AiQ Consulting White Paper

Airport Check-in Automation – building capacity in 2023 and beyond

Airport Check-in Automation - Building Airport Capacity in 2023 and beyond

The priority in summer 2022 was rebuilding the workforce following the pandemic but it is clear that the new priority for airports should be planning for automation to improve operational efficiency and to build resilience into their operation. In the coming years **automated technology** is going to be a critical factor in providing increased capacity.

Our [experience](#) working in space constrained airports such as London Heathrow, Schiphol and Bangkok and rapidly expanding regionals such as Bristol, Leeds Bradford and Budapest shows us that small changes can make a big difference to the efficiency of the operation.

Working with airports pre-COVID we observed that [engaging stakeholders](#) can often become a stumbling block for implementing CUTE and CUSS, as this reorganisation of assets can only be done with the agreement of many stakeholders. It therefore needs careful planning and modelling to show clearly how it will work in practice.

Our analytics and modelling work identified a number of key benefits of automation **to all stakeholders**:

- Reduced passenger process time
- Increased passenger throughput
- Increased passenger satisfaction
- Asset optimisation, particularly floorspace
- Greater flexibility in the use of resources
- Increased resilience for operators
- Reduced operational costs

Other benefits include

- Creation of greater opportunity for future growth
- Keeping pace with future demand
- Reduced need to invest in fixed infrastructure

In our blog of Sept 2018 called '[CUTE and CUSS – How does common use equipment give airport operators more flexibility?](#)' we discussed the improvements already generated by automated technology. In this white paper we will move on to discuss the newer automation technologies being adopted and how they will make check-in faster and smarter.

If you need a refresher of all the automation acronyms, we've included our [glossary of terms](#) which might be helpful. The glossary is also included as an addendum at the end of this white paper.

As airports implement automated processes such as CUSS, SSBD and CUTE we want to take a look at the direction automation is moving in. The world's largest global airline alliance, Star Alliance, has defined an approach to newer technology solutions that are now being introduced (see graphic below) which focuses on moving it **upstream**, doing it **faster** and doing it **smarter**.
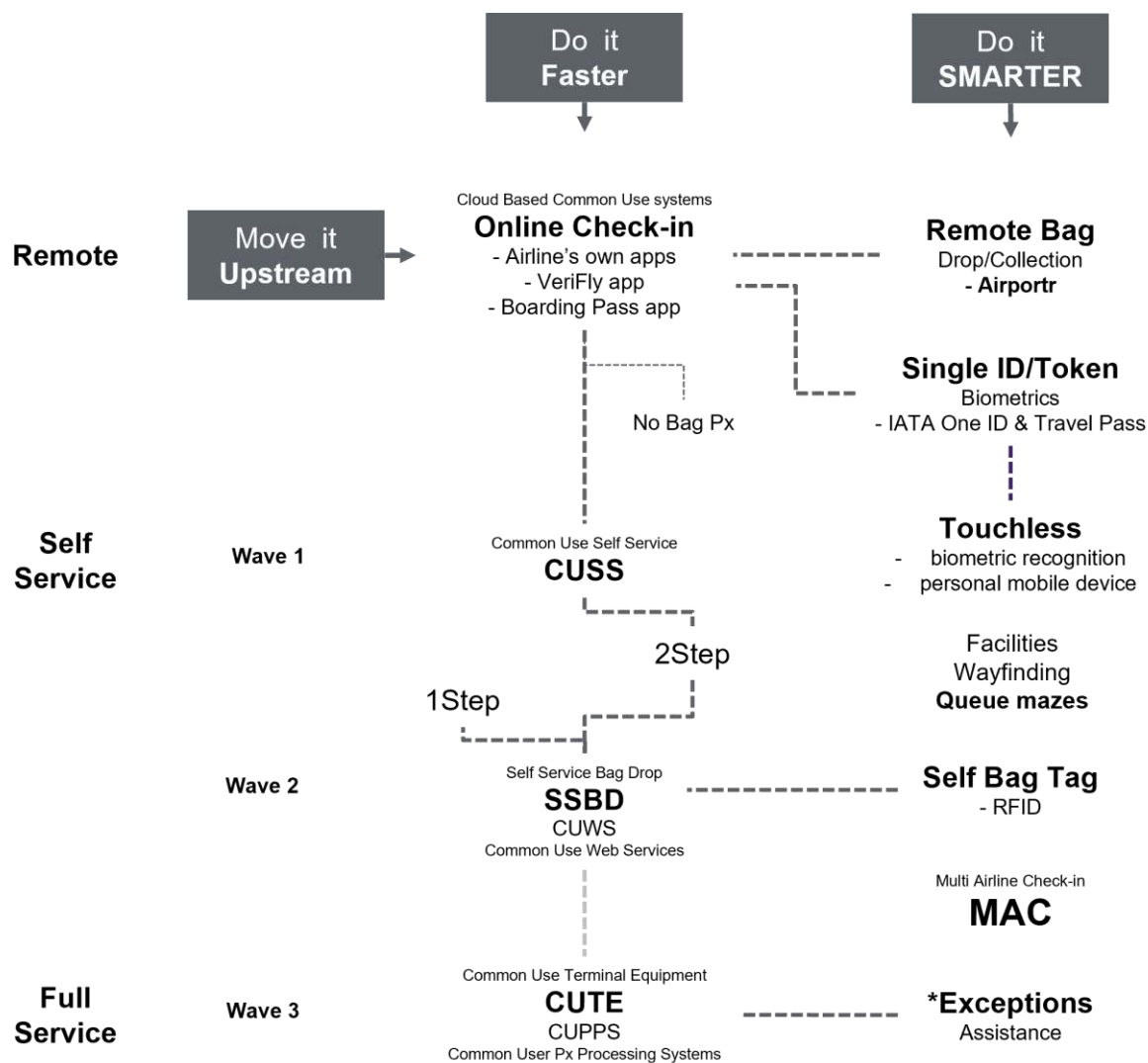
1. Move it Upstream

Moving core airport processes upstream means passenger check-in procedures are undertaken earlier in their journey and often even before arrival at the airport. The adoption of this type of Cloud Based Common Use system gained pace towards the end of the pandemic when passengers were encouraged to arrive at the airport "ready to fly" in order to minimise their time and interactions there. Consequently, a lot of these processes are already well established; processes like passengers checking in before they arrive at the airport, using airline apps and travel document management apps such as VeriFLY, boarding pass apps and facilities like remote bag drops. All of these technologies help minimise impact on airport operations.

Passenger independence is key to airport efficiency - the more the passenger can carry out core processes themselves the more the airports and stakeholders benefit; from reduced operational costs to increased passenger throughput and all with no increase in footprint.

2.   Do it Faster

Automated Check-in

The current trend is to encourage passengers to check-in online and use automated check-in processes at the airport. By allowing the customer to take charge of the process and perform the activities traditionally undertaken by airline agents, including baggage labelling and baggage drop, the airline can improve passenger satisfaction, performance, reduce resources and therefore cost. In addition, the airport benefits from improved capacity whilst maintaining its footprint and increasing passenger flow.

Anecdotal evidence suggests that younger age groups adopt online/mobile and the use of apps more readily than older generations and that older and premium passengers still prefer a personal full-service check-in. A recent survey by AiQ also established that airlines serving emerging markets have passengers that still prefer a personal full-service check-in rather than the automated approach, whether online or at the airport.

COVID-19

COVID changed everything. Check-in reverted to a highly manual full-service process to allow for rushed, unautomated documentation requirements from Governments to check passenger nationality and vaccination certificates. Different countries required different documents and the whole process became very complicated.

As of the final quarter of 2022, most airlines can now handle these documents through their online systems or through independent apps such as VeriFLY. Generally, the content of the document is not being checked, but rather its existence. Moving forward we expect any new document checks to be automated.

Recent AiQ check-in surveys across a range of airports – hub and regional – shows that **COVID has accelerated online and mobile check-in with most airlines achieving 70% or above**.

Check-in automation approaches

With airlines achieving high levels of online/mobile check-in, current Common User Self Service or CUSS kiosk installations at airports, for a check-in only process, will start to be phased out.

With passenger check-in more or less automated the next challenge is to automate baggage check-in. New types of CUSS kiosks are being introduced with baggage labelling and excess baggage payment to support a Self-Service Baggage Drop or SSBD approach.

SSBD

The two most common types of SSBD are one-step and two-step:

- One-step is where passenger and baggage check-in are done at a dedicated SSBD point, which is also the entry point to the baggage system. This is normally an adapted conventional check-in desk, which may fall back to full-service use when contingences such as COVID occur.
- In a two-step process the passenger can check-in and print their baggage labels at a CUSS kiosk on the concourse. The passenger then takes the bag to an SSBD point to input into the baggage system.

AiQ survey data from a number of airports shows that **two-step SSBD generally has faster passenger throughput times than one-step**. By splitting the process into two parts each step is shorter. Using 'Lean methodology' principles both steps are shorter therefore improving the passenger throughput time and resulting in more capacity. Two step utilises the concourse space more efficiently and less baggage inputs may also be required.

Some airlines prefer one-step SSBD as this simplifies the customer choice and improves customer experience but sacrifices capacity by utilising more baggage system inputs. In most airports baggage system inputs are a scarce and limiting resource.

In summary both one and two step SSBD provide significant advantages over conventional full-service check-in.

Multi-Airline Check-in (MAC)
SSBD has the additional advantage of fully enabling Multi-Airline Check-in or MAC, which allows passengers to check-in for any airline at any kiosk or baggage input point, further improving passenger experience, throughput and therefore capacity. This will be discussed in more detail a bit later.

Drivers for change
Clearly all airlines can see that efficiency and cost saving that automation brings, but it does not work for all, in all situations.

AiQ survey data shows that **the passenger profile of an airline has an impact on take up of SSBD**. We have observed that full-service airlines wish to preserve the premium products as a personal service. Also, airlines from emerging economies feel that their customers may not travel sufficiently often to confidently use automated systems and they often have complex travel arrangements, which can be problematic with automation.

Timing for the introduction of automation is also an issue in the last quarter of 2022. Many airlines seem to be sceptical about restarting or implementing automation, creating yet more change as they emerge from the impacts of COVID.

Exceptions
Of course, automation is not yet a panacea and there are still exceptions that need to be managed on a full-service basis, which may include:

- Non-standard documentation check such as health tests and health insurance
- Re-ticketing and payments
- Re-pack/excess baggage payments
- Out of gauge baggage
- Passengers requiring assistance
- Complex transfer passengers
- Minors
- Firearms
- Animals

Clearly some of these activities are being automated, but for now will still require human intervention.

IT as an enabler
10 years ago, the discussion was about the constraints of legacy IT systems to enable the move from full-service desks. That argument has now moved on and IT systems have enabled a future with online processes and apps. Airports and the airlines have had to collaborate closely with the drive for change coming from either or both stakeholders. The airlines have been driven by the need for efficiency and realising greater flexibility of their resources while the airports are focused on maximising their capacity while maintaining their footprint.

3. Do it Smarter

Here, we look at future trends in airport automation and how they will make check-in **smarter** and what this means for airports and stakeholders. As referenced earlier Star Alliance has defined an approach to newer technology solutions that are now being introduced, shown in the graphic below:
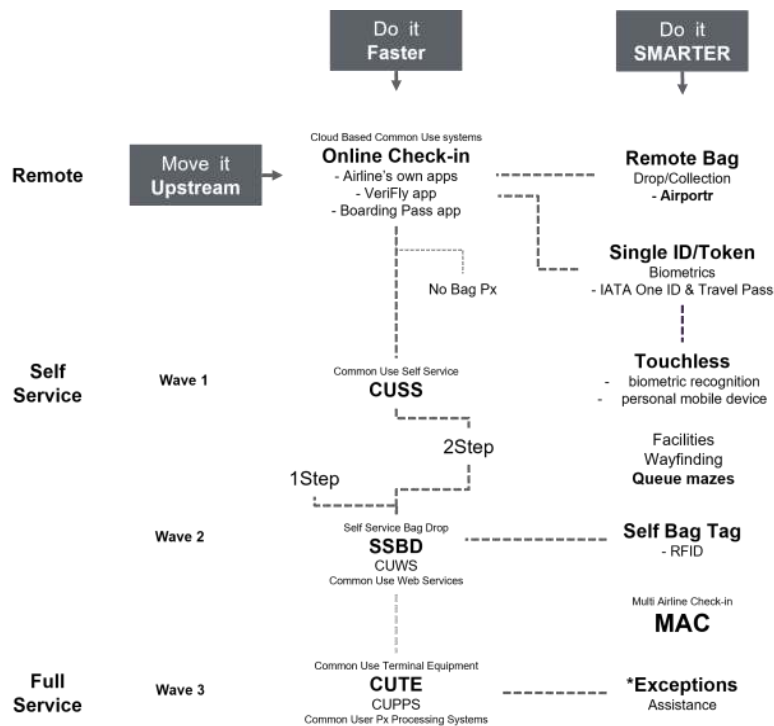
Remote Bag drop/collection
Dropping the bag off at the airport can be inconvenient and can result in queuing. A remote collection service such as AirPortr is working with airlines such as British Airways, American Airlines, easyJet etc and collects the bag from the passenger, either from home or their place of work, and then drops the bag off at the departure airport. The bag is screened off airport and is then taken into the airport through the security control posts and put into the baggage system for full screening. Currently, the bag still has to fly with the passenger but in the future it may fly cargo to be picked up at the arrivals' airport reclaim or could even be part of a completely remote process where it is taken straight to the hotel. This obviously takes the check-in process off the airport, freeing up capacity.

Self Bag Tag
As a frequent flyer having a personalised bag tag registered to the individual means the need to print a bag tag for every flight (which currently can only be done at the airport) is avoided. The bag can be registered before arriving at the airport leaving just the one-step process of placing the bag into the baggage system. There are some technologies which have an RF transmitter in the tag allowing the bag to be located during transit.

Learn more about BAGTAG here: https://bagtag.com/ or TAG from British Airways here: https://www.britishairways.com/en-gb/information/baggage-essentials/digital-bag-tag

Single ID/Token
This is a biometric identity system carried with the passenger with the passport biometrics and all other details and documentation needed to fly

IATA have developed One ID Travel Pass which you can find out more about here: https://www.iata.org/en/programs/passenger/one-id/

There is currently a potential data protection issue with this kind of system and the sharing of personal data across different organisations such as airport, airline, border agencies, etc. The individual will need to provide permission at each point of use to comply with data protection laws which do not allow the transfer of personal information between different entities.

Touchless
There are currently two common approaches to Touchless:

1. Mobile – instead of touching the CUSS or SSBD kiosk the data is held on your smart phone and is scanned at the kiosk
2. Biometric - the next level is where all transactions are done at home, put online and facial or fingerprint recognition is used to recognise the passenger and enable the transaction.

Exceptions
Dealing with the list of check-in exceptions is still mostly manual as of the last quarter of 2022 but some automation is extending to documentation such as COVID vaccination certificates, Apps like VeriFLY are coming on stream to automate this transaction as well as the airlines' own apps. Exceptions can also include visas, ESTAs and other work required documentation.

Other exceptions such as firearms and out of gauge luggage are not automated at all yet; airports and airlines need to get smarter in order to speed the exceptions process up and find cleverer ways to manage them using automation.

Facilities, Wayfinding and queue mazes

Making it smarter also includes better filtering as you enter the terminal. For example, a passenger with a family and out of gauge luggage for a skiing holiday may be directed to a full-service desk while a business traveller with cabin baggage is directed to a SSBD kiosk. Currently this is done by a member of staff at the airport but in the future your smart phone will be able to direct you automatically by knowing whether a 'simple' or 'complex' check-in is needed. While some manual processes are still required, airports and airlines can still better automate the sortation process and become smarter at managing exceptions and providing assistance. The airport of the future will have most of the check-in processes automated leading to improved passenger flow and less need for queues and queue mazes. Simplify the process, reduce the transaction time and create infinite capacity.

MAC

Multi airline check-in allows any airline check-in at any check-in point. This is enabled by the technologies discussed previously. Constrained airports and hub airports are in the early phases of adoption of MAC approach. Our experience at AiQ shows that its implementation needs a high level of co-operation between the airlines, the handlers and the airport and a high level of automation.

Conclusion

Airports should be embracing automation to improve operational efficiency and to build resilience into their operation. As automation becomes more and more sophisticated and innovations continue at a rapid pace it is vital that airports implement the latest technology and thinking and in doing so take a critical step towards increased passenger throughput and satisfaction, increased efficiency and resilience for operators, reduced operational costs and all the other benefits detailed in this white paper.

At AiQ, our award-winning team of operational and analytical experts are dedicated to analysing, modelling and optimising every aspect of an airport. If you would like to find out more about automated check-in technology and how it could benefit your airport please do get in touch.

We would love to carry on the conversation and connect with you on LinkedIn, you can find the AiQ profile page here and our Managing Director Adrian Todd's here.

If you are unfamiliar with any of the terms referenced in this white paper we have included a glossary as an addendum on the next page which you might find useful.

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Addendum

Automation glossary

The terms can be divided into **standards** and **approaches**.

Standards

CUTE stands for **Common Use Terminal Equipment** and applies to the sharing of traditional check-in desk equipment to easily switch between individual airline Departure Control Systems (**DCS**) simply and effectively.

CUWS stands for **Common Use Web Services**, the purpose of this technical specification is to standardise data exchange supporting **CUSS** through the use of web services technology and is the enabler for **SSBD**.

CUSS stands for **Common Use Self Service** and refers to using a simple, customer-friendly user interface to automate part of the initial check-in process by allowing multiple airlines to use the same kiosk thereby reducing the amount of facilities and Ground Handling Agents (**GHA**) needed.

CUPPS stands for **Common Use Passenger Processing Systems** and is the range of services, specifications and standards which enable multiple airlines, service providers or other users to share physical check-in and gate kiosk/podium positions (simultaneously or consecutively).

SSBD stands for **Self Service Bag Drop** and is an automated technology and equipment reliant on **CUWS** designed to reduce passenger check-in times. **SSBD** technology allows passengers to print bag tags and boarding passes at a **CUSS** kiosk or injection point and then place their hold bags into the baggage system themselves.

Approaches

MAC stands for **Multi Airline Check-in** and is an approach that allows passengers to check-in for any group of airlines at any group check-in point improving passenger experience, throughput and therefore capacity.

Other

DCS stands for **Departure Control System**.

GHA stands for **Ground Handling Agents**.

RFID stands for **Radio Frequency Identification** which uses electromagnetic fields to automatically identify and track tags attached to objects.