GOVINSIDER

GUIDE TO SMART BORDER CONTROL

IN PARTNERSHIP WITH DXC TECHNOLOGY

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You shall pass: How tech powers Smart Border Control

FOREWORD

Poon Yun Xuan

Deputy Editor, GovInsider

In his essay 'Walking', American philosopher and naturalist Henry David Thoreau expounded the merits of travelling within one's own neighbourhood. "A single farm-house which I had not seen before is sometimes as good as the dominions of the King of Dahomey," he wrote.

Nearly 200 years later, people all over the world had to test this out for themselves. The pandemic brought travel to a grinding halt when it arrived at the beginning of 2020, and for a while it seemed there would be no safe way for people to cross borders again.

But touchless tech such as facial recognition and iris scanners bring hope. This guide explores the innovations that are helping countries reopen borders safely and securely. From biometrics in the UK to the UAE's automated clearance gates, we look at how authorities are melding health information with immigration data at its borders, and what the future of travel may hold. We're delighted to be working with DXC to share their expertise.

Happy reading!

Gordon Heap

Director, Public Sector, DXC Technology

International travel is resuming. Following a prolonged period of curtailed immigration, Governments globally are keen to revive their economies. Business trade and tourist receipts are essential for many.

This guide provides a glimpse into what travellers can anticipate as travel resumes and borders are reopened.

The pandemic resulted in health being a criterion for entry to most countries. A lack of international standards to capture and authenticate vaccines, and relevant health information, has presented challenges. The guide looks into best practices being adopted to prevent the international transmission of Covid-19 and how authorities are preparing for future pandemics.

Advances in biometrics, plus an increasing adoption of digital identities, are innovations that can enhance border security while improving the traveller's experience. Many nations are relying on biometrics to screen and authenticate travellers. Biometrics can either augment identity verification, in combination with a passport, or even documentless.

Managing the pandemic, combined with the adoption of advanced technologies, has many airports and immigration authorities looking for touchless solutions. The guide explores what leading authorities are embracing when it comes to a seamless, touchless and documentless experience.

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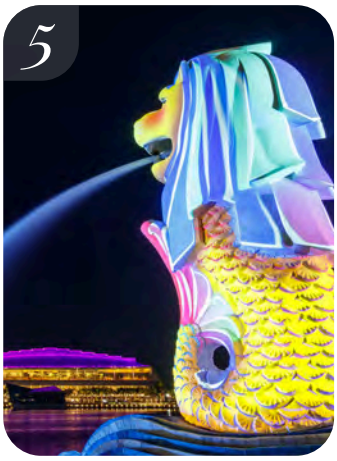

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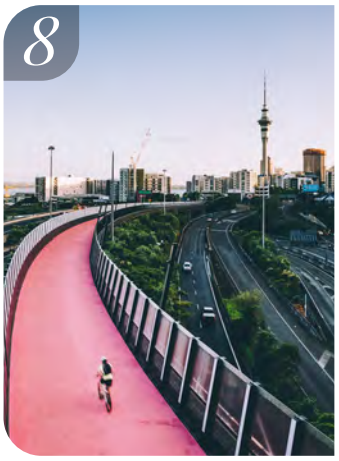

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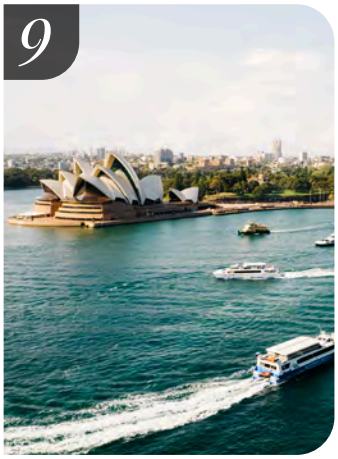

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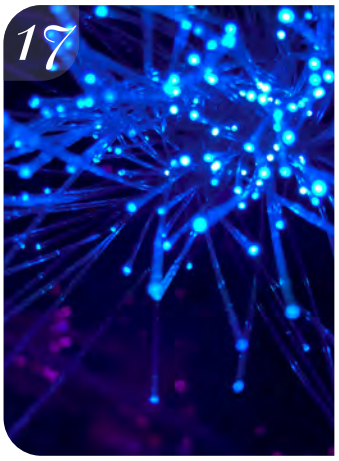
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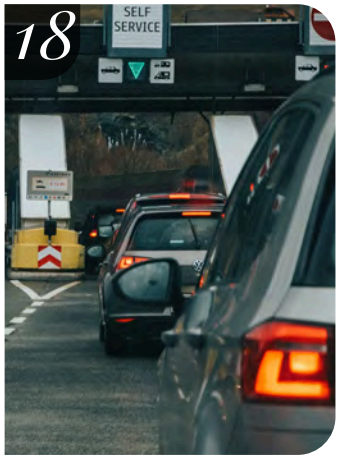

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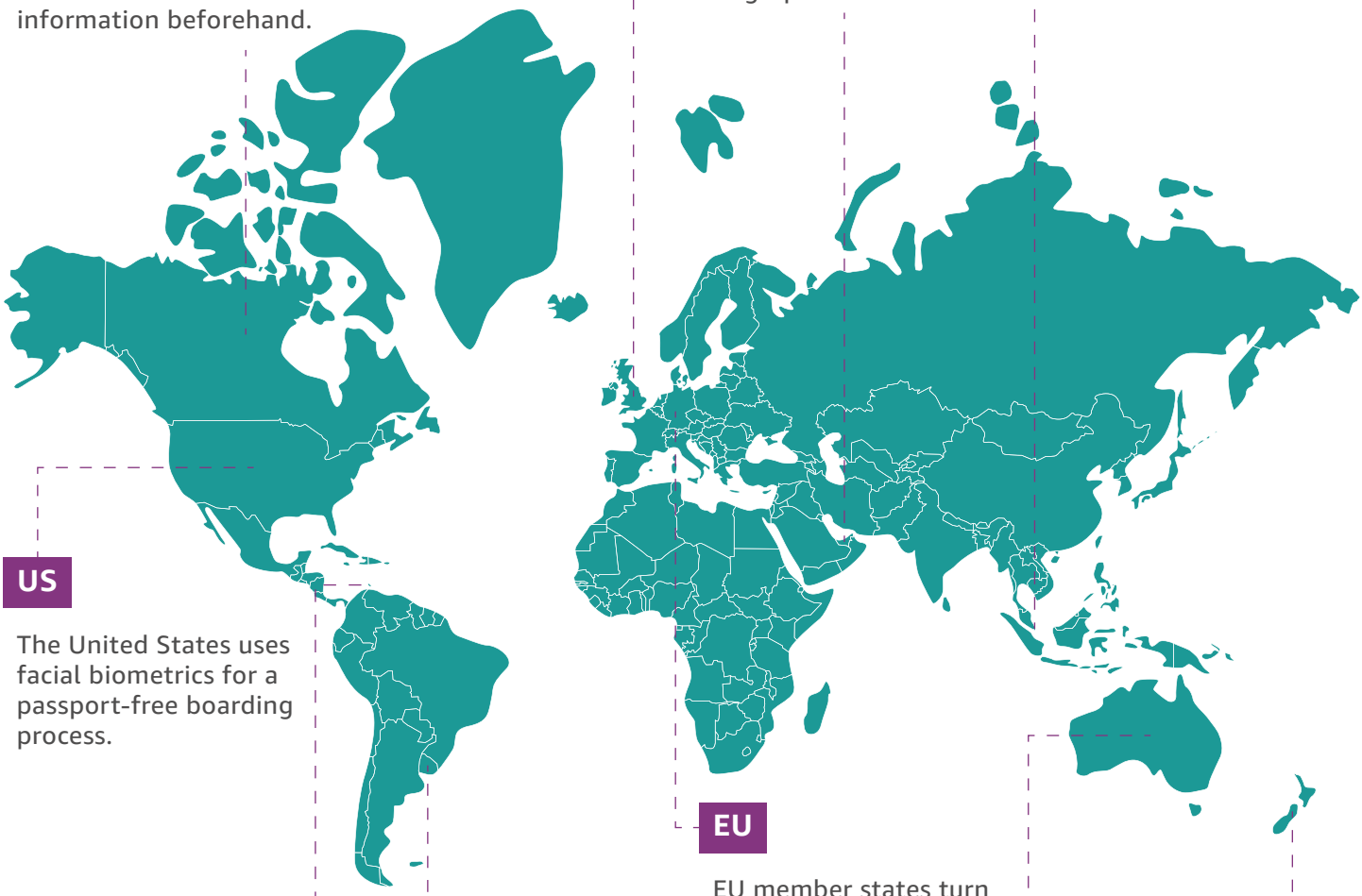
A world tour of smart border control tech

Explore this map of the world's automated and biometrics-powered border control tech, from facial recognition in Aruba to the UAE's iris scanners and automated clearance gates. Click around to read more.



Canada

Canada's digital platform allows incoming travellers to submit health and travel information beforehand.

UK

UK will have fully digital borders by end 2025.

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UAE will have a fully touchless clearance process with contactless fingerprint scanners.

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EU member states turn to biometric technology to secure their borders.

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Aruba Happy Flow uses facial recognition to identify passengers at check in, bag drop and aircraft boarding.

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Carrasco International Airport installs automated gates with facial recognition.

New Zealand

Paperless visas and facial recognition at airports.

Australia

Home to "one of the world's most accurate biometric identity management systems used for visa and border processing", according to Business Wire.

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Singapore looks into building a digital passport

Singapore plans to upgrade all of its checkpoints so passengers will no longer need to present a passport at immigration. This is part of its New Clearance Concept vision, which includes using facial and iris scans to identify travellers.

It also plans to allow most foreign visitors, including first-time visitors, to clear immigration at automated gates without having to register their biometrics beforehand.

Singapore is looking into building a digital passport, which could potentially replace a physical passport.

A digital passport would allow passengers to share their information ahead of travels, so they can cut down wait times at airports. Border control officers could identify higher risk travellers more efficiently. This would also be safer as it reduces the exchange of physical documents.

In November 2020, the International Civil Aviation Organisation (ICAO) approved the specifications for one of three types of digital travel documents. This is one step closer towards having a globally recognised digital passport, and has "tremendous potential in a post-Covid travel context", ICAO told The Straits Times.

In March 2021, former Minister-in-charge of the Smart Nation Initiative Vivian Balakrishnan shared that the national digital identity system SingPass could be expanded to become a digital passport. The country is currently working on a digital passport with Australia and Britain, though this could take a few more years to be realised.

Sources:

Immigration and Checkpoints Authority of Singapore
Futuretravelexperience.com
News.nestia.com
Straits Times

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How Aruba is creating a seamless travel experience with facial recognition

Annet Steenbergen, Project Lead of the Aruba Happy Flow project for the Government of Aruba, shares how the programme has revolutionised travel for the country.

By Liew Ming En

In Avengers: Endgame, a team of superheroes had the chance to travel back in time to reverse the actions of the main villain. However, time travel is not possible in reality. Time once passed is gone forever, making it an extremely valuable resource.

Yet, travelling is often a time-consuming process that requires travellers to arrive at the airport hours earlier. They will then need to go through long queues and numerous document checks. In the island country Aruba, this tedious process may soon be a thing of the past.

Annet Steenbergen, Project Lead of the Aruba Happy Flow project in Aruba, shares how facial recognition technology has sped up the country's travel and border clearance.

Improving efficiency to create a seamless travel experience

Upon arrival at the airport, passengers have to go through numerous stages such as checking in, bag drops, border clearance, and boarding. At each stage, they need to queue and present their passport and boarding pass for verification.

The Aruba Happy Flow programme eliminates the need for multiple checks, says Steenbergen.

With the programme, passengers who wish to use it only need to present their travel documents at check-in. Then, a temporary virtual identity is created using their facial biometrics.

At subsequent stages in the travel process, passengers can use their faces to verify their identity instead of presenting their travel documents, she explains. Each stage now only takes a few seconds.

In fact, the process was so quick that Aruba had to slow down the process at boarding, as it led to a bottleneck at the airbridge where passengers boarded the plane, adds Steenbergen.

The Happy Flow programme helps border authorities as well. All stakeholders have a real time overview of the passenger's process. This allows them to actively monitor passenger flow and make changes if there are bottlenecks.

The programme was piloted at the Aruba International Airport, and was developed by numerous parties including Aruba, the Netherlands, and airline carrier KLM.

Minimising data sharing to maximise privacy

Aruba's Happy Flow programme allows passengers to only share data that is absolutely necessary, says Steenbergen.

For example, airlines will only get the passport data that they need and they receive it digitally knowing it is verified and trusted. "You share less, but the data comes from a trusted source," says Steenbergen.

Aruba looks forward to extending this programme to the entire travel experience in the future, including hotel check-ins and car rental, she shares. Hotels, for instance, would no longer need to collect the full copy of guests' passports during check-in.

No hotel wants to collect passport copies because it is very sensitive information, Steenbergen explains. With Happy Flow, they can just obtain the information they need, and trust that guests' identity is verified, she says.

Data protection and educating the public

The sky's the limit for using data to create more effective processes, as long as they adhere to the highest privacy and data protection standards, says Steenbergen. And if passengers are not well-informed, they can end up sharing their data with the wrong people, which is a privacy concern, she cautions.

Any data collection programme should comply with data protection regulations, says Steenbergen. For instance, the Happy Flow programme adheres to the EU's GDPR data protection standard.

Organisations also need to ensure that passengers are informed on how their data is being used, and to obtain consent from citizens before collecting and using their data, she says. An opt-out option should be available if passengers do not wish to share their data, or wish to pull out of the programme, she adds.

Government agencies, airlines and airports have a responsibility to educate their citizens and travellers by having a clear privacy policy, she says. This means that the privacy policy should not be in small fonts and be excessively lengthy.

A lot is possible with data, but authorities need to build trust with the different parties involved, emphasises Steenbergen. This can be done through the creation of a trust mark, similar to those on bank cards, she suggests.

Aruba's Happy Flow project is an example of what a seamless travel experience can look like across the world. If successful, travelling can soon be a speedy and fuss-free process.

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How going paperless allowed New Zealand to continue immigration during the pandemic

Immigration New Zealand (INZ) introduced improvements to the Immigration Online system earlier this year, says Stephen Dunstan, the agency's General Manager of Enablement. It has made visa processing smart and paperless.

Going paperless was crucial for the continued processing of visa applications during the pandemic. Many paper applications could not be processed when New Zealand entered lockdown, as the hardcopy documents were too sensitive to be removed from offices.

The new system also improved visa processing times. By automating previously paper-based tasks, INZ has more time to assess risks and strengthen the quality and consistency of decision making for visa applications.

Applicants can keep track of the progress of their application through email notifications and a dashboard which updates the status of their application in real time.

The system is designed to allow INZ to respond more quickly to demands on the immigration system, says Dunstan. For example, they can respond more readily to changes in immigration policy settings, and peaks and lows in visa application volumes.

Meanwhile, travellers to New Zealand enjoy touchless travel through eGates when they arrive at Auckland, Wellington, Christchurch and Queenstown airports. These gates use facial recognition technology to verify traveller identity and are eligible for travellers over 12 years of age with passports which hold biometric information from a list of specified low-risk countries.

The gates will match live images of each traveller to that of their passports. This eliminates the need for physical examination by an officer, speeding up the border control process.

To boost border security, New Zealand also introduced an electronic authorisation in 2019, which travellers from visa- or transit-waiver countries need to apply for. This process is quick, with 99 per cent of applications being processed automatically within 10 minutes.

Additionally, the New Zealand Customs Service used virtual reality (VR) to improve customer experience and operations at Christchurch International Airport. Participants in the project gave feedback on the airport's departure area and experience based on a VR simulation.

The study helped the New Zealand authorities to gain a better understanding of the desired customer experience, and eventually contributed to the redevelopment of the departures area.

Sources:

New Zealand Customs Service [1]
New Zealand Customs Service [2]
New Zealand Digital government

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How Australia is preventing fraudulent identities with biometric technology

Australia is introducing a new biometric identification system to optimise passenger visa and border processes, and detect criminals and national security threats.

While the country has been using gates with facial recognition technology since 2007, the country believes that this new system will speed up identity verification and authentication. Previously, smart gates verified travellers' live facial image against data stored in biometric passports.

This new system will use both facial and fingerprint recognition to verify passengers' identities. Their biometric information is then checked across multiple physical and digital platforms, strengthening the defense against identity fraud.

It will be used to verify the identities of all passengers entering Australia, be it through visa or citizenship applications.

The technology will help border clearance staff to quickly verify the identities of travellers and confirm that they are who they say they are. This will prevent delays, queues, and improve the overall experience.

With Australia expecting visitor numbers to rise in the coming years, this upgraded system is well-timed, as it can store over one billion possible identities.

Sources:

Airport Technology
Business Wire
Unisys

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How Canada plans to eliminate physical contact at borders

Canada created a digital platform to process travellers' health and travel information prior to their arrival at the border. This platform hopes to reduce the spread of Covid-19 and improve the efficiency of customs and border clearance processes.

All travellers must submit information such as proof of vaccination, quarantine plan, and their travel details, to the platform via its mobile application or web portal. The platform played "a significant role in reducing the introduction and transmission of Covid-19" in the past year, says the Canadian Border Services Agency (CBSA).

It also helps to speed up Canadian airport clearances, adds the CBSA. Select international travellers arriving at Vancouver International and Toronto Pearson Airports can use the platform to prepare their customs and immigration declaration online before flying to Canada. They can make their declarations up to 72 hours in advance.

A separate programme operated by Canadian and American border authorities will also speed up border crossings for low-risk, pre-approved Canadian, American, and Mexican citizens. This programme is applicable for travellers with pre-registered biometrics.

These travellers can use automated self-serve kiosks or receive expedited clearance through security screen lines in Canada. For instance, eligible travellers arriving at the Winnipeg Airport can use automated clearance gates at customs instead of going through the manual checks.

Dedicated lanes are also available at land borders, and travellers can call in for expedited entry if entering by boat.

There are plans for more touchless border processing to reduce possible disease transmission points, shorten wait times, and improve travellers' experience in the coming years, reveals the CBSA.

Sources:

Canada Border Services Agency
Public Health Agency of Canada

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UAE gears up for touchless travel with biometrics

Travellers can soon travel to the UAE through a completely touchless process, as the country introduces more biometric tech.

The country already verifies identities through iris scans. It is also in the midst of developing a system that can scan biometrics through mobile apps.

With the pandemic bringing the need for touchless experiences to the forefront, existing biometric programmes using fingerprints in the UAE will soon become touchless as well. This is done through the use of automated clearance gates, which allows passengers to pass border controls without the need for human inspection.

These gates use smart high definition cameras which can capture four fingerprints in less than a second with just a wave of the hand. Meanwhile, biometric iris scans are done simply by passengers looking at the tower.

These technologies are especially useful for families and individuals with reduced mobility, as children aged six and above and passengers in wheelchairs can now pass through easily.

Once the biometric data is captured, authorities can determine whether travellers are eligible to cross the border simply by checking them against national law enforcement databases. This process only takes a few seconds.

In addition, passengers whose biometric data is not yet registered have to pass through semi-automated counters that will register them for future use of biometrics. At these counters, passengers need to submit their biometric data, identity verification and will go through a background and eligibility check. This process is only required once.

Sources:

Biometric Update
International Airport Review
Issuu

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How Uruguay uses biometrics to protect passenger safety at the airport

Diego Arrosa, CEO of Corporación América Airports Uruguay shares how Carrasco International Airport uses biometrics for border control in the pandemic.

By Liew Ming En

A Chinese proverb goes, 'When the winds of change blow, some people build walls, and others build windmills.' Uruguay's Carrasco International Airport chose the latter by turning to touchless biometric technology and automation to cope with the pandemic.

The result is the Easy Airport, a speedy and almost contactless way for passengers to pass through immigration. It is a "100 per cent digital passenger journey", highlights Diego Arrosa, CEO of Corporación América Airports Uruguay.

Arrosa shares how Carrasco International Airport at Uruguay uses touchless and automation tech to guard its borders and ensure the safety of passengers and staff.

Automating airport processes with touchless tech

"When trying to contain the spread of a virus that can spread over surfaces, touchless technologies and biometrics play an important role," highlights Arrosa. Carrasco International Airport aims to give passengers an almost entirely contactless experience, he says.

Arriving passengers can go through self-service eGates instead of manned border clearance booths, shares Arrosa. These gates are located at every checkpoint inside the airport, including at the entrance, immigration points, boarding and arrivals.

The gates use facial recognition tech to verify the validity of passengers' passports and their identity. They do so by comparing the facial image from passengers' passports against a live captured image.

Automated immigration controls are also present at manned booths to reduce physical contact. These controls allow border guards to verify a passenger's identification through their biometric information, such as their face and fingerprints.

The airport uses an automated monitoring system to ensure safe distancing among passengers as well.

Photo: Diego Arrosa

This system uses cameras and sensors in high traffic areas to observe passenger flow, allowing staff to deploy additional measures to ease the crowd if there is a need in real time.

Passengers also need to submit a digitalised health declaration and their vaccination status when passing through the airport, shares Arrosa. This ensures compliance to border control measures and the safety of passengers and staff in the airport, he explains.

Using data to ensure safety

Uruguay uses data to assess the risk level of passengers entering the country. For example, a passenger travelling from a country with many Covid-19 cases will be flagged as a higher health risk.

Border control information used to only be for border security, but are now used for national health as well. This data allows immigration officials to assess the health risk of passengers entering the country so that they can enforce additional measures if necessary.

Additionally, Uruguay collects passenger feedback to improve their experience at the airport, such as in areas of queuing and waiting time, says Arrosa. These two aspects are key to passengers' experience, he adds.

Feedback platforms are present at various steps in a passenger's travel journey through the airport for them to leave feedback in real time. Airport staff can then measure these feedback and implement measures to improve queuing and waiting times if needed.

Future of travel

As travel slowly ramps up amidst the pandemic, Uruguay expects biometrics and touchless tech to play a greater role in border control, Arrosa says. "The physical footprint of every step of the journey will become less relevant, and it will move towards a seamless and contactless experience," he continues.

Future airports will feature sensors that activate when passengers walk by, or complete connectivity using smartphones at each step of the airport journey, he says. Eventually, there will be a "complete disappearance of paper in the passenger journey."

The gale force winds known as the Covid-19 pandemic has brought about massive changes to the travel industry, but Uruguay is rising to the challenge. Through the use of biometric and automation tech, future airport journeys are looking much safer and smoother as borders reopen.

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Border security goes digital at the United Kingdom

In May 2021, the UK announced plans to make their borders fully digital by the end of 2025.

Today, the UK government already makes extensive use of biometrics in their immigration and border processes. All travellers entering the UK for more than 6 months must submit their face and fingerprint biometrics. EU, EEA, and Swiss nationals will also need to upload a digital photo through a smartphone app.

Further digitalisation will take place over the next few years. This will include automated security checks, and Electronic Travel Authorisations replacing paper visas in order to enter the country.

Additionally, travellers from select countries who hold a biometric passport can use digital identification to apply for visas, eliminating in person visits to a Visa Application Centre. The UK hopes that digitalisation will help them keep track of the number of people entering and leaving the country, improving security.

In light of the Covid-19 pandemic, the UK also requires all travellers entering the country to submit a health declaration form detailing their contact details and travel information. This information will help the UK government more effectively track overseas visitors and minimise infection rates.

To help outgoing UK travellers, the government has implemented the NHS COVID Pass, which contains details of individuals' Covid-19 vaccine. The pass provides a convenient proof of their Covid-19 status when travelling abroad to other countries or territories.

Sources:

2025 UK Border Strategy
Etauk.uk
travel-healthcertificate.com
Nhs.uk

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The United States simplifies travel through biometrics and mobile apps

In the United States, U.S. Customs and Border Protection (CBP) has recently enhanced their international arrival process at selected airports, seaports, and land borders.

The new Simplified Arrival Process allows travellers to verify their identity through facial biometrics, automating the previously manual document checks required to enter the country.

Instead of presenting their passports for inspection, travellers will have their photos taken. This photo will be compared against an existing passport or visa photo to verify the traveller's identity. This process is carried out alongside trained CBP officers who will verify the authenticity of travel documents.

To maintain security, travellers who cannot be matched to a photo on record will go through the traditional manual document checks.

Additionally, foreign travellers who have previously travelled to the U.S. will no longer need to have their fingerprints captured. Instead, their identity will be confirmed through the touchless facial biometric comparison process.

With this simplified process, passport-free boarding is now possible. The facial biometric comparison process has an accuracy rate of over 98 per cent and takes only a few seconds to complete. This speeds up immigration processes and provides travellers with a secure and touchless travel experience.

The Transportation Security Administration (TSA) has also conducted pilot tests to assess the feasibility of using facial recognition technology for security clearance. However, this assessment is still at an early stage.

To improve security and accessibility, CBP has also introduced the CBP One™ mobile app. Travellers can conveniently apply for and verify the status of tourist permits online. Cargo personnel can also use the app to make appointments for the inspection of perishable cargo.

Sources:

U.S Customs and Border Protection [1]
U.S Customs and Border Protection [2]
U.S Customs and Border Protection [3]

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Biometric and electronic systems enhance border security in the European Union

The EU is developing a new biometric system that will register the time and place of entry and exit of all third-country nationals crossing external EU borders. This system will start by 2022, and will help the Union keep track of those authorised to stay in the Union and manage migration flows. EU Member States are currently setting up the necessary biometric border control tools.

The EU will also introduce a fully electronic system in 2022 that will keep track of visa-exempt visitors entering the Schengen Zone – a collection of 26 countries within and surrounding the EU which have no internal border controls. This new system will require all visa-exempt travellers to get prior authorisation before entering the zone

To ensure that visa-exempt visitors do not pose a security threat, the electronic system will carry out a detailed security check of each applicant. It will then gather, keep track of, and update necessary information to determine whether it is safe for them to enter Schengen countries. This authorisation is eligible for business, tourist, medical, and transit purposes.

The main aim of these initiatives is to manage traveller flows in and out of the EU, while at the same time strengthening internal security and border control for the EU Member States.

Sources:

HID Global
Thales
ETIAS

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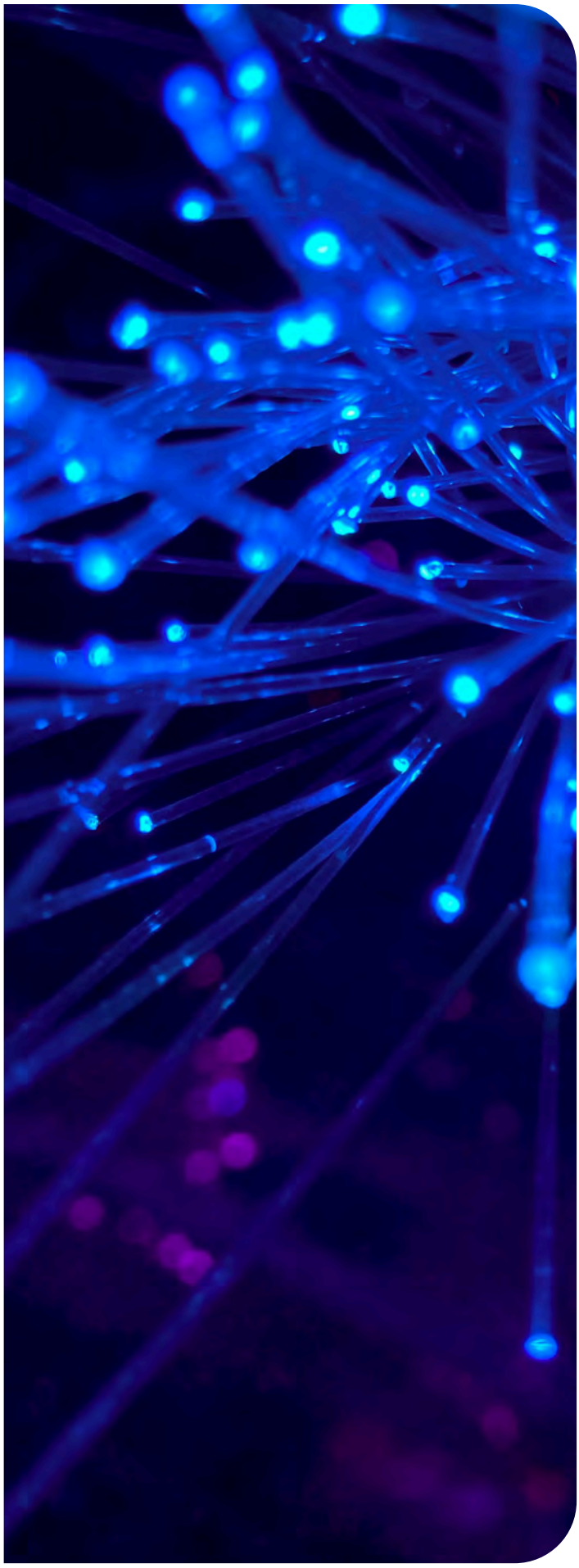
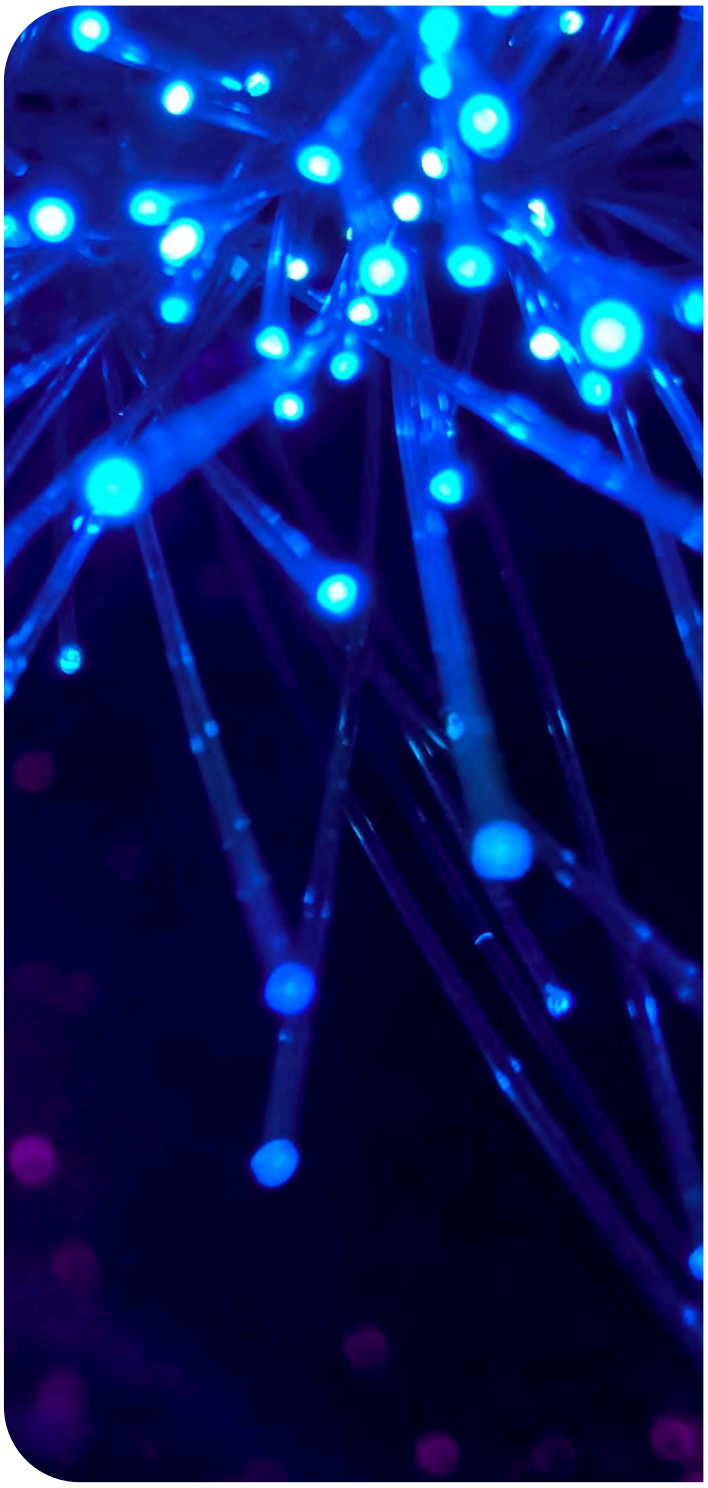


Introducing the tech players

Safely reopening borders is a joint effort by both the public and private sector. We've heard from the public sector on how they are implementing policies and using tech to launch safe travels. Now, we turn our attention to the private sector to learn how innovation and tech are taking the travel industry to new heights.



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You shall pass: How tech powers Smart Border Control

DXC Technology shares the opportunities and challenges that await governments with tech-powered border control.

By DXC Technology

Imagine landing at an airport, walking from the aircraft gate to the baggage pick-up, then hailing a cab to your hotel, without stopping even once. And yet, border control is seamlessly secure — border control officers use biometrics systems to verify travellers' identities. Only travellers who raise security concerns are apprehended.

Many immigration authorities today still rely on manual passport-stamping, invasive body searches and physical border barriers. But as technology advances, is it time to dream of a better system?

DXC Technology explains the vast possibilities of smart border control, and what governments can do in order to make frictionless travel a reality.

The opportunities

For governments, border control has always been about balancing speed and security. Security is of paramount importance: traveller identities, documents, cargo, and vehicles need to be meticulously checked.

However, delays exasperate travellers and incur huge costs as well. For instance, in 2016 alone, delays at the US-Mexico border crossings between San Diego and Tijuana cost the region a whopping US$3.4 billion in lost economic output. Idling engines spewed out 457 metric tons of carbon dioxide every day, posing environmental concerns.

Fortunately, some governments are leading the charge in operating state-of-the-art border control systems that enhance security while maximising efficiency.

Aruba, a constituent country of the Kingdom of the Netherlands, has implemented a biometric system that allows passengers to show their passport just once during their airport journey. Once their information is logged, facial recognition technology is used to verify their identities through self-service passenger touchpoints.

The country plans to expand this service in future to include car rentals, hotel check-ins and health declarations.

This centralised system also helps airport administrators. For instance, staff at the boarding area might see that a passenger has checked in their bags, but will not be able to clear immigration before the gate closes. With this real-time oversight, airlines can proactively remove the passenger's bags from the aircraft.

As another example, Singapore used mobile apps to expedite immigration clearance amidst Covid-19. Travellers can submit their personal information and health declarations on their phone or via the web. This declaration allows the authority to pre-screen, provide travellers with approvals and expedite clearance through immigration.

The country has also identified improved border clearance operations as one of five National AI Projects to be prioritised in the near term. Singapore aims to roll out AI-powered traveller risk assessments. This system would help officers assess the risk profile of travellers entering Singapore, allowing them to adjust security screening levels to match.

Challenges ahead

Of course, overhauling existing border control systems is no easy feat. To effectively and securely transition, governments will need to address key practical challenges.

First, smart border control will significantly increase the level of personally identifiable information that authorities capture and store. Governments' data management practices must keep pace with technology shifts.

Second, governments must understand their responsibilities when it comes to data storage and handling. Especially when working with foreign travellers' information, they need to ensure that their data collection process aligns with national and international data protection guidelines.

For instance, the European Union (EU) protects citizens' and long-term residents' biometric data through the General Data Protection Regulation (GDPR). Biometric data cannot be shared with third parties without data subjects' explicit consent, and data subjects have the right to withdraw their consent at any time. A breach could cost organisations up to 20 million Euros in penalties.

To this end, governments can take a leaf out of Estonia's book in managing personal data. Estonia's state-certified digital ID programme allows users to use facial recognition for authentication on public and private websites.

Estonia's decentralised ID system prevents hackers from accessing a single point of attack. Individuals are able to see when, why, and by whom their data was accessed. The biometric system meets the EU's highest level of security, and is recognised across EU states.

Lastly, seamless border control has much wider implications on digital identity. In the future of travel, citizens will be able to travel without a passport, as airports verify their identities with biometrics or digital systems instead. These biometric and digital identity systems can then be integrated into financial services, healthcare, and public services to bring convenience to citizens and businesses alike.

Governments should approach travel security with the broader goal of digital identity and multi-modal biometrics in mind, ensuring that IT solutions and consent and privacy protocols are applicable beyond the immediate context of border control.

Flexible, bespoke solutions

In the high-stakes environment of border control, there is little room for error. Security hinges on immigration officers' ability to use their tools to make the right decisions. Systemic changes will need to be carefully calibrated, and unexpected scenarios accounted for.

DXC Technology's Digital Innovation Lab joined forces with one of the busiest checkpoint agencies in Asia to create a digital simulation of the checkpoint within five weeks. The simulation allowed agents to model scenarios on-the-ground, adjusting variables such as inspection duration, vehicle type, and even weather conditions to understand and plan for numerous possibilities.

With rapidly evolving technology, the time is ripe for governments to reimagine the future of border control. A dependable, well-resourced technical partner can make all the difference in helping governments achieve these smart aspirations.

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How countries can take automated border control to new heights

Gaurav Gupta, Sales Director for Public Security & Identity, ASEAN, IDEMIA, explores how countries can make travel safer with contactless technology and data.

By Liew Ming En

Checking in, going through security, and boarding a flight without once removing your physical passport from your backpack – this is what the future of travel could look like. As borders reopen, countries are looking for new ways to improve border security and efficiency.

"We need to put that confidence back into the travellers that they can safely travel," says Gaurav Gupta, Sales Director for Public Security & Identity, ASEAN, IDEMIA. Digital passports, biometrics and automation will be key, he believes. Border control measures will also need to focus on health and sanitation while maintaining security.

Gupta shares how contactless biometric technology and data analytics can improve the screening and border clearance process when travelling post-pandemic.

Contactless travel during Covid

Covid-19 has accelerated the adoption of contactless technology in airports, says Gupta. This helps to prevent contamination and minimise the spread of the virus by reducing physical interaction between passengers and airport staff, he explains.

There are three types of biometric tech that are promising. The first is face recognition.

ADP Group and French airline company Transavia have introduced face recognition for passengers at Paris Orly Airport from check-in to boarding. Singapore's Changi Airport has also implemented face capture to give passengers a frictionless experience all the way through to border control.

The second type of contactless verification involves iris scanners. Passengers typically have to stand really close to traditional scanners, but IDEMIA has developed a more advanced tool.

The improved tech works even when passengers look at the device from a distance while still in motion. This means that passengers do not need to stop while getting identified, says Gupta.

Third is touchless fingerprint sensors, Gupta shares. Traditional fingerprint sensors can only capture fingerprints when passengers press their fingers down on a screen.

These new touchless fingerprint sensors contain high definition cameras that can capture fingerprints with a wave of the hand, without any compromise on accuracy. "It's a much faster process and provides contactless experience to the passenger," he notes.

Health risk profiling

Biometrics are important, but border authorities need to consider the complete concept of operations for border clearance as well, says Gupta. For example, gathering information in advance can create a more effective clearance process, he adds.

Governments have started checking travellers' health-related information to determine whether they may enter the country. Information such as recent travel history, Covid-19 test results, and vaccination status helps authorities identify risky profiles.

Border control agencies can combine this health data with other forms of travel data, including passenger travel authorisations, to make better decisions, he shares.

However, it can be tricky for border control authorities to validate health information. There is no international standard for implementing health and vaccine certificates yet. A vaccine certificate issued by one country, for example, may not be recognised by another country.

To address this problem, IDEMIA developed an interoperable health travel pass which helps governments verify the health status of incoming travellers before they begin their journey, says Gupta.

With the health travel pass, travellers can upload their health information beforehand, whether they are digital or paper-based. This information will be authenticated and verified though an IDEMIA tool to ensure that all elements required by the destination country are present.

They will then follow entry-exit rules of destination country on whether to admit the traveller into the country.

Balancing privacy and efficiency

Biometrics often brings with it sticky privacy concerns, since the information is incredibly sensitive. But passengers shared that they are willing to share biometric data and immigration information if it does improve border clearance processes, according to the International Air Transport Association's 2021 Global Passenger Survey.

12 million US passengers have already enrolled in the TSA PreCheck US Programme, which allows low risk travellers to go through a faster security screening process with biometrics, Gupta shares.

"Passengers need to have a clear understanding about the purpose of the usage of their biometric data," he says. While biometric technology has great potential to increase convenience, it still needs to be done in an ethical and secure way, he continues.

Citizens need to know when their biometric data has been captured, how long, and what it will be used for, he says. The overall IT security is important for any large-scale identity-related programmes that include biometrics, Gupta continues.

Data should be stored behind strong encryption protocols. For instance, biometric data should be stored such that it cannot be decrypted even if leaked, he explains. Additionally, organisations managing biometric data need to comply with local guidelines and regulations to establish trust, he adds.

With citizens' trust, organisations will have access to more data and be able to create better technology, further improving the border clearance process. With a combination of data and technology, the future of travel may become quick, easy, and completely automated, while still maintaining respect of privacy and rigorous security standards.

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How governments can best use data to improve border security

Shaun Barry, Director of SAS, shares tips and use cases of how data is best used to help governments improve border security.

By Liew Ming En

Data has the power to change the world. West Java, Indonesia used hospital occupancy rates and Covid-19 test statuses to manage resources in the pandemic. In Singapore, clinical data helps to improve the physical and mental wellbeing of expecting mothers and their children.

Likewise, data can be a valuable asset for governments when it comes to border security. When used properly, it has the power to predict threats and help border officials make more informed decisions.

Shaun Barry, the Director of SAS, shares how the potential of data can be maximised through careful analysis and complemented with other forms of technology to improve border security.

Using data to predict risky travellers

It is difficult for immigration officials to obtain data promptly to make an informed decision about whether to let a person or goods in and out of the country, says Barry. The Singapore-Malaysia border, for example, is one of the busiest in the world, with more than 450,000 people crossing daily pre-pandemic.

An immigration officer needs to face these people walking, on bicycles, or driving, and make a quick decision on whether to allow that person to enter, illustrates Barry. Time is of the essence, and it's not easy to do these analytics in real time, he says.

Governments can use data to help them predict the risk level of travellers carrying out suspicious or illegal activities, he adds.

For example, one country developed a prediction software that uses data to assess the risk of vehicles crossing their land border, he illustrates. In the past, immigration officials would not know anything about a vehicle trying to cross the border until they reached the clearance booth.

The country is now able to use data to predict the possibility of vehicles carrying illegal contraband or

doing human trafficking before they stop for screening, says Barry. The software collects data on the vehicles through thermal cameras or scanning their license plates, he explains.

Thermal cameras allow officials to determine the number of occupants in a vehicle, which is a factor in determining the risk level of a vehicle. The system combines license plate information with existing border data to identify patterns on each vehicle's movement, explains Barry.

For instance, a vehicle crossing the border every weekday at a fixed time in the morning likely belongs to an office worker. The prediction software will then categorise them as lower risk. On the other hand, a car regularly travelling across borders at odd hours will be flagged as higher risk.

The software can also be used to detect corruption by identifying if vehicles are approaching certain immigration officers more than others, adds Barry.

This prediction system helped the country improve their land border crossing security significantly, reveals Barry. Immigration officials correctly identified only one out of ten suspicious vehicles previously when they did random screenings for vehicles.

The prediction system, however, has a 90 per cent success rate, says Barry. "The country has significantly changed their risk assessment, and they believe that their border is much more protected," he shares.

Enhancing data with image recognition

Countries can combine data with other technologies to increase their effectiveness, suggests Barry. This can help customs and immigration officers to do risk profiling and assessment and help them in their responsibilities, he says.

For example, a country combined data analytics with image recognition technology to identify false passports.

Image recognition tech can help officials identify "subtle and hard to detect differences" in fonts or how the documents are printed to identify fraudulent documents, he says. This particular government successfully identified false documents 85 per cent of the time using image recognition tech, he continues.

Using data they already have

"Many government officials think that to do risk assessments, they need to get more data," notes Barry. Supplemental data sources such as social media data can help governments have a better risk assessment, but this is not always necessary.

"The only thing that is truly needed is data that most of the immigration officials around the world and customs officials have already collected," he says.

For example, a country in Asia Pacific successfully identified a case of student visa abuse by combining data on student visas issued and the travel patterns of students in the country, illustrates Barry.

The country identified a suspicious pattern of 20 alleged students who left the country up to eight times during a three-month semester, explains Barry. After further investigations, they turned out to have been smuggling drugs into the country.

"There was no need to go find new and exotic data sources," highlights Barry. "Information was already hidden in plain sight."

Data on its own is a powerful resource to gather information on travellers to assess their risk level. Combining data with other forms of technology and information allows governments to maximise data they already have and better defend their borders.

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Exclusive: How digital health passports will help Singapore reopen travel

Interview with Zheng Wei Quah, CEO and Co-founder, Accredify.

By Yun Xuan Poon

Two years after the pandemic hit, travel is slowly resuming with countries around the world opening their borders to vaccinated international travellers. Singapore is taking a cautious approach with designated travel lanes, and using blockchain technology to give the assurance that passengers are indeed virus-free.

Travellers can display their Covid-19 test results on the Digital Health Passport app built by local startup Accredify. Customs and airline officials will be able to check the authenticity of these test results.

The app was officially launched on 30 November 2020. GovInsider spoke with Zheng Wei Quah, CEO and co-founder of Accredify, to understand how it works and his plans for expanding its uses.

Digital Health Passport

Accredify's Digital Health Passport allows hospitals to digitise Covid-19 test results in a secure, tamper-proof way. Users can show this record on the mobile app via a QR code. This will be crucial for restarting travel and allowing people into mass gatherings safely, Quah says.

Before this tool, hospitals issued physical pieces of paper bearing swab test results. Travellers would have to bring this to customs.

But there's no way that border control officers can counter check this, unless hospitals open their networks to share the results directly. "That's obviously not very secure," he says. Blockchain offers a way to reliably authenticate the results outside of the hospital's networks.

Parkway Pantai, Singapore's largest private integrated healthcare provider, was the first to start issuing digital swab test results on the app. As of July 2021, Accredify has partnered with more than 900 clinics and hospitals across Australasia. It has also issued more than 600,000 Covid-19 certificates which have been verified nearly 7 million times.

More uses

Travellers could eventually be able to share other kinds of immunisation records, including malaria, tuberculosis and hepatitis, says Quah. Border control can easily verify that inbound travellers have the necessary vaccinations to enter the country.

In the long term, Quah believes the Digital Health Passport could make contactless check-ins at the airport more feasible. Once travellers scan their flight booking confirmation, the app would tell them which documents they need, and whether they have to undergo quarantine, for instance. "Before you even step into Changi Airport, the airlines would have already cleared you for travel," he says.

More broadly, this blockchain tool would give hospitals a secure way to share patient data externally, Quah notes. It can also be extended to verifying reports for insurance claims, he adds.

Improve patient care

This tech isn't just useful for Covid-19 test results. "What we're doing here is to build the first foundation and the bridge for a healthcare provider to share any kind of healthcare data," says Quah. Accredify is currently working with a public hospital in Singapore to decentralise pre-consultation check ups and distribute patient demand, he shares.

Instead of queueing up for a check up at the hospital, patients can check which nearby clinics have available slots and head there instead. These blockchain-verified results can be shared with the doctor at the hospital. Patients can even do telehealth consultations after the check up.

This could reduce overall healthcare costs, he notes. Hospitals don't have to keep raising their charges to cope with the high demand.

How it was built

The tech behind the Digital Health Passport was first tested out during Singapore's Covid-19 spike amongst its foreign workers. The government needed a trusted way to allow them to reenter the workforce.

Initially, foreign workers were given physical pieces of paper to prove they were well enough to work. "It created a huge issue in terms of potential forgery because they wanted to go back to work," Quah shares. "Employers kept calling the Ministry of Health and Ministry of Manpower to check if they were true."

The Ministry of Health then reached out to Accredify to digitise all discharge memos with blockchain, he says. Foreign workers could use their smartphone to display the verified discharge memo. This tool is offered on the Ministry of Manpower's app, which monitors foreign workers' health, and completed 2 million verifications in just three months.

The startup worked closely with government agencies to ensure the tech would align with the policy. "We were solving a future problem," Quah says.

It consulted MOH and the relevant authorities to understand what Singapore's reopening would look like. It then designed the app to be able to work with different countries' travel frameworks, he shares. "We thought that there was just one standard compliance framework, but that's not true."

Accredify also worked with GovTech, the Ministry of Health and Temasek to ensure the Covid-19 test results issued in Singapore would be recognised elsewhere. They created standards for recording data, based on an interoperability framework commonly used for e-health records.

GovTech provided tech support in other ways as well. The Digital Health Passport is built on the OpenAttestation framework, an open source blockchain tool developed by GovTech, says Quah. The tool was built in collaboration with SGInnovate, a government-owned firm that invests in tech startups, and funded by the National Research Foundation.

Countries are gradually opening up after travel lockdowns. Blockchain could offer a safe step towards normalcy.

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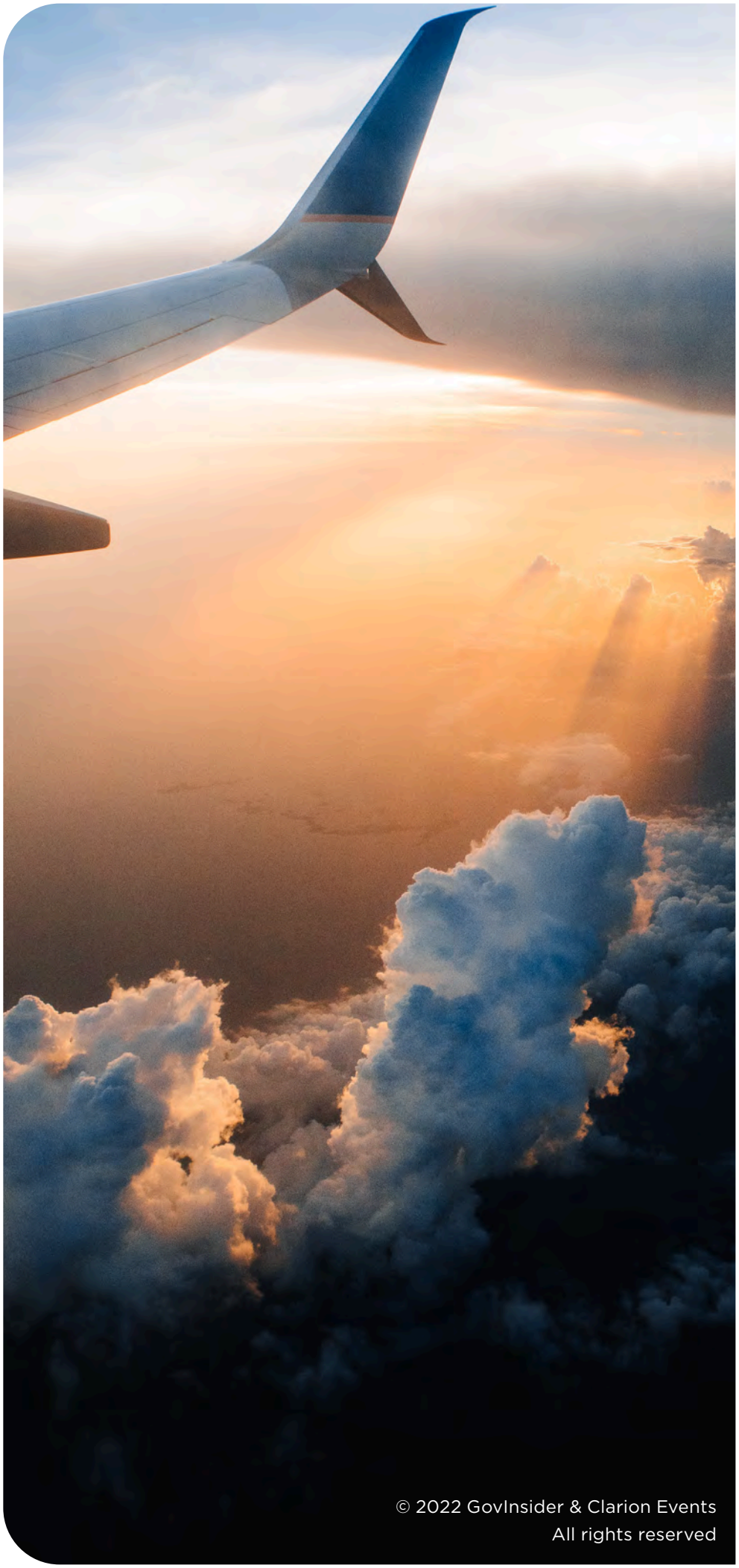

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