CONCLUSIONS PAPER

Building an Analytical Culture for Success

How the University of North Texas created a new data landscape

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Contents

Featuring:
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An ambitious vision

The University of North Texas is home to 38,000 students, enrolled in more than 100 graduate programs. Since its founding in 1890, the university has been a pioneer in emerging technology. Located about an hour north of the Dallas/Fort Worth metroplex, the university is known for its research activity and offers degrees in business analytics and data science. It was only natural, then, to turn quantitative expertise on itself, to advance its use of data and analytics to help promote student success, get students to degrees faster, reduce their debt, make campus operations more efficient and in general improve the academic setting.

That vision got a big push in 2014 from the incoming campus president, Neal Smatresk, who called the units together and said, "I don't want to catch up to other institutions of higher education on analytics. I want us to leapfrog ahead."

That was an ambitious vision, given the history behind it. "The university had failed in three previous attempts at doing a data warehousing analytics project," said Jason Simon, the university's Assistant Vice President for Data, Analytics and Institutional Research. Simon would soon take on the challenge of establishing a new enterprise-wide data warehouse, analytics and dashboarding solution. "I came in on the fourth effort, and I certainly did not want to be the fourth failure. So we decided to tackle this project in a little bit of a different way."

Rather than rushing to embrace new tools and technologies, Simon took a radically holistic approach. His team of business intelligence professionals, data modelers and institutional researchers methodically planned to not just deploy the latest tools of the trade, but to establish an inclusive, planned culture of data.

The Data, Analytics and Institutional Research team collaborated with partners from across the campus. They conducted stakeholder analysis, engaged subject matter experts, and held forums with vendors and academic partners. The end result was the launch of the Insights Program, a comprehensive approach to data warehousing and predictive analytics.

'The best way to predict the future is to create it'

That quote from management guru Peter Drucker is a Simon favorite. So is this one: "Culture eats strategy for breakfast." So Simon and his team set out systematically to create a new data landscape, starting with a very intentional focus on the cultural context.

The time was right. "Our constituents were changing, their needs were evolving, and we needed to keep up or get passed by," Simon said.

Today's students are a different breed. They had computer chips in their crib toys and got their first computers as toddlers. They have never known a world without smartphones, streaming media, digital processes and online everything. Stakeholders from the boomer generation and beyond live in a world of pervasive digital transformation. They're a tough audience with high expectations about the information they should be able to get – easily and on demand.

"When we talk about wanting to implement a new data landscape or analytics strategy, we often jump directly into the tools of the technology, and we don't think about the broader organizational or cultural context in which we expect those tools to operate."

Jason Simon, Assistant Vice President for Data, Analytics and Institutional Research

The starting point was knee-deep in the weeds

At the time, the university's data landscape was a virtual overgrown lawn – overabundance that begets chaos. "Our campus was overwhelmed with data," said Simon. "It was everywhere. It was unruly and growing out of control. People didn't know where to turn to look for answers. We needed a different approach.

"We wanted to know where we could draw upon data for key questions. We wanted to validate the data and have a sense of trust in it. We wanted executive leaders to understand the utility value of their data. We wanted to live in harmony with our data. We were up to the hard work of clearing out the undergrowth, but it was a challenge no less."

And it was imperative. Higher demands for information were pressing from all directions. For example, students and parents now expect more transparency about the courses they need to take, the grades faculty members give, the time to degree and so on. Legislators are asking for more clarity about what the institution delivers for taxpayer dollars.

"Legislators, college champions and executive sponsors want the rose-colored gardens where data is awash and beautiful," said Simon. "But the reality at many large comprehensive research institutions – and I'd argue, the reality in most sectors – is that the data is still very much in a messy situation. You have issues around trust and veracity and location of information, who owns data, who controls data, who stewards data. These are endemic challenges for institutions."

A landscape plan emerges

Static spreadsheets and hindsight data are so yesterday – literally. The goal now was to use data to see and shape the best that could happen in the future.

"We took this very seriously that we did not just want to make data look pretty," said Simon. "We wanted data to live in a way that our executives and decision makers could leverage it to really improve the outcomes for the people we serve and the faculty and staff who work here."

But change, even positive change, comes with hurdles. People are naturally resistant to uncertainty. "Beyond the technical intelligence element, there's also emotional and cultural and organizational intelligence that needs to be brought to bear," Simon noted.

It would have been easy to base the whole project on the wish list of an executive sponsor. But Simon knew that wouldn't fly in an organization of more than 5,000 employees – plus outside parties – with diverse data needs. So his team did a remarkable thing. They invited the anthropology faculty to conduct a research study. The research question: What would an ideal data landscape look like in an institution of higher education?

A team of qualitative researchers conducted dozens of hourlong interviews with diverse stakeholders – from chancellors and presidents to end users in functional offices. "That work, while time-consuming up front, actually paid huge dividends once we implemented, because we were now all effectively marching down the same path," said Simon. The right path.

Below the waterline

When setting out to change an organization's data landscape, it's natural to acknowledge the visible and obvious success factors. If you picture an iceberg, these would be the known elements above the water's surface – things like tools and facilities, technologies, policies and rules, program charter, and financial and staffing resources.

But Simon believes firmly that the success of a data transformation rests on the often overlooked cultural influences hidden below the waterline:

- Attitudes about data. Is it trusted? Is it confusing for people? Do they know how to find it? Do they believe what they see? Do people have to call five different areas of the organization to get an answer?
- Communication patterns. What is the tone of the conversation? How do people talk about data, technology projects and the importance of staying current with innovation?
- Informal data planning processes. Do subject matter experts convene offline informally in meetings to talk about data problems, or are there formal councils or structures to do this in a systematic way?

> "Take a step back, look at your own history with regard to how the organization approached data in the past – and then organize smartly before proceeding. The last thing you want to do is create yet another failed attempt in a long litany of past challenges."
>
> **Jason Simon**, Assistant Vice President for Data, Analytics and Institutional Research

- Social and emotional skill. Are people willing to build bridges and work across boundary lines, both formal and informal? Can team members discern nonverbal signs of discomfort, frustration or concern?
- Existing unsolved problems. What problems has the organization tackled in different ways at different times without success? Do you want to start there or circle back later after building some trust?
- Conflict resolution practices. How will the organization manage the inevitable conflicts that arise around data management and data governance?
- Politically driven behaviors. How will you keep the project moving forward within the realities of institutional politics and bureaucracy?
- Orientation toward change. Do you have a leadership sponsor who prizes innovation and embraces change – or one who just wants the end result and doesn't care how you get there?
- Individual work demands. Is there enough staff to carry out the plan? Or do you tap the same technical specialists time and again until they are they overtaxed and overwhelmed?

"You obviously have to pay attention to the visible and known," said Simon – the financial resources, tools and so on. "But you're not going to be successful if you don't focus on all that stuff below the waterline."

Figure 1. You have to address the visible and known elements, but to succeed, you have to focus on the cultural factors below the waterline.

A road map for success

Six principles led to success where three previous attempts had faltered. "It allowed us to not repeat the mistakes of the past," said Simon. "This is our road map for how to do this well."

- Focus on people first.
- Develop a master plan.
- Instill a culture of data governance.
- Engage today while thinking about the future.
- Anticipate challenges and prepare solutions.
- Demonstrate a culture of value and impact.

While this Insights Program was done for a university, Simon emphasized that most or all of the concepts apply equally in other industries or companies – anywhere there's a need to turn a data jungle into an orderly, trustworthy and sustainable business intelligence system.

Focus on people first

Confirm and provide proactive status updates to champions. Without being asked, the project team provided regular summary progress reports to champions and executive sponsors, a few bullet points every few weeks.

Document work processes for employee adoption if needed. With the inevitable turnover of data workers in higher education, it was important to have documentation that would enable new hires to get on track quickly.

Value and engage communication experts. Identifying audience segments, messaging, themes and a brand for the program – the UNT Insights Program – helped raise the profile on campus and beyond.

Prioritize resources for training, training space and trainers. A new training space and a new data professional with training responsibilities ensure that users across the campus know how to manage and apply the data.

Develop a master plan

Articulate resource needs and staffing models. Looking closely at present and future needs enabled Simon to advocate for a significant team expansion, from nine members to 22 by the end of 2018.

Develop an evidence-based program road map. KPIs related to analytic products delivered, data dictionary terms defined, faculty and staff trained – even some projected revenue returns – demonstrated the team's effectiveness.

"We were working to get short-term wins while also laying a solid foundation for the future. We needed to very quickly demonstrate project ROI, to show executives and decision makers the value and the impact on moving the institution forward."

Jason Simon, Assistant Vice President for Data, Analytics and Institutional Research

Conduct stakeholder interviews and develop a RACI matrix. For each data subject area, the carefully defined matrix identifies who needs to be responsible, accountable, consulted and/or informed for each role.

Have the final data products in mind. Extensive stakeholder interviews established the expectation. Working backward, the team laid out a plan to get to that end game in the most efficient and expedient way.

Instill a culture of data governance

"This was a huge point of interest in our executives, because some of those previous failures didn't spend enough time focusing on data governance," said Simon. This time, governance would be at the forefront, but with a twist.

Establish data governance protocols and timelines. And not by just forming a committee or council and "getting everyone in a room for three hours to debate what a customer is," Simon quipped.

Explain why leaders should trust data governance efforts. Using real cases where the institution had faltered in the past and gotten different answers to the same question, the team showcased the merits of the new approach.

Deconstruct data governance into key components and train. The team mapped out the building blocks of data governance – data quality, clarity, etc. – and the technical and functional experts who needed to be in the process.

Govern and define data before visualization. "We made it a point to not release an analytic product until every variable on that analytic product was already linked and defined in the business data network," said Simon.

The building blocks of data governance

"The goal of any data governance program should be to increase business intelligence while also increasing the trust in the data," said Simon. "The ultimate goal is to be able to trust the decisions."

With that in mind, the data must be addressed first. "Where does it exist? How do you manage it? What's the metadata around it? For us, getting our data in order has been our secret sauce."

The university began by tackling the data dictionary. What were the business terms? How are they defined and used? Where should they exist? The SAS Business Data Network enabled the data team to discover, document and manage an extensive glossary of business terms. Each term includes a definition of the term; the networked relationship of the term to other terms; and the relationship of the term to other content such as documents, web pages, tables and business rules.

> "We went from a team of nine to 16 by the end of 2018. That's a rarity in an institution of higher education. It was certainly the first time in my 20-plus-year career where we were able to see that rapid escalation of resources, but it was because we had taken the time to demonstrate the value to the organization."
>
> **Jason Simon**, Assistant Vice President for Data, Analytics and Institutional Research

Having an authoritative vocabulary promotes a common understanding among all stakeholders. "We are now able to see all the different hands that touched that data element," said Simon. "Who created it, when it was last modified? All of that transparency ultimately built trust in the program."

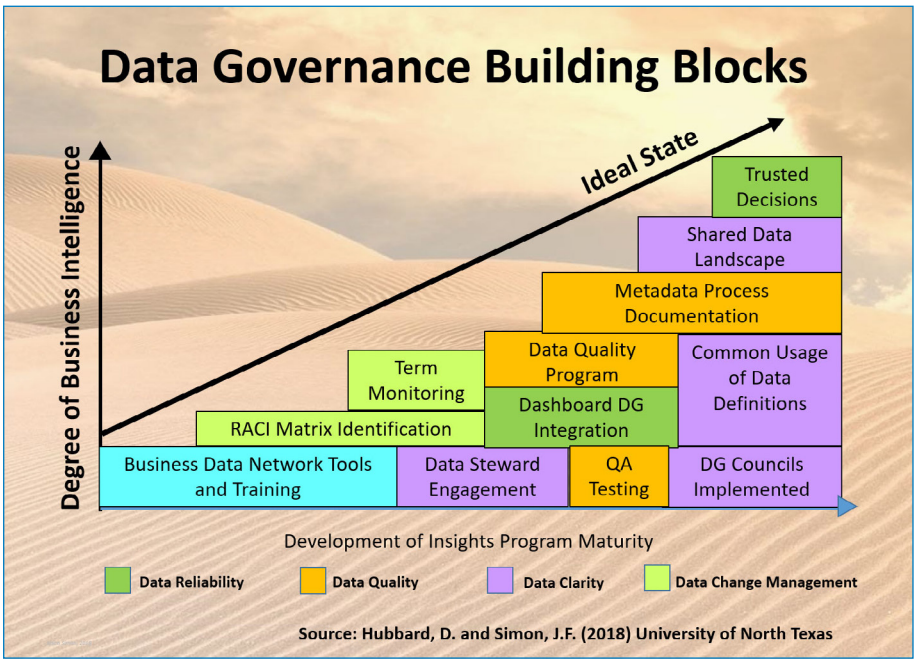

Figure 2. The building blocks of data governance.

The SAS Business Data Network in Figure 3 is the cornerstone of that effort. "We invested here quite a bit, because we knew everything had to build on that," said Simon. "You'll also notice that we placed the data governance councils toward the end of the maturity spectrum, because we had to do all the other components to get to the point where we felt comfortable in our own data governance practices."

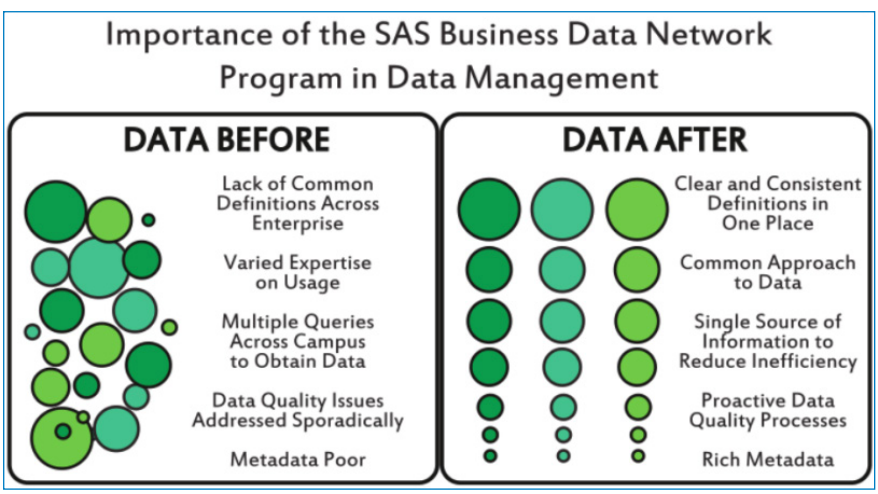

Figure 3. The strategic business value of the new data environment.

"We like to joke, 'There is no visualization without representation,' Every variable in an analytic product is linked and defined in the business data network. If an executive or user ever has a question about the source of a data point, it's just a simple right-click. It's a connection to our SAS Business Data Network, where they can see the metadata around that data point."

Jason Simon, Assistant Vice President for Data, Analytics and Institutional Research

Engage today while thinking about the future

Consider that there are four generations in the workforce right now, with people of all levels of data comfort and literacy. How do you create a data landscape that serves them all?

- **Build adoption by executives via concierge service.** "We really want to pay special attention to executives' needs," said Simon. "We also recognize that those individuals are going to help support and sponsor the programs."
- **Ensure systems are aligned and tested with key partners.** The project had to bridge the traditional chasm between IR and IT to establish the necessary infrastructure, storage, security and supporting processes.
- **Launch new reports to influence decision making.** The team earned some quick, validating wins by offering ways people could use analytics differently – to ask questions and get answers they couldn't get before.
- **Recognize and anticipate executive stressors and respond.** What was keeping executives up at night? How could we alleviate some of that? A customer-centric perspective helped boost top-level endorsement.

Anticipate challenges and prepare solutions

- **Manage and monitor expectations with intentionality.** Once you show some wins, everybody wants a part of it. Having a program charter enables you to push back where necessary and prioritize the most important areas.
- **Reinforce that users can learn and grow as the program matures.** With a robust training program, users can come back and expand their skills as new data products are introduced.
- **Hand-hold executives until they are comfortable.** Yes, this has been mentioned before. But it's so important that it's worth repeating. Executives must feel comfortable with the system and have it meet their needs.
- **Plan ways to engage tech-resistant users.** "Some of your most ardent supporters might never use the product as deeply as you wish they would," said Simon. Cultivate them anyway. There's value in their advocacy.

Demonstrate a culture of value and impact

- **Measure outcomes against original program goals.** There's power in proof. For this project, that meant showing executive sponsors tangible progress toward goals in enrollment, finance and academic performance.
- **Provide positive stories for executives to evangelize.** "We provided very specific stories of how others around the organization were using the data in new ways," said Simon, "and then that story took off like wildfire."
- **Highlight real-time decision-making capabilities.** "We're getting to a point where users have as much trusted data as they probably need to make a decision," said Simon. "That was a major culture changer on our campus."
- **Reflect internally and assess next steps.** Pause and evaluate. "If you spend every minute of your week putting out fires, and you're not reflecting on progress from a strategic perspective, you're doing yourself a disservice," Simon said.

"We believe in the power of creating a network of voices to talk about the good work that's happening within the new data landscape and happening within the analytics enterprise."

Jason Simon, Assistant Vice President for Data, Analytics and Institutional Research

Examples of analyses, dashboards and reports

Payroll dashboard

How many people are you paying each month? Back in the day, the CFO could see how many paychecks were going out, but things got murky if you wanted to slice, dice and get more granular than that. The new Insights system has a full chart string. You can look at any department on the campus, do multiyear comparisons, and all of the data points are drillable.

Grade distribution

In the past, the chief academic officer could see DFWI (drop, fail, withdraw, incomplete) grade reports one semester at a time. Now it's easy to see trends over time by educational format – classroom, online and hybrid.

Insight into which students are struggling – at risk of not being retained – led to some real policy changes. For example, now only the registrar can issue a withdrawal with failing grade, not the faculty member. Before, the faculty member would be able to do that. "We found there was a definite linkage between students getting those WFs and then not being retained and coming back," said Simon. "That's a good example of a data-based policy decision that came about because we are able to surface analytics in a new way."

Retention dashboard

Similar to a market basket analysis for a retailer – what behaviors lead to a positive or negative purchase decision – understanding academic performance patterns can help you spot early indicators of a student at risk of not being retained. "We wanted to see the patterns," said Simon. "Suppose a student passed a course with a C or even a D. We knew that student would likely be struggling two or three courses further down the sequence. So now we can intervene earlier to support the student for a greater chance of success."

"We're getting emails from our campus budget officers who are telling us things like, 'My co-workers are concerned about me, because they keep hearing me squeal with delight.' It's not very often that a data professional in higher education gets an email like that."

Jason Simon, Assistant Vice President for Data, Analytics and Institutional Research

"One of the big 'aha' moments happens when you get out of your own data silos and start to model it, bring it together and connect it in new ways. That's where it gets really exciting. That's where it gets visualized and it's easy to see the next steps from a leadership perspective."

Jason Simon, Assistant Vice President for Data, Analytics and Institutional Research

National student clearinghouse

Using National Student Clearing House data for educational outcomes research shows where the competition is. From which high schools did you work hard to recruit students who then chose to go somewhere else? "This analysis gives us more of a 360-degree view into our 'customer,' although in this case it is a failed customer," said Simon. Regional recruiters can use this insight to refine their strategies when visiting those high schools.

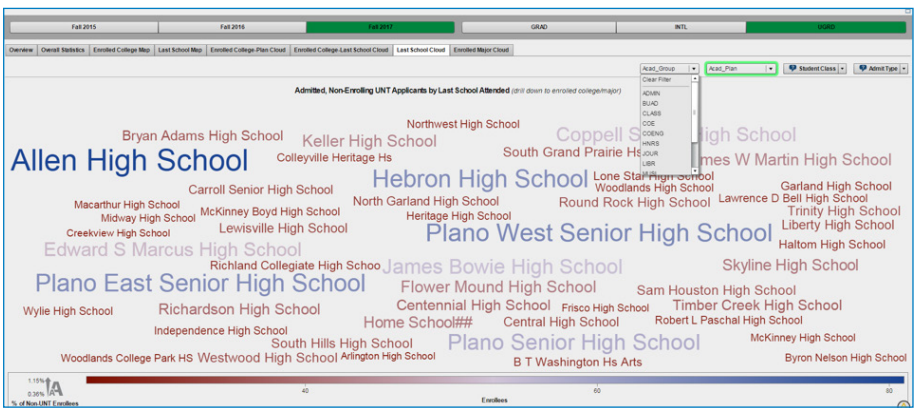

Figure 4. Where did you work hard to recruit students who ultimately chose to go somewhere else?

Geographic distribution

You want to build a robust class that balances access with quality with diversity. By visualizing admissions test scores by geography, regional recruiters get valuable insight about how to advance that mission.

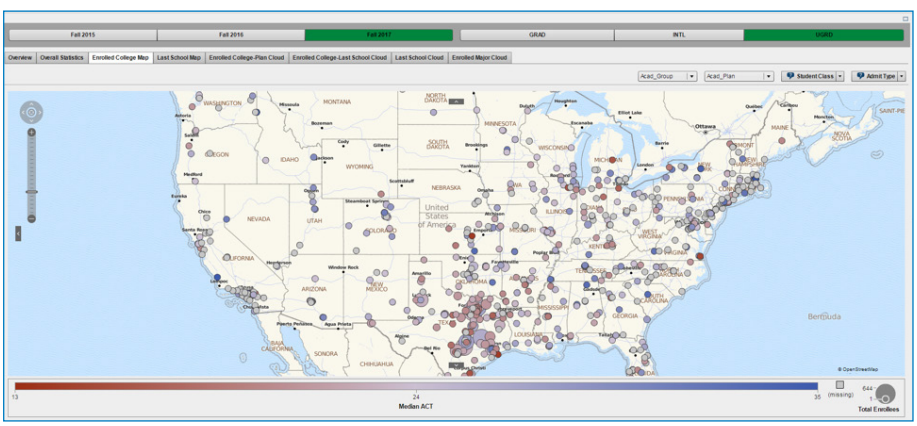

Figure 5. A simple yet powerful tool to build a better student body.

Student activity

Is the campus engaging students in class and out of class in a way that deepens relationships and retention? "We can now analyze ID card swipe data to understand the student's involvement on campus in big-picture perspective," said Simon. "It allowed us to have very different conversations around the utility value of some services that on the surface look very expensive, but when you start correlating them with academic success or re-enrollment, that changes the equation significantly."

Head count

When every student matters, visualizing headcount over time enables executives to ask questions about positive or negative trends – and the administrative practices that might be influencing those trends.

Early wins, quantifiable ROI

The new Insights Program delivered immediate and tangible results. For example:

- Simon and his team looked at where students lived in relationship to campus. Using SAS Visual Analytics, they created a heat map of student housing, which they overlaid on top of transportation routes. The 30-minute exercise exposed an opportunity to eliminate some buses while retaining adequate transportation options. This optimization analysis enabled the university to renegotiate a transportation contract and save $450,000 a year.
- By using the Insights Program for a finance project, the university didn't have to buy another vendor tool, which saved the finance department $125,000 a year.
- A lift of slightly more than 1 percent in student retention yields another $450,000 a year for the institution.

"More than $1 million in savings; that's not a bad value proposition for just one year," said Simon. "It's one that we hope to grow as more people use the data and analytics."

The results run deeper than quick-win cost savings, Simon noted: "People trust the data now. You can't underestimate the value of that. They're spending more time asking value-added questions instead of questioning the value of the data. The whole conversation is starting to evolve."

"We're connecting things that were once mysterious and unknown to us to now being much more comfortable at looking at the interplay between data areas. The questions are evolving too. The questions used to be, 'How many' or 'What's the count?' Now we're asking questions like, 'Why do we think that's happening, and how can we make it better?'"

Jason Simon, Assistant Vice President for Data, Analytics and Institutional Research

Key takeaways

Invest in the data governance tools – in this case, the UNT Business Development Network, powered by SAS.

Capitalize on existing strengths and focus on nurturing your advocates and champions. Assemble a team of individuals who believe in the work you're trying to do.

Set expectations and influence momentum. Don't just let culture happen to you. Be the change you want to see in your culture.

Be an active participant in building the analytic future your organization deserves. Remember, the best way to predict the future is to create it.

And most important: Culture matters. Be a culture-centric leader as well as a data-centric leader. Don't just buy a tool and expect new technology to work for you.

Closing thoughts

The cultural underpinnings of success for the Insights Program at the University of North Texas are clear. Put the people first, start with the strategic questions, follow a master plan, build in data governance from the early stages, plan ahead, be prepared for trouble spots, and use the data to not just populate reports but to inform better decisions for tangible results.

But the technology underpinning had to be right as well. "For us, having a single, unified environment really gave us efficiencies," said Simon. "It enabled us to build trust in the program. Our IT team understood that we were working with a single provider. Our executives understood the value of that. And so it really made an impact for us.

"Since implementing SAS, efficiencies afforded by analytics have reduced costs at the university by more than $1 million. Factor in the positive impacts on student success, and you've got a strong analytics culture where decision making generates wins on multiple fronts.

"I consider myself one of the luckiest people at the University of North Texas. I get to work with an amazing team of staff who really are fundamentally reengineering the data landscape of the institution. When we're successful, our executive leadership, our regents and our students yield more benefits, because we're helping the institution connect data with decision making in brand new ways."

"One of the major reasons we went with SAS is because they had a complete process for us. It was more than data integration, analytics or visual statistics. It was also the business data network, and the ability to create a seamless connection between the analytic product and the underlying data."

Jason Simon, Assistant Vice President for Data, Analytics and Institutional Research

About the presenter

Jason Simon is Assistant Vice President for Data Analytics and Institutional Research at the University of North Texas. In this capacity, Simon leads an enterprisewide data warehouse and analytics program that brings together data sources across the entire campus. He also serves as an affiliate faculty member in the higher education department. Over his 23-year career, he has led teams in advancement, student affairs, academic affairs, and finance and administration.

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