

JOHN G. WENSVEEN

Air Transportation

A Management Perspective



E I G H T H E D I T I O N

ROUTLEDGE



AIR TRANSPORTATION

The 8th edition of this book is dedicated to my wife, Lisa. I'd ask you to marry me but you already said yes!

To my parents, John and Sandi, and my sister, Kirsty. Although we are separated by time and many miles, I think of you often.

Madison—Your potential as a human being ... is unlimited. You have within you the ability to become and to achieve anything you want.

The Berrys—Thank you to the entire family for all your kindness.

Bryanne—Your first words were spoken under the big tree at the Spruce Creek Fly-in. "DaDa plane," you said and pointed to the sky. You dreamed of flying and I hope you reach for the clouds every day.

Air Transportation

A Management Perspective
Eighth Edition

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About the Author

Dr. John Wensveen is Head of the Department of Aviation Technology at Purdue University where he serves as the Chief Academic and Administrative Officer. In addition to his administrative role, Dr. Wensveen is an active researcher and expert speaker with a concentration on the airline start-up process and creation of new business models. He is also President and CEO of Airline Visions, an industry-leading aviation advisory and futurist firm specializing in business, strategy, and marketing plans for new-entrant and established airlines.

Prior to the above role, Dr. Wensveen was Partner of the Americas and Executive Vice President, Airline Start-ups, at Mango Aviation Partners responsible for overseeing airline start-up and airline restructuring projects from concept through launch of commercial operations. He was also Managing Director of Ventana Aviation Academy, Mango's subsidiary training company.

Dr. Wensveen was Global Head of Airline Services at Radixx International where he was responsible for building and overseeing the advisory services division. Until June 2010, Dr. Wensveen was Dean, School of Aviation, at Dowling College where he was Chief Academic and Administrative Officer for the 120-acre Brookhaven Airport campus. Prior to this role, he held an executive position at InterVISTAS-ga2 where he was responsible for developing international partnership agreements for air carriers worldwide.

Dr. Wensveen was one of the founding team members of Washington-Dulles based MAXjet Airways, the first US air carrier to receive certification since the events of 9/11. Until March 2005, he was Vice President and Senior Director of International Development. While at MAXjet, he led partnership negotiations and the set-up of the European infrastructure.

From 1999 to 2004, Dr. Wensveen was employed as Professor of Airline Management with the College of Business at Embry-Riddle Aeronautical University where he instructed airline management and operations courses. Prior to pursuing graduate studies, Dr Wensveen held various management positions with Canada 3000 Airlines and was also the airline's official mascot, Air Bear.

Dr. Wensveen is a Certified IATA instructor and conducts training programs for Terrapinn Training and Euromoney Training at various global locations. He publishes frequently in major aviation publications and is an aviation analyst for the media. He is author of the industry's leading aviation textbook, *Air Transportation: A Management Perspective*, and is author of the airline industry's only book on how to start an airline, *Wheels Up: Airline Business Plan Development*.

From 1996 to 1999, Dr. Wensveen hosted a number of leading radio shows in the United Kingdom and was awarded 'Best Male Presenter' in 1997 at the BBC Radio One Awards. His interests include international travel, cruising the high seas, flying, boating, scuba diving, fishing, and hitting the open road in his diesel pusher bus. Dr. Wensveen was recently married to his wonderful wife, Lisa, and resides between a sunny little island near Key West, Florida and a home in West Lafayette, Indiana.

Dr. Wensveen, born and raised in Vancouver, Canada, earned PhD and MPhil degrees in International Air Transport/Business from Cardiff University (UK) and a BA in Geography/Transportation Land Use Planning from the University of Victoria (Canada). He also earned a Certificate in Airline Finance and

Accounting from IATA.

Foreword

As we celebrate 100 years of commercial aviation and 70 years of the International Civil Aviation Organization, let us remember that a country's or region's competitiveness is directly related to its connectivity.

Taking its wider supply chain impacts into account, the World Travel and Tourism Council found that travel and tourism's total contribution to global GDP grew by 3.0 percent in 2013, faster than overall economic growth for the third consecutive year and outperforming other global sectors such as manufacturing, retail and distribution, public services, and financial and business services.

Globally travel and tourism represents US\$7 trillion, 266 million jobs, and US\$1.3 trillion in exports.

The multiplier effect of air transport is amazing, as ICAO estimated that every US\$100 of revenue produced by air transport triggers an additional US\$325 and that every 100 jobs generated by air transport triggers over 600 additional jobs in other industries.

It is therefore simply senseless and counter-productive for anyone trying to stimulate socio-economic growth and jobs to fail to effectively promote connectivity.

In these exceptionally difficult financial times, governments should not clip the wings of a sector that makes economies take off.

The following statement by President Obama in his radio speech of May 17, 2014, applies to all countries:

If we make it easier for more foreign visitors to visit and spend money at America's attractions and unparalleled national parks, that helps local businesses and grows the economy for everyone.

UNWTO-WTTC research shows that visa facilitation will bring US\$206 million extra receipts and 5.1 million additional jobs in G20 economies alone by 2015.

However, we cannot promote connectivity if we ignore profitability and we cannot promote profitability if we ignore all that undermine it.

Dr. John Wensveen's insightful *Air Transportation: A Management Perspective* reminds us that even if air transport is the strongest link in the job creation and economic development chain, it remains the weakest and most exposed link in the travel and tourism value chain.

Inefficient national and regional air space management, misguided national or regional regulation of the commercial and operational aspects of international civil aviation, and unreasonable taxes, fees and charges undermine both connectivity and profitability.

ICAO and UNWTO must urge the UN, regional governmental organizations, heads of states and governments to stop undermining the great contributions of travel, tourism and air cargo.

These leaders must be persuaded that, as a general rule, aviation and tourism tax revenues will be offset by the losses to the economy and jobs whereas an initial loss in revenue from abolished aviation and tourism taxes will be offset by an increase in trade, travel and tourism.

They must be persuaded that air space mismanagement impacts negatively on both the environment and

airlines' costs.

They must be persuaded that the obvious interdependency, synergies and vital importance of both tourism and air transport require aligned national sectorial policies on air transport and tourism.

Travel and tourism will indeed flow smoothly in a country and in a region only if, and when, all the stakeholders develop the necessary synergy and work in harmony in the pursuit of a shared vision.

To achieve this alignment requires a worldwide culture of communication and cooperation because as states, ICAO and UNWTO, as air navigation service providers and CANSO, as airlines and IATA, as airports and ACI, as cargo operators and TIACA, as travel and tourism professionals and WTTC, as consumers, as employees, as aircraft and engine manufacturers and as ground handlers, we need each other and we depend on each other.

We are and we will remain a community of linked interests and we will make a formidable difference if and only if we can work together to harness the formidable power of travel and tourism to bring about socio-economic growth, jobs, understanding and happiness worldwide.

Vijay Poonoosamy
Vice President International and Public Affairs
Office of the President and CEO
Etihad Airways
President, Hermes Air Transport Club

Foreword

The year 2014 marks a milestone for commercial aviation. It has been 100 years since the first commercial flight took off, and ever since the world has been literally transformed into a small village. Today thanks to aviation, people and businesses enjoy unfettered mobility. From practically any point in our planet, people can connect the entire earth in an ever safer, more reliable, more comfortable and more affordable manner. But the wonders of aviation and its contribution to a more integrated and prosperous world have yet to be fully recognized, especially here in Africa, where our sector is subject of many restrictions and excessive levies.

Despite high fuel price, excessive taxation and extreme sensitivity to economic shocks, our industry continues to show an incessant ability to adapt and remain resilient through new technology, consolidation and more importantly through the skill of its talented workforce.

Going forward as we enter the second century of aviation, I am more than ever convinced that it is not the amazing progress in aircraft technology or the introduction of new and game-changing products and services, that will determine success or failure, but rather how each airline nurtures, develops and manages talent.

People often ask me the secret of the amazing Ethiopian success over the last 10 years, especially in a context of an African airline industry with stagnating market shares and continuously in the red. I always repeat the same answer. Behind Ethiopian exceptional results lie the dedication, competence and skill of its management and employees.

Our investment in talent and skill development is at the heart of the success of our fast, profitable and sustainable growth strategy, Vision 2025. It is our employees who have made it possible for Ethiopian to continuously register an average growth of 20 percent to 25 percent per year in all operational parameters over the last decade. Just to give an example, in 2004 we were making \$390 million in revenue. In 2013, we had a turnover of close to \$2.5 billion, becoming the largest African airline. This is staggering growth by any standard in any industry. It is even more remarkable that we achieved this feat in an industry that is highly capital intensive, skill-driven and hypercompetitive.

Our performance also speaks volumes about the soundness of our 15-year strategic roadmap (Vision 2025), in an industry that is not accustomed to the notion of long term planning. Given our current growth track, we are well on our way to becoming a \$10 billion company by 2025.

Of course, it is a great personal satisfaction and honor for me to be at the helm of my beloved airline in such exciting times. I literally grew up at Ethiopian, having joined the airline right after school, and have remained with the carrier for almost 30 years. Ethiopian is not just my workplace. It is my second family. My passion and love for the airline knows no bounds. The same holds true for my colleagues in senior management positions. I think that Ethiopian management and employees love and dedication to their national carrier is truly unique and without parallel in our industry.

I remain optimistic that in the twenty-first century Africa will have a strong, globally competitive and indigenous airline industry. My optimism is backed by the continent's strong fundamentals: a billion and young population, rapid urbanization and fast-growing middle class, most of the world's uncultivated arable

land, and many of the world's mineral and natural resources combined with improved governance mean that Africa's GDP will grow at six percent for the foreseeable future and that FDI flows will be robust. This will translate into higher travel demand, which in turn should generate more business for African airlines if the continent's decision makers and airlines get their policies and strategies right.

In his book Dr. John Wensveen, a leading expert on aviation with not just academic but extensive hands on experience of our industry, covers all the critical issues that are shaping our industry. His astute and in-depth coverage of the mega trends in our external operating environment and the way our industry is responding to these changes with new business models and economics as well as the success factors in critical areas such as fleet planning, scheduling, marketing, pricing and labor relations, makes his book particularly relevant for airline industry executives who want to understand the big picture and how to come out on top. But the scope and depth of the issues he covers makes his book pertinent to all who are interested in our industry, whether they are policymakers, academicians or outside observers. It is definitely a must read.

Tewolde Gebremariam
CEO, Ethiopian Airlines Group

Preface

Since the last edition of this book was printed, the global aviation industry has changed as a result of new trends and challenges. Along with such, the industry has also been faced with new opportunities and strategies. The eighth edition of *Air Transportation: A Management Perspective* addresses the reasoning behind such changes and attempts to forecast the future to a certain degree in terms of how air transportation will evolve.

Aviation continues to be the most high-profile industry in existence but perhaps, one of the most neglected in terms of infrastructure investment. The technology exists to make the industry more efficient and profitable and yet, such technology is not utilized to the fullest extent due to a lengthy list of factors. This book attempts to address some of the related issues with the goal of stimulating the reader to seriously reflect on the historical and current aspects of aviation. It is the author's desire to educate the reader on the inner workings of the industry so we all have a better understanding of how to predict the future and implement strategies with positive results. In the airline industry specifically, success is often measured by one's ability to show up at the office and turn the lights on. The industry must make changes eliminating the mentality of short-term vision and think about how to achieve long-term success while addressing the various internal and external variables thrown one's way.

The eighth edition remains introductory in nature providing the reader with a solid foundation of the air transportation industry and a greater appreciation of the major management functions within an airline. Various references are provided at the end of each chapter encouraging the reader to explore and keep abreast of current periodicals and web sites. The reader should grasp enough knowledge to reason accurately and objectively about problems facing the industry and the development of a lasting interest in the air transportation industry. The basic concepts and problems facing the industry in a straightforward and logical fashion are presented throughout each chapter.

CHANGES IN THE EIGHTH EDITION

The airline industry is constantly evolving, making it difficult to document current trends due to the delay between writing and publishing the book. The eighth edition of this text has been updated to address trends, challenges, opportunities, and strategies to the fullest extent possible. Additionally, there is an increased focus on the global industry with many highlights on the six regions of the world as defined by IATA (North America, Latin America/Caribbean, Asia-Pacific, Europe, Middle East, Africa). The reader is guided through the ins and outs of the air transportation industry as well as through the details of management functions within airlines. A new chapter on airlines in social media has been added. Tables, figures, statistics, key terms, websites, and review questions have been updated.

TEACHING AND LEARNING AIDS

The substantive content of a textbook is only part of what makes it usable in the classroom; for the book to be effective, its content must be taught by instructors and learned by students. To facilitate the process, this edition continues to pay particular attention to teaching and learning aids, such as the following:

1. *Chapter outlines.* Each chapter opens with an outline of the major topics to be covered.
2. *Chapter checklists.* After the outline, each chapter includes a checklist of objectives that students should be able to accomplish on completing the chapter.
3. *Relevancy.* Most of the examples, applications, and extensions of the basic material are drawn from and apply to the air transportation environment of the 1990s.
4. *Staying power.* The text is designed to have staying power over the years. It emphasizes the underlying principles, practices, and policies that will not change appreciably over time. It is recognized that instructors will supplement the material with current, topical applications and events.
5. *Figures and tables.* Important points in each chapter are illustrated with strong visual materials.
6. *Logical organization and frequent headings.* Air transportation can easily become overwhelming in its multitude of topics, concepts, practices, and examples. The material covered here has been put in a systematic framework so that students know where they have been, where they are, and where they are going in the text. Frequent headings and subheadings aid organization and readability.
7. *Key terms.* Each chapter concludes with a list of key terms used in the text.
8. *Review questions.* Review questions at the end of each chapter address important points.
9. *Appendix and suggested readings.* One chapter includes an appendix that is of practical interest and that reinforces the material covered. A list of suggested readings is included in each chapter for students who wish to pursue the material in greater depth.
10. *Career appendix.* This edition once again includes an appendix on jobs in the air transportation field and ways to get them.
11. *Glossary of air transportation terms.* All key terms appearing at the end of each chapter, as well as many other terms used in the text and others of significance in air transportation, are included in the glossary.
12. *Complete index.* The book includes a complete index to help students find needed information.

INTENDED AUDIENCE

Because the aspirations of most students of air transportation (and, for that matter, most career paths) lead to the airline segment of the air transportation industry, the major focus of this text is on the management functions and organization of airlines. However, the significance and contribution of general aviation is not overlooked.

This book is intended for three somewhat different audiences with similar interests: students enrolled in a course such as “Air Transportation” or “Airline Management”; students in transportation and traffic management programs who wish to gain more insight into the air transportation industry because most of their classes concentrate on surface transportation modes; and individuals who work for an airline and want to gain a better understanding of managerial aspects. Too often, an airline employee, as a specialist, sees only a limited part of the overall operation and has little, if any, knowledge of such important subjects as marketing, pricing, scheduling, and fleet planning. Even individuals within marketing—reservations, for example—have little appreciation of their company’s growth strategies and market segmentation. These employees are simply too busy fulfilling the functions of the particular job description.

ORGANIZATION OF THE TEXT

The following is an outline of *Air Transportation: A Management Perspective*, eighth edition.

Part One An Introduction to Air Transportation

- Chapter 1** “The Airline Industry: Trends, Challenges and Strategies.” **Chapter 1** provides the reader with a solid overview of the different stages of development impacting the airline industry alongside past, present and future trends. In addition, the main challenges and strategies are presented leading into a discussion on the new breed of airlines.
- Chapter 2** “Aviation: An Overview.” **Chapter 2** introduces students to the characteristics, scope, and economic significance of the aerospace industry and its major segments—the government market and the commercial market for air transport and general aviation aircraft. The air transportation industry is clearly defined, and its contribution to the economy is discussed in depth.
- Chapter 3** “Historical Perspective.” This chapter provides a historical sketch of U.S. airlines and general aviation, including the federal legislation that has affected their growth and development. The Airline Deregulation Act of 1978 and the circumstances leading up to it are thoroughly explored. The postderegulation era from 1978 to the early 2000s is discussed, including changes in the structure of the industry and new airliners entering the market (low-cost carriers, virtual carriers, and mega-carriers).
- Chapter 4** “Air Transportation: Regulators and Associations.” This chapter discusses the roles played by the four primary federal agencies that interface with both segments of the air transportation industry: the Department of Transportation (DOT), the Federal Aviation Administration, the Transportation Security Administration, and the National Transportation Safety Board. The offices at the Department of Transportation responsible for carrying out the remaining functions of the former Civil Aeronautics Board are thoroughly explored. The purpose and major functions of the prominent aviation trade associations are also described.
- Chapter 5** “The General Aviation Industry.” This chapter concludes Part One by reviewing the general aviation industry, including its statistics and a description of widely diverse segments according to their primary use categories. Other topics include the role of general aviation airports, FAA services to general aviation, and the general aviation support industry, which, like a three-legged

stool, is made up of the manufacturers, the fixed-base operators, and the users of general aviation aircraft.

Part Two Structure and Economics of the Airlines

- Chapter 6** “The Airline Industry.” This chapter reviews the current structure of the U.S. airline industry and its composite financial and traffic statistics. A complete discussion of the postderegulation expansion, consolidation, and concentration of the industry is included. The growing role of regional carriers and new types of airlines is thoroughly discussed. This chapter also includes a section on airline certification, including types of and requirements for certification and offices within the DOT responsible for this important function. The current trend of intra-industry agreements, such as code sharing and other cooperative efforts, are described in detail.
- Chapter 7** “Economic Characteristics of the Airlines.” This chapter deals with the economic characteristics of oligopolies in general and the unique characteristics of airlines in particular. Attention is also given to the economic forces in the postderegulation period that have led to such mega-carriers as American, United, Continental, and Delta. The significance of airline passenger load factors is thoroughly explored. This chapter also discusses how the industry has changed since the events of 9/11 and current global events.

Part Three Managerial Aspects of Airlines

- Chapter 8** “Airline Management and Organization.” The opening chapter of Part Three introduces students to the principles and practices of airline management and organization. The different levels of management within an airline are explored, along with the functions of management planning, organizing, staffing, directing, and controlling. This is followed by a comprehensive review of organization planning and a description of a typical major air carrier’s organizational structure, including the purpose and function of various administrations and departments. Departmentalization and the need for new divisions within the organization, such as safety and security and training, are introduced.
- Chapter 9** “Forecasting Methods.” Forecasting is extremely important in the management of airlines. All planning involving personnel and equipment needs is based on forecasts of future traffic and financial expectations. For this reason, this chapter naturally precedes all of the chapters relating to the other managerial aspects of airlines. The purpose of this chapter is to expose students to the primary forecasting methods used by firms engaged in air transportation.
- Chapter 10** “Airline Passenger Marketing.” This chapter begins with a discussion of how the marketing of air transportation has changed over the years. The marketing mix (product, price, promotion, and place) is analyzed in depth, and the consumer-oriented marketing concept of the late 1990s and early 2000s is discussed. Various current airline marketing strategies are then explored, including such intensive approaches as gaining deeper market penetration, increasing product development, and developing new target markets. Direct marketing, computerized reservation systems (CRSs), travel agents, frequent-flier programs, business-class service, code sharing, hub-and-spoke service, and advertising and sales promotion are all highlighted.

- Chapter 11** “#Airlines in Social Media.” This chapter discusses social media and how airlines exercise their presence on social media. The objectives of the airlines’ presence on social media as well as the major aspects of social media campaign development are presented. Several examples of airline best practices in crisis management through social media are included as well as airline best practices in driving customer service and revenue.
- Chapter 12** “Airline Pricing, Demand, and Output Determination.” This chapter focuses on pricing, certainly one of the most volatile of the “four Ps” of marketing since deregulation. Subjects include the determinants of airline passenger demand and elasticity of demand. The types of airline passenger fares are discussed, followed by in-depth coverage of the pricing process, including pricing strategies and objectives, pricing analysis, and the steps involved in analyzing fare changes. The important role of inventory, or yield, management is addressed as well. This is followed by an in-depth discussion of airline operating costs, profit maximization, and output determination in the short run.
- Chapter 13** “Air Cargo.” After a brief discussion of the history of air cargo in the United States, students are introduced to the importance of air express and air freight today and to the expectations for future growth in the industry. The market for air freight is then covered, including the types of air freight rates. Special air freight services are discussed, as are factors affecting air freight rates. The concept of the very large aircraft (VLA) is also discussed.
- Chapter 14** “Principles of Airline Scheduling.” Unquestionably one of the most critical and yet most difficult tasks facing airline management is scheduling equipment in the most efficient and economical manner. This chapter deals with the many internal and external factors that affect schedule planning. Types of schedules are discussed, along with several examples of how a carrier goes about putting a schedule together. The chapter concludes with a discussion of hub-and-spoke scheduling and its importance in the competitive postderegulation environment of the 1980s, 1990s, and 2000s.
- Chapter 15** “Fleet Planning: The Aircraft Selection Process.” The decision to purchase new aircraft is certainly one on which management expends a great deal of time and effort. This crucial decision will entail millions of dollars, and its effects will remain with the carrier for years. Students are introduced to the aircraft selection process, first from the standpoint of the manufacturer and then from the individual carrier’s viewpoint. The trend toward leasing is thoroughly explored, along with the growing problem of noise restrictions on older aircraft. All of the inputs to the process are addressed, as are the criteria by which a carrier evaluates a particular aircraft. The new generation of aircraft, including the regional jet and new long-range twin-engine aircraft, are introduced. The chapter concludes with an appendix demonstrating the fleet-planning process at American Airlines.
- Chapter 16** “Airline Labor Relations.” Representing over 35 percent of a typical carrier’s operating expense, labor is certainly one of the most important areas of concern to management. This chapter opens with a thorough discussion and analysis of the Railway Labor Act, followed by a review of the collective bargaining process under the act. A historical sketch of airline union activity in the United States, beginning in the 1930s through the postderegulation period, is also provided.

This chapter educates the reader on trends affecting future development of human resources departments. The chapter ends with an overview of the collective bargaining process in recent years and its impact on the carriers.

Chapter 17 “Airline Financing.” This chapter takes up the problem of airline capital financing. The major sources of funding are examined, followed by a discussion of the sources and the use of funds over the two decades following the introduction of jets. The final portion of this chapter deals with funding sources in the 2000s and the important subjects of cash management and financial planning.

Part Four The International Scene

Chapter 18 “International Aviation.” The final chapter rounds out the text coverage of air transportation by adding the dimension of international aviation. Air transportation plays a significant role in the movement of passengers and cargo between countries, and this chapter discusses how the various international conferences and conventions have shaped worldwide aviation. The last section of the chapter covers the international aviation market following the passage of the International Air Transportation Competition Act of 1979. The subjects of globalization and international airline and airport alliances are thoroughly explored.

Appendix “Career Planning in Aviation.” This appendix provides a structured approach to the all-important subject of career planning. Students are taken through the steps of choosing and getting their first job in aviation, identifying sources of career information, developing résumés, and preparing for an interview. Included are numerous job descriptions from all segments of the aviation industry.

A NOTE TO INSTRUCTORS

Anyone who has taught courses in air transportation has surely recognized the paucity of texts on the subject. The few books that are available either are too broad in scope, resulting in a shallow overview of most topics, or examine a particular segment of the industry or phase of management in depth but with very little breadth. I have attempted to take a balanced approach, recognizing that most instructors will have their own ideas regarding the importance of the subject matter under discussion and will supplement the text with their own materials accordingly. Statistics appearing in tables and charts have been drawn from easily accessed sources, such as *Aerospace Facts and Figures*, *FAA Statistical Handbook*, and ATA annual reports, so that they can be readily updated by users of the text.

This book is designed to carry its fair share of the burden of instruction. Students using this text should not rely on you for detailed, repetitive explanations. Less class time is required to generate functional understanding of the subject, so more time is available for class discussion and the application of the material to current issues. In researching this book, I acquired a wealth of materials, most of them free, from numerous sources, including the DOT, RITA, FAA, NTSB, ICAO, A4A, RAA, and *World Aviation Directory*. The air carriers are a rich source of material that can be used to supplement your course: write to the particular department about which you are seeking information. GAMA, AIA, A4A, and individual aircraft manufacturers can also supply a host of materials.

Another source that I have found helpful in our courses is the Harvard Business School Case Services, Harvard Business School, Boston, Mass. 02163. Some of the air transportation cases will be appropriate for your courses, and the students will enjoy them.

Suggested Outlines for a One-Semester Course

Courses in air transportation vary in content and emphasis, and so will the uses of this book. Some courses may cover the material from beginning to end; others will focus on certain sections and omit the rest. Parts One and Two offer a broad-based introduction to air transportation and should be suitable for most users. Airline management courses might focus on Parts Three and Four.

These recommendations are flexible. Other combinations are possible.

Chapter Topic	Introductory Air Transportation Course	Airline Management course	Aviation Administration
1. The Airline Industry: Trends, Challenges and Strategies	•	•	•
2. Aviation: An Overview	•	•	•
3. Historical Perspective	•	•	•
4. Air Transportation: Regulators and Associations	•	•	•
5. The General Aviation Industry	•		•
6. The Airline Industry	•	•	•
7. Economic Characteristics of the Airlines	•	•	•
8. Airline Management and Organization	•	•	•
9. Forecasting Methods		•	
10. Airline Passenger Marketing		•	•
11. #Airlines in Social Media	•	•	•
12. Airline Pricing, Demand, and Output Determination	•	•	•
13. Air Cargo	•	•	•
14. Principles of Airline Scheduling	•	•	•
15. Fleet Planning: The Aircraft Selection Process		•	•
16. Airline Labor Relations	•	•	
17. Airline Financing		•	
18. International Aviation	•		•
A. Career Planning in Aviation	•		

A NOTE TO STUDENTS

I hear and I forget

I see and I remember

I do and I understand

—Confucius

The most effective and interesting way to learn any subject is by doing it. No professor or textbook could ever

teach you all about air transportation; all they can do is help you to learn it. Much of the learning process is up to you. This text has been designed to be easy to understand. Usually, as you read the text, you won't have to struggle to get the meaning of a concept or principle. But understanding is one thing; learning something well and applying it to current events is something else.

Before starting a chapter, review the chapter outline and checklist. Take notes and highlight the major points as you proceed with your reading. After reading the chapter, see if you can accomplish the objectives listed in the chapter checklist. The review questions at the end of each chapter are also designed to bring out the most important points made in the chapter.

Become familiar with aviation trade journals and magazines. You will be surprised to see how many articles there are relating to the material discussed in class. This literature will not only enhance your own knowledge of the subject matter but also enrich your classroom experience as you discuss the material with classmates.

This is probably one of the most exciting periods in the brief history of our air transportation industry. With the passage of the Airline Deregulation Act of 1978, and the emergence of liberalization and open skies we have witnessed the emergence of a completely new structure for air transportation services in the United States and around the world. The industry stands poised for a new surge of growth. Many new career paths will surface in the next several years for those of you who have prepared for them. Good luck!

Acknowledgments

My passion for aviation began at the age of three when I had to evacuate a Boeing 747 with an engine fire. I was dressed in a US Air Force pilot's uniform proudly displaying my wings. Little did I know the events of that day would change the course of my life and fly me down a path to a lifelong career in aviation. As a small child, my dream was to learn to fly and after a few hours playing with the stick and rudder, and a few years of maturity, I realized my real passion was aviation business.

I owe many thanks to the pioneers of aviation and the entrepreneurs of today that continuously amaze me with new developments. There are few industries in existence where one can go to sleep at night and wake up the next morning faced with challenges that did not exist the day prior. The excitement created by the daily stresses of this business keeps me going and striving toward the design of the ultimate airline business model. Is this even possible?

Many thanks are owed to industry sources who provided a great deal of material that was extremely helpful in putting together this textbook. Thank you to the Department of Transportation, Research and Innovative Technology Administration, Transportation Security Administration, National Transportation Safety Board, Federal Aviation Administration, Airlines 4 America, Regional Airline Association, National Business Aviation Association, Aircraft Owners and Pilots Association, International Civil Aviation Organization, and the International Air Transport Association. Additional thanks to Airbus Industrie and The Boeing Company.

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A very special thanks is owed to three aviation professors for assisting with revisions of the eighth edition of this text. Dr. Benedikt Badanik, Air Transport Department, University of Zilina (Slovakia) authored [Chapter 11](#), “#Airlines in Social Media.” Dr. Rico Merkert, Institute of Transport and Logistics Studies, The University of Sydney Business School (Australia), assisted with revisions to [Chapter 7](#), “Economic Characteristics of the Airlines”, and [Chapter 13](#), “Air Cargo”. Dr. Xiaowen Fu, Institute of Transport and Logistics Studies, The University of Sydney Business School (Australia), assisted with revisions to [Chapter 18](#), “International Aviation”.

A very special thanks is owed to Dr. Rhett Yates, Davis Aviation Center, Jacksonville University, and three hard-working students for assisting with data collection: Steven Paduchak (President, Jacksonville University Aviation Ambassador Program), Chris Manis, and Joshua Holt. A very special thank-you is owed to my graduate research assistants at Purdue University (Department of Aviation Technology), Wesley Major and Lukas Rudari. Both these guys are superstars with bright futures in aviation.

A textbook of this nature cannot come together without the assistance of a team. Thank you to Dr. Alexander Wells for believing in me to carry on the legacy and Ashgate Publishing, especially Guy Loft.

John “Air Bear” Wensveen

PART ONE

An Introduction to Air Transportation

1

The Airline Industry: Trends, Challenges and Strategies

Introduction

Stages of Development Impacting the Airline Industry

Past, Present and Future Trends

Regional Analysis

The Industry: Challenges and Strategies

The New Breed of Airlines

Failing and Achieving Success

Chapter Checklist • You Should Be Able To:

- Define the four stages of development impacting the airline industry
- Discuss the main trends impacting the global airline industry including regional challenges
- Describe and discuss the main critical financial issues and challenges associated with air transportation
- Understand the main strategies for global aviation in order to achieve success
- Discuss the different types of air carriers evolving and the main factors behind success and failure
- Describe how evolving new technology may impact the future of aviation

INTRODUCTION

In previous editions of this book, [Chapter 1](#) provided an overview of the air transportation and aerospace industries. Given the volume of change constantly occurring in the aviation industry, it is important for the reader to have a full understanding of the global airline industry before proceeding with the other chapters in the book. Having knowledge at the macro level will assist the reader in better understanding the other chapters presented. This chapter provides a background on the current global industry including a regional analysis, discusses current and future evolvement of the industry in terms of trends, discusses challenges and strategies impacting the industry, discusses the new breed of airlines, and discusses why airlines fail and what can be done to achieve success. [Chapter 1](#) presents an overall framework to supplement the other chapters in the book. As a result, some information presented in this chapter will be repeated in other chapters and discussed in greater detail.

STAGES OF DEVELOPMENT IMPACTING THE AIRLINE INDUSTRY

Historically, the United States aviation industry has been the center of focus for discussions related to history, change, challenges and strategies. One of the main reasons for this is because the U.S. has traditionally been at the forefront of evolvement in the aviation industry and that is the one major reason why the bulk of reference material on the market is heavily concentrated on the U.S. airline industry. However, as the rest of the world

experiences increased change in political environments, different regions of the globe are becoming more important in terms of change, resulting in decreased emphasis on the U.S. industry. Although some experts disagree, there are four stages of development impacting the airline industry in terms of maturity. Some regions of the world have skipped a step or two resulting in both positive and negative results for the industry. With that said, the logical stages of development include: regulation, liberalization, deregulation and in some cases, re-regulation. The first three stages of development are discussed in greater detail throughout the book.

Stage I: Regulation

At one point in time, the bulk of the global airline industry was heavily regulated meaning governments had strict control of the industry in terms of air fares, routes and market entry of new airlines. The main factors resulting from a regulated environment include, but are not limited to, the following: strict ownership control of airlines, limited to no competition on selected routes, limited markets served, limited city-pair frequency, high air fares for passengers, government bail-outs for air carriers in distress, and incentive to achieve airline profitability.

Stage II: Liberalization

In a liberalized environment, there is less government control of the industry compared to a regulated environment. Although liberalization generally brings positive results to the industry, one large barrier to implementation is that the global airline industry cannot implement seamlessly or simultaneously. However, the industry does recognize the need to implement where appropriate and as of mid-2011, the industry appears to be moving forward in a positive direction with increased bilateral negotiations between countries. As per the International Air Transport Association (IATA) liberalization allows for expansion into new markets, diversification into new products, specialization in niche products, and market exit for air carriers not able to succeed in specific competitive markets.

Stage III: Deregulation

In a fully deregulated environment, government controls like entry and price restrictions for air carriers are removed allowing airlines to serve any given route and freely compete with other carriers. In many ways, deregulation is the opposite of regulation. Generally speaking, air fares are substantially decreased, safety is improved, and service quality increases (i.e., route frequency, total number of miles flown, on-time performance, frills and amenities). In the case of the United States, selected small- and medium-sized airports have not felt the true benefits of deregulation because of the limited amount of competition in each market.

Stage IV: Re-regulation

In 2007, the United States airline industry entered formal discussions regarding the possibility of re-regulating the industry as a result of merger discussions between American Airlines and Northwest Airlines and United Airlines and Continental Airlines.

In a re-regulated environment, the government would have a role in pricing and restrict airlines from

selling air fare below actual cost. Re-regulation would also result in changes to the Railway Labor Act, as discussed in later chapters of the book, where unions would not be permitted to strike resulting in binding arbitration. Suggested changes also include restricting airlines to utilizing larger aircraft on certain city-pairs resulting in decreased frequency. Also, the air traffic control system would be updated to increase efficiency of the national air transport system and decrease delays at hub airport facilities throughout the country. As the airline industry restructures, it appears there will be increased expansion, increased consolidation, and increased concentration.

By 2014, a number of changes impacted the U.S. airline industry as a result of merger deals between legacy airlines. The industry moved from having eight major players to essentially four. American Airlines and US Airways merged to create a new American Airlines. Delta and Northwest merged to create a new Delta. United and Continental merged to create a new United. Southwest and AirTran merged to create a new Southwest.

Some industry experts argue that the U.S. airline industry is in a re-regulation phase given the Justice Department's decision to allow such mergers to occur. Experts argue that consolidation in the industry reduces competition, ultimately creating monopolies at select key airports across the country. Experts on the other side argue consolidation is a positive thing for the industry as it creates new opportunities for low-cost carriers and new start-ups.

Technically, as of 2014, the U.S. airline industry was deregulated but there are emerging trends incorporating forms of re-regulation. What happens in the next decade in terms of deregulation v. re-regulation will be dependent on the success of the existing air carrier structure. Unfortunately, it is not possible to forecast the future as the airline industry is unpredictable and volatile.

PAST, PRESENT AND FUTURE TRENDS

The Global Airline Industry

Since the terrorist attacks on the United States on September 11, 2001, the global airline industry has experienced four phases of evolution: survive, adapt, recover and rethink. The rethink phase is an ongoing process forcing air carriers worldwide to constantly enhance business models to achieve profitability while maintaining a safe and efficient operation. In the new operating environment, airlines are no longer defined as airlines but as businesses where only the fittest survive. If the bottom line is not met, the air carrier disappears and is often replaced by a new competitor or an existing competitor expands its operation.

Scenarios

In the past decade, the global airline industry has faced a long list of negative scenarios resulting in high barriers for successful operations. Some of these scenarios include: 2003 outbreak of Severe Acute Respiratory Syndrome (SARS), the Iraq War, the Afghan War, the ongoing Syrian crisis, and the 2008–2012 financial crisis. In the year 2014 onwards, airlines will be forced to prepare for additional scenarios whether they occur or not. Preparation includes developing a flexible business plan allowing the airline to adapt to most any environment. Historically, well-established airlines have not done a great job adapting to fluctuating

environments because of their dependency on legacy-based systems. New air carriers, particularly those known as “low-cost” carriers have been able to withstand changes in the global environment because their business models incorporate flexibility. With that said, not all such airlines have been able to survive. Moving forward, airlines must prepare for globalization, changes in the international political landscape, distribution of natural resources (oil, gas, water), internal conflicts (shifts in power), unintended consequences and unintended consequences from good intention, public and international perception, war, terrorism, and continued financial issues.

The Top Five Frustrations in Aviation

The airline industry is perhaps the most high-profile industry in the world, but it is also considered one of the most neglected in terms of investment. With that said, the airline industry faces numerous frustrations and the list is lengthy. For the purpose of discussion, the author highlights what are considered to be the top five frustrations impacting aviation today (in random order). These include: fuel and oil; pollution control; personnel cutbacks; global economic woes; and recurring safety lapses. Additional areas of debate include: costs associated with Air Navigation Service Providers (ANSP); government interference; the environment and efficient infrastructure; security and taxation. Such topics are discussed in greater detail throughout the book.

The Top Three Costs for Airlines and Typical Airline Operating Expenses

The top three costs for most airlines, in any order, are: fuel, labor and maintenance. In the United States, fuel was approximately 40 percent of airline operating costs in the year 2013 as per IATA. Actual costs associated with airline operations vary region by region, country by country, and company by company. In the U.S., the Air Transport Association (ATA) produces a Passenger Airline Cost Index on a quarterly basis. The author recommends the reader consult the ATA web site to get a better understanding of costs associated with operating an airline. The index takes into account the following costs: fuel; labor; aircraft rents and ownership; non-aircraft rents and ownership; professional services; food and beverage; landing fees; maintenance material; aircraft insurance; non-aircraft insurance; passenger commissions; communication; advertising and promotion; utilities and office supplies; transport-related; and other operating.

The Aviation and Aerospace Almanac lists typical operating expenses as: ticketing, sales, promotion; general administrative; fuel and oil; station expenses; passenger services; maintenance and overhaul; flight crew; depreciation and amortization; landing and associated airport charges; en route facility charges; and other operating costs. For specific percentage breakdowns of costs, the reader is encouraged to review ICAO Air Transport Reporting Form EF-1.

REGIONAL ANALYSIS

Airlines are important to the global economy because they link regional economies with the rest of the world. When the economy is doing well, airlines tend to profit but when the economy is not doing well, airlines tend to lose profit, often being the first and hardest hit industry in turbulent times.

In order to better understand the aviation industry, it is important to have a global understanding of how

the industry functions as well as a regional understanding. Just because one region is successful, it does not mean another region is following similar patterns. However, the effects of a region do have positive and negative impacts on other regions causing what is called the domino effect or a chain reaction.

At the end of 2009, the aviation industry suffered from a global economic crisis the implications of which will never be fully known. According to IATA, airlines worldwide lost a combined US\$11 billion in 2009 due to rising fuel costs and reduced earnings on fares and cargo. Despite indications of certain economies returning to positive environments, the positive impact on air carriers worldwide has been slow to grow. As a result, airlines have been shrinking capacity to accommodate reduced bookings for first and business class travel. Typically, when the economy suffers, the volume of business travel is reduced or eliminated by many corporations negatively impacting high-end fares.

By the end of 2012, business confidence had bottomed out and there was the expectancy that business activity would increase dramatically. However, by early 2014, this trend had not occurred. In 2013, GDP growth averaged 2 percent compared to 2.2 percent in 2012 with developed nations doing better than developing nations like India, Brazil, and China. In 2013, oil prices were approximately US\$109 per barrel while jet fuel averaged US\$126 per barrel. The 2013 fuel bill for the global airline industry was approximately US\$213 billion or 31 percent of total costs. In 2013, passenger growth fell to 5 percent from 5.3 percent in 2012. IATA expected worldwide passenger numbers to reach 3.12 billion by end of 2013, early 2014 combined with record load factors of 80.2 percent. Demand for air cargo is declining and for 2013, growth was only 0.9 percent forcing airlines to focus on passenger traffic. Air cargo revenue reached a peak in 2011 declining to \$59 billion in 2013 while passenger revenue increased reaching \$565 billion.

Table 1-1 highlights current regional regulatory trends. Depending on what direction regional and global economies take, such regulatory trends may change to adapt to the changing environment. It is expected the volume of airline consolidation will increase to compensate for increased operating costs and increased competition in specific markets.

TABLE 1-1 Regional Regulatory Trends

Region	Regulation	Liberalization	Deregulation	Privatization
North America	No	No	Yes	Privatization
Latin America	No	No	Yes	Privatization
Europe	No	Yes	No	Privatization
Asia-Pacific	No	Yes	Yes	Privatization
Middle East	No	Yes	No	Limited
Africa	No	Some	No	Cautious

North America

In terms of regulatory trends for North America, Canada has experienced the privatization of airlines, airports, Air Traffic Control (ATC), and the rise of the low-cost airline. The United States has experienced the rise of the low-cost carrier, government control of airports, the development of secondary airports, major airline debt, bankruptcies, mergers, stagnant domestic passenger growth, and increased international growth.

U.S. domestic routes have been hit hard in recent years. Mexico has experienced government control of the industry and bankruptcies in addition to the emergence of the low-cost airline.

Although most U.S. airlines utilize a hub-and-spoke strategy as defined later in this book, some airlines are now implementing de-hubbing or de-peaking strategies to spread flights more evenly throughout the day, allowing airlines to use their resources in a more efficient manner. Such a strategy also allows for a reduction in energy which ultimately reduces airport congestion. Aircraft fleets are becoming more simplified as airlines realize the high costs of operating mixed fleets. Automation initiatives are being implemented to improve customer service and enhance productivity. Airlines are changing distribution methods with a huge reliance on the Internet for ticket sales and there is a shift in in-flight services to more economical offerings.

Consolidation seems to be a modern trend as seen with recent mergers among the legacy airlines. Additionally, the subject of regulation has reappeared and there is talk about the possibility of moving from a deregulated environment to a re-regulated environment.

Europe (European Union)

In terms of regulatory trends for Europe, the Third Package was implemented in 1997 creating a fully liberalized environment. Airlines have privatized and the region has experienced the growth of low-cost airlines and the growth of alliances including airlines and airports. Competition between different modes of transportation has impacted the airline industry, especially the use of high-speed rail. The theme for the future of the European Union (EU) is “leadership in air transport regulation”. National pride continues to be an issue for the industry and many challenges will continue to be faced as the EU expands its geographic boundaries.

In recent years, Europe has seen the slowest growth among the six main regions partly due to economic instability in select regions of the Eurozone. Airlines serving the intra-European markets are not performing as well as airlines serving long-haul markets.

Asia-Pacific

In terms of regulatory trends for Asia-Pacific, the region has experienced managed liberalization and change has been slow compared to North America and Europe. The region has felt the positive rewards of strong growth since late 2001 especially in China and India. Interestingly, the busiest international route in the world is Hong Kong–Taipei.

The region is somewhat unique in the sense that there is no regional organization providing many opportunities as well as challenges. Megacarriers and small international carriers co-exist and there are limited interline agreements despite having the largest share of the world economy. There has been increased growth in the development of airline alliances and the region faces increased airport and airspace congestion as well as competition. There is a dire need for advanced navigational equipment to improve efficiency and enhance safety measures.

Due to the decreased demand for air cargo, Asia-Pacific has been hit fairly hard resulting in flat performance. Air cargo operators in Asia-Pacific have the largest cargo fleets forming a direct correlation with demand.

Middle East

In terms of regulatory trends for the Middle East, the region has experienced fairly stagnant growth in recent years due to the great divide between rich and poor. Historically, the passenger market was limited forcing airlines to bank on repeat travel by passengers. Today, airlines are implementing low-cost strategies and there has been an emergence of low-cost carriers. The Middle East is strategically positioned and the use of efficient hub airports has resulted in a stronger presence in the long-haul markets. Safety and security continue to be issues requiring addressing.

Africa

In terms of regulatory trends for Africa, airlines do not really contribute much to the economy due to the low propensity to fly. Standards are low compared to other regions of the world particularly when looking at safety and the environment. North Africa appears to be growing at a higher rate compared to other parts of the region. North Africa's air transport is estimated at 4–6 percent per year for the period 2000–2013. There has been increased stability in the region which will hopefully increase the propensity to fly variable over the next decade.

Africa operates an older aircraft fleet mainly due to the low standards issue and lack of capital. The average aircraft age in Africa is more than 20 years and there continues to be large utilization of what are referred to as Stage I and II aircraft (i.e., Boeing 727). Such aircraft are inefficient to operate, noisy, and damaging to the environment. It is estimated that up to 1,000 new aircraft will be required over the next decade to replace antiquated technology.

Since 1992, the region has experienced airline integration, restructuring, and commercialization. Gradually, flag carriers have become more self-reliant and there has been increased privatization and less government control in the industry. There is a strong need for training especially at the management levels to cope with global trends. In addition, there is the need for autonomy in civil aviation authorities and improved and additional infrastructure. Airlines need to learn to work together as partners rather than compete and it is expected that as the industry matures, low-cost carriers will enter certain markets.

Latin America/Caribbean

In terms of regulatory trends for Latin America/Caribbean, there is a shift from regulation toward liberalization. The region has experienced increased passenger growth and competition as well as increased alliances. Airlines are developing corporate strategy and a competitive strategy to cope with competition. There is a strong need for training at the management levels as well as a need for research and development. Brand culture is very important in the region and there has been an increased focus on safety in recent years.

Throughout the region, airlines are thinking as a business and not necessarily as an airline in the traditional sense. Cost-saving initiatives are being implemented and governments have learned the economic benefits of successful air carrier operations. There is a strong debate about the regional airport system and whether airport privatization has failed or not.

Safety performance continues to be an issue in Latin America/Caribbean with an annual average of 14

percent of the industry's total incidents. This percentage is high considering the region makes up approximately 5 percent of the world's total traffic.

There has been an increased emphasis on improving environmental performance with investments in new technologies, efficient use of infrastructure, more effective use of aircraft operations, and discussions on emissions trading.

THE INDUSTRY: CHALLENGES AND STRATEGIES

Forces Impacting the Airline Environment and Infrastructure Issues

There are a number of forces impacting the airline environment including internal and external. The main forces include physical, economic, political and/or legal, socio/cultural, demographic, and technological. Airline management must be aware of all the factors that arise or could arise as applied to each force. The airline has the ability to control certain aspects of the forces but cannot control other aspects. For example, the airline can prepare strategies to combat competition but cannot fully insulate itself from the threat of competition like new entrant carriers (i.e., deregulated/liberalized environment; freedom of entry/exit; aircraft availability) or new substitutes (i.e., telecommunications, video conferencing). The airline does not have control over the power of the customer or the power of market intermediaries.

It has been said that aviation is the highest-profile industry in existence but also the most neglected in terms of infrastructure investment. There has been an ongoing debate about where such investment is needed and although there is often a strong consensus addressing specific areas, there is frequently strong resistance. For example, in the U.S., ATC technology is antiquated and most agree it should be updated. However, there is the possibility that other countries will be able to tap into U.S. technology and take advantage of it without paying for it.

Capacity in the sky and on the ground is an important topic in the global aviation industry. If there is no additional investment into capacity infrastructure, and demand is greater than capacity, there will be increased congestion and delays resulting in increased costs and loss of economic benefits. Investment into infrastructure development will result in an efficient air transportation system with economic benefits being realized. The above will be discussed in greater detail throughout the book.

Airlines must plan for the future when it comes to the changing regulatory requirements for pilot training. This is a global challenge and each country of the world will be impacted. For example, in the U.S., pilot training is a current challenge due to the 2013 Federal Aviation Administration (FAA) ruling, known as Public Law 111–216 (“The 1,500 Rule”), that says all commercial pilots must have a minimum of 1,500 flight hours to be hired by an airline (FAR Part 121). Prior to this ruling, the minimum hourly requirement was 250. The rule does not apply to all commercial pilots as there are exceptions for those who have been employed as military pilots and students graduating from select undergraduate programs from accredited colleges and universities. In short, the new rule was passed to increase safety in an airline environment by providing enhanced training and increased experience before holding a first officer position. The 1,500 Rule stems from a Congressional mandate following the 2009 crash of a Colgan Air Bombardier Q400.

Critical Financial Issues and Challenges

As previously stated, the global airline industry will continue to face critical financial issues and challenges.

Table 1-2 outlines some of the major factors corporations must address in order to succeed.

TABLE 1-2 Financial Issues and Challenges Impacting Air Transportation

Cost controls	World economy
Access to capital markets	Irrational pricing and predatory action by major carriers
Insurance	Over-capacity
Foreign currency exposure	Cash flow and ability to self-finance
Fleet replacement and price of new aircraft	Debt/equity ratios
Industry losses and inconsistent profitability	Taxation
Cost of funds and low yield on surplus funds	Ownership issues
Productivity and labor reform	

TABLE 1-3 Challenges Impacting global Air Transportation

Bankruptcy and shut downs	"Generic" vs. "Airline" business plan
Flexible strategic plan	Treat as a "business"
Regulation, liberalization, deregulation	Rising costs (fuel, oil, labor, maintenance, security)
New generation airlines vs. legacies	Restructuring and alliances
Excessive capacity	Competition from other modes of transportation and technology
Customer (target, loyalty)	Organizational design
Internal challenges	Overall strategy
Duplication of work structures	Functional and departmental barriers
Staff relations and new types of employees	Legacy system dependencies
Lack of compromise	Air carrier ownership and control
Sustainability of air carriers and safeguards	Physical and environmental constraints
Air transport and the global trade mechanism	Consumer protection and passenger rights
Impact of technology (aircraft, e-commerce, Internet, Computer Reservation Systems, Global Distribution Systems) on liberalization process	Future approaches to regulatory reform
	Pilot training requirements

TABLE 1-4 Strategies for global Aviation

Understand the reality of change and become flexible	Revitalize strategy
Development of new types of air carrier business models	Focus on the customer and ask what they want
Eliminate duplication of work structures	Organizational accountability
Turn staff relations into strengths	Update airline systems
Build partnerships (alliances, interactive marketing)	Act decisively
Diversify the business (core and non-core)	Create new ways to reduce future costs and spending of capital
Increase efficiency	Reduce dependence on local, national, and international economies
Airlines must take control of business issues	Work in partnership with other organizations

Global Aviation Challenges in the 21st Century

The global aviation industry will face a long list of challenges in the 21st century due to the new operating environment resulting from the tragic terrorist attacks on the U.S. in 2001 and changing political environments. [Table 1-3](#) outlines some of the major challenges that are discussed throughout the book. The reader will gain a better understanding of most topics plus additional ones in upcoming chapters.

Global Aviation Strategies in the 21st Century

The global aviation industry is learning to adapt to the multiple changing environments in which it operates. The incorporation of flexible strategies is becoming more important than ever before leading to the development and implementation of new business models with various types of businesses under the umbrella of air transportation. [Table 1-4](#) outlines some of the global aviation strategies the industry must address. The reader will gain a better perspective on some of these topics as they are presented throughout the book.

THE NEW BREED OF AIRLINES

Since the terrorist attacks on the U.S. on September 11, 2001, the global industry has gone through multiple phases of development including survive, adapt, recover, and rethink. The latter phase is an ongoing phase that will never end forcing air carriers to constantly rethink business strategies. The main advantage of having to rethink regularly is that it forces management at the leadership level to strengthen the core business for long-term survival and success. As airlines rethink their business models and new entrants emerge based on new business platforms, new breeds of airlines will emerge and succeed as well as emerge and fail. The ultimate business model will probably never be developed because of the impossibility of being able to predict the future of the industry and all the factors that influence its growth. Although a frustrating scenario, excitement is added to the industry with the challenge of becoming the best.

There are different categories of air carriers to be discussed in an upcoming chapter, ranging from the true legacy airline to the regional/commuter to the low-cost airline to the specialized airlines including the network specialist, the product specialist, and the price specialist. Before discussing any of the above in great detail, the reader should know that the term low-cost airline has been a major buzz word in the industry over the past decade and there is the belief that low-cost means an efficient operation with “cheap” air fares.

Aside from the conventional airline industry, the world is preparing for the future of high-speed travel by air as well as space travel served by airlines. Richard Branson’s Virgin Galactic seeks to offer suborbital spaceflights and be the first airline in space. Billionaire and entrepreneur Elon Musk, who is co-founder of PayPal and CEO of Tesla Motors, is working on new hyperloop technology that, in theory, could transport passengers in pods at speeds up to 760 miles per hour. The hyperloop transportation system would propel passenger travel pods at high speed and high altitude creating a 30-minute trip between San Francisco and Los Angeles, for example.

Discombobulated Syndrome: What the heck does low-cost mean?

Low-cost airline is a frequently misused and misinterpreted word even by industry experts. For the purpose of

debate, there is no such thing as a low-cost airline but the reader can decide if that is true or not by consulting the chapters in the book. It is important to have a basic understanding of the above issue prior to moving forward with the readings so that there are no misconceptions about terminology used in the content. The industry tends to use numerous definitions for low-cost operations and the author wants to alert the reader of such because often multiple definitions mean the same thing. For example, a low-cost airline might refer to the following: low-cost carrier (LCC); low-cost/no frills carrier (LCC/NF); low-fare/high-value carrier (LFHV); less frills carrier; value carrier; budget carrier; or new generation carrier. The author refers to the above as discombobulated syndrome.

In upcoming chapters, the new breed of air carriers, discussions on the new airline/airport system, and newly developing trends in airline alliances will be introduced to the reader.

FAILING AND ACHIEVING SUCCESS

Historically, airlines have failed and airlines have achieved success in all regions of the world. As already mentioned, no business model is perfect and there is always room for improvement. Many lessons will be learned throughout the chapters in this book and the reader will recognize common traits leading to failure.

Failures in Airline Business Planning

Some of the common failures in airline business planning will now be highlighted and later discussed in upcoming chapters.

Undercapitalization is a common basis for failure. Existing airlines rarely have enough capital to keep up with high operational costs and start-up airlines rarely have enough capital to either launch the company or remain in business. Access to funding has become increasingly difficult and will most likely become more difficult until the global economy becomes more defined.

Overexpansion is another common trait associated with failure. There is often a common belief that bigger is better and sometimes, leadership feels it is better to have larger access to a market over a competitor rather than operate a successful and efficient operation. In certain cases, when an airline grows to a certain size, often measured by the amount of annual revenue, the airline has no choice but to continue growing due to various factors including size of infrastructure.

Lack of flexibility is a major negative factor impacting airlines worldwide. The business platforms of legacy carriers are often based on old regulatory environments designed to operate in a specific type of environment that no longer exists. Unfortunately, because the legacy carrier is often too established, it has difficulty adjusting to changing environments. However, newer carriers have a major advantage over legacy carriers because business platforms are developed incorporating flexible strategic parameters, allowing the airline to adapt to multiple changing environments as necessary.

“Wrong” money and “wrong” leadership are negative contributors when an airline seeks to be successful. Wrong money is invested by parties that do not understand the nature of the operation and as a result of having an active voice in the decision-making process, ultimately lead to the demise of an organization. Wrong leadership includes having the wrong person in the wrong job and in some cases, having the right person in the wrong job. Airlines, no matter how big or small, should make sure only right money is invested

into the organization and the right people should be placed in the right positions.

Unable to obtain sustainable, competitive advantage is a large factor contributing to failures in business planning. This is one of the reasons why some air carriers believe in the bigger is better philosophy. Market dominance is often more important than achieving profitability but as access to capital is decreased and government bail-out packages decrease, airlines will be forced to restructure strategies if they wish to remain afloat.

Finally, a failure to demonstrate revenue growth and profitability is a major failure in airline business planning. This is difficult to achieve but it must be done. Failure to identify market need is a common mistake made in the development of the airline business plan. It must be superior to any potential competitors' business plan and should be able to gain the attention of investors.

Achieving Success

The reader will quickly learn of the many failures associated with different types of businesses in the air transportation industry. There is a large focus on air carrier operations as this book concentrates on this but it also introduces the reader to other aspects of air transportation including general aviation, air cargo, and aerospace. In terms of discussing how to achieve success in the industry, airlines are the primary focus. The reader should be aware that different success strategies apply to different aspects of air transportation depending on the specific focus. However, as success relates to airlines, success can be achieved by following, but not limited to, some basic factors including: development of a solid airline business plan (not a generic business plan); incorporate flexibility; diversify business structures; recruit and hire the right leadership; implement steady and moderate growth strategies; implement effective cost-cutting strategies; practice aircraft fleet commonality; seek reasonable capital requirements; ensure that available tonne-mile remains congruent with demand (route/network realignment/optimization); shift capacity to take advantage of routes and markets where depressed currency will significantly increase value-for-money opportunities; improve balance sheets and credit ratings (prudent capital planning); develop strategies to counter continuing pressure on yields; carefully evaluate new partnerships and alliances; respond to consumer needs rather than dictate; create an environment that enhances labor/management relationships with cooperation; engage in effective lobbying efforts to influence critical government policies, laws, regulations, and taxes; eliminate inefficiencies; increase productivity to the greatest extent possible; and have a long-term vision rather than concentrating on "today".

KEY TERMS

Air Navigation Service Providers (ANSP)

Deregulation

De-hubbing

Liberalization

Low-cost carrier (LCC)

Railway Labor Act

Regulation

Re-regulation

Severe Acute Respiratory Syndrome (SARS)

REVIEW QUESTIONS

1. List the four stages of development impacting the airline industry and briefly describe how each has impacted the future direction of the industry.
2. What are the top five frustrations in aviation today? Describe each. What are additional areas of debate?
3. What are the top three costs for an airline typically? In addition, list other typical airline operating expenses. What is the name of the index that produces such costs? How often is the index published?
4. What are the six aviation regions of the world? Describe the regulatory trends associated with each region.
5. What are the main forces impacting the airline environment? What are the main infrastructure issues?
6. What are the main failures in airline business planning? Describe each in detail.
7. Other than airline travel as we know it today, what other forms of air transport are being developed? Describe how this emerging technology could impact the future of the airline industry.

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2

Aviation: An Overview

Introduction

The Aerospace Industry

The Air Transportation Industry

Chapter Checklist • You Should Be Able To:

- Define *aerospace industry* and describe its basic characteristics and economic magnitude
- Discuss some of the problems faced by the government market
- Describe the current economic outlook for the three segments included in the civil aviation market
- Identify and briefly describe the factors affecting commercial transport sales
- Define related aerospace products and services
- Define *air transportation industry* and distinguish between certificated air carriers and general aviation
- Describe the impact of the air transportation industry on the economy
- Describe how air transportation contributes to the efficient conducting of business and affects personal and pleasure travel patterns

INTRODUCTION

In a short span of 100 years, we have gone from making a few test flights to orbiting celestial bodies, from sliding along sand dunes to spanning oceans, from performing feats of isolated daring to depending on aviation in our everyday lives. Speeds have increased a thousandfold, as have altitude and range capability. No longer is the sky the limit. Ahead lie risks and rewards as vast as space itself. We have the promise of new airliners that fly with greater fuel efficiency, of huge air freighters that move the nation's goods, of an expanding general aviation fleet, and of the peaceful uses of space for exploration and research.

THE AEROSPACE INDUSTRY

The **aerospace industry** includes those firms engaged in research, development, and manufacture of all of the following: aerospace systems, including manned and unmanned aircraft; missiles, space-launch vehicles, and spacecraft; propulsion, guidance, and control units for all of the foregoing; and a variety of airborne and ground-based equipment essential to the testing, operation, and maintenance of flight vehicles. Virtually all of the major firms in the aerospace industry are members of the **Aerospace Industries Association (AIA)** or the **General Aviation Manufacturers Association (GAMA)**. Founded in 1919 and based in Washington, D.C., the AIA is a trade association representing the nation's manufacturers of commercial, military, and business aircraft, helicopters, aircraft engines, missiles, spacecraft, and related components and equipment. GAMA, also based in Washington, D.C., is the trade association that represents the interests of manufacturers of light

aircraft and component parts.

As the 21st century began, approximately two-thirds of the aerospace industry's output was bought by the federal government. During the past two decades, this figure has ranged as high as 74 percent. At the same time, the aerospace industry is the world's largest producer of civil aircraft and equipment. Roughly 6 out of every 10 transports operating with the world's civil airlines are of U.S. manufacture, and in addition, the industry turns out several thousand civil helicopters and general aviation planes yearly.

These facts underline the unique status of the aerospace industry. Its role as principal developer and producer of defense, space, and other government-required systems in large measure dictates the industry's size, structure, and product line. Because it operates under federal government procurement policies and practices, the industry is subject to controls markedly different from those of the commercial marketplace. But the aerospace industry is also a commercial entity, and it must compete in the civil market for economic and human resources with other industries less fettered by government constraints. Its dual nature as government and commercial supplier makes the aerospace industry particularly important to the national interest. Its technological capabilities influence national security, foreign policy, the space program, and other national goals. Also, the efficacy of the national air transportation system depends to a considerable degree on the quality and performance of equipment produced for the airlines and the airways operators.

Naturally, such an industry is vital to the U.S. economy, especially in the following areas:

1. *Trade balance.* The excellence of U.S. aerospace products has created strong demand abroad, with the result that the industry consistently records a large international trade surplus.
2. *Employment.* Despite several years of decline in number of workers, the aerospace industry remains one of the nation's largest manufacturing employers.
3. *Research and development.* The industry conducts more **research and development (R & D)** than any other industry, and R & D is a major long-term determinant of national economic growth.
4. *Impact on other industries.* A great many new aerospace-related products and processes have spun off from the initial aerospace requirement and have provided value to other industries, both in sales and in productive efficiency. In addition, the aerospace industry is a large-scale user of other industries' goods and services: it has been estimated that for every 100 aerospace jobs created, another 73 are created in other industries.

Each of these factors represents a significant contribution to the U.S. economy; collectively, they elevate aerospace to a key position among the nation's major industries.

Characteristics of the Industry

The history of the aerospace industry has been a saga of continuing adjustment to changing national policy and economic conditions. Since 1960, fluctuating government demands and a variety of international events have teamed up to produce a roller-coaster-like sales curve: up to a peak, down to a valley. Over the years, the industry's operations have become increasingly complex, with each increment of complexity heightening the

industry's problems in adapting to change. Today, the industry's unique characteristics make the adaptive process extraordinarily difficult. An understanding of the difficulties is best promoted by an explanation of how the industry has been transformed in the past quarter of a century.

Prior to 1950, the industry was relatively unsophisticated. Its product line was entirely aeronautical—aircraft, engines, propellers, avionic components, and accessories. Long-run production of many airplane types was the order of the day. The labor force, during the post-World War II retrenchment period, was less than one-fifth of the later peak. Three-fourths of the workers were moderately skilled production workers. R & D was an essential prelude to production, but the subsonic aircraft then being built were less demanding of technological advance, and R & D represented a considerably less significant portion of the total workload than it does today.

The transformation began in the early 1950s with the production of the jet-powered supersonic military airplane, which brought about across-the-board changes in the industry—new types of engines, totally different airframes, different on-board equipment, new tooling and facilities, and, most of all, a vastly greater degree of complexity in products and the methods employed in producing them. New-airplane performance dictated that far greater emphasis be placed on R & D. The combination of R & D and product complexity required a major shift in the composition of the work force to include ever-increasing numbers of scientists, engineers, and highly skilled technicians. All of these changes resulted in increased emphasis on an ever more sophisticated managerial process.

While the industry was adjusting to these changes, it inherited a new responsibility: development and production of guided missiles, particularly long-range ballistic weapons. Then came another major change: the application of turbine power to commercial airliners, whose resemblance to military jets ended with their propulsion systems. The need to transport large numbers of people at high subsonic speeds and multimile altitudes involved a further modification of the industry's methods. Finally, in the late 1950s, the industry was assigned still another responsibility: fabrication of equipment to meet the nation's goals in space exploration.

Each of these changes compounded the need for change in the entire industry—more R & D, greater product complexity, more personnel per unit produced, higher skill levels in the work force, longer program development time, and greater need for new facilities with only single-program utility because of their specialized natures. Such changes contributed to higher costs of the end products, and the demand in the 1960s and 1970s for still more advanced aerospace systems further escalated both the rate of change and the costs. In defense output, cost—together with the greater capability of the individual system—influenced a trend away from volume production and toward tailored manufacture of fewer types of weapons and fewer numbers of each type.

A half-century of evolution has left the aerospace industry with a set of characteristics unique in U.S. manufacturing:

1. Performance demands for new systems require continual advancement of the technological frontier, which in turn involves unusual degrees of uncertainty and risk.
2. Because the government is the principal customer, the product line is subject to revisions in program levels occasioned by changing requirements and funding availability.