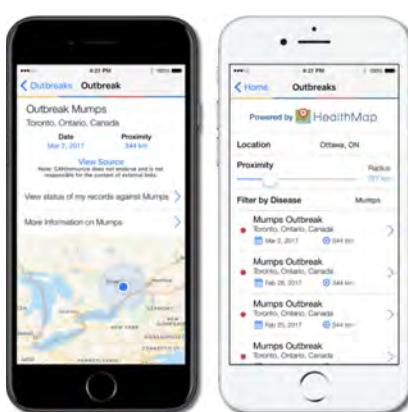
Status

Released



Sources

<https://www.canimmunize.ca/en/home>



Vaxiglobal

Zimbabwe

Note: This is not an app, this is a vaccine information management system. The vaccine administrator enters information in the system, and you get a QR code sent to your phone. This QR code is your credential.

Open or Closed

Closed

Vaccine Credentials

Yes

COVID-19 Test Results

No

Symptom Screener

No

Features

- Links with vaccine database management systems
- When vaccine is administered and entered into database, a static QR code gets sent to your phone

Status

Released

The screenshot shows the 'Update Certificate' page of the Vaxiglobal platform. On the left, a sidebar menu includes 'Dashboard', 'Doctor', 'Nurse', 'Certificate', 'Vaccination' (selected), and 'Change Password'. The main area displays 'Vaccination Info' with a table showing a single record: Vaccine (Yellow Fever), Manufacturer & Batch# (Sanofi 1991), Vaccine given by (Ahmed Clinic), Date (2-4-2020), and Action (edit and delete icons). Below this is a section with a passport photo and details: Traveller Name (Integrity Mchechesi), Passport Number (BN908833), Nationality (Zimbabwean), and Email (integritym@live.com). A large blue circular button with a plus sign is visible on the right side of the page.

Sources

<https://www.canimmunize.ca/en/home>

Accredify

Singapore

Open or Closed

Open, open source schema from GovTech Singapore

Vaccine Credentials

Yes

COVID-19 Test Results

Yes

Symptom Screener

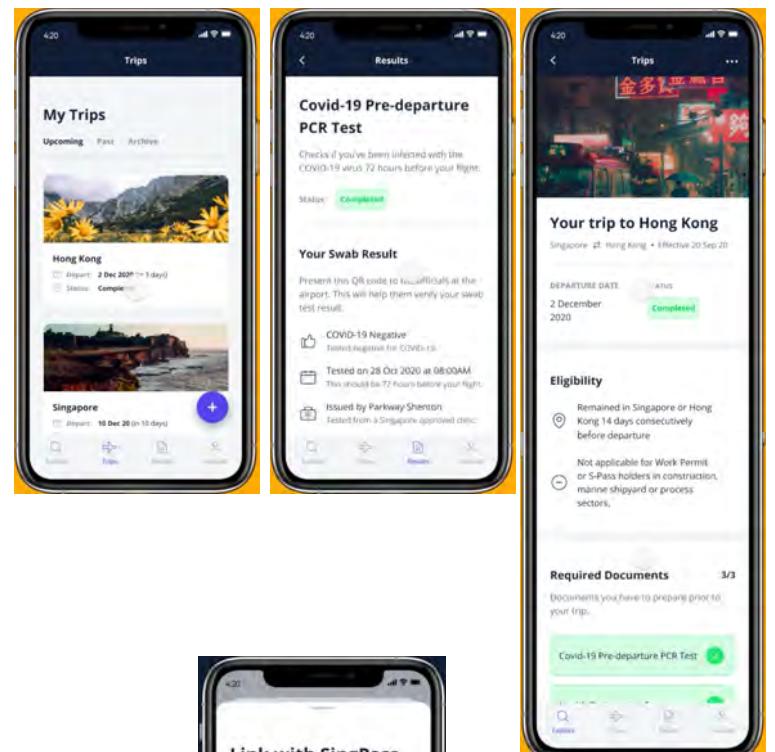
No

Features

- List of necessary medical documents needed to travel
- QR code that contains COVID-19 medical records
- Shows partner clinics with tamper-proof COVID-19 medical records
- Integrated with SingPass, clinic must use this database management system in order to integrate with the Digital Health Passport

Status

Released



Sources

<https://accredify.io/>

CLEAR Health Pass

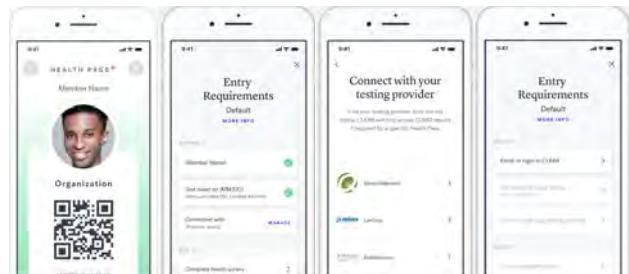
Clear

Open or Closed

Closed

Vaccine Credentials

No, but coming soon



COVID-19 Test Results

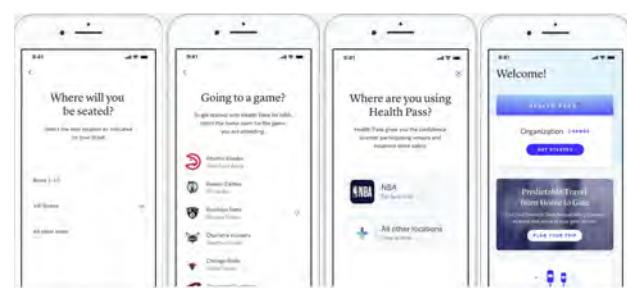
Yes

Symptom Screener

Yes

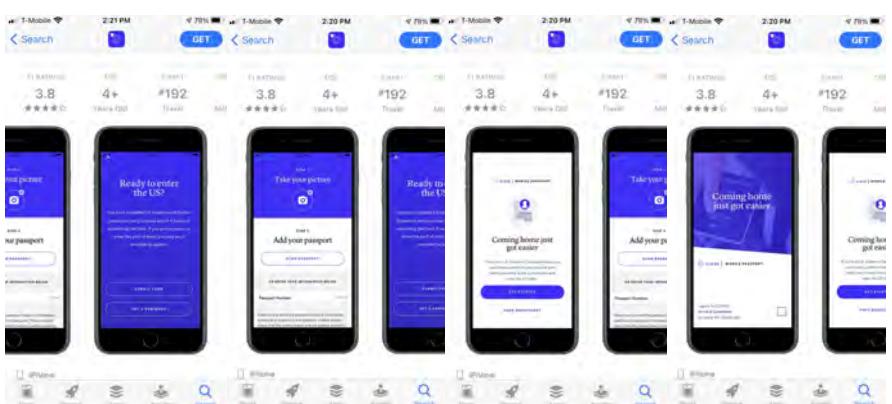
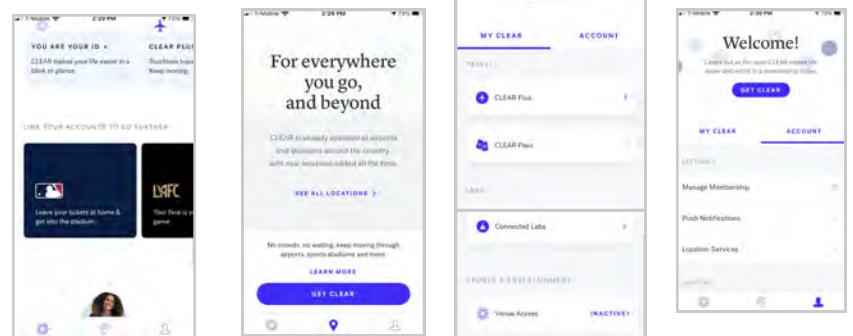
Features

- Integrate COVID-19 lab results with app
- Scanned by kiosks in participating locations



Status

Released

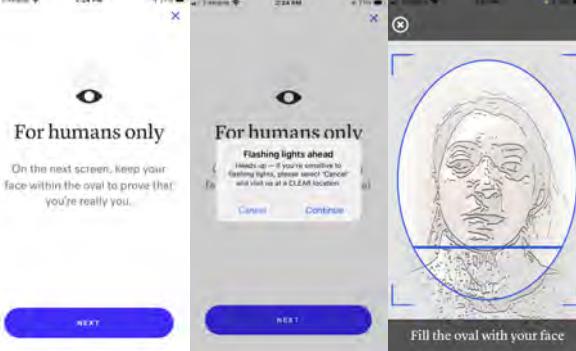
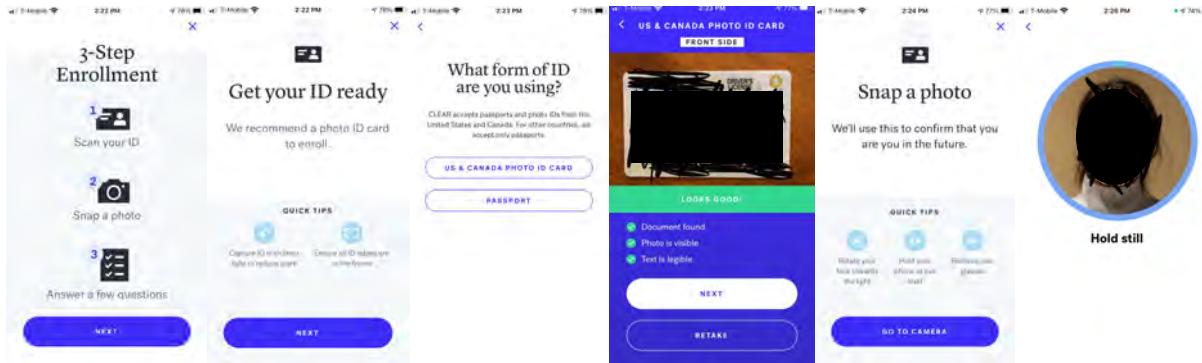


Sources

<https://www.clearme.com/healthpass>

CLEAR Health Pass (cont.)

Clear, New York, USA



Boost 19

PatchCheck Foundation

Open or Closed

Open, Creative Commons CC-BY License

Vaccine Credentials

No, to be used in concert with Paper Cred (a vaccination credential in paper format, see literature review in Paper Credential section)

COVID-19 Test Results

No

Symptom Screener

Yes

Features

- Vaccination tracker dashboard - how many people have received the vaccine
- Integrates with “check-in” app that can be used by employers to verify credentials

Status

Not Released

Sources

<https://www.pathcheck.org/en/vaccines>

VC Wallet

NHS

Open or Closed

Closed

Vaccine Credentials

Yes, but currently only available to East Kent Hospitals University NHS Foundation Trust staff.

COVID-19 Test Results

No

Symptom Screener

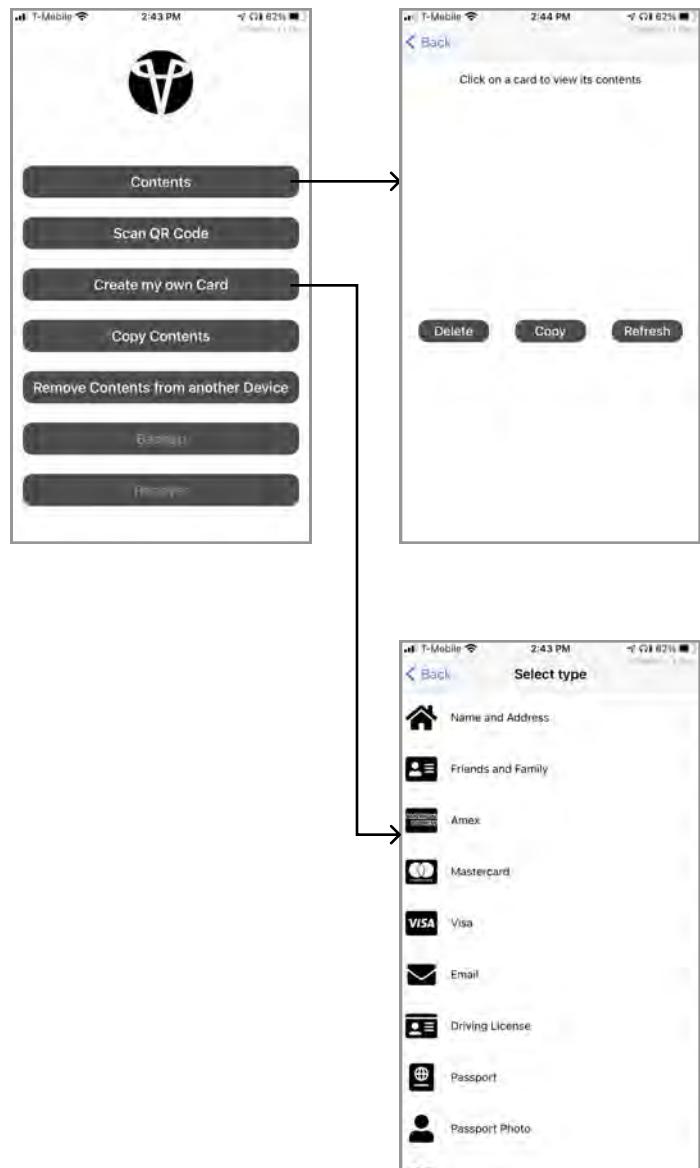
No

Features

- For available users: displays vaccine credentials using QR code
- stores other personal data such as passport, driver's license, and credit cards

Status

Released



Sources

<https://verifiablecredentials.info/>

Literature Review

Paper Credentials

Not all users who receive the vaccine will have a smartphone. In addition, not all users who receive the vaccine may want to have their credential on their smartphone. In order to make vaccine credentials accessible to all, paper credentials are also needed.

Paper Cred by PatchCheck Foundation

A product of note in this literature review is the Paper Cred. Developed by teams at IDEO and MIT, this design can be printed on a home printer and contains the QR code that links to the vaccination record. The trifold design allows the user to choose how they display their information. Depending on the institution requesting the credentials, it may not be necessary to reveal certain personal information.

Review Criteria

Open or Closed: Is the design for the paper credential open source?

Vaccine Credentials QR Code: App contains a vaccine credential verification system using a QR code..

Status: Is the paper credential currently in circulation?

	Open-Source	QR Code	In Circulation
Paper Cred	✓	✓	
CDC Vaccination Record			✓
NHS Reminder Card			✓
NHS Vaccine Certificate		✓	✓*
Yellow Card			✓

*See in-depth literature review for more information

Paper Cred

PatchCheck Foundation and IDEO

Open or Closed

Open, Creative Commons CC-BY License

Vaccine Credentials QR Code

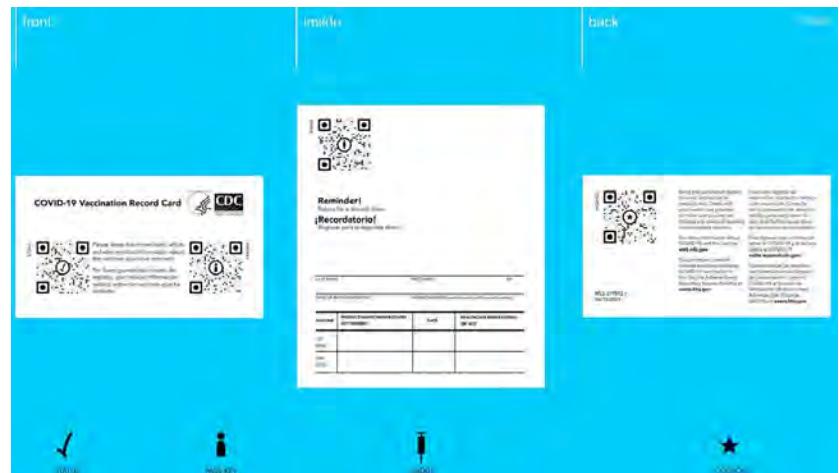
Yes

Features

- QR code is scanned at vaccination site by vaccine provider
- vaccination information will be sent to CDC
- connects to Boost-19 app (see vaccination credential mobile application literature review section maybe put page number here)
- the trifold allows the user to choose which information they want to display

Status

Not in circulation



Sources

<https://spectrum.ieee.org/tech-talk/biomedical/devices/paper-cards-and-digital-codes-target-vaccination-chaos>

CDC Vaccination Record Card

Open or Closed

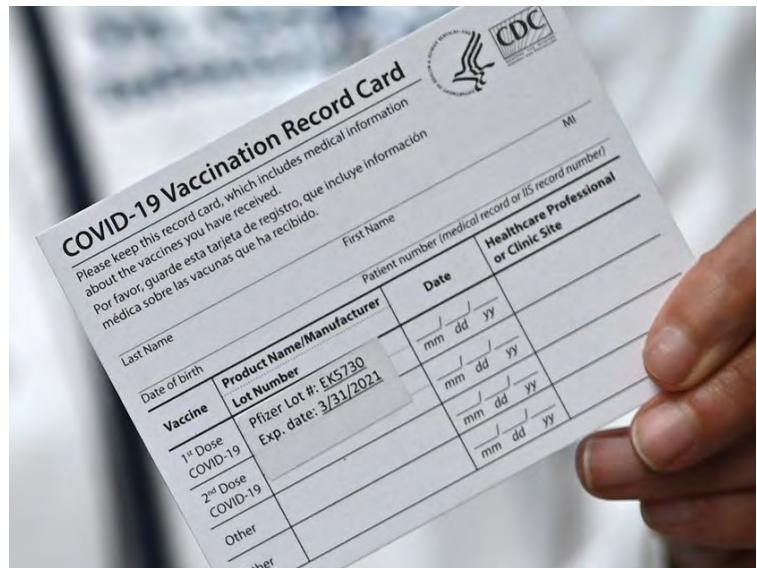
Closed

Vaccine Credentials QR Code

No

Features

- Displays name
- Displays healthcare professional or clinic site where vaccine was administered
- Displays the manufacturer and vaccine lot number
- Displays date vaccine was administered
- All information must be filled out manually by vaccine provider



Status

Currently in circulation

Source

<https://www.nytimes.com/article/covid-vaccine-card.html>

NHS Reminder Card

Open or Closed

Closed

Vaccine Credentials QR Code

No

Features

- Displays name
- Displays the manufacturer and vaccine lot number
- Displays date vaccine was administered
- All information must be filled out manually by vaccine provider

Status

Currently in circulation



Source

<https://inews.co.uk/news/health/covid-vaccine-card-what-nhs-vaccination-cards-immunity-passport-explained-785544>

NHS COVID-19 Vaccine Certificate

Open or Closed

Closed

Vaccine Credentials QR Code

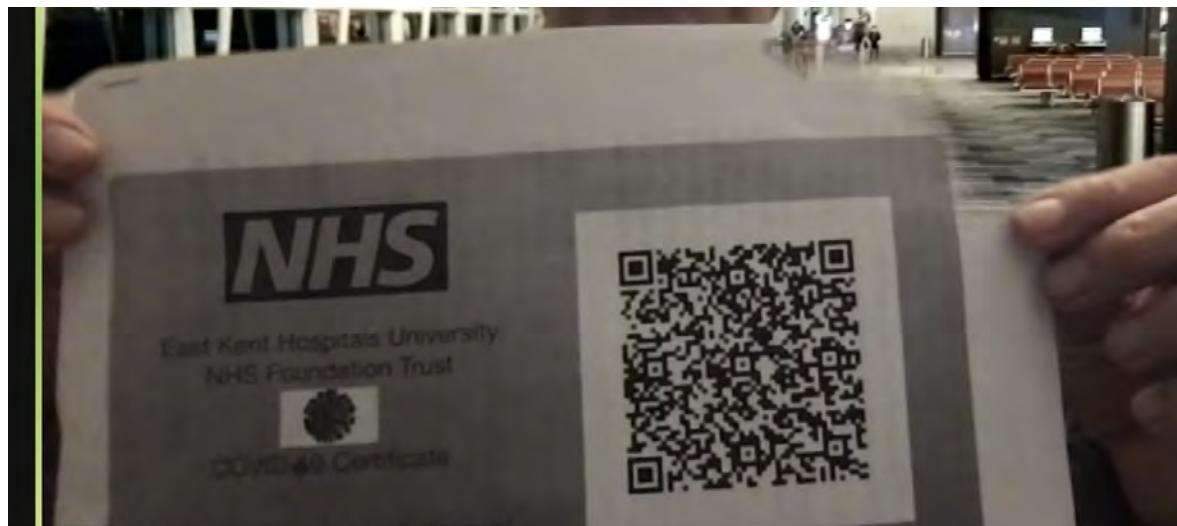
Yes

Features

- Provides selective disclosure of any of the following vaccination details as determined by the verifier's policy: Patient NHS Number, Patient name, Vaccine name, Vaccination Centre (where vaccine administered), Dose number (1 or 2), Batch Number and Date of last vaccination
- The information is fetched dynamically on demand from the NHS's vaccination database, so it is always up to date.
- To be used with the VC wallet system (see mobile credential literature review section for app information)

Status

Currently the complete system is only available to East Kent Hospitals University NHS Foundation Trust staff.



Source

David Chadwick, CEO Verifiable Credentials Ltd

International Certificate of Vaccination or Prophylaxis (Yellow Card)

World Health Organization

Open or Closed

Closed

Vaccine Credentials QR Code

No

Features

- Displays name
- Displays healthcare professional or clinic site where vaccine was administered
- Displays the manufacturer and vaccine lot number
- Displays date vaccine was administered
- All information must be filled out manually by vaccine provider

INTERNATIONAL CERTIFICATE OF VACCINATION OR PROPHYLAXIS						CERTIFICAT INTERNATIONAL DE VACCINATION OU DE PROPHYLAXIE		
This is to certify that [name] Umar Khan date of birth 23 May 1968 sex Male nationality British national identification document, if applicable whose signature follows : Dr. Khan						Nous certifions que [nom] _____ né(e) le _____ de sexe _____ et de nationalité _____ document d'identification national, le cas échéant dont la signature suit : _____ a été vacciné(e) ou a reçu des agents prophylactiques à la date indiquée contre (nom de la maladie ou de l'affection)		
in accordance with the International Health Regulations.								
Vaccine or prophylaxis Vaccin ou agent prophylactique	Date Date	Signature and professional qualification of medical practitioner Signature et titres cliniques responsables	Manufacturer and batch number of vaccine or prophylactic Fabricant et numéro de l'agent prophylactique et numéro du lot	Certificate valid until Certificate valid à partir du _____ jusqu'au _____	Official stamp of the issuing authority Cachet officiel du comité émissaire			
Poliomyelitis	11 June 2014	A. N. Other RGN	Sandoz Pasteur XX - XXX	11 June 2014 10 June 2015	Practice Stamp			

Status

Currently in circulation

Source

https://www.who.int/ihr/ports_airports/icvp/en/

Use Cases

Vaccine credentials may not be the only line of defense in stopping the pandemic. Consistent symptom checking will continue to play an important role in virus prevention.

The following use cases have been split into 4 categories: high frequency, high traffic; low frequency, low traffic; low traffic, high frequency; and low traffic, low frequency (see Figure 1). These scenarios affect the level of scrutiny and information on the app. For example, a high traffic area that isn't frequented often may require that the user submit information prior to entering the high traffic area. In cases where users are in high traffic, high frequency areas such as a public transit station, it's essential that any credential can be presented swiftly and efficiently.

Some establishments may not have the funds or IT infrastructure to install QR code scanners. Scenarios where no QR code scanners are available have been included.

Additional Considerations

Many of these use cases are dependent on other precautionary measures in addition to receiving the vaccine. For example, masks are generally required (depending on state regulations) in all areas listed in Figure 1. It is assumed that masks will still be required in these areas until the virus is declared to be contained.

No credentials are required for the grocery store at this time.

Planned Revisions

Planned revisions may include integrations with third party systems. For example, Ticketmaster is working with CommonPass to require vaccination credentials in order to generate the ticket.

For users that may not have any form of identification

For high frequency areas, IDs will not be required due to the virus spread being low when everyone in the vicinity is wearing masks. In addition, many of these high frequency areas are considered essential for all members of the population to access.

In areas of low frequency, unique codes will be sent to the vaccinated person prior to entering the establishment.

Establishments that are requiring vaccination credentials should note that an ID should not be necessary, although it can speed up the process if an ID is submitted during set-up. If identification must be verified, this can be indicated when the establishment sets up their credential verification system. When that establishment's QR code is scanned and the user has not submitted an ID, a screen with their photo will appear alongside the credential.

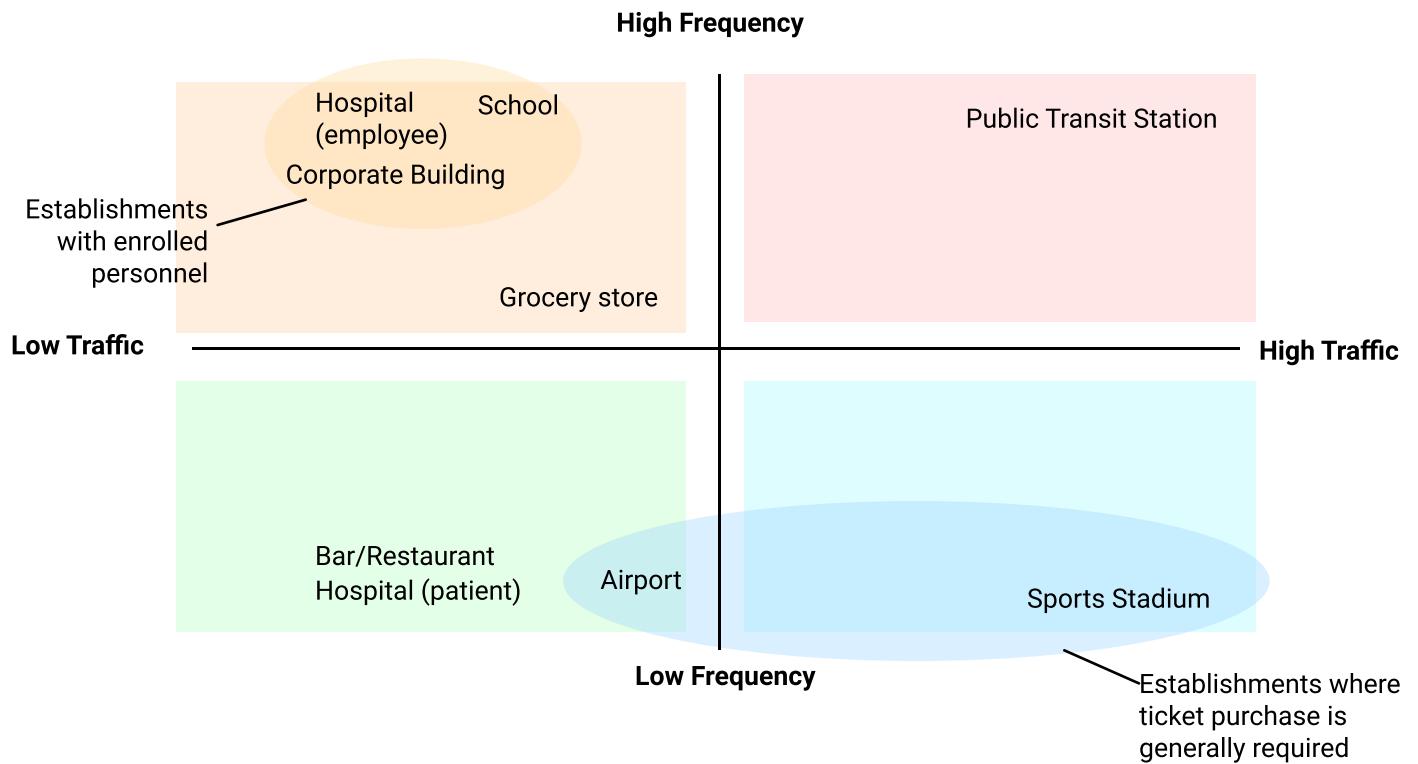
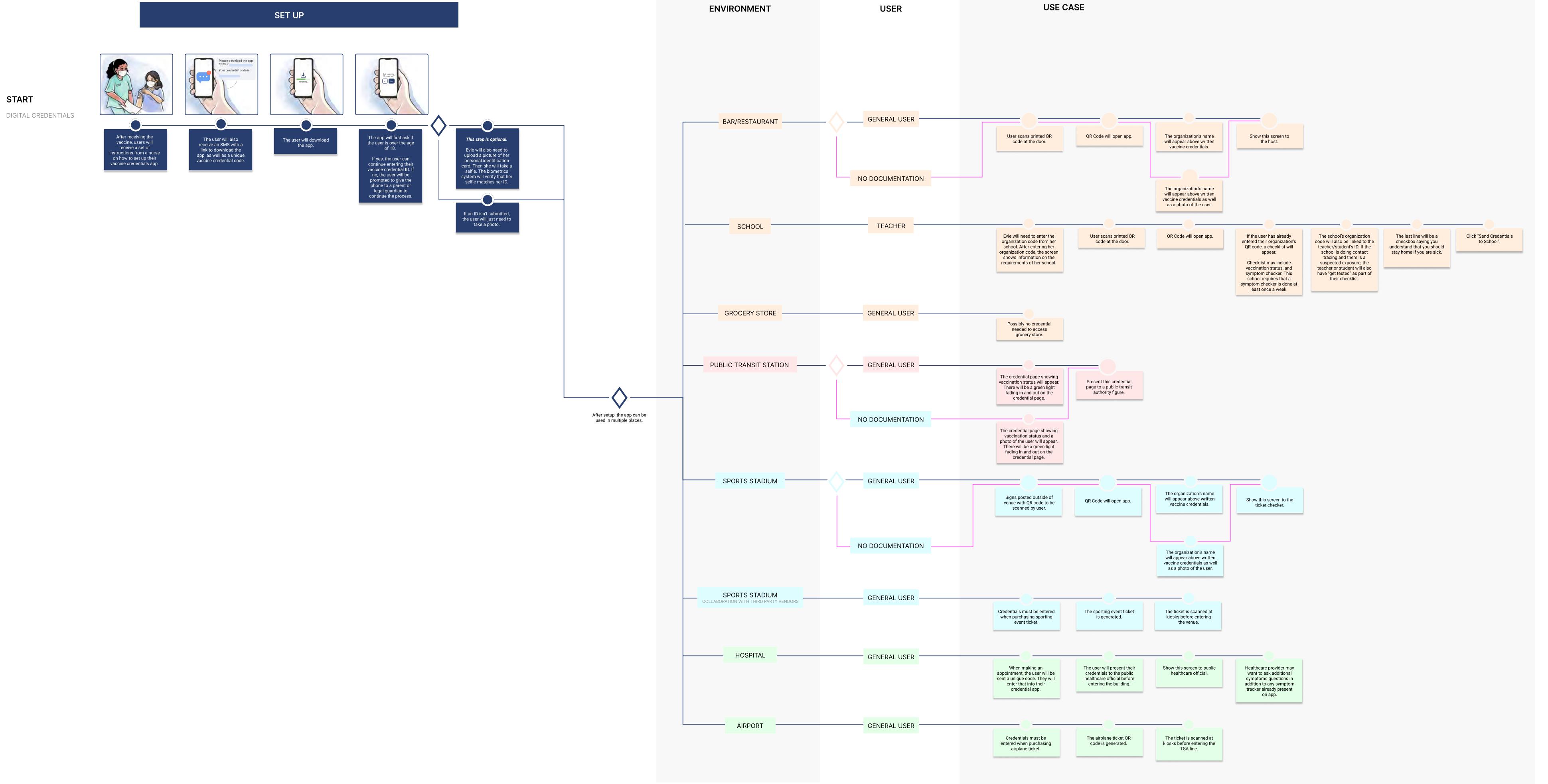


Figure 1: Common establishments frequented by a large number of people at a given time, ranked by rate of frequency and traffic.



User Survey Results

Background and Objectives

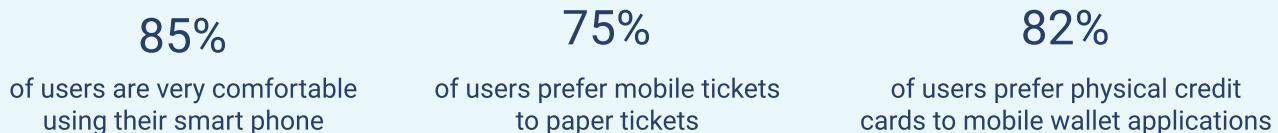
The purpose of this survey was to identify pain points smart phone users experience when using mobile tickets and mobile wallets. These two applications contain features and use cases that are similar to a vaccine credential application. Some of these features and use cases include but are not limited to:

- Used in situations of heavy traffic where user is in a long line of people and pass must be shown quickly
- Contains multiple tickets/credit cards that the user must select when making a transaction
- Mobile tickets contain a QR code or bar code that must be scanned swiftly to enter an establishment

In addition, the goal of this survey was to better learn user's habits around carrying paper tickets and transit cards. The method that they carry their ticket or card may provide insight into how a paper credential can integrate into the user's day-to-day life. Some concerns around paper credentials are damage or misplacement, and we would like to mitigate these concerns from our findings.

Users were asked questions that compared their experiences between mobile airplane tickets vs. paper airplane tickets and mobile wallet applications vs. physical credit cards.

Executive Summary



Users may prefer mobile airplane tickets to paper because their smart phones are already an essential item, whereas a paper ticket is an extra item to keep track of. Users were asked why they would choose mobile airplane tickets over paper airplane tickets and vice versa. 73% of users choose mobile tickets or paper tickets in part because they won't forget it at home. However only 3% of users will choose paper tickets for this reason. In addition, 68% of users reported that it's easier to carry mobile tickets.

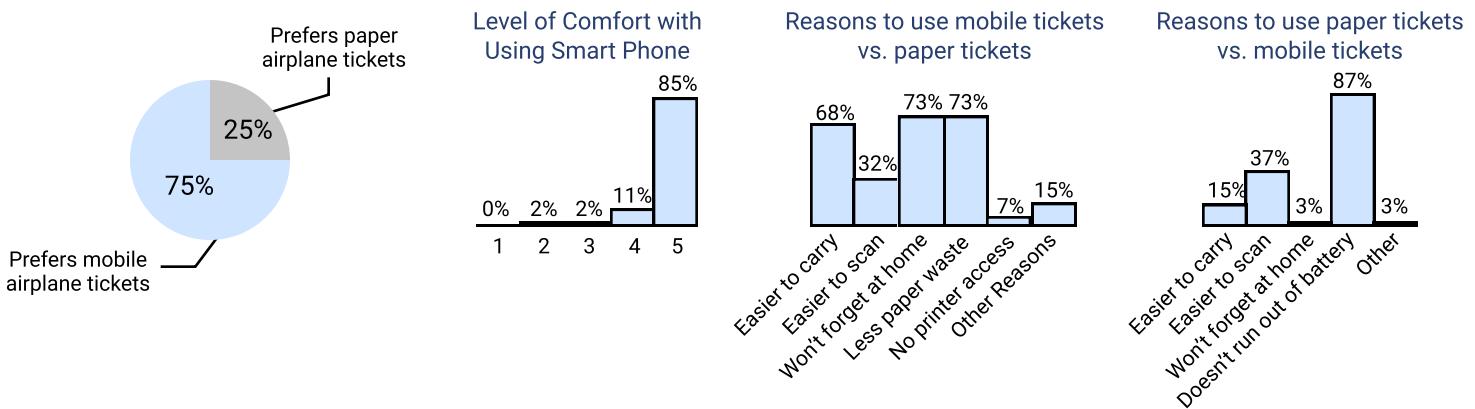
Mobile Wallets vs. Physical Credit Cards

Although a third of users felt very comfortable using their mobile wallet, half of them still opted to use physical credit cards. Some users mentioned they were concerned about the privacy of mobile wallets. Many users also commented that using physical credit cards was out of habit. Perhaps since users typically use airplane tickets less frequently than credit cards, the transition to mobile airplane tickets was not disruptive. However, the frequent usage of credit cards has become a habit, and the benefits of a mobile wallet do not outweigh the effort of changing a habit.

Almost all users within each age group except for 35-44 preferred mobile airplane tickets and physical credit cards. The 35-44 age group preferred printed tickets but a mobile wallet.

Detailed Findings

Mobile Airplane Ticket vs. Paper Ticket Usage

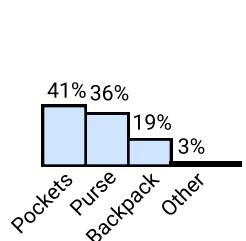
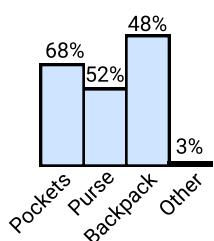


User Comments on Drawbacks of Mobile Tickets

"It's hard to find the actual ticket."
 "My phone almost died and I didn't have internet."
 "Your phone locks and the app closes and you lose the ticket for a moment."
 "Sometimes the app doesn't load on time. It's anxiety inducing to make sure your screen is on and ready instead of just holding a paper ticket."
 "Turning up the brightness."

Paper Ticket Usage

Methods of Carrying Belongings Without Holding a Paper Ticket

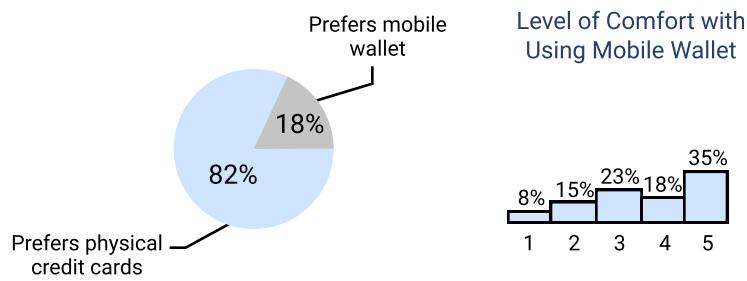


Note: The format of these two question was not consistent. A direct comparison of figures is inconclusive.

User Comments on Carrying Paper Tickets

"I want to keep the paper ticket safe. There is one quick pocket on my backpack, that's where I keep important things that I need in a hurry."
 "I keep mine in my wallet/pockets for easier access."
 "I usually put paper tickets somewhere they can be kept flat."

Mobile Wallet Usage



Why Users Choose Physical Credit Cards over Mobile Wallets

- "Not all places have mobile wallet capabilities."
- "I don't want cards on an app."
- "Habit."
- "Not used to it."
- "I often can't find stuff in my mobile wallet."
- "I'm scared of hackers."
- "I don't see mobile wallet as an improvement on physical credit cards."

18%

mentioned they won't switch from physical credit cards because of habit

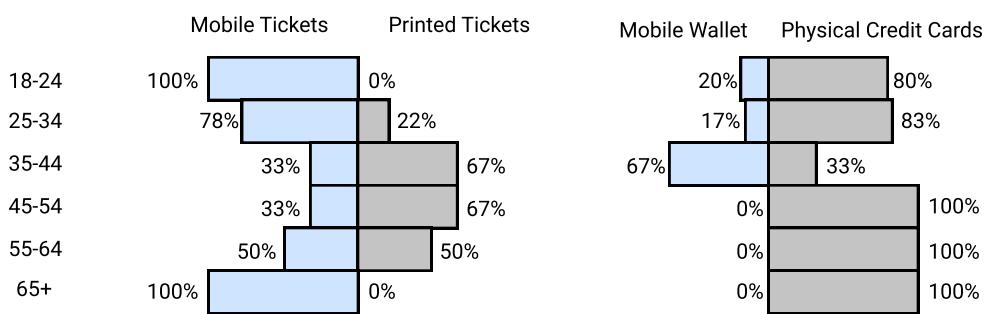
18%

were worried about privacy or hackers

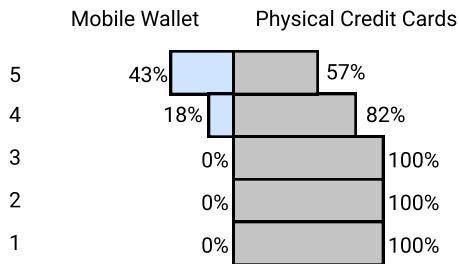
What Users Would Change About Their Mobile Wallet

- "Make it easier to find what I'm looking for."
- "Apple wallet is bulky and saves coupons/rewards cards so weirdly. It's easy to forget they're there."
- "Shortcut to open app and get to credit card."

Mobile Airplane Ticket and Mobile Wallet Users by Age



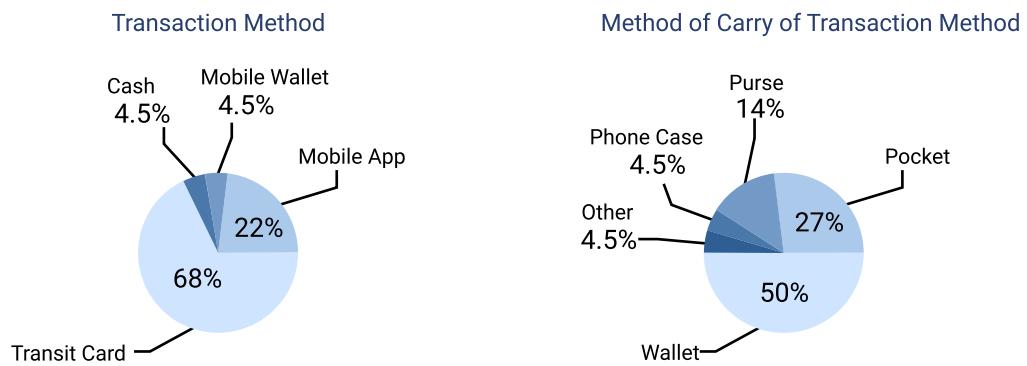
Mobile Wallet vs. Physical Credit Card Preference Based on Level of Comfort with Mobile Wallet Application



Transaction Methods Used to Board Public Transportation

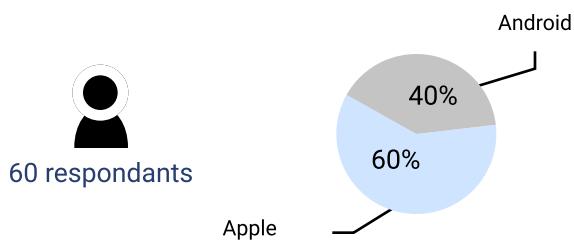


Respondants who did not regularly use public transportation were screened out.



Methodology

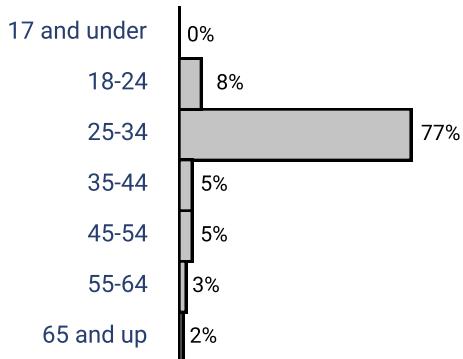
Respondants who were not planning on receiving the COVID-19 vaccine were screened out.
If the user did not have a smart phone, they received a different set of questions that focused on paper tickets only.
However, every respondent owned a smart phone. Please note that race or ethnicity was not a demographic question.



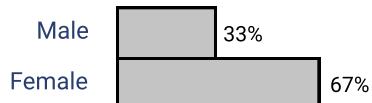
GEOGRAPHICAL LOCATION



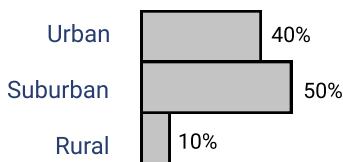
AGE



GENDER



GEOGRAPHICAL CLASSIFICATION



Conclusion

Overall, respondents who were comfortable using their smart phone seemed quite comfortable using mobile airline tickets. Users that were comfortable using their smart phone most likely possess the ability to adapt to mobile wallets if there was a specific use case where mobile wallets were necessary. Participants feel that the advantages of the electronic alternative must outweigh the disadvantages of changing a non-electronic habit in order to switch to mobile wallets.

Acknowledgements

These survey results were made possible by the respondents, both anonymous and known, who agreed to partake in this survey without compensation.

In addition, thank you to the Linux Foundation Public Health for providing a platform to share these results.

Paper Credential Design Criteria

The current CDC cards cannot serve as valid vaccine credential because they can be easily replicated. A credential that contains a unique QR code can verify that the user has been vaccinated while maintaining the private health and personal information of the user.

The scope of this report does not cover the backend development required to create the QR code. PathCheck is developing an open source QR specification that can be viewed on [GitHub](#).

Desired Features Based on Survey Insights and Research

In the previous survey, users commented that they keep paper tickets in places where they will be kept safe from damage. Furthermore, users that typically carry their belongings in their pockets will switch to a backpack in order to safely carry their ticket. It's important to note that paper tickets are carried for temporary events, and paper vaccine credentials may need to be carried on a daily basis.

The paper credential should have a QR code for the purposes of unique identification and defense against falsification. Designers should consider a photo of the user in addition to the user's name as opposed to personal information. In some cases, users may not want to provide personal information, and the photo and QR code should suffice in confirming that the credential holder matches the credential.

QR Code Criteria



Source

[QR Code Distance](#)

[6 Reasons Why Your QR Code Isn't Working](#)

Analysis of Paper Cred by PatchCheck Foundation and IDEO

The tri-fold style of this paper credential is intended to protect the user's privacy. The last panel can fold outward and the front flap can fold over the middle panel to cover up personal information.

The paper credential features are called out in the photos below.



Recommendations for Improvement

A paper credential design that can easily fit in a wallet will best integrate into the user's life. As we learned from our survey, personal items are most commonly kept in wallets and held in pockets or purses. It can be inferred from the results that since tickets are not properly sized to fit in wallets, the user must change their method of carrying their personal belongings in order to keep it safe from damage.

In order to adapt to wallet size, the Resource Page may need to be removed or modified. In addition, it is unclear as to why multiple QR codes are needed. It is recommended to have one QR code that is linked to the user's vaccination status.

Considering eliminating all personal information from the paper credential except for a name and photo.

Source

<https://spectrum.ieee.org/tech-talk/biomedical/devices/paper-cards-and-digital-codes-target-vaccination-chaos>

Mobile Application Credential Design Criteria

Data Elements and General Criteria

As seen in the paper credential design criteria, it's important to only show the necessary data. The hierarchy of essential information will start with the QR code unique to the user that verifies their vaccination status. The next sets of essential data will include personal identifying information and a photo. During the onboarding process of using the app, the user should be required to upload a photo of themselves. Once the onboarding process is complete, they cannot change this information. Again, requiring official documentation should be eliminated.

The user's unique QR code should be prominent on the page and easy to find. QR code will automatically generate from uploading the vaccine credential. The app should also allow users to upload COVID-19 test results and symptom checks, as many establishments may require these items in addition to immunizations. The QR code will also regenerate when these items are uploaded. The backend system of this application will allow the administrative user to input their criteria for allowing users to enter their establishments.

There are two possible features that could ensure validity. The first is that the QR code page will have an animated element that will prevent the code from being easily screenshot. It is recommended that the animated element fade in and out. However, many phones are now capable of screen recording. The second line of defense to ensure validity is that the QR code will automatically regenerate every day.

At this time, there are no existing government policies that dictate what information needs to be shown at certain establishments. **The data elements that appear in the following low fidelity wireframes are purely conceptual. Please note that these wireframes do not represent a high fidelity, production worthy design.**

How is vaccine information uploaded into the app?

Currently, there is no central vaccine management system. Many immunizations are kept in state health records. For the COVID-19 vaccine, records may continue to be kept by the state, but this varies state by state. At the very least, the clinic where the vaccination was given will have a record who was vaccinated at their site. With the backend of this credential app, the administrative user on the clinician side can generate unique codes to be sent to vaccinated patients. The disadvantage of this process is this doesn't guarantee that everyone will be successfully notified. If you have any insight on this data collection process, please contact hello@goinvo.com.



Vaccine Credential Code (Concept)

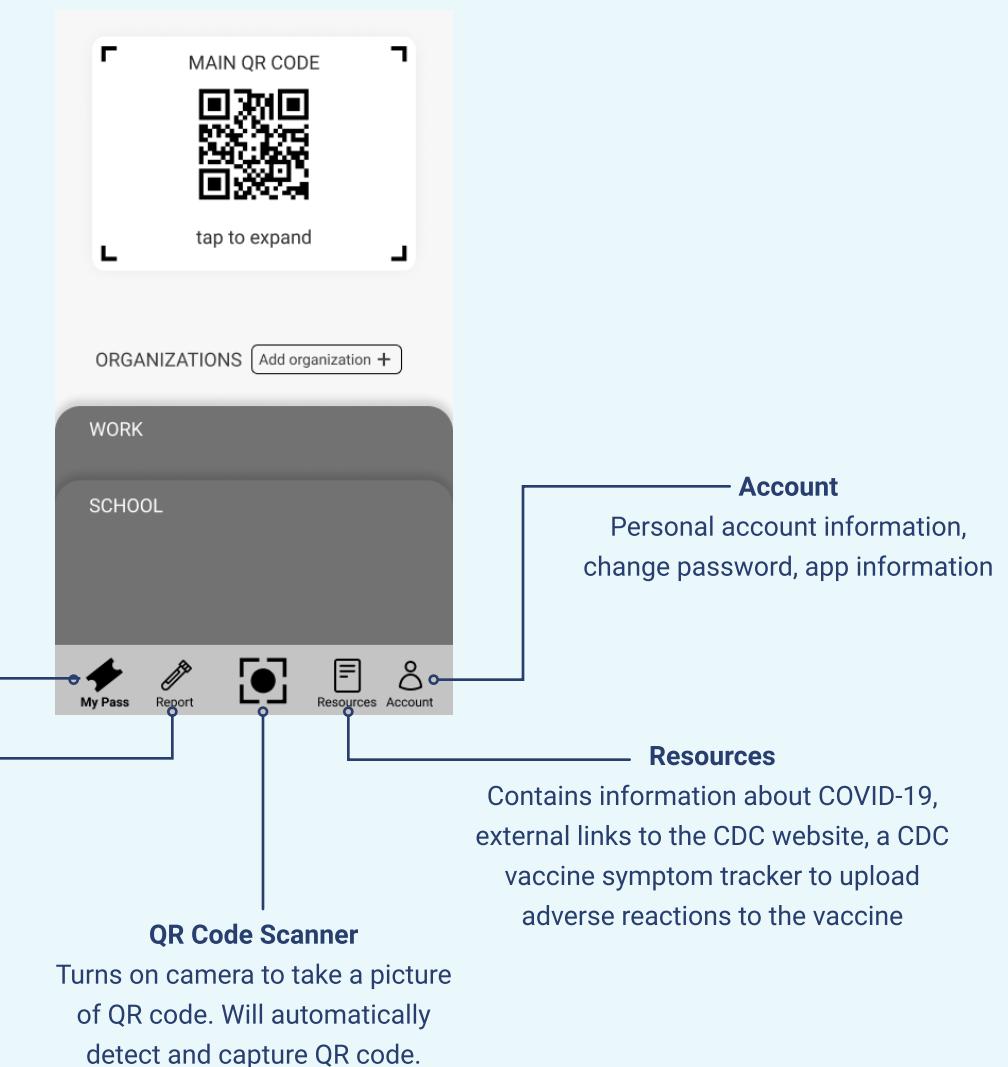
A unique ID given to all vaccinated users that can only be used one time during the onboarding process.

Mobile Application Credential Design Criteria

Dashboard

It is recommended to have a navigation bar across the bottom of the app. This menu format allows the user to easily identify all information available to them on the app at all times. The default home page should contain the user's QR code.

Suggested Navigation Bar Items



Mobile Application Credential Design Criteria

Criteria Based on Use Cases

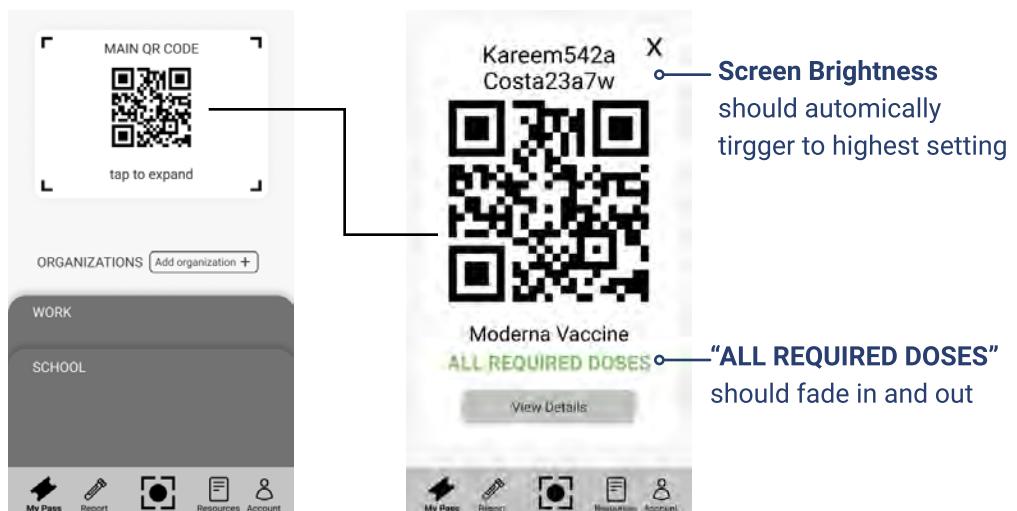
Earlier in this report, several use cases based on the user and the environment were outlined. Most users will experience one of 3 use cases:

- The user is at an establishment that possesses a QR code scanner. The user will need to scan their QR code and the backend system will verify the code.
- The user is at an establishment that doesn't have a QR code scanner. The user will then scan a QR code that the establishment printed on a piece of paper. The establishment does not require any information in addition to a vaccination status (i.e. symptom check, COVID-19 test)
- The user is at an establishment that doesn't have a QR code scanner, but does require more information in addition to vaccination status (i.e. symptom check, COVID-19 test)

The following pages will review the app interface for each use case.

QR Code is Scanned by Organization or Establishment

The user is at an establishment that possesses a QR code scanner. The user will need to scan their QR code and the backend system will verify the code. The QR code will contain all information regarding vaccination status, symptom checks, and COVID-19 tests that have been uploaded by the user.



Mobile Application Credential Design Criteria

QR Code is Scanned by Organization or Establishment (cont.)

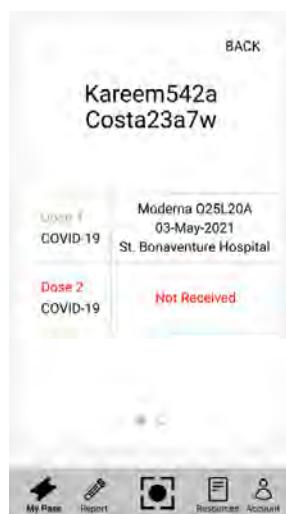
When the QR code is tapped to expand, there will be an option to view details about the received vaccination and the user. This information is not displayed along with the QR code to protect the user's privacy. Furthermore, the user's personal information is not on the same page as the vaccination information.

The figure displays three mobile application screens. Screen 1 shows a QR code for 'Kareem542a Costa23a7w' with the text 'Moderna Vaccine ALL REQUIRED DOSES' and a 'View Details' button. Screen 2 shows 'Vaccine Information' for 'Dose 1 COVID-19' (Moderna O25L20A, 03-May-2021, St. Bonaventure Hospital) and 'Dose 2 COVID-19' (Moderna O25L20A, 03-June-2021, St. Bonaventure Hospital). A line connects the 'View Details' button on Screen 1 to the 'Dose 1' section on Screen 2. Screen 3 shows 'User's Personal Information' with fields for Birth Date (02/07/1975), Height (5' 8"), Eye Color (Brown), and Sex (M), along with a placeholder 'photo'.

Screen 1
QR Code

Screen 2
Vaccine Information

Screen 3
User's Personal Information

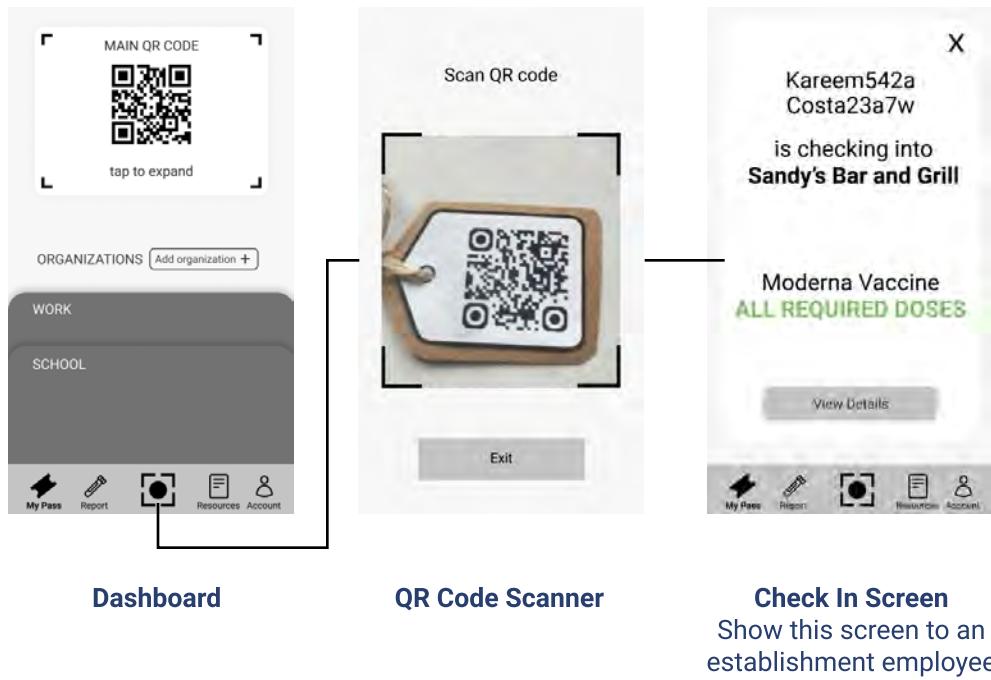


Alternative Screen 2

Mobile Application Credential Design Criteria

User Scans QR Code Provided by Organization or Establishment - No Information Required Other Than Vaccination Status

This user flow is necessary when the establishment does not have a QR code scanner but needs to verify the user's vaccination status. The establishment will provide a printed QR code on a piece of paper. When the user scans the QR code using the app, a page will open with the user's name and the name of the establishment. The administrator for the establishment will specify the establishment name they want shown on the user's app.



Dashboard

QR Code Scanner

Check In Screen

Show this screen to an establishment employee

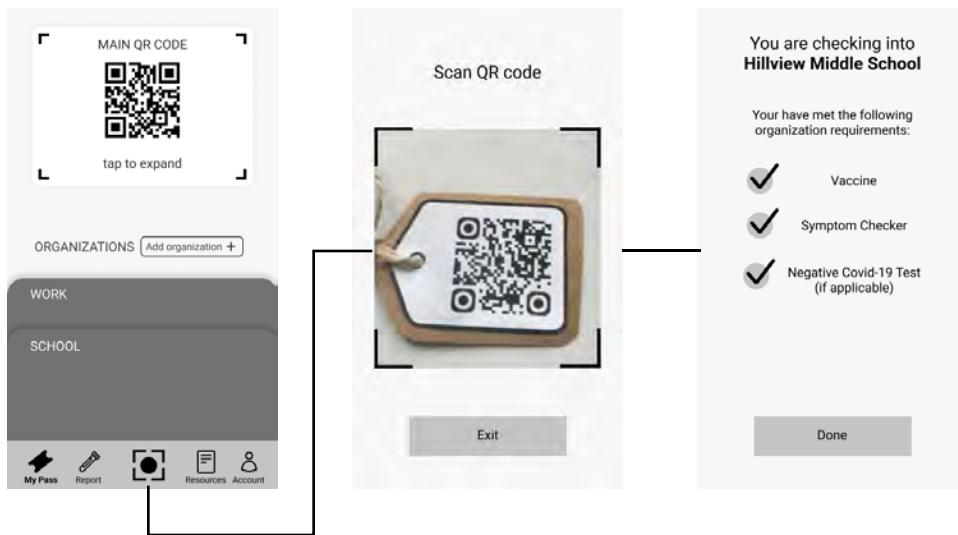
Mobile Application Credential Design Criteria

User Scans QR Code Provided by Organization or Establishment - Information in Addition to Vaccination Status Required

This user flow is necessary when the establishment does not have a QR code scanner and more information in addition to a vaccination status is required. An example where this use case is needed is at a school. Schools generally require that their students and teachers have multiple requirements satisfied: negative covid test, symptom check, etc. When scanning into the school, you will need to have this checklist of requirements complete.

For these more specific cases, you can add this organization by using an organization code. The user will receive reminders if items in the organization's checklist of requirements are missing. This checklist of requirements can also apply to airlines or countries that also have specific requirements to enter. Ideally when the user purchases their ticket, they will receive a code that can be entered into the app to show these requirements.

In the case that a specific ticket is needed (whether it be to fly or to enter a venue), the designer may also consider directly adding these tickets to the credential app.

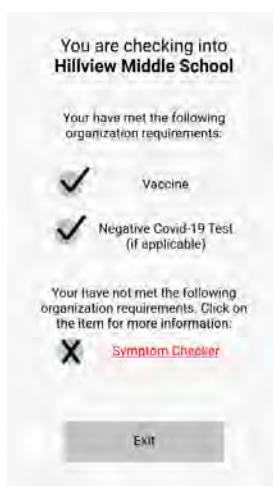


Dashboard

My passes contains specific requirements from organizations that are added by the user.

QR Code Scanner

Establishment Requirements



Establishment Requirements Alternative Screen