

Timetabling for higher education

Increasing demands on expensive and scarce resources in education are forcing the industry to adopt management styles that emphasize more efficient utilisation of time, money and resources, both human and physical. Academic timetables assign resources to teaching activities, and represent the most accurate measure of how efficient the organisation is in terms of utilisation. Educational institutions also provide a valuable and complex service to literally thousands of students, whose satisfaction can be one of the institution's greatest assets.

And yet, many institutions still rely on manual timetabling techniques involving hundreds of wasted man-hours, or computer-assisted methods that merely create working timetables, without attempting to optimise the allocation and utilisation of resources.

Because time and resource utilisation have direct financial implications, an improvement of even a few percent could lead to a substantial reduction in costs for an institution. Imagine being able to avoid constructing a new building by making better use of existing venues. Or of increasing student performance and throughput by providing all students with completely clash-free and evenly spread exam timetables.

o!Timetabling presents a new way of thinking about the complex problems of timetable planning, making timetables an asset for the organisation and managing them to provide more efficient service to students and staff. Our products combine the power of modern computers with the world's best mathematical optimisation methods from our partner ILOG (www.ilog.com). We provide tools that address the most common timetabling problems, while being flexible enough to handle unusual constraints and requests that might be unique to an institution.

What really sets o! apart is the ability to truly optimise resource utilisation, all within the framework of user-specified constraints and zero-clash solutions.



Products

Our range of timetabling solutions consist of o!Timetable, o!Exam and o!Booking. Although the different modules have been designed to function together, they can also be implemented as fully functional standalone solutions.

o!Exam and o!Timetable consist of the following modules :

WebEditor : Used to gather and store subject and curriculum data.

Optimiser : Used to search for optimised solutions, based on data and constraints in the WebEditor.

WebViewer : Web-based viewer where staff and students can request a variety of views on the timetables. (Personal, per venue, per subject, per curriculum, etc.)

Rebuilder : Provides drag-and-drop editing capabilities for existing timetables, with dynamic clash information and guidance.

o!Timetable

o!Timetable uses curriculum and subject data to create clash-free class and venue timetables. Subject data and preferences are entered by authorised faculty members via an intuitive web interface. This data is then combined with curriculum data from yearbooks or calendars, and used to create class timetables that can be fully customised, edited and published. Our powerful optimisation engine ensures that resources are used optimally, and creates timetables in a matter of minutes.

o!Timetable has been developed and continuously improved by a team of experts over several years. It has been extensively tested by large universities, and refined by inputs from various experts, ranging from mathematicians to university timetablers with decades of experience. The team from Integrear Abacus has incorporated their input and requests into a single, easy-to-use product, making the best possible use of a powerful optimisation engine from world-renowned ILOG.

Main Features & Benefits of o!Timetable

- Fast, efficient optimization with complete user control.
- Ability to handle very large problems with thousands of activities.
- Optimise venue and resource utilisation.
- Web based input of data and constraints from different faculties or departments.
- Automatic data verification and error checking.
- Web based viewer for individual, group or venue timetables.
- Drag-and-drop editing of existing timetable, with detailed clash information.

User testimonials:

"I found the whole package user-friendly in operation, visually acceptable, easy to understand and manage and would recommend it wholeheartedly knowing that any special needs will be seen to, if at all possible. "

User : Esther Cumber

Institution : Durban Institute of Technology

o!Exam

o!Exam uses student registration data to create clash-free exam timetables that provide the majority of students with the best possible spread of exam papers, and schedules all exams in venues so that the number of cross-venue splits and wasted seats are minimised. It also takes into account all user-specified preferences and constraints, while providing complete control with drag-and-drop editing of the result. The final timetable can be published to the WebViewer or exported to flat files for easy upload to other systems.

For long-term fixed timetables, o!Exam can be used with historic registration data as well as defined combinations from yearbooks or calendars. In this way, a fixed timetable can be created that caters for all allowed and popular combinations, while spreading the papers according to actual registration numbers.

o!Exam has been implemented at various institutions with great success. Case studies have shown a dramatic improvement in the spread of student papers, while it has also been possible to decrease the number of sessions used.

User testimonial :

"o!Exam has revolutionized the timetabling processes at the University of the Western Cape. It has allowed us to move from the manual preparation of seven different faculty timetables to a single automated electronic process. The examination paper distribution across the spread of the timetable is now more equitable and we are able to maximise the use of our examination venues. The program has proven to be reliable and very well designed."

User: Sue Nitsckie

Department: Deputy Registrar's Office
(Timetables for approx. 12,000 students)

Main Features & Benefits of o!Exam

- Optimise student paper spread for better student performance and satisfaction.
- Minimise venue splits and unused seats.
- Fast, efficient optimization with complete user control.
- Ability to handle very large problems on multiple campuses.
- Integrates with existing administrative systems to download student registrations.
- Web based input of data and constraints from different faculties or departments.
- Automatic data verification and error checking.
- Web based viewer for individual, group or venue timetables.
- Drag-and-drop editing of existing timetable, with detailed clash information.

o!Booking

o!Booking provides institutions with a centralised web-based system for room and equipment booking. The system provides unlimited user-defined attributes to be defined for rooms or equipment, and sort and search capabilities on these attributes. Users log in via the web, and can then view current bookings for venues and equipment. Bookings can be requested for available times, and will be shown as provisional, unless the user has the rights to make a permanent booking. Equipment and venues are assigned to Owners, who must approve or deny each request for a booking. As soon as an Owner has finalised the request for a booking, the person making the booking will receive confirmation, and the booking will show as final on the web. Only an Owner or the person making the booking can cancel a booking.

All timetables created with o!Exam or o!Timetable can be uploaded to the system in a batch booking process, to save time. The system also provides a set of reports and valuable utilisation statistics.

Main Features & Benefits of o!Booking

- Centralised system for an entire institution, even across multiple campuses.
- Web based for easy access from anywhere, at any time.
- Prevent double bookings and clashes.
- Give staff control over venues for their classes or exams.
- Different access levels prevent unauthorised access.
- Provides management with detailed resource utilisation statistics.

Products

What really sets o! apart is the ability to truly optimise resource utilisation, all within the framework of user-specified constraints and zero-clash solutions. Better use of time and resources can lead to substantial benefits for the entire organisation.

Student satisfaction and corporate image

Educational institutions provide a valuable and complex service to literally thousands of students, whose satisfaction can be one of its greatest assets. For students, timetables control almost every aspect of their education : Which subject combinations can be enrolled for, what the weekly workload is like and even what the distribution between academic and personal time looks like. Exam timetables with poorly spread papers can seriously impede academic performance, while clashes could mean an extra semester or year to finish a degree.

Students often complain about time wasted to sort out the administrative side of academic study. Student-friendly timetables that are always current and easily available on the web can save a lot of time and improves the perception of student-oriented service. With o!Timetabling products, teaching logistics are taken care of to ensure efficient and uninterrupted teaching cycles.

Staff

Staff members are also affected by academic timetables : They need to find a balance between time for teaching, research and general administrative tasks. Many departments employ staff members who have off-campus career responsibilities and very constrained personal timetables. o!Timetable allows blocking times for such staff members, while their teaching load will be spread evenly over the available days and periods. For staff members who are responsible for more than one subject (even from other faculties), o!Timetable ensures that there will be no clashes.

An often overlooked problem is how traditional timetables impact negatively on the effective application of skills and knowledge. Many institutions have fixed timetables where departments must allocate work not according to the skills available, but rather to the slots that the timetable allows. If the best lecturer for a subject cannot be on campus on Mondays, but the subject is on Monday, another staff member will have to teach that class. With o!Timetable, departments decide which staff members should teach what, and the classes are placed to allow them to do so.

Administration

Administrative departments often end up with the difficult task of making timetables fit the needs of the academic departments, who feel that administrative principles and concerns should not be allowed to interfere with day-to-day teaching activities. It is often a case of balancing management's need for efficiency with academic requirements within faculties.

"The program identified the need to streamline our academic programmes."
 D. Human
 Deputy Director: Academic Administration
 Institution : Technicon Northern Gauteng

o! Timetabling products bridge this gap between academic and administrative needs, by allowing departments to enter requests, requirements and preferences themselves. In this way, departments take ownership of their timetables within the broader framework of institution-wide needs and constraints, as prescribed by management. By using the planning and modeling capabilities of the software, administration can quickly see the effect of potential changes in curriculums or teaching times, and identify problem areas within the current structures.

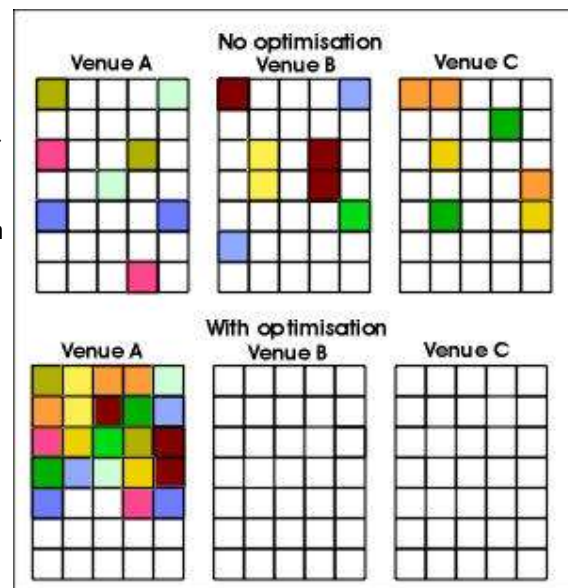
Timetablers

Timetablers and timetable committees usually 'evolve' through time to the point where they alone know the full extent and complexity of the task of timetabling. Students and staff are often unaware of the amount of time and work that timetablers spend to arrive at a final working timetable, while timetablers know that their work is never finished. For every working timetable, staff members and departments will always have change requests and complaints that must be taken into account for the next version of the timetable. If the timetabler is also an academic staff member, he or she will spend more and more time resolving conflicts or working on changes, and have less time available for teaching and research.

o! Timetabling products can greatly reduce the time and effort spent on creating and managing timetables. Because the data collection is distributed to the departments who know exactly what their own needs are, the collection time is reduced and the need for an outside person to 'negotiate terms' is eliminated in most cases. The powerful mathematical optimisation engine at the core of the Optimiser can pack timetables for thousands of contact sessions in a matter of minutes, while drag-and-drop changes can be made with the Rebuilder tool. There is also no need for a single timetabler to remember every request and preference, as this data is conveniently stored in a database, ready for use in all future timetables. For exam timetables, the bulk of the data is downloaded directly from existing systems, and it has been possible to create a completely clash-free and optimised exam timetable for about 20,000 students in less than 2 days.

Resource Logistics

Academic timetables assign resources to teaching activities, and represent the most accurate measure of how efficient the organisation is in terms of utilisation. Where resources are scarce or expensive, an improvement of just a few percent could result in substantial savings. o! Timetabling products are designed to optimise venue utilisation for both class and exam timetables. For class, the emphasis is on using maximum capacity for continuous periods, resulting in better utilisation of space. In some cases, it might even be possible to reduce the number of venues used, so that others can be made available for rental. The system can be used to generate utilisation statistics, or to model the effect of planned buildings on the timetable. For exam timetables, the number of venues and invigilators can be reduced by minimising the number of papers that are split across multiple venues.



By utilising venues in continuous blocks, energy

expenses can be reduced as well. Air conditioning and lighting can be switched off when there are no classes, while continuous blocks reduce the number of times air must be re-cooled.

Re-use data

Once all the data has been collected and a timetable made, there is no need to repeat the entire process for the next academic cycle. All constraints and requests can be rolled over to the next year, so that the users only have to check existing data for correctness. In most cases, the only real changes from year to year will be the work distribution within departments. Any new lecturers can be added to the system, while possible clashes can be identified and resolved with the Rebuilder.

For institutions that wish to re-use exam timetables, actual registrations can be compared to the timetable to identify possible clashes, which can then be resolved.

Contact Details

Feel free to contact us for any assistance or additional information about our products.
Our physical address is :

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Alternatively, you can contact us by [email](#).

