Taking the Airlines Testing Industry to the Future, Faster
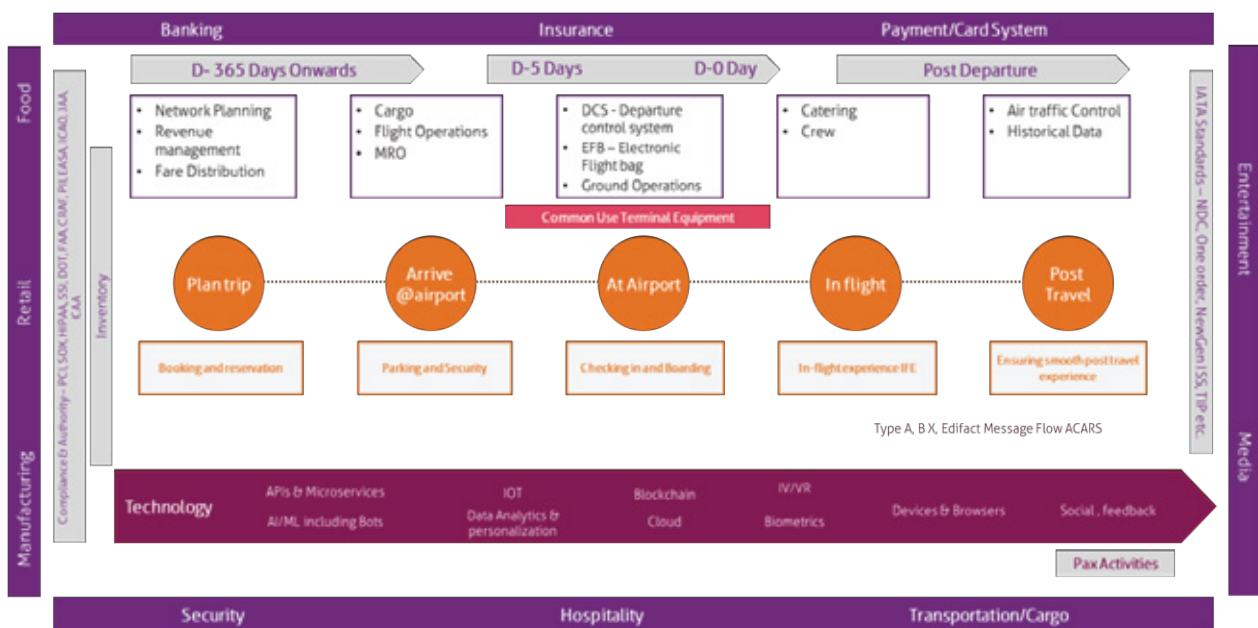
By Test Advisory Team

I would like to start by quoting what Steve Jobs said: "Technology is nothing. What is important is that you have a faith in people, that they are basically good and smart, and if you give them tools, they'll do wonderful things with them."

With the advent of modern technologies impacting every industry, the travel sector has been ahead in terms of adopting them at a fast pace, specifically to help airline operations become more efficient and flexible. In the airlines industry, the margins are thin; it is imperative to innovate constantly to keep the margins high.
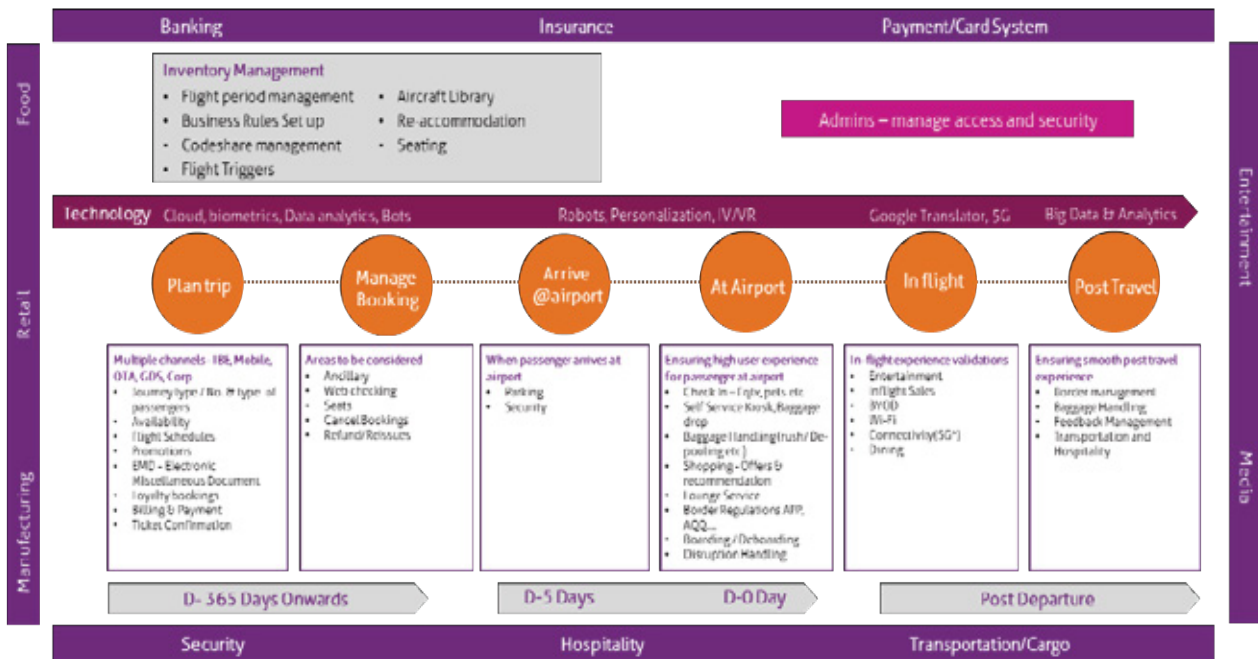
The travel industry has been eagerly waiting for emerging technologies like virtual and augmented reality, facial recognition technology, Internet of Things, robotics, data analytics, chat bots etc. to help it take the big leap in digital and technology transformation. It is an industry that cuts across all others like retail, entertainment, manufacturing, network and telecom, hospitality, transportation, payments, maintenance, insurance, cargo, and catering. It is the only industry that is so diversified, in terms of inter-dependency. It is unimaginable to think of a smooth, safe, and secure end-to-end journey without the advent of technology as depicted below, with passengers and operations working together in the whole process.

Airline Landscape tranformation through various technology

The end-to-end journey of passengers, as depicted in the snapshots, starts with trip planning, ticket searching on multiple platforms, booking, using check-in kiosks, dropping bags at the drop-off zone, pre-ordering parking space, shopping at the airport, touchless boarding, watching videos, connecting devices to a network, eating, and then sleeping, all while feedback is provided through different channels upon journey completion. The planning is done almost a year earlier through use of advanced decision-making and planning software. Loyalty has its own important role to play where passengers and airlines both have a win-win situation.
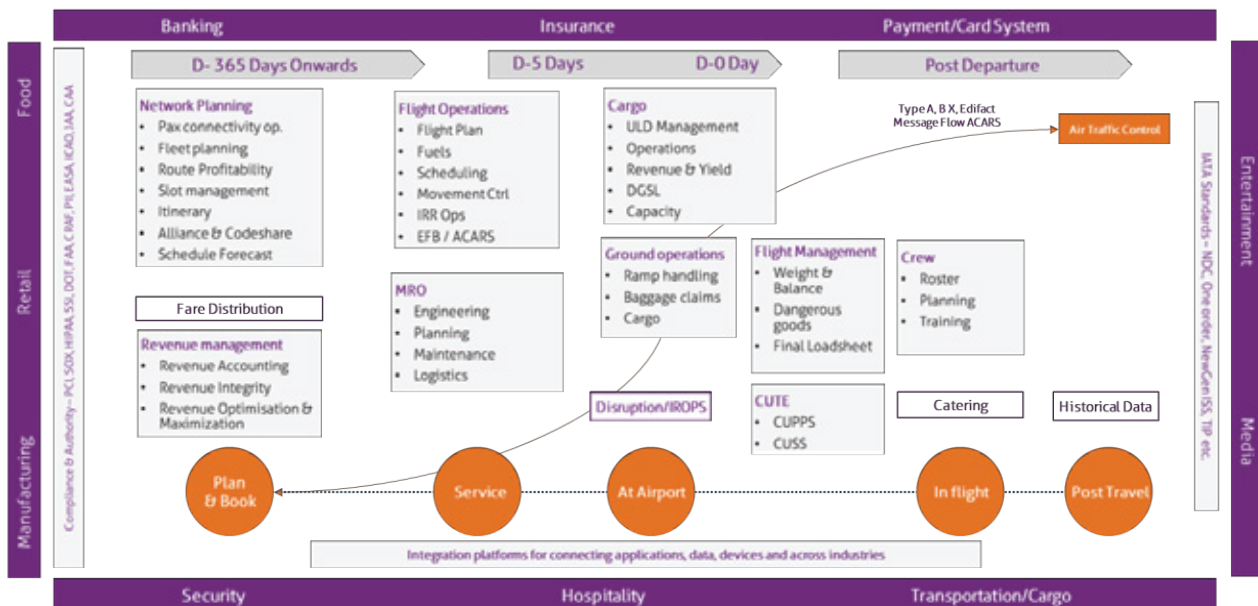
Passwnger End to End flow & Passenger service system

On the other hand, there are operations carried out in parallel at the airport, ranging from handling security measures at ground and ramp to ensure that there are no abrupt hindrances -from handling multifarious operations including loading/unloading of baggage, ramp clearance, measuring the weight and balance of aircraft, keeping the center of gravity within complaint and certified envelopes of airline structural limitations, landing and take-off limits etc. to the creation of the final load sheet that includes fuel and passenger information, baggage, crew etc. The use of EFB (Electronic Flight Bags) help flight crew perform tasks more easily and efficiently with less paper, even allowing for an e-sign from pilots. We also have millions and billions of messages (Edifact, TypeX, etc.), which are key to the airline industry between airport operators, ground handlers and other partners. Then, there are IROPS (Irregular Operations) and handling notifications, loyalty members, customer satisfaction, grievances, refunds etc.

Some innovations and interesting uses of technology adoption include smart speakers in hotels, virtual reality tours from travel companies, new and seamless ways to check-in, self-driving guide robots, digital twin for operations, chatbots, and AR/VR that helps view the cabin and can be used to upsell seats, crew training, marketing, analyzing the complex layout of an airport, wireless airplane network, and providing real-time IoT data on elements where new business models and revenue streams can be created. Additional use cases include big data and analytics to study revenue leakages and personalization etc., and facial recognition. Technology is becoming all-pervasive, and we are also witnessing new horizons of development after 5G.

Airline / Airport Operations

At LTIMindtree, we have the expertise and experience in terms of validating and testing these complex systems and have reached the pinnacle in executing and providing support during multiple releases to our clients. We have worked with leading airlines and have understood their complex systems, which has helped us gain domain cognizance and align ourselves with their vision and goal. We have brought new and innovative testing solutions, and delivery and cost models to ensure that we deliver at and above pace with the industry.

Over the years, with our deep knowledge about the airline industry, we have helped build robust business and end-to-end scenarios. We are part of certification testing, which shows the confidence we have gained while working with our customers. Our automation expertise stretches beyond legacy automation, and we have built automation solutions, frameworks on various recent tools and technologies involving AI/ML, digital technologies, parallel execution, use of dockers and other latest technologies to bring in constant effort reduction from 60-70%, and building packs of regression suites. We have moved from traditional performance testing to performance engineering. We have been involved in innovation and co-innovation, by working closely with client systems to bring transformations. We have transformed the way testing is carried out from QA to QE to QI in airline and travel testing.

In the past, the work that we have done has led to on-time delivery, reduction in manual effort and cost, faster time-to-market, and lesser defects in production, leading to long-term relationships with our customers. A few instances include:

- Set up continuous test and manage delivery model for one of the largest low-cost carriers, saving millions over the years

- Tested complex big data-based critical revenue management for a large European airline

- Set up common framework and advanced automation tools for a Canadian airline, saving 70-80% effort

- Validated multiple commercial and operational systems for another large airline in US, bringing in multi-million dollars in savings

- Brought in digital and automation transformation for a few airlines in the Middle East, saving 800 man-days of effort

- Verified complex scenarios for seat assignment algorithm and UI

- Provided inflight testing in a simulated environment using real devices to test scenarios that replicate the environment 30-40,000 feet above earth, and validate the videos, images etc. Our testing of crew management, network planning, and MRO forms just a fraction of our testing expertise. To test the migration of cloud applications, we carried out multivariate and significant cross browsers testing through tools.

To conclude, we all love technology, and I would like to quote from the book, 'Factfulness,'

"When we have a fact-based world view, we see that the world is not as bad as it seems, and we can see what we have to do to keep making it better"

This is exactly what technological and digital transformation is doing to humanity and particularly the airline industry - making it better with each step; as we move towards approaches that enables organizations to rapidly identify, vet, and automate as many processes as possible using technologies like robotic process automation (RPA), low-code application platforms (LCAP), artificial intelligence (AI) and virtual assistants. With AI/ML-enabled automation frameworks and more futuristic technologies like quantum computing, AI, IoT, 5G, metaverse, NFT and digital avatars, testing will gain more momentum - and we will explore more innovative ways to examine multiple scenarios to ensure we reduce time-to-test and have 0% defect delivery.

About the Author

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Arvinder is experienced in test program management, delivery, and presales, and is responsible for transformation and transitions. He has professional experience in test/ quality engineering delivery services, predominantly in the airline, and in the media, BFSI, retail and transportation domains. He is adept at delivering testing projects and has worked on airline operations, cargo, GDS, check-in systems, IBE, and PSS Migration, with multiple airways across geos.