

Digitalization, AI in Aviation and the Human Factor

Presented by ALTA



ALTA's Position Paper on Digitalization, AI in Aviation and the Human Factor

Is Latin American & the Caribbean aviation prepared to implement AI?

Latin American and Caribbean air transport today represents 8% of global passenger traffic with over 316 million passengers, more than 3 million aircraft departures and over 1,900 aircraft in service.

Despite political, economic and social unrest that frequently challenges industry performance, the Latin American and Caribbean region is gaining relevance within the global market and yet has important growth potential with expectations to double passenger traffic within the next 10 years (reaching more than 600 million passengers) and growth rates surpassing global average within the next 20 years according to different projections (5.9% growth in the region vs. 4.6% global average growth).

Those are quiet relevant figures that makes our region an important focal point for global aviation. So, what do we need to do to reach our full potential?

Latin American and Caribbean passenger traffic reached in 2019 its sixteenth consecutive year of growth; however, we still travel very little (0.4 air travels per capita per year) compared to mature markets as Europe (with 1.1 air trips per capita per year) and United States (with 2.2 air trips per capita per year).

Our geography has given us the privilege of beautiful landscapes, wonderful fauna and flora, and a very vast variety of natural and cultural resources. We have a major opportunity to attract more tourists as today just the Eiffel Tower receives more tourist per year than Brazil.

Due to geographical characteristics, our region needs air transport and we have in front of us a spectacular opportunity to develop capillarity to communicate our countries and bring the benefits of aviation to every corner of the region. Infrastructure, competitiveness and connectivity – not only in major cities – are key to achieve it.

Connectivity is crucial to bring the benefits of aviation to more places and more people, generating employment, services, tourism, and business opportunities. For every job created in aviation other additional 4 jobs are created in other industries.

Aviation and tourism are key for the sustainable economic and social development of the region and an increasing joint work between industry and government is vital to take the actions needed for the industry to reach its full potential.

Open skies agreements, passenger fees and taxes reduction, air space redesign, harmonization, fuel cost reductions, and monopolies elimination are some of the good practices that will enhance aviation to grow. But one of the most important ones is to continue making aviation the most efficient and environmentally responsible means of transportation.

Technology plays here a key role and fortunately aviation is well recognized as an always evolving industry. Innovation is part of its nature, despite of intrinsic and external aspects. However, due to the financial nature of the airline industry - characterized by very low profit margins and major focus on operational and safety issues - airlines in most cases have not had the resources to heavily invest in digital transformation, so its maturity on the industry lags behind other industries such as retail or banking.

Just as an example, the distribution and flight shopping technologies the industry currently relies on, were developed decades ago when the Internet didn't even exist. This causes that in many cases the processes are not flexible nor efficient enough.

In regards of digitalization, other challenge so far has been the traditional education systems and even the traditional mindset within industry companies, where yet conventional skills are requested over new digital and technological skills. We need our universities to be ready to prepare the new workforce the industry needs.

In this sense, we need to reinvest in the industry and reinvest in education. Dedicate resources to create a culture of flexibility and adaptability to re-learn, to think outside the box, to keep innovating. Industry cannot do it alone, need government and education stakeholders joint work.

Why?...

According to a study carried out by Accenture, digitalization has the potential to generate approximately US\$1 trillion of value for the industry and wider society over the next decade.

The possibility to increase efficiency, generate savings and reduce risk can largely benefit the industry and furthermore enable more people to make use of air transport. The airline industry is well-known for transferring its efficiencies to the air transport user and this has allowed that, in real terms, the rates have decreased by 16% since 2011.

According to Oliver Wyman consulting firm, advance analytics can generate between 2% and 2.5% of savings in airlines global operating costs (between US\$ 5 billion and US\$ 6 billion annually). This represents an important cost reduction that would benefit the entire ecosystem.

Technology has been and is key to make it more affordable for more people to make use of air transport, which is so necessary in the region as previously saw.

From a technical point of view, digitalization can help the industry make a smarter use of assets, anticipate the needs of the equipment and operating conditions, optimize efficiency of all processes, develop a better understanding of the business, routes, costs and opportunities of improvement, and even increase safety with more efficient surveillance and real-time communication systems.

Digitalization has demonstrated it can help improve airport security, make control processes more agile, helping operations go out on time and decongest air and ground infrastructure already collapsed in the main markets of Latin America and the Caribbean.

From a commercial point of view, digitalization can help better understand travelers needs and improve passenger experience, from the desire to travel and throughout the entire journey.

We have seen lots of improvements in AI with more intelligent machines capable of processing impressively large amounts of data.

According to Oliver Wyman consulting firm, by 2026, the global fleet will annually generate 98 exabytes (or 98 billion gigabytes) of data; and the newest generation of aircraft will generate between 5 and 8 terabytes per flight (up to 80 times what older planes generate today).

AI systems can reliably process all this data generated by millions of people on thousands of flights and operations in hundreds of countries, all in real time, which wouldn't be possible to manage by humans. This data translates into better business decisions and into better experiences for passengers.

AI is already a reality in some ALTA airlines as they are using this technology to improve customer service. GOL, for example, with its virtual assistant Gal takes care of customer needs in real time, no matter the day or hour. Other airlines have opted for more interactive and intuitive apps, self-service kiosks at airport with facial recognition capabilities and programs to anticipate customer preferences, to name a few.

Maintenance, materials and repairs currently represent 6% of Latin American and Caribbean carriers total operating costs. Digitalizing MRO can effectively reduce maintenance costs, delays and aircraft downtime. Several ALTA Affiliate Members are offering these solutions, and we consider key to continue bringing this topic to meetings to better understand how airline, suppliers and regulators can define the best way to take advantage of digital systems.

According to Infosys, digital services and consulting company, IIoT (Industrial Internet of Things) systems can help to make procurement more accurate and automated by helping take better decisions on price, quality and time; can help deliver between 10% to 30% higher efficiency in inventory management compared to current MRO software tools; and can help predict demand accurately and in advance.

The correct management and analysis of data will inevitably lead to a wider comprehension of the operation, making it possible to opportunely respond to expected and unexpected events. Digitalization furthermore helps all aviation ecosystem to be connected and in constant communication, making the entire value chain safer, more efficient and even more enjoyable.

When adopting AI strategies, companies have to review their corporate culture, have a leadership committed to embrace disruption and budget to develop training to guarantee the correct understanding of new systems.

The implementation of digitalization will require human time and resources. A change of mindset and lot of training is required to have a successful migration to a digital industry. As a result, AI and digital systems will lead to a reduction in process driven, low-skilled physical and administrative jobs (for example check-in staff). However, new types of jobs will emerge empowered by technology to perform more complex tasks. Reviewing corporate culture and developing programs to train employees on new digital skills will be fundamental to prepare the industry's workforce for the changes ahead.

In the first place, embrace a corporate culture that recognizes the value of innovation, education and people. Having a dedicated team to manage transformation is key to review current talent, the talent needed to perform the new tasks and what to do to train, attract and retain those talents.

How?...

In ALTA's perspective, there are 3 enabling factors that can incentive the industry to adopt digital transformation ensuring continued safety, security and sustainability:

Regulation: regulations and regulatory frameworks will have a strong influence on digital transformation and the speed of digitization. Regulations can face major complications for cross-border integration, as in diverse countries they can be very different and may have different interpretations.

Technology and innovation are generally several steps ahead of regulation and policymaking, so institutions and governments need to work faster on new regulations in order to catch up with emerging technologies as they are developed.

Regulatory fragmentation also poses a threat; this is especially true for airlines in the Latin America region where major carriers have a holding structure, having multiple carriers in different states with multi-national operating certificates. The low level of harmonization in terms of regulation among countries in the region can affect the profitability and possible efficiencies of adopting digital technologies.

Investments in infrastructure: digital transformation is complicated and expensive by legacy technology investments and many times airlines need to make two ends meet. One end is the very traditional legacy systems, and the other is the very fast-moving digital technology.

A single digital initiative may sound easy to implement by an airline but doing so involves changes to multiple older legacy systems, with those changes demanding a lot of human and financial resources. Airlines in their vast majority currently rely on old IT infrastructure that makes it difficult to pull out all the data together into an environment that enables them to get all the value possible from it.

Workforce readiness: Digital transformation demands different skills compared to the skills needed for legacy systems. Airlines have to adapt to this transition, with change being led by people within the organization. The main challenge will be training current and new workforce to adapt to a more digitized environment: digital transformation will lead to a reduction in process driven, low-skilled physical and administrative jobs (for example check-in staff). On the other hand, new types of jobs will emerge empowered by technology to perform more complex tasks. Reviewing corporate culture and developing programs to train employees on new digital skills will be very important to prepare the industry's workforce for the changes ahead.

In conclusion, every effort from ICAO on regulations and standards, need to involve a task-force leadership team from governments and the airline industry in order to effectively launch together several custom-made and creative solutions across regions for the 3 enabling factors mentioned above. Solutions should make air transportation safer, more efficient and more accessible, by leading to:

- Support the design of national and subnational digital plans and agendas for the expansion of the digital ecosystem.
- Strengthen institutional development of the digital ecosystem.

- Advocate for the definition of public policies to create conditions for the development of the digital economy such as data protection, privacy etc.
- Review and implement new procedures to drive technological change.
- Reduce barriers related to implementing new technologies.
- Develop a cyber-security legislative framework.
- Establish fast-paced prescription cycles (based on sufficient performance evidence, technology evolution and safety standards) on when and where human involvement and management is essential, according to each phase of technology implementation.
- Create, adapt and promote educational programs based on the prior prescription cycles and technology development.

Aviation is a highly regulated industry; therefore, regulatory entities play a key role towards a successful digital implementation. Furthermore, aviation is a highly specialized industry that requires training and certifications, which make it necessary to have industry organizations, regulators and companies on board and aligned.

Once again joint and aligned work throughout the entire value chain is key. Digital implementation starts by understanding the new market needs and tools available, review corporate structures and dialogue to take the actions needed granting training, safety and correct execution.

This year ALTA will add two focus to its activities: digitalization and environment.

The first one, as just explained will help aviation to reach its full potential to widely benefit the region and its people, have a more connected world with more and better options for all.

The second one is key to ensure the sustainability of air transport. Environmental responsibility is not a trend, but a long-term commitment to make innovation sustainability viable and respectful to our mother earth.

In 2010, the aviation industry set three goals to mitigate the environmental impact of its operations: increase 1.5% per year the efficiency in fuel consumption between 2010 and 2020; achieve carbon neutral growth as of 2020; and reduce by 50% net CO₂ emissions by 2050, compared to 2005 levels. These ambitious goals will be achieved through four pillars: technological innovation; operational improvements; infrastructure improvements and economic and market measures.

ALTA member airlines are a global example, since they have achieved an annual fuel efficiency of 3.5% (higher than the goal of 1.5% set in 2010) and have avoided the emission of one million tons of CO₂ in the last 7 years, thanks to the fact that they have renewed more than 50% of their fleet over the last decade, thereby reducing 35% the average age of the fleet which is estimated today is 8.5 years on average. Airlines in the region have not only renewed their fleet but have also implemented several operational measures to reduce fuel consumption and therefore emissions, such as single engine taxiing, reduce flap configuration takeoff, reduced APU usage and many others.

In terms of fuel, there is an important potential to reduce emissions up to 80% for the aircraft of the current generation and we hope that soon this type of fuels gets more affordable and accessible. Currently, some concepts of hybrid aircraft and electric battery are being studied. Development of electric aircraft is expected to begin in the mid-2020s with prototypes with a capacity of 15 to 20 passengers and with the aim of climbing to larger capacity aircraft (regional or single aisle) in 2035.

Aviation is the greater engine for economic and social development and now, with a strengthening on the commitment with the environment, the industry will drive a sustainable growth in Latin American and Caribbean countries. From ALTA, we will continue accompanying and advocating to consolidate the best conditions for air transport to continue growing.

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