

Are your students at risk of attrition from their program or study?

Identify them with the Cortell Student Retention, Attrition and Intervention Platform



A Model for Identification of Students at Risk



Executive Summary

Universities are constantly seeking new sources of revenue. While new revenues are an important way to increase funding, higher education providers suffer leakage of revenue when students decide to leave their chosen course or school. Student attrition is a growing concern for all types of higher education institutions.

One of the critical consequences of student attrition is the cost to the institution.

These costs are not only borne by the institution that loses the student. In a five-year study that ended in 2009, the American Institute of Research (AIR) concluded that state and local governments spent approximately US\$3B to help pay for the education costs of students who dropped out of colleges (Schneider & Yin, 2011). Add to this the federal appropriations allocated to these students, costs were estimated to be almost US\$4B (Schneider & Yin, 2011).

The Cortell Student Retention, Attrition and Intervention solution is a framework which identifies those students at risk of attrition from their program or study. It also supports the analysis and capture of intervention programs used to retain students. The framework provides a structured approach to monitor the success - or failure- of the chosen intervention strategies.

The Cortell solution has been deployed in a large number of educational institutions. Cortell has built this framework using the extensive experience gained through these implementations resulting in a solution that encompasses best practise for a streamlined deployment with a wealth of out-of-the-box capability.

Overview of the solution

Cortell has developed a solution that identifies the students predicted to leave their school or faculty. The models provided as part of the solution, combined with specific intervention strategies, have proven to reduce student attrition rates and therefore increase student success.

The solution is developed to predict the likelihood of attrition in both commencing students as well as continuing students. Commencing students are those who are enrolled but have not commenced their studies.

Continuing students are students who have already commenced their course. These different categories of students have different data requirements, business objectives and requirements, and therefore intervention strategies are different. The intervention strategies are derived by using data from previous interventions. The solution will recommend intervention paths that optimise the attrition rates.

In addition to identifying students at risk, the solution provides comprehensive reporting and analysis through a set of reports and dashboards that can be targeted to the relevant audience, such as a student success team.

The Cortell solution provides the reporting and analysis of student retention activities as well as providing a platform for what-if modelling and planning activities such as forecasting or budgeting student load projections.

The offering is underpinned by the market leading Business Analytics product suite from IBM. The solution leverages SPSS Modeller and IBM Cognos TM1, along with the expertise of Cortell Australia's consulting team to provide a unique offering to Higher Education organisations internationally.

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Data Requirements

The solution relies on data that can be broken down into four major areas;

| Data Type | Examples |
|-----------------------|--|
| Demographic Data | Age, gender preference, ethnicity |
| Activity Data | Grades, semesters completed, subjects failed |
| Financial Data | Payments, fines, penalties |
| Program & Course Data | Class size, historical pass rates, capacity |

Table 1: The availability and quality of data items will influence the outcomes of the models. A comprehensive list of data items required to optimise the outcomes of the model can be obtained from Cortell Australia.

The model will take advantage of additional data if provided, as well as operate with a subset of the defined data required. However, results will differ depending on the quality and robustness of the data provided to the model.

An additional, optional, module allows the use of text-based data fields. Examples of these data fields are free form information collected from surveys, social media data from Twitter, Facebook and other online forums.

The model operates at a program or course level and looks for correlations between this data and likelihood of attrition.

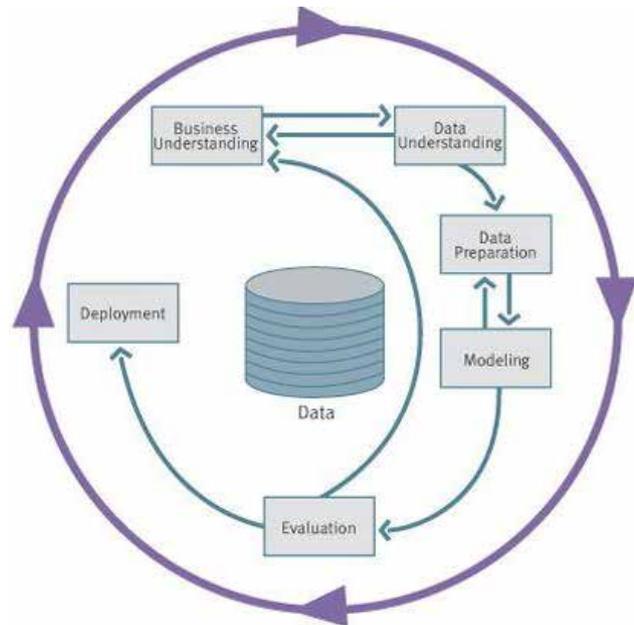


Figure 1: The Cortell solution is based on an iterative process of continual learning and improving. Intervention strategies are implemented and the outcomes tracked. The outcomes are used to improve future strategies.

Data Preparation

The Cortell solution has to the ability to create and derive new data fields from the data points supplied.

Some examples of this derived data include distance from home post code to current campus, time since last education and home language proficiency.

The solution will take advantage of additional fields as provided which allows for an open and extensible model to cover all current and future requirements.

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Modelling and Evaluation

The framework provides an automated classification modelling technique which applies up to nine algorithms to the data set and returns suitable results ranked by overall accuracy. As the modelling and evaluation is dependent on the data sets, and differs for each organisation, the evaluation of the results still requires consulting and professional services to review the output and assess the best model to apply.

The solution identifies the students who are at risk of leaving the institution. The list can either be exported using industry standard formats, or used as an input to IBM's Cognos TM1 for further reporting, analysis, modelling and deriving intervention/interaction strategies.

As part of the engagement, Cortell consultants can answer questions being; should any advanced settings such as "misclassification costs" or "ensembling" techniques be used and applied.

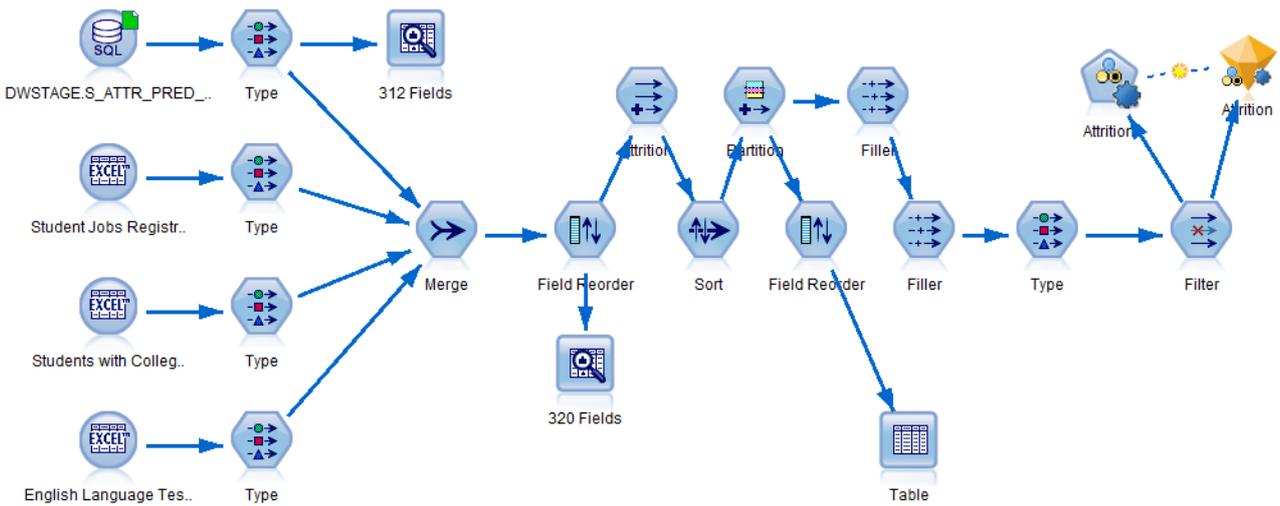


Figure 2: The Cortell solution uses IBM's predictive analytics technology. The models are configurable to use additional data points.

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Reporting and Analysis

The solution has the facility to generate a customised “Attrition” data repository. The specific data elements of this data store can be selected or defined either as a one-off setup process, or amended as required.

This data store can be used to support the reporting output and provide additional metrics and measures including:

- Count of new students identified as being at risk, between each period by which the attrition model is completed in SPSS Modeller
- Calculate the consecutive weeks a student has been identified as being at risk
- Calculate the overall average consecutive weeks a cluster or cohort of students have been identified as being flagged at risk (for benchmarking and KPI metrics)

In addition, a number of standard reports and dashboards are provided to support the various analytics, reporting and monitoring of retention performance. These can be run for the entire student body or “sliced and diced” by any of the previously mentioned data elements as determined by the customisation and setup process. 1 SPSS Modeller will determine the relevant algorithms to apply to the data and the specific number of applicable techniques will only be determined by the data types, quality and fields used for modelling.

The IBM Cognos BI reporting platform can be used to extend the reporting functionality. IBM’s BI solution is the industry leading Business Intelligence solution that offers ad-hoc reporting capability, automated report generation, alerts for when KPI’s fall outside defined thresholds and much more. Reports can be delivered to mobile devices as well as any browser-enabled platform.

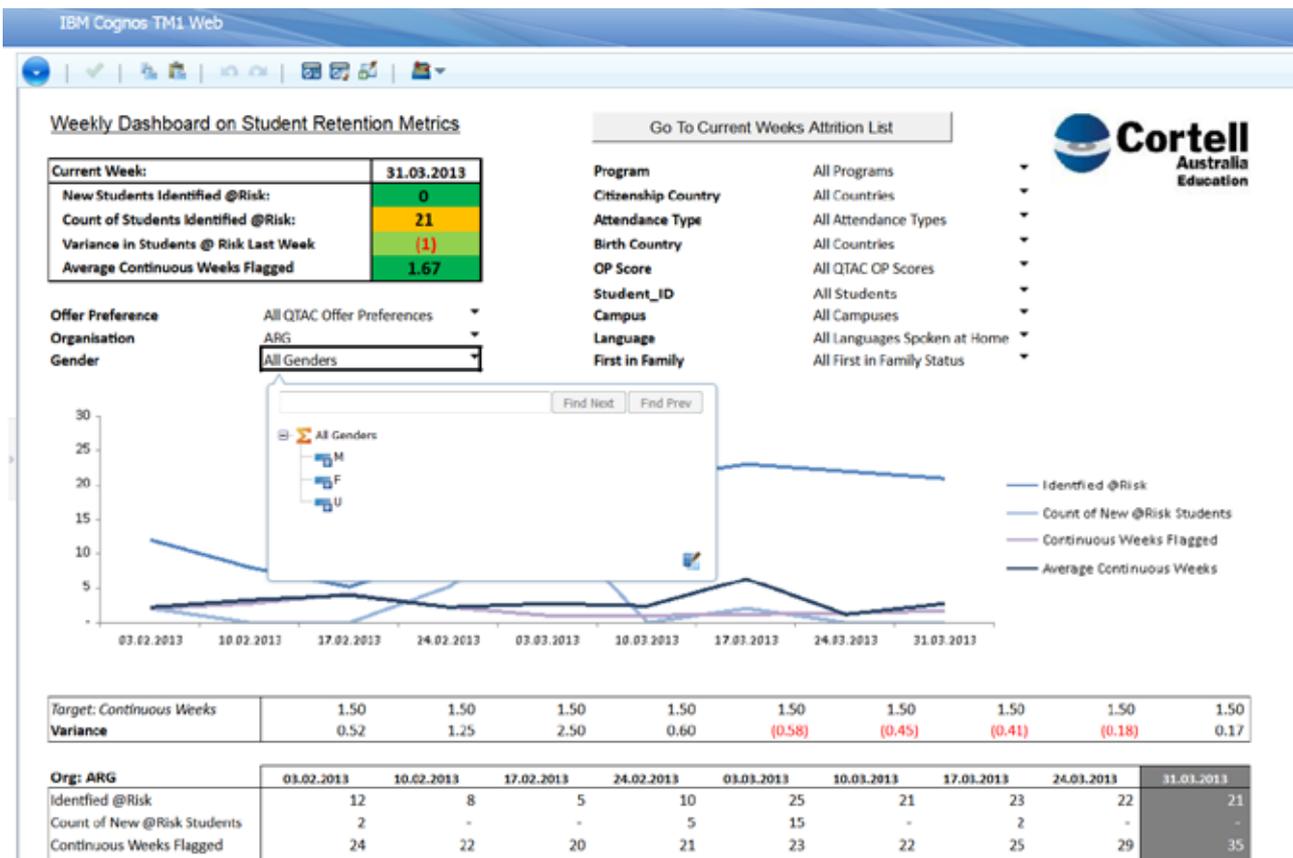


Figure 3: The Cortell solution uses IBM’s advanced reporting solution to provide detailed reports, dashboards, scorecards and allows for ad-hoc reporting for all users across the organisation.

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Intervention Strategies

The solution identifies the cohorts of students that are at risk. It allows the user to drill down to an individual student's record. Details at this level include the student's name, contact details, preferred method of contact, and key attributes relating to why they have been flagged as being at risk.

The Cortell Australia solution also stores a history of interventions and interactions that have taken place. The details include the date of occurrence, whether the interaction was automated (campaign, bulk SMS notification, learning systems) or manual, strategic class of intervention (advisory, negotiated or performance) any notes, and a specific follow-up date.

While some of the records can be sourced from systems, the solution allows for manual entries to be created. The user can select the intervention from a standard list to add specific notes and next steps for each of the students identified as being at risk. The solution is date sensitive and allows for the user to specify a follow-up date to trigger an e-mail alert notifying a student success advisor (or whomever is responsible for having the interaction/recommending intervention) to action the intervention strategy.

Decision Management and Real-Time Scoring

The solution incorporates IBM's SPSS Collaboration and Deployment Services, which allows you to manage analytical assets, automate processes and efficiently share results widely and securely.

SPSS Collaboration and Deployment Services includes capabilities that:

- Collaborate so you can develop and implement analytics across the enterprise
- Automate data flows so you can construct flexible analytical processes
- Provide real-time scoring based on inputs into the intervention/interaction models

In addition, the use of rules can be used to automate decisions based on business logic, or on the output from predictive models. You might use rules to exclude students based on payment history, to refer those students with poor academic performance to a special team within a faculty, or to target those with the highest propensity to switch programs of study, as identified by a predictive model.

While rules bring automation, models provide predictive power, and the ability to combine them is one of the key features that distinguish the Cortell Australia Student Retention and Intervention solution from other analytical tools.

Documentation and Updates

The solution is comprehensive and includes documentation, notes and tips to support a successful deployment. Updates are provided regularly and incorporate best-practice

knowledge gained from deployments across the globe. Latest information also consist of regulatory changes as defined by authorities in different countries and regions.

Cortell Australia



About Cortell Australia

Cortell Australia is the region's largest and more experienced provider of Business Analytics and Business Performance Management solutions. We're also a multi-awarded preferred partner of the full suite of IBM applications:

- IBM Cognos TM1
- IBM SPSS
- Cognos BI
- Information Management
- Cognos Express
- Cognos Disclosure Management

900 Successfully delivered solutions and counting

Our globally recognised expertise is built on experience. And with over 900 business changing solutions delivered to more than 500 companies across a diverse range of industries, we know exactly how to deliver exceptional results on tight deadlines and budgets.

Cortell has won the following Awards:

IBM Software Australian Partner of the Year 2013

IBM Worldwide Business Intelligence & Advanced Analytics Partner of the Year 2013

IBM Business Analytics Australian Partner of the Year 2013

IBM Business Analytics Asia Pacific Partner of the Year 2011, 2012 & 2013: Excellence Award

IBM Business Analytics FPM Partner of the Year 2010

IBM Business Analytics Industry Partner of the Year 2009



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² Version number: WPSTAR01