

The background of the top half of the page is a photograph of a modern airport terminal. The interior features a high ceiling with a grid of white structural elements and large glass windows that offer a view of the tarmac. Outside, several aircraft are visible, including a prominent red and white Turkish Airlines plane. Ground service vehicles and equipment are also on the tarmac. Inside the terminal, a potted plant is visible in the foreground.

# Rethinking ORAT

**Whitepaper 2025**

Driving Transitions from Construction to Operational Excellence

# Modernizing ORAT for the Digital Age



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Since its introduction, ORAT has been the gold standard for airport commissioning, ensuring a seamless transition from construction to operation. However, the traditional ORAT framework has not evolved at the same pace as airport IT architectures, passenger numbers and demand for travel, security and safety requirements.

This has led to challenges in systems integration, cybersecurity, and digital process alignment. Yet, IT integration is still often treated as a secondary priority in ORAT programs, increasing the risk of encountering operational inefficiencies.

The paper proposes a digitally enhanced and IT-centric evolution of the traditional ORAT model which dates back to the opening of Munich Airport in 1992. This evolution faces the modern complex IT infrastructure by embedding airport IT systems expertise into the ORAT framework, ensuring seamless system integration.





## Introduction

1992 marks the year where the first ever Short Message Services (SMS) was sent. That same year, Munich Airport relocated from its city centre location Riem to a newly built airport outside the city, completing the transition in just one night. Made possible by the “Operational Readiness and Airport Transfer” (ORAT) program, this milestone established a new framework for airport commissioning.

Since then, ORAT has been implemented hundreds of times worldwide, with minimal changes to its core concept from 1992. In contrast, airports changed – computer and digital systems became a key component of modern airports transforming them into intelligent digital concrete structures with new challenges to commissioning.

This whitepaper explores the limitations of the existing ORAT framework in commissioning modern airports with their IT architectures and presents a new approach to ORAT created by M2P Consulting as a solution to overcome these challenges.

## What is ORAT?

ORAT is a structured and holistic approach designed to prepare new airports, terminals, or subsystems for seamless operational readiness. Usually starting at the end of the Design Phase, it has the goal to ensure that facilities, processes, and people are fully ready to deliver smooth and efficient operations from day one. It integrates all key activities, aligning stakeholders, validating operational processes, and addressing potential risks before they appear.

Using this framework allows airports to reduce costs, minimize disruptions, and build up stakeholder confidence while maintaining safety and compliance regulations.

## Limitations of ORAT

Since its introduction in 1992, thirty-three years of technological innovation have significantly transformed airport operations. From the customer’s perspective, notable advancements include

self-service check-ins, self-boarding, and digital immigration systems. Further trends such as Common Use Passenger Processing Systems (CUPPS), Computer Tomography (CT) Scanner, biometric data processing and AI based turnaround monitoring align with this development.

These state-of-the-art digital technologies enable airports and airlines to optimize space and operations while reducing capital expenditures, increase operational efficiency and enhance the overall customer experience [1]. Behind the scenes, IT systems have become fundamental to airport operations. Airports Council International (ACI) guidelines emphasize the need for airports to establish Airport Operation Control Centers (AOCCs) to enhance the overall management and efficiency of airport operations [3]. Leveraging data streams from across the airport, IT systems such as the Airport Operational Database have become the cornerstone of airport system architecture, facilitating seamless integration and decision-making across all facets of airport management.

A comparison of the present state of airports with that of the late 1980's and 90's, when computers were only beginning to be introduced into significant roles, reveals that a holistic approach to systems commissioning, especially IT systems, has become an inevitable necessity.

Today, managing the activation of airport systems is one of the critical components of a successful ORAT process, as demonstrated by experiences such as Istanbul Airport [2]. Central IT systems, such as AODB and CUPPS, have brought a range of challenges – data migration and security, to name a few – to the forefront. These aspects cannot simply be outsourced to external IT-software providers with the expectation of flawless execution.

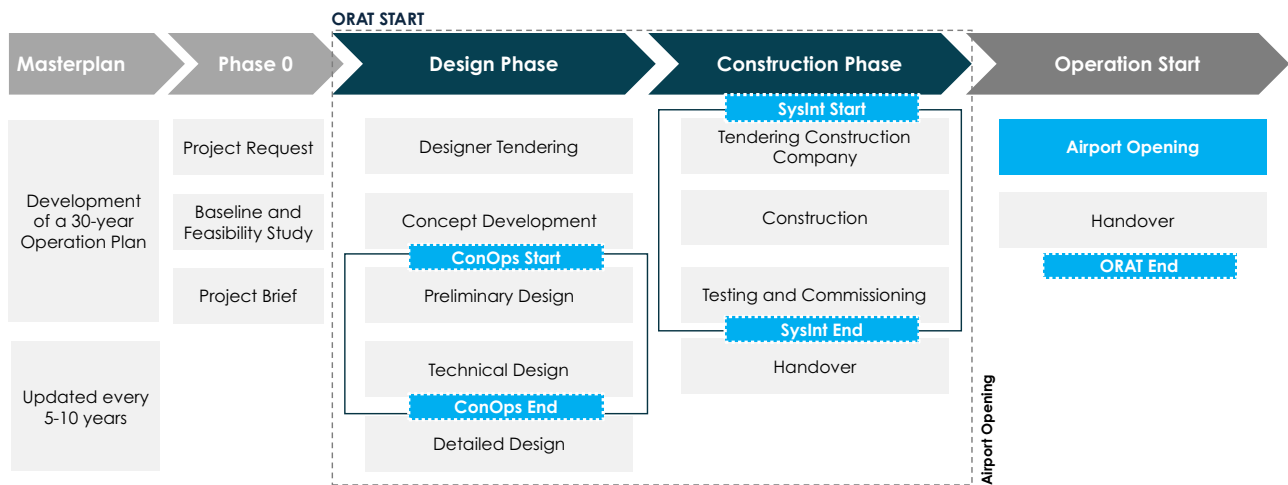
Furthermore, the shift from traditional service staff to IT technicians offers airports an opportunity

to address current staff shortages. However, this transition also underscores the growing need for a reliable and skilled team of IT technicians, thereby altering the scope of certain elements within the ORAT framework.

Reviewing the existing ORAT framework reveals that its limitations are increasingly putting the success of operational readiness at risk. As a result, changes are necessary to advance the framework to its next evolutionary step. To address these challenges, M2P has identified critical issues with the current approach and developed M2P's ORAT approach, a forward-thinking solution that represents the future of operational readiness and airport transfer.

## The Future of ORAT

As airports undergo digital transformation into smart airports with complex and non-transparent IT architectures, M2P leverages its decades of experience in airport operations and IT systems to ensure IT holds the same critical position in ORAT as it does in the actual daily operations. Understanding IT, its importance in airport operations, and its role among internal and external stakeholders provides a comprehensive view of challenges related to system interoperability and end-to-end operational functionality. Additionally, modern technologies such as digital twins, digital trials, and advanced software tools further optimize the ORAT process while reducing risks and costs. The following chapter explores the structure of M2P's ORAT approach and how it improves upon traditional ORAT approaches.



**Figure 1: Schematic overview of the construction process from the strategic Masterplan over project initiation (phase 0) to Operational Start at the end.**

## Structure of ORAT

Airports establish their long-term strategy through a Master Plan, typically spanning 30 years, updated every five to ten years. Construction projects are typically aligned with this Masterplan and follow a phase-based approach from phase 0 to operational start as illustrated in Figure 1.

The ORAT methodology integrates itself into the construction framework as a mandatory part ensuring a smooth opening. While ORAT programs commonly commence during the Design Phase at the end of concept development, their initiation can vary. M2P strongly recommends an early ORAT start to mitigate rising change efforts and associated costs in later project phases. For the following description, this will be seen and assumed as the ideal process.

The first step in ORAT involves developing or reviewing the Concept of Operations (ConOps), which defines all operational processes and lays the ground for further design iterations, resulting in the technical and detailed design. M2P provides comprehensive ConOps development services, making it a fundamental part of its ORAT program. During the construction phase, ORAT focuses on

the systematic integration of airport systems and processes alongside ongoing construction. Key activities include vendor coordination, end-to-end system testing, and familiarization training, all leading to operational readiness. The airport opening signifies the conclusion of the ORAT program and the transition to full operational handover to the airport operator.

## M2P's ORAT Approach

The foundation of our revised ORAT approach is built on recognizing the critical role of modern IT within the airport ecosystem and its many stakeholders. Additionally, advanced digital tools eliminate the reliance on inefficient, nontransparent Excel spreadsheets and endless team meetings.

As illustrated in Figure 2, ORAT follows a three-phase approach: ORAT setup, execution, and airport opening, with project management as a continuous element. Effective project management, especially in large-scale airport developments, requires precise tracking of the current state. Key Performance Indicators (KPIs), such as the Operational Readiness Indicator (ORI) and the Open Issue List (OIL), enable steering committees to monitor progress against milestones. Traditionally, these

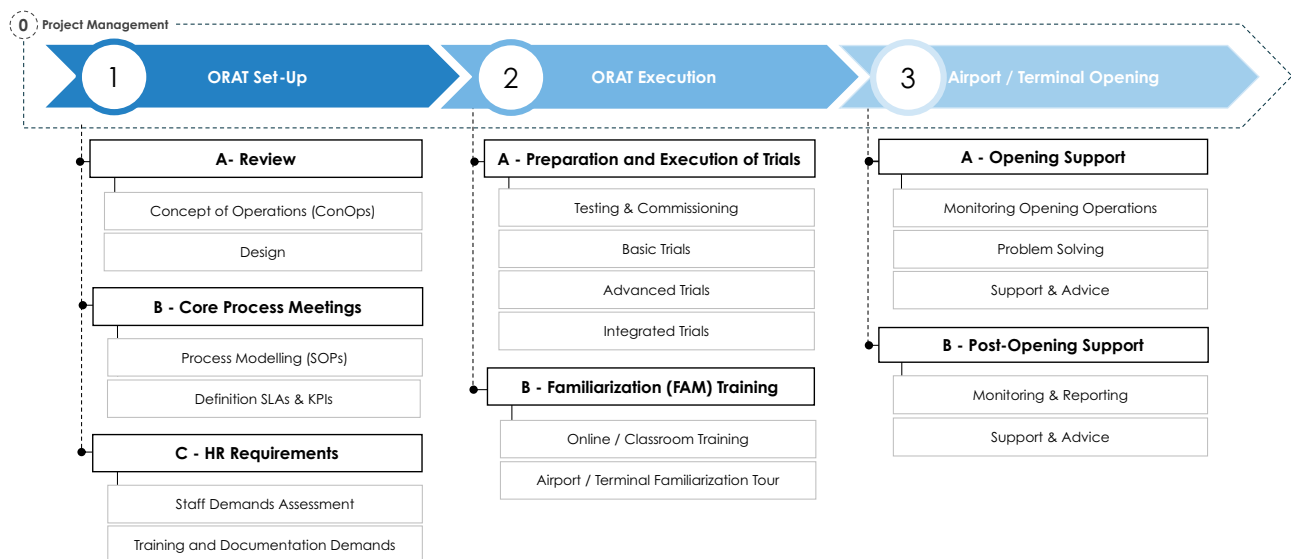
KPIs rely on numerous variables and are typically managed through large, error-prone spreadsheets, resulting in an inefficient and time-consuming workload to keep these lists up-to-date and prepare it for meetings.

M2P's approach integrates a modern software tool for KPI tracking, replacing outdated spreadsheet-based processes. This digitalized monitoring system allows quick information sharing, reducing the common inefficiencies associated with manually maintained data. Steering committee meetings could be streamlined by topic, improving stakeholder engagement, and decision-making. Moreover, transparent development tracking facilitates early identification of challenges, ensuring proactive issue resolution.

In the first phase of ORAT, the setup phase, key elements for airport operations are established. This includes developing or reviewing the Concept of Operations (Co-nOps) and the definition of Standard Operating Procedures (SOPs) which form the core of airport operations and are discussed in Core Process Meetings. In addition, Service Level Agreements (SLAs) and Key Performance Indica-

tors (KPIs) are being defined. Developing SOPs requires a deep understanding of the entire airport eco-system, including airlines, ground handling providers, ATC, authorities, and construction companies – to name a few. With this in mind, the ORAT team ensures a holistic approach, managing dependencies while aligning the project with operational objectives. Experts have to be set in place, pouring their knowledge into core process meetings where SOPs are defined and system integration is initiated.

M2P emphasizes the need for increased automation and digitalization to enhance airport efficiency while reducing personnel demands, preparing airports for future challenges. However, this necessitates adapting existing IT infrastructures often described as flexible as "digital concrete" due to legacy systems. Integrating new systems with existing ones presents significant challenges, making IT a fundamental component of ORAT from the outset. M2P advocates for early system integration to ensure seamless interoperability and long-term operational success.



**Figure 2: schematic overview of ORAT across its three project phases: set-up, execution and Opening with Project Management as an overall activity.**

Phase 2 marks the realisation of the developed plans and set the stage for implementation, testing, commissioning, and familiarization training. M2P follows its understanding of IT and sets the focus on the end-to-end testing of airport processes, simulating the future daily operational business. IT systems, in particular, require thorough testing across their interfaces to ensure uninterrupted functionality.

M2P has developed a specialized trial framework addressing IT dependencies, improving system reliability and integration. Traditional testing relies on paper documentation, requiring manual digitization, which introduces risks such as inaccuracies and data loss. M2P advocates for digitalized testing documentation, eliminating inefficiencies, enhancing transparency, and reducing costs.

Familiarization training programs (FAM) prepare staff for operations, but conventional classroom training and scheduling methods via emails consume valuable resources. Modern, customized online training platforms with online scheduling capabilities streamline training coordination, allowing self-scheduling and personalized learning, increasing efficiency and reducing administrative burdens.

As ORAT concludes, terminal opening and post-opening support focus on issue resolution. Issues are tracked in the Opening Issues List, traditionally managed via spreadsheets. To enhance coordination, a modern software solution should replace spreadsheets, offering real-time tracking, filtering, and sharing capabilities for seamless issue resolution among stakeholders.

## Future Development and Trends

Integrating a holistic IT systems and architecture approach into ORAT enhances efficiency through modern software tools, marking the foundation of a new ORAT methodology. Technologies such

as digital twins offer further potential to increase efficiency and reduce costs. By creating a digital representation of airport infrastructure and operations, combined with simulation models, familiarization (FAM) and trials can be conducted virtually, minimizing physical testing costs and identifying potential issues early.

This approach reduces the need for repetitive testing, optimizing resource allocation, and lowering overall costs. Additionally, the digital representation could serve beyond ORAT, supporting operational optimization, automation, and data-driven decision-making for long-term airport efficiency.

## Conclusion

As airports increasingly transform into complex, digitally integrated environments, the traditional ORAT framework must adapt to meet the growing complexity of modern airport operations and IT architecture. While the original ORAT methodology has successfully guided airport openings for decades, its limited integration of IT systems poses increasing challenges to operational readiness.

M2P's ORAT approach addresses these challenges by embedding its expertise in airport IT systems into the ORAT framework, ensuring seamless system integration. Through the use of a modern software tools enabling real-time KPI tracking, M2P's ORAT approach enhances efficiency, transparency, and risk mitigation while reducing operational costs and resource constraints.

## Get in touch

Speak with our expert team to learn how our ORAT approach can help you.



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Follow us on LinkedIn for regular updates.

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