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Airport digital passenger journey

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The airport journey comprises several stages that are undertaken by passengers as they move through the airport. This includes surface access to/from the airport, check-in, security, commercial activities such as shopping, eating or drinking, information and wayfinding, passport control, departure, and arrivals. Each stage interrupts the passenger journey. In addition, most stages are delivered by different service providers (e.g. airlines, ground handlers, security companies, border agencies, the airport operator, concessionaires), each with varying degrees of service quality (Halpern and Graham, 2013). As a result, passengers may feel they are bounced from one stage to another, and inconsistent or inadequate experiences can be a source of frustration to them. Such experiences can negatively affect passenger expenditure at the airport, for instance, as a result of being unhappy or held up in queues. They can also negatively affect the likelihood to recommend or reuse the airport, or even to revisit the destination (Prentice and Kadan, 2019).

There is therefore a great deal of interest in improving the airport journey, and digital technologies are increasingly recognised for the role they can play. For instance, SITA (2020) identify high levels of adoption of digital technology among passengers at airports and find that passengers using digital technologies are more satisfied than those that do not. Further, in light of COVID-19, there is expected to be an acceleration in the deployment of digital technologies that offer contactless and touchless solutions that minimise the risk of transmitting the virus (Serrano and Kazda, 2020).

Figure 1 illustrates key stages of the airport journey and provides examples of digital technologies that are currently being explored or introduced at airports. This includes autopay car parking systems, introduced for all parking spaces at Oslo Gardermoen Airport by 2019, where cameras read the license plate of cars when entering and exiting the car park. Digital signage and parking space indicators direct drivers to the nearest available space. Users that create an online profile with the operator and save credit card details to their profile can then drive seamlessly in and out of the car park.

Digital bag tags, for instance TAG by British Airways, offer passengers the ability to update a permanent digital tag on their baggage each time they travel. This can be done from their mobile device instead of printing a tag at the airport. It would subsequently allow passengers to track their baggage throughout its journey and receive notifications, for instance, to tell them when it is ready for collection, and from which carousel. Passengers using a digital tag can skip check-in at the airport and simply use the self-service bag drop to deliver their baggage on arrival at the airport.

Biometric identification is gaining interest at airports with the idea being that passengers pre-register their travel and biometric details (e.g. facial or other personal features) when checking-in via their mobile device. They can then then use biometric identification (e.g. facial scanning) at each stage of their journey. Biometric identification can be combined with advanced technologies such as infra-red cameras that scan passengers as they walk through security without needing to show a boarding pass to enter security screening or remove items for screening. Thus, facilitating a walk-through experience. Emirates introduced a biometric path for its passengers in collaboration with Dubai International Airport in 2020 to offer a more seamless journey at check-in, passport control, access to the Emirates Lounge, and the boarding gate.

Interest in the use of mobile technologies has grown at airports. Not only to allow passengers to access and scan their boarding pass on their mobile device but also for mobile payments in commercial areas, and to access information and wayfinding services. Mobile technologies can allow airports to deliver personalised notifications directly to the mobile device of passengers, for instance, with real-time information on queue times (e.g. at security or passport control), or flight status and gate information. They can also be used to offer augmented and virtual reality experiences, for instance, to show the closest shopping and dining options to passengers via their mobile device, and to offer customised and context aware offers (e.g. from nearby shops). As an example, Miami International Airport has a mobile application called MIA Airport Official. As of 2020, the airport had installed more than 500 data beacons throughout the airport that use location-based technology to provide personalised notifications and customised offers to passengers, as well as using blue dot technology to help passengers navigate the airport, and to provide them with estimated walk times to nearby shops or dining options.

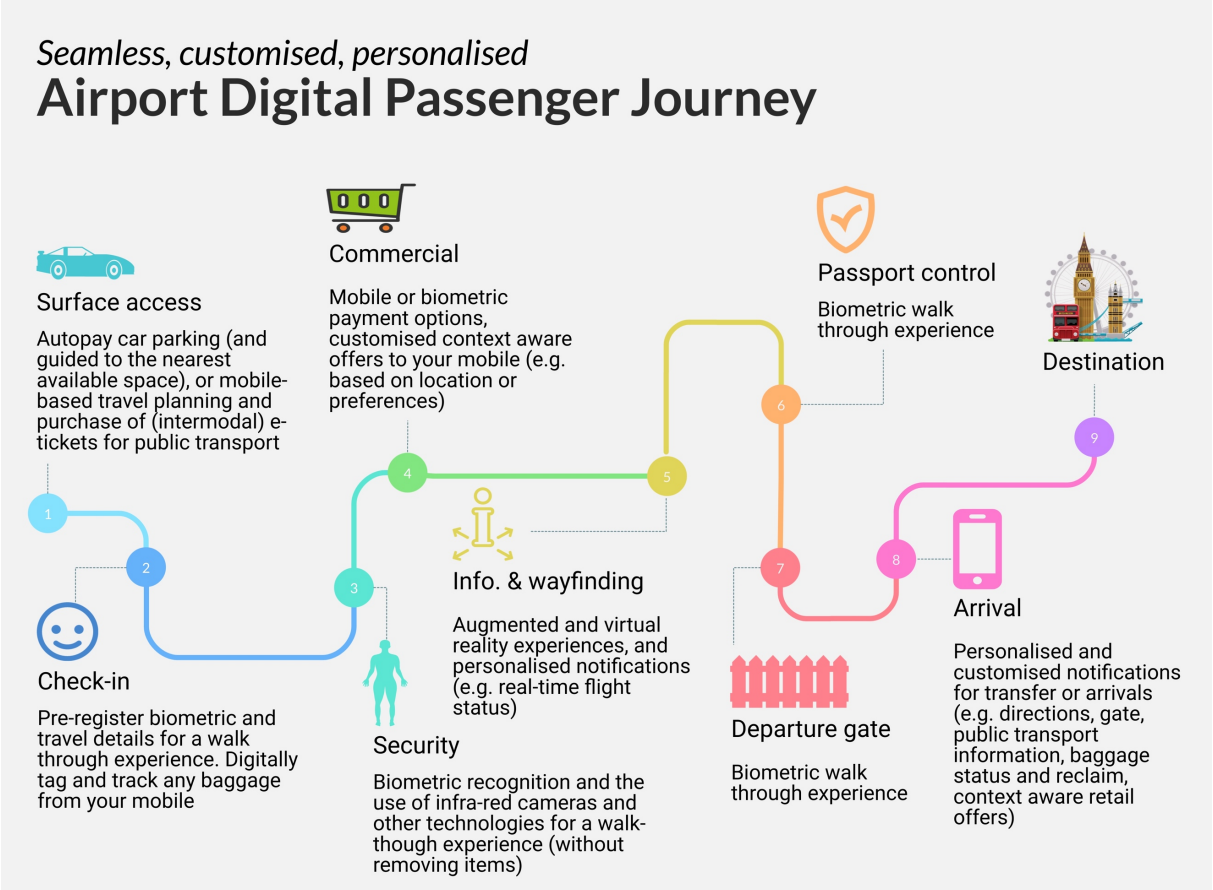

Figure 1. Airport Digital Passenger Journey.

The examples in Figure 1 are of course just a selection. They are not meant to be an exhaustive list of solutions because technologies change so rapidly. Besides, technologies alone do not create significant value. This only happens when there is an overall cohesive architecture. That architecture is synonymous with the ´smart´ or ´connected´ airport concept that is based largely on the Internet of Things (Zmud et al., 2018). Smart or connected airports consist of a digitally connected network of objects (e.g. mobile devices in the case of passengers). These objects generate information in the form of data gathered from sensors (e.g. optical, pressure, motion or proximity sensors) or other smart instruments. That data can then be communicated across the network to aid decision making. A particular challenge at airports is that different service providers are involved in key stages of the journey, so in order to make the most of any smart capabilities, airports need to collaborate on capturing and sharing data with other service providers. This requires the integration of systems and processes with other service providers, often via the use of open application programming interfaces that allow business processes, services, content, and data to be securely connected.

There are therefore several challenges associated with developing a smart or connected airport. According to Halpern et al. (2021a), this includes costs and uncertainties associated with investing in the necessary technologies, which as mentioned can change quickly. There may be reluctance among service providers to engage in data exchange. There may also be concerns regarding cybersecurity, data privacy and potential adverse effects of digitalisation such as on the standardisation or loss of jobs. In addition, while digital technologies may enhance the journey of passengers with high levels of adoption, not all passengers are interested in using digital technologies. Indeed, there is a small yet significant proportion of passengers that prefer to use manual processes such as a staffed check-in desk during their journey (Halpern et al., 2021b). This may change in light of COVID-19, and as interest grows in using digital technologies that can reduce the risk of transmitting the virus. However, that is yet to be proven. Also, there is a group of passengers that are in need of assistance at airports from an accessibility perspective – the needs of whom should be considered when developing smart capabilities at airports, so that they too can enjoy the benefits. It means that airports will need to invest in organisational capabilities needed for digital transformation (e.g. see Halpern et al., 2021c). This will help them to identify and implement the technologies that are needed. It will also help to engage other service providers, for instance, on data exchange. For passengers, airports will need to introduce education and awareness campaigns and develop an all-inclusive approach that reconciles different passenger preferences for using digital technologies at airports.

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