



Understanding student success at Dublin City University through data analytics

Introduction

This case study describes how Ildiro Analytics worked with Dublin City University to explore how advanced analytics can be used to understand students' experience in a new way.

Specifically, DCU engaged Ildiro Analytics to explore how student data could be used to predict, manage and improve future student experience, behaviour and outcome.

The problem

Each year a number of students drop out of university. This results in significant loss of revenue for the university, as well as wasted time and effort for the student.

DCU invests heavily in student supports, and believed that an analysis of all the available data associated with that student could lead to an improved understanding of student experience, thereby enabling resources and supports to be targeted more efficiently.

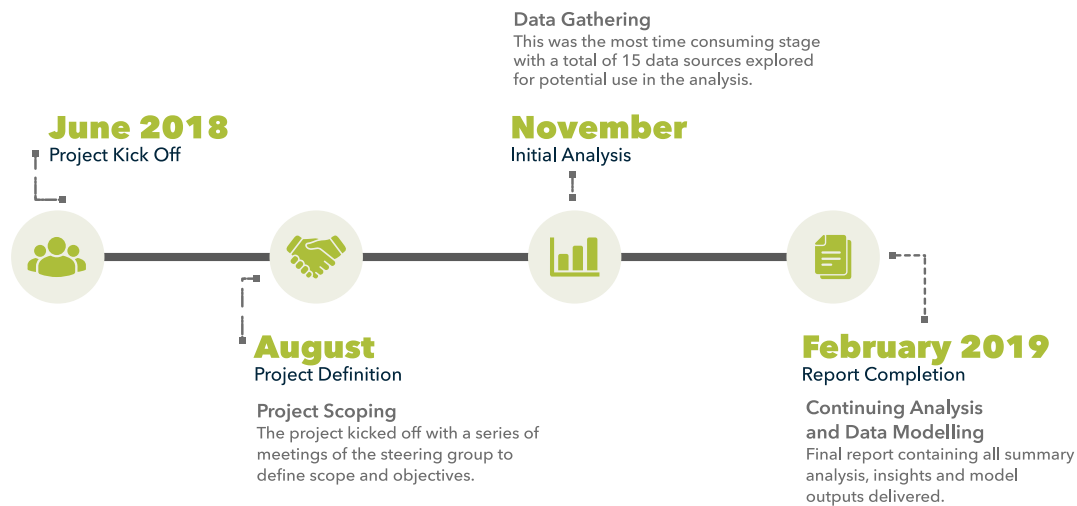
The overall problem was defined loosely as an analysis of data around students and their behaviour to identify factors associated with the student experience.

At a higher level, this project represented an important step in making DCU more data-driven in its decision making.

Related to this, one anticipated benefit was a vastly improved understanding of the data sources available and how they could be used.

Ildiro's approach

This project took place in 2018/19.



Idiro took the following approach with this project:

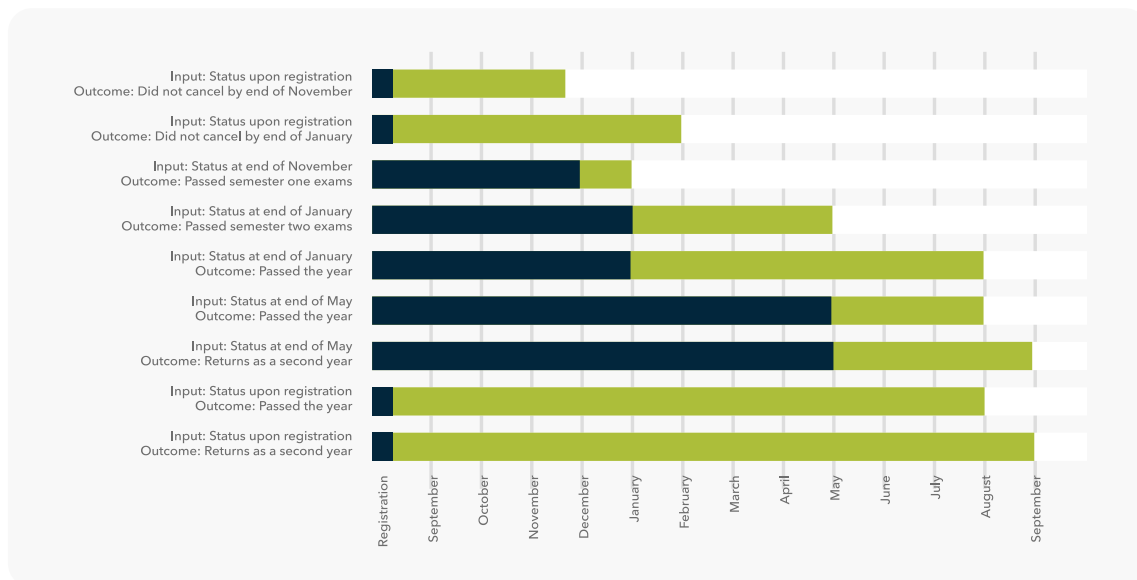
- 1 As this was an exploratory project, the first step was to define the project's specific scope and objectives in a series of meetings with stakeholders. The stakeholders decided that the project should look for insights around the factors associated with students leaving at any one of several critical points in their first year; first month, first semester, time where fees could be refunded, start of second semester, complete second semester, return for second year.
- 2 Next, a large number of data sources across a 5-year period were identified and evaluated in detail. These were:
 - Student registration data (first and second year)
 - Biographical data: data of birth, gender, citizenship, ethnicity
 - Addresses during the year (home and term)
 - Course of study (course ID and results of exams / assessments)
 - Detailed Leaving cert results
 - Membership of clubs & societies
 - SUSI funding
 - Data of each borrowing from the library
 - Library entry logs
 - Computer labs usage logs
 - Printer usage logs
 - Moodle data - Submission of projects
 - Records of interactions with the Student Support office
 - Demographic of secondary school attended
 - Sports Centre usage logs
- 3 The data from each source had to be extracted, audited, transformed, anonymised and loaded into a database for analysis. Given the wide variety of data sources and the fact that this was the first time these data sources were brought together, a lot of work was needed to produce a clean and usable dataset.
- 4 Finally, the data could be analysed. An initial exploratory analysis was completed. The objectives were to identify, and quantify and model where possible, the principal influencing factors associated with a number of specific student outcomes.

This initial data gathering stage represented a significant phase of work as it highlighted areas where potentially useful data was unavailable or was not available in a useable way.

The following graphic shows the different outcomes that were examined, and the stage within an academic year when the input data to analyse them would be available. For example, in the first example we examined the data that was available at the time of registration as variables predicting whether a student would drop out by the end of November.

● Period over which input data was taken from

● Period between input data and outcome to be predicted



5

Finally, Ildiro completed a programme of advanced analytics. In this programme we used decision trees and data visualisation techniques to deliver insights.

Here are some examples of the insights:

- The study confirmed a correlation between CAO points on entry and student success in 1st year. However, the study also showed that students can do well if they enter on low points.
- The same applied for the points achieved by students in Mathematics.
- The study highlighted areas where data is under-utilised or not utilised at all.
- The study showed deep knowledge within the university, but fragmented or hidden with individuals or units. Effective data-driven decision-making requires us to be able to see right across units and processes.

6

The final report was presented to DCU and detailed discussions held on the findings. Ildiro took time to ensure that the conclusions and their implications were understood and accepted by all.

Benefits

This project was an excellent example of how Ildiro was able to support an organisation embarking on an analytics agenda for the first time.

DCU recognised the value of its digital assets and the potential of data to support improved decisions and allocation of scarce resources and this pilot study was an essential first step towards becoming a data driven organisation.

Ildiro's work in building and cleaning a comprehensive data set gave the university a much better understanding of its data assets and what steps would be required to deliver a mainstream approach to analytics.

The project highlighted the importance of data governance: where university data will be consistently defined, of good quality, standardised, integrated (or integrate-able).

DCU has taken the learning from this project and is applying it to reach agreement on how data will be stored, shared, managed and used for all aspects of its business.

“Idiro recently completed a data analytics project for us. They took Data from a wide variety of sources and provided us with a range of valuable insights. They were professional and easy to work with, and I look forward to working with them again.

The road to becoming an analytics-driven organisation is complex and Ildiro was a great partner as we started out on this journey. It has been challenging to define our data analytics objectives and strategy and make decisions on where to target our resources and efforts. The Ildiro team helped us greatly with making sense Of our goals and achieving the most from our initial investment.”

Orna Duggan

Head of Strategic Intelligence and Operational Excellence,
Dublin City University.

Further information

Many more of our case studies cannot be published due to confidentiality.

For more information about these, or about how Ildiro can help your business, contact us at **info@ildiro.com**

