

ITS Abacus

University class and exam scheduling



Objective

More than 30,000 full- and part-time students attend hundreds of courses offered by North-West University (NWU) of South Africa. Scheduling classes to accommodate both students and instructors poses a significant challenge for the school. Courses are taught on campus, by correspondence and via television through more than 80 centers across the country, straining the school's limited resources and leading to potential clashes in course and exam times. Adding to the challenge is the growing number of students, which requires the university to continually add new classes and renders course schedules obsolete from one year to the next. But by adopting a scheduling system created by ITS Abacus, NWU has fully optimized its timetabling and become one of the best-managed universities in South Africa.

Solution

ITS Abacus specializes in timetabling solutions for tertiary institutions. Its o! suite – o!Timetable for class and venue scheduling, and o!Exam for exam scheduling – is based on ILOG optimization and visualization software. ILOG CPLEX, the world's leading mathematical programming technology, does most of the optimization work, while ILOG Constraint Programming (CP) handles the especially tough problems. ILOG Views is used to display course timetables in an interactive graphical environment that allows the university's planners to fine-tune schedules on screen. The ITS Abacus suite virtually eliminates scheduling clashes by optimally assigning courses, teaching venues and other resources.

ILOG Products: ILOG CPLEX, ILOG Constraint Programming and ILOG Views

- **Industry:** University timetabling
- **Application Name:** o!Timetable & o!Exam
- **Geographic Coverage:** South Africa
- **Benefits:**
 - ▶ Fewer scheduling conflicts
 - ▶ Better use of venues
 - ▶ Greater student & instructor satisfaction



Changing the rules of business™

Power and speed for extremely large timetabling problems

ITS Abacus built the o! suite with ILOG optimization and visualization technologies in order to provide the power and speed needed to handle extremely large timetabling problems. The o! suite has been extensively applied at large universities, and refined with input from various experts, including mathematicians and university course planners, all with decades of experience. The result is an easy-to-use product suite that makes the best possible use of ILOG optimization to automate the timetabling process and optimally allocate time slots and resources.

At NWU, o!Exam uses ILOG CPLEX to create optimized, clash-free exam timetables for more than 30,000 students across multiple campuses. At the same institution, o!Timetable provides class and room scheduling to make the best possible use of very limited resources. Solutions created with the suite are displayed with ILOG Views-based graphical user interfaces, which allow users to refine the schedules easily. ITS Abacus currently has installations of one or both o! products at other schools, including Tshwane Institute of Technology, University of the Western Cape, Durban Institute of Technology and the University of Venda. All of the company's customers have reported similar results and tremendous satisfaction in the o! suite.

Benefits

Optimizing the timetabling process helps NWU provide schedules that better match individuals to classes and venues. There are fewer scheduling clashes, and both students and instructors are more satisfied with the timetables they are given. The class timetables have improved venue usage, enabling the school to get more out of its limited resources. The exam timetables have enabled the school to eliminate one session a day, reducing costs significantly and allowing students to leave earlier in the evening.

About ITS Abacus

ITS Abacus currently leads the South African market for tertiary timetabling solutions. It offers a wide range of services to its customers, providing comprehensive implementation training and assistance with its software. Post-implementation product maintenance, software updates and future releases for acquired systems are provided under an annual maintenance contract.

"o! has enabled us to produce both class and examination timetables of the highest quality and flexibility in record-breaking time. ILOG optimization components ensure that all resources are used optimally, while clash-free examination timetables with good paper spread have greatly increased student and staff satisfaction across our campuses."

– Ivan Meyer
Former Timetabler
North-West University

"Using ILOG, we not only generated clash-free timetables, but we were able to satisfy the special requirements of the majority of faculty and students."

– Hercules Dreyer
Managing Director
ITS Abacus

ABOUT ILOG'S OPTIMIZATION PRODUCTS

More than 1,000 commercial customers, including 160 members of the Global 500, use ILOG optimization tools and engines to solve the world's most challenging planning and scheduling problems. ILOG optimization products are also used by a majority of the leading supply chain management software vendors, as well as in research programs at over 1,000 universities around the world, making the products the "gold standard" for performance and solution quality in the operations research community. For more information and a complete list of customer references, please visit <http://optimization.ilog.com>.

ABOUT ILOG

ILOG delivers software and services that empower customers to make better decisions faster and manage change and complexity. Over 2,500 global corporations and more than 465 leading software vendors rely on ILOG's market-leading business rule management system (BRMS), optimization and visualization software components, to achieve dramatic returns on investment, create market-defining products and services, and sharpen their competitive edge. The BRMS market share leader, ILOG was founded in 1987 and employs more than 700 people worldwide.

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