

## **University Budgeting & Planning with Quantrix**

**Distributed Budgeting Solution Improves Collaboration, Flexibility, & Accuracy**



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# University Budgeting and Planning with Quantrix

*“The more I saw of Quantrix, the more I realized that this is what universities need - users can model multiple dimensions of planning, and put them all together in a workable, usable model.”*

Bill Massy

Former Vice President for Finance, Stanford University, and Founder, The Jackson Hole Higher Education Group, Inc.

Author, Planning Models for Colleges and Universities, Honoring the Trust

Financial planners and business officers recognize through experience that budgeting and planning for universities is notoriously complex, with multiple, interrelated models required for capital expenditure, enrollment, endowment, and financial planning. Each university needs a customized set of models to reflect its unique conditions and mission, and the traditional approach of using spreadsheet-based tools combined with costly custom programming has become overly difficult to manage and maintain. Added to this, many universities are adapting their business models to manage multiple dispersed campuses and service delivery programs, adding to the multi-dimensional nature of the challenge.

Institutional modeling activities such as budgeting and planning as well as ad hoc and exploratory analytics guide university decision-making processes. Oftentimes, budget data and the budget models themselves need to be broadly and readily accessible to campus planners, school deans, and other individuals throughout the university system. Quantrix offers a solution for dynamic budgeting and planning models and analyses to be flexibly and securely shared throughout the university.

A Quantrix-based budgeting and planning solution addresses the challenges of dynamic and multi-tiered institutions. Many universities are organized as a matrix of campuses, colleges, departments, and programs. These “units” need the flexibility to create highly specific financial, operational, and decision-support models that address the issues and challenges that are unique to their missions. The outputs of these specialized models flow into the unit’s budget model. While each unit’s budget model reflects specific needs, expenditures and projections, it also must “normalize” the data so that it can be accessed by the Chief Business Officer for consolidation into a master budget model.

Quantrix allows university planners to develop the specialized models that enable accurate planning and roll up into the budget model. Take, for example, a modeling challenge that all universities contend with - Enrollment Planning. An enrollment planning model computes the annual student enrollment based on survival rates across numerous departments, student levels (undergraduate, graduate and graduate research), financing types (subsidized vs. full fee paying) and other dimensions such as an extended (e.g. 5 year) planning horizon. With Quantrix, financial planners benefit from three key capabilities:

- the model logic is easy-to-understand and self-documenting;
- the model is expandable/extensible across academic years;

- and, the model scales across colleges within the university

In this example, there are assumptions matrices called Survival Rates and Intake Planning. These matrices are linked to the aggregation matrix (e.g the Academic History matrix) so that any changes to values will automatically be reflected throughout the model. These two matrices are illustrated below in a convenient layout:

**Survival Rates**

	Undergrad				Graduate	
	Freshman	Sophomore	Junior	Senior	Post Grad 1	Post Grad 2
Graduates	0%	0%	3%	95%	0%	45%
Drop Outs	10%	10%	5%	5%	10%	55%

**Intake Planning**

	Planned Intake				
	2007	2008	2009	2010	2011
Arts and Sciences	1,000	1,020	1,040	1,061	1,082
Nursing	500	510	520	531	541

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✓ 1. Planned Intake = Planned Intake:Academic Years[PREV]\*1.02

The Academic History matrix, as seen in the illustration below, calculates the inputs and survival rates to display “actual” as well as “projected” figures. The logic of this “Student Cohort Model” is clear, comprehensible, and transparent.

**Academic History**

			2007	2008	2009	2010	2011	
Arts and Sciences	Undergrad	Freshman	Starting Student FTE	-	-	-	-	-
		Intake	1,000	1,020	1,040	1,061	1,082	
		Graduates	-	-	-	-	-	
		Drop Outs	(100)	(102)	(104)	(106)	(108)	
		Ending Student FTE	900	918	936	955	974	
		Sophomore	Starting Student FTE	-	900	918	936	955
		Intake	-	-	-	-	-	
		Graduates	-	-	-	-	-	
		Drop Outs	-	(90)	(92)	(94)	(96)	
		Ending Student FTE	-	810	826	843	860	
	Junior	Starting Student FTE	-	-	810	826	843	
	Intake	-	-	-	-	-		
	Graduates	-	-	(24)	(25)	(25)		
	Drop Outs	-	-	(41)	(41)	(42)		
	Ending Student FTE	-	-	745	760	775		
	Senior	Starting Student FTE	-	-	-	745	760	
	Intake	-	-	-	-	-		
	Graduates	-	-	-	(708)	(722)		
	Drop Outs	-	-	-	(37)	(38)		
	Ending Student FTE	-	-	-	(0)	0		
Graduate	Post Grad 1	Starting Student FTE	-	-	24	733	747	
Intake	-	-	-	-	-			

Schools Academic Levels Activities

Function... = + - \* / ^ .. : :: ( ) In Skip [THIS] [FIRST] [PREV] [NEXT] [LAST]

- ✓ 1. in Undergrad:Intake,Freshman = Intake Planning::Planned Intake
- ✓ 2. In Graduate[FIRST],Intake=-sum(Undergrad:Graduates)
- ✓ 3. Ending Student FTE = Starting Student FTE+Intake+Graduates+Drop Outs
- ✓ 4. Starting Student FTE = Ending Student FTE:Academic Years[PREV]:Academic Levels Graduate[FIRST]
- ✓ 5. Graduates=(Starting Student FTE+Intake)\*-Survival Rates::Graduates
- ✓ 6. Drop Outs=(Starting Student FTE+Intake)\*-Survival Rates::Drop Outs

Quantrix transparency features reduce the opportunity for errors being introduced into the model, going undetected, and contributing to a faulty budget and plan. It also makes it much easier for new staff to comprehend the model and work with it - an issue with institutions experiencing turnover. With Quantrix, enrollment planning is a straightforward modeling exercise. The model is easily scalable to incorporate new colleges, departments, years, business logic, etc. With two-dimensional tools such as spreadsheets, enrollment planning is a cumbersome, time-intensive, and error-prone process.

The following are additional examples of models that comprise the budgeting solution:

**Tuition and Grant Revenue Model** which aggregates the information from the cohort model and forms the basis for computing tuition revenues and aid grants for subsidized students. Business rules are incorporated to reflect the change in funding schemes by government and/or other authorities.

**Manpower Planning and Cost Forecast Model** which calculates and projects personnel wages and benefits cost. The number of required instructors is directly linked to the

cohort values, offering a realistic forecast of necessary faculty to maintain the targeted student-to-faculty ratios. Additionally, support staff requirements are pegged to the appropriate faculty and student headcount drivers.

**Gifts and Sponsored Research Model** which projects gift flows and the direct expenditures and overhead recovery for research. If desired, the overhead model can incorporate A-21 rules for projecting the indirect cost rate.

**Operating Expenses Model** which provides maximum flexibility for projecting specific expenses by multiple cost drivers. For example, facilities operating expense can be driven by square footage or by student headcount.

**Capital Budgeting Model** which is based on approved, planned and forecasted capital improvement requirements. The model can be evaluated against the Cohort model to determine if the area (in square feet) of facilities would be adequate given student levels several years hence. This model also calculates the actual contributions and any sinking fund requirements.

**Investment and Endowment Planning Model** which tracks new endowments by type and purpose and is linked to authorized and planned endowment expenditures (for example, target spending rates and smoothing rules). Additionally, the returns from various investments are allocated to capital preservation and accumulated surpluses.

From a features/benefits perspective, a distributed Quantrix-based budgeting and planning solution offers:

#### **Accessibility**

Quantrix Modeler is readily deployed with a database on a centralized server so that current budget data are accessible by authorized personnel in any location at any time. Various versions of the budget model and the data itself are not isolated in a tangled web of spreadsheets located on individuals' desktops. Rather, the Quantrix solution allows individuals and teams access to the latest budget data when they need it without impeding others.

#### **Ease of Use**

Quantrix models can be configured so that users can create, manipulate or view only the budget elements or data that are important to them. This speeds implementation, simplifies the end-user experience, and reduces the chances of unintended entries or changes.

#### **Secure Collaboration**

In many universities, collaboration is crucial to success yet fraught with risk. Quantrix employs a highly structured User Role and Permission framework that enables administrators and financial planners to control the interaction that colleagues can have with models. This eliminates the well-publicized vulnerabilities associated with sharing spreadsheets.

#### **Flexibility**

Over time, spreadsheets become rigid and prone to error as they grow in size and complexity. Integration points break with even the slightest changes to data or

structure. Most enterprise budgeting solutions are costly and tend to force organizations to work within the lowest common denominator with simplified, narrowly-focused templates. In contrast, Quantrix Modeler, which is designed for the business user, is inherently flexible and configurable to each unit's needs. It delivers insights while ensuring models of the highest accuracy, integrity and dynamism. Budgets and plans developed with Quantrix enable institutions to anticipate changes that occur in competitive academic environments and devise a plan for success.

### **The Urgency of Now**

Quantrix provides the appropriate solution when you need an answer or insight right away. Information assets such as data warehouses, databases and OLAP cubes can be accessed and queried by business users with Quantrix DataNAV for creating ad hoc and exploratory analyses, models, and visualizations that answer urgent questions outside the scope of existing analyses and reports.

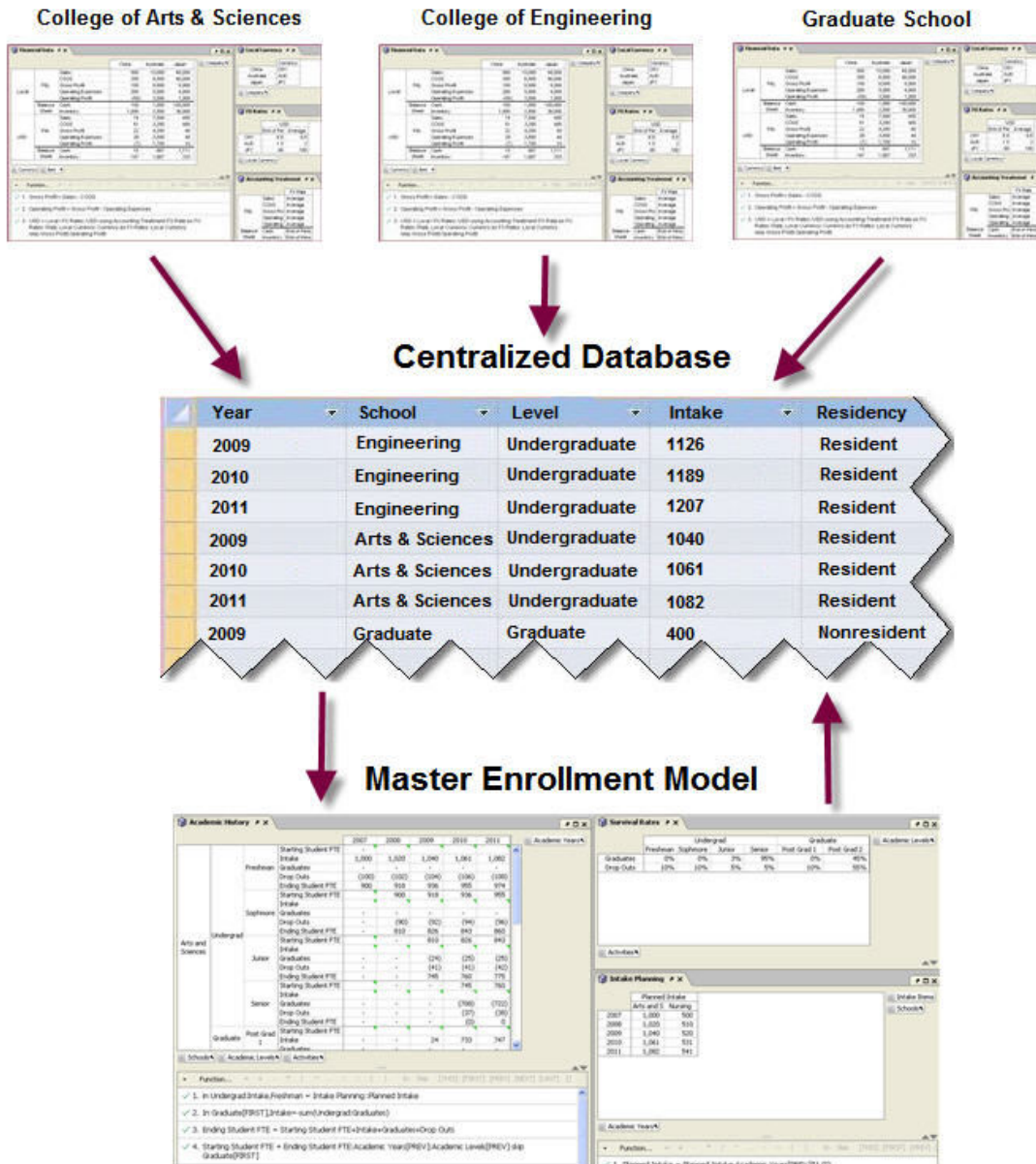
### **Transparency**

Institutions that implement a Quantrix budgeting and planning solution have greater confidence in the numbers. Quantrix models are highly transparent so that users can quickly grasp the purpose, structure and validity of the model. Business logic is defined with plain-language formulas that are easy to read and understand. With spreadsheets, the business logic is cryptic and hidden within the cell. With Quantrix, model authors and end-users alike can add notes or explanations to formulas or cells, without affecting their integrity or performance. Model, cell, and data dependencies are visually presented with the Dependency Inspector. The DataNAV cursor hover indicates the source of the data for the cell. The audit trail feature automatically tracks and records user interactions with the model.

### **Consolidations**

Budgets, forecasts, and other models can be linked so that information and analyses can either automatically or manually consolidate to "master" models, providing the big picture view. With globally-integrated institutions operating in multiple currencies, it is important for the university to be able to convert into a standard reporting currency. With Quantrix, consolidating to a reporting currency is both easy to do and easy to automate. Also, some study-abroad or international colleges may find it desirable to work with the local language in the budgeting process. This is readily accomplished with the Quantrix Vocabulary Manager add-on, which enables models to be displayed in multiple languages. The Chief Business Officer can then view the same model in its standard reporting language.

# University Budgeting & Planning - Enrollment Model



*Illustration: The image above shows how enrollment models for each college within a university system can be “pushed” to a centralized database and then consolidated into a master enrollment model that integrates with a master budget model..*

## Quantrix Product Portfolio

The Quantrix-based enterprise budgeting and planning solution is deployed with a combination of Quantrix Modeler (Professional or 64), DataLink, DataPush, and

DataNAV. The solution leverages the capabilities and benefits of a database. Product descriptions are as follows:

### **Quantrix Modeler**

Quantrix Modeler is business modeling and analytics software that offers unmatched capability for budgeting, forecasting, planning, risk modeling, visual analytics and more. Quantrix addresses the limitations and risks inherent to spreadsheets when developing business-critical models. It allows you to tap into the collective expertise of your team without the business risks associated with sharing spreadsheets. It also enables the business user to create interactive presentations, reports and dashboards. But Quantrix doesn't stop there - it allows you to develop "what if" scenarios and model the financial and operational impact of the business decisions you might take.

### **DataLink and DataPush**

DataLink and DataPush are add-on tools that allow institutions to bi-directionally integrate Quantrix models with databases and business applications. "On-the-fly" updates make budgeting and planning activities even more dynamic by enabling real-time analysis. The business user can integrate models with existing databases, flat files, spreadsheets, matrices and all types of business applications via an easy-to-use Wizard - often without involving the IT department. The database can be any type (MS SQL Server, MySQL, Oracle, IBM DB2, Sybase, and others) provided that Quantrix Modeler can connect and communicate via ODBC/JDBC drivers. The database enables versioning of data as well as security controls.

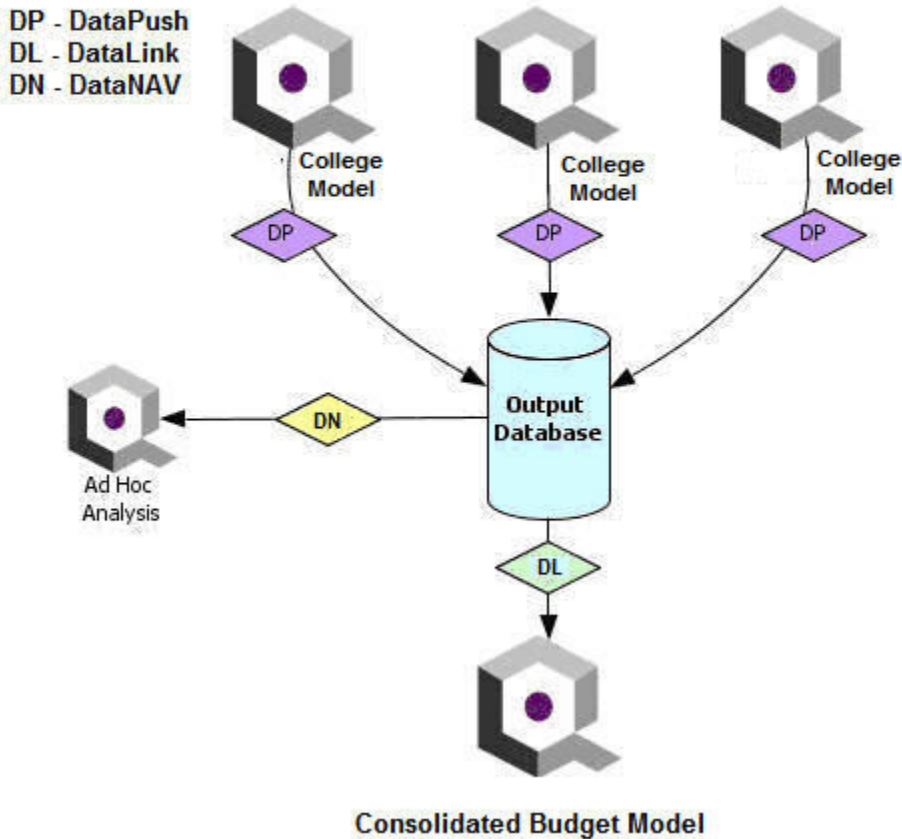
### **DataNAV**

DataNAV is a substantial advancement for Data Navigation, Analysis, and Visualization (DataNAV), enabling both business and IT professionals to easily query data sources to develop ad hoc, exploratory, as well as structured analyses. The combined DataNAV and Quantrix Modeler solution represents a practical and easily deployed alternative to the widespread yet highly problematic practice of pairing spreadsheets with rigid enterprise budgeting and planning tools. DataNAV can access data sources including MS SQL Server, IBM DB2, Sybase, Vertica, MySQL, PostgreSQL, Firebird, MonetDB, MS Access, MS Excel, Text Files, and more.

## **A Distributed Solution**

The Quantrix solution enables both concurrent model inputs and calculations for a distributed budgeting system. This is particularly important when there are a number of campuses, departments or other organizational levels that are responsible for their own budgets, which are then consolidated up to a master budget model. The models developed and maintained by these units are "pushed" to a central database, using the DataPush add-on product. During the push, the unit's budget model tags its records with its unit identifier. The master model includes a business unit category on which a DataLink can roll up the various units. The solution architecture is outlined in the illustration below:

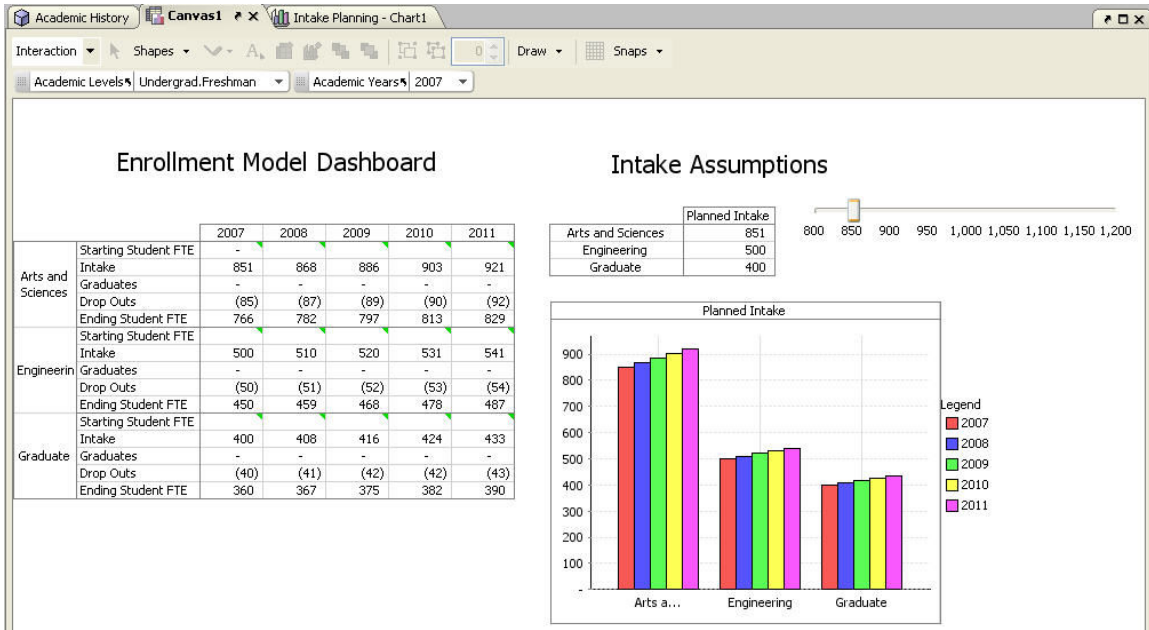
## Distributed University Budgeting & Planning



*This diagram illustrates the architecture and data flows for a Quantrix-based University Budgeting and Planning Solution. It also demonstrates how DataNAV can access the centralized database for ad hoc and exploratory analyses and modeling outside the scope of the budget process.*

### Interactive Dashboards, Presentations and Reports

The Presentation Canvas feature in Quantrix Modeler allows financial planners to highlight important budget views, charts, images, and annotations onto a single interactive presentation view. Using the Presentation Canvas, interactive dashboards and reports can be designed to enable comparative analyses of the performance of colleges and departments. Since the budget model data has been normalized, this allows “apples-to-apples” comparisons where appropriate. Interactive sliders enable dynamic presentation of “what if” scenarios. Quantrix 'Snap' technology precisely lines up objects on the canvas for a clean, symmetrical layout that can be presented or printed.



*Illustration: The Presentation Canvas allows users to create, share and print dynamic dashboards, presentations, and reports. Dashboard sliders, dial gauges, thermometers and other widgets enable interaction with and visual analysis of “what if” scenarios.*

## Conclusion

A Quantrix-based budgeting and planning solution will improve university performance through enhanced accessibility, collaboration, flexibility, time-to-insight, transparency and consolidations across the institution. A Quantrix solution can be quickly configured and deployed to meet the diversity and uniqueness of a university’s varied budgeting and planning needs. For more information on how to substantially improve budgeting and planning at your institution, please contact [info@quantrix.com](mailto:info@quantrix.com).