Chapter 13

ePlanAirport: A Web-Based Tool to User-Friendly Decision-Support Systems for Airport Stakeholders and Policy-Makers

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ABSTRACT

ePlanAirport is a Web-based tool that allows running complex studies based on airport systems. The primary goal of the tool is helping to the airport stakeholders and policy makers in the decision-support processes. Nowadays, there is a lack of tools and systems that may help the targeted users in such a process. Otherwise, this tool could guide them in the current global scenario.

So, ePlanAirport fills this gap detected allowing a non-expert user in complex tools to fulfill successfully his mission. For that purpose, a relevant set of data got in a simple and fast way via Web will be available, and they will help in the planning of airport infrastructures and operations.

For instance, the planner will know how a change in an operational procedure or a change in the fleet characteristics or a change in the current infrastructure of the airport will impact on key performance indicators such as capacity, delay, or environment.

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INTRODUCTION

Before the current economic downturn spread all over the world, Eurocontrol forecast a rising traffic above 3% in the period 2008-2014 only in Europe (Eurocontrol, 2009). Other sources say that within the European Union, air traffic demand is expected to double by the year 2025. But, taking into account the present conditions, the growing demand and the resulting mismatch between demand and supply of airport services, this will result in an increase of congestion problems at airports.

So, the simulation role becomes even more important now. There are two main characteristics in this kind of systems:

• Evaluate alternative paths that will help in the decision-support process.
• Support to research and development activities based on new concepts.

These models provide concrete answers dependent on input conditions more than a general solution.

On one hand the simulation activities guide the experimentation and sensitivity analysis in a controlled way. And, on the other hand, the simulation is able to run complex studies that otherwise would require much more effort and time until its complete calibration.

CONTEXT: AIRPORT PLANNING AND AIR TRAFFIC MANAGEMENT

Currently, there are simulation tools able to deeply analyze concrete aspects of the airport environment. Particularly, there are tools intended for capacity analysis, environment analysis, cost-benefit analysis and so on. These tools work with specific sets of data and analyze exclusively some aspects either the traffic or the airport.

The available (analytical or simulation) tools can jointly address all airport elements and flows (at the airport airside and in the airport terminal), support different levels of decision making (strategic, operational and tactical) and analyze nearly all types of performance measures (capacity, delay, level of service, third-party risk, security, environmental impacts, and cost-efficiency). However, as it was stated, each tool is only suited for a specific element, flow, decision-making level, or performance measure, so that tools have to be used in combination for conducting a total airport performance analysis.

So, this initial constraint is a drawback to extend the studies and make deeper ones, being necessary to design a new workflow for the aforementioned complex works. In this new workflow, several tools would be involved being the output of one tool the input of the next one in the workflow. This also implies that the airport planner would require either a deep knowledge of the tools involved or rely in technical experts to get specific output results. Of course, there is a background task related with the design of the correct workflows, which is not straightforward, because there is a need to measure the impact of a little change in the input conditions and check how the output is modified accordingly and in a significant way.

A first step forward in this sense was the idea behind the OPAL project that established a centralized data repository for the whole process, so all tools related in the process could read the needed data and write back the results. Moreover, that project developed the data converters for the simulation tools. So, as the tools could connect to the repository through the data converter, it would allow the final user to implement virtually all combinations of tools to solve a wide range of issues. But this first approach arose two main technical difficulties:

• Need of a high process capacity.
• High volume of information to be managed.
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