



EXECUTIVE INSIGHTS

Deploying AI and Generative AI in the Airline Industry: Enhancing Operations and Improving Customer Experiences

Global airline traffic is surpassing 2019 levels, but the industry is facing serious challenges, including elevated fuel costs, pilot shortages, increasing competition, calls to reduce carbon emissions and shifting traveler preferences. Like many industries, airlines are increasingly turning to artificial intelligence (AI) for help in addressing these issues. For example:

- Lufthansa leveraged Google Cloud's AI software to optimize capacity by forecasting wind patterns that affect flight operations (e.g., delays, cancellations).
- Air France used generative AI to create personalized advertising campaigns that target individual customers based on their preferences.¹
- JetBlue invested in and partnered with FLYR Labs, using AI to optimize revenue management.²
- Delta developed Delta Sync, an initiative that integrates the total guest travel experience — from Wi-Fi to food and beverages.³
- Emirates Airlines leveraged generative AI for customer service improvements, including AI-driven cabin crew training and efficient flight route planning.⁴

The latest evolution of generative AI technology augments earlier AI/machine learning (ML) tools and provides a powerful way to synthesize new and original content, creating new opportunities for airlines to improve back-end functions through a much more accessible (and potentially more powerful) user interface that also directly supports consumer-facing operations. This technology is also enhancing employee productivity and output across sectors, enabling higher performance for early generative AI adopters.

Successful strategies and business outcomes are driven by both AI (e.g., data interpretation and analysis) and generative AI (e.g., content creation and issue resolution), depending on a company's specific situation and needs. In this edition of *Executive Insights*, L.E.K. Consulting explores the benefits and key challenges of adopting AI and generative AI for airlines and offers a roadmap for successful deployment.

Benefits of generative AI for airlines

AI and generative AI can drive wide-ranging benefits across organizations, including increased deployment of data-driven decision-making. For airlines in particular, generative AI can be leveraged to improve two key areas: customer experience enhancement and functional optimization.

Customer experience enhancement

- **Virtual agent:** Using generative AI, airlines can offer personalized travel solutions and recommendations, such as flight scheduling and in-flight amenities, through conversational chatbots. Beyond predictive AI's upselling suggestions (e.g., car rentals, hotels), generative AI enhances interactions by providing two-way conversations and tailoring recommendations to the traveler's specific itinerary (e.g., recommending an electric vehicle for certain driving distances).
- **Virtual customer service:** Generative AI can be trained to provide quick solutions to common customer issues by instantly serving data from an airline's reservation system, help center, etc. For example, Delta uses its AskDelta chatbot to help passengers quickly book alternative travel arrangements, including accommodation, when delays or cancellations occur. The chatbot also answers questions about airline policies and procedures, minimizing customer friction and reducing the need for live customer service.
- **Personalized frequent flyer programs:** Analyzing passenger data such as travel preferences and past behavior, generative AI can improve loyalty program features by recommending targeted redemption opportunities and creating tailored rewards and loyalty incentives. It can also be used to develop a more user-friendly way to navigate possible itineraries and identify compelling redemption options.

Functional optimization

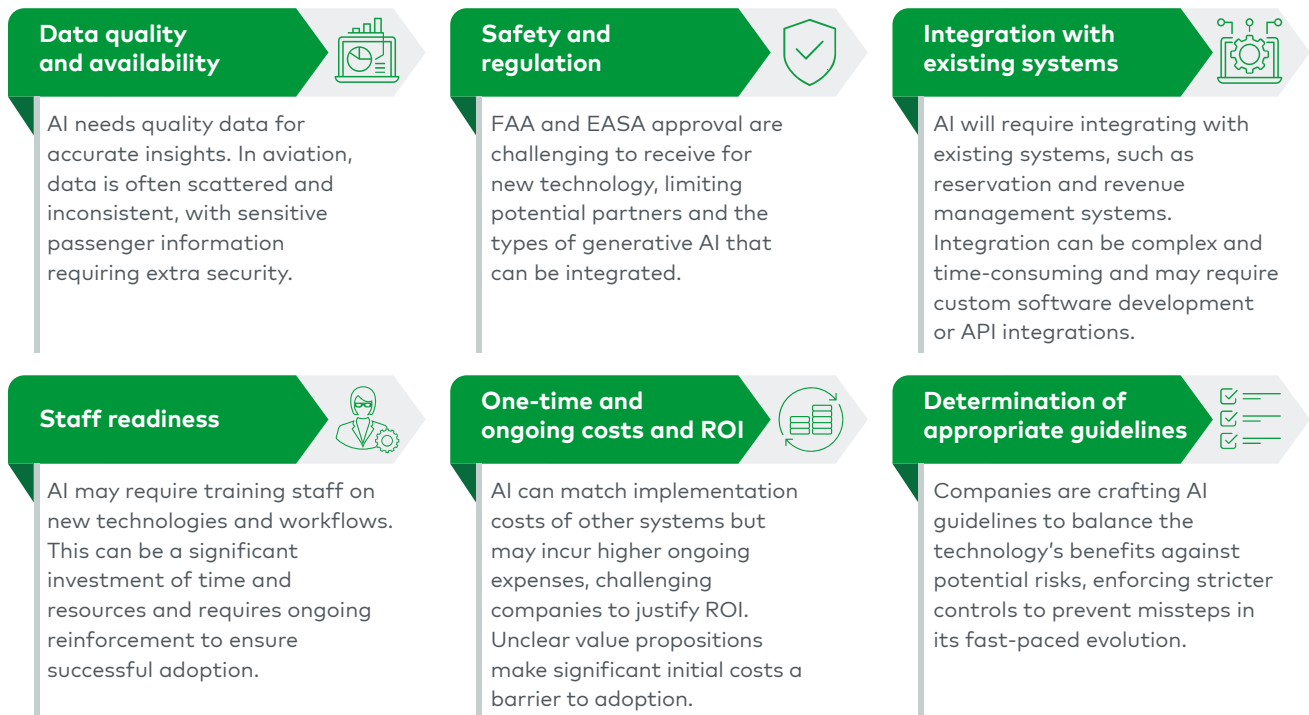
- **Communications leverage:** Departments such as marketing, human resources, investor relations and public relations/communications can also use generative AI to create first-pass content (e.g., press releases, internal communications, in-flight training videos, scripting for social media posts) more quickly and cost-effectively.

- Engineering efficiency:** Generative AI already helps airlines diagnose software issues more quickly, enabling faster issue resolution. It can automate repetitive and time-consuming software engineering tasks (e.g., writing code, identifying potential errors and bugs, optimizing coding for scalability). Also, generative AI can be leveraged to develop digital twins, which help with predictive maintenance as well as both product and air service development.
- Customized training:** Generative AI crafts tailored training simulations with dynamic scenarios, adjusting to individual performance and providing personalized feedback. This approach enhances realism and relevance, boosts pilot confidence and safety, and gives instructors more time for one-on-one teaching. Generative AI offers similar benefits to other airline personnel, such as flight attendants and ground crew.
- Revenue management (RM):** RM departments have used AI for years to optimize unit revenue, but new generative AI-based tools help augment base fares with more personalized offers/vacation packages.

Challenges of deploying generative AI, specifically, for airlines

While the benefits of generative AI are clear, deploying it in the airline industry can be challenging. See Figure 1 for some of the key barriers.⁵

Figure 1
Key challenges of generative AI in the airline industry



Note: AI=artificial intelligence; API=application programming interface; FAA=Federal Aviation Administration; EASA=European Union Aviation Safety Agency
Source: L.E.K. research and analysis

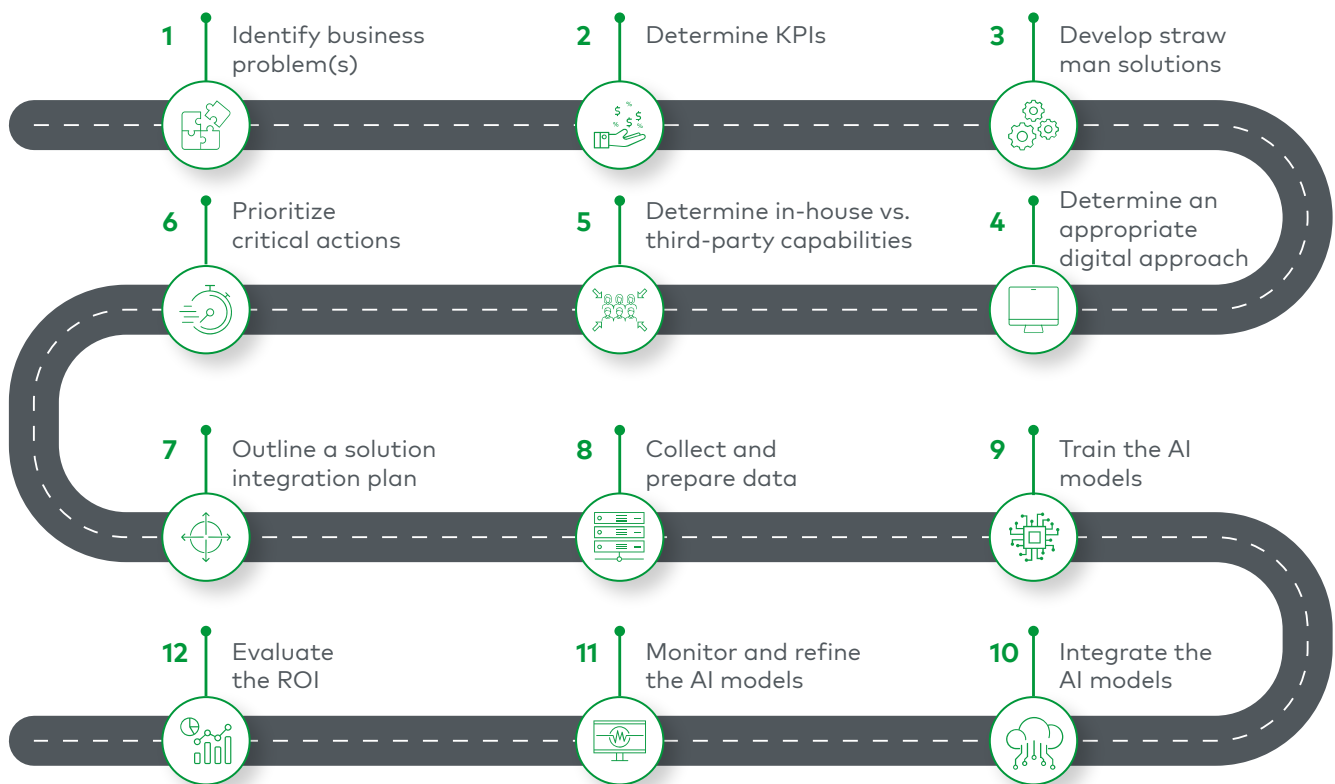
Without careful consideration and implementation, as outlined in Figure 2, major problems can be created. For example, in November 2022, Air Canada faced a challenge when its chatbot erroneously promised a refund that did not follow company policy on bereavement fares. A Canadian court ruled that Air Canada had to fulfill this promise to the customer, underscoring corporations' accountability for their digital engagements.

As Christopher Rivers, a member of the Civil Resolution Tribunal, remarked, "While a chatbot has an interactive component, it is still just a part of Air Canada's website. It should be obvious to Air Canada that it is responsible for all the information on its website. It makes no difference whether the information comes from a static page or a chatbot." This incident illustrates the critical necessity of ensuring data quality and integration with an ever-changing set of terms and conditions. This can be accomplished only by dedicating substantial effort to ongoing, meticulous training and quality control of AI and generative AI tools.⁶

Roadmap for successful deployment

We have developed a comprehensive roadmap for the airline industry to use in deploying the next wave of generative AI (see Figure 2).

Figure 2
Roadmap for successful AI deployment



Note: AI=artificial intelligence
Source: L.E.K. research and analysis

- 1. Identify business problem(s):** First, identify the specific business problems you want to solve. This could include both back-end optimization and customer-facing improvements (e.g., better pricing, improved flight operations, automation of the consumer purchase journey).
- 2. Determine KPIs:** Early identification of accurate key performance indicators (KPIs) for each business problem will help evaluate the short- and long-term return on investment (ROI). Establishing KPIs is critical for tracking and managing performance against the predetermined business problems. A clear set of KPIs will help you drive more targeted development of AI solutions and facilitate subsequent ROI analyses based on clearer and more established performance improvements.
- 3. Develop straw man solutions:** Next, carefully think through which business processes could be eliminated, streamlined or otherwise improved with AI. This requires a systematic review of which capabilities can be readily plugged in and which would pass regulatory scrutiny. It also requires an open-minded approach to rewriting standard operating procedures, given newfound sources of leverage.
- 4. Determine an appropriate digital approach:** Evaluate generative AI alongside other AI- and digital-based solutions to determine the best fit for the identified problem. Generative AI solutions are not a universal fix and, depending on the use case, may still involve unaffordable training costs compared with other solutions.
- 5. Determine in-house versus third-party capabilities:** Based on the data and internal resources available, identify which approach makes sense. Companies that are more “digitally progressive” are five times as likely to deploy AI in-house, enhancing their expertise and capabilities.
- 6. Prioritize critical actions:** It is important to carefully evaluate which actions are most valuable in terms of cost savings, speed of service or overall service quality. Weigh the trade-offs, and predict and plan the second-order effects of implementation. You can then identify the highest-value items for testing.
- 7. Outline a solution integration plan:** Organize critical actions and dependencies into a phased integration plan. Phasing will allow for a more measured implementation and opportunities to correct and amend the plan, depending on the team or function to which actions are being applied.
- 8. Collect and prepare data:** Once you have aligned on the principal business problem to solve and an appropriate solution integration plan, it is important to collect and prepare the data needed to train the generative AI models. Depending on your objective, this may include structured data (such as flight and passenger data) as well as unstructured data (such as social media posts and customer feedback). This data must be high quality, well organized and consistent across different systems.

- 9. Train the AI models:** After data collection and preparation, you must train the generative AI models. This involves using ML algorithms to analyze the data and generate insights. The models will likely require iterative testing and refinement to ensure accuracy.
- 10. Integrate the AI models:** Once the AI models are trained, they must be interfaced with existing airline operations. This may involve creating custom software application programming interfaces or working with existing systems to automate tasks or generate the required insights.
- 11. Monitor and refine the AI models:** After deployment, it is important to monitor the AI models to ensure they are generating accurate and useful insights. The models will likely require ongoing refinements and adjustments to how data is collected and cleaned, to improve accuracy.
- 12. Evaluate the ROI:** Finally, plan to evaluate the ROI of the generative AI deployment. This involves measuring the impact on business performance (such as revenue growth, operational efficiency, passenger satisfaction, customer acquisition cost and lifetime customer value) and comparing these measures with the costs of deploying and maintaining the AI models.

Successfully meeting the challenges of deploying generative AI in the airline industry requires working with experienced strategists, data scientists and AI experts. They can help identify the most effective techniques and tools to generate insights and improve business performance. They can also assist with developing a comprehensive deployment strategy that accounts for data quality and availability, integration with existing systems, staff training, and ROI evaluation.

Conclusion

Embracing generative AI isn't merely an option for the airline industry — it's an imperative. This technology is revolutionizing business processes that can move airlines into a future where exceptional passenger experiences, streamlined back-end operations and maximized revenue are everyday realities. Generative AI also promises to help redefine operational efficiency, making it possible for airlines to meet and exceed the evolving expectations of customers and stakeholders.

Yet the journey to integrate generative AI is fraught with critical challenges. It demands meticulous planning, precise execution and a strategic approach to overcome hurdles that include creating seamless integration, establishing robust guidelines, and navigating the complexities of staff adaptation and acceptance. The stakes are high. Airlines that hesitate or fail to adeptly implement these solutions risk falling behind in an industry that will quickly embrace the leverage that these step-change technologies can confer.

Endnotes

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