2017

University Academic Program Cost Modeling: A Roadmap to Fiscal Sustainability

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Consultancy Project
Executive Summary

Organization:	Wingate University
Project Title:	University Academic Program Cost Modeling: A Roadmap to Fiscal Sustainability
Candidate:	Patrick Biggerstaff, MBA
Consultancy Coach:	John D. Balls, Ed.D. Gardner-Webb University
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Authorized by:	T. Rhett Brown, Ed.D. President Wingate University

Acknowledgments

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Abstract

University Academic Program Cost Modeling: A Roadmap to Fiscal Sustainability. Biggerstaff, David Patrick, 2017, Consultancy Project, Gardner-Webb University, Digital Commons/financial, budget, academic, program, university, college, sustainability, efficiency, effectiveness, fiscal, cost model

Fiscal sustainability has plagued institutions of higher education for as long as universities have existed. Colleges and universities must gain a better understanding of the cost to teach our students and the fiscal performance of our academic programs to survive. Understanding how we construct and arrange resources around the essential academic delivery will allow university leadership to better align program decisions with financial sustainability. This project outlines a financial analytics dashboard showing the fiscal impact of academic programs for strategic operational planning and design at institutions of higher education. The dashboard developed was built on a common unit of measurement, the credit hour, and revenue and expense allocated to each academic unit through an adopted methodology framework. The resulting product is a net cost model for full-program analysis and per-unit analysis. The analysis required the mitigation of significant organizational culture risks as dashboard results reveal objective financial performance data. This model does not measure program performance as it relates to academic success or institutional effectiveness. The final product provides a working analytics dashboard outlining the fiscal production and outcomes for each undergraduate and graduate program at the university.

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1 Introduction

1.1 Project Purpose

Understandably, universities often inadvertently make de facto business decisions/commitments while purposefully designing and implementing academic programs. Many times, these programs are conceptualized within the academy with very little consideration given to the financial burden or benefit to other programs and/or the university in whole. There are certainly many good examples of well thought-out programs that take both academic and comprehensive operational considerations into account; but I daresay this is not the rule. With the evolution of higher education, the demands of a more competitive and global job-market and the sheer volume of higher education competitors, universities must function more efficiently and effectively.

For the 2013-2014 fiscal year, Wingate University recognized over $85 million in gross revenues and an overall enrollment of 3,000 students. Since 2000, Wingate University has experienced a 133% total enrollment increase. Associated with enrollment growth, the university has experienced over 247% growth in gross revenues. This level of growth during this short time by a private, nonprofit institution of higher education is a statistical outlier. Additionally, Wingate has financed much of the growth through cash, essentially illustrating incredible growth without significant debt leveraging. Growth was accelerated by changes to the financial aid distribution system, undergraduate and graduate program additions, and other aggregated institutional successes and initiatives.

After 14 years of unprecedented growth, Wingate University is going through a period of stabilization, strategic alignment and planning, and by happenstance a chief executive leadership change that has existed for 23 years. Enrollment projections and potential program expansion show the possibility for continued growth. In the past 10 years, Wingate has added a School of Pharmacy, a Physician's Assistant Program, a Nursing Program, and a Physical Therapy program. These programs have had a major impact on enrollment and university operations. While these programs require exclusive admission into each program, they have all contributed to a secondary increase in undergraduate enrollment and impacted our science undergraduate programs. The comprehensive financial impact this secondary enrollment has had on undergraduate operations and academy is unclear.

While Wingate has maintained healthy and broad fiscal management during the past 14 years, the university lacks a comprehensive and detailed understanding of fiscal program performance. Critical to the long-term success of the university is the fiscal sustainability of all operations, especially those directly related to academic delivery. Understanding how we construct and arrange resources around the essential academic delivery will allow university leadership to better align program decisions with financial sustainability. Simply put, this project will outline financial analytics showing the fiscal impact of academic programs for strategic operational planning and design at institutions of higher education.

1.2 Associated Documents

Final Defense PowerPoint in Appendix.

1.3 Project Plan Maintenance

Since the project's conception, regular evaluations and updates were made in the fall, spring and summer with the project advisor, Dr. John Balls. Additionally, the site supervisor, Dr. Rhett Brown, provided additional guidance and approval.

2 Project Scope

2.1 Outline of Partnering Organization's Objectives

2.1.1 Objectives

Objective 1: "Determine the cost to educate a Wingate University undergraduate student."

Understanding the costs associated with product production is an essential requirement for any business. In this case, the product is the conferment of a bachelor's degree. While Wingate operates as a nonprofit organization, the university must still balance expenses with revenue. As typical with most universities, all sources of revenue are not directly sourced from tuition and fees, requiring further revenue and expense analysis to fully understand the cost formula. As tuition and fees for higher education skyrocket and discount rates take on monstrous proportions, it is critical to have a fundamental understanding of the true cost of educating and graduating a student. Gross costs (sticker price) for a 4-year education at Wingate are over $160,000. The problem is that this is not the true number as additional expenses are covered by development (fundraising, outside scholarships) and the institutional discount rate reduces the expense by almost half. This complex cost analysis requires regular review and understanding as strategic operational decisions are made.

Objective 2: "Provide a comprehensive program evaluation as it relates to expense and revenue."

Generally, universities operate in a financial operational mode that the academic curriculum dictates operational expenses. Support services such as Financial Aid, Admissions, Student Life, etc. are often held to a different standard regarding expense and service outcomes. The purpose of this objective is to establish a core set of metrics that can be applied to both academic and nonacademic programs that measure expense, revenue, and added-value for the university. For example, while operating a residential campus has significant expense related to it, the associated revenue offsets other university program expenses as well as the operational expense to run the residential program. Additionally, the art program is not a major and therefore has no direct revenue sources in terms of enrollment but adds significant value as a curriculum elective. This analysis will serve to not only measure program financial effectiveness but provide a templet for analyzing potential program growth and expansion.

2.1.2 Success Criteria

The success of this project will be the final production of a working analytics dashboard outlining the fiscal production and outcomes for each undergraduate and graduate program at the university.

2.1.3 Risks

Please refer to Section 9.

2.2 Outline of Student's Objectives

2.2.1 Objectives

This project had two major objectives: (1) determine the cost to educate a Wingate University undergraduate student; and (2) provide a comprehensive program evaluation as it relates to expense and revenue. While this project has many contributors and consultants, the student is directly responsible for all work related to the project.

2.2.2 Success Criteria

The success of this project will be the final production of a working analytics dashboard outlining the fiscal production and outcomes for each undergraduate and graduate program at the university.

2.2.3 Risks

Risks to the project are outlined in section 9.1. There are no significant risks to the organization.

2.3 Definitive scope statement

The scope of this project was limited to revenue and expense analysis of the university academic programs. All other support and auxiliary enterprises were considered indirect expenses and aggregated into the analytic model as such in relation to each academic program.

3 Deliverables

3.1 To partnering organization

A final production of a working analytics dashboard outlining the fiscal production and outcomes for each undergraduate and graduate program at the university will be completed. This dashboard will be updated annually. *See "Dashboard Example" in Appendix*.

3.2 From student

Please refer to Section 3.1.

4 Project Approach

4.1 Project Lifecycle Processes

1. Define the Scope of the Project.

As documented in Milestone 3, one of the greatest threats to this project was scope creep. The project topic, “The development of financial analytics for strategic operational planning and design at Wingate University,” has created a platform for organizational inquiry and evaluation. While this is great evidence that the project has been successful, it also led to many distractions as the final product was developed, including restructuring the methodology (or at least an ongoing discussion) during any evaluation where the model was used. However, some of this scope creep helped strengthen core aspects of the platform as these alternate models repeatedly tested the model in ways that would not have been tested in a vacuum. As the project concludes, the original scope of the project was maintained and achieved.

2. Initial Methodology Development

Most certainly, one of the most complex and debated activities of the project is the methodology. Specifically, breaking down direct and indirect costs and defining the common unit of measure were spiritly debated and evaluated by leaders across the university organization. This resulted in multiple variations of the methodology and further debate. The outcome, with some minor changes, resulted in the use of the original measure of the credit hour. Currently, the model for the 2016-2017 fiscal year is being built. To create a final majority agreement of the indirect and direct cost allocation, senior leaders will be surveyed and aligned with commonly accepted accounting principles. Additionally, this breakdown must also be transferable and replicable within all fiscal models, including the university ledger.

3. Obtain and Develop Data

This activity was achieved through sheer perseverance. A huge issue revealed was the data governance of faculty and student data across the curriculum. Small errors across program data sets led to huge problems in the earliest stages of the project. Weeks were spent looking for “clean” data and simply resulted in corrections made by hand for over 36,000 records. This activity resulted in the appointment of a special taskforce to review and establish data governance standards across the curriculum.

4. Prepare Draft Analytical Model

This activity is very much a work in progress. While a model was selected and used, it is clear that the presentation of the model requires significant explanation and guidance for any decision maker not familiar with how both the budget works and classes are structured. Essentially, the “Dashboard” is a work in progress and will be revisited in the next iteration of the model.

5. Test Draft Model

The first full presentation of the model included two informed stakeholders. Quickly, scope creep became an issue; however, the greatest threat to the project became apparent: data misuse. Quick conclusions were made to the success or failure of academic programs. While the data can illustrate programs that are thriving and programs that are struggling,

the purpose of the project is to direct questions for inquiry and further assessment. Few programs within the model are isolated from the effects of the common curriculum and therefore further analysis is almost always required. Regardless of the scope creep, the initial presentation was very successful and energized the stakeholders.

6. Develop Key Indicators for Effectiveness/Efficiency

One of the positive results of testing many approaches to the methodology was the development of a model to illustrate program fiscal effectiveness and efficiency. This model evaluates the balance between direct cost relative to the whole and applies a weighed value to the indirect costs, resulting in values that may be compared to the straight-line method used in the model. The difference between the numbers evaluates a combination of factors resulting in a comparable fiscal balance. Programs may be highly effective in using fiscal resources or less efficient or neither. While this assessment should not be directly used to make conclusions, it serves to raise questions for programs.

7. Integrate into Faculty Governance, Master Planning and Strategic Planning

The ultimate success of this project will only be able to be measured over time. The model is designed not to provide answers but to give direction to informed inquiry that leads to strategic decision making. Additionally, the model is designed to provide a tool for organizational learning, leading to a cycle of continuous evaluation and action. The earliest models have already proven useful.

4.2 Project Management Processes

Regular evaluations and updates were made in the fall, spring and summer with the project advisor, Dr. John Balls; the site supervisor, Dr. Rhett Brown, provided guidance and approval. Additionally, the dashboard and methodology were presented for feedback to a current Wingate University Board of Trustee member and former Board Chair Dr. Joe Patterson as well as a consultant to the Board of Trustees, Dr. Peter Mitchell. Feedback provided support and challenge to the methodology and adjustments were made accordingly.

4.3 Project Support Processes

Project support was provided for unlimited access to university data, including academic data, and expense and revenue lines.

4.4 Organization

4.4.1 Project Team

Primary Project Manager	Patrick Biggerstaff, Chief of Staff, Provost's Office
Project Advisor	John Balls, Gardner-Webb University DEOL
Site Advisor	Rhett Brown, President
Advisor	Helen Tate, Provost
Advisor	Sam Petoskey, Research and Evaluation
Advisor	Amanda Smith, Controller
Advisor	Bill Durham, Chief Financial Officer
Consultant	Joe Patterson, Trustee
Consultant	Peter Mitchell, Proactive Transition Management

5 Communications Plan

Who - stakeholder	What info do they need	Why do they need it	When will they get it	How will they get it
Dr. Rhett Brown, President and Site Advisor	Project Description, Scope, Plan, Risks, and Desired Outcome.	To understand what they are sponsoring and provide ongoing support and approval.	An intial meeting defining the project and support needed was help in the Fall of 2014. Final product will be presented in draft form in Fall of 2016, with a final complete product presented Spring 2017.	Hard copy and presentation.
Dr. Helen Tate, Provost	Progress and final product.	Dr. Tate is the chief academic officer of the university.	Final product will be presented in draft form in Fall of 2016, with a final complete product presented Spring 2017.	Hard copy and presentation.
Academic Deans	Progress and final product.	The academic deans are responsible for the academic enterprise of the university, reporting to the Provost.	Final product will be presented in draft form in Fall of 2016, with a final complete product presented Spring 2017.	Hard copy and presentation.

6 Work Plan

6.1 Work Breakdown Structure

The following table outlines in linear order each activity, including the strategy used to accomplish the activity, the timeline/deadline, the predicted outcome, and the completion/results of each activity.

Activity	Strategy	Timeline	Predicted Outcome	Actual Results	Commentary
Define the Scope of the Project.	Review, assess, and revise program goals as appropriate with project evolution.	Ongoing	Clear and finite project outcome.	Complete	#1 in Section 4.1
Initial Methodology Development	Outline project outcomes and map information and format needed to achieve those outcomes.	Spring 2015	Replicate-able and working methodology for initial model testing.	Complete.	#2 in Section 4.1
Obtain and Develop Data	Gain access to appropriate data sources.	Spring 2015	Full access.	Complete.	#3 in Section 4.1
Test Data for Errors	Use university data sources and verify for strength and reliability.	Spring 2015	Consistent, reliable, code-able data.	Found several data related issues. Started a new University Data Governance committee to address issues.	Appropriate adjustments and corrections completed.
Test Methodology	Use data to test established methodology.	Spring-Summer 2015	Methodology produces desired outcomes and measures.	Limits in in data due to data governance somewhat limited the testing but overall the test was successful.	Appropriate adjustments and corrections completed.
Prepare Draft Analytical Model	Produce a Model Summary for Presentation	Summer 2015	Model illustrates principle outcome of program cost modeling.	Complete.	#4 in Section 4.1

Activity	Strategy	Timeline	Predicted Outcome	Actual Results	Commentary
Test Draft Model	Present draft model.	Fall 2015	Simple presentation on cost modeling to multiple stakeholders.	Complete.	#5 in Section 4.1
Obtain Feedback	Collect feedback on cost model.	Fall 2015	Receive feedback for improvement.	Presented to analytics office and Chief of Staff.	Appropriate adjustments and correction completed.
Update Methodology	Update methodology based on feedback.	Fall 2015	Methodology produces desired outcomes and measures.	Complete.	
Retest Model	Retest model, expand to other stakeholders.	Fall 2015	Receive feedback for improvement.	Presented to President and Consultant.	Appropriate adjustments and corrections completed.
Update Methodology	Update methodology based on feedback.	Fall 2015	Methodology produces desired outcomes and measures.	Complete.	
Retest Model	Retest model, expand to other stakeholders.	Spring 2016	Receive feedback for improvement.	Presented to CFO, Controller and VP for Academics.	Appropriate adjustments and corrections completed.
Expand Model Test	Further development of modeling.	Spring 2016	Model covers all programs and corrects for early assumptions.	Complete.	
Update Methodology	Update methodology based on feedback.	Spring 2016	Methodology produces desired outcomes and measures.	Complete.	
Develop Final Analytical Costing Model	Complete proposed complete cost modeling for testing.	Spring 2016	Present as complete and test for viability.	Presented to Former Board Chair, Trustee Consultant, with full endorsement!	Appropriate adjustments and corrections completed.
Develop Comprehensive	Using key indicators,	Fall 2016	Work with Presidential	Complete.	

Activity	Strategy	Timeline	Predicted Outcome	Actual Results	Commentary
Program Evaluation Model	complete comprehensive program evaluation model.		appointed task force to develop model.		
Test key indicators within program evaluation model	Test the evaluation model with real data.	Fall 2016	Simple presentation on cost modeling to multiple stakeholders.	Complete.	
Assign weights to key indicators for evaluation	Assign weights to align program emphasis to Strategic Plan.	January 2017	Model covers all programs and corrects for early assumptions.	Complete.	
Test Program Evaluation Model	Test the evaluation model with real data.	Spring 2017	Simple presentation on cost modeling to multiple stakeholders.	Complete.	
Adjust weights	Update weights based on feedback.	Spring 2017	Methodology produces desired outcomes and measures.	Complete.	
Test Program Evaluation Model	Test the evaluation model with real data.	Spring 2017	Simple presentation on cost modeling to multiple stakeholders.	Complete.	
Create final program evaluation model	Create final model with full endorsement.	June 2017	Model is fully accepted and endorsed.	Complete.	
Project Complete!					

7 Milestones

Milestone number	Title	Forecast date
1	Develop Statement of Purpose for Project	Fall 2014
2	Develop Project Objectives	Spring 2015
3	Outline Project Scope	Spring 2015
4	Identify Benefits to Organization	Summer 2015
5	Identify Risks and Mitigation Plan	Fall 2015
6	Identify Key Facts for Planning and Execution	Spring 2016
7	Create Outline of Project Plan	Summer 2016
8	Identify Financial Budget	Summer 2016
9	Outline Quality Assurance Plan	Fall 2016
10	Document Overall Project Performance	Spring 2017
11	Present Final Product	Summer 2017

8 Metrics and Results

The project was meant to be a simple dashboard to help resolve assumptions often made of program financial performance. What resulted was a data set that changed the way we look at the entire educational model on which the university is built. While the model does not evaluate program outcomes and student learning, it does begin to illustrate market demand, pricing modeling, program overlap, and organizational and physical capacity. The model is helping the university align administrative priorities and curricular outcomes into a sustainable education ecosystem. The impact the model has had on the university, even before completion, has been beyond simply achieving the goals outlined 3 years ago.

The challenges of the model have also had a significant impact on my professional work. One of the greatest challenges has been the adoption of the model for actionable decision making. In the face of fiscal facts, departments continue to make decisions based on assumptions and perceived value. One of the biggest risks to the model has been organizational culture and history. Culture distorts, manipulates, and creates facts to challenge or justify contrary results in the model. For example, one department's spending on financial aid had outpaced the rest of the university significantly. Regardless of the data, the argument was that the department could not complete its mission without the funds. The data illustrated the contrary. The result was a painful decision that left many employees disenfranchised. Organizational change modeling is critical to the use of the model.

This past year, the data in the model resulted in the following:

- A comprehensive evaluation of our graduate campus.
- A change in tuition pricing for graduate programs.
- Restructuring of the athletic financial aid distribution model.
- A reduction is program spending in some of the most expensive programs.
- Integration of the model into faculty governance for program evaluation.
- The elimination of some duplicated services within our professional programs.
- The university ledger, presented annually to the Trustees, was restructured.

9 Risks, Constraints, Assumptions

9.1 Risks

Risk Assessment Chart:

High Risk		*Scope Creep*			*Managing Conflicting Perspectives*
Moderate Risk				*Modeling and Analytics*	
Average Risk					
Low Risk		*Access to Data*		*Institutional Support*	
Little to No Risk					
	Little Mitigation Required	**Low Mitigation Required**	**Average Mitigation Required**	**Moderate Mitigation Required**	**Extreme Mitigation Required**

Criteria for Assessment of Risk Factors:

Each factor considered must be broadly applicable to the project, as many details may present isolated risk factors. Additionally, each factor is analyzed based on the amount of risk (impact on the completion of the project) and amount of mitigation (management of the prevention of failure). So, a factor may be high risk but require simple steps to mitigate or even eliminate the risk.

Access to Data:

Access to data and the collection of data are critical elements to this project. Most of the risk associated with data access and collection is related to reliable, relevant, and correct data. To date, much of the data that has been analyzed has many minor inconsistencies that are generally human input error or inconsistent entry or application to code tables. The good news is this issue, as well as others outside of this project, has created a university wide task force to create and provide data governance protocols and procedures for data controllers across the university system.

While critical to the project, the risk assessment remains low as data are readily available and the institution and all constituents are bought into developing a data governance policy and procedure guide. The biggest risk to access to data is always the integrity of the data; however, all officials involved in data governance are highly motivated to resolve any known or potential issues.

Institutional Support:

Given the breadth of the project and the institutional impact, institutional support is a requirement. Organizational Perspective, as outlined in Hughes et al. ("Becoming a Strategic Leader"), is critical to developing and cultivating institutional support. This component has low risk; but the risk is dependent on the development and cultivation of support, thus requiring a moderate amount of mitigation action.

Examples of mitigation steps already taken have been meeting with academic deans and partnering for data analysis considerations; regular updates on the progress of the project; providing support and quick outcomes/results for supporting analysis that may be relevant but not directly related to the project; and regular, informal meetings (over coffee) with key players to discuss perceived conflicts. These mitigation steps have proven to be highly effective so far. Additionally, listening sessions follow-up by responsive action have resulted in stronger relationships and increased political capital. Strategic leadership competencies (Organizational Influence, Collaborative Relationship Building and Acting Systematically, in addition to others) will all be important applications of project leadership and execution.

The final mitigation tactic is the current strategic planning process the institution has been conducting. Many of the analytical aspects of the project are being actively requested, organically building support for the work. Additionally, the project having the full support of the president helps remove many barriers even before they were ever encountered.

Scope Creep:

Scope creep is a high-risk consideration; but with discipline and scope management, the creep can be held at bay. As discussed in Institutional Support, this project is big and has wide sweeping implications for every aspect of the university. Already, many "What ifs" have been asked and posed as possible extensions to the project. While many of these questions are really good and deserve further exploration, they must be strategically managed and kept out of the scope of the project.

An important mitigation tactic for the managing scope is the ability to develop clear guidelines and timetables for achieving non-scope related requests. An important consideration for institutional and personal buy-in is not to quickly dismiss requests or ideas but to place them in a "parking lot" for prioritization, planning, and discussion. Dismissing an idea can begin to erode individual and eventually institutional support.

The biggest threat to scope creep is me. I tend to be naturally inquisitive and will chase a rabbit down a hole without hesitation. Constant vigilance on remaining focused is critical. One tactic I have used is to continue to ask myself how an idea supports the project and is it directly related to the success of the outcome? My salvation is for every consideration that does not make the project, it sits in a parking lot for future analysis; this potential makes me very excited!

Comparative Modeling and Data Analytics:

Analytical modeling is essentially the primary focus and outcome of the project. Data presentation and use are widely used in institutions of higher education but rarely used in a quantifiable comparable way. Too many data presentations are so isolated and limited, the equations and analysis used to build the model can rarely be applied to other models or even fit in a comprehensive data analytics model. The risk is simply the ability to not only

put the data in a format leaders can use to make decisions but to create a unified, quantifiably connected and balanced model that builds on each individual subanalysis.

Mitigation of this factor requires external research, collaborative problem solving, strong data governance, and a high level of institutional perspective that is related to each aspect of the data. As part of the process of developing a comprehensive model, I have begun to research existing models, comparative data warehouses (IPEDS for example), and other institutions' analytic models. Mentioned in the data risk factor, a data governance task force has been formed to help provide constancy and reliability to institutional data sources, entry, and use. Finally, I have spent a considerable amount of time meeting with various institutional constituents, including the institutional researcher and registrar, to build and develop my understanding of the data, what they are, what they mean, and how they are currently being used.

Institutional perspective is critical to mitigating the risk and developing the model. While I can apply some universal data analysis modeling, much of the project is developing a proprietary system to develop data specific to an institution into a single, unifying equation. Much like admissions must consider weighted and unweighted high school GPAs, the challenge is to develop a balancing equation to create a comparative model for strategic decision making.

Mitigating this factor requires a significant amount of testing, simulation, and consultancy. To address this problem, I have partnered with several highly regarded and experienced "experts" in data analysis, financial management and decision making, and communications. Each provides a set of "fresh eyes" to the project and often a contrarian view of my methodology and conclusions. Each has also been very affirming in the development of my methodology and the direction of my models. An unexpected benefit has been when each advisor disagrees with each other on a specific point or conclusion. What has resulted is a stronger and more comprehensive outcome that addresses multiple challenges and viewpoints.

Managing Conflicting Perspectives:

Absolutely the most significant risk factors are competing perspectives, people, and culture. One of the most significant challenges in assessing data is objectively reading results and reducing speculation on correlation and causation. Additionally, data, in isolation from perspective and other data, can be manipulated into any narrative desired.

Currently Wingate, with new senior leadership, is going through a transitional culture change. During this transition, power, authority, and culture are all out of balance giving way for the potential of individual and organizational struggles to capture influence and power. While the new culture is slowly establishing itself, individuals are seeking to find their way and challenging old models of authority and influence. Already, I have seen the effects of this as I have met with leaders who are less interested in objective, comprehensive analysis of both strengths and weakness and more interested in models that support self-gain or pet projects. A significant factor for this behavior is a lack of trust resulting from an old authoritarian model where the culture was based on influence, relationships, and "good ole boy clubs."

Mitigating this factor is complex and requires significant coordination of effort from me and others. A helpful piece, as mentioned before, is the current strategic planning initiative currently taking place. The planning process provides access to "safe places" when talking about assessment tools and quantitative decision making. Additionally, the process forces

many tough conversations about program evaluation, assessment, and outcomes. Strategically, although it was not terribly difficult, I was able to promote and ultimately place program evaluation and assessment as a strategic planning priority.

Another mitigation tactic for managing conflict is helping provide data to individuals seeking their own assessment means. While sometimes this practice results in contrasting sets of assessment in the short run, individuals walk away feeling included and partnered. This inclusion and trust building has allowed me follow up later and bring them back on board with the larger initiative.

The final mitigating practice is managing the data itself. Comparative modeling with supporting data analytics specific to each department will help prevent data manipulation and provide supporting dismissive analysis. Already, deans have balked at perceived apple to oranges comparisons and data sets. However, the data analysis I have provided so far was either early sample seeking guidance or was comprehensive enough to include any contrarian rebuttal they had, thus fending off conflict with simple object insight.

The alternative plan if conflict cannot be avoided is the simple, transparent presentation of data in a University Fact Book accessible to all employees. While this is a path I will take regardless of conflict mediation, nonconformists will not be able to fight culture or consensus over time.

9.2 Constraints

Time is the ultimate constraint to this project. As the project matures and methodologies are developed and agreed upon, time is constantly passing. With each day, week, and month that passes, new information is introduced and older information becomes irrelevant. For the project, time is essentially a continuously moving period of about 3 years (the previous year, the current year, and the following year). As each year passes (or even each semester), the model evolves and changes. The constraint of this is the limitation of refinement relative to a set period of time.

Access to data and the collection of data are critical elements to this project. Most of the risk associated with data access and collection is related to reliable, relevant, and correct data. To date, much of the data that has been analyzed has many minor inconsistencies that are generally human input error or inconsistent entry or application to code tables. The good news is this issue, as well as others outside of this project, has created a university wide task force to create and provide data governance protocols and procedures for data controllers across the university system.

While critical to the project, the risk assessment remains low as data are readily available and the institution and all constituents are bought into developing a data governance policy and procedure guide. The biggest risk to access to data is always the integrity of the data; however, all officials involved in data governance are highly motivated to resolve any known or potential issues.

Given the breadth of the project and the institutional impact, institutional support is a requirement. Organizational Perspective, as outlined in Hughes et al. (“Becoming a Strategic Leader”), is critical to developing and cultivating institutional support. This component has low risk; but the risk is dependent on the development and cultivation of support, thus requiring a moderate amount of mitigation action.

Examples of mitigation steps already taken have been meeting with academic deans and partnering for data analysis considerations; regular updates on the progress of the project;

providing support and quick outcomes/results for supporting analysis that may be relevant but not directly related to the project; and regular, informal meetings (over coffee) with key players to discuss perceived conflicts. These mitigation steps have proven to be highly effective so far. Additionally, listening sessions follow-up by responsive action have resulted in stronger relationships and increased political capital. Strategic leadership competencies (Organizational Influence, Collaborative Relationship Building and Acting Systematically, in addition to others) will all be important applications of project leadership and execution.

The final mitigation tactic is the current strategic planning process the institution has been conducting. Many of the analytical aspects of the project are being actively requested, organically building support for the work. Additionally, the project having the full support of the president helps remove many barriers even before they were ever encountered. Scope creep is a high-risk consideration; but with discipline and scope management, the creep can be held at bay. As discussed in Institutional Support, this project is big and has wide sweeping implications for every aspect of the university. Already, many "What ifs" have been asked and proposed as possible extensions to the project. While many of these questions are really good and deserve further exploration, they must be strategically managed and kept out of the scope of the project.

An important mitigation tactic for the managing scope is the ability to develop clear guidelines and timetables for achieving non-scope related requests. An important consideration for institutional and personal buy-in is not to quickly dismiss requests or ideas but to place them in a "parking lot" for prioritization, planning, and discussion. Dismissing an idea can begin to erode individual and eventually institutional support.

The biggest threat to scope creep is me. I tend to be naturally inquisitive and will chase a rabbit down a hole without hesitation. Constant vigilance on remaining focused is critical. One tactic I have used is to continue to ask myself how an idea supports the project and is it directly related to the success of the outcome? My salvation is for every consideration that does not make the project, it sits in a parking lot for future analysis; this potential makes me very excited!

9.3 Assumptions

Many assumptions associated with this project, by the very nature of being "assumed," are outlined in Milestone 5 Risk Analysis. For all practical intent, these assumptions could also be considered risk factors with the premise an assumption could, in time, result in an alternative outcome. Key assumptions have been broken down into three major categories: financial, operational, and human resources.

Financial:

While the actual initial development of this project has little financial reliance, it is completely dependent on the ability to influence and inform the institutional strategic budget process. Primary financial assumptions include proper funding for software and systems to process and display massive amounts of data. Most of these assumptions can be counted on as they exist in the current and committed infrastructure of the university.

Operational:

Adoption – As the very premise of this project is founded in fiscal understanding of university operations and programs and the ability to influence and inform the institutional strategic budget process, the biggest key assumption for the entire project is the ultimate

adoption of the analytic modeling by senior management, middle managers, and front-line faculty and staff. The entire product of the project is built to inform strategic decision making regarding funding and organizational prioritizations. If senior managers do not make using the model a standard tactic in decision making, the project has failed. This assumption requires a great deal of development and nurturing to accomplish the end goal. Transparency and relationship building are critical. Offering opportunities for senior managers to influence and invest in the project will help increase the likelihood of the assumption coming to fruition.

Methodology Development – While not the most critical assumption, methodology development is certainly the most difficult assumption to realize. Methodology development involves a shared agreement on how each metric is created, interpreted, and used. For example, institutional overhead is a very large portion of the university operational expenses but is difficult to effectively distribute to each program. Developing the calculation for distributing overhead is complex and full of political pitfalls as each method benefits some and hurts others. Like other assumptions, transparency, inclusion, and trust are critical to realizing the assumption.

Time – Time is always a resource that is never in abundance. The assumption of time is that prioritization is given to managing the analytics and assisting in the evaluation of the change initiative as well as the strategic plan associated with the initiative. The time granted to develop the model has been integrated into daily work flow.

Human Resources:

Culture Change – Once the project is initially implemented, the lasting impact of the project will be largely dependent on the long-term shift in how the organization makes strategic decisions. Information, in any form, runs the risk of being misunderstood, too complex, or too disconnected from the practical day-to-day operations of an organization and can be relegated to a bookshelf or browser bookmark that is only looked at once or twice. Culture change is built into all assumptions in that the culture must shift to making informed decisions while minimizing assumptions.

Position Commitment – Managing the analytical dashboard and strategic initiatives associated with it will require almost full-time work. It is assumed this project will be part of at least one job description, if not supported by multiple people.

10 Financial Plan

Very little, if any, costs are directly associated with this project. It is important to provide some context to this consideration. At the project's most basic foundation is simply data mining, evaluation, and presentation. While the hope is this project greatly influences financial spending, there are no direct fiscal costs associated with the work. This is greatly due to my role as a strategic planner at the university. My role includes process optimization and strategic initiatives and has regular access to senior leadership and the president at the university. While this project is part of my consultancy work for Gardner-Webb University, it is also a top priority for Wingate University. The tools needed to achieve success are provided by the university as a part of my role and are not specific to the project. The basic assumption for successful completion of the project and the elimination of direct expenses is directly tied to the job itself.

11 Quality Assurance Plan

The very nature of the project could be considered the “Check, Act, Plan” stages of Deming’s model. The final analytics product provides more substantive analysis for solving complex organizational programs. While the model does not provide solutions, it does provide some indication where a solution may be found and measures the results of the “Do.”

It is critical that this model also be continuously tested and adjusted as the organization evolves. Technical aspects of the model can change at any time, such as tuition models, enrollment calculations, and cost distribution. However, as the model naturally seeks balance, weights must be given to values and mission-driven aspects of the organization that otherwise would be devalued by the model and made less effective by the model’s natural push to become more efficient. These values and mission-driven priorities evolve, adapt, and change over time. Additionally, the matrix nature of each variable within the model must be considered as changes or balance in one area may negatively impact another.

The model below outlines the process in which the model is tested and evaluated to provide the most accurate information to the appropriate leadership.

Check

In the case of evaluating the model itself, several tools are used including the model itself. The “check” phase involves a three-step process: data acquisition, data governance, and data validation. Data acquisition involves pulling together all the necessary data variables used in the model under a unique identifier and then cross-referencing against the system for validity and accuracy. Once the data are collected, the data must be evaluated for consistency, accuracy, and equivalency. This data governance check is the most complex and time consuming. Finally, the aggregate of the data is checked for validity and accuracy against the ledger, enrollment charts, and budgets. This process can result in revisiting the data governance process until errors are resolved and the system balances.

Act

Once the model has been checked and balanced, the “act” phase involves pulling the data together in meaningful ways to evaluate and provide guidance for any particular problem. Measures are evaluated for validity, impact, and consistency. For example, does a change have a proportionate impact regardless of the variable or category? This test is critical to the plan and to phases as inconsistent change and impact will result in misrepresented results.

Action is also taken from the “Check” phase to modify formulas, the evaluand, and balance of the results shown. Adjustments can be made to better illustrate the appropriate value of each variable being measured. Weights and values to each of these will change over time and with change in the variables.

Plan

Once the model has been validated and built, the evaluator must create a test hypothesis given a set goal with assumption on the effect of value on effectiveness and efficiency. For example, if the model shows a program to operate at a net loss, the test hypothesis would be to affect the variables that contribute to the net profitability of the program, assuming profitability is the goal.

The variables can be adjusted based on the hypothesis. An example of variables to change would be enrollment, faculty load, reduction in expense, increase in tuition, etc. Again, most of these variables are not mutually exclusive and are bound to each other in complex ways.

Do

The model will allow for the simulation of actual changes in variables. The model is limited in evaluating only the variables and their relationships that exist within the model but do not reflect relationships that are not evaluated in the model. For example, price tolerance for graduate education: The model will allow you to evaluate the effect of the change in tuition on net revenue but will not tell you if the market would tolerate any type of increase.

Running the simulation requires a significant understanding of each variable's impact on each other, and disregard for the impact will show in the "check" phase. The simulation itself is virtually instant, but the reality of the model being deployed for real problems and solutions is a full year.

Summary

Quality assurance is critical to the success of the project. As each iteration of the model develops, the model will become more complex. Additionally, given that the model must be rebuilt yearly, constant evaluation of the model must be completed for confidence assurance. Any miscalculation could result in devaluing the analytics the model provides, rendering it essentially useless. The Plan, Do, Check, Act quality assurance model allows for a uniform, replicable, and reliable system of evaluation resulting in a stronger product.

12 Reflection

The project was meant to be a simple dashboard to help resolve assumptions often made of program financial performance. What resulted was a data set that changed the way we look at the entire educational model on which the university is built. While the model does not evaluate program outcomes and student learning, it does begin to illustrate market demand, pricing modeling, program overlap, and organizational and physical capacity. The model is helping the university align administrative priorities and curricular outcomes into a sustainable educational ecosystem. The impact the model has had on the university, even before completion, has been beyond simply achieving the goals outlined 3 years ago.

The challenges of the model have also had a significant impact on my professional work. One of the greatest challenges has been the adoption of the model for actionable decision making. In the face of fiscal facts, departments continue to make decisions based on assumptions and perceived value. One of the biggest risks to the model has been organizational culture and history. Culture distorts, manipulates, and creates facts to challenge or justify contrary results in the model. For example, one department's spending on financial aid had outpaced the rest of the university significantly. Regardless of the data, the argument was that the department could not complete its mission without the funds. The data illustrated the contrary. The result was a painful decision that left many employees disenfranchised. Organizational change modeling is critical to the use of the model.

13 Areas for Future Study

One of the greatest challenges of this project was managing scope creep and the alternative opportunities this model provides. One of the biggest opportunities is adding a layer of analysis that provides objective information for operational capacities. Examples of these capacities are faculty load, section size, and classroom size. The addition of this metric(s) will allow leadership to gain further perspective into where programs may need to expand the number of students or cut back on the amount of resources allocated to a program. Additionally, the model sets the stage for integration into our enrollment decision making as we can target specific growth programs or programs with capacity. The model also illustrates, but not clearly, the impact of the common curriculum on program net costing. Future study into how the common curriculum interacts with program coursework could potentially result in significant gained efficiencies in capacity and cost to teach a student.

14 Appendix

Dashboard Example

Depart-ment	Credts Taught	Student Sections Taken	Tuition Revenue	Room and Board	Other Sources All	Other Sources UG Only	Gross Revenue	Financial Aid	Direct Program Expense	Institutional Overhead	UG Overhead	Room and Board Expense	UG Athletics Expense	Gross Expense	Net Revenue	Depart-ment
Dept 1	1,554	665	$1,349,798	$383,414	$52,075	$5,812	$1,791,099	($787,238)	($169,479)	($431,561)	($153,209)	($106,806)	($88,733)	($1,737,027)	$54,072	Dept 1
Dept 2	5,773	1,597	$5,103,655	$1,452,108	$193,453	$21,591	$6,770,808	($3,036,689)	($778,778)	($1,603,220)	($569,160)	($396,778)	($329,638)	($6,714,263)	$56,545	Dept 2
Dept 3	5,849	2,039	$4,928,760	$1,465,471	$196,000	$21,875	$6,612,106	($3,079,909)	($987,077)	($1,624,326)	($576,653)	($402,002)	($333,978)	($7,003,945)	($391,839)	Dept 3
Dept 4	4,010	1,097	$3,582,509	$1,076,918	$134,375	$14,997	$4,808,799	($2,235,379)	($599,776)	($1,113,617)	($395,346)	($275,607)	($228,971)	($4,848,696)	($39,896)	Dept 4
Dept 5	2,970	1,001	$2,367,768	$706,524	$99,525	$11,108	$3,184,924	($1,375,302)	($305,791)	($824,799)	($292,812)	($204,128)	($169,587)	($3,172,420)	$12,505	Dept 5
Dept 6	4,483	1,507	$2,810,266	$5,482	$150,225	$71	$2,966,044	($12,130)	($1,681,215)	($1,244,974)	$0	$0	$0	($2,938,319)	$27,725	Dept 6
Dept 7	2,477	1,051	$2,305,268	$557,475	$83,004	$9,264	$2,955,011	($1,249,349)	($485,343)	($687,888)	($244,207)	($170,244)	($141,437)	($2,978,469)	($23,457)	Dept 7
Dept 8	4,947	1,698	$4,240,709	$1,249,265	$165,774	$18,502	$5,674,250	($2,502,701)	($465,463)	($1,373,831)	($487,725)	($340,007)	($282,474)	($5,452,201)	$222,049	Dept 8
Dept 9	2,231	777	$1,137,810	$0	$74,761	$0	$1,212,571	($43,949)	($549,384)	($619,571)	$0	$0	$0	($1,212,904)	($333)	Dept 9
Dept 10	4,288	1,407	$1,475,422	$7,195	$143,691	$0	$1,626,309	($142,627)	($1,294,161)	($1,190,820)	$0	$0	$0	($2,627,609)	($1,001,300)	Dept 10
Dept 11	891	298	$227,227	$6,168	$29,857	$0	$263,251	($49,624)	($195,040)	($247,440)	$0	$0	$0	($492,104)	($228,852)	Dept 11
Dept 12	5,977	2,015	$5,139,068	$1,473,009	$200,289	$22,354	$6,834,721	($3,106,558)	($417,613)	($1,659,873)	($589,272)	($410,799)	($341,287)	($6,525,402)	$309,319	Dept 12
Dept 13	5,670	1,787	$4,991,774	$1,499,735	$190,002	$21,206	$6,702,717	($3,177,759)	($348,422)	($1,574,616)	($559,005)	($389,699)	($323,757)	($6,373,257)	$329,460	Dept 13
Dept 14	336	204	$285,065	$97,310	$11,259	$1,257	$394,891	($175,903)	$0	($93,311)	($33,126)	($23,093)	($19,186)	($344,619)	$50,272	Dept 14
Dept 15	3,166	1,066	$2,741,366	$782,247	$106,093	$11,841	$3,641,547	($1,663,557)	($163,746)	($879,230)	($312,136)	($217,599)	($180,779)	($3,417,046)	$224,501	Dept 15
Dept 16	1,941	1,485	$1,654,761	$556,447	$65,043	$7,259	$2,283,510	($969,303)	($626,924)	($539,035)	($191,363)	($133,405)	($110,831)	($2,570,861)	($287,350)	Dept 16
Dept 17	1,107	415	$1,017,197	$196,675	$37,096	$4,140	$1,255,108	($547,894)	($554,352)	($307,425)	($109,139)	($76,084)	($63,210)	($1,658,105)	($402,997)	Dept 17
Dept 18	5,713	1,785	$3,616,292	$0	$191,443	$0	$3,807,734	$0	($1,677,851)	($1,586,557)	$0	$0	$0	($3,264,408)	$543,326	Dept 18
Dept 19	15,133	6,738	$12,554,670	$63,388	$507,107	$793	$13,125,958	($130,522)	($8,794,694)	($4,202,585)	$0	$0	$0	($13,127,802)	($1,844)	Dept 19
Dept 20	4,008	1,389	$3,313,139	$888,808	$134,308	$14,990	$4,351,245	($1,767,309)	($271,061)	($1,113,062)	($395,149)	($275,470)	($228,857)	($4,050,907)	$300,338	Dept 20
Dept 21	3,579	1,211	$3,106,878	$917,247	$119,932	$13,385	$4,157,443	($1,961,080)	($281,381)	($993,924)	($352,854)	($245,985)	($204,361)	($4,039,584)	$117,858	Dept 21
Dept 22	3,372	1,176	$2,843,761	$760,318	$112,996	$12,611	$3,729,687	($1,545,742)	($292,858)	($936,438)	($332,445)	($231,758)	($192,541)	($3,531,783)	$197,904	Dept 22
Dept 23	4,600	1,994	$3,986,686	$1,272,908	$154,146	$17,204	$5,430,943	($2,653,824)	($606,004)	($1,777,466)	($453,514)	($316,158)	($262,660)	($5,569,626)	($138,683)	Dept 23
Total	94,075	34,402	$74,779,848	$15,418,115	$3,152,453	$230,261	$93,650,677	($32,214,348)	($21,546,413)	($26,125,568)	($6,047,116)	($4,215,623)	($3,502,286)	($93,651,354)	$0	