IATA

StB
Simplifying
the Business

StB

**Simplifying
the Business**

2011

A road map to prepare for tomorrow's passenger

Five goals towards sustainable profits and better service

StB
Simplifying the Business

2012

IATA presents the New Simplifying the Business (StB) Program

Tomorrow's passenger journey will be simple, from travel shopping to airport security

StB
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2013

Simplifying the Business (StB)

Transformation in progress and explorations underway

Making the industry easier to do business with for both customers and partners.

StB
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2014

Simplifying the Business

Leading transformation for customer-centric air travel

StB
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2015

Simplifying the Business

Innovating better together to benefit the future passenger

StB
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2016

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Innovating better together

Foreword

Eric Léopold
Director Transformation,
FDS – IATA

Innovation and digital are the key StB drivers for enhancing customer experience.

Over the past 13 years, the StB program has progressed in improving the passenger experience through bridging gaps between processes, exploring new initiatives and involving various stakeholders to ensure the customer remains the focus. The 2020 vision of the perfect journey continues to guide the development of current and new projects.

The scope remains on the customer experience, but has expanded into other areas. For example, this year, the scope evolved to look into payments for passengers and the benefits for customers in airport automation. Innovation and digital are the key StB drivers for enhancing customer experience. This was demonstrated through current projects based on product differentiation, providing customers with more choice and transparency, customer identification and allowing for a secure and seamless experience through the airport.

Progress in technology has never been so impressive. It plays an increasingly integral part in the StB ideas, initiatives and projects. Artificial intelligence and machine learning encourages many benefits from better personalization of content, offers, and experience to automated vehicles and processes.

Similarly, Blockchain is promising seamless, friction-less payments. Technology enables many benefits and we need to focus on its impact on the human interaction part of customer experience.

Besides all of these initiatives, we can continue to improve the speed of design and implementation of new standards. IATA has focused recently on accelerating the formation of ideas, through the Ideation Hub and hackathons; on speeding up the development of solutions, through incubation and funding programs; and on getting solutions to market faster, through events and networking. IATA aims at combining these modules in an innovation ecosystem, to accelerate adoption of new industry standards.

I look forward to the discussions and potential initiatives that the new ideas elaborated in this document will incite.

A special thank you to the StB Ideation Hub participants and IATA staff that created this document and continue to lead innovation in our industry.

Sincerely yours,

StB Big Picture

In 2015, the StB formulated the "Big Picture". It included five essential areas of the customer's end-to-end journey: shop, order, pay, engage and experience. All of the ideas from the StB IH fall into one of these areas.

Shop **Order** **Pay** **Engage** **Experience**

StB
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IDEAS

Executive Summary

The IATA Simplifying the Business (StB) program is a transformative driver of innovation through key projects and initiatives that aim to improve the passenger experience. Led by a group of innovation-focused airline representatives that are key transformers within their proper organizations, StB has become a cornerstone of innovation in IATA and across the industry. The program will be explained in more detail in the next section of this document.

One of the key pillars of the program is the StB Ideation Hub (IH), consisting of key strategic stakeholders from across the industry, including airlines, airports, IT providers and other partners. Led by IATA, this team of transformative individuals meet to brainstorm new ideas and develop them throughout the year.

The outcome of the 2017 StB IH is explained in this document. In addition, Proof of Concepts (PoCs) are developed to further articulate the ideas. These PoCs are presented at the annual IATA World Passenger Symposium, where the larger audience is encouraged to discuss the ideas even further. The document also includes an update on the 2016 ideas (Baggage, One ID, Open API and Payments), including their progression and evolution since the 2016 White Paper.

This year the three StB Ideation Hub ideas are:

1 Autonomous Vehicles

2 Passenger Payments

3 Personalization

Overview of the content

Section 1

Executive Summary – introduces the StB White Paper

Section 2

StB Overview – introduces the StB program, methodology and governance

Section 3

Update on 2016 Ideas – provides updates on the 2016 ideas

Section 4

2017 New Ideas – introduces the three new ideas

Section 5

Conclusion – outlines the next steps and conclusion

Annual StB White Papers can be found at www.iata.org/stb

StB Overview

The program

The IATA Simplifying the Business (StB) program is unique. Born from a need to find cost reduction and greater automation possibilities through simplifying processes and making the most effective use of existing technology, it became a key driver of industry adoption and speed. IATA's role was to bring all the stakeholders with a common vision together to develop industry-wide standards. The aim was to benefit both the industry and the customer by making a more efficient travel experience for everyone, improving customer service while saving at least US $6.5 billion in annual costs. The original five core projects were e-Ticketing (ET), Common Use Self-Service (CUSS), Bar-Coded Boarding Pass (BCBP), Radio Frequency ID (RFID) and IATA e-Freight.

Over the years, the StB program has evolved from the original focus of improving processes to more forward transformational thinking. The core activity is still based on improving the passenger experience and cost reduction, but the shift of focus is based on transforming the way we operate, rather than simply improving it. In other words, the program tries to reimagine the industry and how we would build things from a blank page.

This unique perspective allows us to focus on ideas that were later pursued into projects. The cycle is becoming increasingly faster. However, we need to push more and become more innovative and deliver benefits to the industry faster.

Benefits

The StB program benefits all involved stakeholders including passengers, airlines, airports, travel agents, ground handlers and system providers.

Unique methodology

The key elements of StB are based on its methodology, consisting of:

- **Idea generation**

- **Project delivery**

- **Industry mobilization and engagement**

- **Solid governance structure and robust communications strategy (including a dedicated industry event)**

In addition, there is a rigorous project selection process, based on specific criteria and these projects are processed through five phases, driven by stage gate reviews. The methodology is necessary to ensure a successful StB program. The StB IH consists of an annual rotating membership of several StB SG members and other partners from specific industries – depending on the topics discussed. The IH focuses on ideation and new initiatives that can potentially be pursued as a StB project. The StB IH publishes this annual White Paper to stimulate conversation and share innovative ideas that will lead to industry transformation.

Project phases

Using program cycles, the projects go through five different phases:

1) **Conceptualization:** Illustrate and sketch the concept. Identify KPIs and reasons for the concept to be explored.

2) **Exploration:** Assess feasibility and develop an industry business case based on the identified KPIs.

3) **Development:** Develop the "product" (e.g., industry standard, recommended practice, implementation roadmap, etc.)

4) **Implementation:** Implement the project, including industry mobilization and market adoption – according to the target roadmap.

5) **Closure:** Ensure the vision/target was achieved, benefits were realized and close the project as a StB project. The initiatives are now transferred to normal operations.

StB
Simplifying the Business

StB Overview

Industry mobilization and engagement

Another unique attribute is how StB mobilizes the industry to deliver the target when projects are in implementation phase. There are designated airline champions that own the process within their own airline. The mobilization effort also relies on strong support from IATA's Board of Governors (BoG) and Strategy and Policy Committee (SPC) – which reports to the BoG. In addition, there are workshops, and campaigns that are regularly delivered to the industry as well as communications including dedicated IATA webpages and social media.

Governance
StB Steering Group

The StB program is governed by the StB Steering Group (SG). The StB SG includes up to 15 airline members directly appointed by their CEO who advise IATA management on the StB program strategy and execution. The group provides IATA with guidance and ensures the StB projects are relevant and meet the needs of IATA members. Each member participates in the SG with an industry mindset, rather than an individual airline mindset. In addition, each member is responsible to brief their CEO on the activities of StB. Finally, the StB activities are reported twice a year to the IATA BoG and SPC, who review and guide the StB program.

IATA World Passenger Symposium

The WPS gathers stakeholders from across the industry to focus on the passenger. The WPS is important for the StB program, since it is an opportunity to highlight and discuss the StB projects as well as the work completed by the Ideation Hub – more specifically, the White Paper. It is the forum where IATA provides the industry agenda and strategy for the years to come on everything relating to passenger. It's also the place where standards are adopted and decisions are made through the various industry meetings taking place simultaneously.

StB project scorecard

	2017 TARGET
BAGGAGE XML	**2** Live Implementations
NDC (New Distribution Capability)	**45** NDC Airlines
ONE ORDER	Message Standard Adoption
ONE ID	Concept Document Published
OPEN API	Feasibility Study Published
TRAVEL COMMUNICATIONS	Industry Data Charter

Update on 2016 Ideas

In 2016, the StB IH explored the following four ideas:

One ID

Payments

Baggage

Open API

These four ideas were articulated into the 2016 StB White Paper. In addition, the team developed proof of concepts for each and presented them at the IATA World Passenger Symposium in Dubai, UAE.

The progress made on each idea since the 2016 White Paper and WPS will be explained in the following sections.

2016

In 2016, one of the new ideas underpinning the third StB pillar of a "seamless and hassle free" travel experience was to connect the dots across the end-to-end passenger process from an identity management perspective. Moreover, the vision was to create a streamlined, friction-free process that allows an individual to assert their identity (online or in person) to the required level, while maintaining the privacy of personal data and enabling significant improvements to operational efficiency and security. It is paramount that this vision will be delivered through true collaboration between airlines, airports and government agencies.

Key concepts and principles

- One ID will rely on a trusted digital identity to facilitate improved customer experience, speed and security. This should be introduced as early in the passenger process as possible, with the validation of identity-related information at the time of booking or shortly thereafter.

- One single capture of passenger data will be used by all stakeholders across the end-to-end journey including outbound and inbound.

- Biometric recognition will be used within the airport environment, to confirm an individual's identity.

- A trust framework will need to be in place, supporting the collaboration of various stakeholders such as airlines, airports and government agencies.

- Privacy by design, and strict compliance with regulations pertaining to data privacy.

- Different systems will be deployed due to differing regulatory and operational requirements; interoperability is key.

Timeframe	Token		Support proof of ID	Necessary conditions
	Pre-departure	At airport		
2020				Biometric data captured once and used through the whole process. Digital form of identity has been developed.
2030				Interoperability between airports (incl. between countries)
Beyond				Digital based identity enabled

In the near term, the main focus will be on the pre-departure process, in particular how identity related information can be verified early on in the process, as well as how biometric information can be used as a single token to facilitate the departure and/or arrivals process within a given airport ecosystem. The e-passport will still be used to authenticate identity.

In the longer term, we will start to see wide scale interoperability between airport ecosystems enabling cross-border scenarios linking departures to arrivals.

Ultimately, we expect to see the use of a digital identity allowing an individual to assert their identity, online or in person, to the required level and throughout the end-to-end process, entirely replacing the use of a physical passport.

Progress in 2017

This new work stream was merged with the existing Single Token work stream under the banner of "One ID", and the IATA team established a task force composed of airlines, airports, governments (immigration, border control and security) and representatives of the vendor community in order to clearly define the scope and the following deliverables:

- High level concept paper describing the importance of One ID and the qualitative benefits derived from it, what it is, and what its core principles are.

- Detailed documentation describing in an evolutionary roadmap what is possible, practical and worthwhile in the short, medium and long-term. The documentation includes:

  - Concepts, solutions and technologies that need to be on our radar screen in each of these time frames.

  - A high level concept of operations that describes, practically, how it could work in each of these time frames. It also identifies the actors and describes their roles, how they interact with one another and for what purpose. The specific outcomes that are expected from interactions between them, and a high level process model and data flows.

  - The elements of a trust framework that would need to be in place between key stakeholders to enable this concept of operations.

  - The regulatory framework that would need to be in place to enable this concept of operations.

- The team is also seeking to formalize the relationship with various proof of concept implementations that are ongoing in different parts of the world, enabling us to learn from their experiences, fine tune concept documentation, and start producing guidance material.

Next steps

In 2018, the task force will leverage various pilot projects to gather operational data in order to further refine the concept documentation and produce initial guidance materials. The development of a template trust framework also features prominently on the agenda.

Several proof of concept implementations are ongoing across the globe, but the vast majority of these currently focus either on the departure or on the arrivals process, and often with a limited number of stakeholders involved. In addition, the team will continue to proactively look for pilot projects demonstrating the viability of cross-border scenarios in 2018. Another area of focus for pilot projects is the pre-departure process, and particularly how identity related information can be validated early in the process; API data quality is a key issue today, and improving this will be a key prerequisite to changing the current trust framework to the benefit of the traveler.

IDENTITY
CONFIRMED
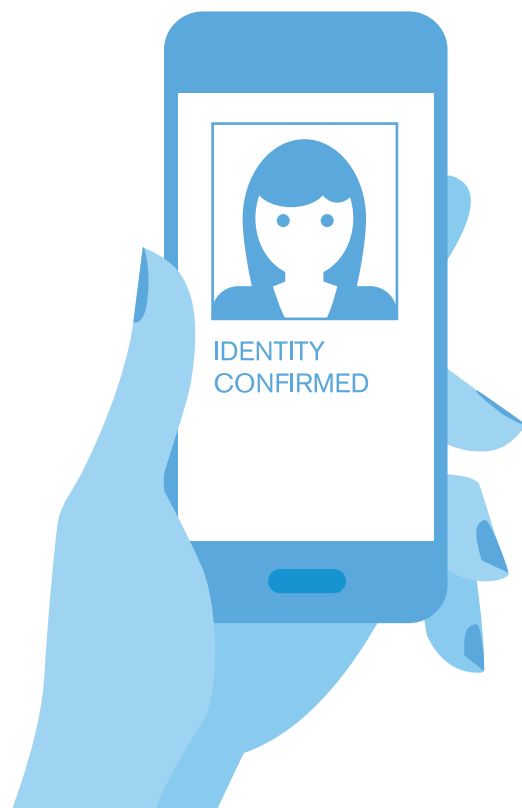
The focus in 2016 was on business-to-business payments. There is considerable global variation in preferred types of payment, banking services, payment acceptance and shopping methods. In addition, the payment and settlement process and service level for airlines varies considerably by region and channel. Payment relies on complex legacy processes that include a diverse and multifaceted regulatory framework. The intent was to make payment processing simple, consistent and secure for the entire air transport industry while reducing payment processing costs and related fraud.

The vision was to enhance the passenger experience by enabling payments anywhere (omni-payment) as well as reducing the complexity on the merchant side.
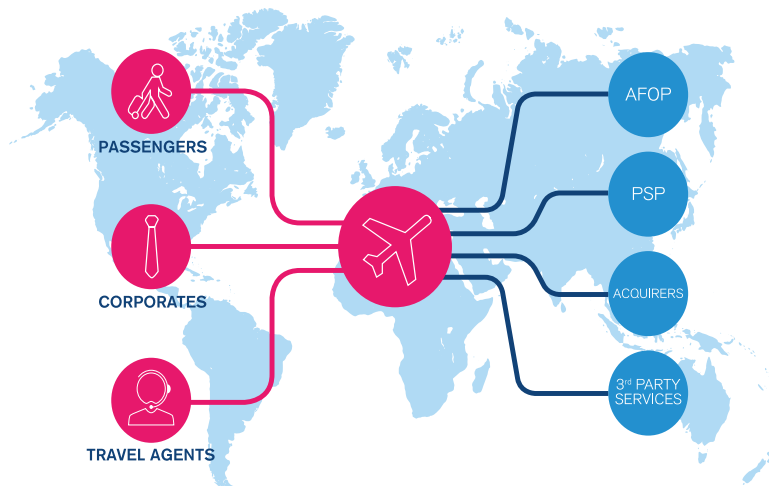
The team worked the idea into the scope of the IATA project called the IATA Financial Gateway (IFG). The IFG focuses on online payments – facilitating and optimizing the online payment process for airlines and other travel suppliers.

Acting as aggregator on various forms of payments and different payment providers, it reduces the complexity of connecting to various services and simplifies the payment process through a single global connection. IFG aims to address the airline's need to increase the availability of various forms of payment in different sales channels including the direct and indirect sales.

IFG provides the ability for airlines to manage the acceptance of various forms of payment, select payment providers, and even restrict or allow specific forms of payment for each individual payment transaction.

Access to multiple payment providers is important but this is not the only benefit the IFG provides. It also enables IATA-managed forms of payment such as BSP Cash or EasyPay for the non-GDS sales channel of the airlines; it makes other IATA card services such as Fraud Clear available as part of the processing as well.

BEFORE IFG PROCESS

PASSENGERS

CORPORATES

TRAVEL AGENTS

AFOP

PSP

ACQUIRERS

3rd PARTY SERVICES

AFTER IFG PROCESS

PASSENGERS

CORPORATES

TRAVEL AGENTS

BSP

AFOP

PSP

ACQUIRERS

3rd PARTY SERVICES

ARC

AFOP - Alternative Forms of Payment   **PSP** - Payment Service Providers   **BSP** - Billing and Settlement Plan   **ARC** - Airlines Reporting Corporation
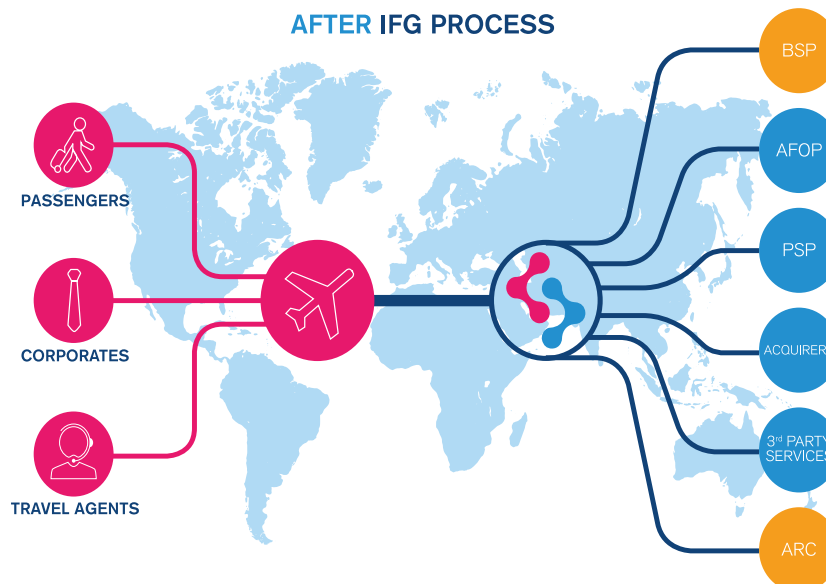
Benefits

Global Reach
Extends market reach and improves user experience to enhance sales opportunities
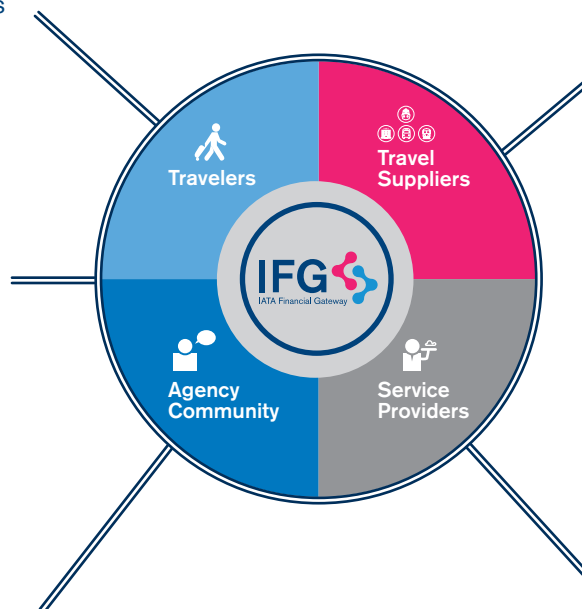
Simplification
Reduces complexity and increases operational efficiency through a single global connection with access to all payment processors, including the BSP

Security
Improves system security by providing a highly reliable system and secured connection with Payment Card Industry Data Security Standards certification and data privacy

Cost Efficiency
Improves operational savings and management of Service Level Agreements and risks while reducing agency settlement costs by deploying BSP settlement in all non-GDS distribution channels using IFG real-time capture services for both ET and ticketless carriers

In Control
Be in control of when each payment is made and the form of payments accepted while having the freedom and flexibility to select or change payment partners without any systemdisturbances

IFG diagram
- Travelers
- Travel Suppliers
- Agency Community
- Service Providers
- IFG (IATA Financial Gateway)

Key features

Designed to meet the payment needs of all airline business models, IFG offers:

- **A single global connection**
- **Access to all forms of payments through a range of payment service providers**
- **A seamless integration with ticketing systems and various distribution channels**
- **Business Rules Management according to the airline's payment strategy**
- **BSP/ARC Sales Reporting**
- **Third party services including fraud prevention, behavior analytics and tokenization services**

Further details and contact information can be found on
http://www.iata.org/IFG

In 2016, the StB Ideation Hub explored different areas of baggage handling transformation. Existing baggage infrastructure is at full capacity and no longer sufficient for future passenger volumes and customer expectations. The vision is to re-invent the baggage process by providing real-time tracking and tracing and robust identification.

Following the StB IH, IATA reviewed current baggage handling processes and completed an assessment of baggage tracking technologies and baggage delivery. These ideas are continuing to be further developed and the below outlines the progress made.

New entrants to the market are bringing into question the way that airlines handle baggage. The unbundling of the baggage product from the ticket price has been a fact for several years in many markets. With this unbundling comes choice - passengers can choose how their bag will travel. These additional services are not quite ready for the mainstream, but will be in the near future.

Passenger expectations are not a new pressure, but they constantly increase. The passenger will soon demand "real-time" notification of their baggage location. Some passengers are already taking this into their own hands by buying tracking devices for their baggage. It is a great shame that with the airlines 99.4% success rate of delivering bags, passengers feel the need to buy an electronic comforter to reassure them where their bag actually is during their journey. IATA Resolution 753 requires airlines to collect the tracking data for baggage but does not require that this is shared with the passengers, as this is an airline business decision.

Current innovations

There are a number of innovations to current processes, where standards exist to enable industry cooperation. These include:

1. Identification

A new identifier (.M) can be applied by any stakeholder in the baggage journey, from bag manufacturer to passenger. The only requirement is that the airline is capable of receiving this identity from the bag. In addition, airlines can take advantage of technology to make the automatic capturing of baggage identities possible. While additional technologies exist for identification, they are either cost prohibitive when applied to many tracking points or not yet proven.

2. Communication

Airlines are now able to use modern Internet of Things (IoT) technology to send messages formatted in XML over the open internet with complete security and confidence in delivery.

IoT uses the Message Queue Telemetry Transport (MQTT), a machine-to-machine /IoT connectivity protocol. This is a lightweight publish/subscribe messaging transport with built in resilience for connectivity drops. It uses a small bandwidth, and is easy to implement making it perfect for large numbers of small messages – such as those found in a baggage tracking implementation.

Long-term transformations needed

1. Smart regulation

Concern over the capability to swap baggage labels or produce fake ones is severely hindering the ability of airlines to use home printed and electronic baggage tags. Regulators need to examine and address the fundamental problems (i.e., insider criminals and lack of observation in the customs hall, antiquated customs processes) rather than penalize the billions of honest passengers who would like to avail themselves of new baggage tags. The transformation needed is to make use of technologies such as Radio Frequency Identification (RFID) that can proactively inform customs if a bag is in the wrong channel, and machine learning to monitor Closed Circuit Television (CCTV) in restricted areas and identify unauthorized baggage access.

2. Revamp of baggage including the tag

Although the short term focus is on efficiency, the longer term will include a complete review of the bag as we now know it and take away many of the weaknesses that the existing baggage processes has, including but not limited to, the lack of data impacting baggage offload processes and limitations attached to the 10-digit tag license plate. Moreover, the actual tagging process is probably the biggest inhibitor to a much smoother self-enabled process with a huge impact on airport design. With permanent baggage tags, passengers would not have to queue.

3. Split the passenger from the bag

The industry invests billions in state of the art baggage screening machines, especially in the run up to the adoption of Standard 3 in Europe (EU law to bring new explosive detection machines capable of Standard 3 in place by 2020). With this investment and the certainty of safety that it delivers, this gives the opportunity for bags to take a separate routing than the passenger and enable end-to-end baggage delivery still under the contract of carriage of the passenger. This would dramatically change the transfer process as bags would cease to follow the passenger and could be free to take an optimized route.

4. Business intelligence and big data

Baggage data, especially where full tracking data is available, is a rich data source and when linked with other data (such as actual flight times) allows an airline to have insight into how they can deliver bags with greater reliability. At an airport level, the airport can learn what baggage routes cause the most stress on their systems, and are most likely to cause them being determined as the station at fault. At an industry level, it could be possible to generate insight into the patterns of baggage movements that would enable airlines to deliver bags more effectively and efficiently.

There are a lot of possible technologies and routes that airlines can make use of to improve their baggage operations. However, to make this transformation, the entire aviation industry must make moves in the same direction. This is difficult for the industry, as airlines have a lot of influence in their hubs but far less in outstations. Thus, a single airline cannot make a significant transformation for the industry. IATA will continue to engage with the entire industry to move forward.

Open Application Programming Interfaces, commonly referred to as Open APIs, are a way to share data between entities in a trusted, timely yet open manner. The need for the entire aviation industry to share data is becoming greater every year. Initiatives such as artificial intelligence, customer personalization, and real-time operations need relevant, trusted, and timely data to operate. The vision is to use Open APIs to allow airlines and airports to communicate with passengers and publish relevant data. Moreover, the aim is to ensure the data exposed from individual airline API platforms is consistent in terms of definition, format and the way the data is accessed (or shared).

Since the 2016 White Paper, IATA built a proof of concept where three airlines and airports were connected through to a single platform via Open APIs and the data was then consumed via the Amazon Alexa smart speaker. The content which was shared was real-time information of departure gate and departure time. We learned that Open APIs are an important concept for the future of data sharing, that we need a standardized model (both on data and connectivity methods) and that airlines and airports need to demonstrate their willingness to share data.

In 2017, the focus shifted to gain a better understanding of the current state of the industry in regard to Open APIs. In addition, the target was to develop a framework to enable a standard way of building Open APIs.

Industry understanding

To better understand the current state of the industry and current airline Open API ambitions, IATA executed both internet research and an industry wide survey asking airlines and airports if they currently have an Open API platform in place and if not, if they have plans to put one in place.

Some key findings from the internet research

From the internet search on all IATA member airlines, we discovered that 10 airlines had an Open API program exposed that could be found by a simple internet search. This represented only 4% of all IATA airlines, but covered 16% of airline traffic.
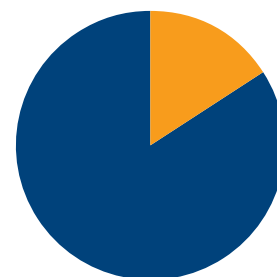
Number of airlines

- API: 4%
- NO OPEN API: 96%
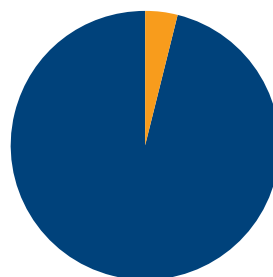
By airline revenue

- API: 16%
- NO OPEN API: 84%

The majority of the data being exposed was in regard to reference data and to the offer.

Some key findings from the survey:

- 38% of those surveyed were aware of the Open API initiative.

- 65% of airlines and airports plan to provide Open APIs by 2020. Of these, the following use cases would be provided by more than 30% of the airlines: flight schedules, flight status, flight offers, and baggage tracking.

- Airlines and airports see the key drivers as sharing of data in a trusted manner, minimizing cost and speed to market.
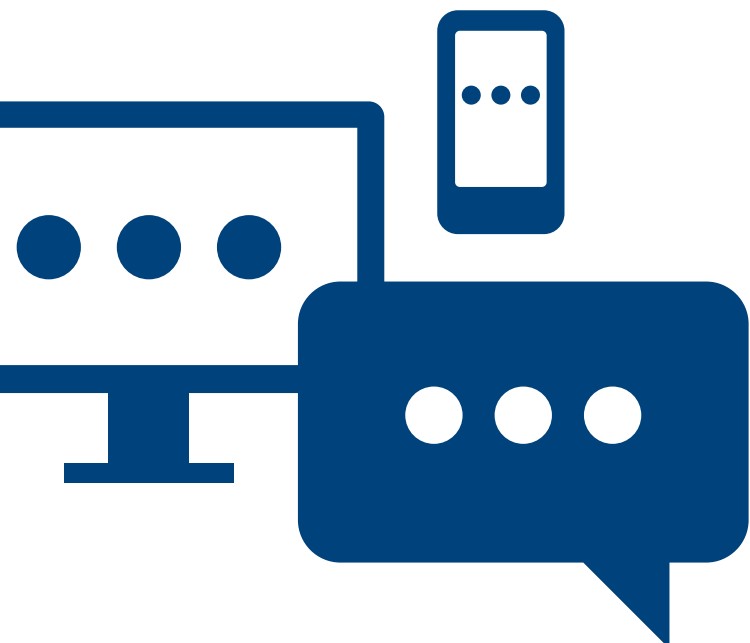
Framework to implement an Open API

A document outlining the deployment approach of an industry Open API model was developed for discussion purposes and can be found at www.iata.org/stb.

This document aims to identify the primary use cases, the airline industry should focus on first. This will enable the greatest benefit to be achieved in the early stages of this initiative.

By looking at the benefits to the customer, the strategic importance and the ability to implement, the diagram below was developed. As a result, it was proposed to a number of IATA working groups, to have the following items in the first phase of Open APIs for the industry:

- **Flight information**

- **Check-in**

- **Boarding tokens**

- **Baggage tracking**

Next steps

In 2017, IATA investigated and researched deeper into this initiative and witnessed the increasing importance of Open APIs in the aviation infrastructure. As a result, this activity and the majority of the work in this program will continue within the governance of the Passenger and Airport Data Interchange Standards (PADIS) Board which is the governing body responsible for data exchange standards. Through this forum, we will continue to promote the initiative, and aim to standardize the approach to Open APIs.
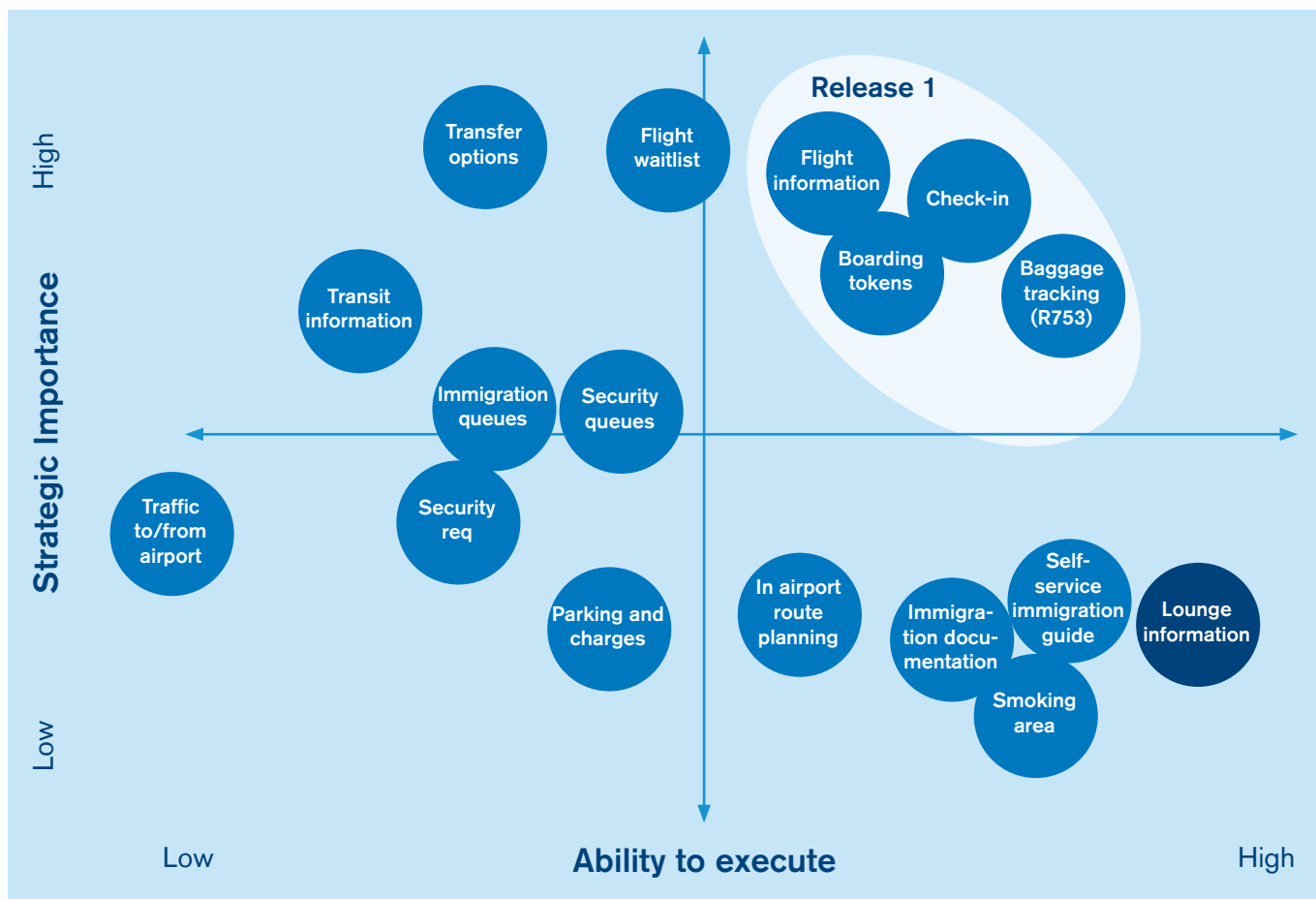
2017 New Ideas

The StB IH continues to focus on strategic ideas that can translate into real transformation within the air transport industry. In 2017, the approach was a little different for the initial ideation process. The team met very early in the year to brainstorm and reimagine the industry with a blank slate. The intent was to have this meeting at the start of 2017 so the team would then complete the idea selection earlier, allowing more time to work on the White Paper and develop proof of concepts.

The team also got to start off 2017 with a group of industry transformers and start-ups, inspiring new thoughts and ideas that would continue to inspire us throughout the year. This initial meeting was held in the Silicon Valley in partnership with Plug and Play (a startup Innovation Platform that the StB Think Tank engaged with in 2016). This time, the group met with start-ups with an aviation industry scope as well as start-ups from other industries that had adjusted their pre-sentations to help us think differently and adapt our thoughts to new possibilities and perspectives. As a result of these start-up presentations and brainstorm exercise, three ideas were selected: autonomous vehicles, passenger payments and personalization.

The Ideation Hub split into three sub-teams to further develop these ideas through the following months. In addition to the detail on the ideas below, Proof of Concepts (PoCs) were developed and presented at the 2017 World Passenger Symposium in Barcelona.

Autonomous Vehicles

Passenger Payments

Personalization

2017

Vision

The concept of a dark airport was the initial motivation behind the autonomous vehicles idea. Imagine an airport where aircraft towing and taxing, refueling, baggage and cargo movements including loading and unloading, and aircraft and airfield inspections are conducted by fleets of fully autonomous vehicles and equipment. This offers levels of efficiency that are otherwise unachievable – but are, even today, badly needed in most airports.

When fully implemented, Autonomous Vehicle (AV) technology is expected to act as the catalyst for the most profound change in society since the Industrial Revolution. AV will cut the time consumed by driving while improving transport safety. In addition, the space needed for vehicles in transit and at rest or parked will drop dramatically.

AV technology offers specific benefits to the air transport industry leading to positive impacts on:

• Customer experience

• Safety and security

• Operational efficiency

• Airfield congestion

• Energy consumption

The vision is for an industry-wide commitment to 'going autonomous'. Furthermore, the air transport industry must set governance structures, interoperability and technology standards, and safety and commercial frameworks, which will pave the way for the methodical adoption of autonomous technologies.

Progressive airlines and airports are already testing drones capable of aircraft inspections, autonomous passenger boarding bridges which repeatedly dock quickly and accurately to aircraft, semi-autonomous tugs for towing/taxing aircraft and use of driverless buses for staff and passengers.

The concept of AVs in a highly controlled, safety-conscious environment, like an airfield, will require meticulous design. The industry as a whole will need to work carefully and methodically to establish the correct protocols and standards to ensure that the value of AV technology does not come at a high cost to the operation and airport performance.

This paper is a call to action to the air transport industry to recognize the transformative potential of AVs and to put its leadership weight behind creating and sponsoring the mechanisms which will deliver much-needed industry changes and performance improvements.

[1]J3016: Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems

Current situation

While airline and airport operations are prime candidates for automation, the sector has achieved very little to date. As the demand for air transportation grows, operations at airports and associated facilities are becoming progressively congested, increasing safety and security risks and degrading operational efficiency and effectiveness. There has been automation in some areas, such as baggage handling and a number of showcase examples in specific locations. However, it remains that autonomous technologies are primarily being exploited by other sectors (e.g. manufacturing road freight services, farming and mining).

Autonomous Vehicles (AVs)

An AV is equipped with intelligence to operate safely and efficiently in its intended environment. At a minimum, it must be able to sense, assimilate and operate in its domain unaided as well as make and react to its own decisions. It must be capable of inter-vehicle communication and communication with its environment.

The Society of Automotive Engineers (SAE International) produced a standard classification[1] of AVs from 0 (fully manual) to 5 (fully autonomous). Reference to AVs in this report means vehicles achieving at least Level 3 (where vehicles would, under most normal situations, drive autonomously but in certain circumstances or conditions would need driver assistance).

Going autonomous will commence the capture of a wealth of new data. Analytics of this data with information captured from other sources, such as high-resolution surveillance cameras, will provide currently untapped insights which will drive continual improvement and even greater efficiencies.

Current AVs trials and developments

The members of the StB Ideation Hub offered some examples of current uses of AVs:

a. Passenger boarding bridges

Today, the docking and undocking of passenger boarding bridges is performed manually, where an individual standing in the cabin of the bridge, maneuvers the bridge onto and off the aircraft using a joy stick.

Passenger boarding bridge suppliers are developing technology to:

- Remotely dock and undock the bridge, allowing one individual to control several bridges at a time.

- Automate the dock and undock process from the aircraft.

- Recognize the door through machine vision.

In the near term, it is expected that passenger loading bridges will operate in a 'semi-assisted' mode where operators will oversee the bridge's operation and manually override potential mistakes.

b. Buses – people transportation

Airports are likely to see the introduction of driverless buses over the next five years. Today, vendors already offer airlines and airports small autonomous shuttle buses, capable of carrying 12 to 16 passengers. The AV bus concept has found particular traction in university campus' and small towns where passenger volumes are low and bus driving is a particularly mundane task. Larger AV buses could be used for ferrying passengers to and from aircraft operating at remote stands.

c. Aircraft movements

The pushback of an aircraft from the stand includes expensive, resource-heavy aircraft tugs that need to be provisioned for each aircraft departure and available at the scheduled time. Travelling between stands and waiting for the completion of other departures mean that the aircraft tug and it operators (generally tug driver and wingman) are under-utilized.

Remote controlled, electric pushback devices offer the ability to reduce the pushback operation to one person, improved utilization and operational performance as they can remain/charge up, on an individual stand and reduce noise and emissions in comparison to heavy, diesel powered tugs.

Automating the connection and disconnection from the aircraft will develop over time. Careful consideration is required to optimize where aircraft can disconnect and limit the impact on airfield congestion. Some solutions offer an electric motor fixed to the nose landing gear and powered by the aircraft's auxiliary power unit. The aircraft can push back and taxi under the command of the pilot.

d. Baggage

AVs will be a key part of achieving the vision of baggage handling that is untouched by human hands. Baggage sortation systems are common place in the industry to automate the movement of bags from landside to airside, and handlers are deploying robotic loaders and unloaders to further automate the process. But moving bags between the sortation systems and the aircraft is done with driver operated baggage tugs pulling baggage carts, trolleys and ULD trains.

The StB IH expects that ground service equipment such as autonomous baggage tugs will be commonplace within 10 years. Currently, self-driving baggage tugs are starting to appear on the market.

Additional use cases for autonomous vehicles in the baggage handling process include:

- Robotic vehicles for loading the baggage and/or containers into the plane.

- Mobile security scanning robot that can be deployed autonomously where needed.

- Drones that could move baggage around the airport to meet tight timelines and tail-to-tail transfers.

- Self-driving cargo ULD's and ULD tugs.

While there are currently some deployments of static robots which pack baggage containers, like a recently announced pilot at Singapore's Changi airport, AVs which autonomously deliver baggage to and from an aircraft and/or load and unload baggage containers are not yet available.

e. Inspections

There are different inspections:

- Planes (for damage, lightning strikes, etc.) while at the gate or during operations such as de-icing
- Runways (foreign object detection and damage detection)
- Airport perimeter (for security)
- Airport complex (for security, maintenance, and construction)

Some of these inspections could be done by terrestrial vehicles, but many of them could also be done using drones. There have been multiple trials in the last year showing mostly remotely-piloted (rather than autonomous) drones conducting inspections. Features like collision avoidance and other safety measures would be required in the airport environment.

Equipping drones with differential lenses enables the gathering of insight beyond visual range of the human eye to deliver better inspection accuracy and from many different angles simultaneously and negotiating obstacles that are risky for human inspection. Drones can patrol surfaces and gaps in airport perimeters to provide additional security and mitigate hazards such as bird strikes by mimicking the appearance and behavior of predators. In addition, drones can be sent into harm's way to aid airport security in crisis response situations.

From an IT perspective, the increased frequency and enhanced precision via automated data collection may reveal unexpected insights overlooked in contemporary operations.

The regulations around the use of drones is a key area that needs development to support the future rollout of drones to conduct inspections.
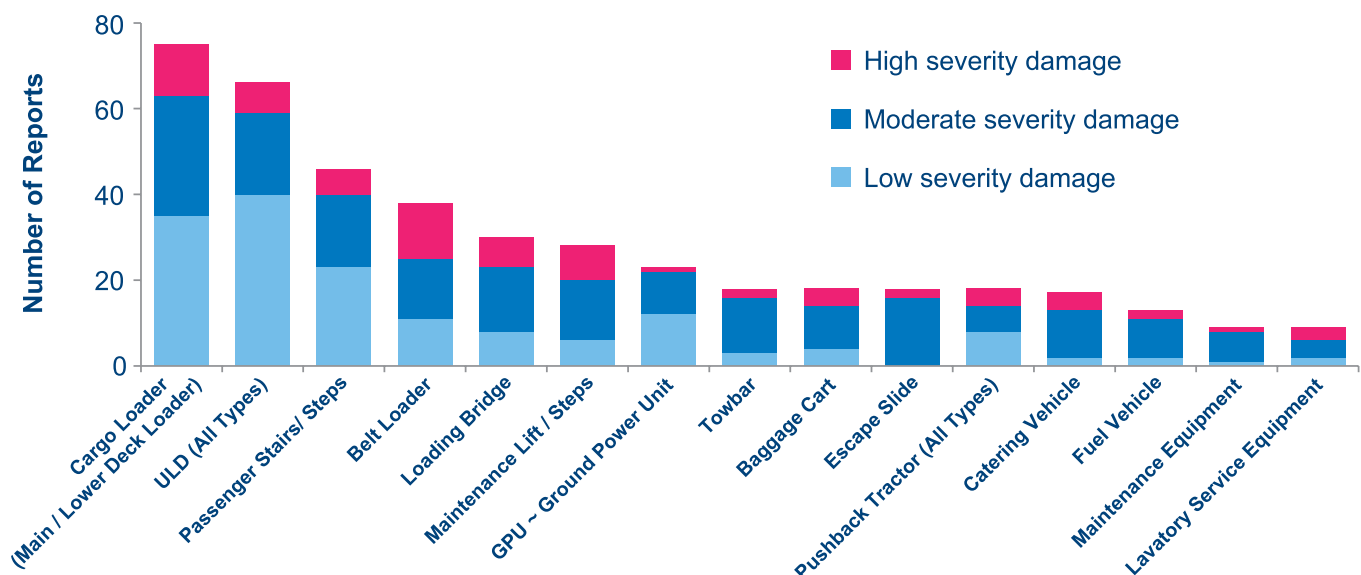
Case for change – AVs and airline operations

The StB Ideation Hub reviewed numerous AV trials and case studies to produce recommendations for AV implementations at airports. The focus is primarily (but not exclusively) on the role of AVs and equipment on the airfield rather than in terminal buildings for several reasons:

- Easier to control and alter to suit an autonomous environment.

- Standard nature of airfield operations means that successful trials can easily be transferred to other airport operations.

- Airfield operations are heavily dependent on driver and vehicle/equipment.

- Several tasks or functions on the airfield are time consuming/pressured, require intelligence to perform and are prone to costly human error (automation helps drive conformity and regularity).

- Aircraft move from one airport to another and across borders. Interaction between aircrafts and ground vehicles needs to be universally governed through standards to avoid accidents.

- Airfield operations are distinct to our industry and therefore require our own focus to make changes happen.

The combination of these factors make the airfield a strong candidate for autonomy.

Top 15 damage caused by equipment *(Source: IATA Ground Damage Database – Winter 2016-17 Analysis)*

Autonomous Vehicles

While demand for air travel is set to continue to rise, structural changes needed in airports to cope with demand will take longer to implement. AVs offer a near-term option to improve airfield efficiency and effectiveness without significant capital outlay.

Separately, environments in which AVs operate fully, or near fully, are likely to be considerably safer and more secure, reducing the insider threats and accidents. Most airfield and landside accidents are caused by human error where regulations or operating procedure were not followed or a judgement error was made. The majority of aircraft damage is caused while at a gate or stand connected to the passenger terminal.

Critical to passenger satisfaction, gate efficiency and reduced aircraft turnaround time is the efficient docking and undocking of the passenger loading bridge. Self-docking loading bridges can significantly address the problems of shortage of staff created by staff turnover and the increased cost and training lead time for new staff. Moreover, if an aircraft needs multiple boarding bridges, then it is very expensive to assign staff to each for such a short time to connect all. Additionally, loading bridge accuracy in docking and undocking can reduce the human errors in these operations which is the leading cause of aircraft and jet bridge damage.

AV applications

The team identified a series of AV use cases, which highlight the potential of AVs in air transport. Several airlines and airports are planning to pilot AVs and equipment in the next two years.

Map of AV use cases

Ground Based Vehicles

Airside Ground service vehicles and equipment
(baggage/cargo carts, dollies and loaders, aircraft tugs, jet bridges, aircraft marshalling cars, employee/passenger buses/shuttles and baggage)

Airside Robots
(AKE & AKH robot loaders at laterals in bag hall, robot loading AKE & AKH onto aircraft, Mobile Robot security screen pod - bag/passenger, aircraft inspections, perimeter monitoring, lawn mowing and de-icing/snow clearance)

Airside Deliveries
(Airside passenger and employee buses/shuttles, catering trucks, cleaning crew vehicles, remote PRM airplane loaders, maintenance vehicles and small parts/items/ rush bag)

Landside Transport
(PRM wheelchairs, PRM carts in the terminals, rental car and parking lot shuttles, employee and passenger buses/shuttles and baggage)

Landside or Terminal Operations
(Mobile security robots and kiosks)

Aerial Autonomous Vehicles (i.e. Drones)

Inspections
(aircraft, runway, construction, building/utility infrastructure, security and safety investigations and remote maintenance issue)

Deliveries
(cargo, baggage, containers: AKE & AKH, maintenance parts and tools across the airfield and last minute meal, food and beverage to aircraft)

Surveillance/Monitoring
(Traffic and Safety and security of perimeter & remote areas)

Operational
(Guiding aircraft to gate stand, chasing away birds and wildlife and unauthorized drone defense measures)

Other
(construction design)

Going autonomous: the way forward

AVs offer an exciting and vital solution to many problems in the air transport industry. A structured and coordinated approach by industry leaders is necessary to ensure the widespread adoption of, and most value from, autonomous vehicles in the air transport industry.

Similar to other industry sectors that are looking to incorporate AVs, the air transport sector will need to appoint leadership teams to develop the standards relating to interoperability, safety and operations which will govern the usage of AVs across the sector.

Amongst the issues that these standards bodies must consider are:

a. Standards focal point

Developing and deploying AV solutions require a coordinated approach by airlines, Ground Service Equipment manufacturers and airports alike to create standards, frameworks and solutions necessary for widespread acceptance and implementation.

b. Safety and control

In a highly-controlled environment, like an airfield, the idea of unattended machines performing critical functions is concerning to many people. Strict policies and standards governing the use of AVs on the airfield must be established. For the purposes of deploying AVs, the air transport industry already benefits from having safety-centric frameworks and mechanisms.

c. Evolving solutions and the business case

The air transport industry has invested considerably in existing manually-operated vehicles. Some new solutions will necessitate the retrofitting of existing vehicles to allow for autonomous or semi-autonomous operations.

d. Labor challenges

Workers and labor unions will be concerned that AVs and equipment will lead to job losses. However, new jobs will be created in developing, managing and monitoring AVs and equipment. In the near to mid-term, level three AVs still will require the presence of drivers and operators. In the longer term, worker re-skilling and retooling will help to mitigate the impact of potential job losses However, the impact of automation on the labor market is a global issue that will need to be addressed generally - not just in the air transport industry.

e. Different needs, same approach

The value of AVs will not be the same to all airlines and all airports. Higher labor costs, environmental differences and different regulatory requirements/imperatives will determine local appetite for AVs. However, this does not remove the need for a widely-agreed approach to AVs.

f. Cybersecurity

AVs are heavily reliant on software and telecommunications; both vulnerable to cyber-security threats. Loss of control of an AV on an airfield could have serious consequences. The industry will need to set hard cyber security standards to ensure adequate protection of AVs.

g. Legal framework

AVs will require a review of traditional laws and regulations to ensure with the right risks are apportioned to the right parties. Such a legal framework and must be developed so that potential liabilities are understood and risk are adequately quantified to warrant appropriate investment.

h. Control, roles and responsibilities

Within an airport setting, it is important to determine which stakeholders are responsible for which components of the AV environment so that proper levels of coordination between AVs and their operators are guaranteed. Airports operators will need to work closely with city, county and state government bodies to ensure their use of AVs is compatible with local laws.

Next steps

Airports, and specifically airfields, are an ideal environment for AVs given that high levels of synchronization produce greater operational efficiency and effectiveness. Since the airfield is a very structured environment, the task of navigation and decision-making is considerably easier for an AV, than operating on, say, the public highway.

The StB IH encourages and promotes the development of AVs and equipment for the airfield environment. Collaborating with IATA and ACI to ensure that minimal but necessary standards are put into place that will facilitate widespread adoption of solutions. Airports, airlines and ground handlers are invited to foster a culture for automation, evaluating business cases as part of a portfolio of automation projects rather than single isolated examples. We can then benefit from much needed changes and performance improvements AVs and equipment can deliver.

Vision

New generations of customers are increasingly open to adopting alternate and convenient forms of payment that fit their lifestyle and needs. At present, numerous new payment players are riding the FinTech wave and addressing these market needs. Nevertheless, the global airline industry offers few of these options while it spends billions annually in payment fees. These costs are projected to increase significantly by 2025. Despite rising costs, friction in payments continue to inhibit customer conversion on digital channels across agencies and airlines. The increase in the cybersecurity threat profile and fraud are realities that need to be continuously mitigated, particularly in the payments space. Finally, while the transition to New Distribution Capability (NDC) is bringing buyers and airlines closer together from an offer and order management perspective, transparency in payments and settlement processes need to keep up with this trend.

There remain significant barriers to entry for emerging forms of payments – and balancing convenience, security and cost remain a challenge. While cards remain the most popular form of payment, emerging entrants have demonstrated that segments of customers are willing to adopt alternatives if convenience, cost, transparency and security needs are met. However, this often introduces additional players into an already complex payment process, which comes at a cost.

The vision is the creation of a potential new form of payment that could re-define the value proposition by enabling customer convenience, global security and lower costs for airlines.
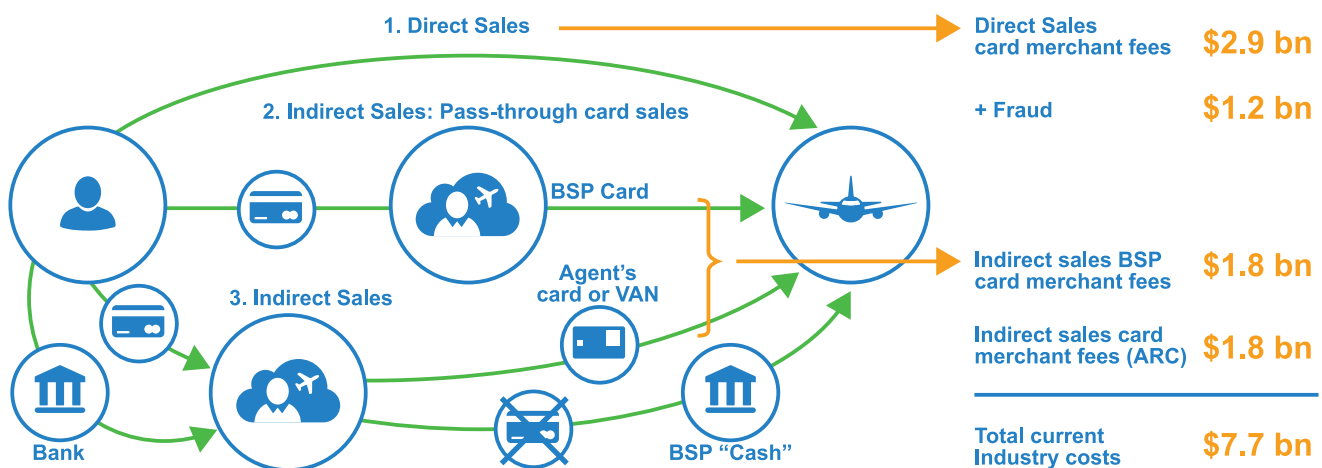
Throughout the year, the team has defined a concept (the IATA Wallet) established a high level conceptual architecture, debated key success factors and delivered a proof of concept.

Case for Change

The key cost drivers for the airlines include merchant fees, fraud (prevention, loss, and false positives), potential usage of travel agents' owned cards and Virtual Account Numbers (VANs), compliance costs (setup, maintenance and fines) and operational expenses (e.g. payment systems, payment organizations, Payment Service Providers (PSPs)).

Gateway and PSP technologies represent a subset of a greater payment ecosystem, which has seen and is expected to see continued revenue growth which reversely impacts airline margins. Based on multiple research reports, annual global payments revenue including all revenue made by payment providers (i.e., banks, card schemes, PSPs, consolidators, etc.) is increasing at such a rate that will exceed $2 trillion by 2025.[2]

According to latest estimates (2015), global airlines spend around $8B in payments (cost of settling the money) every year.

1. Direct Sales	
Direct Sales card merchant fees	$2.9 bn
2. Indirect Sales: Pass-through card sales	
+ Fraud	$1.2 bn
BSP Card	
Agent's card or VAN	
3. Indirect Sales	Indirect sales BSP card merchant fees	$1.8 bn
Indirect sales card merchant fees (ARC)	$1.8 bn
Bank	BSP "Cash"	
Total current Industry costs	$7.7 bn

[2] McKinsey & Company Global Payment Map, as reported in "Global Payments 2015: A Healthy Industry Confronts Disruption," McKinsey & Co., October 2015; The Boston Consulting Group (BCG) report entitled 'Global Payments 2016'; http://www.consultancy.uk/news/12651/global-payments-revenues-to-hit-2-trillion-by-2025-emerging-economies-lead

Multiple industry initiatives have been launched over the last few years to help airlines cope with this significant cost, particularly in the indirect sales channel. Nevertheless, the cost of payments is forecast to increase yearly, potentially doubling by 2025.

Despite the rise in costs, friction in payments continue to be a significant impediment to improving checkout conversion rates – with highest conversion rates correlated with fewer number of clicks, lower transaction time, zero profile requirements, retail incentives, and higher number of payment methods.

In response, the pace of innovation in the payments space has accelerated with multiple FinTechs proposing alternatives to established players. Apple Pay, Google Pay, Samsung Pay, AliPay, Venmo, Fast payments, etc. are tackling issues of convenience, flexibility and security – further taking control away from retailers. Airlines are rapidly adopting these forms of payments to improve conversion on their channels, despite additional transaction costs.

While the financial performance of the global airlines has improved over the years, margins remain thin – with harsh economic environments in some areas due to weaknesses in local markets and currencies. The current cost of payments, and the projected increase – pose a disproportionate financial burden to the industry.

Given this complex challenge, the StB IH examined the problem and defined a set of future state requirements for a strategic industry payments initiative – that can help airlines and other travel providers serve their customers better and improve revenue, while reducing costs.

StB Proposal

Payment solutions for the future must address five thematic requirements to be successful:

Convenience

The solution must fit the digital lifestyle of consumers today and promote channel conversion. Frictionless is of the essence and transparent (Uber-like) payments are in the vision with a natural integration with the IATA One ID project.

Omni-channel

The solution must transfer funds directly from the payer to the payee or vice-versa. Travel providers must be able to provide consistent payment methods across direct and indirect channels.

Security

The solution must be secure, allow for third-party identity providers, multi-factor authentication, and reduce the attack footprint for potential cybersecurity threats (e.g. PCI footprint).

Efficiency

The solution must bridge the gap between payer and payee in order to improve transparency and trust. It must offer a more efficient settlement process at lower processing fees.

Flexibility

The solution must be future-proof and be extensible to support plug-and-play banking APIs, authorization engines and payment types, including emerging cryptocurrencies. The solution should enable a platform for value-added third-party services like insurance, installments, currency services, etc.
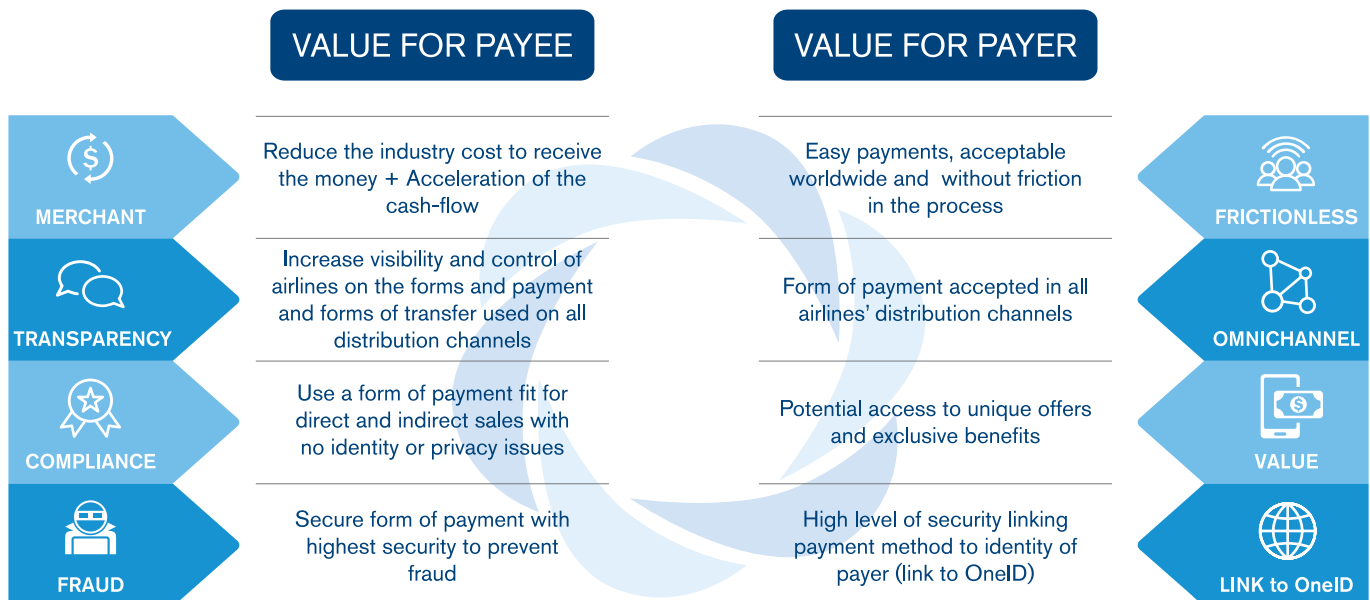
At this point, the industry would like to analyze the potential creation of a new form of payment that would help deliver the above requirements. This proof of concept is the IATA Wallet:

- Convenient digital wallet that can link to bank accounts, or other forms of payments

- Secure and 1-touch payment options to improve conversion and simplify payments across direct and indirect channels

- Efficient settlement process at a lower cost

- Easy airline adoption by leveraging on existing IATA platforms for direct and indirect settlement

- Adoption incentives to payers at the discretion of travel providers

- Integration with emerging technologies and APIs

- Third-party ecosystems that enable value-added services for consumers

Key benefits

Beyond the PoC, the group would like to deliver an industry solution that would enable the following benefits for payers (passenger) and payees (airlines), as shown in the diagram below.

VALUE FOR PAYEE

MERCHANT	Reduce the industry cost to receive the money + Acceleration of the cash-flow
TRANSPARENCY	Increase visibility and control of airlines on the forms and payment and forms of transfer used on all distribution channels
COMPLIANCE	Use a form of payment fit for direct and indirect sales with no identity or privacy issues
FRAUD	Secure form of payment with highest security to prevent fraud

VALUE FOR PAYER

|	
Easy payments, acceptable worldwide and without friction in the process	**FRICTIONLESS**
Form of payment accepted in all airlines' distribution channels	**OMNICHANNEL**
Potential access to unique offers and exclusive benefits	**VALUE**
High level of security linking payment method to identity of payer (link to OneID)	**LINK to OneID**

Proof of concept

During 2017, the StB Ideation Hub put together a proof of concept for the IATA Wallet. The concept introduces a new digital wallet in a model airline check-out process that leverages the popular credit card authorization process, but banking rails to remit payments, with specific messages for revenue accounting and settlement. The form of payment in the wallet and the authorization process can be easily swapped for a debit card/bank account and other authorization engines/ banking APIs.

The first step (not included in the PoC) was the setup of a digital wallet by the passenger:

1. Customer enrolls in the IATA Wallet (offline process) which is linked to his bank account. The wallet provider complies with existing regulations on anti-money laundering, know your customer, etc.

2. Customer initiates purchase at AlphaAirlines.com and selects IATA Wallet as form of payment. On selecting IATA Wallet, the customer is sent to the wallet provider's site or mobile app to authenticate the user using two-factor authentication, and the provider responds with information about the customer's account to the airline.

3. The airline website initiates a transaction authorization request with the wallet provider using IATA Wallet rails.

4. IATA Wallet authorization engine verifies sufficient funds are available and blocks the funds in the customer's account.

5. The authorization engine responds with an authorization code and a BIN number.

6. Airline payment interface routes the payment request using their current PSP provider and issues the ticket. At this point the passenger would be requested to complete a two-factor authentication step (not in scope of the PoC).

7. Sales reporting and settlement processes are initiated in the back office to manage the funds transfer from the wallet to the airline.

The flow of the POC
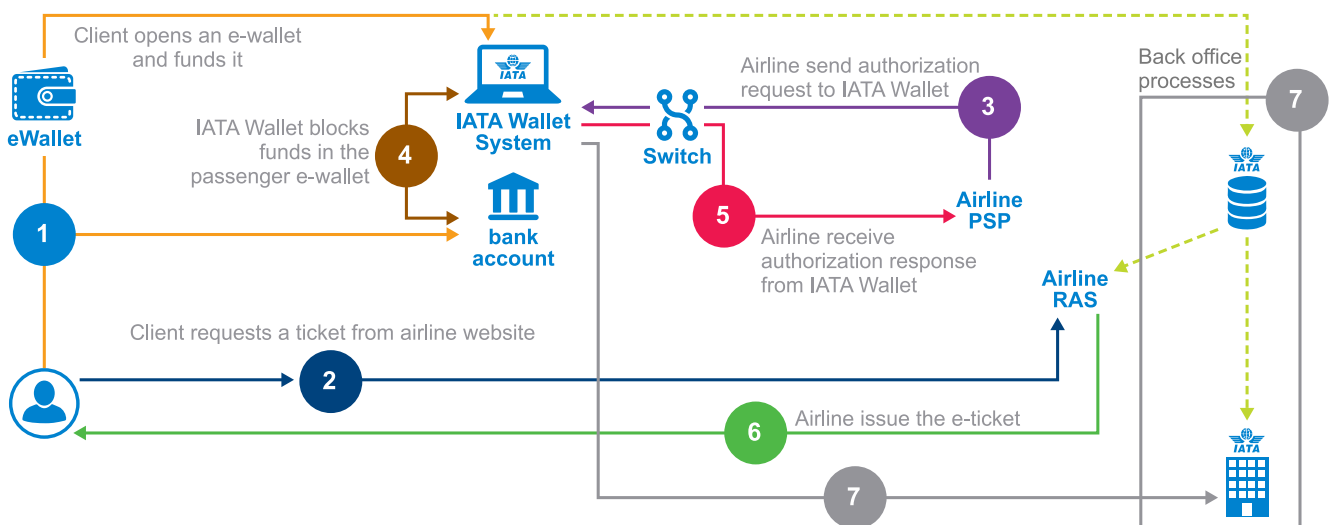
Next steps

Given the successful PoC, the key next steps include market validation, business model and technology definition and a targeted pilot.

- Focus groups, corporate and passenger surveys could be effective tools in validating market demand.

- Additional discussions with both direct and indirect distribution channels – including GDSs, travel agencies and corporate travel buyers – will help in validation of the business and technical model.

- From a pilot perspective – selection of a core set of payment technologies and geographic markets would be important to ensure global adoption of the Wallet by travel providers.

Vision

Personalization has been at the forefront of travel sales, service, and delivery for over twenty years, but the technology needed to deliver personalization at scale is only just reaching maturity. With strategic coordination between members of the travel ecosystem on the use of traveler data and clear standards for its management and application, the travel industry has the opportunity to deliver on the longstanding promise of a truly personalized travel experience.

Our vision is to enhance the passenger journey by delivering a frictionless and personalized end-to-end travel experience. Service provision will be facilitated and streamlined based on the preferences and journey attributes voluntarily and specifically shared by the customer and his approval of contextualized data exchange between stakeholders. We envision a collaborative environment of travel stakeholders across the whole engagement cycle to meet the customers' service expectations. With collaboration in place, various stakeholders can provide a much more tailored level of personalization that the customers expect and demand.

This enhanced vision for personalization has the potential to revolutionize the way travelers get services delivered. In this new paradigm, it is the travelers (not travel providers), that control which data elements can be shared, enabling customer-selected travel providers to determine the level and type of personalized service they will provide for each customer.

To implement this vision in a manner that is harmonious with evolving global data privacy regulations the industry should adopt an open trust-framework, i.e., a set of specifications, rules and agreements that governs the data sharing and use.

Current situation

Passengers currently have high expectations with regards to the provision of contextualized and personalized services tailored to their personal situations, which are largely shaped by their experiences with other industries.

To varying degrees, travel personalization happens today, but is cumbersome, costly and inconsistent. For instance, travelers will frequently be asked to enter travel-related information multiple times. For these reasons, most personalization in the travel industry is directed to only the most frequent and/or high-spending travelers and focused and controlled around the airline hubs.

The challenges associated with delivering personalization to travelers are well known. By and large, the industry has not been able to combine what the customer really wants, with the wealth of information/options available from variable parties in a contextual situation to improve the customer experience.

One of the main reasons that customers do not share or limit the data sharing between travel providers is the lack of a trusted means by which to view and control their data. Similarly, travel providers lack a secure and trusted framework to support the exchange of contextualized travel data, such as operational status and locations of passengers. Clearly, these two factors severely limit both the scope and scale of travel personalization.

Since its induction, the StB program has launched a number of initiatives to improve the ability of airlines to personalize their delivery of services to travelers, including the NDC, One ID, ONE Order, Travel Communications and Open API initiatives. While these initiatives will deliver value for passengers and the industry, the benefits of these programs will remain limited to those services that can be manually identified and delivered by individual airlines.

Case for change

Ample evidence from both inside and outside the travel industry suggests that many customers are willing to share subsets of their travel data between airline and non-airline travel providers.

Unfortunately, no single member of the travel ecosystem has the capability to optimize the end-to-end journey on their own. Even the most capable and ambitious travel provider would need the cooperation of others to deliver integrated and contextual end-to-end travel services to its customers, and to do that, a coordination framework is needed.

By contrast, the benefits of a system of secure, open, trusted and customer-authorized data exchange are clear, as shown in the table below.

- **Airports** could leverage data about the location, time to board, and preferences of the customer to offer services, information, and retail products tailored to the needs of individual travelers.

- **Rental car companies** could improve their demand plans and staffing levels using non-specific customer information about arriving customers who also have reservations with their company, perhaps even getting aggregate data about the number of customers who have checked a bag, and might therefore be waiting in a baggage area.

- **Hotels** may wish to offer upgrades or other assistance to travelers whose flights have been delayed or whose connections have been canceled, in the very same message airlines use to share the news about other travel options.

- Parties like **security/immigration or booking providers** like Travel Management Companies (TMC) would like access to reliable data about where customers are in their journey to either provide better customer service or be better prepared.

Potential benefits for the main aviation stakeholders, along six levers and three benefit types:

Primary program benefits	Efficiency	Revenue	Experience
Passenger data control – enable travelers to manage what data elements are shared with which entities for an end-to-end journey	• Eliminates redundant entry (pax) • Less data duplication (providers)	• Monetize travel data (pax) • Monetize insights (providers)	• Increased awareness of data usage (pax) • Improved data security
Irregular operations management – facilitate ecosystem data sharing to reduce the impacts of delays and disruptions	• Improved prediction of IROPS effects • Better and more coordinated IROPS management between stakeholders • Enhanced and more customer-centric IROPS recovery	• Potential services fees (providers) • Additional sales from ecosystem partners (providers)	• Improved experience during IROPS (pax) • Reduced impact of IROPS (pax) • Stronger travel brands (providers)
Enhanced merchandising – improve offers based on deeper, contextualized insights about passenger needs and preferences	• Fewer service recovery payments • Less marketing waste (providers)	• Higher per-trip expenditures (providers) • More revenue due to higher visibility of services	• Fewer untargeted offers (pax)
Service personalization – apply insights from customer approved data sharing and operations to personalize and customize travel experience	• Much less effort to anticipate passenger needs (providers) • Improved resource-planning and allocation (providers)	• Increased ancillary sales (providers)	• Improved interaction context (pax and providers)
Distribution personalization – enhance customization of travel bundles, prices, and products on customer insights	• Lower intermediary costs (providers)	• More inclusive (larger) travel bundles (providers)	• More targeted service of more narrow segments (pax)
Journey management – deliver seamless experiences across providers leveraging shared data about preferences and operational conditions	• Fewer process duplications (pax) • Less effort to manage travel (pax) • More time-efficient travel (pax)	• Increased attractiveness of air travel and time spent at airports • Exchange of money for valuable service (pax and providers)	• Less coordination required of traveler (pax)

How the solution can work

The proposed IATA personalization program consists of three main components:

1. **Data sharing taxonomy:** a simple traveler data taxonomy will serve as the basis around which customer data will be organized shared, and used across the travel ecosystem.

2. **Data interface and control guidelines:** travelers will enjoy full access to and control of the data in their travel profile. This data will be viewed, changed, and applied only with the explicit approval of each customer. A clear set of guidelines and recommended technologies will be provided to ensure consistency across members of the travel ecosystem.

3. **Data integrity mechanisms:** data integrity will be ensured by enabling customers to control which companies and entities, if any, will be granted access to their data, e.g., using shared ledger technologies. Additionally, each time customer data is viewed, changed or accessed, a record of that usage will be retained and secured for use of the customer.

With these three components, the IATA Personalization program complements existing initiatives. It relies on Travel Communication to provide travelers and any suppliers with the quality information they need to know. Open API is the prime enabler for information exchange while ONE ID identifies the passenger to all stakeholders (including authorities). Finally, NDC and ONE Order allow stakeholders to book contracted services to the specific journey.

Together, these components will enable airlines and other travel stakeholders to generate and share insights about individual travelers (if authorized by the passengers) and about groups of travelers in an anonymous basis. It will define the standards by which the entire travel ecosystem can share insights and data on behalf of the traveling public in accordance with the prevailing laws governing customer data in each geography (e.g., General Data Protection Regulation in the EU) and in a manner that is consistent with the shared principles of customer privacy, autonomy, and self-managed data control.

Challenges

The primary challenges associated with the suggested solution are:

1. **Diverse travel ecosystem:** Establishing a data sharing framework that can meet the needs of diverse travel ecosystem participants while leveraging the industry-wide developments and systems that are emerging and already in place.

2. **Control of data:** Developing open standards and technology ground rules that individual actors can use to enable travelers to control and manage their individual travel data and preferences. This is a mostly technical challenge that will leverage distributed ledger technology, open API frameworks, and industry standard data definitions. These make it clear how developers can create apps, websites and other platform that harvest, analyze, and deliver travel data to members of the travel ecosystem in a manner that is visible to and controlled by the traveler.

Next steps

IATA, through its StB program, is working with airlines and solution providers to develop a demonstrational prototype that will embody the principles of this White Paper and enlighten members of the travel ecosystem about the benefits such a system could bring to the whole travel value chain.
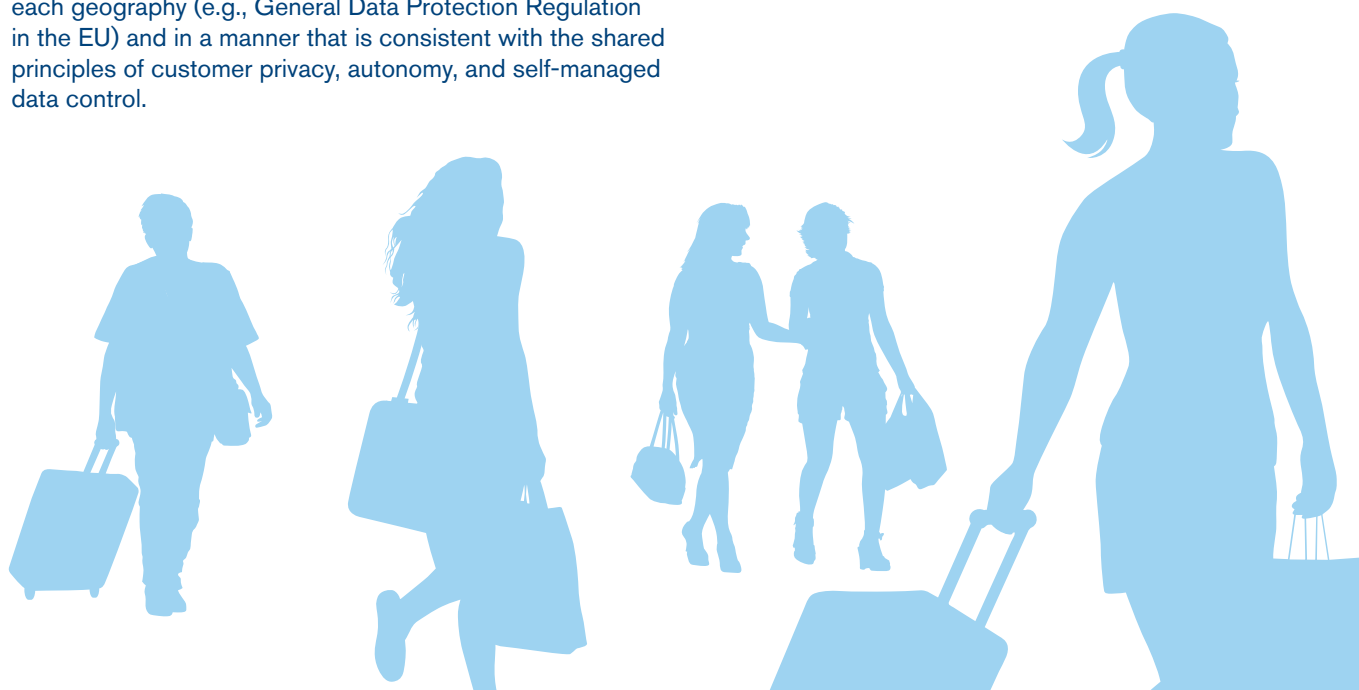
Conclusion

The 2017 StB Ideation Hub has been a great experience with solid results. Since its inception, six years ago, the StB IH continues to grow each year, attracting more interest and wider participation. Also, the format has evolved, to a more aggressive and challenging scope, interacting with different industries and start-ups who offer a whole new way of looking at and doing things.

The StB IH is one of a kind and maintaining its relevance is fundamental to the growth of our industry. We must continue to innovate and transform processes that simply do not work anymore. In doing so, it is important to ensure a wide representation of participants from across the aviation industry. In addition to the IH meetings, the team will listen carefully to the thoughts and discussions at the 2017 World Passenger Symposium. Views expressed there will guide the IH and provide ideas for the future growth of our industry. Together, we will continue to work towards our 2012 original vision of the perfect trip by 2020.

Partnering for success

A special thank you to the contributors of this paper.

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**Simplifying
the Business**

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