TECHNOLOGY SOLUTIONS
CASE STUDY

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Dartmouth College Staff Create a BI Tool to Support Research Institutions

DARTMOUTH COLLEGE

Founded in 1769, Dartmouth College (Dartmouth) is a four-year, private liberal arts college that serves approximately 4,400 undergraduate and 2,100 graduate students. The Carnegie Foundation classifies Dartmouth as having "very high research activity." Established in 1797, the Geisel School of Medicine at Dartmouth is the fourth oldest medical school in the U.S. Consistently ranked among the nation's top medical schools by *U.S. News & World Report: Best Colleges*. Geisel is renowned for its leadership in medical education, healthcare policy and delivery science, biomedical research, global health, and in creating innovations that improve lives worldwide. Geisel encompasses 20 clinical and basic science departments. In addition to the MD degree, it offers graduate education in biomedical sciences and public health in conjunction with Dartmouth's Guarini School of Graduate and Advanced Studies.

Dartmouth also offers graduate programs in health care delivery science and a combined MD-MBA degree in partnership with the Tuck School of Business. Dartmouth is ranked 13th in National Universities, 10th in Best Value Schools, and 2nd in Best Colleges for Veterans in the 2021 edition of *U.S. News & World Report: Best Colleges.*

DEVELOPING A BI TOOL FOR RESEARCH HURON FINANCIAL FORECASTING

Huron Financial Forecasting originated at Dartmouth where its founders intended to provide research administrators with the ability to evaluate the performance of sponsored projects and accurately model and forecast annual sponsored revenue and expenditures. In 2006, Steve Shulman, who served as the Director of Budgets and Financial Planning at Dartmouth from 2003 to 2008, began developing a forecasting tool that, in addition to actual awards, leverages other types of information—such as the number of proposal submissions, success ratios, and impact of large (mega) grants—to more accurately provide an estimate of Dartmouth's future year of research spend and facilities and administrative (F&A) cost recovery. Shulman continued to refine his forecasting methodology in Microsoft Excel for several years, soliciting feedback from his colleagues, including Jennifer Friend, Director of Institutional Reporting at the Geisel School of Medicine at Dartmouth College. By 2017, Shulman was ready to scale the product to accommodate more institutions. The caveat was that the Excel format had grown complex with 140 worksheets, which made it difficult to onboard new users.

Shulman partnered with application design and development studio Krit to migrate the solution to a web application hosted on Amazon Web Services. Shulman launched the tool as a SaaS solution called B3i Analytics in July 2018 and deployed it at six US universities. In 2020, Huron acquired B3i Analytics from Shulman, and the solution was rebranded as Huron Financial Forecasting. Today, the solution has been used across more than 10 US higher education institutions with annual research portfolios ranging from $60 million to $600 million.

IMPLEMENTATION

Since Huron Financial Forecasting acts as an auxiliary system to an institution's enterprise research administration system and is not a transactional system, the implementation is typically not a big lift. The qualifying factor is the state of an institution's data. If institutional data is not consistent and clean, data conversion can be onerous and extend the implementation timeline. Huron provides training and support during the implementation of Huron Financial Forecasting. Institutions can anticipate going live on a timeline ranging from a few weeks to a month, assuming there are no data issues. According to Friend, institutions should bring in at least six years of historical proposal data into Huron Financial Forecasting and start with the fiscal year of the oldest active award for award data.

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Friend reports that one of the most challenging aspects of implementation is learning to look at an institution's portfolio using Huron Financial Forecasting's high-level econometric approach that focuses on the performance of the portfolio based on proposals and awards, rather than historical spend, or activity in individual departments. The premise is that organizational trends tend to be more consistent from the whole institution perspective, and that trends in proposals and awards have more predictive value than prior actual expenditures.

The Geisel School of Medicine at Dartmouth also uses the Huron Research Suite along with reports developed in Dartmouth's data warehouse to populate Huron Financial Forecasting. Huron is in the process of migrating Huron Financial Forecasting to the same platform as the Huron Research Suite to facilitate integration between the solutions.

BEST PRACTICES

At the Geisel School of Medicine at Dartmouth, Friend is the primary user of Huron Financial Forecasting, and a few colleagues have access to see the visualizations for planning purposes. Friend strongly recommends training more than one person on the system so that an institution has backup support. Friend typically uses Huron Financial Forecasting to perform monthly financial reviews, but the heaviest use of the solution occurs during the Geisel School's budgeting process and quarterly projections, especially during the second and third quarter projections.

According to Friend, Huron Financial Forecasting initiates a high-level cross-institutional perspective of looking at the research portfolio. It may take institutions time to adapt if they are accustomed to forecasting research predictions based on historical spend, or by analyzing department level trends.

Huron Financial Forecasting organizes data in three tiers based on division, sector, and department. Friend recommends that institutions consider how to use this hierarchy to best reflect their own organizational structure, and how to align researchers with departments. In particular, institutions will need to develop consistent methodologies for classifying researchers who are affiliated with one or more departments, or cross-institutional centers.

Friend also emphasized the importance of working with the Office of Sponsored Projects to identify common data problems and best practices to promote data consistency. Friend recommends that institutions carefully monitor grants with greater than $1m/year in total costs (mega-grants), as these have an outsized impact on an institution's portfolio.

BENEFITS

Huron Financial Forecasting uses a patented econometrics-based forecasting methodology and features visualizations and analytics that allow users to see trends over time, including the distribution and cyclicality of awards and proposals. The solution provides a way to evaluate and apply assessments when developing a budget for sponsored revenue and F&A recovery, and to refine projections throughout the year. Huron Financial Forecasting includes an algorithm that amortizes the lifetime value of multi-year awards to factor in the allotted monthly amount and has built-in adjustments to accommodate for grants not spent in their expected time periods. The tool combines the proposal volume forecast with the conversion ratio in dollars and shows a dollar-to-dollar value comparison of the proposed amount compared to what was received. Historical expense data provides comparisons to prior years.

Friend reports that, overall, Huron Financial Forecasting provides high-level insight and transparency into the sponsored projects portfolio that inform discussion with departments and PIs. Friend can drill down into specific departmental data before quarterly meetings with department leaders and uses the tool to provide a topline projection over each department's forecast. According to Friend, the accuracy of Dartmouth's projections have improved to about a 1 percent margin of error for F&A recovery since using Huron Financial Forecasting. Reports are available at the department level that show each PI's current state of active funding and how it amortizes over the next few fiscal years, along with whether there are other proposals in the pipeline that can cover expected drop-offs. Friend reports that the solution helps to identify any PIs with funding challenges.

Friend concentrates on F&A recoveries as the best metric to evaluate Huron Financial Forecast's accuracy because it is difficult to predict the sponsored portfolio's non-modified total direct cost component that includes one-time costs—such as subcontracts and equipment supplements—that can swing the budget by large sums. She notes that Huron

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Financial Forecasting does not account for different modalities of revenue recognition for sponsored projects, such as cost-reimbursable rewards or event-based schedules.

FUTURE PLANS FOR HURON FINANCIAL FORECASTING

Looking forward, Friend would like to expand the use of Huron Financial Forecasting and complement the high-level econometric approach to also allow users to build their budgets and projections at the department level. New departmental functionality that Dartmouth is interested in includes the ability to extrapolate the submissions of PIs and allow administrators to build in and test recruitment plans to determine the projected return on investment calculations for start-up packages.

In the future, Friend would like to see each department create its sponsored budget with Huron Financial Forecasting to inform the overall annual budgets for each school. She also envisions that once Dartmouth implements broader access to the tool, chairs and operations directors can use the research dashboard to access real-time information on research program performance.

In addition to the Geisel School of Medicine, other schools at Dartmouth are actively looking at using the solution.

REFERENCES

As part of this research, Tambellini briefed with Jennifer K. Friend, Director of Institutional Reporting at the Geisel School of Medicine at Dartmouth College. Those briefings helped inform this case study. Tambellini also used publicly available information for this study.

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The purpose of this report is to provide higher education institutions with information about the objectives, solutions, and outcomes related to the utilization of technology in colleges and universities across the US.

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