Timetable-generating software improves students' efficiency

The Faculty of Engineering, Built Environment and Information Technology at the University of Pretoria is proud to be the home of innovative young minds. Yi-Yu (Bruce) Liu, a third-year BCom (Informatics) student, along with his project team, has successfully developed groundbreaking timetable software for use by UP students and staff.

This software allows one to automatically customise one's university timetable, while being able to add additional information like test dates and personal events, from a single platform. The student team's Chylls Timetable Assistant has proven that dedication and creativity, along with an understanding of human needs, is the key to unlocking innovation in the field of informatics.

Bruce's goal has always been to inspire people. This mindset, along with his passion for developing technical skills in computer programming, has led him to pursue a career in informatics. Bruce experiences informatics as a study of people as much as it is a discipline dedicated to logical problem-solving. His combination of the soft skills needed for interacting with people, an understanding of business processes and the application of technical programming skills has led to the continuous development of this software.

Getting a good idea to become a workable project

The idea behind the Chylls Timetable Assistant originated from brainstorming sessions for undergraduate projects for which other ideas were pursued. However, with support from his colleague, Christopher Park, also a third-year BCom (Informatics) student, Bruce embarked on the process of turning this idea into a workable project. The two students teamed up to do the groundwork for the first version of the program, and during their university holiday, Bruce and Christopher approached both the Business Incubator at UP and Prof Alta van der Merwe, Head of the Department of Informatics, with a prototype of their software.

Prof Van der Merwe assisted the students to get their program onto the University's ClickUP system for students to start using. ClickUP is the University of Pretoria's centralised Blackboard e-learning system, to which all students and staff have access. At the beginning of an academic term, UP students and staff can download the Chylls Timetable Assistant software directly from the ClickUP home page.

In 2014, Chylls Timetable Assistant got some 5 000 clicks, and in 2015, this number has increased to some 9 000 clicks.
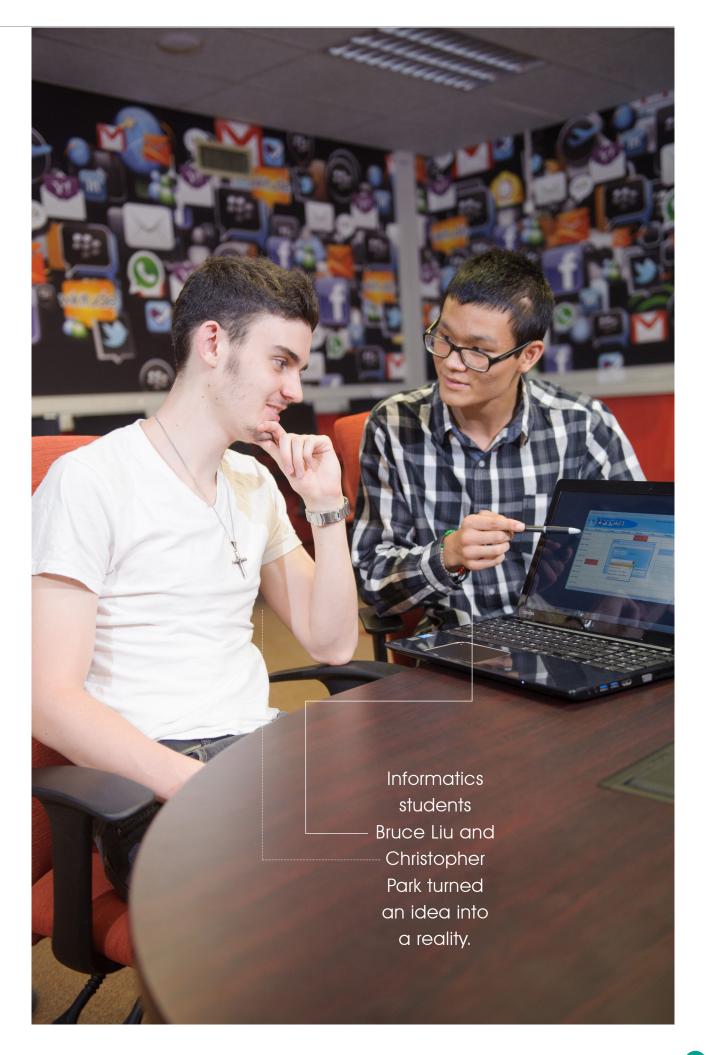
Bruce has been approached to present the program to first-year BCom (Informatics) students with the aim of not only boosting the user numbers for the Chylls Timetable Assistant, but also of inspiring them to work hard towards achieving great things while at UP.

The Chylls Timetable Assistant

The Chylls Timetable Assistant is linked to the University's database of information regarding academic modules, time slots, venues and test dates. What this means is that the program's database is automatically updated when the University's database is updated, eliminating the time-consuming process of manually updating datasets.

A user selects a Chylls Timetable template from a list provided. This includes the lecture timetables of the Faculty of Theology, the Groenkloof Campus, the Hatfield Campus, the Mamelodi Campus and the School of Engineering. The user then inputs his or her modules, specifying the language and period of presentation. The software has the ability to generate up to 30 000 colour-coded timetable options in under a minute, giving users the opportunity to plan their days much more efficiently. It also alerts users to subject clashes, which they can then attend to before registering for elective modules. This streamlines the process of generating individual timetables and allows for timetable optimisation in cases where the classes for one module can be attended at different times and in different groups.

The software code employs a true or false test that considers the

Informatics
students
Bruce Liu and
Christopher
Park turned
an idea into
a reality.

→ *The Chylls Timetable Assistant has proved an excellent tool to optimise the compilation of students' timetables.*

variables for each module in a recursive method. It incorporates a loop that goes through each module, puts everything onto the timetable and evaluates if each item can be seen as true (possible). Each variable that is not possible (either as a result of a clash or an alternative possibility) is marked as false and the system goes on to the next possibility. Users commend this by saying that it enables them to adapt their schedules to their needs; a frustrating and time-consuming thing to do by hand.

Technology always moves forward

If technology does not continue to develop, it stagnates; often unable to adhere to the changing needs of its consumers. In their second year, Bruce and Christopher were joined by other members of their class – Kristina Jovanovic (BCom (Informatics)), Duran

Cole (BSc (IT) Software Development) and Nonde Masondo (BCom (Informatics)) – who assisted with interface redesigns and internal updates to improve the user experience of the program.

Most significantly, these improvements have been the program's ability to add test dates, times and venues, personal events and friends' timetables to a user's own timetable.

The program also has the ability to present summaries of modules and tests, generate reports and view maps of the various UP campuses. The new interface allows for complete customisation in terms of font and colour options for the timetable cells.

A significant requirement for the success of a new technology is its ability to integrate itself into the technologies that users

already rely on. The Chylls Timetable Assistant can synchronise the timetable that it generates with a user's personal Google calendar – thereby using existing technology to improve user experience and adhere to user needs.

Prof Van der Merwe says that the Department of Informatics is proud of the students who were involved in the development of the Chylls Timetable Assistant software.

She believes they have gained valuable experience in the development and deployment of such a valuable system. Bruce expresses that he has learned that it is not enough to just develop a product. The process of getting users to interact with a new product is where more hard work starts. Networking and the promotion of a product that can improve people's lives is an essential step

in the technology transfer process.

Furthermore, it is essential that a product – especially something as depersonalised as computer software – continuously allows for its own adaption to consumer needs.

Harold Abelson, founding director of both Creative Commons and the Free Software Foundation, said that programs must be written for people to read, and only incidentally for machines to execute. This is especially true when it comes to the field of informatics, where user needs dictate technical outputs.

The Chylls Timetable Assistant is compiled in such a way that future improvements in the form of added variables are possible as the need for these arise, enabling continuous innovation in this market. ✪