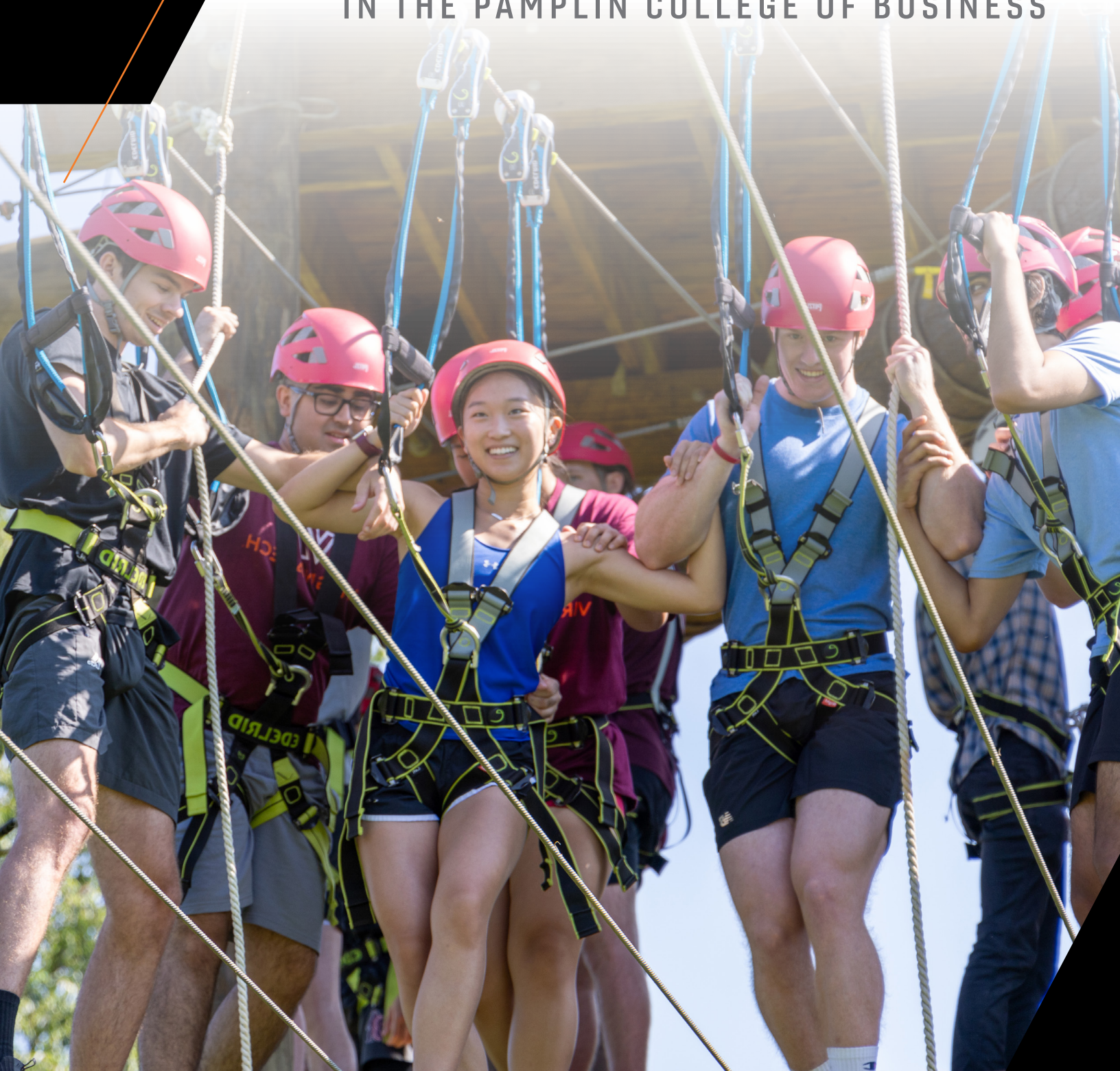
PAMPLIN COLLEGE OF BUSINESS
CENTER FOR BUSINESS ANALYTICS
VIRGINIA TECH

2023-24 ANNUAL REPORT

CENTER FOR BUSINESS ANALYTICS

IN THE PAMPLIN COLLEGE OF BUSINESS



CENTER FOR BUSINESS ANALYTICS

Educating students, accelerating careers, and advancing research at Virginia Tech.

The Center for Business Analytics (CBA) is proud to publish this annual report which summarizes a record-setting year. The impact of the CBA continues to grow with the expansion of the Impact Living Learning Community (focused on analytics), a growing alumni base that is receiving significant recognition, and a master's degree program that continues to produce graduates in high demand by leading companies in numerous domains.

Our students in the MSBA-BA (Master of Science in Business Administration with a concentration in Business Analytics) come from a wide variety of undergraduate majors and possess strong problem-solving and communication skills. They are formed into teams consisting of 4-5 students that tackle real-world, complex problems from our corporate sponsors. Throughout the 9-month capstone project the student teams meet with their corporate sponsors, faculty advisors, and CBA staff to create solutions to these challenging problems. The program culminates in the delivery and briefing of the solution to the corporate sponsors at their location. This experience produces graduates who are ready to work on Day 1 and possess skills far ahead of their peers.

Academic Year 24-25 promises to be another banner year with our largest number of students (48) ever. It is a privilege to serve Virginia Tech, our students and our capstone sponsors. Please reach out to us if you have any questions or would like to learn more about the CBA. We can be reached at vtcba@vt.edu. Follow us on social media accounts @cba_vt.

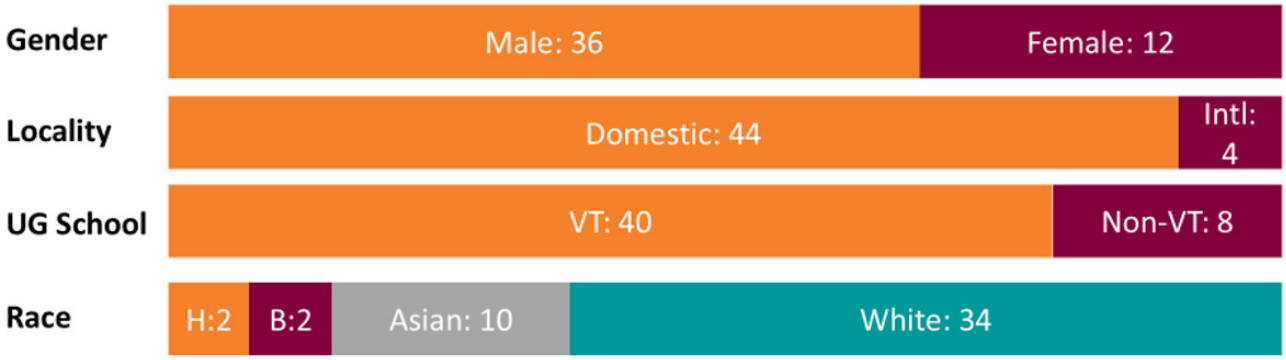
Jay Winkeler
Executive Director, Center for Business Analytics

MSBA-BA COHORT 8

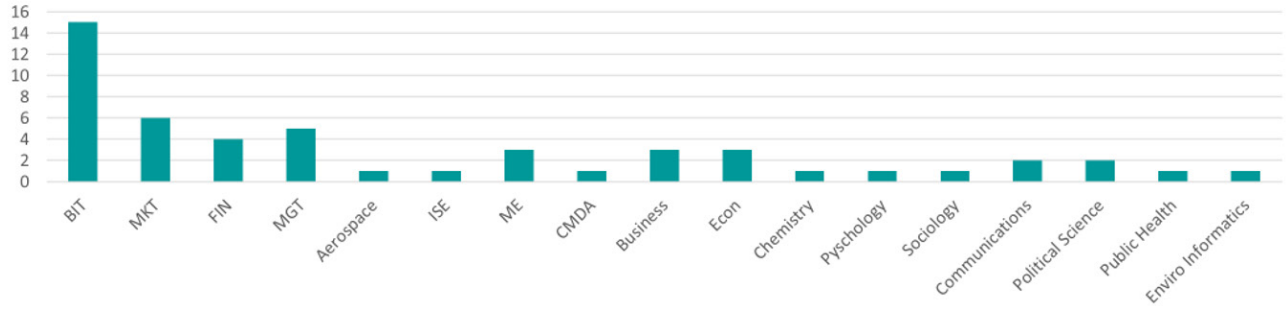
MSBA-BA Cohort 8 Group Photo

In August of 2023, our 8th MSBA-BA cohort joined us in Blacksburg for orientation. Representing 17 different majors and arriving from 10 different universities at home and abroad, Cohort 8's diversity of background and experience proved an asset over the course of the capstone process. Their journey through the program was characterized by a strong sense of camaraderie and teamwork, which we know from experience translates into an enduring professional network.

Cohort 8 Demographic Data



Majors Represented:



Cohort 8 Sponsors

In total, Jay Winkeler and Jennifer Havens traveled 5,612 miles over 11 days to facilitate Cohort 8's final presentations to their clients. Without exception, the presentations were met with positive feedback by sponsoring companies.

Cohort 8 Employment Data

$81,300
MEDIAN SALARY

$7,000
MEDIAN SIGN-ON BONUS

81.4%*
EMPLOYED POST-GRAD

Industries range from consulting and defense contracting to the healthcare and entertainment sectors. Cohort 7 had an employment rate of 97% and as of the publication date of this report, Cohort 8 has an employment rate of 81%.

***Please note:** 6 months post-graduation will elapse in February of 2025. This statistic is expected to change and reach near 100% before the end of the measurement period.*

Cohort 8 Student Athletes

Cohort 8 included 6 varsity student athletes competing in Track & Field, Swimming, Dance and Baseball. Several of these students received awards and recognition from the Atlantic Coast Conference during their time in the MSBA-BA program.

Who Hired Cohort 8

Hazen, Virginia Tech, ValleyStar Credit Union, Peraton, censeo Consulting Group, Alpine Consulting Partners, GE, Guidehouse, Total Wine & More, CoStar, KCIC Consulting, Clark Construction, IRS, Deloitte., NTT DATA, EY, Collins Aerospace, Department of Defense, flexMetrics, Fidelity Investments, MIMEDX, ais Applied Information Sciences, OPEXUS, leidos

Cohort 8 Public Presentation Day

Public Presentation Day for Cohort 8 **was held on Tuesday, June 19, 2024 in the new Data & Decision Sciences building on the campus of Virginia Tech.** Students delivered the public versions of their final presentations, received certificates marking their completion of the MSBA-BA program, and enjoyed a video recapping the year.

IMPACT OF THE CBA

Cohort 8 FlexMetrics Team Presents to the Company

Each year, several industry-leading companies sponsor MSBA-BA capstone projects. These 9-month professional-quality consulting projects are managed by a team of MSBA-BA students. For the 2023-24 academic year, students completed and delivered 11 graduate-level capstone projects to sponsors. Below, we have highlighted three of these case studies; to see all 11 case studies, please visit our website.

Cohort 8 Case Studies: FlexMetrics Team

Cohort 8 FlexMetrics Capstone Team

The Challenge:

MSBA-BA graduate students Tyler Scott, Esther Wang, Kayla Jones, Isaac Moore, and Brendan Atkisson took on the challenge of predicting machine failures for Flex-Metrics, a company that provides real-time tracking of manufacturing outputs. Their goal was to develop a predictive analytics method that could be integrated into Flex-Metrics' software to help manufacturers prevent costly machine downtime. This would be achieved through a machine learning model and a Power BI dashboard that would deliver actionable insights to Flex-Metrics' diverse client base.

The Solution:

The team developed a machine learning model using a random forest algorithm, chosen for its ability to accurately predict machine failures while minimizing false positives. This balance was crucial to ensure user engagement with the tool. They transformed and analyzed data provided by Flex-Metrics, focusing on 26 unique metrics over five shifts of data to create a robust predictive model. The model was integrated into Flex-Metrics' software, with predictions refreshed before each shift via a Python script connected to a SQL database. The resulting Power BI dashboard provides daily risk assessments, showing machine risk levels and top predictors of potential failures. This solution not only increased product value and user engagement for Flex-Metrics but also introduced the company to the world of predictive analytics, offering new opportunities for future product development.

Cohort 8 Case Studies: HP Team

Cohort 8 HP Capstone Team & Sponsors

The Challenge:

MSBA-BA graduate students Ayman Belafia, Jake Facciani, Dani Villaroel, and Sean Walsh were tasked with addressing educational and technological disparities in gentrified areas of Austin, Texas. Their focus was on students from Title I schools, aiming to provide culturally sensitive support through HP's corporate social responsibility initiative. The team aimed to mitigate the impact of gentrification on predominantly African-American and Latino students, who are often displaced into lower-funded communities and schools due to rising living costs.

The Solution:

The team proposed several solutions to bridge the technological divide for K-12 students and promote digital equity. They recommended HP-led boot camps and after-school programs, collaborations with existing STEM programs in Austin, and enhancements to technological infrastructure. Their blueprint for sustainability included prioritizing Title I school students and leveraging HP employee volunteers. They also suggested partnerships with established STEM organizations like Mad Science of Austin and Snapology to utilize their expertise and expand the reach of their efforts. Long-term success would be measured through return on impact, involving pre-, midpoint-, and post-tests to gauge students' progress, as well as ongoing feedback sessions to continually improve the programs. These recommendations aim to create a sustainable and scalable model, leveraging HP's resources for maximum impact and setting a foundation for future replication in other areas.

Cohort 8 Case Studies: NobleReach Team

Cohort 8 NobleReach Capstone Team

The Challenge:

MSBA-BA graduate students Brian Bogert, Grayson Lawrence, Samir Hossain, and Altan Mitchell collaborated with NobleReach to develop an entrepreneurial talent matching system. This system aims to automate the process of matching entrepreneurs with government research projects, significantly reducing the manual work involved. The primary objective was to create an efficient and scalable solution to connect entrepreneurs with opportunities at organizations like the National Science Foundation (NSF) and Defense Advanced Research Projects Agency (DARPA), addressing the current manual and time-consuming matching process.

The Solution:

The team developed an automated system that uses Diffbot to scrape entrepreneur and startup data and Lightcast taxonomy to tag skills. The system matches entrepreneurs with projects based on skill overlap, significantly reducing the time required for matching by 95% and the time spent on data scraping by 98%. This process involves dividing the gathered data into categories such as education, employment, and general information, which are then analyzed to generate relevant skill tags. The system integrates with Salesforce to track entrepreneur availability, ensuring accurate and efficient project assignments. Financial benefits include reduced matching time and enhanced scaling capabilities, enabling NobleReach to handle more contracts. Further recommendations included optimizing the code for Salesforce integration and implementing a feedback loop with machine learning to continually improve the matching process.


Cohort 8 Teams Present at Public Presentation Day

Day for Data Symposium 2023

Day for Data Symposium 2023

The 2nd annual Day for Data symposium, held on Sept. 8, 2023 and hosted by the Center for Business Analytics, connected more than 250 students, faculty, and industry professionals in an exploration of the modern applications of data analytics in the corporate setting. Featuring 6 industry subject matter experts leading sessions on a variety of business analytics-related topics, a research poster session of VT faculty, networking opportunities, and more, the event was lauded as a success by attendees and sponsors alike. In the post-event survey, 97% of respondents were satisfied or very satisfied with the event, and 100% would recommend the event to others.

Esther Wang, Cohort 8 MSBA-BA student said about the event, "*today has been a great educational [experience] for me. I learned about how different industries can utilize data and data analytics into their corporate strategy and also the new big thing: AI, and how it has been affecting different industries and different companies.*"

Jason O'Connor, Senior Vice President of Cyber and Analytics for Leidos, said that "*speaking from the corporate perspective… hearing the exchange of students, presenters, faculty, and other companies all within the room helps us understand what's on their mind, helps us keep our programs focused, and it keeps us on the right page when we go to engage through recruiting activities.*"

Virginia Tech Giving Day 2024

The Center for Business Analytics made remarkable gains during the 2024 Virginia Tech Giving Day on February 21 & 22, an annual 24-hour period of giving to the university. This benefits not only the CBA, it also helps the Pamplin College of Business maintain its standing as the top college for donations received and individual donors. Giving Day ranks departments based on the number of individual donors, and in 2024, the CBA received 167, marking a 60% increase in individual donors from the previous year, and unlocking $6,000 in donor matching funds for the CBA, in addition to the $8,000+ raised for the Center by its donors.

167
DONORS

$14,000
RAISED OVERALL

7TH PLACE
WITHIN PAMPLIN

MSBA-BA Alumni Events Held

Spring 2024 Washington, D.C. Area MSBA-BA Alumni Event

In the Spring semester of 2024, we hosted two regional MSBA-BA alumni events. These informal gatherings provided alumni the opportunity to reconnect with each other and catch up with CBA staff.

Washington, D.C. Event: 27 attendees
Blacksburg Event: 22 attendees

UPDATES FROM THE CBA

2024 Ragsdale Distinguished Service Award Recipients

On Public Presentation Day on Tuesday, June 18th, executive director Jay Winkeler announced the first three winners of the Ragsdale Distinguished Service Award: Cliff Ragsdale, who founded our center and for whom the award is named; Mike Flint, who served as director from 2017-2021; and Adrienne Sable, who served as Program Coordinator from 2016-2022.

Pamplin College of Business professor emeritus Cliff Ragsdale founded our Center for Business Analytics in 2015, welcoming the first cohort of graduate students in 2016. Since then, the center has graduated 273 high-impact business analytics leaders and delivered 65 graduate capstone projects to customers. Even after 33 years of dedicated service to the university, Cliff continued to serve as Academic Director well past the official start of his retirement, all to ensure the continued success of the program and its students. Those who know him will tell you: no one embodies the spirit of Ut Prosim more than Cliff Ragsdale.

All three of these outstanding individuals were recognized, as the award states, “for your outstanding contributions and unwavering commitment to the success of the Virginia Tech Center for Business Analytics and the Master of Science in Business Administration with a Concentration in Business Analytics (MSBA-BA) degree program.”

Area Analytics Directors Meeting

Participants at the 2024 Area Analytics Directors Meeting

In January, the CBA hosted the Area Analytics Directors meeting, an annual meeting attended by leaders in the field of analytics from major universities in Virginia, Washington, DC, and Maryland. The event was held in the Data & Decision Sciences building in Blacksburg and attended by more than 15 representatives from Virginia Tech, William & Mary, University of Virginia, Johns Hopkins University, University of Maryland, Old Dominion University, George Mason University, Georgetown University, and Virginia Commonwealth University.

Faculty Professional Development Funding

For Academic Year 2023-24, $33,000 was funded for faculty professional development. In Academic Year 2024-25, this figure is projected to be $33,000.

Welcome Jason Deane, CBA Academic Director

Jason Deane

The CBA is pleased to welcome Dr. Jason Deane as our next academic director! Jason is Associate Professor of Business Information Technology in the Pamplin College of Business at Virginia Polytechnic Institute & State University. He received a Ph.D. in Decision and Information Sciences from the University of Florida, and an M.B.A. and B.S. in Business Administration from Virginia Tech. His current research interests are in the following areas: IT, addiction, disaster and humanitarian operations, and supply chain cybersecurity.

Preview of Cohort 9

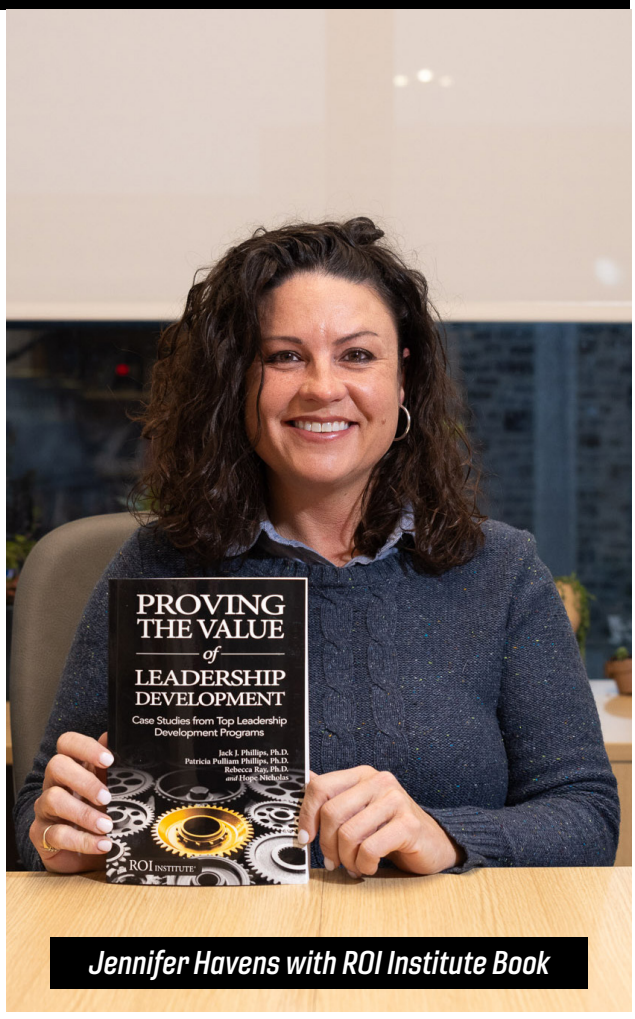
MSBA-BA Cohort 9 Group Photo

Our 9th Cohort of MSBA-BA students is our largest yet, with 48 students. The CBA's new location in the Data & Decision Sciences Building enables these students to learn and collaborate in state-of-the-art facilities and classrooms.

Jennifer Havens Contributes to a ROI Institute Book

Jennifer Havens, director of the Center for Business Analytics, recently contributed her expertise to the book, "Proving the Value of Leadership Development: Case Studies from Top Leadership Development Programs."

Incorporating her wealth of experience as an entrepreneur, executive leader, and professional coach, Havens contributed a case study to the book, offering valuable insights for those engaged in leadership development. The book employs research, instructional methodologies, and illustrative examples, and introduces 12 new case studies to comprehensively outline the process of demonstrating the effectiveness of leadership programs through the return on investment (ROI) methodology. Havens's chapter in the book is focused on how leadership development practitioners can effectively set up how new leadership development programs will be measured prior to their implementation.



Jennifer Havens with ROI Institute Book

INSIGHTS: A LOOK AHEAD

Navigating the Future of Business Analytics Education: Strategic Insights from Industry Leaders

Written by Jennifer Havens, Director of the Center for Business Analytics

As we look to the future of business analytics education, significant advancements in artificial intelligence (AI), machine learning (ML), and digital transformation are rapidly reshaping industry needs of our future high impact business analytics leaders. At the Center for Business Analytics, our mission is to equip students to meet these changes head-on and lead in this dynamic environment.

This is a preview of what is on the minds of Virginia Tech's Center for Business Analytics team and how we plan to continue partnering with colleagues and stakeholders to deliver a world-class education that molds high-impact business analytics leaders.

The 2023 appointment of Dean Saonee Sarker has infused Pamplin College of Business with a renewed focus on innovation. Dean Sarker's Next-Gen Pamplin initiative emphasizes academic excellence, experiential learning, and research excellence–principles that are deeply integrated into our business analytics education. Her vision of creating "Pamplin-plus" students–agile, collaborative, and proficient in digital technologies with a strong ethical foundation–guides our curriculum development.

In the MSBA-BA program, we are committed to developing these Pamplin-plus students by incorporating the latest industry insights and trends into our coursework. By blending technical skills with power skills, we ensure that our graduates are equipped to transform data into actionable insights and make strategic decisions that drive business success.

Top Trends in Business Analytics 2024-25

AI and Machine Learning Advancements
AI and ML are driving more sophisticated predictive and prescriptive analytics. The emergence of AI-powered decision engines, such as Autonomous Supply Chain Management Systems, promises to revolutionize customer relationship management and supply chain optimization by enabling real-time, strategic business decisions.

Real-Time and Streaming Analytics
As the demand for real-time insights grows, real-time analytics is becoming essential in areas like supply chain management and dynamic pricing. For example, ride-sharing companies use real-time analytics to dynamically adjust pricing, optimizing revenue and customer satisfaction.

Cloud-Based Analytics
The acceleration of cloud adoption allows organizations to deploy scalable, cost-effective analytics solutions. Retail giants use cloud-based analytics to process vast amounts of sales data in real-time, enhancing inventory management and operational efficiency.

Data Democratization and Self-Service Analytics
Data democratization empowers employees at all levels to leverage data-driven insights, fostering a culture of informed decision-making. Financial institutions, for instance, use self-service analytics platforms to enable managers to make localized decisions independently.

Data Governance and Ethics
As data volumes grow and privacy concerns increase, robust data governance and ethical practices are critical. Healthcare organizations adopt comprehensive data governance frameworks to ensure compliance with regulations like GDPR and HIPAA, safeguarding patient data.

Augmented Analytics
The integration of AI and ML into analytics tools automates complex data analysis, making insights more accessible and actionable. E-commerce platforms, for example, use augmented analytics to generate personalized product recommendations, enhancing customer engagement.

Decision Intelligence
Combining analytics, AI, and behavioral science, decision intelligence is improving business outcomes. Consumer goods companies are using decision intelligence systems to optimize product development by integrating market data and customer feedback.

Embedded and Edge Analytics
Embedded and edge analytics bring analytics capabilities closer to the source of data generation, enabling real-time decision-making. Manufacturing plants use these technologies to monitor equipment performance in real-time, reducing downtime and enhancing efficiency.

As we continue to navigate the future of business analytics, our commitment at the Center for Business Analytics is to stay ahead of these trends, ensuring our graduates are not just participants but leaders in their field. By aligning our program with industry advancements and Dean Sarker's visionary leadership, we are preparing the next generation of business analytics leaders to thrive in an increasingly data-driven world. Our focus remains on developing agile, ethically-grounded professionals who live our Hokie-centric values of Ut Prosim.

ACKNOWLEDGEMENTS

We extend our deepest gratitude to the corporate partners and sponsors who have generously supported the Center for Business Analytics over the past year. Your commitment to analytics excellence not only fuels the intellectual growth of our students but also invigorates the industry with fresh insights and innovative solutions.

We are also indebted to the remarkable faculty advisors who have provided unwavering guidance and mentorship: Jonathan Everett, Barbara Fraticelli, John Geraghty, Eli Jamison, Andrew MacKinlay, Jian Ni, Michelle Seref, Onur Seref, Dan Simundza, and David Tegarden. Your contributions ensure our curriculum remains cutting-edge and our students are well-equipped for the challenges they will face in their careers.