

Airline Operations Control Center Procedures Mrbyte

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.

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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.

The conclusion of a war typically signals the beginning of a flood of memoirs and instant campaign histories, many presenting the purported, but often dubious, lessons of the recent conflict. Cordesman is careful to avoid such pitfalls in this detailed and closely reasoned analysis. He builds a thorough case for the actual lessons of NATO's first battle fought within Europe. Cordesman concludes, unflinchingly, that the air campaign over Kosovo exposed deep fault lines within and among the NATO countries, and fundamental flaws in the way the West wages war.

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.

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.

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.

Introduction: The purpose of this document is to construct a recommended course of action in the next year for Garuda Operations Control in its efforts to upgrade its information systems technology. The process of installing new technologies is not one that can be done quickly or easily. It is also not one that can be accomplished by simply purchasing new software, even if that software were to exist. Rather, the process of upgrading technologies must follow a carefully planned and designed path. Among information systems specialists, the process is often referred to as the Systems Development Life Cycle (SDLC). The scope of an SDLC can vary. For airline operations control projects, the scope of the SDLC process is large. It involves many people, both internal and external to the organization. It requires the establishment of a Systems Development Team with membership from several units of the airline to direct the project and to resolve problems. It (ultimately) involves a substantial resource commitment, typically on the order of \$2,000,000 to \$3,000,000 in development funding. It involves a number of tasks that need to be performed as part of the development effort. And the project typically takes a number of years to implement. Failing to follow a proper Systems Development process may lead to a number of risks, such as:

- e The new system may not meet the user's needs.
- e The acquisition of unnecessary or inappropriate hardware.
- e The acquisition of insufficient software, or software that does not allow the airline to grow or handle future expansion.
- e Software that may be inadequately tested and may not meet requirements or expectations.

One way to look at systems development is to divide it into six phases: Phase 1 - Analyze the current system Phase 2 - Define new system requirements Phase 3 - Design the new system Phase 4 - Develop the new system Phase 5 - Implement the new system Phase 6 - Test and evaluate the system's performance and its ability to meet the user's requirements During the last year, MIT/FTL staff have been working on Phase 1. The results of our analysis of GA's current system have been documented in a separate report by Michael Clarke and Yudi Naryadi entitled "The Airline Operation Control Centre: An Overview of Garuda's Operation Control (EM) at Cengkering", which was recently submitted to GA. Perhaps more work needs to be done in Phase 1 by GA internal staff after GA has reviewed our report. For example, it might be wise to:

- a) Evaluate the sources of all data needed to support operations control.
- b) Document the flows of these data as EM goes about solving various operations problems, or resolving irregular operations.
- c) Document the information needs which are not currently available.
- d) Review current EM policies and procedures to obtain suggestions for improvement.

However, it is the next two phases in the SDLC process (Phase 2 - defining the new system requirements, and Phase 3 - designing the new system) for which we now need to turn our attention. Within the next year of the cooperation between MIT and GA, there are a number of tasks that can be accomplished to complete these next two phases. What follows is our suggestion for what should be accomplished within the next year.

2. Suggested steps for the next year of cooperation between MIT and GA Operations Control

Step 1 - Establish a Systems Development Team. The very first step that should be taken is the establishment of a team of individuals from both within GA and external to GA. The mission of this team would be to oversee the development effort: direct all activities; approve all decisions; make recommendations on the design of the new system; and resolve problems that occur along the way. The team should consist of personnel from:

- e Operations (EP, EM)
- e Flight Dispatch, Navigation (EA, ON)
- e Operations Control Center (OCC)
- e Maintenance (MCC, MP)
- * Crew Planning (OB)
- e Airport Operations (KO)
- e Information Systems (DX)

The team should have a leader from within GA, and MIT/FTL staff would act as "consultants" to this team.

Step 2 - Complete Phase 2 of the System Development Life Cycle. In the second phase of the SDLC, we need to scope out the requirements for the new system in enough detail so that both the computer systems developers and the users know exactly what the new system is going to do and how the system is going to do it. Needless to say, these requirements should solve the problems identified in Phase 1. The requirements should identify the user's needs (what the system will do) as well as the hardware, software, and data needs. This phase concludes with a system requirements report.

Step 3 - Configure and install the computer hardware and networking technology that is necessary to allow personnel to electronically communicate and interact with one another, make good use of existing Operations Control systems, and to establish reliable access to all necessary information/data. The design of the hardware and network configuration is not a trivial task. Questions need to be answered:

- e What would be the underlying operating system: UNIX, Windows NT?
- e What hardware will the system run on: 80486 PC's or UNIX Workstations?
- e What client - server architecture is optimum?
- e What local area network is best: Ethernet, Token-Ring?
- * What media: Twisted-Pair, Co-ax?
- e How is the network to be connected to the mainframe and other systems?
- e What communications and network software is needed?

It is planned that the installation of this hardware and software will be incremental and evolutionary. GA can initially procure just a few workstations and connect them up on a local area network. This "test cell" of computers will allow GA to gain some experience with the new hardware before making a more substantial commitment of resources. In addition, this step will allow EM personnel to become familiar with the new computer hardware before the application software is designed and installed. It will also allow EM personnel to communicate with each other through a local area network. In addition, the hardware and operating system software that is chosen should allow EM to continue to access and use current systems, even if those systems are on the mainframe computer or other workstations. At the same time, it should allow an evolutionary transition to better systems and software.

Step 4 - Begin installation of a centralized Database Management System to hold the data items that are needed for effective Operations Control. Refer to the earlier proposal entitled "System Operations Control Database

Development" written by Dennis Mathaisel in July 1995 for a more detailed discussion of this step. Configuring and installing an effective DBMS is not trivial. It is intended that an improved DBMS will be available on-line at EP/EM by transferring and updating data currently in other systems. Step 5 - Complete Phase 3 of the System Development Life Cycle. This third phase focuses on the design of the new system software before the software is procured or developed. The phase involves two main objectives: e To optimally design the new system. e To establish a sound framework of controls within which the new system should operate (basically, meeting the requirements). The completion of the design phase is marked by a couple of events: the team completes, organizes, and assembles the system design documentation; and a series of meetings/presentations are organized to present and review the design proposal. From an overall perspective, next year would be devoted to a year of assessment and design, combined with the installation of necessary hardware, operating systems, and local area networks. It would require a commitment from Garuda to purchase necessary hardware and LAN technology, as well as taking the first steps necessary to install a centralized DBMS. 3. Beyond next year... Once the above steps were completed, then GA can begin to acquire more advanced software to assist in planning and execution of Operations activities. The greatest mistake would be to acquire existing software packages before a thorough study and design was completed. A complete plan for developing a new operational system must be established first. Beyond next year, the basic steps would be as follows: a) Complete the construction of the centralized DBMS. b) Replace the ROC system currently in use in Operations Control with advanced computer-graphics displays on high-powered workstations that are connected on a local area network and connected with the mainframe computer. This step involves a transition to UNIX-based software. c) Then, and only after the above steps were taken, consider the introduction of automated decision-support models to solve specific problems that are encountered in irregular operations, etc.

Introduction: Airline operations are generally handled in two phases, strategic and tactical. Strategic operations are concerned with schedule planning. Given the desired schedule of services to be offered to passengers (called the Schedule of Services) established by the Commercial/ Marketing department, the Operations group generates the Nominal Operational Schedule (NOS) for the airline's resources such aircraft rotations and crew rotations, and then assigns tail numbers, and individual crew members to a given flight. These activities constitute the schedule generation and resource allocation phases of the scheduling process. They are carried out by various groups which support the development of the planned schedule for all airline resources. Given these resource schedules, the tactical side of the Operations group is responsible for the final stage of the scheduling process: Execution Scheduling. Execution scheduling is the process of executing the system resource schedules on a daily basis. This involves three main activities: executing the pre-planned schedules, updating the schedules for minor operational deviations, and rerouting for irregular operations. The tactical operations of a regular scheduled air carrier is usually under the 24 hour/day control of a central organization often referred to as the Airline Operational Control Center AOCC. This chapter presents a summary of a typical AOCC, outlining its organization, primary activities within the airline, and operational facilities. The facilities and personnel of a particular AOCC will vary considerably depending on the type and size of the airline. AOCC centers can range from a single controller/dispatcher on duty to several dispatchers and hundreds of other personnel handling flights throughout the carrier's entire global network. During the process of operation control, the AOCC is supported by the Maintenance Operations Control Center (MOCC) which controls aircraft maintenance activities, and various Station Operations Control Centers (SOCC) which control station resources (gates, refuelers, catering, ramp handling, and passenger handling facilities). Operations Control Centers are usually linked to the Aeronautical Radio Inc. (ARINC) and the Societe International Telecommunications Aeronautiques (SITA) networks to send and receive teletype/telex messages. Communications with maintenance and engineering, customer service, and airport services are maintained to facilitate prompt contact with the appropriate personnel. Teletype, telex, facsimile, telephone, leased lines, and public data networks combine to provide an effective medium of collecting information and communicating revised operational plans developed by the AOCC center. In some cases, the AOCC has communications systems connected to VHF, HF and Satcom radio links, air traffic control centers, and other relevant locations, allowing them to effectively gather and disseminate information instantaneously.

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Operations Research in the Airline IndustrySpringer Science & Business Media

By far the most comprehensive book on the subject, the completely new Second Edition of Airport Operations updates the many developments in this fast-changing industry. The book provides a broad perspective on the effects of deregulation, privatization, and commercialization. Thoroughly illustrated, it examines the most current practices in airport security and terminal access, cargo relations, noise control, scheduling issues, and more. It is equally valuable to aviation educators and students as well as to airport

personnel.

This book reviews Operations Research theory, applications and practice in seven major areas of airline planning and operations. In each area, a team of academic and industry experts provides an overview of the business and technical landscape, a view of current best practices, a summary of open research questions and suggestions for relevant future research. There are several common themes in current airline Operations Research efforts. First is a growing focus on the customer in terms of: 1) what they want; 2) what they are willing to pay for services; and 3) how they are impacted by planning, marketing and operational decisions. Second, as algorithms improve and computing power increases, the scope of modeling applications expands, often re-integrating processes that had been broken into smaller parts in order to solve them in the past. Finally, there is a growing awareness of the uncertainty in many airline planning and operational processes and decisions. Airlines now recognize the need to develop 'robust' solutions that effectively cover many possible outcomes, not just the best case, "blue sky" scenario. Individual chapters cover: Customer Modeling methodologies, including current and emerging applications. Airline Planning and Schedule Development, with a look at many remaining open research questions. Revenue Management, including a view of current business and technical landscapes, as well as suggested areas for future research. Airline Distribution -- a comprehensive overview of this newly emerging area. Crew Management Information Systems, including a review of recent algorithmic advances, as well as the development of information systems that facilitate the integration of crew management modeling with airline planning and operations. Airline Operations, with consideration of recent advances and successes in solving the airline operations problem. Air Traffic Flow Management, including the modeling environment and opportunities for both Air Traffic Flow Management and the airlines.

This Fleet Marine Force Manual (FMFM) sets forth the organization, doctrine, tactics, and techniques to be used in the formation and employment of Marine air-ground task forces (MAFTF's).--p. i.

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