

The aviation industry has weathered multiple storms over the past three years. Yet while the industry is firmly on its journey back to growth, it continues to find itself in a complex and dynamic environment, where disruptions are the now the rule, rather than the exception.

Technology, consumer preferences and climate change are playing a huge role in how companies are facing the future, driving massive structural shifts in how the world operates, and the aviation industry is no exception. This pace of change calls for continuous reinvention, and the adoption of a new strategy, one that we call Total Enterprise Reinvention.

Those that adopt this strategy, (known as the Reinventors), understand that all strategies lead to more technology, and this new way of being will see them set a new performance frontier for their companies, leading to improved financials, the ability to achieve breakthrough innovation, increased resilience in the face of any disruption, and an enhanced ability to create value for all stakeholders.

Climate-induced disruptions are real—and growing. External weather events are increasingly changing in frequency, severity and profile, wreaking havoc on all industries—and the Aviation ecosystem is no exception. Weather-related disruptions have shown an increasing trend over the years. They lead to knock on effects through delays and cancellations that can further affect the extended enterprise.

Our research indicates that an average airline today suffers 400+ (IROPs) a year. It's becoming harder to manage delays and cancellations that affect airlines, airports and customers.

In fact, 98%

of the 209 Travel industry leaders surveyed by Accenture across the Aviation ecosystem (spanning Airlines, Airports, ATCs/ANSPs and Border Agencies) reported an increase in climate disruptions affecting aviation operations. Yet, despite recognizing them as 'important' or 'highly critical',

only 50%

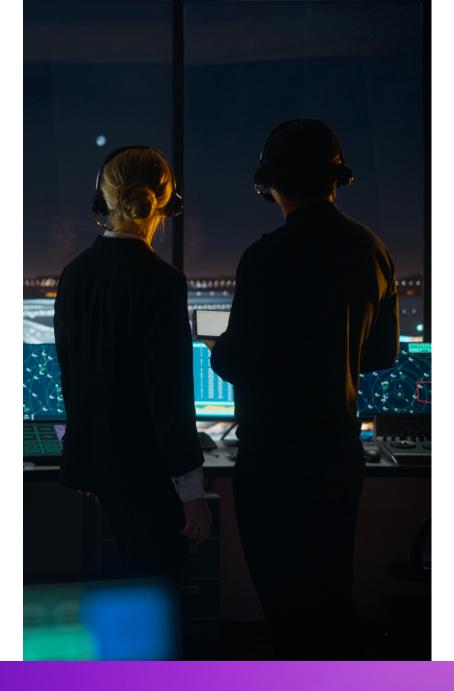
of these companies have a concrete technology strategy to prevent and mitigate these disruptions.

Nearly 40%

of firms reported that they are not yet adequately prepared to predict climatic or external disruptions in advance at an ecosystem level. As travel continues on its journey back to growth, airlines and airports need to improve operational efficiencies to better prepare for future disruptions and keep pace with increasing growth and reinvention. Managing complex environments requires organizations to be adaptable and proactive in their response to rapidly evolving aviation guidelines and customer experience expectations.

Over the years, our research has shown that the more that companies have transformed, the more they've recognized the opportunities to connect transformations and work across functions to fundamentally change every part of their business. Most companies–86%–are known as Transformers. They focus on transforming parts of their business rather than the whole and tend to treat transformation as a finite program rather than a continuous process. Many, though, are beginning to recognize the importance of aspiring to a new level of performance through their transformation programs, and see Total Enterprise Reinvention as a natural next step.

For these companies, the digital core becomes a primary source of competitive advantage. By leveraging innovative data and 'applied intelligence' assets (for example, combining artificial intelligence technologies with data analytics, automation and human ingenuity) at the core of their business, airlines and airports can prepare for disruption and achieve operational transformation. These changes will enable them to improve decision making that unlocks significant value and drives the next level of performance across the enterprise.



The digital core consists of three layers, an infrastructure and security layer, a data and AI layer and an applications and platforms layer. For airlines and airports, effective data enablement offers significant potential to fuel post-pandemic reinvention and will form a key part of their Total Enterprise Reinvention strategy.

However, companies are currently unable to unlock the full value of the data at their disposition owing to a legacy technology infrastructure characterized by rigid business silos and vast untapped data sets.

Our survey revealed that while organizations recognize the impact of imminent disruptions, they are still in 'strategizing phase'. Additionally, several organizations still lack the predictive capabilities to tackle disruptions in advance.

Achieving the scale of Total Enterprise Reinvention requires companies to connect people, processes and data across the enterprise and beyond, creating a boundaryless organization.

This interconnection is critical in an era where passengers expect their travel journeys to be disruption-free and seamless.

The state of
Aviation Enterprise
Technological
Readiness

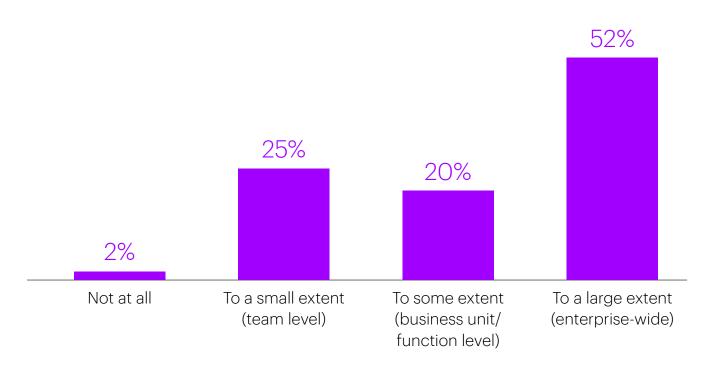


Weather-related disruptions have increased over the years; for example, in 2021, the ten most expensive weather-related disasters caused \$170 billion in damage globally (across all industries), a 13% increase over 2020. Aviation is no exception, and our recent survey reveals that 96% of the organizations have suffered some form of damage or impact to operations in the last five years owing to weather-related and external disruptions. Surprisingly, 50% have yet to implement a concrete technology strategy to address these disruptions.

Even as organizations continue to strategize against disruptions, they face multiple challenges on several fronts. Aviation networks and infrastructure are pressured by internal and external constraints, as they balance other priorities such as workforce, cash flow and sustainability. Additionally, numerous challenges exist around siloed data, particularly in on-premise environments.

Question

Does your workforce have the skill and capacity to perform real-time data analytics and prioritize the most valuable actions, to deal with external disruptions?



Note: % may not be equal to 100, owing to decimal accounting

While technology used to be considered a disrupter, it's now seen as an enabler, the primary source of competitive advantage that will allow companies to build exceptional experiences and breakthrough innovations. But even if the C-suite recognizes the importance of making the shift toward being a data-driven enterprise, a bigger disconnect exists between strategy, implementation, and operational readiness. Organizations are evenly split on workforce readiness and competency to perform real-time data analytics and prioritize the most valuable actions to deal with external disruptions.

51%

of C-suite have defined a strategy to shift towards being a data-driven organization

47%

have a defined governance strategy around data/analytics

58%

use data to fuel innovation around products and services

While some have made inroads on formulating data strategies, defining transition states and communicating an overall data proposition, implementation remains a challenge.

Our survey revealed a glaring trend – while predictive data strategy is gaining traction, many organizations surveyed are yet to implement a data framework while nearly 2 in 5 organizations do not have an enterprise-wide data strategy. This is concerning in an era where value proposition from an integrated data strategy, if communicated properly, can drive significant bottom-line benefits. In fact, our research shows that organizations that have adopted Total Enterprise Reinvention as a strategy and have achieved Reinventor status generate far more than financial value. They actively manage for – and deliver on – 360° value, looking beyond short-term financials to understand what creates long-term, sustainable value in a world where people are more empowered than ever to choose the companies they engage with.

Only 44% of organizations have implemented predictive data capabilities at scale

Our survey revealed that the majority of organizations still lack 'enterprise-wide analytics capabilities', impacting their ecosystem strategy in the process.

Question

What stage are you at in your predictive data-led enterprise transformation?

3% Strategy

We are at the planning/blueprint stage

40% Transform

We have implemented predictive operations in some units of the organization and for specific purposes

13% Assess

We are trying to partner with firms and evaluate potential deployment

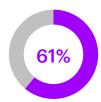
44% Scale

We have implemented predictive operations across the enterprise and continually update



By now, most organizations are steadily migrating toward cloud, but lack predictive data capabilities. Our survey revealed that the majority of organizations have some form of analytical solution already on cloud, yet 40% are still unable to pull data together from various systems. For example, airports struggle to combine data from airport and non-airport systems for comprehensive analysis

Airlines and airports also struggle with manual processes that affect their ability to capture critical data on a real-time basis – thereby affecting predictive decision making.



store and process data in a central location from various system, which can be easily melded together.



actively use modern predictive modelling, analytics and machine learning to find the root cause of the problems.

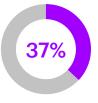


can capture critical data, real-time.

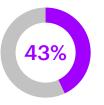
Only a handful of airlines and airports have been able to truly democratize analytics-related capabilities across their enterprises



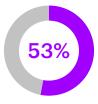
can predict disruptions, in advance.



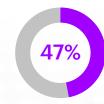
can pull and customize data easily from airport and non-airport systems, together.



have a 360-degree view of operations, across the enterprise.



have singular and integrated visualization view, to help assess disruption impact costs & KPIs.



can extract, transform, & load (ETL) code that enables faster development & processing for analytics & visualizations.

Using data to predict disruption





At an ecosystem level, our research shows that airlines and airports lack a unified view of critical data. They are unable to use technology for predictive recommendations, and can't perform effective root-cause diagnosis of external disruptions. They lack a full view of operations. But airlines and airports must first overcome the problem of legacy technology to embrace the power of data, and this will enable them to build deeper collaboration with their ecosystem partners in turn. Partners are a crucial part of adopting a strategy of Total Enterprise Reinvention, as they bring resources that can accelerate progress at scale.

Only 37% of organizations surveyed have a mature, contextualized data and insight service which their users can use on a self-service basis. Our survey revealed that organizations face challenges on two fronts:

Strategy & Collaboration

only 24% of organizations surveyed establish business priorities at an ecosystem level and collaborate to achieve them

Innovation

only 56% collaboratively use data to fuel innovation around products and services

Question

Which statement best resonates with your current data strategy/maturity at an ecosystem level - i.e., accessible by users across company-types (airlines, airports, ANSPs, Border Agencies)?

8%

do not have a unified data strategy, common to and agreed upon by all company-types

29%

only have a static portal that can be accessed by users (across company-types) to discover and acess

26%

users collaboratively support and share the development of new use cases for the data

37%

have a mature, optimized and contextualized data/insight service available for all users as they need it The complexity of managing change and the lack of a centralized tool for data capture and analysis, respectively, remain the two primary pain points for organizations today. Airlines and airports lack best of its kind AI and machine learning tools and operate primarily on spreadsheets, restricting their ability to capture and analyze data effectively.

Incumbents might not necessarily overhaul their systems from legacy or part-cloud into greenfield systems at once. They can however explore integration-worthy and interoperable technologies that would be key to their long-term strategic objectives as a first step. They can be driven through a focused digital strategy, complemented by one-stop-shop tools or platforms with enterprise data capabilities.



Function Focus



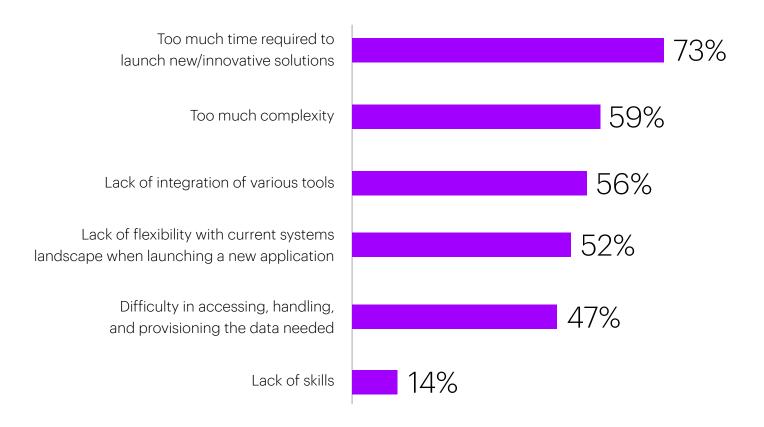
Our survey revealed that most functions within airlines and airports aspire to be a tech-driven business, with more predictive or intelligent operations.

73% of organizations are concerned with the slow go-to-market time that comes with new tools; additionally, the complexity of new solutions remains another key concern.

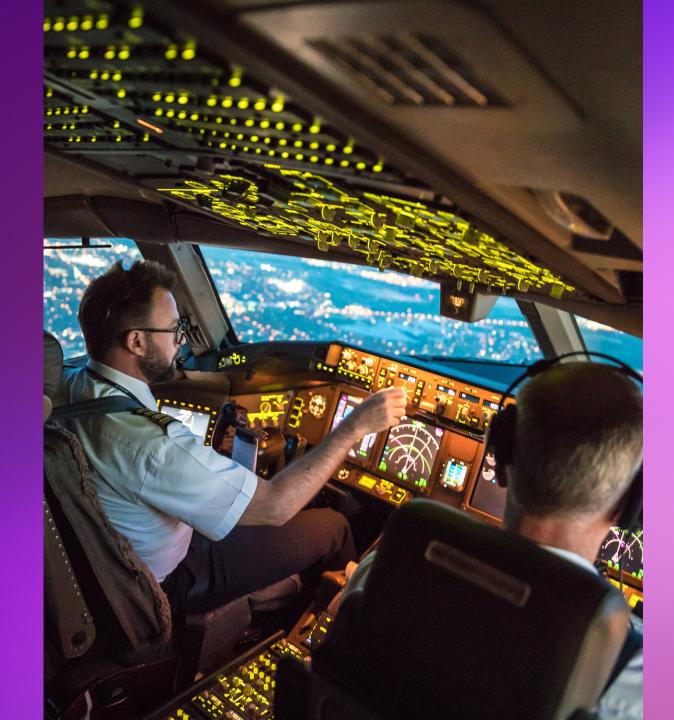
Simplifying technology for intelligent and predictive operations, and integration across tools is a key imperative for airlines and airports as they navigate complex macro-variables. This approach requires a holistic solution built on quick business re-platforming rather than the current way of operating with spreadsheets.

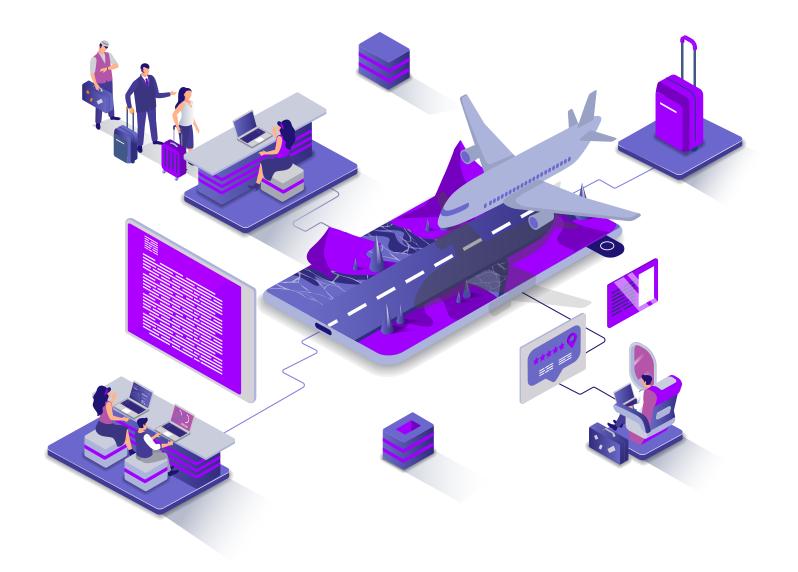
Question

For the functional objectives, what are the top technology challenges you expect to encounter? (includes top-3 selection by respondents)



Enabling the future of a changing landscape





The aviation environment is complex, with multiple stakeholders coming together to facilitate the safe movement of people and freight. Airports, Airlines ANSPs/ATCs and Border Agencies are the logical players to bring a fragmented system into a coherent whole – helping the interdependent ecosystem operate more efficiently and effectively find opportunities for growth and new value.

Airlines and airports need to engage and influence more broadly to drive an intelligent, integrated response between ecosystem players and their infrastructure. As the aviation industry moves toward Total Enterprise Reinvention, they will naturally draw on the power of these partners to deliver continuous reinvention.

By using technology to disruption-proof the industry and drive the next level of performance, airports and airlines will be able to reinvent themselves and the wider industry.

Case study

One of the busiest airports in Asia Pacific developed an enterprise data platform to provide a 360° view of operations.

The challenge

- O Too many point-based legacy solutions impacted the operator's ability to achieve an complete view of data and corresponding insights
- O When new technologies were added, the airport didn't have any process to connect these new data sets to the rest of the operational tools
- O Lacked visibility of operational impacts across BUs and the ability to predict activities into the near future
- O Manual handling of data in a siloed fashion
- O Inability to make informed operational decisions
- O Limited practical insights

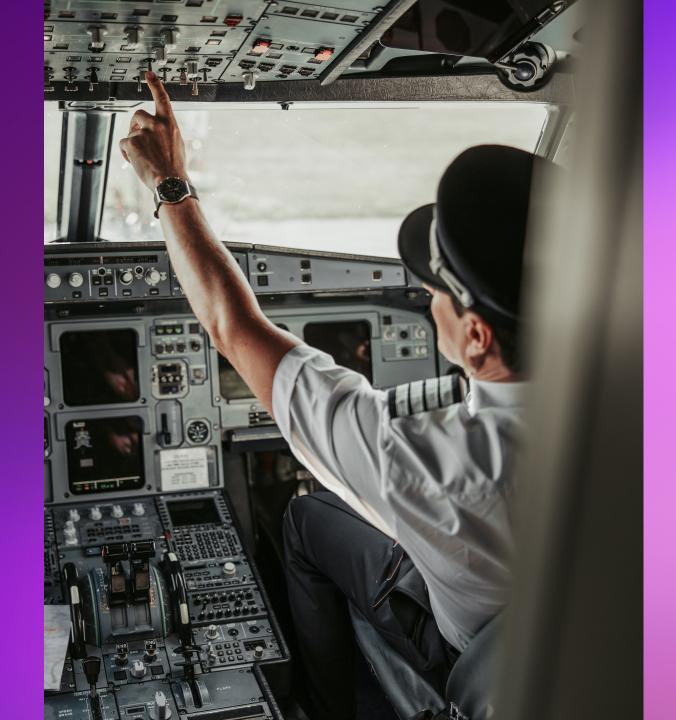
Solution

- O Identify key pain points, explore possible solutions and test use cases
- O Integrate Wi-Fi, location modeling, Airport Gate Scheduling, Airport Operations data, Passenger numbers, Queue times, Road performance data and 3rd party flight data
- O Create dashboard to provide a comprehensive single view into current and future passenger flows for international arrivals
- O Develop a flexible, unbiased, and collaborative platform that pulls data from aviation and non-aviation systems together, providing meaningful insights in real time and predictive manner

Value delivered

- O Our data platform solution integrated systems, data, and applied intelligent analytics throughout passenger and aircraft turnaround journeys to provide a 360-view of the entire airport
- O Accelerated the airport's ability to improve its operations, reduce operational cost, increase revenues, improve safety and provide a safe and seamless personalized customer experience
- O Improved visibility of operations insights in real time and predictive manner
- O Reduced manual handling and improved confidence in data
- O Increased Service Quality scores via improved quality of operations, dealing with issues faster or before they become issues
- O The data platform solution won the Innovation award at the Airport Industry Awards

Driving Decision Intelligence



Decision Intelligence—underpinned by advanced analytics technologies such as Artificial Intelligence and Computer Vision—can help improve strategic planning across multiple business units. It can unlock value through reduced delays, optimized cancellations, controlled costs and reduced uncertainty. This includes fleet planning, network and scheduling, crew planning, engineering and maintenance, station operations, customer care, as well as finance and other considerations, while keeping sustainability objectives in mind.

Here are some of the ways predictive data can drive value:

- Enabling real-time visibility of current performance
- Providing a predictive view of event chain impact
- Historical reporting to allow for strong feedback loops highlighting the interdependencies and root-causes
- Establishing an understanding of the traveler
- Focus on business outcomes, not analytics and plumbing
- Correlation to understand 'so what'

Capability



Actionable data



Event Classification



Predictive Monitoring



Operational Awareness



How?

Automated processing of public & private data in an **integrated cloud object**

Historical clustering of similar events via **machine learning** to inform decisions

Forecast disruption impacts & create **recommendations**

Give singular & integrated visuals that help assess disruption impact costs & KPIs

Expand to other Ops decisions & business units to **impact margin**

Value Unlocked

Consolidated real-time & resilient data

Feedback loops that improve decision effectiveness

Proactive & automated decision support

Consumable information to make decisions faster

Enhanced long-term planning



Improving Pre and Day of Ops decisions can reduce disruption costs, while expanding decision intelligence creates 360° enterprise value.

Business unit Sample Opportunity

Higher productivity and lower headcount through optimized reserve ratios

Reduce "insurance" embedded across the operation to reduce overhead costs

Increase NPS through consistent service delivery

Track real-time maintenance condition to optimize hanger time and operating decisions

Better gate utilization (i.e.: less waiting time at gate)

Reduce space aircraft count needed to run the network

Optimize CO2 emmissions on routes & aircraft to meet airline goals

Better management of seat allocations for IROPS recovery

Tighter connection times and higher aircraft utilization

Real-time content management to improve answers to customers, reduce interaction times, and reduce hold times

Crew Scheduling

Finance

Customer

Tech Ops

Station Ops

Fleet planning

Sustainability

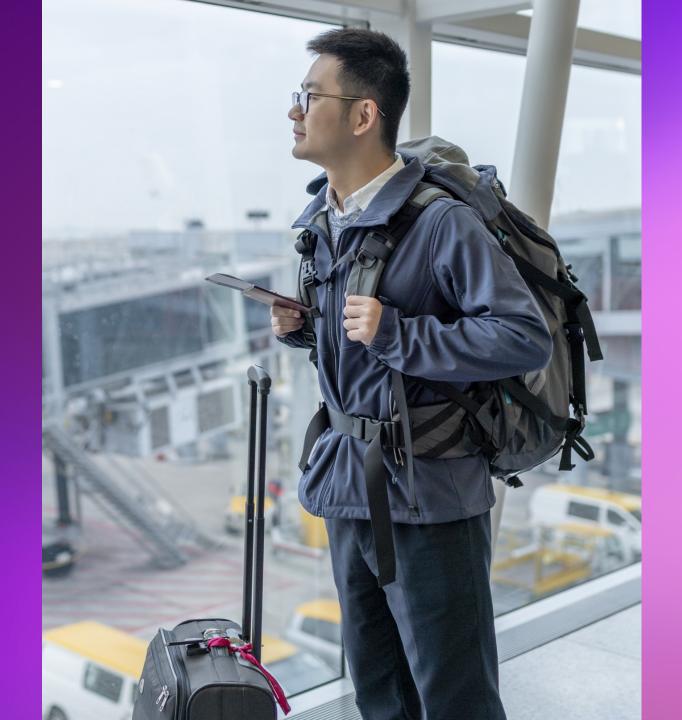
Revenue Management

Planning and scheduling

Contact Center

		\times		?
	Reduce Delays	Optimize cancels	Control costs	Reduce uncertainty
Key levers	 First flight bank delays / propagration Total delay minutes Overtime 	 Number of cancels Cancellation impact Operations Revenue Vouchers 	 Unplanned deadheads Diversions/Ferries Reduced taxi out delays 	 Crew, tech, ops, and ground reliability buffers Space aircraft Passenger re-accomodations
Key initiatives	 Coordinate & improve first bank performance Provide early swap recommendations 	 Break crew pairings on stress points Pre-cancel on high certainty events Block space for re-accomodation 	Report on priority lines Identify critical connects	 Optimize & prevent max capacity shortfalls Optimize CI Combined effect of all initiatives

Getting Started



Transforming data into a differentiated asset for the long term requires a focus on three interrelated actions across business, technology and people:

1



Build a strong data foundation

Create an effective data management program, which includes data governance, data quality and master data management; technology platforms and data architectures; and data supply chain management.

2.



Mobilized advanced technologies

Use artificial intelligence (AI), machine learning and analytics to glean critical insights from data.

3.



Create a data-led culture

Manage the people and cultural dimensions of advanced data management

Accenture's Airport Advanced Analytics solutions are fast-to-deploy and adaptable to unique environments, with a fully supported data platform that provides clients with real-time insights. The enterprise data and analytics platform introduces a holistic approach to harness the technology to treat 'Data as an Asset.'

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