How to accurately use enrollment to predict revenue in higher education

Written by Bob Cortland, Sr. Solutions Engineer

Questica
A Euna Solutions Brand

Contents

University Finance officers face increasingly challenging decisions when trying to satisfy competing priorities and interests within an institution.

These decisions become even more difficult when there isn't a systematic way to predict future revenues. Revenues, for the most part, are a combination of counts (number of enrolled students) and rates (tuition/fees/books/boarding/etc.).

Colleges and Universities have a lot of control over the rates, but do not have the same control for the counts. The solution? Come up with a more scientific approach for projecting enrollment.

Enrollment forecasting methods

Enrollment being by far the biggest driver of revenues at Higher Education institutions, some form of Enrollment forecasting usually takes place on some level. But what is the best way to predict enrollment? In truth, there is no 'one size fits all'. There are various models to consider, each with their own relative strengths and weaknesses. Counterintuitively, sometimes a more simplified and straightforward model will outperform more complicated one. **Let's discuss a few options available for institutions to explore.**

1 BASELINE MODEL

The simplest of the models that will be covered, to use a baseline model is to simply take a historical count of enrollment across the different departments/ programs across the school.

Then you need to adjust for the ratio between total enrollment and the individual departments or programs. This model implies that this relationship between the departments and overall enrollment remain consistent over time, and any change in enrollment is directly related to the institution's overall increase/ decrease in enrollment.

Pros: Simple to calculate, is based on historical counts

Cons: Assumption that departments and overall enrollment remain consistent over time can be onerous.

2 TREND LINE MODEL

The use of a trend line model employs regression analysis to determine trends over several historical years for enrollment levels. This model will then naturally extend these trends into the future.

So, if a program's enrollment has been static, then there will be no increase or decrease predicted by this method. If a program or department has been steadily increasing, then that rate will continue into future semesters, and so on.

Pros: Simple to calculate, with only a few years of historical data required.

Cons: Rapid changes in trends will not be accurately accounted for in such a model, which can be slow to adapt to such developments.

3 MARKOV CHAIN MODEL

Many institutions employ some flavour of the Markov chain model, which looks largely at current values to predict future outcomes. Sometimes known as transition models, in terms of enrollment the model is treating each cycle (semester) as a transition. Each transition would therefore have a probability, over the course of a cycle (4 years for an undergraduate degree, for example).

Markov Chain models have many statistical applications to real-world use-cases, notably for enrollment predictions. This model will track students (based on different types or statuses), from one year to the next. This leads to rates being created for both recruitment and dropout rates. By using formulas to combine these different rates and counts, this can lead to a systematic way to predict future enrollment levels for each class of student.

Pros: Extremely effective in calculating cost-effectiveness

Cons: First-order Markov chains do not account for historical data, which can be essential to understanding enrollment patterns. However, when this historical data is then introduced, adds a lot of complexity to the model and introduces potential for confounding variables.

4 COHORT SURVIVAL METHOD

If we think of progressing through the years at an institution as 'surviving', then establishing the survival levels of each cohort of student will give a good indication of how likely they are to continue onto the next year of study.

Taking a new student, we can calculate the ratios between 'birth to freshman', freshman to sophomore', and so on. Additionally, several assumptions can be built into the model to augment the raw numbers, like perceived increases/decreases in enrollment, scholarships, etc.

Pros: Relatively simple, just need to calculate the ratios between the different cohorts and student types over time.

Cons: Reliant on very accurate historical data in order to work properly.

5 'UNIVERSITY OF DELAWARE' MODEL

The University of Delaware set out to research the best enrollment projection methods and determined that research in this area was lacking. So, they built their own model.

This looked at historical enrolment rates, separated the students into their different types and statuses, then set out to develop both 'yield rates' (how likely a student was to join the school if they were accepted) and retention percentages (how likely is a student to continue in the Spring semester from the Fall, or from the Spring to the following Fall semester. Once these numbers have been crunched, a tuition model is used to project the revenues associated with these different students, based on the fee structure used at the school.

Pros: Straightforward, builds on the pros from several of the models listed above.

Cons: Can be difficult to implement as it does involve large amounts of calculations, increasing for each dimension you include (students types/fee structures).
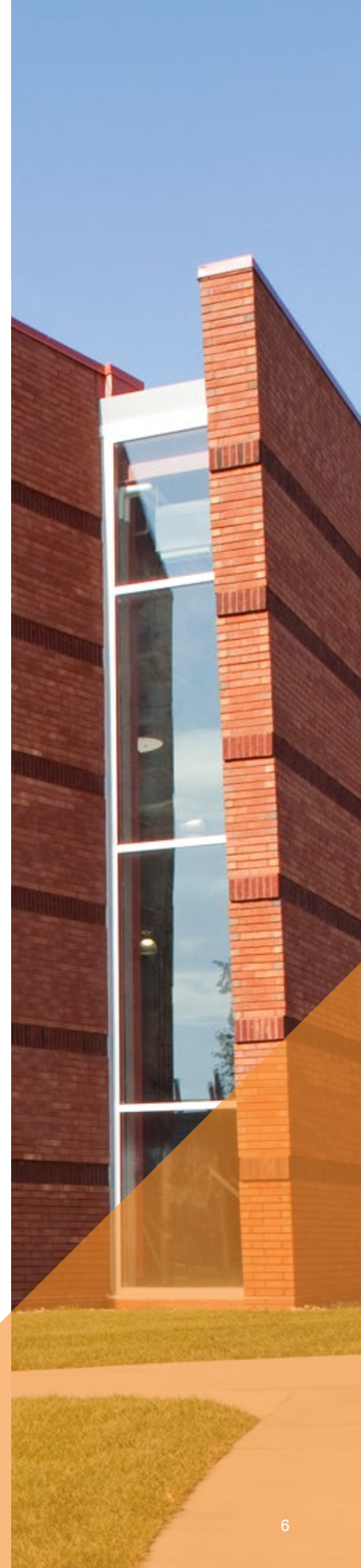
Convert theory to practice

Once a method and a model has been selected, there is the small matter of turning these concepts into practical, usable solutions.

Due to its flexibility as a program, many institutions lean on Microsoft Excel to build out these worksheets, to crunch the associated numbers to project enrolment counts and rates, and to calculate future revenue. Excel is an extremely powerful and popular program, but has some drawbacks associated with it.

These include things like human error, and lack of visibility into the underlying assumptions and formulas that make up the workbook. There is certainly truth to the saying 'the more people that use a spreadsheet, the more likely something will go wrong'.

Some institutions will also set out to build their own software solution to accurately project enrollment numbers and forecast revenues for the institution. This is great for those institutions who a) have the institutional knowledge/team to execute a project like this and b) the funding to support building out a custom solution. There is a very short list of schools that have either the time, or the money that would be associated with this approach.

A final option? Purpose-built, configurable software which will allow for robust implementation and execution of any quantitative modelling process. Ideally, one should be able to include any high-level assumptions that can augment the model, while also being easy enough to use and understand by everyone involved in the process.

Conclusion

By adopting a formalized method for projecting enrollment, Colleges and Universities are better able to project anticipated revenues and student counts. This can help inform institutional decision making and puts the institution in a far better position to plan effectively.

There are multiple methods and models which aim to do just this, and there is not one that's objectively 'best'. Institutions should evaluate the different options they have in order to determine what's going to be the most appropriate for predicting the future One way to reduce the pain of converting theory to practice is by implementing a comprehensive budgeting and forecasting solution, which can incorporate any of these models.

Most importantly, an institution should have the flexibility to change or adapt their methods over time. Questica Budget allows for the incorporation of enrollment projection, tuition revenue modelling as well as flexible approvals for building out the entire budget of the school.

Call us to learn more.

About Questica

For over 20 years, Questica, a Euna Solutions brand, has partnered with public sector organizations has partnered with public sector organizations to enable data-driven budgeting and decision-making, while increasing data accuracy, productivity and improving stakeholder trust. Over 700 organizations are using Questica's budgeting, performance, transparency and engagement software solutions.
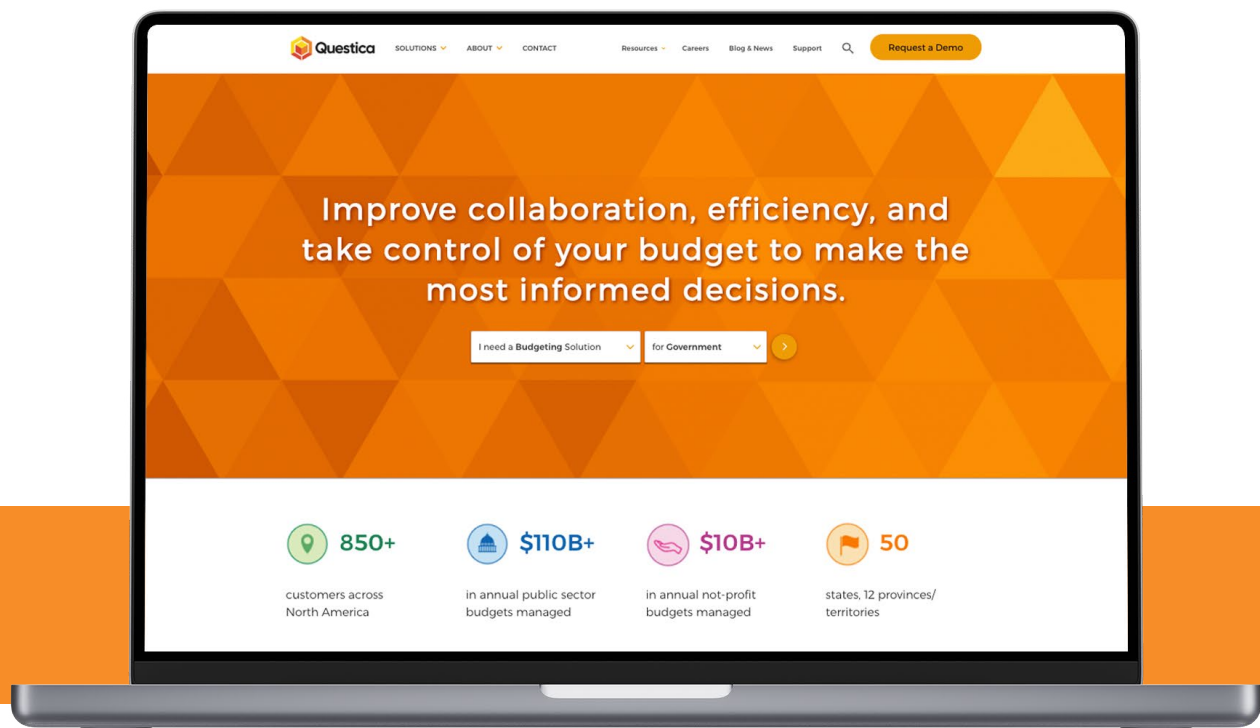
Budget

Questica Budget is a powerful, multi-user and multi-year budget preparation and management software suite that helps your public sector organization run operating, salary and capital budgets with accuracy and efficiency.

Integrating with dozens of financial systems, Questica Budget has everything you need in one place to develop, track, monitor and adjust your budget, plus generate custom reports, create what-if scenarios, and develop complex budget formulas with our new Advanced Calculation Engine. Imagine no longer having to enter data into error-prone Excel spreadsheets, and having time to analyze and plan for the budget.

📘 OpenBook

In addition, our Questica OpenBook transparency and data visualization Software makes sharing financial information effortless.

Your stakeholders will have a better understanding of your budgeting goals when the budget is brilliantly visualized with descriptive text, informational pop-ups, charts and tables. Both tools integrate with our partner Balancing Act's budget simulation and citizen engagement tool.

🔺 Performance

Questica Performance allows your organization to track and measure the performance of unlimited budget and non-budget KPIs with a system of programs and scorecards to ensure that your organization is meeting important goals and objectives.

With interactive analytic tools, you can drill down to specific strategies, programs and initiatives to see where changes or improvements need to be made to reach peak performance.

Over 700 organizations across North America in 48 states and 12 provinces/territories have opted for smarter planning, budgeting, performance measures, management, reporting, transparency and engagement with our software solutions.

For over 20 years, Questica been working with public sector organizations—governments, hospitals and healthcare facilities, colleges and universities, K-12 schools and non-profits—to better enable data-driven budgeting and decision-making, while increasing data accuracy, saving time and improving stakeholder trust. Our customers are using our Questica Budget suite to drive budget transformation by creating a single source of data truth.
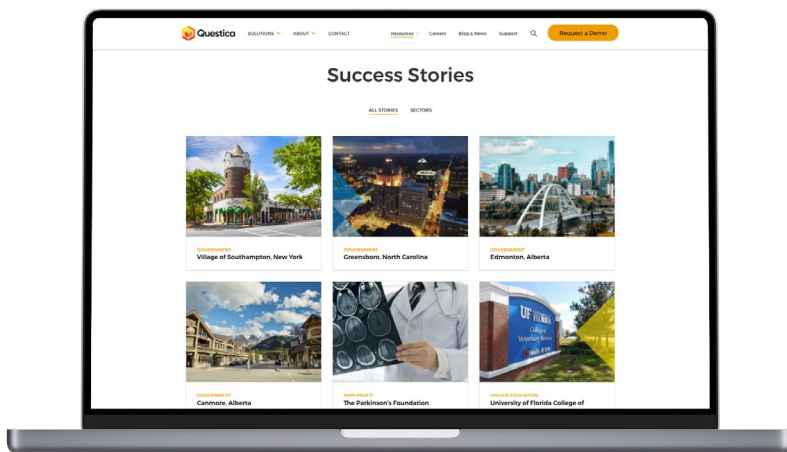
Learn how Questica and our software solutions can help your organization today.

REQUEST A DEMO

Questica
A Euna Solutions Brand

www.questica.com | Questica is part of the GTY Technology group of companies.