THE INTELLIGENT ENTERPRISE FOR THE AIRLINES SECTOR

Providing a trusted, personalized experience while increasing profitability
Dear Customers,

The last 30 years have seen a number of changes and challenges for the airline industry sector, such as the increased market share of low-cost carriers and major disruptions – from erupting volcanoes to infectious disease outbreaks. The next 30 years will be even more turbulent as the industry faces a new wave of technological changes and innovation.

Cybersecurity, level of integration along the airlines supply chain, tensions between data privacy and surveillance, and so on, combined with evolving passenger expectations and the need to simplify airline distribution (including new modes of consumption), will have a profound effect on airlines and the aviation sector.

These changes will require airlines to be even more efficient in managing costs and generating revenue streams by providing new and innovative services to customers at competitive prices. Airlines and alliances that use technology in the most innovative ways to achieve these objectives will be the survivors and leaders of tomorrow.

To get there, airlines must focus on five strategic priorities:

- **Personalize the traveler experience**
- **Sell and merchandise like retailers**
- **Create new alliances and networks**
- **Adopt intelligent operations**
- **Enable predictive safety and maintenance**

To execute on these strategic priorities and achieve their vision for 2025, companies need to change the way they operate. They must integrate and increase transparency of their own end-to-end processes and operations and combine this with real-world awareness that encompasses customers and the environment. They will then need to learn from this information to make decisions and solve problems in novel ways.

By shifting routine tasks from humans to business systems enabled by machine learning and artificial intelligence, airlines will free up the capacity needed to define and pursue innovative and transformative business models.

With the Intelligent Enterprise framework, SAP provides the integrated suite of applications, the intelligent technologies, and the digital platform that companies need to make this shift. We have the vision, the solutions, and the commitment to go with you all the way from defining your transformation strategy and delivering the right solutions to running your digital backbone in the cloud.

Sincerely yours,

Eva-Maria Roe
Head of Airlines Solutions
SAP SE
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OUR PLACE IN THE NEW WORLD

Global “megathemes” are affecting the airline sector and are providing new opportunities for growth.

- **Changing business models**: Airlines are reinventing themselves to differentiate their services and generate new sources of revenue. This means that airlines are forming business partnerships with nonairline partners to extend their service offerings: extending from the current rental car offerings to accommodation, experiences, and events before, during, and after a trip. Travelers expect a single record that covers all of their travel activities – one that is recognized by all service providers – which has driven the International Air Transport Association (IATA) to develop the New Distribution Capability (NDC) and ONE Order programs.

- **Increased traveler demands**: Customers want a consistent experience across all brand touchpoints, with personalized, relevant offers and engagement along the journey. Customers also want convenience when making bookings, and digital intermediaries are challenging airlines on how to stay close to their customers. On data privacy and trust, we will continue to see customers increasingly shift to “passive,” trusted airlines with personal consented data in return for convenience, economic benefits, and security. To increase convenience for travelers, bridging the gap between different modes of transport is part of a move toward **integrated mobility**.

- **Continued financial pressure**: Pressure comes from all sides: the state of the global, regional, and local economy; environmental catastrophes; high fuel prices (the change driver with the biggest impact and uncertainty); and a hyper-competitive marketplace. These factors all will continue to put immense pressure on airlines to minimize costs while “intelligently” pricing their services to ensure healthy revenue growth while staying profitable.
Digital strategies are disruptive and changing the rules for airlines.

**GoAir** has migrated its ERP system to SAP S/4HANA® to be “future ready” and scalable as it inducts new aircraft regularly and increases data. Today, GoAir uses SAP S/4HANA to enhance performance, get quicker reports, use new SAP Fiori® apps to streamline work, and add analytical reporting capabilities. The company was also able to develop airline-specific solutions on SAP S/4HANA, including fuel accounting, airport charges accounting, and route profitability.

SAP worked with International Airlines Group (IAG) to develop a proof-of-concept project to showcase its commerce and revenue products and solutions, which are integrated using IATA ONE Order services. The pilot delivered eight separate use cases that covered basic end-to-end booking and accounting flows for card and card-plus-miles payments, flight and ancillary products, and voluntary and involuntary change scenarios.

Korea Railroad Corporation (KORAIL) initiated its KORAIL Vision & Innovation System (KOVIS), implementing SAP S/4HANA, including using the SAP HANA® database to replace an Oracle database, for running the business. With response times slashed to small fractions of what they used to be, KORAIL is much better positioned to achieve its goal of connecting major base cities in Korea, with travel times projected to be shorter than 90 minutes by 2020. That way, travelers can save time while they are enjoying the view.

**Global growth**: Passenger demand growth is set to increase dramatically, with a major growth in the Middle East, Africa, Asia, and Latin America. Passengers want to fly, but the challenge for each airline is to ensure their market share of the rapidly growing pie with scalable resources and business practices to grow with the market.

**Technology advances**: The airline industry appears to react to new technology rather than lead the way. While the hospitality sector has been providing free Internet to customers for years, airlines are just starting to make (chargeable) Internet and mobile phone connectivity available during flights. Disruption to existing airline models may come from energy breakthroughs, alternative modes of transport, new manufacturing tools, and so on.

On the information technology front, we already see the impact of Big Data and data transparency, artificial intelligence, and specifically machine learning (which learns from that Big Data). Speed is key, and that is what keeps an airline in front of the competition.

**Paper is waste**: Wasted time, wasted productivity, wasted information – airlines will continue to eliminate paper in all departments to not only become a truly digital enterprise but also to help enable a digital supply chain. Digital business processes feed real-time digital business intelligence. Digital connectivity and data will help empower people throughout the organization. This supports the need for a circular economy to save limited resources.

**In addition, the airline industry is reshaped by four major trends:**

- Owning the traveler conversation in a more complex travel distribution world with new players
- Sparking loyalty and creating brand value
- Finding new revenue sources and increasing margins
- Optimizing operations by using technology and reducing costs

Being able to address the global megathemes and the airline sector priorities will determine who will be among the winners in the next 10 years.
By 2025, airline companies will deliver more-personalized services and frictionless travel at scale. This will be in spite of the challenges of rising competition, increased operational costs (especially fuel and labor), tough regulations, and high passenger expectations. A customer’s last best experience sets the minimum expectation for every subsequent experience.

In delivering these transformational personalized services to customers, airlines will be able to maximize revenue by positioning relevant and personal ancillary services. This one-to-one segmentation and communication with travelers will soon be possible, raising data privacy questions. These service offerings will go beyond selling tickets for a flight. They will include additional services from the airline and, most important, from its partners to provide a complete travel experience, including ground transport, accommodation, excursion, events, and more (see Figure 1).
Digital tools like biometrics will help reduce queue time, and chatbots with AI will help resolve customer queries at any point of contact. Airlines will be able to monetize customer data assets.

*Frictionless travel* will be extended by cloud-based biometrics to minimize queue time throughout the travel experience. By 2025, we believe facial recognition will eliminate the need for security queues and identity verification. Passengers will walk directly through terminals to departure gates. Data sharing with partners will provide service partners with the information required to deliver the best possible travel experience for the customer.

*Operational costs* will be minimized with robotics, automation, and machine learning. In customer interactions, this will also provide a better, uniform customer experience. In operations, machine learning will help minimize disruptions and reduce aircraft turnaround time.

Airlines will need to redefine their core competencies in light of digitalization and rebuild their business models around them. They will need to take advantage of digitalization to integrate and optimize their product, supply chain, and service systems to improve their products, services, and the customer experience.

Digital tools will enhance and transform internal and external processes, and drive even more productivity gains and cost savings through autonomous aircraft health reporting, automated assistance technology in aircraft maintenance, and open and collaborative innovation.

Successfully embracing the opportunities from new technologies and consequently implementing the right business initiatives will be the foundation of successful digital transformation and staying ahead of the innovation curve.

**Figure 1:** The Main Unifying Criteria for the Passenger Travel and Leisure Industry Sectors
We have identified five strategic priorities necessary for airlines to transform their business.

1. **Personalize the Traveler Experience**
2. **Sell and Merchandise Like Retailers**
3. **Create New Alliances and Networks**
4. **Adopt Intelligent Operations**
5. **Enable Predictive Safety and Maintenance**
PERSONALIZE THE TRAVELER EXPERIENCE

The travel industry is experiencing a digital revolution in the way consumers research, shop, and purchase travel. Mobility and access to an increasing number of customer-centric applications and pervasive hyperconnectivity now drive travelers to expect a seamless and consistent experience across all their devices throughout the entire customer journey. This is especially true in the case of disruptions. An airline can destroy or create loyalty in the way it handles disruptions. Personalization and customer value play a role in effective disruption management. Customer trust about their data and legal compliance have also become important factors.

The Vision
In 2025, airlines will be able to maintain “customer-for-life” relationships with a focus on long-term value based on a 360-degree understanding of their customers, starting with the detailed understanding of requirements and needs and ending with the knowledge of how customers use products in their daily operations (see Figure 2).

Loyalty management will move away from a miles-based system to a system where customers receive more experience-based rewards. Airlines will interact with their customers on a constant basis, seamlessly, through multiple channels – from Web to direct and including Internet of Things (IoT) connectivity. By combining traveler experience feedback and operational data, airlines can make better decisions about what drives satisfaction and revenue.

The Journey
Once current routes to the customer have evolved into a true omnichannel model, traveler experience must include a real-time view of customer shopping patterns and preferences in full compliance of privacy legislation. Airlines must collaborate with customers in a 360-degree manner, from sensing demand to delivering value, through products and services on the fly.

Figure 2: Personalize the Experience for a Single Customer

Today

Future

Segmentation

Single customer for life
Putting the customers’ point of view at the center of every decision is a key prerequisite for success in the digital age. It’s therefore absolutely vital to know that point of view and target travelers in the most individual and context-relevant way. It’s also important in today’s age to make sure travelers trust you with their data. To both know travelers and be able to predict their next steps and preferences, it’s becoming more and more important to capture the feedback of their experiences with you. Experience management is the next level of customer engagement.

SAP enables personalization in an intelligent enterprise by providing a complete integrated suite that covers any aspect of the customer experience. It is supported by real-time customer data captured from all sources, internal and external systems and social media, and is empowered by intelligent AI solutions that allow predictions of behavior and preference – while making sure that the customers are in control of their data and that the airline complies with all international rules.

**PERSONALIZE THE TRAVELER EXPERIENCE**

**INTELLIGENT TRAVELER ENGAGEMENT AND REVENUE MANAGEMENT**

**TRADITIONAL SCENARIO**

Business relying on unknown traveler profiles to try to fulfill demand:
- Selling only capacity, lack of demand knowledge
- Traveler profile mostly unknown or data in several places; no single view of the customer
- Sales channel very inefficient with spam and aggregator channels
- High percentage of sales achieved through indirect channels

**NEW-WORLD SCENARIO**

Build segment of one:
- Capture data, build profile, and enhance the travelers profile
- Capture and react to sentiment and behavior
- Identify propensity to buy product or service
- Convert indirect to direct sale channels
- Achieve real-time revenue recognition and reconciliation

**TOP VALUE DRIVERS**

- Create great customer experiences – every time
- Build the brand and keep customers loyal
- Increase customer trust and retention
SELL AND MERCHANDISE LIKE RETAILERS

Today’s traveler expects a “retail” experience that is in context, delivering the right offer, at the right time, at the most appropriate touch point.

Airlines can increase their revenue sources and margins by fulfilling these expectations and providing a more complete service portfolio.

The Vision
In 2025, airlines will have moved toward a simplification of distribution and will act as true retailers in the sky, owning the customer conversation. With the ability to deliver completely customized offers and services that precisely fit the preferences of an individual customer, a major portion of airline revenue will stem from up-selling and third-party offers to travelers. These offers are based on and built around products and services, the value they deliver, and the data assets they create. Services will move from being human-provided add-ons to the reservation to becoming offerings in their own right, with separate revenue streams. They will evolve into multibrand services as shown in Figure 3. Airline pricing will also evolve to a much more dynamic model with contextual and even personalized pricing.

In addition, companies will use their increased customer relationships and control over their own products to offer these products “as a service,” where the service provider maintains ownership, operates the product, and charges for the value delivered to the end customer.

The Journey
Within a complete retailing solution, airlines will use predictive intelligence to create on-the-fly offers to travelers based on preferences, location, and advanced segmentation, along with communication channel preference. They will adopt an end-to-end process from offer management to revenue accounting, and leaders will simplify their distribution by adopting the newest industry standards.

Figure 3: Expanding Offerings to Meet Every Customer Need

Today

| Flights |

Future

| Experiences |
SELL AND MERCHANDISE LIKE RETAILERS
MERCHANDISING AND DISTRIBUTION ALIGNED TO TRAVELER’S BUYING BEHAVIOR

A digital and mobile world changes the way travelers book travel. Airlines have learned from retailers and are adopting their approach with travelers. IATA is striving to simplify airline processes with NDC, which has already been largely adopted, and ONE Order—based order management and accounting, which is on the horizon. Airlines that don’t adapt risk simply being a supplier in the travel chain, leaving others, such as the Internet giants or new players entering this sector, to control the traveler conversation. Adopting a clear merchandising and distribution strategy is vital in gaining direct access to the traveler, but it’s also vital for surviving financially. SAP enables airlines to realize their strategy and is fully aligned with industry sector standards.

In the travel world of the future, there will be travel platforms proactively offering a complete experience with all products and services that are using predictive capabilities and are fully connected to all touch points – with customer chatbots and voice communication being the standard. The intelligent airline will be fully empowered to be such a travel platform.

TRADITIONAL SCENARIO

NEW-WORLD SCENARIO

TOP VALUE DRIVERS

Increased agility and innovation capability – short time to market for new products and services

Increased revenues by enhancing product portfolio

Reduced distribution costs
CREATE NEW ALLIANCES AND NETWORKS

Meeting customer requirements and differentiating every solution for each customer requires even more flexible service offerings, going beyond selling flight tickets and flight-related ancillary services.

This is what customers expect and demand. But it also creates new revenue opportunities, helping airlines fight the ever-closing gap between rising operational costs and falling ticket prices and revenue. Airlines will extend their networks of partners and suppliers.

The Vision
By 2025, airlines will shift from selling largely flight-related services to being complete travel experience service providers. This will cover the complete trip, from the initial planning and booking to airport transfers and the airport experience, as well as accommodation and activities at the destination (see Figure 4). Customers, employees, business partners, and suppliers will collaborate and co-innovate to deliver better, more holistic shopping experiences.

All this will function seamlessly through a network of business partners, not just selling tickets on each other’s behalf. Ultimately, the total experience will reflect greatly on the airline and its brand loyalty.

The Journey
Airlines will be able to extend their service offerings to include the services of their partners and to manage the quality of the services included in their portfolio. This requires efficient processes and data exchange with the partner network, leveraging the newest technology.

Figure 4: Covering the Complete Trip – From Booking to Accommodations
Airlines do not operate in a vacuum but are heavily dependent on contracted suppliers to deliver a consistently high level of branded service to customers. These suppliers include ramp and passenger services at the airport, catering services, cargo services, and so on.

A data platform that can link to these suppliers through an open network will enable airline suppliers to receive flight- and passenger-related data in time to deliver the service level expected by the airline. This can be as simple as the passenger numbers for a flight available to the catering service provider, or it could be an updated ratio in the meal choices based on predicted passenger preference data. Or it could be last-minute rescheduling data for the fuel truck to minimize the potential of a flight delay (see Figure 5).

Exploring new revenue models will also require airlines to connect to new partners—ground transport, accommodation, excursion, and activity service providers. The platform should not only enable airlines to check availability and sell these services, but it should link to these providers easily to enable expanding and changing services in a scalable fashion, and to monitor the delivery (and quality) of these services. This needs to be based on international standards, such as the IATA NDC initiative.

**Figure 5: Evolution of the Airline Business Network**

Today: Point-to-point links for all airlines, ground service providers, and airports

Future: Open business network between airlines, service providers, and airports

**TOP VALUE DRIVERS**

- Flexible and agile selection of business partners
- Lower IT costs to build and maintain interfaces to business partners
- Easily extendable to nonaviation partners
In 2018, labor became the biggest contributor to airline operating costs – the first time it has exceeded fuel costs since 2006 – with ticket prices staying relatively flat due to fierce competition.

Airlines have to lower operating costs while providing ever-better service levels to their customers. This requires operational efficiency at levels never seen before, at the front office, back office, and across operations. Lean operations are not sufficient, as they normally cannot cope with disruptions. After all, travelers judge airlines on the way they manage disruptions. You know the difference between a good airline and a bad airline when things go wrong.

The Journey
First, airlines have to change the mind-set of employees and departments so they can focus on the end-to-end value chain to achieve overall business outcomes (productivity growth, best-in-class customer experience, and new business models and revenue streams). Airlines also have to provide employees and departments with a single, integrated technology platform with embedded intelligence and capabilities to automate repetitive tasks, gain visibility and control, optimize efficiency, and better understand and respond to customer demands. This will be a data-driven organization, which will cover not only operations within the airline but also the large number of service providers throughout the supply chain (see Figure 6).
Business transformation often starts with a paradigm shift that triggers a cascade of business innovations. Change the focus from historical operational procedures to data-driven orchestration of real-time events – and innovators will generate a broad range of opportunities. Turning ideas rapidly into experimental practices needs technologies and services for rapid composition of new ways to carry out airline hub operations and transform the airline business.

Airlines succeed or fail depending on their ability to fill seats and maximize the revenue paid for each ticket. When potential customers are deciding which airline to choose, a key decision criterion is the likelihood that the plane will depart and arrive on time. This key performance indicator is called on-time performance (OTP). Although airlines understand that OTP is a key measure of success, they have historically struggled to deliver reliable OTP. Many risk factors affect OTP – everything from weather, crew availability, and safety checks to ground-handling services and cabin readiness.

Each one of these “moving parts” adds complexity and is a risk factor that impacts an airline’s ability to deliver on its customer promise. Now, however, technologies such as AI, machine learning, and predictive modelling are processing the airline’s operational data and offering responsive suggestions on how to improve OTP.

Additionally, when on-time performance is compromised by a refueling delay or unavailable maintenance item, for example, these new technologies are helping airlines to immediately come up with an action plan to accommodate customers and minimize the cascading impacts of the delay, such as missed connections, an overnight stay, inconvenient rebooking, and so on.

With intelligent operations, airlines have an integrated view of estimated inbound block time (EIBT), the impact on the next station’s ability to achieve on-time departure, and the impact of targeted off-block time (TOBT). TOBT is used to determine engine start time, aircraft pushback time, and queue position for departure. These events impact the EIBT for the next station and are linked to the disruption solver for reaccommodating and recovery management.

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<td><strong>Lack of full visibility on status updates</strong></td>
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**TOP VALUE DRIVERS**

- **Increase** on-time departure and passenger satisfaction
- **Reduce** costs of delays

- **ADOPT INTELLIGENT OPERATIONS**
- **ENSURING ON-TIME AIRLINE HUB OPERATIONS**

- **Value**
  - Increase on-time departure and passenger satisfaction
  - Reduce costs of delays

- **Analog communications**
  - Lack of full visibility on status updates
  - Manual interventions for changes

- **New-world scenario**
  - From: ETA to ETD
  - To: EIBT to TOBT
ENABLE PREDICTIVE SAFETY AND MAINTENANCE

Around 12% of airline operating costs can be attributed to maintenance costs. But the cost of maintenance impacts the airline’s bottom line much more deeply.

For example, a third of total delay time is due to unplanned maintenance. Adding to the challenge is that an increasing proportion of aircraft are “new generation,” which are more complex and require new maintenance skills and technologies.

**The Vision**

By 2025, airlines will be able to maximize aircraft availability at the lowest cost with absolute safety and with the highest level of dispatch reliability. Maintenance strategy will have moved to predictive maintenance, which will be at least 40% of maintenance, while reactive maintenance will be no more than 10%. This will increase dispatch reliability and maximize the time to respond to a potential failure. Connected aircraft and IoT-enabled, data science—driven maintenance approaches ultimately increase first-visit fix rate, reduce maintenance costs, improve safety, and maximize aircraft availability and dispatch reliability.

**The Journey**

It should be recognized that predictive maintenance does not apply to all components. The failure patterns exhibited by around 11% of aircraft components are related to age, so a preventive maintenance strategy is more appropriate. Eighty-nine percent of components exhibit random failure patterns, so an on-condition or predictive maintenance strategy is also required. Key to this is the connected aircraft, which can feed health indicators to the aircraft and engine health monitoring system to predict potential failures and prescribe corrective actions, often based on machine learning (see Figure 7).
Figure 7: Realizing the Connected Aircraft

Today: Manual logging of defects

The future: Connected aircraft, predictive maintenance

Less time to respond drives aircraft-on-ground (AOG) spares procurement, lower dispatch reliability, higher labor costs

More time to respond drives lower spares procurement cost, better dispatch reliability, lower labor costs

Potential failure = First indication of failure
Aircraft maintenance traditionally follows an “on-condition” maintenance strategy, focusing on the impact of a potential failure. Such maintenance programs consist largely of inspection activities and corrective actions can be taken as per aircraft or engine maintenance manuals. The impact is that the planning and scheduling of all the maintenance resources (labor, tools, spare parts, and so on) can only be planned once the inspection finding is available. This has a negative and costly impact on aircraft availability and resource utilization.

With a predictive maintenance strategy, airlines and their maintenance service providers evaluate connected aircraft data (IoT for other industries) and develop models to predict failure patterns of components. Included in this is also the ability to determine the most efficient corrective actions for these components as well as changes in the maintenance strategy for these components.

By monitoring the fault messages and related performance messages, the system can provide early predictions of potential failures and corrective actions, maximizing the planning window to secure all the relevant maintenance resources and to ensure any issue is fixed before it actually fails.

### Top Value Drivers

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#### Traditional Scenario

- Various tools and manual work involved to address planning and scheduling tasks
- Time-consuming maintenance planning with fragmented scheduling activities
- User experience that are enabled by GUI and Web-based transactions

#### New-World Scenario

- One tool to efficiently address planned and unplanned maintenance
- Comprehensive view into work center load and capacity and work situation
- Faster work-order-to-schedule process
- Extended and continuous scheduling with the SAP Multiresource Scheduling application
- Predictive algorithms that will generate alerts for potential failures, and machine learning that will prescribe the most efficient repair schemes
KEY TECHNOLOGIES

The airline industry appears to react to new technology rather than lead the way. The impact of changes on the information technology front show the impact of Big Data and data transparency, artificial intelligence, and specifically machine learning (which learns from that Big Data). All the data, regardless of the source or the department, needs to be brought together in real time so the airlines can analyze, make predictions, and, ultimately, make informed decisions. Speed is key, and that is what is keeps an airline in front of the competition.

Artificial Intelligence and Machine Learning
Big data, predictive analytics, and artificial intelligence (AI) enable rapid forecasting of intentions and behavior. How many times does the customer visit the Web site before booking a flight? What ancillary services does this customer normally purchase? What was the experience the passenger had during the last flight? Based on this information and through machine learning, the airline can tailor a personal offering to the individual customer for this specific event to maximize revenue.

Experience Management
By combining experience data (X-data) and operational data (O-data) the airline can make a decision based on both. In the above example, the experience of the passenger combined with operational data of past flights and selections offers the complete picture.

The Internet of Things
Advances in ubiquitous connectivity and edge computing are driving a step change in business productivity. This connectivity, coupled with AI and machine learning, can analyze petabytes of data and affect real business outcomes. By connecting the aircraft and combining aircraft and other data with predictive analytics and AI, airlines will be able to accurately predict the performance (and potential failures) of aircraft, engines, and components and proactively take action to minimize disruptions and costs.

Machine learning will enable airlines to optimize maintenance schedules to maximize aircraft availability and minimize disruptions and maintenance costs. Big Data and real-time engine health monitoring and aircraft health monitoring will have the most significant impact on the airlines of 2025 and beyond.
Advanced Analytics
The integration of advanced analytics capabilities, including situational awareness, into applications enables business users to analyze data on the fly and drives better decision-making, whether deciding ticket pricing for a new route or managing operational disruptions. Empowered users, benefiting from embedded analytics in business processes and environmental data, can get real-time visibility into their changing environment, simulate the impact of business decisions, mitigate risk, and achieve better customer outcomes.

Virtual and Augmented Reality
Virtual reality, the use of digital technology to create immersive simulations, was once the stuff of science fiction. So was augmented reality, which lets users interact with digital content that is overlaid on the real world. Already in use to help technicians with difficult or infrequent aircraft and engine maintenance activities, this will become even more critical to attract and retain millennials as an employer.

Data Platform to Manage Experiences
In the digital economy, the cycle time to sense, analyze, and respond is a big competitive differentiator. Leaders are interlocking the operational performance data from companies’ business systems, which explains what is happening, with the experience data coming in the moment from customers and employees.

Blockchain
A relatively recent breakthrough technology, blockchain is revolutionizing the movement and storage of value by creating a chain of unaltered transactional data. The blockchain model of trust, through massively distributed digital consensus, could reshape supply chains and commerce across the entire digital economy. For example, digitalizing rotatable repair and scrap certificates will help eliminate bogus rotables from the industry.

Conversational AI
Advances in machine learning are enabling algorithms to become highly accurate in natural-language understanding and in image and speech recognition, which is especially useful in maintenance and call-center activities. Voice interface will be the go-to for the next generation of applications, allowing for greater simplicity, mobility, and efficiency while increasing technician productivity and reducing the need for training.

Robotic Process Automation
Robotic process automation streamlines repetitive, rule-based processes and tasks in an enterprise and reduces costs through the use of software and robots that replicate specific tasks or keystrokes.
GETTING THERE: A PHASED APPROACH

Companies will become intelligent enterprises on three distinct tracks as they evolve their strategic priorities to match their company’s vision. They will:

1. **Optimize** what they already do by implementing a stable and scalable digital core to make processes more transparent and integrated

2. **Extend** their current processes by connecting them to the real world using IoT technologies

3. **Transform** their business using a constant stream of data enabling new service-driven business models. (See Figure 8)

Figure 8: Innovation Along the Airline Value Chain

- **Real-time intelligence platform**
  - Digital boardroom

- **Intelligence embedded into business processes**
  - Intelligent asset condition monitoring

- **Consistent data model**
  - Intelligent data model

- **Process integration beyond corporate boundaries through networks**
  - Operational reporting and analytics

- **Consistent intelligence and experience across lines of business**
  - Customer retention

- **Seamlessly integrated end-to-end processes**
  - Conventional customer service bots for commerce and service

- **Strategic demand management**
  - Fuel management
  - Strategic planning and network performance for airlines

- **Operations and asset management for airlines**
  - Maintenance, repair, and overhaul
  - Operational risk management

- **Ground handling, catering, and billing services for airlines**
  - Planning and analysis
  - Quote to cash
  - Strategic procurement
  - Accounts payable and receivable
  - Responsive manufacturing

- **Contextual marketing and customer service excellence**
  - Single customer view
  - Optimized marketing
  - Consent-based marketing
  - Omnichannel service excellence

- **Digital transformation of commerce and sales**
  - Omnichannel commerce management
  - Commerce personalization
  - Sales force empowerment
  - Sales performance management
  - One-order accounting

- **Consistent, end-to-end engagement financials**
  - From one order and one subscription through delivery of service to revenue recognition and accounting

- **Real-time insights into key performance indicators**
  - Such as operational analytics, managerial accounting, route network–capacity utilization, on-time performance, profitability management

- **Next-generation user experience**
  - Including business-context awareness, proactive suggestions and predictive capabilities, and digital assistant with natural-language processing to create a human-like experience
SAP’S FRAMEWORK FOR THE INTELLIGENT ENTERPRISE

The Intelligent Enterprise framework (see Figure 9) is a suite of intelligent business applications that use intelligent technologies and can be extended on a digital platform. This enables next-generation business processes to deliver breakthrough business value on our customers’ journey to becoming intelligent enterprises.

Figure 9: SAP Intelligent Enterprise Framework
In the digital economy, intelligent technologies and integrated business processes are now driving digital transformation.

To do this effectively requires an end-to-end plan for becoming an intelligent enterprise. This includes creating an intelligent enterprise road map and implementation plan with proven best practices and deployment options that optimize for continuous innovation with a focus on intelligent outcomes.

The end-to-end journey to becoming an intelligent enterprise

- **Plan**
  - well to manage expectations

- **Simplify and innovate**
  - Remodeled business models, business processes, and work
  - SAP Intelligent Enterprise Framework methodology as a guide for digital transformation
  - Value-based innovation road maps

- **Standardize and innovate**
  - Model-company approach to accelerate adoption with model-industry solutions
  - Design thinking and rapid, tangible prototypes
  - Coengineered industry innovations delivered with agility

- **Run**
  - all deployment models
  - Run with one global support
    - One global, consistent experience
    - End-to-end support – on premise, cloud, or with a hybrid approach

- **Optimize**
  - for continuous innovation
  - Optimize to realize value
    - Continuously captured and realized benefits of digital transformation

To move forward with speed and agility, it helps to focus on live digital data and combine solution know-how and industry-specific process expertise with data analytics so that the right digital reference architecture is defined and delivered. In that context, a model-company approach can enable airlines to transition from their current state to digital. Model companies represent the ideal form of standardization for a specific line of business or industry. They are built on preconfigured SAP solutions based on best practices supported by SAP, along with the business content that encompasses our experience and expertise relevant for the industry. They provide a comprehensive baseline and come with the accelerators to jump-start digital transformation projects.
COMPREHENSIVE SAP ECOSYSTEM
ORCHESTRATING THE WORLD TO DELIVER VALUE FASTER

Our comprehensive airlines ecosystem offers integration into:

- A wide range of business services
- Open architecture with a choice of hardware and software
- Complementary and innovative third-party solutions
- Broad reach through partners to serve your business of any size anywhere in the world
- Forum for influence and knowledge
- Large skill sets

Our partner ecosystem includes, among others:

- Accenture
- BoedsKapper
- Capgemini
- Celonis
- Deloitte
- DXC.technology
- EY
- HCL
- IBM
- Lufthansa Systems
- MSG
- Nagarro
- OPENText
- Reply
- Tata
SAP IS COMMITTED TO INNOVATION

10-Year Innovation Vision
SAP delivers fully intelligent business solutions and networks that span across company boundaries and promote purpose-driven businesses. These solutions will be the most empathic symbiosis between machine intelligence and human ingenuity.

- Self-running enterprise systems
- Self-organizing business ecosystems
- New markets and business models

Comprehensive Industry Coverage
SAP enables the comprehensive coverage of the complete travel value chain across the enterprise. With its clear industry road map, SAP is the partner of choice for the airlines industry.

- 87% of airlines in the Forbes Global 2000 are SAP customers
- 8 of the 10 most on-time airlines in the world run SAP solutions
- 10 of the 10 largest airframe MRO providers in the world run SAP solutions

Proven Services Offering
By bringing together world-class innovators, industry and emerging technology expertise, proven use cases, and design thinking methods, we help airlines develop innovations that deliver impact at scale.

- Proven methodologies to drive innovation, from reimagining customer experiences to enhancing operations
- Innovation that is fueled through a managed innovation ecosystem from SAP
- Ability to build your own innovation capability and culture

SAP supports the airlines sector in becoming an intelligent enterprise – providing integrated business applications that use intelligent technologies and can be extended on SAP Cloud Platform to deliver breakthrough business value.

Learn more
- Airlines solutions from SAP
- SAP Leonardo
- SAP Digital Business Services
- SAP Design Thinking
RESOURCES

Outlined below is external research that was used as supporting material for this paper.

9. Economist Intelligence Unit and SAP.

Note: All sources cited as “SAP” or “SAP Performance Benchmarking” are based on our research with customers through our benchmarking program and other direct interactions with customers.