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Airline Operations and Delay Management fills a gap within the area of airline schedule planning by addressing the close relationships between network development, economic driving forces, schedule demands and operational complexity. The pursuit of robust airline scheduling and reliable airline operations is discussed in light of the future trends of airline scheduling and technology applications in airline operations.

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Description. \"Airline Operations and Delay Management\" fills a gap within the area of airline schedule planning by addressing the close relationships between network development, economic driving forces, schedule demands and operational complexity. The pursuit of robust airline scheduling and reliable airline operations is discussed in light of the future trends of airline scheduling and technology applications in airline operations.

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Overview This course is offered in T1 and focuses on: airline ground operations (including passenger facilitation and aircraft turnaround operations), delay data collection, delay data analysis, delay development modelling, airline networks and the emerging concept of robust airline scheduling.

~~Handbook—Airline Operations and Delay Management~~

Air traffic control groups are required to collect and provide information, such as the likelihood of future ground delays, to airline operations controllers to improve future airline scheduling and planning. Enabling Effective Disruption Management. An efficient disruption management process helps airlines and airports with

Airline Operations and Delay Management fills a gap within the area of airline schedule planning by addressing the close relationships between network development, economic driving forces, schedule demands and operational complexity. The pursuit of robust airline scheduling and reliable airline operations is discussed in light of the future trends of airline scheduling and technology applications in airline operations. The book extensively explores the subject from the perspectives of airline economics, airline network development and airline scheduling practices. Many operational issues and problems are the inevitable consequences of airline network development and scheduling philosophy, so a wide perspective is essential to address airline operations in their proper context. The influence of airline network development on schedule planning and operations driven by economic forces and relaxed regulations is thoroughly examined for different types of operations in aviation such as network carriers and low-cost carriers. The advantages and disadvantages of running different networks and schedules are discussed and illustrated with real airline examples. In addition, this book provides readers with various mathematical models for solving different issues in airline operations and delay management. Airline Operations and Delay Management is ideal for senior undergraduate students as an introductory book on airline operations. The more advanced materials included in this book regarding modeling airline operations are suitable for postgraduate students, advanced readers and professionals interested in modeling and solving airline operational problems.

Most of the research efforts dealing with airline scheduling have been done on off-line plan optimization. However, nowadays, with the increasingly complex and huge traffic at airports, the real challenge is how to react to unexpected events that may cause plan-disruptions, leading to flight delays. Moreover these disruptive events usually affect at least three different dimensions of the situation: the aircraft assigned to the flight, the crew assignment and often forgotten, the passengers ' journey and satisfaction. This book includes answers to this challenge and proposes the use of the Multi-agent System paradigm to rapidly compose a multi-faceted solution to the disruptive event taking into consideration possible preferences of those three key aspects of the problem. Negotiation protocols taking place between agents that are experts in solving the different problem dimensions, combination of different utility functions and not less important, the inclusion of the human in the automatic decision-making loop make MASDIMA, the system described in this book, well suited for real-life plan-disruption management applications.

Operations research techniques are extremely important tools for planning airline operations. However, much of the technical literature on airline optimization models is highly specialized and accessible only to a limited audience. Allied to this there is a concern among the operations research community that the materials offered in OR courses at MBA or senior undergraduate business level are too abstract, outdated, and at times irrelevant to today's fast and dynamic airline industry. This book demystifies the operations and scheduling environment, presenting simplified and easy-to-understand models, applied to straightforward and practical examples. After introducing the key issues confronting operations and scheduling within airlines, Airline Operations and Scheduling goes on to provide an objective review of the various optimization models adopted in practice. Each model provides airlines with efficient solutions to a range of scenarios, and is accompanied by case studies similar to those experienced by commercial airlines. Using unique source material and combining interviews with alumni working at operations and scheduling departments of various airlines, this solution-orientated approach has been used on many courses with outstanding feedback. As well as having been comprehensively updated, this second edition of Airline Operations and Scheduling adds new chapters on fuel management systems, baggage handling, aircraft maintenance planning and aircraft boarding strategies. The readership includes graduate and undergraduate business, management, transportation, and engineering students; airlines training and acquainting new recruits with operations planning and scheduling processes; general aviation, flight school, International Air Transport Association (IATA), and International Civil Aviation Organization (ICAO) training course instructors; executive jet, chartered flight, air-cargo and package delivery companies, and airline consultants.

This text is among the first to reveal the intricacies of an airline's Operations Control Centre; especially the thought processes, information flows, and strategies taken to mitigate disruptions. Airline Operations Control provides a deep level of description, explanation and detail into the activities of a range of highly professional and expert staff managing the 'sharp' end of the airline. It aims to fill a void as little is understood about this area, and very little is written for practitioners in the airline business. The book offers a comprehensive look at the make-up of the Operations Centre, its component sections, and the processes that occur both in preparing for and executing the current day's schedules. Several chapters provide real-life scenarios and demonstrate how Operations Centres manage evolving situations – what they need to take into account, and how they need to have Plan B and Plan C ready when things don't go right. This book is designed to deliver knowledge gains to both new and experienced aviation industry practitioners with regards to vital operational aspects. Additionally, it also offers students of air transport management a readily accessible and real-world-perspective guide to a crucial function present within every airline.

Airline Operations and Management: A Management Textbook is a survey of the airline industry, mostly from a managerial perspective. It integrates and applies the fundamentals of several management disciplines, particularly economics, operations, marketing and finance, in developing the overview of the industry. The focus is on tactical, rather than strategic, management that is specialized or unique to the airline industry. The primary audiences for this textbook are both senior and graduate students of airline management, but it should also be useful to entry and junior level airline managers and professionals seeking to expand their knowledge of the industry beyond their own functional area.

We study strategic and operational measures of improving airline system performance and reducing delays for aircraft, crew and passengers. As a strategic approach, we study robust optimization models, which capture possible future operational uncertainties at the planning stage, in order to generate solutions that when implemented, are less likely to be disrupted, or incur lower costs of recovery when disrupted. We complement strategic measures with operational measures of managing delays and disruptions by integrating two areas of airline operations thus far separate - disruption management and flight planning. We study different classes of models to generate robust airline scheduling solutions. In particular, we study, two general classes of robust models: (i) extreme-value robust-optimization based and (ii) chance-constrained probability-based; and one tailored model, which uses domain knowledge to guide the solution process. We focus on the aircraft routing problem, a step of the airline scheduling process. We first show how the general models can be applied to the aircraft routing problem by incorporating domain knowledge. To overcome limitations of solution tractability and solution performance, we present budget-based extensions to the general model classes, called the Delta model and the Extended Chance-Constrained programming model. Our models enhance tractability by reducing the need to iterate and re-solve the models, and generate solutions that are consistently robust (compared to the basic models) according to our performance metrics. In addition, tailored approaches to robustness can be expressed as special cases of these generalizable models. The extended models, and insights gleaned, apply not only to the aircraft routing model but also to the broad class of large-scale, network-based, resource allocation. We show how our results generalize to resource allocation problems in other domains, by applying these models to pharmaceutical supply chain and corporate portfolio applications in collaboration with IBM's Zurich Research Laboratory. Through empirical studies, we show that the effectiveness of a robust approach for an application is dependent on the interaction between (i) the robust approach, (ii) the data instance and (iii) the decision-maker's and stakeholders' metrics. We characterize the effectiveness of the extreme-value models and probabilistic models based on the underlying data distributions and performance metrics. We also show how knowledge of the underlying data distributions can indicate ways of tailoring model parameters to generate more robust solutions according to the specified performance metrics. As an operational approach towards managing airline delays, we integrate flight planning with disruption management. We focus on two aspects of flight planning: (i) flight speed changes; and (ii) intentional flight departure holds, or delays, with the goal of optimizing the trade-off between fuel costs and passenger delay costs. We provide an overview of the state of the practice via dialogue with multiple airlines and show how greater flexibility in disruption management is possible through integration. We present models for aircraft and passenger recovery combined with flight planning, and models for approximate aircraft and passenger recovery combined with flight planning. Our computational experiments on data provided by a European airline show that decrease in passenger disruptions on the order of 47.2%-53.3% can be obtained using our approaches. We also discuss the relative benefits of the two mechanisms studied - that of flight speed changes, and that of intentionally holding flight departures, and show significant synergies in applying these mechanisms. We also show that as more information about delays and disruptions in the system is captured in our models, further cost savings and reductions in passenger delays are obtained.

Previous studies conducted within the aviation industry have examined a multitude of crucial aspects such as policy, airline service quality, and revenue management. An extensive body of literature has also recognised the importance of decision-making in aviation, with the focus predominantly on pilots and air traffic controllers. Understanding Decision-Making Processes in Airline Operations Control focuses instead on an area largely overlooked: an airline's Operations Control Centre (OCC). This serves as the nerve centre of the airline and is responsible for decision-making with respect to operational control of an airline's daily schedules. The environment within an OCC is extremely intense and a key role of controllers is to make decisions that facilitate the airline's recovery from frequent, highly complex, and often multiple disruptions. As such, decision-making in this domain is critical to minimise the operational, commercial and financial impact resulting from disruptions. The book examines many aspects of individual decision-making in airline operations, and addresses the deficiencies found by presenting to the reader an examination of the relationships among situation awareness, information completeness, experience, expertise, decision considerations and decision alternatives in OCCs. The text utilises a multiple case study approach and proposes a number of relevant and important implications for OCC management. Practical outcomes highlight the need for enhancing training programs enabling existing controllers to readily identify and classify elements of situation awareness and decision considerations as a means of improving the decision-making process. They also draw attention to the need for airline OCCs to understand the extent to which industry experience and expertise of controllers is important in the selection of future staff.

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Written by a range of international industry practitioners, this book offers a comprehensive overview of the essence and nature of airline operations in terms of an operational and regulatory framework, the myriad of planning activities leading up to the current day, and the nature of intense activity that typifies both normal and disrupted airline operations. The first part outlines the importance of the regulatory framework underpinning airline operations, exploring how airlines structure themselves in terms of network and business model. The second part draws attention to the operational environment, explaining the framework of the air traffic system and processes instigated by operational departments within airlines. The third part presents a comprehensive breakdown of the activities that occur on the actual operating day. The fourth part provides an eye-opener into events that typically go wrong on the operating day and then the means by which airlines try to mitigate these problems. Finally, a glimpse is provided of future systems, processes, and technologies likely to be significant in airline operations. *Airline Operations: A Practical Guide* offers valuable knowledge to industry and academia alike by providing readers with a well-informed and interesting dialogue on critical functions that occur every day within airlines.

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