WHITEPAPER

\ Orchestrating a brighter world NEC

TAKING TRAVEL TO NEW HEIGHTS



A fresh experience, enabled by technology to meet new expectations

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EXECUTIVE SUMMARY

The travel industry has faced a series of challenges in the past several years, from having to cater to unprecedented growth to finding ways to make the travel experience safe and convenient as countries emerge from the pandemic of early 2020.

While passenger traffic will not recover until 2024, as estimated by the International Air Transport Association (IATA)[1], there is little doubt that demand for air travel will return when the conditions are right again.

Already, many countries have carefully opened up "green lanes" where certain pre-approved travelers from selected regions may be allowed to enter without a quarantine period. Others have installed temperature scanners to ensure that travelers are fit to travel.

Many old practices associated with air travel may not return. Topmost on travelers' minds will be safety. Travelling has to come with enough safeguards that would put their minds at ease about the risks involved.

At the same time, while it is understandable that there will be new safety arrangements such as temperature checks, travelers will still want to be able to be on their way fairly quickly.

As in other industries, here is an opportunity for the aviation sector to reset. By setting up a safe, trusted environment, it can deliver a travel experience that is unlike any before.

The good news is that many of today's technologies are ready to deploy to transform this experience. Some have already been set up as part of the industry's digital transformation efforts before the pandemic hit.

Digital onboarding before a flight, for example, has been existent for several airlines on Star Alliance, the world's largest airline alliance, for a few years. Today, travelers can check-in on their phone at their convenience, drop off luggage at self-service kiosks and breeze through immigration checks and the boarding gate.

The key to this is the integration of several important technologies into a seamless process. Highly accurate and fast face recognition, for example, enables the traveler to be recognized at various checkpoints without having to stop to present documents.

[1]IATA, July 2020: https://www.iata.org/en/pressroom/pr/2020-07-28-02/

To meet new challenges, technology solutions have to be upgraded as well. The best face recognition engines can now recognize a person even when they are wearing a mask, reducing contact and enabling safe distancing at each segment of a journey.

The upsides go beyond just reducing the hassles of travel. Digital solutions can make a journey not just safe but also one that delights and surprises. When travelers visit an airline lounge, for example, they can be identified with just their face and be presented with VIP treatment. The same when they visit a retail shop in the duty-free section of the airport.

Finally, before they board a plane, the boarding gate will be ready for them by once again recognizing their faces as they approach. After they land, they may continue to use this digital ID to check in to a hotel or even visit a theme park while overseas. This ensures that the improved experience goes from curb to gate to hotel, throughout the entire journey.

This will be an ideal scenario as air travel returns to some semblance of normalcy after this year's unexpected disruption. Most important for the industry is the ability to ensure a safe and pleasant journey for travelers, many of whom have not lost the desire to travel.

The groundwork for a future when air travel will be dramatically different has to begin today. Just like many organizations have accelerated their transformation efforts during the pandemic, the aviation industry has to turn to key enabling technologies to lay the foundation for their recovery efforts, in preparation for the new normal.





RECONNECTING WITH TRAVELLERS

In 2020, global airline passenger numbers or enplanements are expected to decline by 55 per cent from a year before, according to IATA. The industry association also predicts that global passenger traffic will not return to pre-COVID-19 levels until 2024, a year later than it had previously predicted.

Facing this unprecedented challenge, the travel industry and travelers alike are rethinking the shape and form that air travel will take in the so-called new normal. It will return gradually but what are required are new processes and practices that will help build up trust over time.

To do so, it is important to ensure that the environment is safe and clean. The processes that are involved in getting passengers onboard a plane and beyond also have to be efficient, so that the additional safety checks involved do not make the experience unpleasant. As before, travelers will expect the journey to be secure.

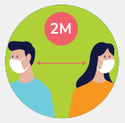
Airports and airlines understand that they have to spend more effort to safely distance passengers, ensuring that those who board their planes are not showing any symptoms of illness, while still offering a great way to fly.

Travelers, meanwhile, are looking for measures that will reduce the risk of being infected and provide efficiency during the additional health safety checks. Key to this is restoring confidence that it is safe to fly again.

In doing so, the industry will have to face some new challenges:



Masks will have to be worn by passengers, as mandated by many governments around the world today, so a new way has to be found to accurately and quickly identify them.



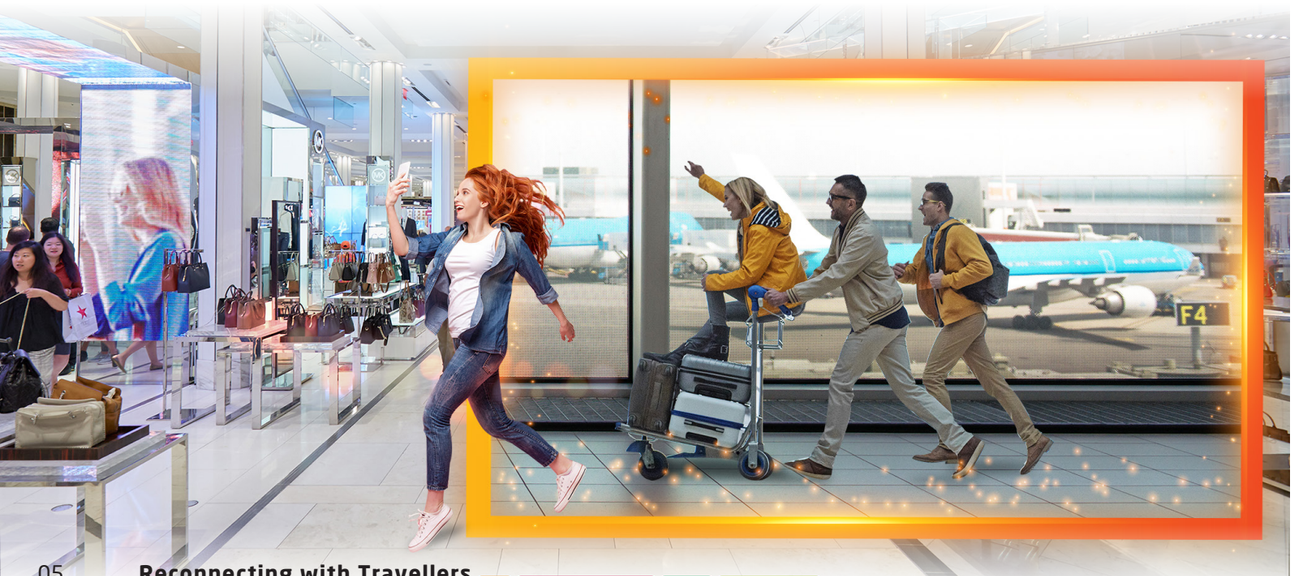
Social distancing will mean that passengers cannot be processed in large groups, which may lengthen the time taken to get them through checkpoints.



Physical interaction will also have to be reduced to protect both passengers and staff working at an airport and other places of interest, so it is imperative that interactions be carried out digitally as much as possible.



Passengers have to be shown to be **fit to travel,** for example, with temperature or other screening tests at the airport, which may increase processing time and add to the inconvenience of traveling.



To overcome these challenges, the industry has to rethink how the travel experience can be improved. There are several strategic approaches that can be expected:



Touchless processing will reduce the need for people to come into physical contact while enabling the necessary identity to be verified and travel documents to be checked. Face recognition is one way to identify travelers while reducing physical touchpoints such as airport check-in counters. The solution has to be able to detect individuals wearing masks.



Moving processes off-airport will enable travelers to move through checkpoints more swiftly, thus enabling improved passenger flow and reducing the concentration of large groups of travelers at an airport. By using a mobile app, for example, travelers can buy a log on to their airline to buy a ticket, check in online and verify their documents, all before heading to the airport. Being "ready to fly" before heading to the airport, a traveler can carry out a lot of the necessary tasks earlier at his own pace.



Faster processing at airports will be important to ensure that travelers can get on with their journey quickly. This means having simple, fast, secure an efficient passenger processing at the various checkpoints through biometrics. The best solutions take just 1.5 seconds to verify a passenger.



Screening travelers to be fit to travel is another key process to incorporate in the new travel experience. This means being able to have a temperature pre-screening process as a traveler is in airport, followed by a more thorough check when he arrives at a checkpoint. This process has to be contactless and anonymous.

On a positive note, some of the groundwork for digital transformation has been done before the pandemic, so the industry is not starting from a blank slate. Instead of deploying the necessary technologies for the first time, many organizations have taken a lead to improve the travel experience in the past few years.

This experience will be instructive in today's climate. For example, in 2017, IATA unveiled a concept of a single digital ID that can be used to seamlessly get a traveler through the various checkpoints at an airport[2].

Separately, in 2019, Star Alliance announced that it was developing a biometric hub that would be trusted by travelers to easily identify themselves to the various checkpoints and locations in a journey, thus improving the travel experience[3].

While these implementations planned to handle the growing volume of travelers before the unexpected pandemic, they have formed the foundation for the transformation that the industry needs today. Technologies such as biometrics can be enhanced to bring benefits to air travel that will be just as impactful to a post-COVID-19 world.

Already, the travel industry is looking to the future, where low-touch and automated passenger processing will help comply with hygiene requirements while enabling a more comfortable travel experience.

With this in mind, NEC and SITA announced a partnership in July 2020 to develop market-leading solutions that enable a secure walk-through travel experience at airports. These will use NEC i:Delight identity management platform together with SITA Smart Path and SITA Flex[4].

[2] **IATA, December 2019:** https://www.iata.org/en/iata-repository/pressroom/fact-sheets/fact-sheet---one-id/
[3] **Businesswire, July 2019:** https://www.businesswire.com/news/home/20190726005052/en/Star-Alliance-NEC-Corporation-Sign-Partnership-Agreement
[4] **SITA, July 2020:** https://www.sita.aero/pressroom/news-releases/nec-and-sita-announce-global-aviation-partnership-agreement-to-deliver-the-future-of-digital-identity-at-airports

THE NEW WAY TO TRAVEL

In a new era of travel, digitalization will be the answer to many of the challenges facing both the travel industry and travelers alike. It will enable travelers to start on the right foot when they begin a journey.

For this, travelers will carry out more self-service actions throughout a journey and meet with less friction at the various checkpoints that traditionally required him to stop and present paper documents.

Crucial to the new journey is the use of biometrics and artificial intelligence (AI) on an integrated, trusted platform that enables travelers to do away with the manual actions required at each part of a journey.

Here is how a typical trip might look out:



01 Enrolling

The journey actually starts when the traveler is at home. At his leisure, he can register with his favorite airline alliance, such as Star Alliance, by scanning his passport and taking a selfie once with his mobile phone.

From this point on, he can log in to an app on his mobile device via three-factor authentication – username, password and face recognition – to find, book and purchase flight tickets.

This is an opt-in process, where a customer decides to share his personal information for an improved experience. All his travel information, such as his flight number, can be retrievable by the trusted parties, such as the airline or immigration authorities. Through integration with government digital ID systems, the traveler is verified online to be who he says he is.

02 Checking in

When the traveler reaches the airport, he uses his face and passport to verify the information that was entered earlier. From here, his face becomes his digital ID for all checkpoints, from the bag drop counter to the boarding gate.

Fight check-in is done through a contactless experience using face recognition. Instead of waiting in a line to pick up his ticket, the traveler simply logs into his account and scans his face.

Baggage drops are just as easy. The traveler drops off his luggage, using his face to confirm his identity, and continues on to his destination. With shorter wait times, he has more time to dine, shop and relax before his flight.



Case Study: Star Alliance

Thanks to a partnership between NEC and Star Alliance, the world's largest airline alliance, their customers can have a seamless and touchless passenger experience that allows them to pass through curb-to-gate touchpoints with airports by using a secure identity management solution featuring face recognition technology. This helps airports and airlines alike to increase operational efficiency while strengthening the consumer loyalty value proposition within the travel ecosystem.

03 Sharing health status

One important checklist to fly in future would be a "fit to fly" status. Through intelligent temperature checks at various checkpoints, a traveler will be assessed to be ready to travel, even if he has a mask on. He will also have, through his mobile app, declared his health status on a questionnaire that the local authorities require of travelers.

04 Entering the restricted area

At the immigration checkpoint, the traveler simply walks through if his face is identified by a scanner to be a valid traveler.

This integrated system, based on advanced biometrics, speeds up standard security procedures by eliminating the need to present passports or check boarding passes.

05 Visiting the airline lounge, shops

Face recognition also allows the traveler to access the VIP lounge, where he is instantly welcomed with a personalized experience. Since the airline also has his information on hand, a traveler can enter the lounge simply by showing up, instead of fumbling for a boarding pass in a bag.

In the same way, purchases can be made at shops by simply scanning his face for identification and even payment. No credit cards, no passport, just a quick face scan.

06 Boarding a plane

As the time to board approaches, the traveler can be prompted to make his way to the gate. A combination of video analytics and face recognition can identify where a passenger is and encourage him to make his way to the gate earlier to board on time.

At the gate, the same face recognition system will automate the boarding process by reducing the need for gate personnel and eliminating the need for paper or mobile boarding passes. Contact is reduced.

07 Going beyond the airport

On arrival at his destination, a passenger can also use the same digital ID to check into a hotel room, rent a car or enter a theme park. This can be biometrics-enabled, for example, at a hotel that lets a guest check in the same way he does at an airport. Such a scenario is possible when the digital ID is extended through secure identity management in the travel and hospitality industries.

INTRODUCING THE FUTURE OF TRAVEL

Experience a whole new way to travel with NEC I:Delight

70% of travelers have a positive attitude towards the use of biometric technology in speeding up their travel experience [1]

MORE THAN 84% of frequent flyers in the U.S. would opt-in to facial recognition to speed up bag drop, check-in, security, and boarding [1]

77% of consumers said they would shop in retail stores more frequently if they could have a fast payment experience [2]

9 MINUTES is the estimated time travelers can save during boarding thanks to face recognition [3]



Every journey starts at home. A traveler signs up for an account on NEC's secure system with just their passport and a face scan.

The entire check-in process is contactless. Travelers are identified through face biometrics, and they can drop off their bags easily and seamlessly at a bag drop before going about their journey.

The traveler's face acts as their boarding pass and passport, eliminating the need to present documents at security checkpoints. This allows even big groups to socially distance.

Multiple people can be screened accurately via thermal imaging, even with the use of face masks, without the need for physical interaction or exposing staff to potential danger.

Travelers get personalized recommendations for shopping and dining at the airport, giving them to have a curated experience that is just for them. They may also unwind at their airline lounge as they wait for their flight to depart, where they be served their favorite drink and snack based on their last visit. No matter what they choose to do, every traveler can feel like a VIP.

NEC's biometric solution identifies travelers in less than two seconds on average, and transitions them seamlessly from pre-boarding and beyond. From airline lounge entry to F&B options to boarding, the entire process is automated, personalized and simplified. A biometric flight manifest is updated in real-time securely and efficiently, ensuring flight safety.

NEC I:Delight is highly portable, and interoperable between countries. This makes border control a breeze, as checks in a traveler's home country also work at their destination.

This automatic identity verification extends to other parts of a traveler's trip, from car rental to hotel check-ins to entry and payments at attractions. So they spend less time in queues and more enjoying experiences designed just for them.

All features are strictly on an opt-in basis.

TECHNOLOGIES THAT ENABLE, DELIGHT

For such an ideal scenario to come together, a combination of various technologies such as AI will have to come into play. Each will allow the traveler to be "known" throughout his journey to each stakeholder that requires that information.

However, requiring a traveler to juggle a multitude of identification cards and digital personas is not ideal. This ruins the idea of a seamless experience because the customer experience will become fragmented, weighed down by unnecessary friction.

Today's travelers want a straightforward, secure and most importantly, seamless experience. This is where NEC I:Delight's solution can create a superior customer experience, balancing customer delight with a steadfast devotion towards trust and security.

Through a single platform using AI and biometric technologies, NEC I:Delight helps streamline both physical and digital identities into an ecosystem to create a seamless, secure and straightforward customer experience.

Designed to eliminate friction and delight customers, NEC I:Delight delivers a unified customer experience across countless environments. By leveraging on contactless solutions that make touchpoints touchless, NEC I:Delight helps to create experiences that are not only effortlessly efficient, but also seamlessly safe.

NEC I:Delight is designed to fulfill a broad spectrum of purposes in a variety of environments, from enhancing travel experiences to minimizing the spread of infectious diseases.



Technologies that work together

For example, face recognition and AI can work together to identify passengers who are wearing masks. Installed at existing self-service kiosks, the technologies can help travelers interface with a touchpoint without any physical contact or to handle physical documents.

Video analytics coupled with AI can also enhance security and provide better management of passengers in a secure area. If a number of those leaving on a flight that is departing soon are stuck at a checkpoint, an agent may be able to quickly assist them to move around faster to their gate to avoid missing their flight.

To ensure that a traveler is fit to travel, an intelligent body temperature monitoring system will improve on current systems, which often require a staff member to physically place a scanner near to a person.

The new system will not only screen multiple persons walking through a checkpoint at the same time but also do so with travelers wearing a mask. This is done by detecting the core body temperature (with an error or just 0.5 degree Celsius), from a reading of the inner canthus of the eye. The process is non-intrusive and the monitoring equipment can be deployed at various checkpoints.

Separately, wireless beacons placed throughout an airport can also detect a passenger's movement through various areas, for example, when he is lounging at a rest area. He can be reminded of his flight or even pushed an offer for a meal or drink in between flights.

This only works if the information is relevant to the context, based on his travel and shopping history. A passenger who has indicated he is heading to Phuket for holiday, for example, may be offered a good deal for some swim gear. Someone heading to a cold country during winter can be reminded to pack warm clothing.

Tying this together is a series of sensors as well as data analytics provided by the known traveler. AI and machine learning, which will figure out his preferences and habits based on this, will be instrumental to creating a new, improved experience.

The quality, and not just the type, of technology solutions is important here, because it could make or break a customer experience. A face recognition technology has to be both fast and accurate to ensure that travelers go past each checkpoint with the minimum fuss.

Built on trust

For any digital solution to work, its users have to be assured that their privacy and data are adequately protected. The same applies to an air travel experience of the future that is empowered by digital technologies. Trust is earned and confidence built through an unwavering effort to ensure that the travelers always have control of their data and privacy.

NEC is committed to protecting the identity of all customers – across touchpoints, modalities, locations, geographies, and regulations – in a reliable and trustworthy manner. To enable this, the I:Delight platform utilizes a privacy-by-design approach and operates purely as an opt-in service.

Users receive a completely transparent view of the services they sign up for and the associated benefits. Intuitive and hassle-free, the I:Delight platform only engages users with the right message at the right time. This transparency also extends to the opt-out process, which is as seamless as the registration process.

This is one reason why Star Alliance has chosen to work with NEC to develop a biometrics platform that would provide a more seamless solution for travelers[5]. It is developed with a "Privacy by Design" approach, which means users' privacy is a foremost priority from the very start. At all times, they have control of their data to define their own travel experience.

Frequent flyers will only need to enroll once on an app and be able to connect to a number of partner airlines, airports and, in future, other destinations of interest, duty-free shops, hotels or even car rental companies.



With cutting-edge identification technologies and AI solutions including the most accurate face recognition algorithm, NEC I:Delight identifies travelers who have opted to use the service to be identified quickly with a high degree of accuracy even when they are on the move. NEC's global partnership with SITA will enable travelers to use their biometric identity to check-in, make payments, drop their bag, pass through border control and board their plane, all by simply scanning their face at each step.

[5]Howard Slutken, Apex Aero, September 2019:
https://apex.aero/2019/10/10/star-alliance-connects-airline-members-with-biometrics

WHY NEC?

Through many years of work with governments and enterprise partners, NEC has developed technologies that can eliminate the need for physical interaction when identifying individuals.

Although the work on touchless technology began long before the current crisis, the COVID-19 pandemic has provided a fresh perspective on the importance of these solutions to essential workers who are on the frontlines to ensure safety and security.

Our commitment to support these workers is one of many factors that have driven the implementation of our biometric and AI solutions for multiple purposes, including aviation and immigration.

An example of our touchless technology at work in aviation is NEC's implementation of the first curb-to-gate biometric terminal in the United States with Delta Air Lines, in partnership with the U.S. Customs and Border Protection (CBP), the Transportation Security Administration (TSA), and Hartsfield-Jackson Atlanta International Airport (ATL).

This curb-to-gate solution enables rapid identification and real-time screening of passengers. Travelers flying to an international destination can choose to use face recognition technology to check in at the self-service kiosks, drop bags at the check-in counters, go through the TSA checkpoint, and board a flight without requiring a physical ID card or boarding pass.

Not only are our solutions more efficient, they are more hygienic with reduced risk of contamination, and they help streamline and secure customer interactions. While integrating thermal sensors is the first step in addressing the COVID-19 pandemic, implementation of secure, touchless access requires sensor fusion.

NEC's award-winning biometrics solutions, including face and iris recognition, coupled with our cutting-edge technologies in behavior detection, body recognition, video analytics, and artificial intelligence, provide the tools to ensure successful implementation of touchless technologies.

A trusted partner since 1899, NEC's biometric solutions have led the industry over the years. They have been ranked tops eight times for fingerprint and five times for face recognition by The National Institute of Standards and Technology (NIST).



In the aviation sector, NEC solutions have been proven in more than 700 systems across 70 countries. Ranging from automated border control gates to biometric passport control, they have been deployed at more than 25 airports around the globe.

Through I:Delight, NEC has been recognized as a leading provider of scalable digital identity platforms that integrate seamlessly with airline and airport systems. These platforms provide touchless processing of passengers and staff, making their journey through the terminal a safe, simple and efficient one

To discover how NEC I:Delight can help deliver a new era of air travel, speak to an NEC representative today.

Case study: Hawaii Airports

NEC, together with Infrared Cameras Inc., is providing thermal temperature screening and face recognition technology at Hawaii's public airports to help protect the community and identify passengers with a potentially elevated body temperature[7].

The companies were selected by the Hawaiian authorities because of their innovative concept and functionality to deliver accurate and efficient thermal temperature screening for people traveling to the state.

The system incorporates privacy protections from design to deployment and NEC works with the Hawaiian authorities throughout this process to ensure the solution meets their requirements.

The system will only temporarily retain a picture of a person with an elevated temperature to help airport representatives identify them and conduct an additional assessment to determine if health precautions are necessary.

The picture will be erased within 30 minutes and will not be shared with any outside agencies. Anyone with a temperature below 100.4 degrees Fahrenheit will not have their image retained at all.

The use of the thermal image capture technology is anticipated to be safer and more cost effective than manual temperature checks. Without the use of face recognition technology, an employee would need to be next to each camera at all times to pull a person aside as they walk by the camera, creating bottlenecks and further exposing employees to travelers and, thus, possible COVID-19 infection.



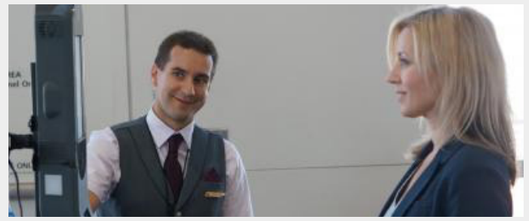
[7]**NEC, July 17, 2020:** https://www.nec.com/en/press/202007/global_20200717_02.html

Case study: Delta Air Lines

In 2018, Delta Air Lines partnered with the United States Customs and Border Protection (CBP), Hartsfield-Jackson Atlanta International Airport (ATL) and the Transportation Security Administration (TSA) to deploy the country's first biometric terminal at Maynard H. Jackson International Terminal and Concourse F in Atlanta[8].

The system set up by NEC offers an option for travelers to use face recognition technology from curb to gate, delivering a seamless end-to-end experience. They check in at self-service kiosks, drop the checked baggage, then simply look at a scanner at a TSA checkpoint and the boarding late to be on their way.

Based on initial testing, the face recognition option not only saves up to nine minutes per flight, but provides employees an opportunity to have more meaningful interactions with customers throughout the journey.



"Launching the first biometric terminal in the US at the world's busiest airport means we're bringing the future of flying to customers traveling around the globe," said Gil West, Delta's COO.

"Customers have an expectation that experiences along their journey are easy and happen seamlessly — that's what we're aiming for by launching this technology across airport touch points," he said at the launch.

[8]**Delta News Hub, Sep 20, 20118:** https://news.delta.com/delta-launch-first-biometric-terminal-us



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