WHITE PAPER

SAFE TO THE GATES

How Beabloo's technology is used at the Istanbul Airport to ensure a safe and seamless flow of passengers to the gates

beabloo intel market ready

Content

1. A glimpse of the situation

The impact that COVID-19 has had on the airport sector has been staggering. Compared to business as usual, the overall loss for 2020 is forecast at around 64.2 percent of passenger traffic and over 65 percent of airport revenue.[1]

To keep passengers and staff safe, airports have had to make substantial operational adjustments as well as implement new health and safety measures. The measures adopted by governments and the industry at airports have been social distancing, mask wearing, improved hygiene and health screening measures.[2]

2021 has also begun with a low number of passengers, as flight schedules were operating at a fraction of the capacity that was experienced during the same period in 2020. Figures released by Statista show that at the beginning of January 2021, the number of scheduled flights worldwide was down by 43.5 percent compared to the same timeframe in 2020.[3]

As part of the process of restarting and recovery of the airport sector, Airports Council International has reiterated its focus on instilling confidence in passengers that flying is safe and sanitary.[4] When travelling today, people are more aware about protecting their health and their demands have gotten more stringent in terms of ensuring the proper safety precautions are being taken.

To instill confidence in passengers that they can travel safely, airports need to have solutions and services in place that adhere to the most stringent health and safety regulations. In coping effectively with emerging health and safety standards, the use of technology and smart solutions have proven to be extremely effective at airports.

Airports have always been quick to implement new safety and security technology, from screening tools to advanced analytics. In terms of the recovery phase of the airport industry, technological solutions play a key role in boosting public confidence in airport safety.

Technology and smart solutions enhance the smooth and safe flow of passengers at airports, limit interactions between passengers and in-airport personnel, allows them to meet new requirements such as social distancing and wearing of masks, and reduces the chance of any new spreading of the infection from occurring.

1. The Advisory Bulletin: The impact of COVID-19 on the airport business. Retrieved from: https://aci.aero/wp-content/uploads/2020/12/Advisory_Bulletin_The_impact_of_COVID_19_on_the_airport_business.pdf?_cldee=am9lQGFpcnBvcnQtd29ybGQuY29t&recipientid=lead-e55b97047281e911a-984000d3af3e521-de90ac2479b749f2a51d6064f04f3e32&esid=389e565e-c738-eb11-a813-000d3af3a7a7, accessed January 10, 2021
2. Council Aviation Recovery Task Force Take-Off Guidance. Retrieved from: https://www.icao.int/covid/cart/Pages/CART-Take-off.aspx
3. Statista: Year-on-year change of weekly flight frequency of global airlines. Retrieved from: https://www.statista.com/statistics/1104036/novel-coronavirus-weekly-flights-change-airlines-region/
4. ACI Insight: Top 10 customer experience recommendations: Restart and recovery of airport operations. Retrieved from: https://blog.aci.aero/covid-19-top-10-customer-experience-recommendations-restart-and-recovery-of-airport-operations/

2. Smart airport concept – the story of the Istanbul Airport

Istanbul Airport is expected to be a digital airport of the future, from its design to its construction phase. The digitization of all processes during its design phase and the introduction of technology at every corner of the airport have made it one of the world's smartest airports. The airport is set to become the world's largest airport by the time it is finished.

Construction of the Istanbul Airport began in May 2015. Located on 76.5 million square meters, the airport is 35 km from the city center. The construction of the airport is taking place in a number of phases, and the airport and its facilities will be expanded over time. The first phase was completed in 42 months and consisted of two runways as well as a main terminal with an annual passenger capacity of 90 million and an area of 1.4 million m2 – making it the largest airport terminal building in the world under a single roof. The inauguration of the airport took place on 29 October 2018 and it became fully operational in April 2019.[5]

A third independent runway was added at the second stage of the construction, which was placed into service in June 2020. This triple parallel runway capability allowed Istanbul Grand Airport to join a small number of airports around the world with this capability, including Amsterdam Airport Schiphol, Kuala Lumpur International Airport and Chicago O'Hare International.[6]

A second passenger terminal with a capacity of 60 million annual passengers as well as an additional runway and a new support facility area is expected to be added at the third stage. The final stage of expansion will include the construction of satellite terminals with a combined capacity of 50 million passengers along with the addition of another runway. When completely constructed by 2025, the airport will have six sets of runways and four terminal buildings with a combined indoor area of 3.2 million m2, making it the largest airport in the world with a total capacity of 200 million passengers per year.

Image 1. Photo of Istanbul Airport

5. IGA Timeline. Retrieved from: https://www.igairport.com/en/about-iga/timeline
6. Simple Flying: New Istanbul Airport Opens Third Runway for First Time. Retrieved from: https://simpleflying.com/new-istanbul-airport-opens-third-runway-for-first-time/

Istanbul Airport is among the few in the world to merge the next wave of technology innovations and smart building systems, putting digitalization and technology at its core. It is committed to creating an end-to-end truly digital passenger experience and some of the initiatives within this scope include e-commerce platforms, digital wallets, digital passenger journeys during the COVID-19 pandemic, contactless purchases, loyalty schemes, digital marketing and digital advertising platforms.

In November 2020 Istanbul Airport was selected as the 'Best Airport' in the category of Digital Transformation (Best European Airport Award for Digital Transformation) as part of the '16th ACI Europe Awards' presented by the International Airport Councils (ACI).[7]

The airport has around 3,500 flight information screens that provide information to passengers throughout the terminal, 467 servers, 780 telecommunications rooms, 3,900 card crossing points, 4,549 PC support equipment, 10,500 surveillance cameras, 5114 HID card readers and more than 10,500 cameras and recording systems.

In addition, all 300+ systems such as Flight Information Display Systems, Common Use Terminal Systems, Baggage Reconciliation Systems, Plane Approach, Virtual Ramp Tower, Passenger Information System, Advanced Control Systems, Premium Facilities and Boarding Pass Validation are all computer controlled.

Image 2. Photo of Istanbul Airport

7. Airport Business: Istanbul Airport committed to award-winning, end-to-end fully digital passenger experience. Retrieved from: http://www.airport-business.com/2020/11/istanbul-airport-committed-award-winning-end-end-fully-digital-passenger-experience/

3. Digital projects for improving passenger safety at Istanbul Airport

When the COVID-19 crises began, Istanbul Airport placed the highest priority on complying with the strictest health and safety guidelines. The airport has made major operational changes and has introduced new policies aimed at protecting passengers and workers and increasing the confidence of passengers in terms of safety and hygiene while travelling.

Istanbul Airport has set up a dedicated IGA Hygiene Team to ensure compliance with the COVID-19 safety guidelines. Passengers are expected to wear a mask at all times, are advised to walk through a special sanitizer mat at all terminal access points, luggage is taken inside after disinfection and trays at security checkpoints are regularly disinfected.[8]

In addition to these steps, concerted attempts have been made to restrict physical interaction between people at the airport premises. To this end, Istanbul Airport takes advantage of its technological innovations and scales up contactless, smart technology-led operations, such as: self-checking at counters where passengers are able to process their IDs and Passports on their own; turnstiles with barcode readers that avoid the physical contact of security personnel with boarding cards during the approval process.

Many other digital initiatives and projects are being introduced to allow Istanbul Airport to comply with health and safety guidelines, reduce risks and enhance safety, such as: an ultraviolet light disinfection system built into biometric readers in e-Passport counters.

Istanbul Airport is also developing a face-recognition system called Smart Path for a low-touch airport experience. Smart cameras can capture the biometric data of passengers at conventional check-in desks and self-service kiosks and use it at all touchpoints for passengers.

This system would allow passengers to pass through their entire airport journey without presenting a document if they wish so. According to airport officials, the Smart Path system will be placed into service in a very short time.[9]

8. Duty Free: Istanbul Airport sets standards in COVID-19 safety. Retrieved from: https://www.dutyfreemag.com/gulf-africa/business-news/airlines-and-airports/2020/06/09/istanbul-airport-sets-standards-in-covid-19-safety/#.YAVKVegzZPY

9. Future Travel Experience: Istanbul Airport CEO: "Big Data, biometrics and IoT allow for more collaboration and an open exchange of data between stakeholders". Retrieved from: https://www.futuretravelexperience.com/2020/07/istanbul-airport-ceo-big-data-biometrics-and-iot-allow-for-more-collaboration-and-an-open-exchange-of-data-between-stakeholders/

Thanks to these practices, Istanbul Airport received the 'Airport Pandemic Certificate' issued by the Directorate-General for Civil Aviation for the important steps they have taken to tackle the COVID-19 pandemic and then signed the 'COVID-19 Aviation Health Safety Protocol' released by the European Union Aviation Safety Agency (EASA).

Istanbul Airport has thus been the first airport in the world to obtain certification under the Airport Health Accreditation program launched by the International Airport Council (ACI).[10]

Image 4. Photo of the ACI Certificate of Accreditation received by Istanbul Airport

10. Istanbul Airport receives the first 'Airport Health Accreditation' Certificate in the World. Retrieved from: https://www.igairport.com/en/press-releases/airport-health-accreditation

4. Istanbul Airport's commitment to an effective passenger flow

One of the initiatives that has always been of great importance to Istanbul Airport is to enhance passenger flow and make it seamless and effective. In this context, the airport invested in a wide range of smart technologies such as geolocation technologies and GPS beacons, to provide passengers with directions to points in the airport and also a self-bag drop system that simplifies and speeds up the passenger check-in process.

In terms of the recovery process of the airport industry, the focus is on restoring passenger confidence that their journey is safe and sanitary, Istanbul Airport has decided to make passenger flow even safer and more seamless. To accomplish this, it was important to proactively promote the wearing of masks as well as optimize the time spent by passengers at the two stop locations characterized for being areas were large crowds gather.

For safety reasons, the flow of passengers through the airport must be fast and effective, avoiding close queuing and unnecessary interaction between people. Istanbul Airport is a place with a high footfall and there are passenger flow sequences that present a variety of challenges when it comes to minimizing physical contact.

There was concern at Istanbul Airport that passengers would frequently need to wait in line at security and passport control checkpoints because they were not properly prepared to process through these checkpoints (they have not pulled prohibited items out of their carry-on bags such as liquids, metal, electronics, or do not have their passports and plane tickets ready before reaching passport control). This increases the time spent at those checkpoints, contributes to creating a bottleneck and poses a challenge in terms of maintaining proper social distancing.

According to the International Air Transport Association (IATA) public opinion research, queuing at check-in/security/border control or boarding is one of the top three issues for passengers when it comes to airport safety according to 42% of respondents (the other two are: being in a crowded bus/train on the way to the aircraft and using airport toilets/toilet facilities).[11]

The ability to minimize these queuing times and ensure a smooth and safe passenger flow through the airport would instill confidence in passengers that they can safely spend time processing through the airport.

11. IATA: Traveler Survey Reveals COVID-19 Concerns. Retrieved from: https://www.iata.org/en/pressroom/pr/2020-07-07-01/

5. Using Beabloo's technology to mitigate bottlenecks and increase safety at the airport

To meet the challenge of creating a smoother and more effective flow of passengers through the airport, but also to ensure that passengers are well protected and wear masks at those checkpoints where minimizing physical contact is a challenge, Istanbul Airport has decided to once again rely on advanced technology.

As digitalization and technology have been at the core of this smart airport thus far, for this project they opted for implementing an automated and intelligent system as the best way to ensure a safe environment and protection for all.

Istanbul Airport approached the Turkish company Mangodo to help them implement a mask detection system that could accurately detect whether or not people are wearing a mask at the different locations where passengers concentrate such as security and passport control checkpoints, and to respond proactively when a person is detected not wearing a mask. In order to improve safety even further, they wanted a system that would also allow them to optimize the time spent by passengers at these two checkpoints where bottlenecks occur by informing passengers how to be ready so they can pass through these checkpoints at a steady pace.

This way, bottlenecks at these checkpoints can be avoided, thus ensuring a much smoother and safer flow of passengers. A very important factor for Istanbul Airport was to ensure that each department was able to access and control the content that is shown on the screens they are responsible for. This is because the airport had a prior issue with a centralized content management system that caused operational issues and delays as a result of displayed content that was not easy to manage.

For this project, the Mangodo team suggested implementing an intelligent safety solution Interaction Care, an Intel® Market Ready Solution powered by Beabloo. Using sensing hardware, analytics software and digital signage, Beabloo's Interaction Care solution ensures a safe environment can be maintained while also providing valuable information. This solution entirely met all of the airport's requirements.

> **Solution**: Beabloo's Interaction Care
> **Implemented components**: IC Mask Detection, IC Safety Content
> **Solution specifications**: 50 cameras, 50 INTEL Corporation SKYBAY 3009882901003653 players, 50 55'' displays, 50 Beabloo's video analytics licenses.

5.1. Ensuring masks are worn to maximize everyone's safety

The installation of video sensors and digital signage screens at airport security and passport control checkpoints, together with Beabloo software, allows accurately detecting if people are wearing masks in real time.

When the system detects that a person is not wearing a mask or is not wearing it properly (wears it down), it immediately triggers a message on the nearest 55' screen stating that to maximize safety, it is mandatory for all individuals to wear masks at the airport. According to the International Air Transport Association Traveler Study, mandatory wearing of masks while at the airport is ranked among the top three measures that make travelers feel safer.

A system that detects when people are not wearing masks in real time and proactively alerts them of the importance of wearing masks, articulates the airport's commitment to maximizing everyone's safety and can instill a sense of confidence in passengers that the airport environment is safe.

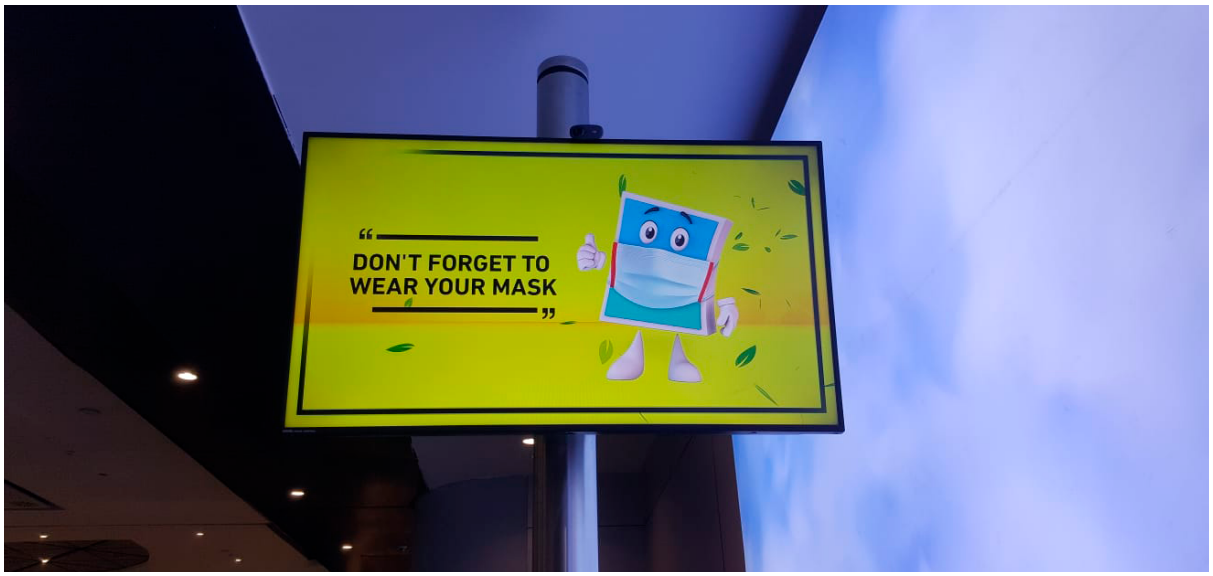


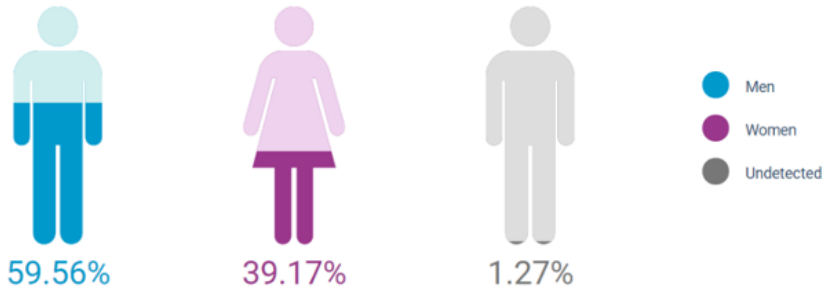
Image 5. Photo of a screen showing a recommendation for mask use triggered by the system after an individual has been detected not wearing a mask.

"Thanks to Beabloo's Mask Detection solution, when the system detects that a passenger is not wearing a mask, the contents of the sign is changed in real time to include content reminding passengers of the importance of wearing a mask"-said the Istanbul Airport management team.

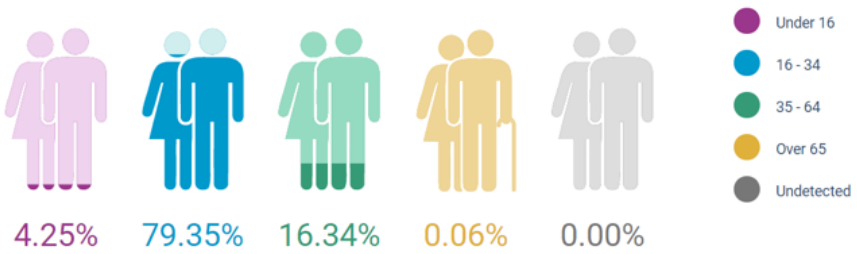
5.2. Collecting data to better understand the behavior of passengers

At the same time, the system anonymously collects valuable data such as gender and age groups, number of times the content is displayed on the screen, the number of people who had the opportunity to view the screen when the content was displayed, the number of views, the effective viewing time (duration of content/ view time), always in compliance with GDPR privacy standards.

This data can be broken down by days, weeks, months, and time slots. This provides Istanbul Airport with powerful insight into the overall audience and customer behavior, shaping short-term actions and long-term planning decisions.

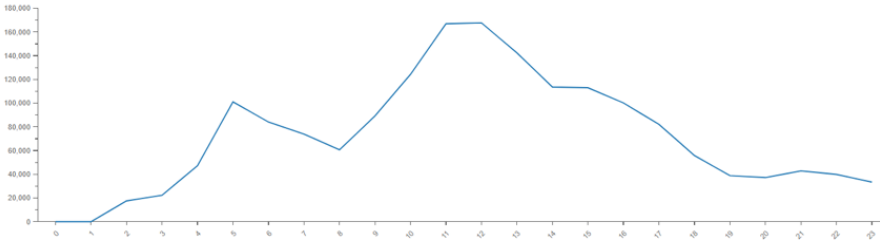


Graph showing the distribution of views of the content that is triggered by the system when a person not wearing a mask is detected, by gender. The data reveals men viewed the displayed content 1.5 times more often than women during the analyzed period (November 2020 - January 2021).



Graph showing the distribution of views of the content triggered by the system when a person not wearing a mask is detected, by age group. The data reveals that a considerably greater number of views of the content displayed by the system was done by people in the 16 to 34 age group.

Graph showing a distribution of views of the content triggered by the system when it detects a person is not wearing a mask, by different time slots. The highest percentage of views of the content occurs in the afternoon – 44% of the total number of views occurs in the 12-17 time slot.



Graph showing the average number of times the content triggered by the system was displayed broken down by hours of the day for the analyzed period (November 2020 - January 2021). The data shows that the average number of times the content was displayed when a person not wearing a mask was detected peaks at 11 a.m.

At all points during the morning (7 a.m.-11 a.m.) and afternoon (12 p.m. -5 p.m.) hours, the number of times the system triggered a mask recommendation content was significantly higher than in the evening, reaching at certain points values more than 3 times higher than in the evening hours (6 p.m.-11 p.m.).

The data collected during the period between November 2020 and January 2021 shows men viewed the displayed mask recommendation content 1.5 times more often than women. An age group comparison shows that almost 80 percent of views of the mask recommendation content triggered by the system are done by people in the 16 to 34 age group.

The average number of times the content was displayed because a person not wearing a mask was detected peaks between 11 a.m. and 12 p.m. and the highest percentage of content views – 44 percent occurs in the afternoon time slot (12 p.m.-5 p.m.).

"By measuring the number of times the message was displayed on the screens, we can understand customer behavior and the effectiveness of IGA's COVID-19 communication campaign" - said the Istanbul Airport management team.

A mask usage recommendation content triggered by the system when it detects a person is not wearing a mask turned out to be the most displayed content on the screens that had been set up for this project during the analyzed period (November 2020 – January 2021). Mask recommendation content was displayed as much as five times more than the second most displayed content.

The effective viewing time ratio for mask recommendation content has provided very significant results. The collected data shows a high percentage of effective viewing time for mask recommendation content. For the observed period (November 2020 – January 2021), the effective viewing time was close to 70%.

5.3. Providing relevant and timely information to speed up passenger flow

When digital signage screens are not displaying mandatory mask wearing content, different airport information is displayed depending on where the screens are located.

The digital signage screens that are installed at the security checkpoint area display informative content to help passengers prepare before going through the checkpoint like for example, instructing them to remove objects from their carry-on bags such as liquids, metal, electronic devices, powders, etc., and placing them in trays so that these items can go through the X-Ray machine separately.

The digital signage screens that are installed at the passport checkpoint area show content instructing passengers how to properly prepare themselves to go through the checkpoint such as ensuring they pull out their passports and airline tickets, taking off sunglasses, etc.

Ensuring that relevant and timely instructions are provided facilitates and speeds up the flow of passengers at these checkpoints. This reduces queuing, increases the distance between people and consequently, reduces the risk of exposure to pathogens, thus enhancing everyone's safety. A quick and efficient flow of passengers helps create a seamless and smooth passenger experience that is vitally important in terms of rebuilding public confidence that the airport environment is safe.

As pointed out by the Istanbul Airport management team: "In this sense, Beabloo is helping us accomplish two things; first, passport procedures are being streamlined and second, spreading of the COVID-19 virus is significantly mitigated by ensuring people remain at a safe distance from each other."

Additionally, digital signage screens display a variety of airport informative messages but also content reminding travelers about the health and safety measures that must be followed such as providing hygiene tips and reminding people about the need to follow social distancing guidelines.

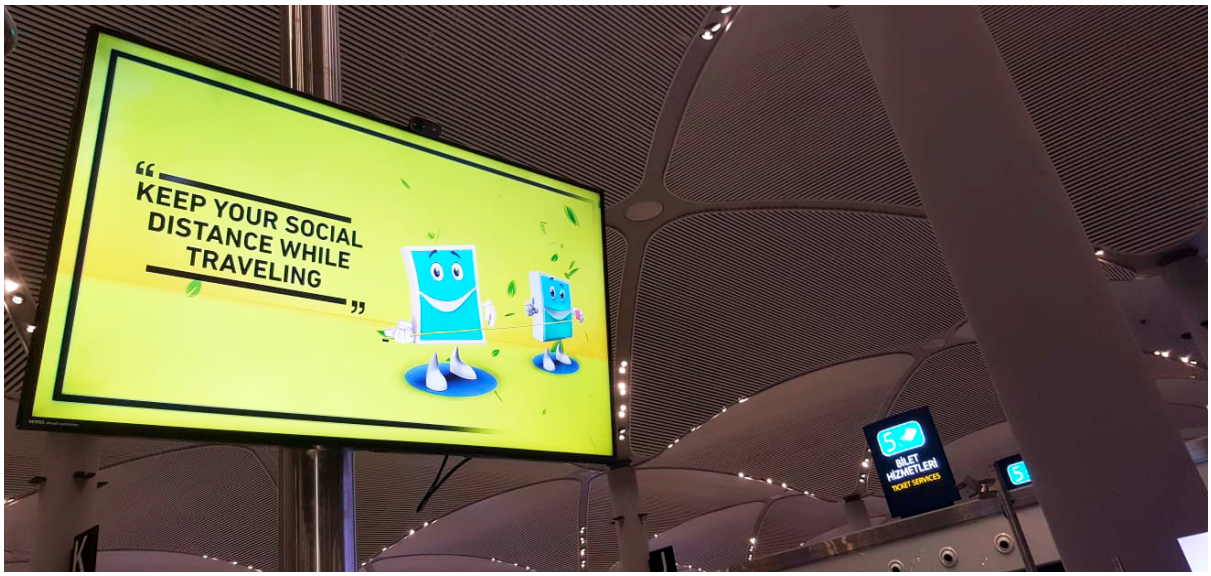


Image 6. Photo of a screen displaying the health and safety guidelines

The implementation of Beabloo's solution also helped Istanbul Airport solve problems they had been having with their old content management system, which was causing operational problems and delays in the displaying of content and was very hard to manage.

As explained by the Airport management team:"Before implementing Beabloo's solution, we had issues with the content management system. We could not give control of the different screens to different units. All the contents were published by one unit, which was difficult to manage and caused delays and confusing information to be displayed on the terminals. The old system also had issues with its operation and stability, which also raised costs.

Now, with the Beabloo solution implemented, we don't have any of these issues. Each department can access the screens they are responsible for and broadcast the content they want. This way, we can avoid potential errors and incorrect information from being displayed.

Beabloo's software is running smoothly, it is easy to install, configure and most importantly, it is easy to operate. The fact that Beabloo has a user-friendly interface was an important factor in choosing this system."

6. Beabloo's innovative technology: A path to a safer and more effective flow of passengers

The implementation of Interaction Care, an Intel® Market Ready Solution powered by Beabloo, helped Istanbul Airport ensure a smoother and safer flow of passengers across its premises.

IC Mask detection, a component of Beabloo's Interaction Care, allowed Istanbul Airport to automatically detect any individual not wearing a mask at passenger checkpoints characterized for being areas where a large number of passengers gather and proactively inform them about the importance of wearing a mask.

Ensuring masks are worn in areas where maintaining a social distancing is difficult is crucial for everyone's safety. The accurate and real time detection as well as the proactive and specific communication provided by Beabloo's Mask Detection technology enabled Istanbul Airport to ensure compliance with the mask policy. Additionally, the system anonymously collects valuable data such as demographics and content views.

This feature allows Istanbul Airport to use information about the overall audience, customer behavior and the effectiveness of their communication campaigns to shape communications and ensure their decision-making processes are data driven.

Beabloo's technology solution also made it possible for Istanbul Airport to optimize the time spent by passengers at the two areas where bottlenecks occur (the Security and Passport Control Checkpoints) by providing them with relevant and timely information. This has made the flow of passengers smoother and safer.

The path to recovering the airport sector in the future is dependent on the level of confidence in passengers that airports are safe places to be. This means we must seek new ways of working as well as new solutions to ensure the safety of all. Innovative and flexible technology solutions such as Beabloo's Interaction Care, which helps achieve a seamless and safer flow of passengers through the airport, are essential in helping airports instill confidence in the public that airports are a safe place to be.

7. Respecting customer privacy

Beabloo guarantees strict compliance with current legislation, such as the European General Data Protection Regulation (GDPR), for all their solutions.

Beabloo also has ISO/IEC 27001:2013 certification, which means the data security management system associated with their Active Customer Intelligence Suite (ACIS) complies with current standards.

All devices integrated with ACIS use anonymized data, so user privacy is respected at all times.

8. Beabloo Interaction Care

Interaction Care (IC) measures human interactions in all kinds of spaces. It uses a unique combination of technologies to help businesses proactively protect their customers and employees from high-risk situations that could jeopardize their health and safety.

This solution can be implemented in a variety of sectors, such as pharmacies,

supermarkets, banks, health care facilities, retail stores, public transportation, and the public sector.

Interaction Care provides clear business benefits even after the pandemic. When the COVID-19 crisis is over and there's no need to monitor or track interactions, companies can repurpose all Interaction Care components to enhance business performance in physical spaces.

9. About Beabloo

Beabloo is a pioneering tech company that develops solutions to make physical spaces smarter. Beabloo's Active Customer Intelligence Suite (ACIS) is a Microsoft Azure-based suite of integrated solutions designed to digitally transform marketing campaigns across industries, including retail, banking, public venues, hospitality, and travel.

An AI-driven platform, ACIS combines digital signage, analytics, and AI automation to revolutionize communication, analyze people's behavior, and automate personalized experiences. Beabloo technology helps physical spaces learn from people and adapt to them in real time to provide better service.

Consolidated experience and international reach

12

Years digitizing business

90+

Employees helping clients undertake business transformations

20+

Presence in countries

400+

Clients, from retail, large venues, banking, hospitality and travel industries, among other sectors

+45

Certified partners are part of the global Beabloo ecosystem

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