



the only system with Unified Management & Optimization of:

flights **aircraft** **crew**

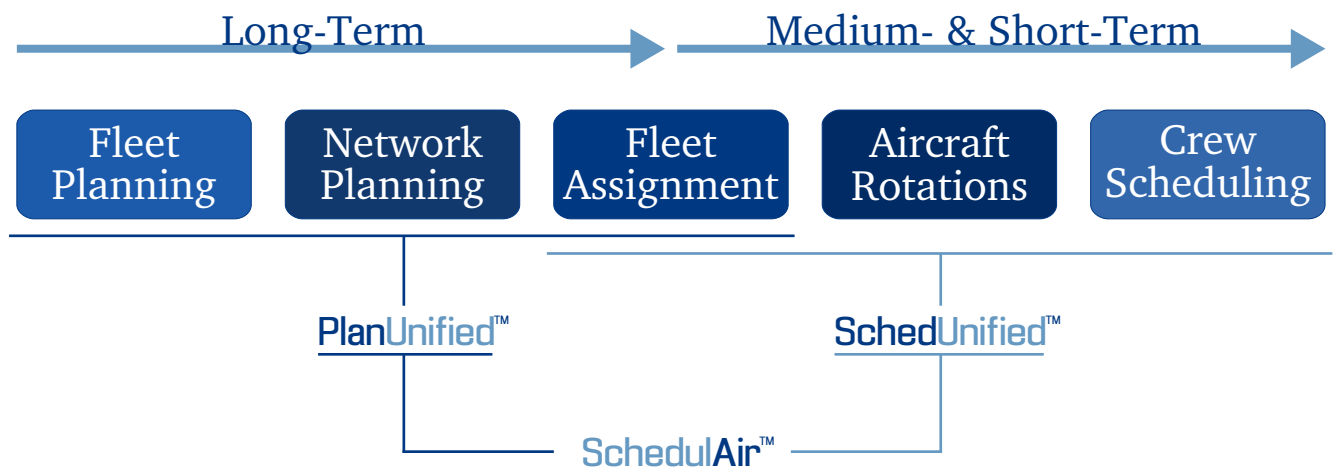
SchedulAirTM

unified management & optimizationTM

unified management & optimization

SchedulAir: The only system in the market to fully combine airline planning and scheduling, and offer a smooth transition between them through its unique Unified Management and Unified Optimization.

Figure 1. SchedulAir's smooth transition from planning to scheduling



Unified Management: SchedulAir's unique ability to simultaneously consider and enable analysis of multiple planning and scheduling constraints and objectives. This is achieved despite being handled at different points in time and often by different people. The result is a schedule that simultaneously achieves the objectives of different departments.

Unified Optimization: The unique ability of SchedulAir's innovative optimizers **PlanUnified** and **SchedUnified** to simultaneously consider the constraints, costs, and revenues of multiple planning or scheduling problems. This results in overall maximum profit and overall constraint satisfaction.

unique benefits

Maximized overall profitability

SchedulAir has the only optimizers in the market that unify the decision making of several planning and scheduling problems (Figure 1). In contrast, other products process the optimization problems independently of each other. As a result, **SchedulAir's Unified Optimizers achieve an overall optimal profit of US\$ 100-400 per flight more than competing optimizers.**

Smooth transition from planning to scheduling

SchedulAir is more than just a platform, it is a system with Unified Management. This means that planners can enrich their modeling with constraints that go beyond their typical grasp (e.g. slot constraints) in order to understand the consequences of their decisions at the scheduling stage. Likewise, schedulers can look back in the analysis of planners and better understand why and how certain decisions were taken and thereby improve schedule implementation quality.

Improved collaboration between and within departments

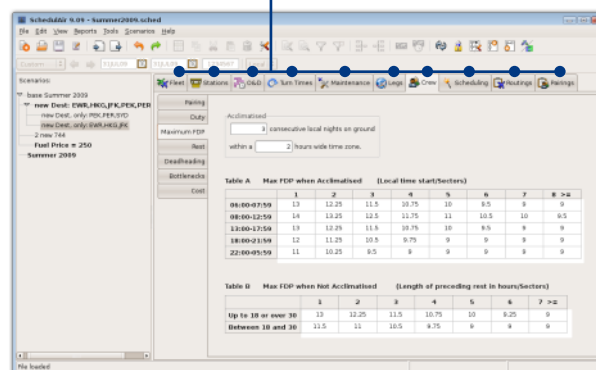
SchedulAir's Unified Optimizers simultaneously comply with the constraints and optimization goals set by different departments within an airline. This is more efficient than the sequential integration of other products, where different departments often have to go through several iterations to remove constraint violations and achieve a mutually agreed schedule.

Additionally, SchedulAir offers multi-user features to distribute work among different schedulers and departments. Users can therefore experiment with different scenarios, as well as develop, compare, and merge schedules in parallel.

Maximized overall resource utilization

SchedulAir's Unified Optimizers explicitly consider the constraints of several resources simultaneously (e.g. crew and aircraft), thereby maximizing the overall resource utilization. As a result, SchedulAir's aircraft and crew utilization is superior to that of other systems, whose fleet assignment disregards the consequences on aircraft and crew schedules.

Figure 2. All schedule phases at your fingertips
flights, airports, aircraft, crew, and partners,
costs & constraints easily accessible through
dedicated tabs



powerful features

Variety of scheduling methods

SchedulAir offers various scheduling methods to best fit the needs of different airlines. You can optimize your schedule using the **daily**, **weekly**, or **fully dated** methods. These methods can be combined to attain the best results, while covering any schedule exceptions (e.g. weekends or special events). The fully dated method considers initial and final aircraft positions, as well as maintenance constraints.

Unified constraint satisfaction and cost consideration

Due to its unique Unified Optimizers, SchedulAir is the only system available today enabling you to simultaneously account for the constraints, revenues, and costs of:

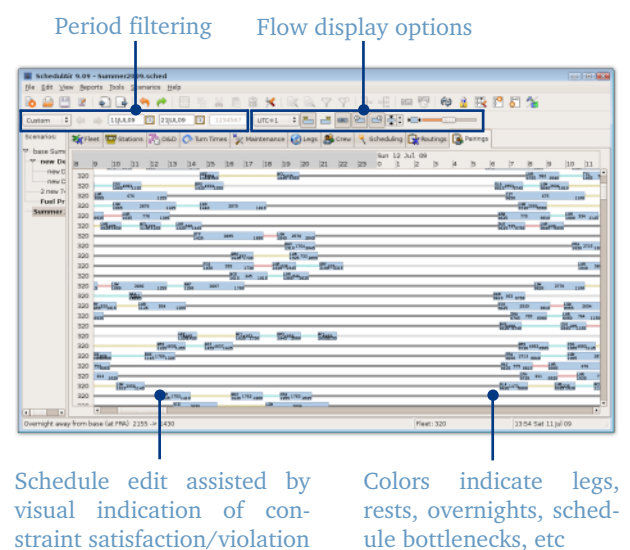
- **Aircraft**, such as initial and final positions, daily availability, utilization limits, fleet mixing, maintenance costs and constraints, number of seats per compartment, range, block and turn times, ownership and leasing costs, en-route charges, and fuel and oil costs.
- **Airports**, for example landing fees as well as slot, runway, and curfew constraints.
- **Passengers**, including revenue from origin and destination (O&D), minimum and maximum connection times, spill, and recapture.
- **Partners and Competitors**, by modeling alliances, codeshare, and interlining, Special Prorate Agreements (SPAs), and fares.
- **Crew**, customized to your needs and based on several regulation families (e.g. CAO-48, CAP-371, EU/JAR OPS 1, and FARs) and crew costs such as utilization, wages, per diems, allowances, standby, dead-head, and hotels.

You can easily modify all of these constraints and further experiment with various changes in order to evaluate different scenarios and their impact on your schedule and profits. Additional constraints can also be tailored to your individual needs.

Flow views

SchedulAir provides flow views **for aircraft and crew** (Figure 3). Each flow view is a Gantt chart displaying lines of flying with user-customizable bars depicting the flights, turns, and connections. It can also display the potential schedule bottlenecks (which can lead to propagation of flight delays). You can easily choose which data to display on the Gantt bars or the status bar. Other viewing and filtering options are also available such as zooming, period selection, and fleet hiding. A modern and user-friendly interface assists manual editing (e.g. swapping, merging, canceling) of the flow views by highlighting which possibilities are within the given constraints.

Figure 3. Flow view example: crew



modern tools

Table views

SchedulAir includes table views for **constraints, revenues, costs, and flight legs** (Figure 4). The data are presented and edited in a tabular form similar to Microsoft Excel. You can make more complex changes affecting multiple entries, for example to re-time multiple flights by adjusting them to all be 10 minutes earlier. Likewise it is easy to compress or split selected flights for a period of your choice (Figure 5). Furthermore, you can globally select or filter bulk data. SchedulAir complies with IATA's SSIM, ASM, and SSM file formats, so you can display, import or export any relevant data.

Figure 4. Table view example: flight legs

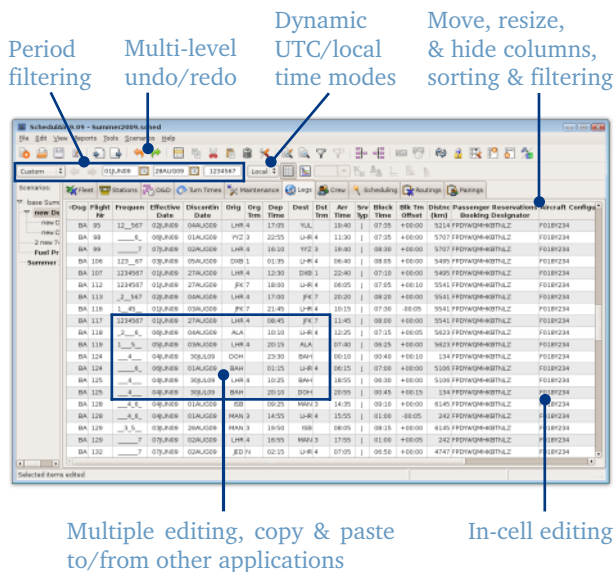


Figure 5. Flight legs split and compressed

CA 927	1234567	10FEB09	28MAR09	PEK	09:20	KIX	13:00	J	02:40	F8Y154V10	73Q
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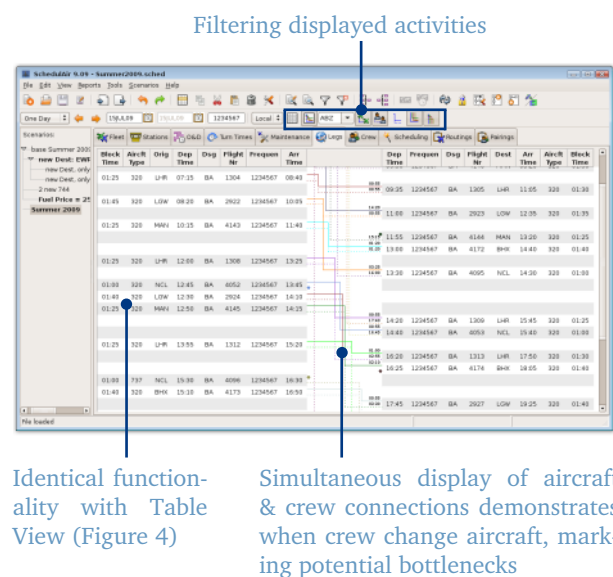
splitting ↓ ↑ compressing

CA 927	1234567	10FEB09	28FEB09	PEK	09:20	KIX	13:00	J	02:40	F8Y154V10	73Q
CA 927	67	01MAR09	21MAR09	PEK	09:20	KIX	13:00	J	02:40	F8Y154V10	73Q
CA 927	12345	02MAR09	20MAR09	PEK	09:20	KIX	13:00	J	02:40	F8Y154V10	73Q
CA 927	1234567	22MAR09	28MAR09	PEK	09:20	KIX	13:00	J	02:40	F8Y154V10	73Q

Unified station activity view

SchedulAir offers unified station activity views for **passengers, aircraft, and crew** (Figure 6). Each station activity view depicts the arrivals and departures for a chosen station. The passenger, aircraft, and/or crew connections can be displayed as links between the flights, with the corresponding connection times shown. With SchedulAir's unique combined passenger, aircraft, and crew activity view you can inspect and manipulate when passengers or crew change aircraft, thereby controlling the potential bottlenecks (which can lead to flight delay propagation). It is furthermore a powerful tool for solving flight-balance problems, as well as manipulating the distribution of operations at a station and connections to other stations. The station activity view inherits all the tabular facilities of the table views so you can select, view, filter, and edit all data in the same manner.

Figure 6. Unified station activity view example: passengers, aircraft, and crew



advanced functionality

In SchedulAir a scenario is defined as:

- a candidate schedule, and
- the corresponding constraints & costs.

Unified what-if scenario analysis and management

SchedulAir offers unified analysis of flight, aircraft, and crew scheduling scenarios. For instance, you may examine the profitability of certain new flights or new aircraft types. Likewise, you can simultaneously assess the effects of different maintenance or crew constraints or costs on your schedule. You may therefore experiment with all these scenarios and thoroughly analyze their consequences. You may also restrict other users from viewing or editing such experiments.

SchedulAir provides a scenario management tree (Figure 7) displaying the history of various scenarios and their evolution throughout experimentation or schedule development. A scenario can be renamed, copied, pasted, deleted, hidden, annotated, and edited. While users edit a scenario, SchedulAir tracks the different versions and which users performed them. It is easy to undo or redo any changes made.

Unified scenario comparison and merging

A scenario comparison and merging environment is also offered, using the familiar SchedulAir views of each scheduling stage (Figure 7). In the comparison environment, all differences between two scenarios are highlighted. This includes differences between the constraints, costs or the legs (either by flight number or by departure and arrival pair). With the differences marked, it is easy to select the legs or constraints you want to keep and merge them into a new scenario or the final schedule version.

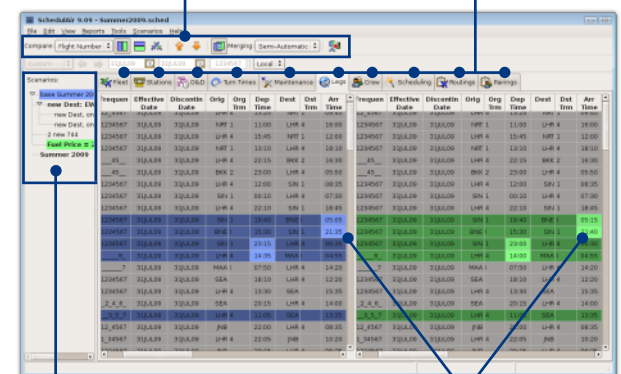
Unified schedule development

SchedulAir assists schedule development between and within departments by including multi-level rights of user and group access for the scenarios, restricting unauthorized view and edit. Therefore, multiple schedulers of different departments can work in parallel and develop distinct parts of the same schedule. These can then be compared and merged into the final schedule version.

Figure 7. Scenario comparison

of flights, aircraft, and crew costs and constraints in their dedicated tabs

Conflicts' view and navigation options



Scenario evolution tree, where you can choose which scenarios to compare

Automatic marking of differences between legs, constraints, or costs, helping you with merging

customizable reporting

Codeshare optimization and competition modeling and analysis

ScheduAir can enhance your profitability by considering codeshare flights, based on the O&D demand and revenue, while respecting passenger minimum connection times.

The schedules of partner and competitor airlines can be imported using IATA's SSIM file format, and stored for future modeling analysis. Such an analysis may include the examination of other airlines' schedules, and exploring important markets, as well as code-share, or passenger connection opportunities.

Fully customizable reports and templates

ScheduAir provides a report generator (Figure 8) with which you can adapt reports to fit the needs of different departments in your airline. It is easy to filter which data to include in a report (e.g. periods, stations, O&Ds, fleets, legs), and to customize the format of text, graphics, or maps.

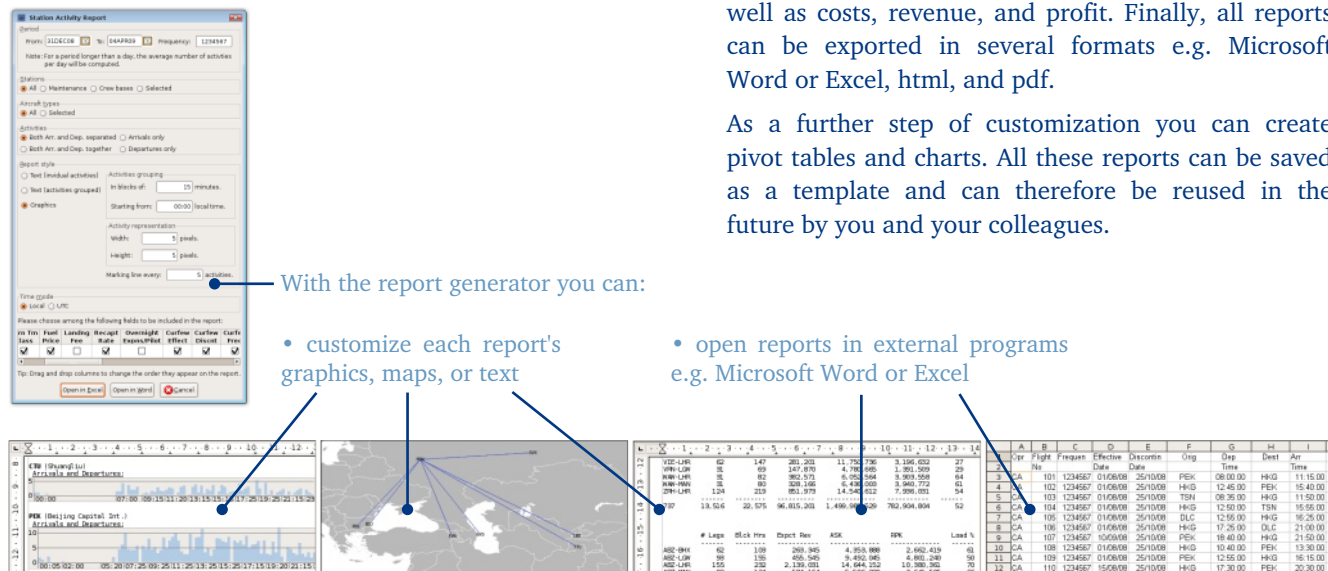
You can produce customized schedule or constraints reports of data including: timetables, aircraft rotations, crew pairings, fleets, stations, markets, O&D pair information, maintenance, flight legs, as well as block, turn, and taxi times. For each of the above the corresponding violation reports can be generated.

You can also customize statistics and marketing reports of: station or aircraft activity, aircraft or crew utilization, O&D statistics, market share, passenger itineraries, and your overall schedule.

All these reports include industry standard data such as Available/Revenue Seats per Miles/Kilometers, as well as costs, revenue, and profit. Finally, all reports can be exported in several formats e.g. Microsoft Word or Excel, html, and pdf.

As a further step of customization you can create pivot tables and charts. All these reports can be saved as a template and can therefore be reused in the future by you and your colleagues.

Figure 8. Customizable reports





cutting-edge product

Integration with other systems

SchedulAir can be smoothly integrated within your current planning and scheduling process, your internal applications, and your external partners' systems, thereby maximizing the benefits you obtain. This includes the ability to automatically or manually send data in customized or industry standard formats (e.g. IATA SSIM, ASM, and SSM).

Tailor-made solutions

Your business has special needs which differ from others, we will therefore configure SchedulAir solutions to match your specific requirements.

System requirements

SchedulAir is platform-independent and can be used in Microsoft Windows, MacOS, UNIX, and Linux environments, as well as tablet computers (e.g. iPad).

Commitment-free evaluation

We can offer a commitment-free hands-on experience of SchedulAir for you to analyze the advantages of Unified Management and Optimization and its impact on your schedule.

Customer support

Decisal provides the highest level of customer support, including:

- user training customized to your needs,
- 24/7 help desk and on-line support,
- upgrades each year.

Research and development

Initial research was performed at Imperial College London and has received extensive worldwide recognition. Decisal has since been continuously investing in research and development for SchedulAir and its optimizers.

Consulting services

It is not necessary to buy SchedulAir to take advantage of Unified Management & Optimization. We offer consultancy services providing you new schedules or advice based on current data you supply, either on an ad hoc or periodic basis. This allows you to optimize your schedules with the changing requirements of your business.

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