Next Generation Airports – A Realistic Perception

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Abstract: - **With the advancements in technology in every field in the world with time, the airline sector is observed with a lot of new headways. One important aspect of amelioration in this tract is advances in the airport bodies. One of the main reasons being the requisite of more travelers for generating more revenue. As well as, to showcase the superiority among other airports. Here, we have worked upon of few aspects to make an airport from the future.**

I. INTRODUCTION

An airport is a mediator between the passengers and the airliners used to improvise the Air transportation. It is also the facilitator for the fixed wing aircrafts and rotary wing aircrafts to lift off or station themselves to the ground. Sometimes they also take the role of a place for maintenance and servicing of airplanes. Typically, an airport should have runways, hangars and terminal buildings. Some small airports are also often called aerodromes.

Airports are classified in many ways mainly on the basis of the operation of flights. Namely, Domestic Airports and International Airports. Some airports are also dedicated for specific purpose such as for VVIP's and other government officials. All the airports are built in accordance with specific rules laid by the Federal Aviation Authority (FAA), International Civil Aviation Organization (ICAO), and local Aviation authorities specific to particular country.

Most of the airports around the globe are owned by governing bodies of the state.

The idea of bringing next generation airports is more and more focused on the airport as a haven instead of just a boulevard. Architects are reshaping the airports to friendlier places to spend more time. Their objective is to make airport an attractive spot and people enjoy the stay in the airports rather than just pass by. But then, a smart airport experience should not just be an architectural excellence but also to be from end to end experience like checking in using two fingers through their mobiles, easy travel to place of visit or stay in the city or town. Technology is the greatest palpable leverage on the airport exposure. Every next generation airport should be flexible to adapt the changes with fewer problems to overcome and strategically outwit hitches.

II. THE CLASSICAL AIRPORTS

To understand next gen airports it is a pre-requisite to know the present.

Airports classically have a corner in the terminal building for airliners where passengers check in themselves, luggage and receive their boarding passes. Then they go for security checks and wait in the lobby till the departure time. Sometimes, people take a transit bus to the aircraft parking to get into the flight. There stalls for refreshments and food courts, restrooms and lounges in these airports. There are galleries for people to have look at various flights taking off and landing, taxiing and parking in their lots. Earlier airports were just transition point between the airside and landside of air operations.

There have been instances when people felt very uncomfortable in airports. It was when the idea of improvising the airports came into the circle. This gave birth to what is called as next generation airports.

III. IDEAS FOR NEXTGEN

Next gen aviation technology primarily focuses on enhancing the productivity of communication systems to make the pilot's job easier.

This means adopting state of the art network systems that enable pilots to adapt to various external influences such as weather conditions, aircraft position, flight trajectory, security associated with airspace etc.

However, next gen may not be limited to this, it also applies to pre take-off and post landing procedures.

For simplicity, let us classify the different ideas into three different categories:

1. Pre flight
2. Mid flight
3. Post flight

1. Preflight: These mostly pertain to improvements for the welfare and convenience of the passengers.

The primary goals to be accomplished here are:-

1. Fewer flights cancelled
2. Quicker takeoffs and landings
3. Simplified procedures and formalities. .
4. Enhanced safety.

Increased number of delays ultimately leads to loss of net productivity.

Some of the methods to achieve these goals are:

E-CHECK IN: Collaborating basic procedures with technology. Ticketless services with the help of smartphones, digital departure procedures and biometric technology will allow passengers to complete their procedures smoothly and safely.

Let us break down the system of e-check in and analyze each constituent element.

i. Electronic Ticket: Tickets can be purchases digitally via the internet. This results in one less item to carry around.

ii. Automated procedures: This involves the use of IC chips rather than printed tickets. This can ensure smooth flow and rapid flow of passengers through ticket gates. Clearly this is much more efficient than a ticket checker looking at each and every passengers' ticket.

iii. Biometric Technology: Biometric technology is known to be the most foolproof technique for identification.
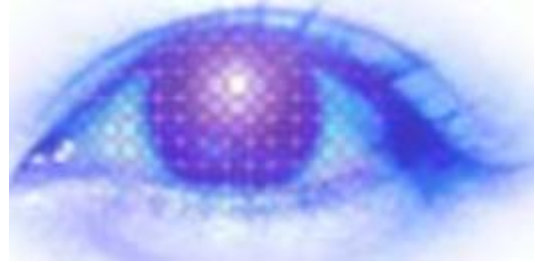
iV. Shorter waiting times: Technology may also be implemented to ensure that just the right amount of time spent by passengers in airports. For example, putting flight status data on a personnel smartphone using System Wide Information Management.

E-NAVIGATION:

i. AIRPORT FACILITIES: Easily understandable real time graphic guide to airport facilities via mobile terminals.

ii. TRANSPORT INFORMATION CITY GUIDES: users will be able to search for public transport, accommodation, etc.and obtain information on services in their immediate vicinity.

iii. E TAG: These function like trackers for luggage thereby reducing the incidence of lost baggage and allow passengers to travel from their home to their destination without being burdened by luggage.

iV. FOOD CATERING SYSTEM: An online service that lets passenger's pre-order food that they'd like to have during the

journey. The service requires the passenger to enter his or her flight details as well. The food is then delivered to the Flight Catering Service which is in turn served to the passengers while on board.

2. MID FLIGHT: Techniques that help optimize the overall flight journey fall under this category. Most of these are technical advancements in avionics systems that help improve various tasks while the flight is airborne such as surveillance, navigation etc.

Performance based Navigation: This is a navigation system that sets rules to help an aircraft move through an airspace. These rules vary depending on a number of factors such as weather conditions, traffic etc.

ADS-B: This stands for Automatic Dependent Surveillance Broadcast System. This system may bring major changes in flight tracking. Instead of seeking data with respect to the ground, it depends on accurate satellite signals for position data which gets automatically transmitted to and from the ATC.

TASAR: This stands for Traffic Aware Strategic Aircrew Requests. This technique involves the use of software in order to provide information to the pilot regarding traffic aware optimized flight trajectories. These can help result in reduced flight time, improved efficiency etc.

3. Post-flight: As the name suggests, this category consists of procedures during and after landing. Many of the procedures involved in preflight may also prove to be useful here. Some of the useful techniques are listed below.

Terrain Detection: This is especially useful during unfavorable weather conditions. Appropriate equipment is employed to detect the favorability of landing in the constituent terrain of a runway.

E-Immigration: This is a system with which passengers can fill up their immigration details beforehand. This helps passengers to save time upon arriving at their destination.

Baggage Trackers: E tags prove to be useful once again. Baggage trackers help passengers to find their luggage easily upon landing. This helps to save a lot of time.

IV. CHALLENGES FACED

All ideas with potential scope in the future have various threats and obstacles to be addressed and overcome before being put into action. Next gen Airports are no exception.

Program execution planning has to look at cost, schedule, and technical performance. Stakeholder buy-in in areas such as equipage and using new capabilities must be ongoing, and all involved — industry, federal agencies, government partners, and Congress — must be on the same path ahead.

Now, we will look at some of the common challenges in brief.

Funding: Naturally, appropriate budgets must be provided in order to optimize efficiency. One of the biggest measures appointed by the FAA was to divide its programs into multiple segments, and funding each segment for a set timeframe or number of milestones because it may mask the final costs.

Equipment: A significant investment must be made in this category. This is because of two reasons: The first being that the technology used to make the equipment is very complex. The second is the fact that good quality is essential.

Training: Although next gen airports primarily rely on advanced technology, skilled man power is still required to operate. For this, appropriate training is essential.

Environmental Impact: Significant consideration should be given to the capability of pollution and production of noise from all the equipment including airliners.

Cybersecurity: There has been a lot of discussion about next gen ideas previously in this paper about E-immigration, E-Tickets, etc. This brings in hacking of these systems into picture. Thus, making cyber-security an important aspect to be looked upon before implementing next gen airports.

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