



the only system with Unified Management & Optimization of:
flights **aircraft** **crew**

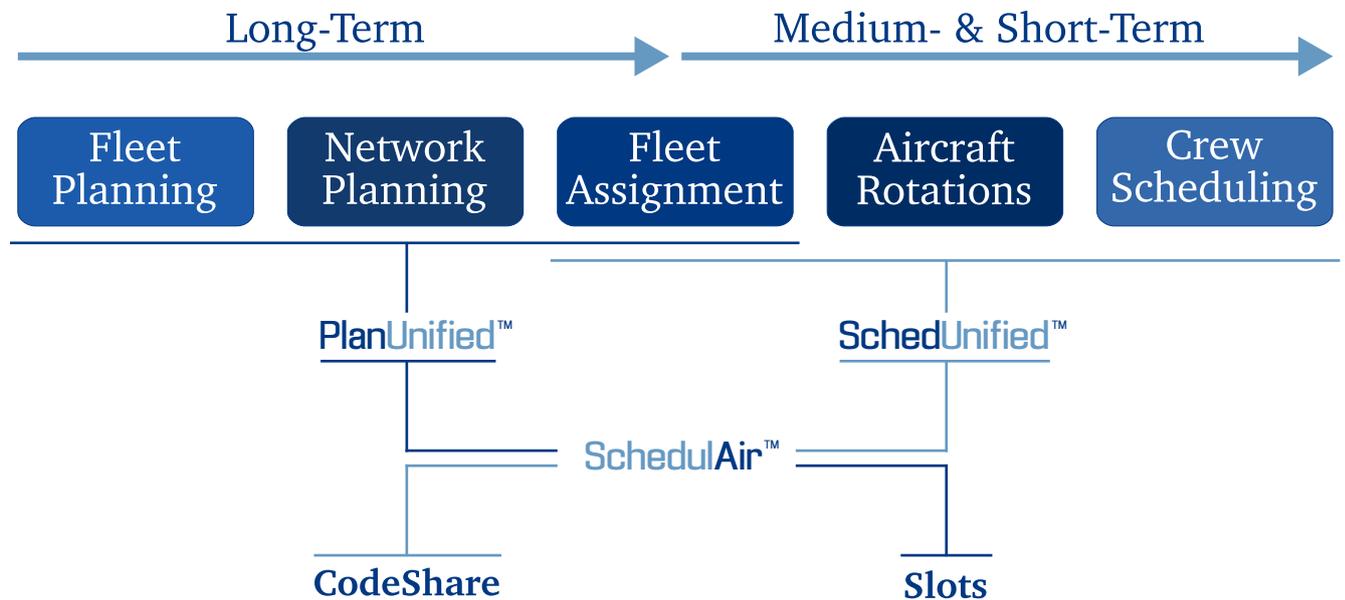
SchedulAir™

unified management & optimization™

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.

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:

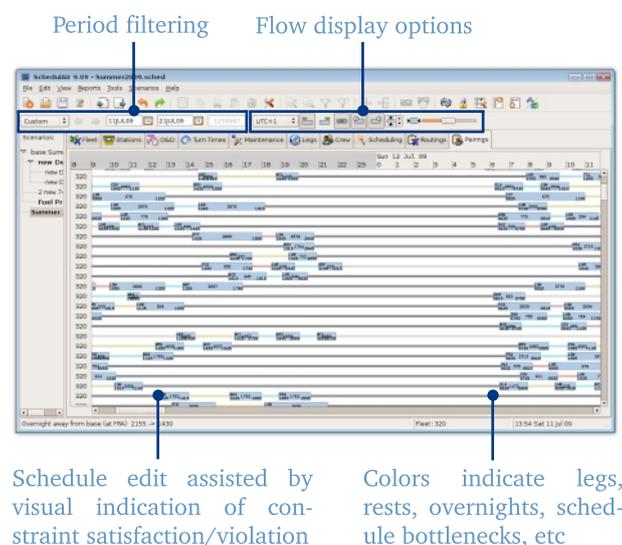
- **Aircraft**, such as initial and final positions, daily availability, utilization limits, fleet mixing, maintenance costs and constraints, number of seats per compartment, range, block and turn times, ownership and leasing costs, en-route charges, and fuel and oil costs.
- **Airports**, for example 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

Annotations for Figure 4:

- Period filtering
- Multi-level undo/redo
- Dynamic UTC/local time modes
- Move, resize, & hide columns, sorting & filtering
- Multiple editing, copy & paste to/from other applications
- In-cell editing

Orig	Flight	Passenger	Effective Date	Obscure Date	Orig	Dep	Dest	Arr	Time	Stop	Block	Time	Offset	Passenger	Reservations	Aircraft	Certificat
BA	90	12_367	02FEB09	02AUG09	LHR	17:00	NLA	18:40	01:40	J	5000	01:40	+00:00	5244	FD0WKE-487H2	F0181234	
BA	90	6	02FEB09	02AUG09	NYC	22:55	LHR	11:30	07:35	J	5000	07:35	+00:00	5707	FD0WKE-487H2	F0181234	
BA	99	7	02FEB09	02AUG09	LHR	16:30	NYC	18:30	02:00	J	5000	02:00	+00:00	5707	FD0WKE-487H2	F0181234	
BA	106	125_01	02FEB09	02AUG09	DXB	10:30	LHR	08:40	01:50	J	5000	01:50	+00:00	5409	FD0WKE-487H2	F0181234	
BA	107	1234567	02FEB09	27AUG09	LHR	12:30	DXB	12:40	01:10	J	5000	01:10	+00:00	5409	FD0WKE-487H2	F0181234	
BA	112	1234567	02FEB09	27AUG09	PKT	18:00	LHR	06:05	07:05	J	5000	07:05	+00:00	5541	FD0WKE-487H2	F0181234	
BA	113	1_347	02FEB09	02AUG09	LHR	17:00	PKT	20:20	03:20	J	5000	03:20	+00:00	5541	FD0WKE-487H2	F0181234	
BA	115	1_49	02FEB09	02AUG09	PKT	21:40	LHR	10:10	07:10	J	5000	07:10	+00:00	5541	FD0WKE-487H2	F0181234	
BA	117	1234567	02FEB09	27AUG09	LHR	08:45	PKT	11:45	03:00	J	5000	03:00	+00:00	5541	FD0WKE-487H2	F0181234	
BA	118	1_2	02FEB09	02AUG09	ALA	10:30	LHR	12:25	01:55	J	5000	01:55	+00:00	5423	FD0WKE-487H2	F0181234	
BA	119	1_3	02FEB09	02AUG09	LHR	20:15	ALA	07:40	08:25	J	5000	08:25	+00:00	5423	FD0WKE-487H2	F0181234	
BA	124	1_4	02FEB09	02AUG09	COH	23:30	BHM	00:10	00:40	J	5000	00:40	+00:00	5124	FD0WKE-487H2	F0181234	
BA	124	1_5	02FEB09	02AUG09	BHM	01:15	LHR	06:05	07:00	J	5000	07:00	+00:00	5106	FD0WKE-487H2	F0181234	
BA	125	1_6	02FEB09	02AUG09	LHR	10:25	BHM	18:55	08:30	J	5000	08:30	+00:00	5106	FD0WKE-487H2	F0181234	
BA	125	1_7	02FEB09	02AUG09	BHM	20:25	DXB	20:15	00:45	J	5000	00:45	+00:00	5134	FD0WKE-487H2	F0181234	
BA	126	1_8	02FEB09	02AUG09	LHR	10:25	MAD	14:20	03:55	J	5000	03:55	+00:00	4242	FD0WKE-487H2	F0181234	
BA	128	1_9	02FEB09	02AUG09	MAN	14:55	LHR	15:55	01:00	J	5000	01:00	+00:00	242	FD0WKE-487H2	F0181234	
BA	129	1_10	02FEB09	02AUG09	MAN	18:50	RER	08:05	09:15	J	5000	09:15	+00:00	4145	FD0WKE-487H2	F0181234	
BA	129	1_11	02FEB09	02AUG09	LHR	18:50	MAN	17:05	01:50	J	5000	01:50	+00:00	242	FD0WKE-487H2	F0181234	
BA	130	1_12	02FEB09	02AUG09	BST	00:10	LHR	01:05	00:55	J	5000	00:55	+00:00	4347	FD0WKE-487H2	F0181234	

Figure 5. Flight legs split and compressed

CA	927	1234567	10FEB09	28MAR09	PEK	09:20	KKX	13:00	J	02:40	FBY154V-V10	73Q
----	-----	---------	---------	---------	-----	-------	-----	-------	---	-------	-------------	-----

splitting ↓ ↑ compressing

CA	927	1234567	10FEB09	28FEB09	PEK	09:20	KKX	13:00	J	02:40	FBY154V-V10	73Q
CA	927	67	01MAR09	21MAR09	PEK	09:20	KKX	13:00	J	02:40	FBY154V-V10	73Q
CA	927	123456	02MAR09	20MAR09	PEK	09:20	KKX	13:00	J	02:40	FBY154V-V10	73Q
CA	927	1234567	22MAR09	28MAR09	PEK	09:20	KKX	13:00	J	02:40	FBY154V-V10	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

Annotations for Figure 6:

- Filtering displayed activities
- Identical functionality with Table View (Figure 4)
- Simultaneous display of aircraft & crew connections demonstrates when crew change aircraft, marking potential bottlenecks

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.

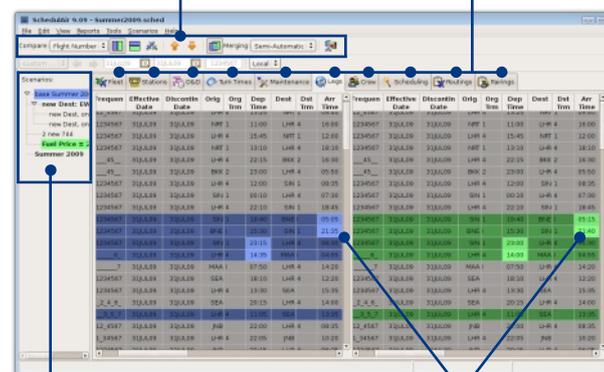
Unified schedule development

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.

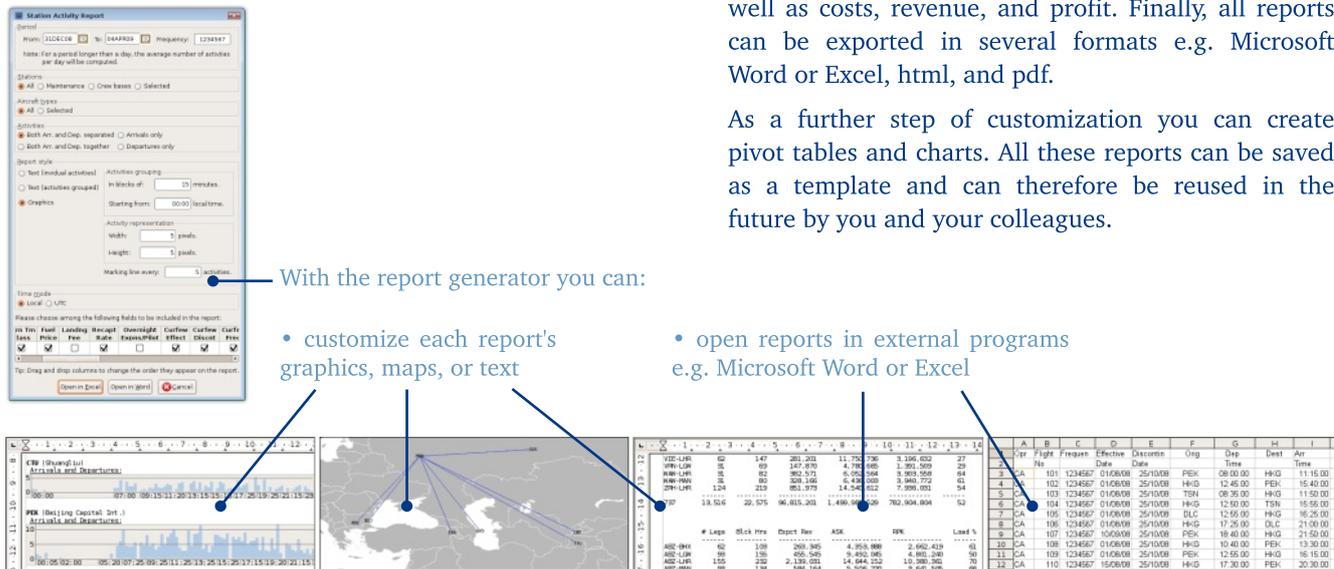
You can produce customized schedule or constraints reports of data including: timetables, aircraft rotations, crew pairings, fleets, stations, markets, O&D pair information, maintenance, flight legs, as well as block, turn, and taxi times. For each of the above the corresponding violation reports can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

Contact Decisal

1 Putney Bridge Approach, London SW6 3BQ, UK

Tel.: +44 (0)800 011 24 31

E-mail: SchedulAir@decisal.com

Website: www.decisal.com

Decisal Ltd is registered in England and Wales, number 5974343. Decisal, the decisal logo, SchedulAir, PlanUnified, SchedUnified, the taglines "making decisions optimal" and "unified optimization" are all trademarks of Decisal Ltd. All other trademarks or trade names are the property of their respective owners.

Copyright © 2019 Decisal Ltd. All rights reserved.