Designing COVID-19 Immunity Certificates: Interviews with Service Providers

DESIGNING COVID-19 IMMUNITY CERTIFICATES

INTERVIEWS WITH SERVICE PROVIDERS

REPORT version 1

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1. Introduction

The COVID-19 pandemic originated from Wuhan, China in Dec 2019. The epidemic started rapidly spreading in the following months and was declared a pandemic by WHO on 11 March 2020 while counties struggled to control the spread of the SARS-CoV-2 virus. The lack of prior knowledge about the virus, its quick spread, the lack of available vaccines and clinically approved treatment plans, as well as slow reactions from many national health systems were some of the key reasons that contributed to an unprecedented situation for humanity (Knight, 2020). In March 2020, the UK government implemented the first national lockdown as part of a series of measures to control the spread of the virus. This first lockdown was followed by other lockdowns and new social distancing rules until July 2021 (GOV.UK, 2021). As a result of these lockdowns and social distancing rules, a significant number of businesses were negatively impacted and either stopped operating or had to limit their operations. The re-opening of the economy was necessary for many businesses to survive. However, a return back to normality had to happen gradually taking into account the epidemiological situation both at a national and local level. As part of this gradual return businesses had to adapt themselves to constantly changing epidemiological needs and implement several protective measures ranging from social distancing (e.g. 2 meter rule) and the mandatory use of masks indoors to the implementation of immunity certificates.

To date, immunity certificates (or passports) have been widely used and become mandatory for international travel in the aviation industry. Currently, there are different examples of implementing immunity certificates for international travel. For instance, the European Union's Digital Covid Passport (EU, 2021), IATA Travel Pass Initiative (IATA, 2021; Memish *et al.*, 2021), Delta-Virgin Airlines' Fly Ready (Virgin Atlantic, 2021) and UK' NHS Covid App (NHS, 2021) are some of these examples that have been implemented to enable safe travel after the relaxation of social distancing rules (EU, 2021; IATA, 2021; Virgin Atlantic, 2021). While, the use of immunity certificates has become necessary and mandatory for international travel from and to the United Kingdom, yet their use domestically is still optional with service providers being responsible for making a decision to implement these in their own businesses.

The present report documents the results of a series of interviews that aimed to understand the implementation of immunity passports from the service providers perspectives and investigate their concerns and key implementation challenges. In-depth semi-structured interviews were conducted with 9 experts from different industries. These interviews followed the results of a series of focus groups that aimed to explore public's key concerns, risks and unintended consequences of immunity certificates/passports without getting into much depth about the needs of service providers. Participants in the interviews represented the cultural, travel, sport and event sectors and they were purposively selected from to represent these specific sectors of economy because immunity certificates could be crucial to help businesses

from these sectors return back to normal. This is because these industries might unavoidably involve people gathering indoors and maintenance of other protective measures (like social distancing or use of face masks) is not feasible. Therefore, the main purpose of the immunity passports will be to provide a safe environment for people to enjoy social events or travel and for businesses to return back to a sense of normality without compromising public safety.

2. Aim and research questions

The overall aim of this research was to explore the implementation of COVID-19 immunity passports (also referred to as health certificates) from the service provider side. Specifically, we aimed to address the following research questions:

- What are the perceived key challenges and pain points related to the implementation of immunity passports into existing business workflows and day to day operations?

3. Methods

To address the aforementioned questions we interviewed nine representatives of businesses representing different industries. Semi-structured interviews were selected as the most appropriate interviewing approach. A list of questions that were part of the interview plan is presented in Appendix A. Interviews were conducted between May and July 2021 and ended in July 2021.

Participant number	Affiliation	Responsibility
Participant 1	Theatre	Chief Executive
Participant 2	Airline	Head of Customer Experience
Participant 3	Aviation consultancy	Senior Consultant Innovation
Participant 4	Hospitality / Tourism	Head of Research and Evaluation (International)
Participant 5	Hospitality / Tourism	Head of Research and Evaluation (Domestic)
Participant 6	Events	Events Management Expert
Participant 7	Sports Venue	Managing Director
Participant 8	Airport management	Head of Passenger Services
Participant 9	Hospitality / Tourism	Senior Events Manager

Table 1 Participant List and Responsibilities

A purposive sampling strategy was used to select experts from each industry, and the recruitment had been done with emails sent to senior management teams in different industries. All interviews were conducted through online conferencing with Microsoft Teams which is a university-approved online conference channel. Interviews lasted approximately 40 minutes to one hour. A sample of the participants from different industries is shown in Table 1. Industries represented in the interviews included:

- Transport Providers: airport and airlines
- Tourism and Hospitality Industry: Tour Operators & Travel Companies
- Cultural Sector
- Sports Industry

Selection of participants from the different industries is not balanced. For example, there were more representative from the Transport and tourism sectors as opposed to cultural or sports. This happened for two reasons. First, the interviews followed a series of focus groups and workshops in which we also involved representatives from different businesses. Therefore, the interviews were purposefully targeting industries for which additional data collection was necessary. For example, several representatives from the cultural sectors had participated in both focus groups and workshops as opposed to representatives from the tourism and transport sectors. Second, we decided to stop recruiting participants when we felt that data collected from the interviews reached thematic saturation.

Data collected from the interviews were transcribed manually (partly using the transcription service provided from MS Teams) and analysed thematically.

4. Findings

As it is shown in Table 2 six main factors affecting the implementation of immunity passports emerged from the analysis of the interviews. These were: the purpose and concept of an immunity passport, business models, key stakeholders, implementation process, costs, and functions and features. Within these broad themes several sub-themes representing key pain-points that affect the implementation of immunity certificates were identified. These are based on frequent and intersecting comments of participants from different industries. Note that not all key themes are mutually exclusive but interrelated. For example, some of the themes such as costs, and functions and features were areas that participants found crucial for the implementation process. However, because they represented areas of high importance, in Table 2 are shown as individual themes. The remainder of this section discusses the findings relevant to each theme in more detail.

Purpose and Concept	**Business Model Factors**	**Key Stakeholders**
• Health & Safety • Legal Requirements • Return to Normal Strategy • Benefits: safety, assurance, opening businesses	• Organisational Characteristics • Customer Characteristics • Stakeholders: Support Channels and Partners	• Government (Policy Maker and support) • Tech Companies • Supporting Sector Organisations • International Collaborations
Implementation Process	**Costs**	**Functions and Features**
• Operational Implementation: Workflow Customisation Staff requirements • Implementation Stages: Purpose Unified Approach Stakeholder Collaboration Consistency	• Non-financial Costs: Time Operations Space • Financial Cost: New Technology Operational Staff	• Key Features • Type of Technology, Format and Software • Data and Data Capture • Accessibility • Area of Validity

Table 2 Emerging themes from service providers' interviews

4.1. The Purpose and Concept of Immunity Passports

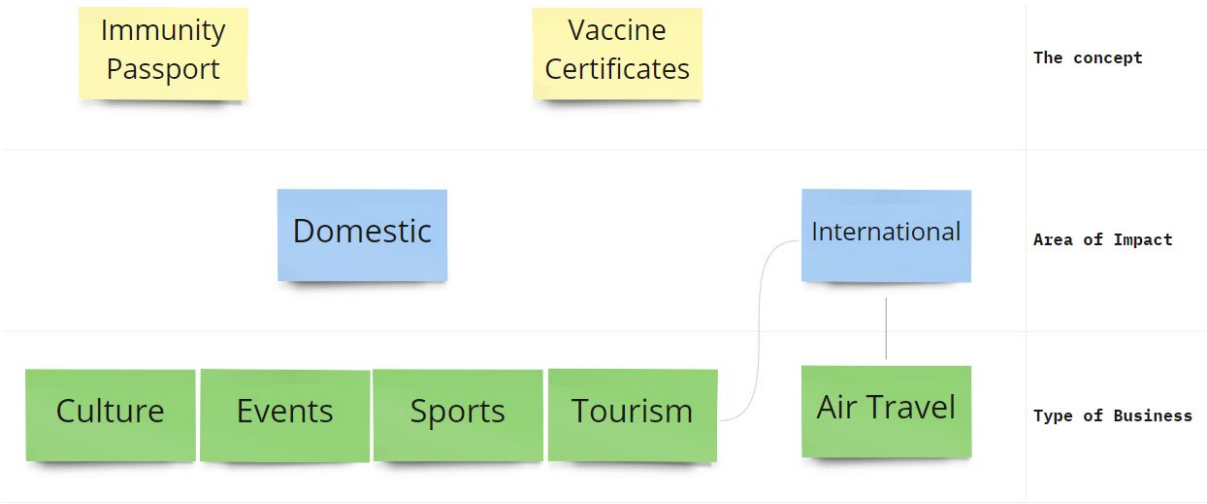

Figure 1 The concept and the supplier/business type

There is an agreement on the main purpose of the immunity passport which is to provide health & safety to customers. Another reason is to reassure people that they are protected and make them feel safe when using their services. Lockdowns and social distancing measures negatively impacted businesses; therefore, service providers are focusing on a return to normality while providing a safe environment and assurance to their customers. They aim to create a healthy environment and increase customers' attendance. Immunity passports were perceived as crucial for the opening of some industries such as the aviation, while some other industries such as cultural and creative industries were more concerned about the purpose and use of immunity passports.

> *"P1: We cannot have a situation where a whole section of the community is prohibited from visiting the theatre because they cannot be vaccinated… Some people have very good genetic reasons why they would respond very badly to vaccination. That does not mean vaccination is a bad thing. It means that one size does not fit all." (Executive Manager, Theatre)*

A theatre executive manager mentioned that they do not need to use immunity passports to operate. There were a couple of reasons for their reluctance to use this service such as data safety, possible segregations, or their business model aiming to support minorities and thus implementation of immunity passports would obstruct customers' from visiting theatres. This was a finding that emerged during our focus groups indicating that the cultural and creative industries were more reluctant to use immunity certificates. However, the theatre executive manager who participated in the interview mentioned that they would be willing to consider the use of other forms of certification, such as proof of negative PCR or LFT tests because these forms of certification are perceived to be less discriminatory and easier to check at the venue.

In addition, the same participant mentioned that it has been theatres had already implemented additional health safety measures such as fever checking.

> *"P1: We do not need immunity passports. At the moment, we ask people to show a negative COVID-19 test which works okay. And thinking back to Christmas, we were taking people's temperatures as they came in and that was before the widespread and reliable free testing. Most people were happy that we were doing the checks and they thought it was appropriate and non-invasive while a little bit time consuming for us. Therefore, something like that would be fine and testing the staff has also been fine and useful. " (Executive Manager, Theatre)*

On the other hand, immunity passports in sectors such as aviation and sports are a necessity and a support mechanism for a return back to normality. For instance, there is a requirement from the international border controls of many countries for each passenger (above the age of 13) to provide proof of their immunity status to travel to another country. An airline executive mentioned that a kind of immunity proof has been required from passengers before flight. The participant described the concept in use as follows:

> *"P2: It is documentation or evidence that somebody has met the criteria put upon passengers and on us to travel to a destination.* It could be everything from immunity evidence or certification of a vaccine according to destination country regulation.*" (Head of Customer Experience, Airline)*

Additionally, the sports facility manager suggested that the use of an immunity certificate as a requirement to attend gyms or sports events can protect athletes, and especially those with chronic conditions that make them susceptible to COVID-19. Therefore, the purpose of immunity certificates would be to protect both the people attending sports events or using sports facilities to exercise.

> *"P6: You have to look at what the priorities are and what do we need to do in terms of protecting our team… for example, football as a sport is an expensive and lucrative business to be in; therefore, they are not going to take the chances of not implementing something like that and it will be a priority for those clubs. Also, it has danger because as a sportsperson, it could have dangerous implications when you catch the virus and can end the carrier or cause long term effects on their performance." (Sports Venue, Managing Director)*

Tourism experts also mentioned that they would be supportive of the use of immunity certificates for both international travel and domestic purposes. However, a senior manager from a national tourism organisation mentioned that the acceptability and necessity of an immunity certificate might not be relevant for domestic uses and normally this should be decided according to each service provider' needs and their ability to take sufficient precautions themselves.

"P5: Domestically, people who are concerned about COVID-19 and people would not welcome vaccine passports is relatively small. Most people are now conscious and concerned about COVID-19, but they want to get their life back while minimising the risk. Those pinch points are not the attractions or the restaurants because people tend to think of those places safe as they limit their capacity and put in social distancing measures in place." (Head of Domestic Research and Evaluation, Tourism Organisation)

In conclusion, while it is agreed that immunity certificates can improve the safe opening of the economy, there is no agreement among the different industries and service providers about the purpose of using these. Thus, service providers in areas such as culture are willing to try only if immunity certificates become a legal requirement by the government. On the other hand, sectors such as aviation, tourism, sports and large event organisations are more willing to implement these. Moreover, there is a debate about whether these certificates should be used beyond international travel. These findings are in accordance with the findings from our focus groups were participants expressed similar concerns and dilemmas about the purpose of immunity certificates.

4.2. Implementation of the COVID-19 Immunity certificates

This theme focuses on the implementation of the immunity certificates for the day-to-day operation of businesses from different sectors.

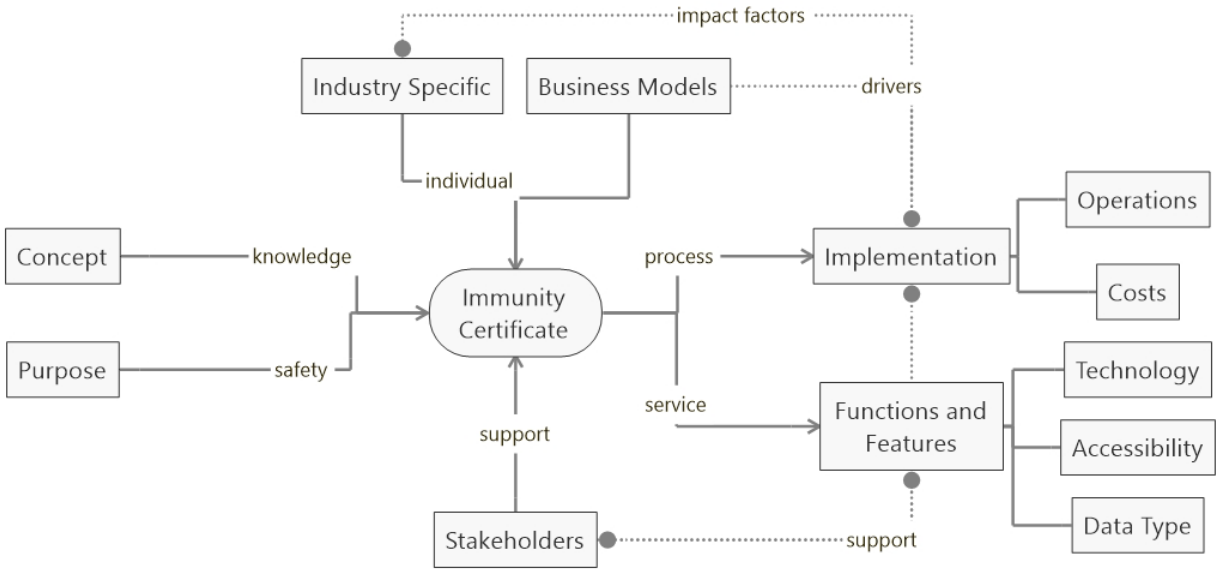

Figure 2 Implementation Process of Immunity Passport

Figure 2, graphically represents the relationship between the key areas of the immunity certificate implementation process. These key areas map to the 6 main themes shown in Table 1: 1. business models; 2. purpose and concept of immunity passports; 3. implementation process; 4. Implementation costs; 5. Key functions and

features; 6. Stakeholders and the support needed. Some issues related to the purpose and concept of an immunity passports were discussed in the previous section. The remainder of this section discusses in more details the other key areas of the implementation process The key pain points are identified and suggestions for overcoming some of these pain points discussed.

4.2.1. Business Model Components and Immunity Certificates

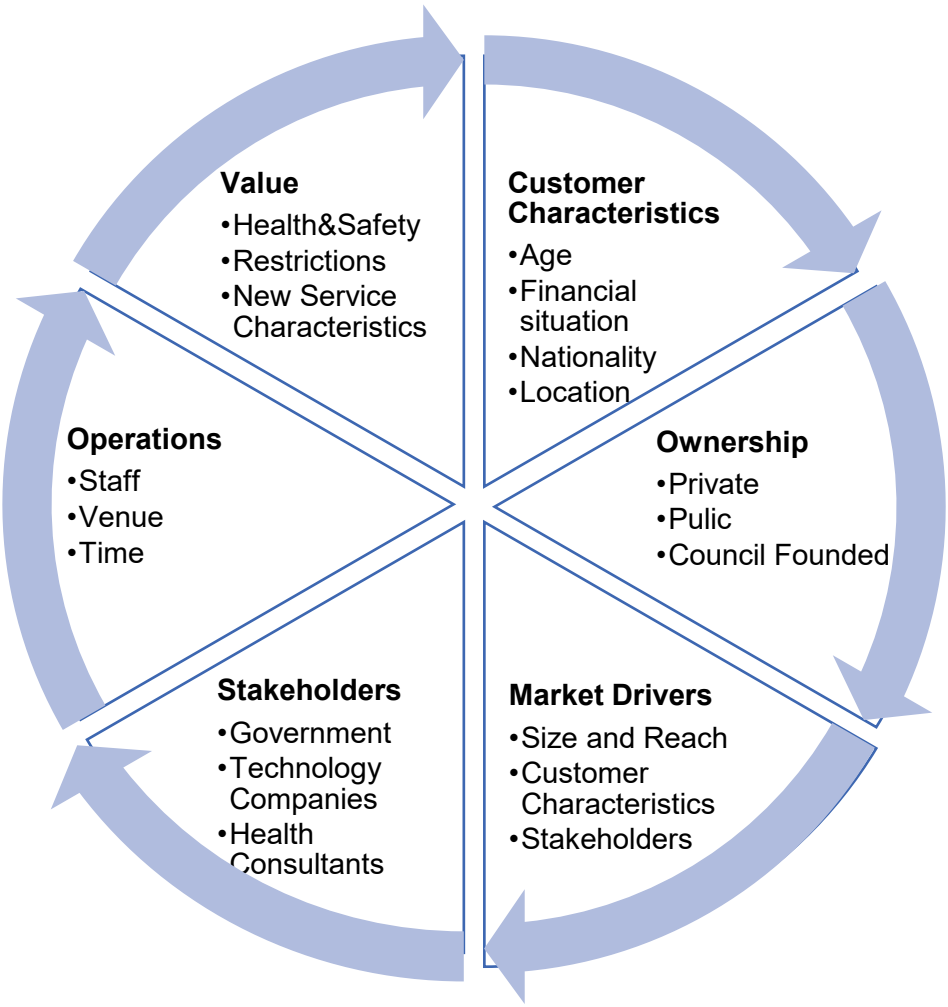

Figure 3 Business model components and immunity passport service design drivers (Adapted from interviews and Baden-Fuller and Morgan, 2010)

Different components of business models can flag areas of concerns when it comes to the implementation of immunity certificates. Thus, it is important to consider the type of business and market that service providers operate in. These key business model factors might include the type of ownership, company size and market characteristics, as well as customer characteristics (accessibility requirements), and key stakeholder needs. These be explained individually in the following sub-sections.

4.2.1.1. Type of Ownership, Company Size and Market

An executive manager of a theatre in the UK mentioned that they are a council funded organisation. According to the participant, the council requires theatres to support people with disabilities and minority groups in the local community; therefore, the theatre which the executive manager represents is reluctant to adopt any immunity certification service that might exclude people who have not been vaccinated.

> *"P1: We are a council-funded and a subsidized organization with particular responsibilities around ensuring that we're fully accessible to people from all cultural backgrounds, disabled people, people with restricted financial means etc. We have particular people we serve and protect." (Executive Manager, Theatre)*

The same participant raised further concerns around the use of immunity passports this time applicable to larger theatres, which even if they are not funded by councils or the government, they would need to invest in additional staff to support health and safety, including verification of immunity status. Therefore, depending on the size of the business additional pain-points in regards to the use of immunity passports will need to be addressed, such as those related to staffing.

> *"P1: A member of staff has to be responsible for health and safety when we are rehearsing. The existing staff can be responsible, and it is manageable with a small cast. However, with a cast of 30 people, you have to employ someone special just for COVID-19 safety. Therefore, large production companies such as National Theatre or Royal Shakespeare, cannot fit it within the job description of a normal stage manager." (Executive Manager, Theatre)*

> *"P7: There will be additional needs for smaller events that are run by communities with volunteers… with GDPR and those kinds of regulations will be more problematic for community events to go ahead. The larger ones will be better placed to deal with situations where extra regulation requires new processes and systems to be implemented." (Event Management Expert)*

Aviation is another industry that requires different approaches for immunity passports. For example, there might be differences in the implementation of these certificates between domestic and international airlines, their destination markets, or the size of their route network.

> *"P2: We have operations in Asia, China, Africa, South Africa… and the U.S., which is a diverse mix of territories, and therefore a diverse set of COVID-19 requirements… on the outbound legs, we have a patchwork of requirements. This is a unique challenge for aviation sector and our customers when the requirements are ultimately not set by us." (Head of Customer Experience, Airline)*

In addition, there might be a difference in the application between international and domestic uses of immunity passports. In the case of tourism, travel and hospitality sectors several pain points and areas of concern emerge when it comes to the international markets. For example, for these sectors implementation of immunity certificates should consider factors such as eligibility of the paperwork issued by foreign authorities, the acceptability of types of vaccines that are not currently approved by the UK's NHS, or fraud.

> *"P5: There is a significant difference between domestic and international. The question about international certification is that there are markets where you can trust the systems, but we have already seen black-market jabs. That is criminal behaviour, and someone might purchase an international certification that is signed by a doctor. The important question is how to recognise a fail-proof vaccine system at the international level?" (Head of Domestic Research and Evaluation, Tourism Organisation)*

4.2.1.2. Customer Characteristics

It has been previously mentioned that the customer base can raise important considerations about the implementation of immunity passports. Customers across different sectors may pose different level of resistance towards immunity certificates. For example, in the case of the theatres. customers may be less willing to use immunity certificates, being more resistant and sensitive towards any form of surveillance of their immunity status and breach of their personal data:

> *"P1: Theatre goers and people who engaged with the arts in general, and it is a generalization, might be less happy with immunity passport type of service especially with ID cards…I think if we tell them that we do not mind vaccination status, but we want to know your immunity status to COVID, they will have questions. These might be about the protection data, who that data is shared with, where it is stored when it's deleted... People are different compared to 3-4 years ago with how they treat their data and how they want their data treated. There is a massive distrust about being spammed, what happens to their data? They do not want the government to know if they are immunity to COVID which is not most of our audiences, but a section of them. An additional concern is what happens to the information?" (Executive Manager, Theatre)*

It is important to consider each sector has a different type of service, customer needs and user characteristics. The executive manager from the theatre pointed out that people who attend cultural events might be in general more sensitive towards any discriminatory service or requirement, data safety and thus react negatively. This kind of reaction might also cause not attendance; therefore, theatres might be more reluctant to adopt this service to not lose their customers after the significant financial crisis of the previous year. However, this kind of negative outlook is not the same for

other industries. For instance, the large sports events industry and international air transport sector have less resistance from their customers as the immunity proof was made a legal requirement by governments. Also, people might find it as a necessity and become more comfortable using this service in these sectors.

> *"P2: We have a strong view on what is required to safely reopen aviation. The liability on airlines to check if the customers adhere to the requirements are set by the destinations, they fly to... passengers would often need a test to travel, but a vaccine would exempt them from quarantine." (Head of Customer Experience, Airline)*

In addition, accessibility of immunity certificates was another reason why service providers felt that their customers would avoid their use.

> *"P2: The lowest common denominator should be paper that requires no dependencies on technology, smartphones, apps or the internet. This is a spectrum up to not having any documentation and all of this being done via web and databasing for the scale and to avoid any discrimination." (Head of Customer Experience, Airline)*

> *"P8: Passengers from some eastern European markets may not own a smartphone and have the old type of phones that do not have Wi-Fi capability. We do still see passengers using that kind of technology, I think that's going to be a particularly unique issue for us, us here and then. How do you roll that out?" (Head of Passenger Services, Airport)*

> *"P1: The assumption is that everyone has a smartphone while people might not have a smartphone. Therefore, the solution should be accessible for everyone. For instance, there should be a paper-based version of it because you may not do everything on a smartphone. There will be older people, poor people who do not have a smartphone. And so there has to be an alternative version." (Executive Manager, Theatre)*

4.2.1.3. Key Stakeholders

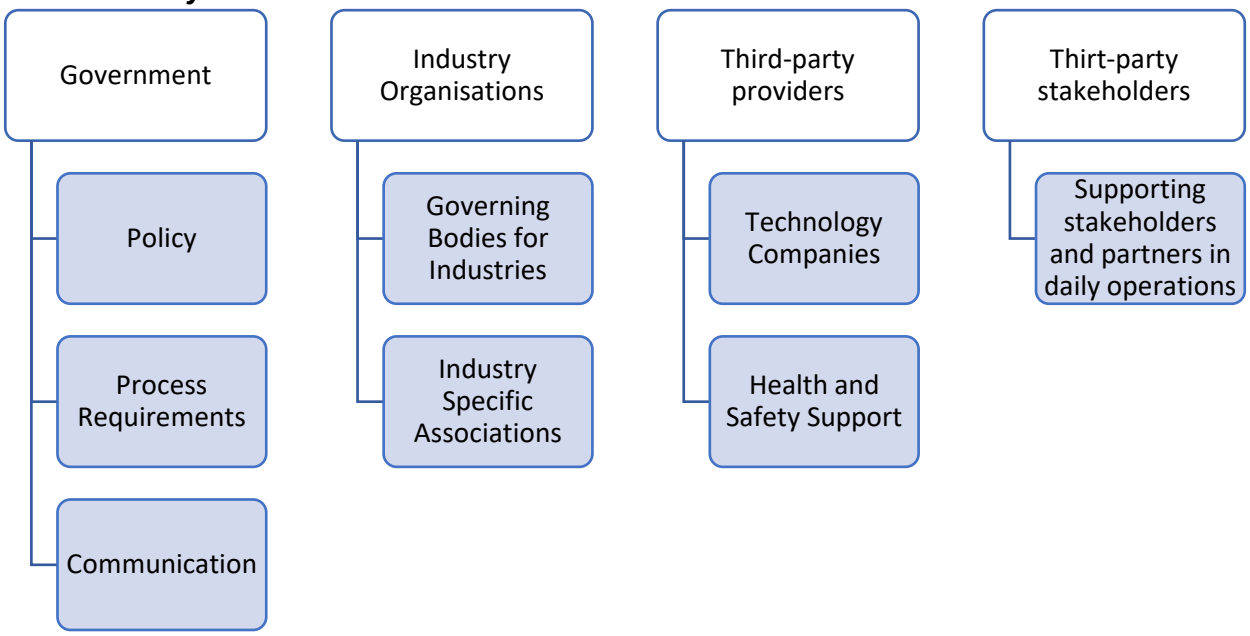

Figure 4 Key Stakeholders in the implementation processes

There are 4 types of stakeholder categorisation in the implementation of immunity certificates. Figure 4 shows these as government, industry-specific organisations, third-party providers, and existing third-party stakeholders. Participants mentioned that businesses were required to get individual support from new partners with the pandemic. For instance, health consultancy from experts on additional health and safety measures from health companies or new software, and website design support from technology companies are some of these stakeholders. Therefore, it is possible to say that businesses required support from the new third-party service providers after the COVID-19 regulations. Participants also stated that the existing partners provide support and had to be involved in the new service designs. However, the government is the most important stakeholder whose support is crucial and required for the widespread implementation of immunity certificates. This is because each service provider requires government regulation and support to use this service.

> *"P5: The government would be responsible to implement policies while the venues and industries are accountable for how it is carried out." (Head of Domestic Research and Evaluation, Tourism Organisation)*

> *"P1: The government is asking for it and exploring it while we do not feel the need for it." (Executive Manager, Theatre)*

> *"P7: The providers of the technology, the venues, the governments and regulators are all going to be important. The ones that will have the most power and influence will be the regulator and government. The technology companies that provide solutions for this is going to make money. Moreover, the companies that have an interest in this process are going to profit because they will make money fulfilling the contracts, whereas the event industry itself such as the*

venues and event organizers have less profit. They have got an interest, but they have less power because it is being done to them rather than they necessarily wish to deal with." (Event Management Expert)

Additionally, according to the aviation experts in the interviews, the multi-government support and collaboration in international travel is significant. This is an important factor in creating efficient and seamless travel for passengers.

"P2: We want the UK government to support our work and vice versa. We want to understand their requirements from us to streamline the process and give customers the confidence to travel. On the other hand, we have to form the same relationship with the government of Nigeria when we fly to Lagos... They are our stakeholders because airlines are liable to board customers and allow them to travel, having met the criteria that they have set for arrivals." (Customer Manager, Airline)

Businesses are required to get consultancies on the new health measures from health experts and companies. This type of support has been the main part of the pandemic, reopening and new regulations while may not necessarily be related to only immunity passports. For instance, a participant from cultural sector mentioned that consultancies supported to create social distancing measures in theatres while integrating new seating bubbles and configurations with the collaboration of box office software partners. The technology and software companies are also key to the implementation of immunity certificates as most of the providers aim to use software and hardware technology for immunity status checks. Businesses had to either collaborate, purchase or design technology to implement the service. This process seems to be happening faster in technologically advanced industries such as the aviation, with adaptations to existing infrastructure. On the other hand, industries, such as events management or culture, might require new resources and additional government support.

"P8: The resource will be required to embed that technology within existing systems. For example, adaptation to the check-in systems, ground handling systems and security systems at the airport. The idea would be to make that process more efficient. In the COVID-19 world, people do not want to be face to face with a person that has to check their status and hand over a piece of paper or hand over a phone. This is against self-distance." (Head of Passenger Services, Airport)

"P1: We have sophisticated CRM systems and Spektrix runs the majority of UK theatre box offices. They have been very proactive and added different technologies to what they offer such as seats with bubbles. However, they have not created a QR code, because they think it should be handled by the government and not worth incorporating. On the other hand, there might be issues related to this. If your ticket and immunity status are in your smartphone, it is all getting tangled up." (Executive Manager, Theatre)

In the sports industry, a collaboration between sport governing bodies might be required. This is to set the suitable rules and systems while considering different sportspeople, situations and individual sports venue or event requirements.

> *"P6: The governing bodies put protocols in place and led the way on. It is now going to be scientific-based decisions, but also operational and how they work together and what that looks like. And with the stakeholders such as governing bodies for sports. We have Paralympic and Powerlifters in gyms and the protocols to keep them safe have to be right because their immunity system is not necessarily strongest as ours." (Sports Venue, Managing Director)*

In the case of the aviation industry, responsibility is shared with a large number of stakeholders while the government is responsible for policy implementation. For example, the support of border control, airlines, and industry associations might be needed to adapt a new software system and create an efficient implementation from aviation perspective.

> *"P3: The UK Border force might be the implementing body that checks people coming back into the UK. The airlines would be the next responsible body because airlines are usually responsible to check paperwork ahead of somebody getting to the relevant authority. There might be also secondary consequences for the airports in terms of incorporating the service to check-in systems" (Senior Airport Consultant)*

To conclude, the UK government is the key stakeholder of immunity passport implementation in terms of policy while service providers are responsible for adapting this service to their day-to-day operations. Most importantly, participants in each industry emphasised the importance of communication from the government at the implementation stage. Next are the industry-specific governing bodies, these organisations communicate with the government on the service requirements and present industry-specific needs. As the sports venue director pointed out before, there might be diverse situations and necessities that need to be communicated with the regulatory government. Moreover, there are two types of third-party stakeholder support required as mentioned. These are the existing partners and new providers to incorporate this new service into their systems and operations. Therefore, it is possible to say that existing partners' cooperation is important in the day-to-day operations while new partners will support the additional immunity certificate implementation requirements.

4.2.2. Operational Implementation

Five key areas have been identified to influence the day-to-day business operation. These are time management, space, queue management, new staff, and technology requirements. Different resources are required to integrate immunity certification into

business operations. There was a consensus among participants in the interviews that staff training, queue management and time management had been already tailored to meet the needs of the certificate check and verification process. The degree to which these were tailored depended on several factors including the immunity certificate format (digital or paper-based), customer base and their characteristics and the presence or absence or existing technological infrastructure. However these changes came with several pain points. For example, the available space in a venue was one of the main concerns across all industries represented in the interviews. This also depends on the decision of immunity passport's format, type of customers and complexity of the existing technological systems or infrastructure.

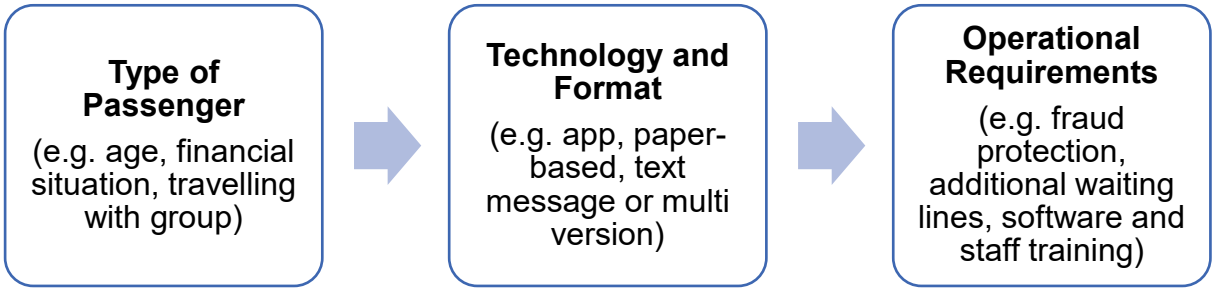

Figure 5 Air passenger, service format and operational requirement relationship (Adapted from interviews)

> *"P8: The concept of a smartphone app is great, but it is in the delivery. Is it going to be on a mobile phone? Is it digitalized? Eastern European market passengers do not necessarily have that kind of technology or a smartphone, Wi-fi capability. Is there going to be a paper backup? There must be a backup, which will be a piece of paper. However, there had been problems with fraud, people faking their status on their flight from and pre-departure tests. If it is not digital, how do you associate it to a specific individual? or a mother travelling with three kids, or a family with one mobile phone. How does that work through a touchpoint when scanning a device? For example, the device will be keep handed back to other family members. These are some of the possible operational challenges." (Head of Passenger Services, Airport)*

> *"P7: Smaller events need to have a system that is not going to place additional burden... On the other hand, larger events will be better to deal with situations where extra regulation requires new processes and systems to be implemented." (Event Management Expert)*

In the case of events management, a participant mentioned that the size of the event or venue where the event takes place may impact the operational process. For instance, large events previously having a high-capacity operational system in place could adapt easier their operations to the needs of immunity certification implementation while small events might struggle to integrate the new requirements without existing infrastructure.

4.2.2.1. Space and Queue management

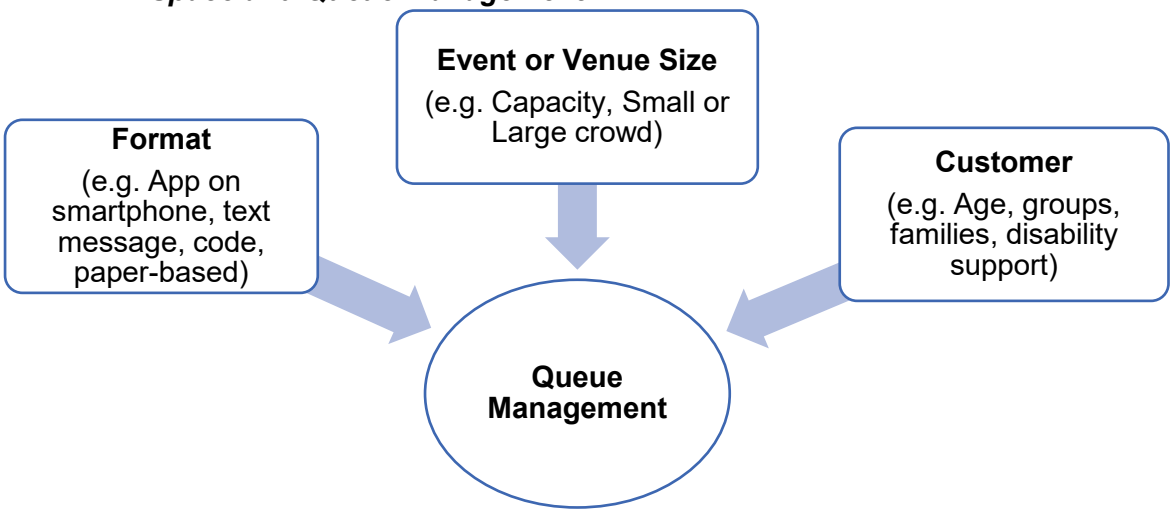

Figure 6 Factors impacting daily operations (Adapted from interviews)

Queue management is another operational area that will be considered in the implementation of immunity certificates. Figure 6 shows key factors that can impact queue management. As it had been mentioned in the previous sections, service providers might consider using multiple versions of an immunity certificate to accommodate the needs of those who are both vaccinated or developed immunity via natural infection, as well as those who may prefer to show proof of their status using paper certificates as opposed to digital. This level of flexibility will not cause segregation and cater to every customer's need. The theatre executive who participated in our interviews mentioned that enabling this strategy will bring in additional check-in processes. This type of multiple version adaptation might need an additional queuing system for theatres.

> *"P1: The usage of smartphones is always the easiest for staff to manage. It could be a text on your phone which is less easy to scan than a QR code. However, having two separate queues can be considered such as one line for the QR code people and one line for the text people. The staff will be reading the text, checking the date and time of the text and waving customers in…(Executive Manager, Theatre)*

Managing the crowd and queues have other types of challenges for the event industry. These might be especially dependent on the size of the crowd, having a last-minute attendance concert or the size of the venues as well as staff training. The process of checking an immunity passport at the door of the venue might be challenging for some types of an event. For instance, an event taking place in a small venue might lead to additional pain points related to staff availability and timing. Therefore, the queue management and immunity check systems at the avenue have to be considered and adapted to the needs of each type of event individually.

> *"P7: If you consider smaller events maybe with 5000 or even 500 attendants such as music gigs, people do not book in advance and come on the night to a live venue. How does it work? Am I going to show my mobile phone to somebody up at the door? There should be people on the door to be trained to recognize exactly what they should be looking at. Also, this could take a lot of time in terms of queuing. Those kinds of practical issues for smaller venues and much smaller events that could be problematic in terms of cost and operational side of managing the crowd, managing the queue." (Event Management Expert)*

In the aviation industry the format and type of immunity certificates used may not be decided by the service provider (e.g. airport or airline) or local government only. Instead, the destination country requirements also have to be considered. Therefore, airlines and airports might need to adapt their operations to a multi-version system. Additionally, available space is another problem when checking the immunity certificates with pain points similar to those in the event industry. Other factors such as the location of the immunity check, number of staff and social distancing measures have to be adjusted to fit the existing rules while providing quick and seamless service.

> *"P3: We are used to operating under kind of relatively free movement in Europe and simply to just have a passport or driving license to get on a plane…India requires different paperwork to go from A to B such as a printed ticket. This increases the queue length; process time and more staff have to be involved. Also, having queues is not a good thing if you are trying to have social distancing. Furthermore, airports are not designed to have lots of people queuing or congregated in quite confined spaces. There will be extra checks at border control and where do those checks take place? What do you do with the people because of the additional processing time? Is there space to handle them? For instance, an airport had to reopen one of the terminals just for the Red List destinations. Most important question is that Will we be able to implement a system that remains reasonably quick to be processed? Can any additional queueing consequences at the additional check-in, security or border controls be handled?" (Airport Senior Consultant)*

4.2.2.2. Staff Training

Staff training is frequently mentioned as an important factor influencing the effectiveness of the certification process, especially at the checking point (e.g. Venue entrance or airport gates). New processes will need to be implemented with front-line and management staff playing an important role. Therefore, training the staff on the new processes and requirements is key to creating a safe, quick and customer-friendly process. Also, new temporary staff might need to be employed to facilitate this process.

"P7: The training will be necessary if there is door staff and checking at the entrance. There is not a significant number of hiring for event companies to implement this service. However, they may have to pay for staff and hire temporary staff to come in and update their systems which could be a necessary aspect of hiring." (Event Management Expert)

The staff training had been a common point in every type of industry included in this series of interviews. Experts from the event industry emphasised the importance of staff training while an expert from the sports industry mentioned the need for additional training on the new system and customer service approach.

"P6: It would be a big policy change that would need to be a need to be communicated not only to customers but also to staff. There might be people that would be difficult about it and who do not like the idea. People might not want to get the vaccine and not like the idea of having this emergency passport. Thus, communication and informing customers on the expectations are important while training staff to deal with those difficult situations. Training staff is a must. There are also the adjustments of the shifts and this might have a slight increase in staff wage costs." (Managing Director, Sports Venue)

4.2.2.3. Implementation Costs

Figure 7 Implementations costs and processes (Adapted from the interviews)

There are different types of implementation costs that have emerged from the interviews with service providers. These costs can be categorised as financial and non-financial costs (Figure 7). The most frequently mentioned non-financial costs are associated with time and service efficiency. The financial cost has two main lines as staff costs and new technology adaptation costs. According to the theatre executive, new staff rostering system and implementation of health measures such as social distancing or cleaning caused additional expenses. It is possible to say that financial

costs might increase with the new processes put in place to check and scan the immunity passports leading to additional technological equipment and staff associated costs.

> *"P1: …There will be two separate queues as one for the QR code people and one for the text people... However, there are staffing issues and we are rostering maybe 50% more staff to handle things safely. This is having an impact on costs and a reason for us to hope these requirements are short term and not permanent because it makes the cost of opening higher." (Executive Manager, Theatre)*

> *"P9: There is a cost because there are different processes around COVID-19 at hotels and events. There is also a time element and admin element because everyone should be informed of the new rules, news and restrictions... Additionally, staff will require extra training for extra processes and businesses might need to buy scanners or similar devices. The new process has a cost." (Senior Event Manager)*

However, having more staff will not only increase the expenses but could negatively impact operational efficiency. For example, the airline customer manager explained the relationship between staff costs, time and space management as follows:

> *"P2: If the operation does not fit in customer base, there is a risk to need more people to process customers. This will be no different in stadiums, mass events or restaurants. The stadium is built on how quickly they can process people into the seats based on transaction time and transaction times are growing. Therefore, it is going to either take longer to process people or more people will be needed to do the processing at an airport. Airports do not have the footprint or space to let people arrived six hours early and it will not be safe. Therefore, the solution is to have more people do the processing. However, there would be more staff paid to be in a confined space which is not good while not going to stimulate the travel economy. Therefore, we want to use these digital solutions to get us to a point of hands-free contact." (Customer Services Manager, Airline)*

Unavoidably, new technology will need to be put in place to support the immunity certification process, this will involve additional costs related to software, hardware and human resources needed to maintain and operate the technology:

> *"P6: If we adopt an automated route, we will need software. There are two main concerns as labour intensity, staffing requirements and automated computer software with high cost. Also, licensing fees, constant updates may be additional costs for a business... " (Sports Venue, Managing Director)*

4.2.3. Features and Functions

Features and functions cover issues related to the technology used to obtain, share and verify someone's immunity status as well as the way data are shared and governed.

4.2.3.1. Technology

Using an app on a smartphone to prove someone's immunity status is practical and easier for service providers to validate its authenticity. However, this approach might not be sufficient and cause discrimination since there are people who might not be owning or using mobile phones.

> *"P1: The assumption is everyone has a smartphone while everyone might not have a smartphone." (Executive Manager, Theatre)*

> *"P8: There will always be a passenger profile who cannot do technology; therefore, it is important to have a backup while it should be predominantly digital. This can be a contact list in the cloud in a mobile phone, QR codes that scan with a centralized system rather than a piece of paper …There is an older generation of people who do not have access to the internet such as foreign nationals' phone might not be compatible with the UK Wi-Fi services or they might not have the tariff that allows them to access data in the UK. Everyone might have an iPhone or smartphone while not everyone has access to Wi-Fi. There are also passengers in the UK who do not speak the language and accessibility is important. We are looking after the PRM (Passenger with Reduced Mobility) contracts and they have a right to access. Additionally, some people cannot read and write because of education while understand or be able to do it. These are important to consider in a world where people can get fined while they physically cannot do, and this is unfair. Therefore, having a backup system is a good point to consider everyone" (Head of Passenger Services, Airport)*

According to the sports venue manager, it would be more convenient for athletes or customers who enter gyms or other sports facilities to use an app to show proof of their immunity status. However, it would be good if proof of immunity status could be shown using existing sports apps that tend to be used by these groups of people when visiting these venues. However, the sports venue manager also pointed out that creating and designing a new system or integrating information about someone's immunity status in apps that are specific to specific venues (like a gym related up or a football fan club related app) is very expensive. In this case, the traditional NHS app would be a more cost-effective option for businesses and will not create additional costs other than educating the staff on the system.

> *"P5: Data never leaves the government database and just saying a reference number. Do they have a green tick next to their name or not? If we all know or NHS number and that is how it might work. At the moment, it would be fairly easy to do that for places that require bookings, and they are already used to dealing with ticket and credit card checking." (Head of Domestic Research and Evaluation, Tourism Organisation)*

Participants from the culture and event management and aviation sectors shared similar views highlighting the need for providing customers flexibility when it comes to proving their immunity passports. For example, immunity status could be embedded or associated with existing loyalty and club cards, accounts or apps used in these venues upon making a booking. In this manner proof could be sought using the means customers would normally use to go to a theatre or book a flight.

> *"P2: If a customer uses a common pass, which is designed for multi-use cases, such as a vaccine or immunity passport for large stadium events or mass gatherings. And has a record of customers' immunity status, we do not want to put them through another process to prove to us. We want to be able to ingest their records from that specific path they are already using." (Head of Customer Experience, Airline)*

Finally, there is a consensus among participants in the interviews that showing proof of immunity status should require a minimum number of actions on behalf of the customers. In the case of paper-based format the process is straightforward since it requires ordering and receiving a paper-based format that can be shown on site as proof. However, in the case of mobile phones there should be a straightforward process of showing proof when launching the app. Figure 8 has been inspired by the airline head of customer experience. Participants suggested an app in which passengers can log in and access their test or vaccine information. The provider will only see the green screen which proves passengers fit to fly approval. Data capture is only momentary and not saved for further use.

> *"P2: We just need an indicator and to know the important information for us. An industry regulator had a tool called COVID check, and it is centralized which passenger can show their vaccine or test. We need a verified and globally accepted solution because airlines have a liability towards the destination government to check this. However, the information can be confidential. I call some system as green tick that people coming to the airport with a green screen saying I am ready to fly. On the other hand, I want to have confidence that person is ready to fly on the requirements to that destination. We do not want to see another information, just want to know that they have their test within the right timeframe, or they have a vaccine that meets the requirements of the destination. Airlines do not want to see anything else, maybe only a passport number or name to verify against our systems." (Head of Customer Experience, Airline)*

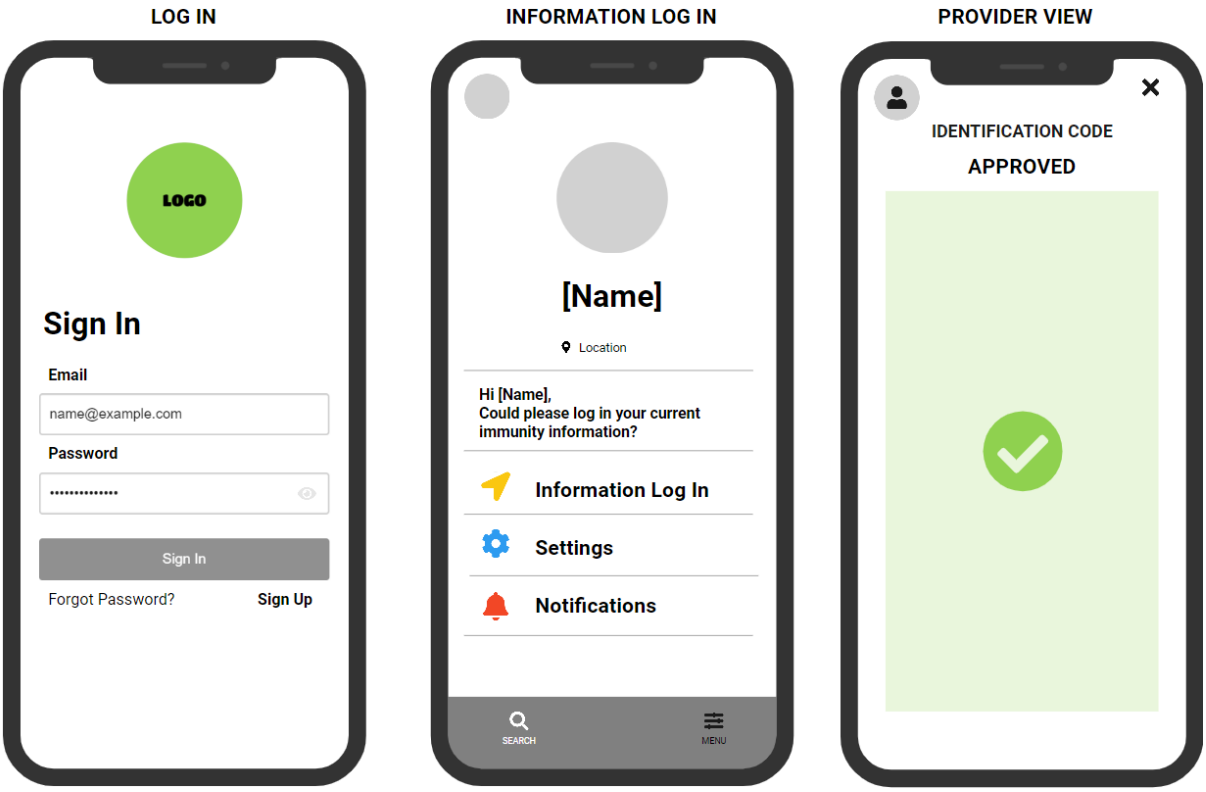

Figure 8 A design example of one side information log in

4.2.3.2. Data sharing and governance

Participants in the interviews frequently mentioned the possibility of fraud, financial gain from data, cyber terrorism, sensitivity of health data or government surveillance. The Theatre executive mentioned the existing GDPR (General Data Protection Regulation) problems and how people are less willing to share their information with businesses. Airline executives also agreed at the same point about ensuring the data collection is complying with these rules.

> *"P1: People are different compared to 3-4 years ago with how they treat their data and how they want their data treated. There is a massive distrust about being spammed, what happens to their data?" (Executive Manager, Theatre)*

> *"P2: We are always conforming to the right GDPR standards for personally identifiable information. Therefore, our data purity teams are critically important. However, our technology teams and digital teams are having to redesign and re-architect systems to receive and verify this kind of data. Also, AI systems are notoriously complex and archaic in most around the world." (Head of Customer Experience, Airline)*

> *"P2: Health data is more of a red flag than any other kind of data. We strongly believe in and advocate decentralised models of customer ownership and we want to see a kind of tokenised response, we never want to receive vaccine*

cards or store and hold any of that information." (Head of Customer Experience, Airline)

The sports venue expert suggested that people using private sports facilities (like gyms or outdoor sports facilities) are used to share personal information to allow provision of more personalised services. Associating the immunity status information with this type of personal information would allow further personalisation of services during the course of the pandemic. However, the interviewee did not provide specific examples on how this could work or the type of personalised experiences that this idea would offer.

"P6: Everyone has to use the sport app to use the gym. They had to log into the app and put their contact details, email address, name and age. That captures the information we currently need to track and trace and amount of people in the gym at one time…The additional data capture would be an advantage. For example, having the details of the people that use the facilities other than the gym. It could be a class, court, or specific sports booking such as badminton. They have used our services; therefore, after going through GDPR, we might be allowed to offer our similar services and entices them to use a different type of service or use it again, put offers on etc." (Sports Venue, Managing Director)

Also, there was consensus among the interviewees that businesses should be provided with clear guidance about how information and data about customers immunity status are to be used, processed and stored. A typical example of the complexity and ambiguity surrounding the processing of data about customers' immunity status was provided by the senior airport consultant.

"P3: It has to be clear about what you can and cannot do with it. I often get quite frustrated with government documentation, even things like applying for a normal passport is overly complicated. The complexity of these might be to make them hard to copy. However, the immunity passport has to be quickly appliable if we are going to have something new and different as it will be used by a lot of people. There will not be having the wrong version of the document, or your version of the document ran out. It has to be binary. For instance, I have got the document; therefore, I can go. And if I don't have the document, I can't go." (Senior Airport Consultant)

"P5: There needs to be a certain threshold of incorruptibility similar to a travel passport as people have confidence in a passport. Internationally and even in the domestic there is a question of safety." (Head of Domestic Research and Evaluation, Tourism Organisation)

4.2.4. Implementation Stages and Process

Participants were asked about the short-, medium- and long-term situation and planning in the implementation of immunity passports. Figure 9 summarises their responses into a 4-stage implementation process model including key consideration at each stage.

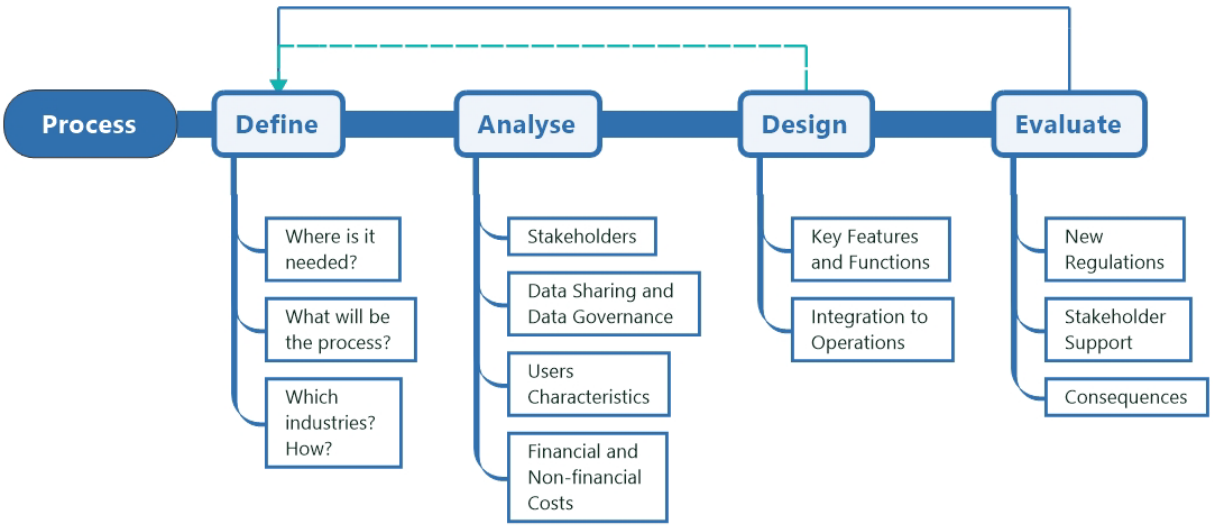

Figure 9 The implementation process summary (Adapted from Interviews and Mital et al., 2008)

The first stage is to define the scope of immunity passport implementation including making decisions about which industries might be requiring this service, what are the benefits and contributions to the existing processes, and what areas of the service are impacted. The remaining stages focus on analysing customer and service needs and requirements, designing a service around the certification process, and finally assess the conformance of the designed service against regulations that are in place and its long-term consequences on businesses operations and customer satisfaction:

> *"P7: Public opinion and support is an important part of the implementation process. Firstly, the system should be piloted with significant crowds and attendees. This will assess the system' robustness and efficiency. After, the process should be consulted with various groups to explore small, medium and large-scale events to see what is going to work within individual situations. These are part of phase one when coming up with different protocols and processes. And assessing how different sized events will respond early in the process, along with persuading customers that it is a good idea. Stage two would be sort of rolling it out after a suitable system has been found for each event size. Then, the system will be rolled out more widely in phase two. Lastly, the system should be evaluated and refined to see if improvements are needed and made as a third stage." (Event Management Expert)*

"P6: The start would be making sure that the information for us and people to use is clear. This is to create a seamless process while capturing exactly what we need. After collecting the data, we need to regularly update in terms of new requirements for different protocols and continuous communication. The pandemic and rules are changing all the time; therefore, it is important to assess if the process is still applicable to the immunity passport." (Sports Venue, Managing Director)

"P2: …We want to use digital solutions to achieve hands-free contact, passengers will have to do their advanced passenger information, put in a passport, contact details, emergency contact information. This should fit into the existing process because the industry, countries and airlines cannot handle a large increase in volumes of people at airports. Border arrival queues are not designed to take more people than they currently hold. That is going to be challenging." (Head of Customer Experience, Airline)

The sub-sections below highlight some key concerns around the process of implementing immunity passports for international travel and domestic purposes.

4.2.4.1. International travel

The travel and flight restrictions were implemented by the governments at the international level after the quick spread of the virus (Chinazzi *et al.*, 2020). Following this, the aviation sector has started to design different immunity passports or health certification systems. For instance, the European Union's Digital Covid Passport (EU, 2021), IATA Travel Pass Initiative (IATA, 2021; Memish *et al.*, 2021), Delta-Virgin Airlines' Fly Ready (Virgin Atlantic, 2021) and UK' NHS Covid App (NHS, 2021) are some examples that have been implemented to enable safe travel after the relaxation of social distancing rules. The aviation sector had to implement certification services as the UK government and other countries required the proof of immunity or negative infection from international travellers. While the aviation industry was the first to implement immunity certification processes yet the lack of a common/global set of regulations about immunity passports (for example, there are different types of immunity passes and not all of them are accepted between different destination countries) there are concerns about the long term sustainability of the certification process in place.

"P8: In the short term, there is something that opens up international travel for them for this summer period and long term. I guess you have the opportunity of time to tweak that app and make it work more efficiently with integrated processes and you know, feeding the data into the airline systems or the border systems and things like that, but I feel like. We haven't got time, so you're just going to have to go live with something that then evolves" (Head of Passenger Services, Airport)

As the UK airport manager pointed out, the industry wanted to react quickly and start operating after the lockdown restrictions had been removed. This quick reaction led the industry to provide a short-term solution to improve in the future. Therefore, it is possible to say that there is a need to create a more advanced and collaborative system to cover every area.

> *"P5: Domestically, it could be implemented quickly if a service provider needed. The problem could be in the long term as systems are competing. For instance, we can probably trust the European market standards while other markets, longer haul markets or developing markets might need to be questioned. The vaccine program requires a lot of people to be involved and the process has numerous corruptibility possibilities even in this market if people were willing to bend the rules." (Head of Domestic Research and Evaluation, Tourism Organisation)*

4.2.4.2. Domestic Use

As part of this study, representatives from four different types of domestic businesses were interviewed, including tourism, restaurants, sports and events management and theatres. The railway and public transport companies and organisations were also contacted; however, representatives from these businesses did not want to be included in the research because they felt that immunity passports were not relevant to them unless they served international markets.

It becomes clear that while the key stages presented in the implementation process summary (Figure 9) are common among the different businesses, yet there are individual differences at the operational level. These differences are attributed to differences in the customer base, business scope and scale and of course business models. A typical example is shown in the extract below explaining differences between different types of events when checking customers' immunity status:

> *"P7: Identification aspect might differ according to the type of event. People going to an event are more identifiable. In the nightclub case, people pay cash on the door at a nightclub to go in while not surveilled by registering the attendance and vaccinations. If people just show it and the staff waves you in, there is no additional surveillance or record within the computerised system." (Event Management Expert)*

Also, in the culture sector, there is a general feeling of resistance against the concept of an immunity passport while it is more acceptable in other sectors such as tourism.

> *"P1: …We do not support immunity passports in my sector because they are viewed as discriminatory to people with disabilities..." (Executive Manager, Theatre)*

The same participant pointed out that some of the complex issues in the implementation stage such as data safety, trust and risk of discrimination can make the use of immunity passports complex in the culture industry.

> *"P1: There are many more pitfalls compared to advantages, not because the concept of a passport is wrong but because of its reality might be lost in complexity..." (Executive Manager, Theatre)*

> *"P1: Theatregoers or people who have engaged with the arts in general probably more likely to be less happy... especially about the idea of data sharing." (Executive Manager, Theatre)*

On the other hand, issues related to the offer of a seamless operational process, data protection and data governance are common among different types of domestic businesses. Figure 10 summarises the diverging and common and intersecting points between the different industries.

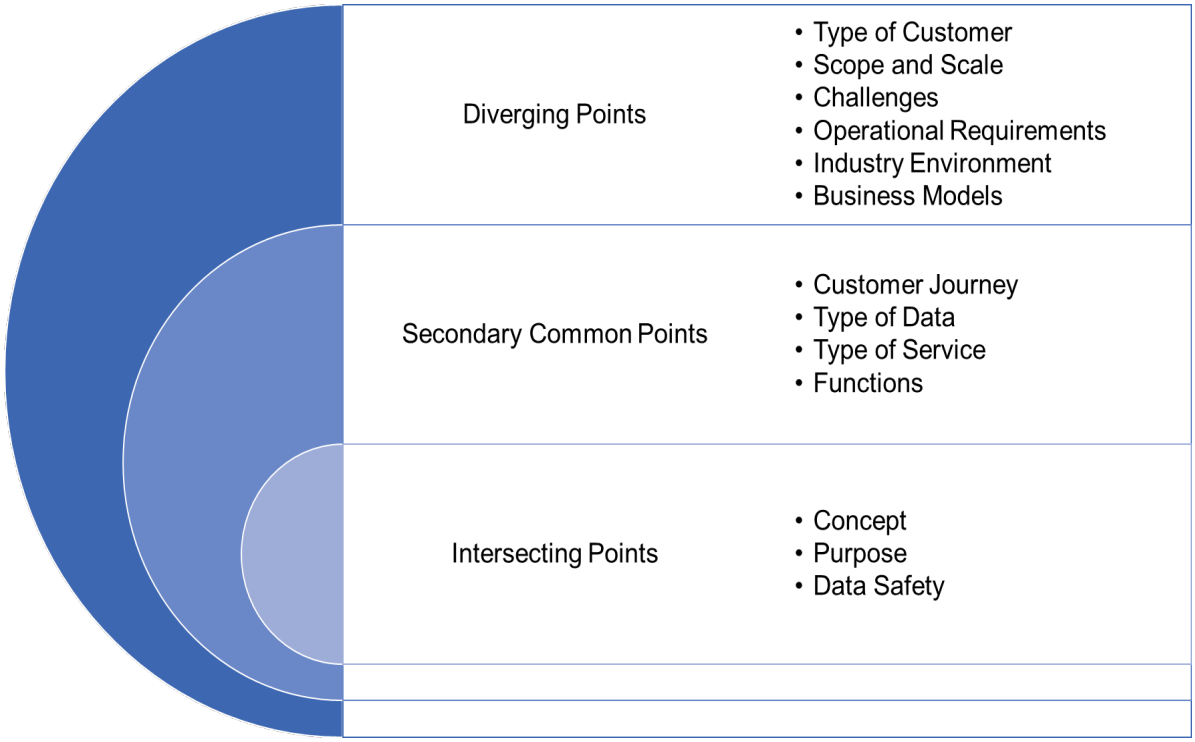

Figure 10 Key Points in the Implementation Process

5.Conclusion

The purpose of these interviews was to provide some insight about what are the perceived key challenges and pain points related to the implementation of immunity passports into existing business workflows and day to day operations across different types of services (domestic and international travel), as well as determine what support would businesses need to overcome the identified challenged or pain points?

Key findings reported were:

- There are six main areas of consideration when implementing immunity passports: purpose and concept of an immunity passport, business models, key stakeholders, implementation process, costs, and functions and features.
- It is clear that while at the overall process of implementing immunity passports across different business sectors is similar and businesses face the same challenges, yet there are individual differences at the operational level influenced by the size and type of business, the customer base, available infrastructure and the business model.
- Challenges faced between the different businesses are common when it comes to data sharing and governance and providing an accessible and seamless way of proving a customer's immunity status. In this case staffing, queues and time are among the most commonly reported by the participants in the interviews problems.
- However, not all types of businesses face the same challenges. Individual differences exist between the culture and the remaining types of businesses when it comes to data safety, trust and risk of discrimination which appear more intense among the customer base in this type of business. As opposed to international travel more problems are perceived to exist when considering the use of immunity passports for domestic use.

The findings of these interviews are synthesised with the results from the focus groups (presented in a separate report) and design workshops (also documented in a separate report) in order to inform the development of service blueprints for the implementation of services around immunity passports.

REFERENCES

Baden-Fuller, C. and Morgan, M. S. (2010) 'Business models as models', *Long Range Planning*, 43(2–3), pp. 156–171. doi: 10.1016/j.lrp.2010.02.005.

Chinazzi, M. *et al.* (2020) 'The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak', *Science*. American Association for the Advancement of Science, 368(6489), pp. 395–400. doi: 10.1126/science.aba9757.

EU (2021) *EU Digital COVID Certificate | European Commission*. Available at: https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/safe-covid-19-vaccines-europeans/eu-digital-covid-certificate_en (Accessed: 14 June 2021).

GOV.UK (2021) *Prime Minister sets out roadmap to cautiously ease lockdown restrictions*. Available at: https://www.gov.uk/government/news/prime-minister-sets-out-roadmap-to-cautiously-ease-lockdown-restrictions (Accessed: 10 April 2021).

IATA (2021) *IATA - Travel Pass Initiative*. Available at: https://www.iata.org/en/programs/passenger/travel-pass/ (Accessed: 14 June 2021).

Knight, T. E. (2020) 'Severe Acute Respiratory Syndrome Coronavirus 2 and Coronavirus Disease 2019: A Clinical Overview and Primer', *Biopreservation and Biobanking*. Mary Ann Liebert Inc., pp. 492–502. doi: 10.1089/bio.2020.0066.

Memish, Z. A. *et al.* (2021) 'COVID-19 air travel restrictions and vaccine passports: An ongoing debate.', *Travel medicine and infectious disease*. Elsevier, 42, p. 102049. doi: 10.1016/j.tmaid.2021.102049.

NHS (2021) *NHS COVID Pass - NHS*. Available at: https://www.nhs.uk/conditions/coronavirus-covid-19/covid-pass/ (Accessed: 10 August 2021).

Virgin Atlantic (2021) *Virgin Atlantic FlyReady to streamline transatlantic journeys*. Available at: https://corporate.virginatlantic.com/gb/en/media/press-releases/virgin-atlantic-flyready.html (Accessed: 14 June 2021).

APPENDICES

Appendix A: Interview Questions

Phase 1: Introduction (Welcome and participant background information)
Introduction to the research project Permission to record the interview Interviewee's background and responsibilities
1. Could you briefly outline your job title and what the role entails? How long have you done this role for? (i.e., professional history)
Phase 2: Ice-breaking questions
2. Could you please explain what do you know about the immune passports and your view on them? (i.e., why do you think it is important?)
Phase 3: main interview questions
3. What do you think would be the advantages, if any, that immune passports could offer in your industry as a whole (not just in your specific organisation or company)?
4.What do you think would be the industry specific challenges? Are there any unique challenges for your industry compared to others when it comes to the implementation of these passports?
5.What would be the main purpose? and Can you suggest some potential cases (services or operations) where immunity passports would be useful to be implemented within your industry as a whole? (Where would you use them? Which specific cases?)
6. Would you be willing to apply the immune passports in your organisation/company? If no, why?
If yes, for which services or operations do you think you would use the immune passports in your organisation/company?
7. Which services should be supported by the vaccine passports? (You might use it for one setting but may not needing for another type for example such as domestic travel)
8. What kind of challenges you might face when implementing the immune passports? and What problems may arise with it being used?)
9. Who are the key stakeholders involved to implement this innovation? Which ones would be the most important for you? (Prob: Whose support/collaboration is necessary for immunity passports to be successful? (i.e., Government, customer, staff, trade reps)
10. What kind of measures might be implemented by you/government to support community cooperation? (Prob: What kind of measures might be taken to support the implementation of immune passports for you?)
11. In your opinion, how immunity passports should operate? What features would you want in an immune passport? What functions do you want? (prob: What would be the best implementation? and What data it should include (in order to facilitate the services or operations mentioned?)
12. In what format (e.g., paper-based vs electronic) would be the most appropriate to support the use of immunity passports (in the services and operation mentioned) for both your customers, your management team, and your front-line staff you prefer to use the immune passports with?

13. What do you think would be the additional staff resources and requirements? (i.e. hiring and training)
14. What kind of data collection/saving method would you choose to implement? Would you consider data capture or to keep the data? (Prob: data related to capturing attendance like the current NHS app/QR codes do or keeping data to provide the immunity passports were checked upon entrance.)
15. What should be prioritised the implementation stages, what would need to happen first, what second and so on? What would be the process?
16. What are the possible costs of the immune passports? Who do you think bear the costs? (Prob: These could be non-financial costs and could be described as cost benefit between free movement/economic benefit and undermined solidarity/moral cost etc)
17. How do you think the identified costs and benefits are distributed? Any refection on the distribution of costs and benefits?
18. How does the short- and long-term cost and benefits looks like in terms of the implementation of immune passports in the UK? (Prob: Could you tell me what do you expect in the short and long term?)
19. Not everyone willing to accept the immunity passport concept, how you think this might impact the implementation strategy in your industry/organisation? What actions should take place (at the service, organisational or institutional/ government level) to mitigate the negative consequences?
Phase 4: End of the interview
20. Is there anything you would like to add or any other issues you think may be relevant to this research?
Thank you for participation.
If you would like to add anything else later, please feel free to contact me.

Appendix B: Emerging Key Themes and Pain Points

IMMUNE- Immunity Passport Service Design

Immunitypassportsdesign.org/

This report was co-authored by the IMMUNE (Immunity Passport Service Design) research team.

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Ethics approval

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