Data, Technology and Cybersecurity Adoption Survey 2025

Executive summary

The Data Maturity Survey 2025 provides an early view of the current state of data, technology, and cybersecurity adoption within the airline industry. This survey, recently launched and conducted on a voluntary and confidential basis, seeks to understand how airlines are integrating these critical components into their operations. Participants' insights are helpful in identifying prevailing industry trends and informing best practices.

As this survey is still in its initial phase, the results presented here are preliminary. The data has been analyzed and aggregated to ensure confidentiality, with non-sensitive findings potentially featured in this report. This initiative aims to shed light on the technological maturity landscape, cybersecurity resilience, and overall data maturity across the global airline sector.

Maturity in the airline industry

In today's rapidly evolving aviation sector, data maturity has become a key component of strategic planning for airlines. It encompasses the ability to effectively manage, analyse, and utilize data to drive decision-making processes, enhance operational efficiency, and improve passenger experiences. High maturity levels enable airlines to harness the power of big data and predictive analytics, transforming insights into actionable strategies. This, in turn, supports robust cybersecurity measures, facilitates technological innovation, and ensures competitive advantage in a highly dynamic market.

Survey results

The survey gathered responses from 96 airlines by the time this report was published, spanning all 7 IATA regions (Fig. 1) and of proportional representation of different sizes of the airlines defined as their yearly Revenue Passenger Kilometres (RPKs), they are grouped in three categories based on the yearly RPK (USD <50M, 50M-100M and >100M). This representative sample provides a comprehensive insight to industry's technological maturity, cybersecurity resilience, and data management practices.

The survey is structured in four sections as follow:
- Section 1: Data Management - This section explores how airlines manage, analyse, and utilize data to drive decision-making processes.
- Section 2: Technology Adoption - This part of the survey investigates the extent to which airlines have integrated new technologies into their operations.
- Section 3: Cybersecurity - This section assesses the cybersecurity measures in place within airlines to protect against data breaches and cyber threats.
- Section 4: Third-party Risk Management Strategy - This section examines the strategies airlines employ to manage risks associated with third-party vendors and partners.
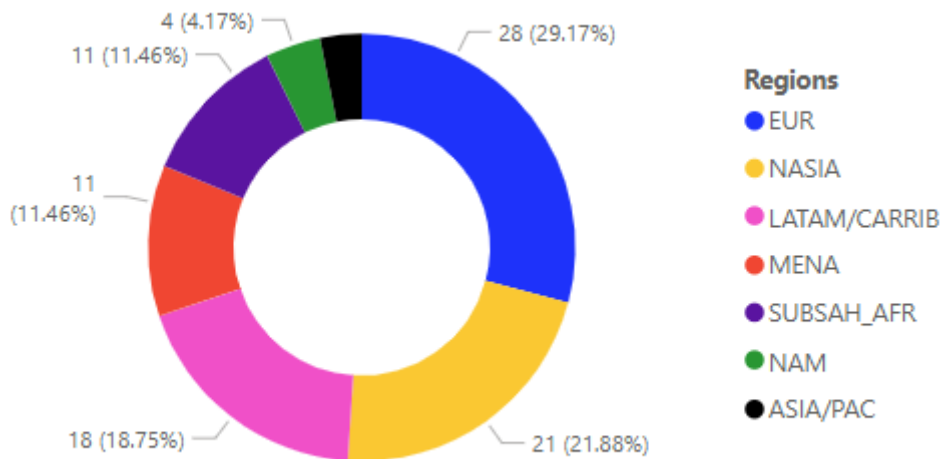
Figure 1: Share of the global regions covered by the survey.

The survey includes 20 questions covering various aspects of data maturity, such as data management, technology adoption, and cybersecurity. It provides a detailed analysis of how airlines handle and protect their data, adopt new technologies, and manage risks associated with cybersecurity.

The questions were sent to IATA member airlines, and the current report summarizes the main insights and analysis from the collected responses. Below is a detailed breakdown of the findings and their implications for the airline industry.

Main global trends

The survey results reveal several key highlights that illustrate the current state of the industry. These insights shed light on how airlines are progressing in areas such as data management, technology adoption, and cybersecurity measures. The main highlights are:

1. Almost half of the airlines 42.8% consider themselves to be in early stages of Data Strategy implementation
2. A mature Data Strategy is achieved with a solid Data Governance framework
3. A comprehensive data catalogue and classification system is essential for achieving data maturity within airlines.
4. Most of the Data Science use cases require experimentation, and scaling them require specific Data Pipelines crafted for AI/ML.
5. Adopting a multi-cloud approach is indicative of technological maturity.
6. Vast majority of airlines have an incident response plan.
7. Having a robust Information Security Management System is vital for supporting a mature Data Strategy focus, with half of respondents implementing it even at the initial strategy stages.
8. More than half of the airlines conduct cybersecurity third-party risk assessments and audits, highlighting the importance of industry collaboration in the area of cybersecurity.
9. Almost all respondents claim having an incident response plan, only half of respondents with an initial data strategy claim they do not, showing its importance to ensure cybersecurity resilience.

Data Maturity

This section explores how airlines manage, analyse, and utilize data to drive decision-making processes. It investigates the strategies and frameworks in place for data governance, the use of data science and AI, and overall data strategy implementation. Each plays a critical role in the overall effectiveness and efficiency of data management within airlines. Half of the airlines surveyed rated their data maturity level as being in the early stages, either Initial or Developing.

About half of the airlines surveyed rated their data maturity level as being in the early stages, either Initial or Developing (see figure 2). This trend is consistent across different regions (see figure 3), highlighting a global pattern in data strategy implementation. Airlines at this stage are focused on establishing the foundational elements of data governance and building the necessary infrastructure to support advanced data analytics and AI applications. This table demonstrates the different levels of maturity and their respective areas.
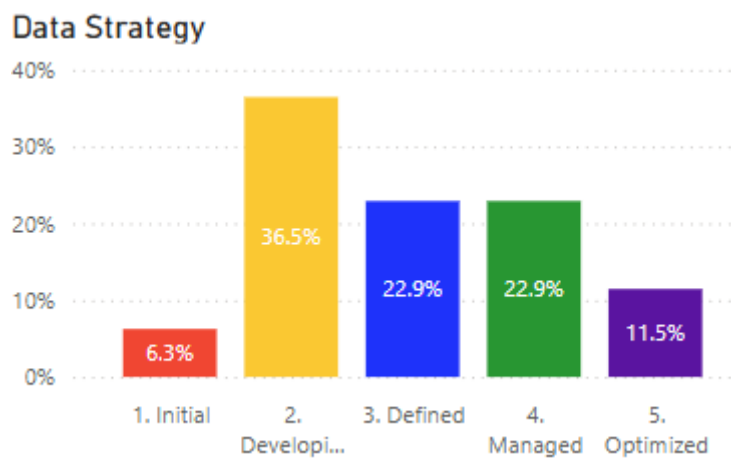
Data Strategy

Figure 2: Data Strategy maturity distribution. Most of airlines consider themselves in early stages in their journey.
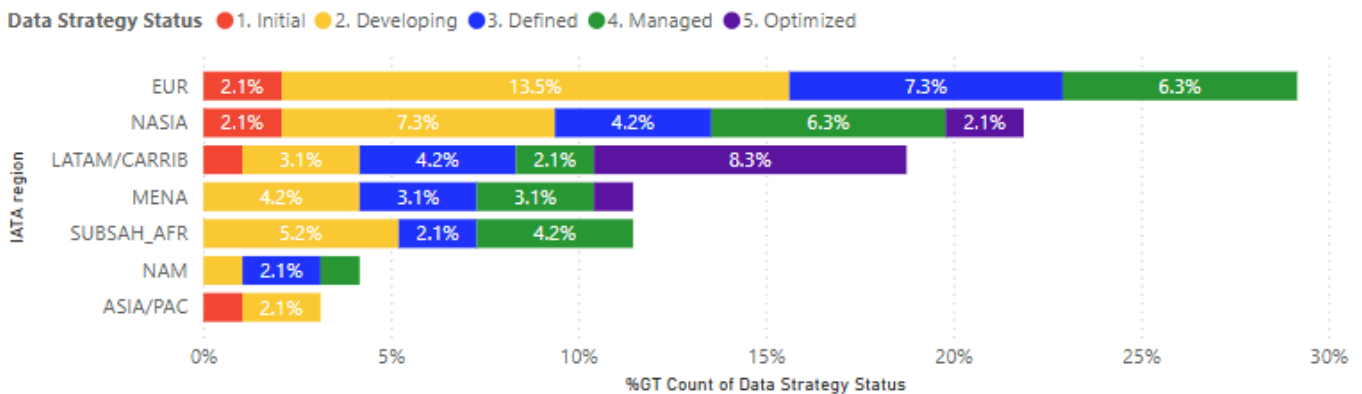

Figure 3: Data Strategy self-assessment breakdown by regions.

Data Governance maturity

The survey indicates varying levels of data governance maturity among the airlines. Some have established comprehensive governance frameworks, while others are still in the process of developing and implementing these structures to ensure data integrity and compliance.
Figure 4 illustrates how the stages of Data Governance frameworks align with the maturity levels in Data Strategy. A clear pattern emerges, showing that for airlines with Defined and advanced levels, a robust Data

Governance framework is essential. As airlines continue to evolve their data strategies, many are recognizing the critical importance of robust data governance frameworks to ensure data integrity, compliance, and effective utilization. Airlines in the early stages are primarily focused on laying the groundwork, while those more advanced are refining and optimizing their data governance practices to support sophisticated AI and data science initiatives.

Furthermore, a Data Catalogue is a crucial element for managing and organizing vast amounts of data within airlines. Only those airlines at the initial stages of their Data Strategy lack this essential tool (see figure). As the airlines progress in their data maturity, the implementation of a comprehensive Data Catalogue becomes indispensable for ensuring data accessibility, quality, and governance. This tool helps airlines streamline their data assets, making it easier to leverage data for advanced analytics and AI applications.

Additionally, the establishment of a Data Classification system also signifies a mature data organization (see figure 6). Airlines typically seem to implement it faster than a data catalogue.
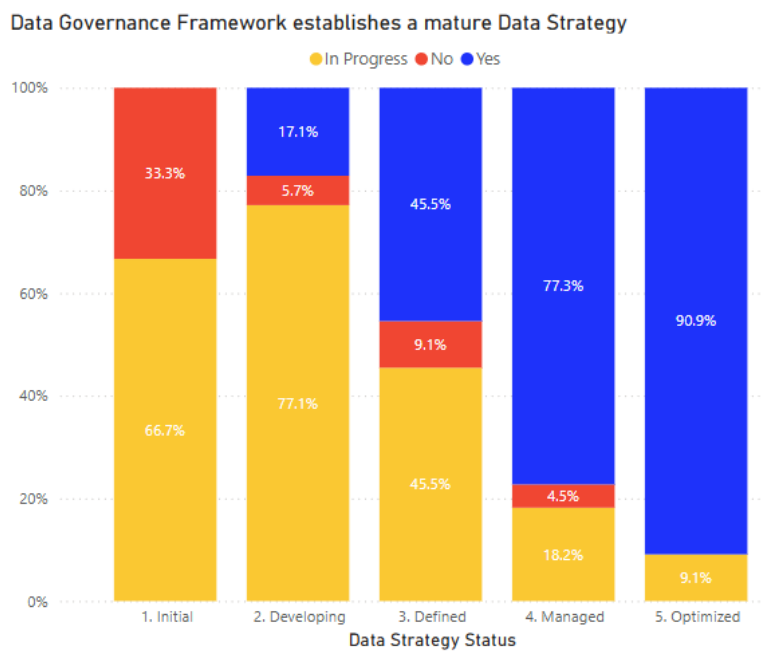

Figure 4: Establishment of Data Governance Frameworks in relation to Data Strategy maturity levels.
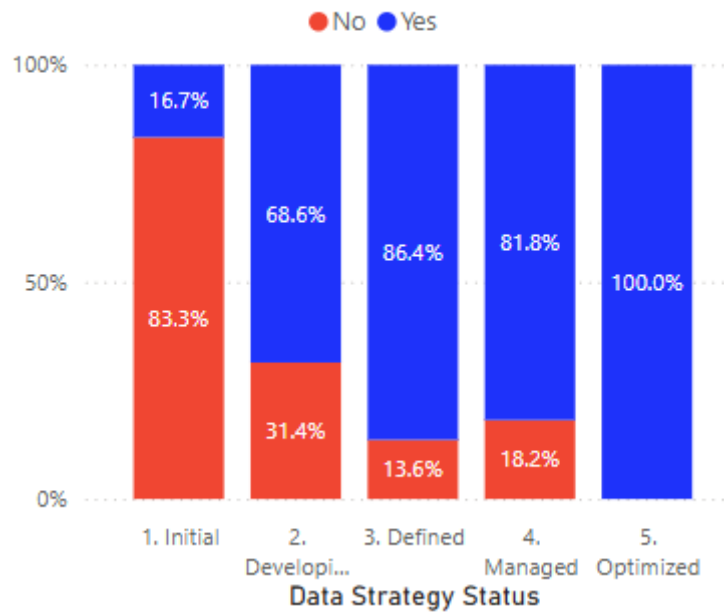
Data Catalogue: a must-have

Figure 5: Distribution of Data Catalogue implementation across different stages of Data Strategy maturity.
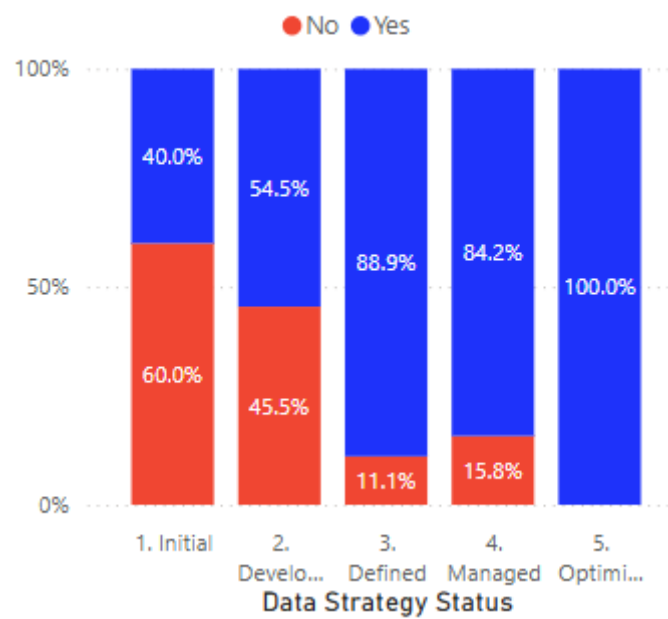

Data Classification: a lever for Data Maturity

Figure 6: Distribution of Data Classification implementation across different stages of Data Strategy maturity.

Data Science maturity

Survey data indicate that over 70% of members report that Data Science Proof of Concepts (PoCs) often do not advance beyond the PoC stage (figure 7), highlighting the exploratory nature of these initiatives. This underscores the need for significant investment to ensure these concepts progress and drive innovation.
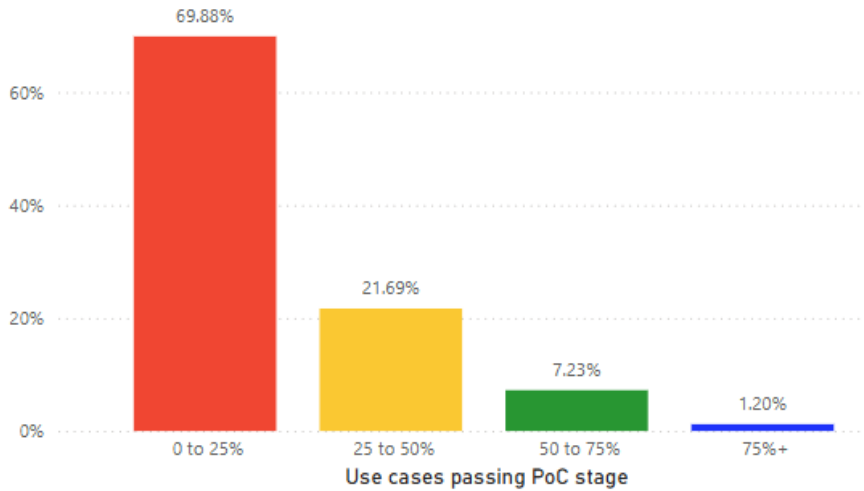
Figure 7: Share of Data Science use cases progressing beyond the PoC stage.

The survey highlights that the increasing number of data science use cases is driving organizations to develop reliable and optimized data pipelines (see figure 7). This is crucial for enabling seamless integration and efficient processing of large volumes of data. However the vast majority of airlines seem to focus their efforts in less than 5 Data Science Use cases. With increasing number of Data Science use cases organizations realize need for reliable, optimized data pipelines.
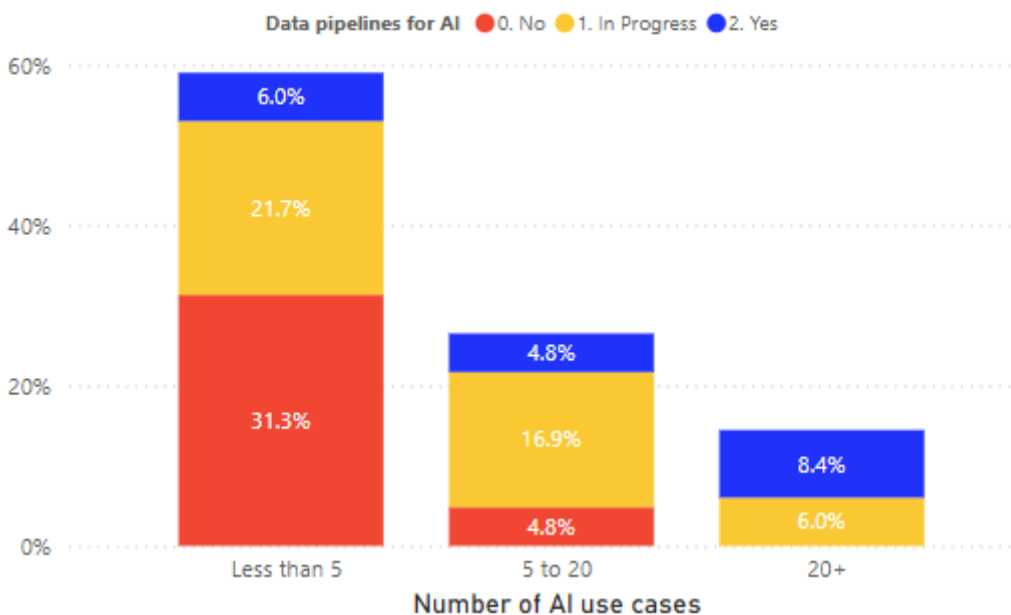

Figure 8: Number of AI/ML use cases and their respective share of Data Pipelines specific for AI.

Technology maturity

This part of the survey investigates the extent to which airlines have integrated new technologies into their operations. It assesses the current state of technological infrastructure, the adoption rate of emerging technologies, and the impact of these technologies.

From figure 9 we note that half of the respondents assessed themselves to be mature in the Defined and Managed stages. However, none of the respondents considered themselves to have reached the Optimized stage in the transformation.

Technology Adoption

- 1. Initial
- 2. Developing
- 3. Defined
- 4. Managed
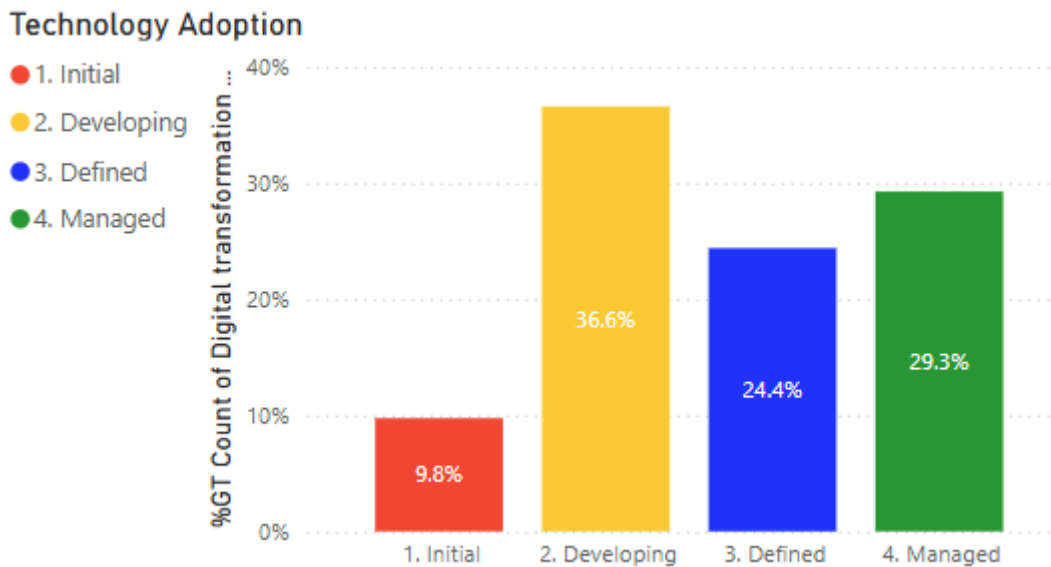
Figure 9: Stages of transformation and the adoption of digital/technology.

Multi-cloud exploration and adoption has a clear correlation with maturity in technology adoption (figure 10). More mature organizations tend to embrace multi-cloud strategies to enhance flexibility, scalability, and resilience.

Multi-cloud adoption increase with maturity on technology adoption

- 1. No Cloud strategy
- 2. Single-Cloud
- 3. Exploring Multi-Cloud
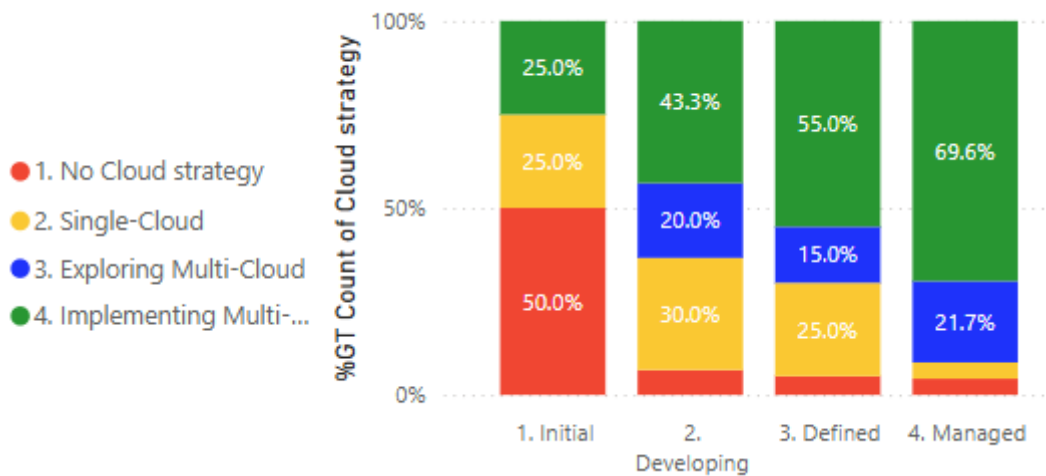- 4. Implementing Multi-...

Figure 10: relationship between the adoption of multi-cloud strategies and the maturity in technology adoption.

Additionally, cloud adoption strategies appear to be globally consistent, as regional breakdowns do not reveal any specific patterns as shown in figure 11. This suggests that airlines across different regions are adopting similar multi-cloud approaches to enhance their operational efficiency, flexibility, and resilience against potential technological disruptions.
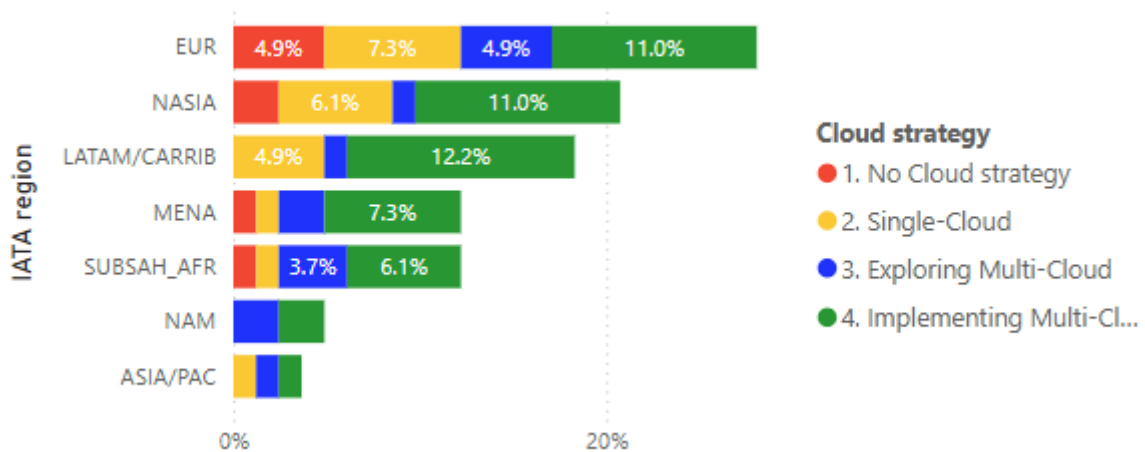
Cloud Strategy breakdown per region

Figure 10: Cloud adoption strategy breakdown in regions.

Cybersecurity maturity

Cybersecurity protocols are critical within the airline industry to safeguard against data breaches and cyber threats. This section delves into the robustness of cybersecurity measures, the investment levels in cybersecurity infrastructure, and the awareness programs implemented by airlines to ensure comprehensive protection.

Figure 11 highlights that the vast majority of airlines have an incident response plan in place, underscoring the critical importance of being prepared for cyber threats and ensuring quick and effective mitigation of any security breaches. These plans typically include detailed protocols for communication, data recovery, and system restoration, ensuring a comprehensive approach to cybersecurity resilience. Additionally, Figure 12 shows that only respondents with an initial data strategy did not have an incident response plan.
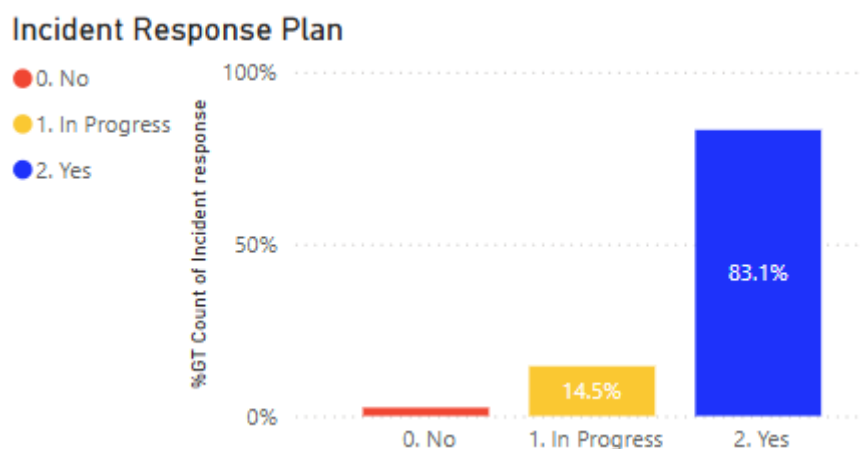
Incident Response Plan

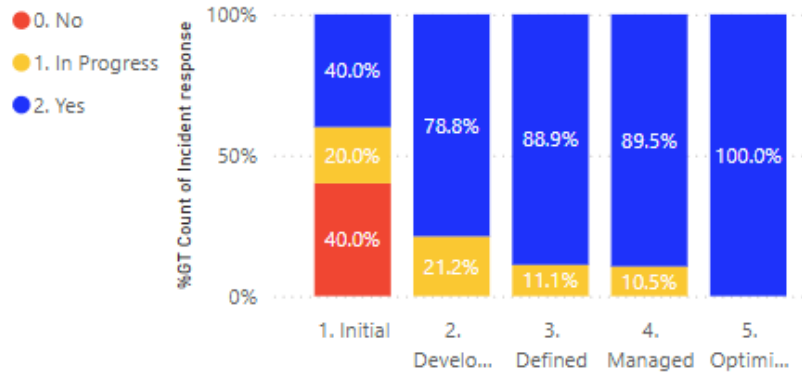Figure 11: Percentage of respondents with an Incident Response Plan.

Figure 12: Percentage of respondents with an Incident Response Plan for different Data Strategy Maturity.

Equally important, an Information Security Management System (ISMS) is crucial for determining data maturity. As shown in Figure 13, airlines at all stages of maturity have an ISMS in place, with half of them implementing it even at the initial strategy stages.
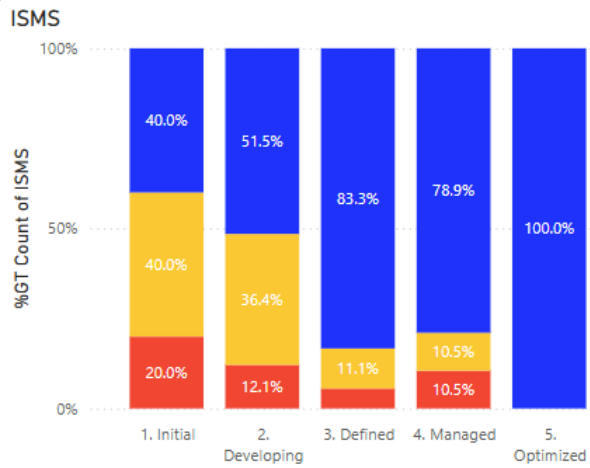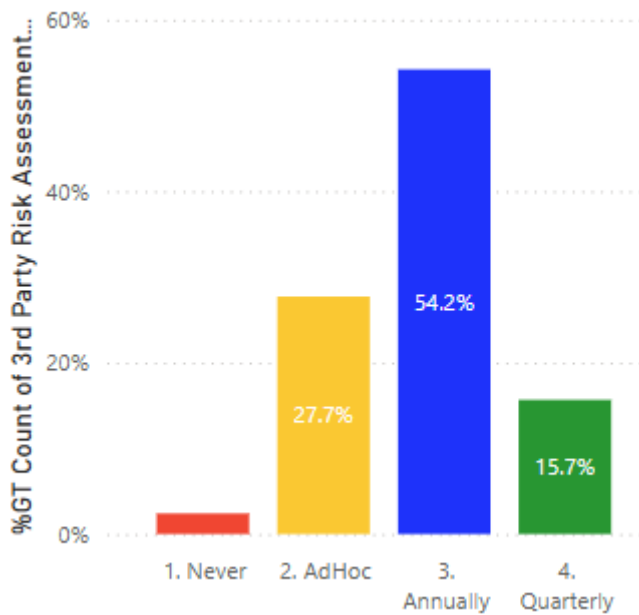

Figure 13: Information Security Management System is key for Data mature airlines.

Moreover, regular third-party risk assessments and audits, as illustrated in the subsequent figure, are essential practices performed by respondent airlines to maintain high-security standards and compliance with industry regulations. Figure 14 show that most of respondents do perform regular 3rd party risk assessments and audits.
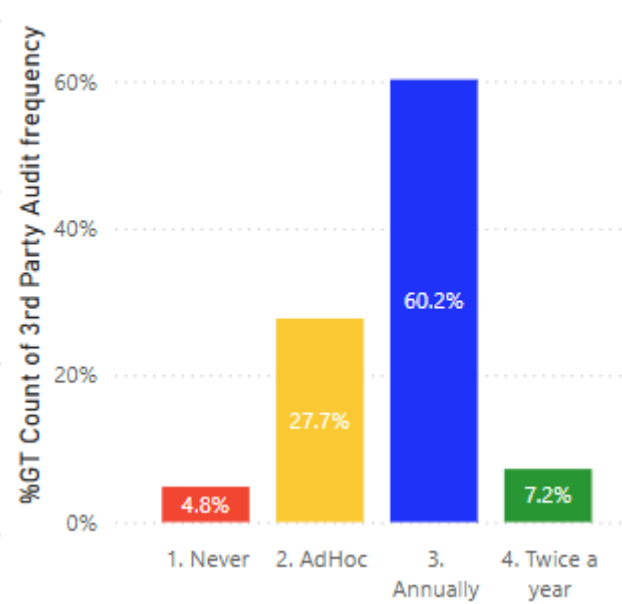
Figure 14: 3rd party Risk assessments and audits frequency performed by respondent airlines.

Summary

This survey is an industry trend analysis in the areas of data management, technology adoption, and cybersecurity measures. It does not reflect the emphasis of any one company. The value of the report is in its ability to assist the aviation to benchmark their Data strategies, technology program maturity, and cybersecurity management against the industry. The survey results reveal several key highlights that illustrate the current state of the airline industry.

The findings indicate that while many airlines are still in the early stages of data strategy implementation, there is a clear pathway to achieving maturity through robust data governance frameworks. Additionally, the importance of cybersecurity resilience is evident, with most airlines having incident response plans and conducting regular third-party risk assessments. These practices are essential for safeguarding against cyber threats and ensuring the integrity and security of airline operations.

We want to thank all the IATA members that participated actively in the survey by sharing their assessment and insights.

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Disclaimers