MASTER OF SCIENCE IN

BUSINESS ANALYTICS

TCU | Neeley School of Business

MESSAGE FROM THE DEAN

The TCU Neeley School of Business issues a promise to our students: to unleash human potential with leadership at the core and innovation in our spirit. In keeping with that promise, we assembled respected faculty, staff and industry professionals to develop a one-year master's program that immediately empowers graduates and increases your long-term career earning potential.

Since business analytics impacts all areas of the marketplace, the new Master of Science in Business Analytics is available to all undergraduate majors and early professionals of all specialties.

In consideration of the extraordinary constraints the marketplace presents in 2020, and to mark the inaugural year of the program, we have waived the GMAT/GRE requirement and all prerequisite course costs.

This report details the near-term and long-term benefits of gaining mastery in business analytics. Students will learn to utilize cutting-edge business technology and processes to drive decision making in a dynamic global business environment. They will master the power of collecting, analyzing and deploying data to create organizational value. With a heavy emphasis on experiential learning, case study analysis and collaborative projects, students will engage in interdisciplinary coursework focused on business analytics, including deep corporate engagement guided by TCU's world-class faculty and dedicated industry practitioners.

TCU is a special place, and our extended community is unmatched in their support for our students and readiness to meet market challenges. During this critical time, we are more committed than ever to fulfill the Neeley promise, and we look forward to helping students of the master's program increase their competitive professional standing while increasing their leadership impact.

Frogs Together,

Daniel Pullin
John V. Roach Dean of the
Neeley School of Business at TCU

Daniel Pullin

**John V. Roach Dean of the
Neeley School of Business at TCU**

THE NEELEY PROMISE

The Neeley School of Business unleashes human potential with leadership at the core and innovation in our spirit.

Minakshi Trivedi, PhD

Neeley Analytics Initiative, Chair
J. Vaughn and Evelyn H. Wilson
Professor of Marketing

BUSINESS ANALYTICS:
OPPORTUNITY AND UPSKILLING FOR ALL MAJORS

I am excited to serve as chair of the Neeley Analytics Initiative, which oversaw the formation of the Master of Science in Business Analytics. The faculty brainpower, administrative commitment and industry insight that contributed to this endeavor have students at the core of our mission.

We invite seniors of all majors and early professionals of all backgrounds to review the following report, which substantiates the immediate need and increasing value of business analytics training. We look forward to bolstering our world-class curriculum with this purposeful and timely degree available to all students.

The Master of Science in Business Analytics was designed to help students upskill and advance their careers with an efficient timeline. In one year, students will be immersed in foundational and applied courses that include Business Analytics; Data Visualization; Marketing Analytics; Financial Modeling; Analytics for Innovation; Business Process and Risk; and Predictive Analytics with SAP. As reflected in this report, business analytics training has broad-reaching impact and applications in the marketplace.

For many graduates, career agility is inevitable, and this degree helps equip students for the marketplace ahead. We performed internal curriculum reviews and extensive consultations with industry practitioners, including executive-level insight to provide high-quality experiential learning opportunities during this historic time. Incoming students will have unfettered access to committed career placement personnel, as well as a remarkable alumni community. Moreover, students will be part of the TCU Horned Frog family that works tirelessly to ensure that our students are well equipped for any market challenge.

Let's Lead On, Together,

Minakshi Trivedi, PhD
Neeley Analytics Initiative, Chair
J. Vaughn and Evelyn H. Wilson Professor of Marketing

CONTENTS

INTRODUCTION

This report informs prospective students and families of the opportunity to join the TCU Neeley tradition of excellence and leadership by earning a graduate degree offering with near-term and long-term value—the Master of Science in Business Analytics. This report also provides insight into the focus of business analytics, its value and application to the marketplace today and tomorrow.

The Master of Science in Business Analytics provides a unique opportunity for early professionals to advance their abilities for a dynamic marketplace, which is increasingly driven by data insights and analysis. This report provides an overview of career positions related to business analytics, salary averages and case studies where business analytics has impacted the market.

The 2020 economic impact from the novel coronavirus prompted immediate downward shifts in job availability. In the years ahead, students and early career professionals of all specialties face new pressures to increase their value to organizations, which increasingly demand data competence and technological training. The Master of Science in Business Analytics addresses these demands with immersive training and guided industry engagement. To learn and apply, visit neeley.tcu.edu/msba.

THE UPSKILLING IMPERATIVE

Upskilling is a continuous process of learning that focuses on skills required for the future workforce and marketplace. Upskilling helps workers adapt to the evolving technological landscape (Stubbings, 2019). The World Economic Forum (2020) suggests that upskilling is a global imperative. The organization submits the following:

> *"To prevent an undesirable lose-lose scenario—technological change accompanied by talent shortages, mass unemployment and growing inequality—it is critical that businesses take an active role in supporting their existing workforces through reskilling and upskilling, that individuals take a proactive approach to their own lifelong learning ..." (Leopold, 2018, p.7)*

The World Economic Forum (2020) predicts that by 2022, 54 percent of employees will require significant upskilling, and that on average, employees will have to spend an extra 100 days learning and training for these purposes. It is within this context of impending marketplace changes that TCU Neeley offers a Master of Science in Business Analytics for early professionals.

Technological transformations such as digitalization, automation and artificial intelligence are propelled by data processing. These burgeoning marketplace technologies offer opportunities for early career data analysts.

Companies are addressing numerous challenges operationalizing the collection, analysis and applications of data insights. There is a race to develop more business analytics and intelligence capabilities. Operationalization and expediency have prompted challenges of sourcing the necessary talent to achieve their analytics objectives. This is one of many indications that graduates of the Master of Science in Business Analytics will offer immediate value to the marketplace.

According to PricewaterhouseCoopers (2019), 80 percent of CEOs now cite a lack of tech savvy, innovative employees as a threat to their ability to seize market opportunities and deliver on strategic initiatives. The solution to this threat is to upskill individuals in the workforce. TCU Neeley provides this solution through a curriculum informed by an academic committee with executive leadership experience, active industry practice and deep research capabilities. The curriculum includes time-relevant case studies, experiential learning projects and guided industry engagements.

AN OVERVIEW OF BUSINESS ANALYTICS

BACKGROUND

At the early stages of digital transformation in 2006, Clive Humby, a mathematician who helped Tesco develop its famous loyalty card, coined the phrase "Data is the new oil." Since then, organizations have come to understand that, like oil, business data that is unrefined and unchanged cannot be extracted for profit-generating purposes. Data must be collected intentionally and responsibly, broken down and analyzed to create value (Arthur, 2013).

Today, businesses of all sizes and industries are operating amidst exponentially growing volumes of varied, real-time and increasingly complex data. As the graph below demonstrates, the International Data Corporporation (IDC) determined that global data volumes quadrupled from 33 zettabytes in 2018 to 175 zettabytes (Reinsel, Gantz & Rydning, 2018).

ANNUAL SIZE OF THE GLOBAL DATASPHERE
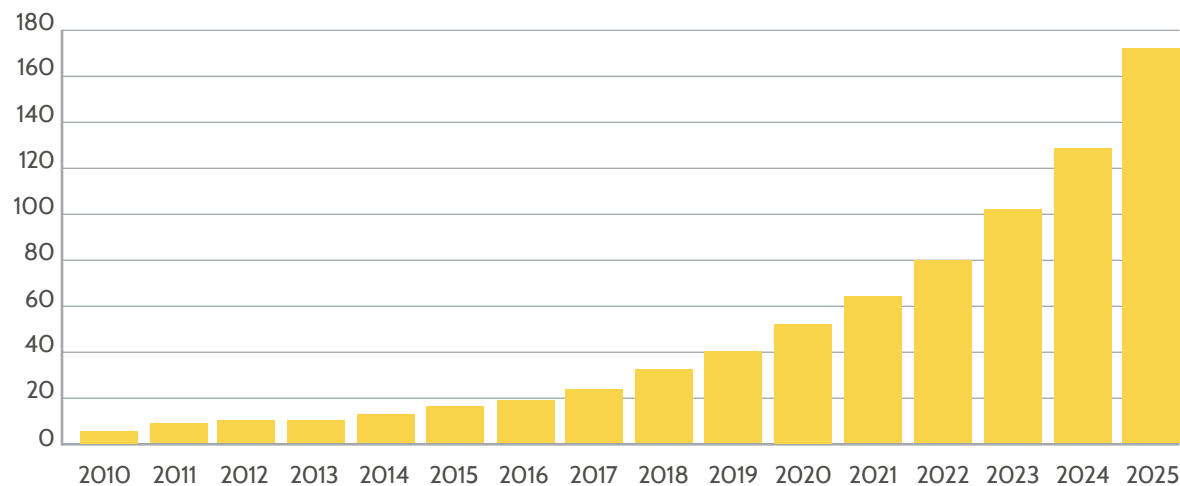
175 ZETTABYTES

Growth in data volumes 2010 - 2025.

Source: Data Age 2025, sponsored by Seagate with data from IDC Global Datasphere, Nov 2018

Big data has seeded new digital business models and processes that rely heavily on data and analytics. To compete in today's data economy, companies must continuously find ways to extract the highest value from the big data volumes to which they have access.

One way businesses are looking to extract value from data is through technology investment. Gartner Inc. predicts the global market for business intelligence tools will reach $23 billion in 2020. Reuters predicts the market will reach $30 billion by 2022, a 15 percent per year growth rate (Adair, n.d.).

Companies seek to invest in people who understand how to leverage and apply business intelligence tools and operationalize the use of data analytics. This need to invest in analytics talent was expressed in BARC Research's 2020 report BI Trend Monitor (Baier et al., 2020):

> *"Given all the exciting developments in the field of data and analytics as well as the rising strategic importance of data literacy, companies need to invest in the skills required to leverage data, technology and analytics."*

As indicated above, the job market for individuals with business analytics skills will accelerate in the coming years. The U.S. Bureau of Labor predicts that some business analytics roles, such as Operations Research Analyst, will grow by as much as 26 percent from 2018 to 2028.

WHAT IS BUSINESS ANALYTICS?

Business analytics refers to a set of quantitative activities and solutions that helps companies derive meaningful insights from business data to solve business problems, improve performance and help make better business decisions. The goal of business analytics is to make data-driven change by providing actionable recommendations to business management. Business analytics typically includes data mining, statistical analysis, predictive analytics and applied analytics.

# HOW DOES BUSINESS ANALYTICS DIFFER FROM OTHER TYPES OF ANALYTICS?

The terms "business analytics," "data analytics," "data science" and "business intelligence" are often used interchangeably. While each of these fields has the goal of understanding historical and current data, and using data to generate business insights, there are subtle differences between them.

Business analytics and data analytics are subsets of overall business intelligence. Business intelligence is the process of collecting, storing and analyzing business operations data. Business intelligence provides business metrics that help support decisions and focuses primarily on describing and summarizing historical data Tableau (2020).

Business analytics uses business data to anticipate trends and outcomes. This approach aims to identify why things are the way they are in order to predict future outcomes. Business analytics involves activities such as data mining, statistical analysis and predictive analytics using large, structured data sets.

Data analytics is a more technically oriented process that involves mining, cleaning and transforming data, as well as creating systems to manage the data. Unlike business analytics, data analytics transcends business and is also used in government, science and many other areas of the marketplace.

Data science takes all functions and uses of business and data analytics a step further. Data science is focused on extracting insights and making predictions from both structured and unstructured, large and messy data sets. Data science is very technical and involves software programming and knowledge of machine learning algorithms.
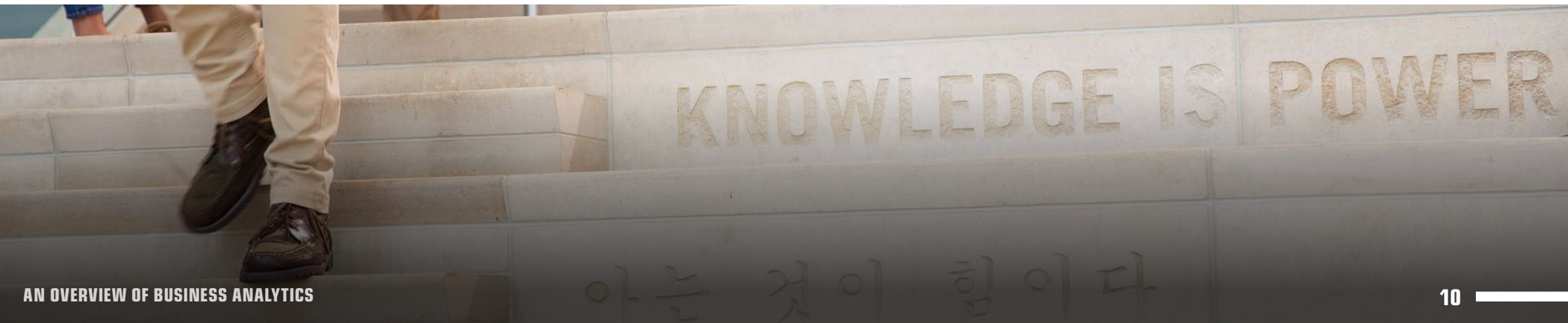
WHAT ARE THE BENEFITS OF BUSINESS ANALYTICS?

INCREASED BRAND LOYALTY

GREATER OPERATIONAL EFFICIENCIES

IMPROVED BUSINESS DECISIONS

IDENTIFYING NEW AND GREATER REVENUE STREAMS

IMPROVED CAPACITY TO REACT TO ENIVIRONMENTAL CHANGES

A variety of studies have shown that companies who actively embrace business and data analytics have a pronounced performance edge over their competitors.

McKinsey and Company found in its 2019 Global Survey of C-level and senior managers that companies with the greatest overall growth in revenue and earnings receive a significant proportion of that boost from data and analytics. These high-performing organizations are three times more likely than others to report that their data and analytics initiatives have contributed at least 20 percent to earnings before interest and taxes over the previous three years. Moreover, McKinsey determined that "the gap between laggards and leaders just keeps growing" (Gottlieb and Weinberg, 2019).

One of the key factors of company performance is the degree to which the workforce is educated about data and analytics. The graph on the right, taken from the Global Survey, shows that the majority of executives and managers at the highest-performing companies are well educated on data concepts.

EDUCATION IS A KEY DIFFERENTIATOR:

At high-performing organizations, employees at all levels are better educated on data concepts.

■ At high-performing organizations

■ At all other organizations

Executives
62
43

Managers
53
38

Frontline Employees
28
25
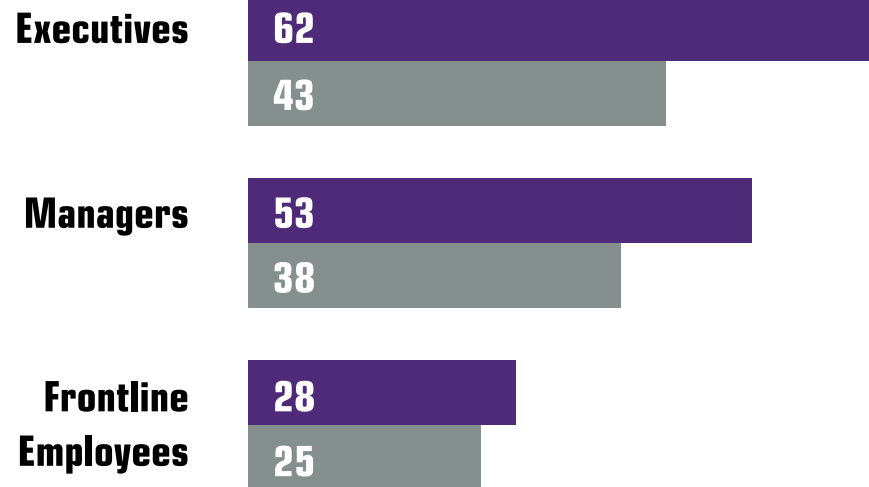
Data education of employees at high-performing vs. low-performing companies

McKinsey & Company

WHAT ARE SOME APPLICATIONS OF BUSINESS ANALYTICS?

- Optimizing paid advertising bids based on sales statistics rather than budget

- Extracting insights from marketing automation and personalization

- Determining through A/B testing if a product iteration improves performance

- Preventive maintenance on industrial equipment

- Extracting new insights from previously unrelated data

- Identifying the most profitable target customer segments

- Upselling and cross selling products and services to existing customers

- Monitoring brand reputation and receiving recommendations for enhancing the brand

WHAT'S DRIVING DEMAND FOR BUSINESS ANALYTICS?

MATURING DIGITAL TRANSFORMATIONS

Gartner (2019) estimated that by the end of 2019, 40 percent of global Chief Information Officers had reached scale for their digital transformation projects, more than doubling the proportion of enterprises from 2018. This means is that these newly transformed companies are inundated with data and ready to turn their sights on extracting value from digital data sources.

MOBILE DATA USAGE

With mobile device usage ubiquitous on a global scale, businesses are faced with new forms and volumes of data that can shed light on consumer behavior. Data is created with every click and swipe. The emergence of mobile data has given rise to a new field of analytics called mobile analytics (ResearchandMarkets, 2020).

ARTIFICIAL INTELLIGENCE INITIATIVES

AI solutions and applications are exploding, driving both an influx of new data and a need for predictive analytics that can help glean meaningful business insights from new kinds of unstructured data such as text and video.

MIGRATION TO CLOUD TECHNOLOGY PLATFORMS

International Data Corporation (IDC) predicts that by 2025, 49 percent of the world's stored data will reside in public cloud environments (Reinsel et al., 2018). Cloud platforms enable significant advances in real-time business learning at reduced costs and with more flexibility. In the last few years, cloud analytics adoption has increased data access for all kinds of organizations, including mid-size and small businesses that had not previously focused on collecting and leveraging data.

RISING ECOMMERCE VOLUMES

The growth in eCommerce has retail and other industries scrambling to anticipate consumers' ever-evolving preferences and behaviors in real time. Customization, personalization, and convenience have become hallmarks of consumer offerings, and with so much choice only a click or swipe away, businesses must develop processes to leverage data to compete. This demand for consumer attention and engagement requires smarter decision making for marketing, sales, and other business practices.

THE INTERNET OF THINGS

The IDC (2019) forecasts the data generated by connected devices to nearly double by 2025 to 80 zettabytes. The migration to a connected world that generates data about almost anything and anyone in real time is underway. Already connected equipment and supply chains in industries such as manufacturing, aviation, and healthcare are creating more data streams and analytics potential.

WHAT IS THE ROLE OF A BUSINESS ANALYTICS PROFESSIONAL?

Business analytics professionals can hold many roles and functions in the marketplace. These roles are often evolving, which is a result of dynamic industries, emerging technologies and the necessity to build upon knowledge to succeed. Someone who engages in business analytics may not hold the title of business analyst. They might be a project manager, data analyst or even a change manager.

Generally, business analytics professionals focus on the overall day-to-day operational data of a business. An analyst typically interacts with various business stakeholders and functional experts to understand their problems and needs, and offers support to find solutions. The analyst then works with different business areas to gather, document and analyze requirements.

Business analytics professionals will use various types of data, statistical tools and techniques to solve business problems and design solutions through the practical application of data insights. Key to the analytics professional role is communication. Business analysts are responsible for communicating insights to business teams and for preparing strategic recommendations (Brandenburg, n.d.).

THE JOB MARKET FOR BUSINESS ANALYTICS PROFESSIONALS

WHAT INDUSTRIES AND COMPANIES HIRE FOR BUSINESS ANALYTICS?

Due to the pervasive need for data insights throughout the marketplace, no one industry dominates the demand for business analytics tools and skills. The graph below summarizes industry hiring data from GMAC's 2019 Corporate Recruiter Survey.

GMAC found that expected 2019 growth in hiring graduates of master degrees focused on data analytics was strongest among employers in the technology (72 percent), energy/utilities (63 percent) and consulting (61 percent) industries. All industries participating in the survey, with the exception of energy/utilities, had plans to increase their hiring of analytics graduates.

Expected industry growth in hiring of Master's in Data Analytics graduates for 2019.
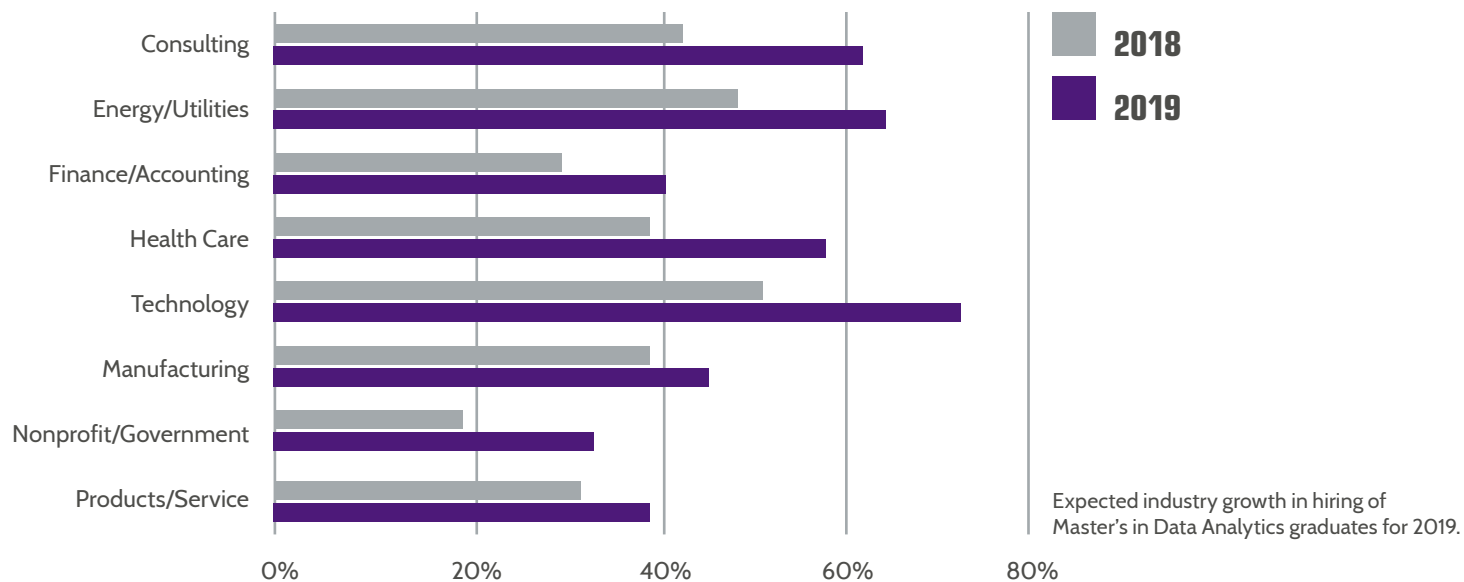
GMAC's 2019 Corporate Recruiters Survey also found that larger companies are more likely than smaller companies to hire graduate-level analytics talent. In 2019, a majority of the Fortune Global 100, 500, and for-profit, public companies had plans to hire graduate level analytics talent. Among the types of organizations hiring for business analytics skills are:

MANAGEMENT CONSULTING FIRMS

According to Glassdoor, several analytics arms of management consulting firms, such as Bain Advanced Analytics, BCG Gamma and McKinsey Quantum Black hire heavily for analytics talent and rank among the top 100 employers (365datascience, n.d.).

TECHNOLOGY AND SOFTWARE FIRMS

Software companies of all sizes are big consumers of data analytics talent. Big names that rank among top employers include IBM, Facebook, Amazon, Apple, Tibco and Cloudera (Kramer, 2019). Dozens of smaller analytics software companies such as Palantir Technologies and Appfolio seek analytics talent as well (365datascience, n.d.).

MANUFACTURERS

Automotive manufacturers are significant users of analytics, including General Motors and Daimler Benz. Other notable manufacturers hiring data analysts include Intel and GE (Kramer, 2019).

RETAILERS

With a long history of data analytics use and the rise of eCommerce, big retailers such as Walmart, Walgreens and REI are among employers reporting an interest in hiring analytics talent.

FINANCIAL SERVICES FIRMS

Financials services firms have historically been heavy users of analytics, so the list of potential employers is long. It includes Swiss RE, Charles Schwab, Discover Financial Services, Zurich Insurance and Northern Trust.

HEALTHCARE

Healthcare analytics is one of the fastest growing fields of analytics. Organizations such as Quest Diagnostics and Memorial Sloan Kettering Cancer Center are typical employers.

WHAT JOB ROLES DO GRADUATES IN BUSINESS ANALYTICS HOLD?

Career paths for business analytics graduates vary, as do job descriptions and responsibilities. The advantage of having a background in business analytics is that this skill set can be applied to almost all industries.

Professionals with this training will have versatility regarding career placement. Business analytics can operate in fields such as engineering, economics, science, marketing and more after upskilling or reskilling in analytics. Additionally, many business analytics roles have overlapping tasks and responsibilities.

Common job titles and role descriptions include:

BUSINESS ANALYST

Business analyst is the most recognizable job title, and one that encompasses a wide variety of potential roles and responsibilities. Generally, business analyst professionals serve as a coordinator between the business and technical teams. Business analysts are sometimes tasked with mining and analyzing data to support strategic planning and forecasting, assess new potential business models, and help optimize business workflows and systems. Business analysts often engage in some data management activities and may build statistical models and create data visualizations (Pratt & White, 2019).

PREDICTIVE ANALYTICS PROFESSIONAL

Predictive analytics professionals primarily analyze big data using a variety of statistical analysis and predictive modelling techniques. Compared to other business analytics professions such as financial analysts, predictive analytics professionals typically work with very large, structured data sets. They spend their time experimenting and looking for patterns in data to optimize business results (Burtch, 2019).

QUANTITATIVE ANALYST

A quantitative analyst usually works in finance to help assess risk and/or design complex mathematical models that enable firms to price and trade securities to generate optimal trading profits (mastersindatascience.org, n.d.).

OPERATIONS RESEARCH ANALYST

According to U.S. News and World Report (2020), Operations Research Analyst ranks as the fourth-ranked business job in terms of demand and popularity among hiring companies. This increasingly popular role involves data mining, optimization and statistical analysis with the objective of helping an organization run more efficiently. Operations research analysts use data to find ways to minimize the waste of resources, identify ways to streamline processes and optimize sourcing.

MARKETING ANALYSTS

According to Glassdoor (2020), the focus of a marketing analyst is to evaluate the market landscape to understand the potential of a new product or service and to help optimize its revenue generation. Marketing analysts research and forecast market trends, conduct detailed analysis to identify target customer segments and measure the success of various marketing efforts. They also engage in competitive research to ascertain a company's position in the market and engage in analysis to predict consumer behavior.

MANAGEMENT ANALYST OR CONSULTANT

A management analyst is what most think of as a management consultant. They evaluate data to propose ways to increase profits and efficiencies, typically using historical data and information. The nature and responsibilities of a management analyst's job typically changes frequently (U.S. News and World Report, 2020).

ANALYTICS TRANSLATOR

According to analytics recruitment firm BurtchWorks (2019), and the McKinsey Global Institute (Henke, N., Levine, J. & McInerney, 2018), analytics translator is a new role being formalized by companies that are on the forefront of business analytics and data science. Translators act as a bridge between the technical expertise of data science and quantitative teams and the operational and business expertise of various functional areas and business units. The goal of translators is to help ensure that the deep insights generated from business analytics translate into impact at scale. McKinsey estimates that by 2026 demand for translators in the United States may reach four million.

WHAT IS THE SALARY OUTLOOK FOR BUSINESS ANALYTICS GRADUATES?

A SHORTAGE OF ANALYTICS TALENT

In a 2019 U.S. Salary Survey (Brooks, 2019), analytics recruitment firm Harnham Recruiters determined that:

> *"The Data & Analytics space remains a candidate-led market, and there is a significant amount of competition to attract top talent."*

The intense competition for analytics talent is because current demand for business analytics talent surpasses supply. The lack of analytics talent is a real challenge for companies, so much so that 54 percent of the respondents in PwC's 2019 CEO survey pointed to a lack of analytical talent keeping executives from getting the information they need to leverage their data. Fifty-five percent of CEOs also reported an inability to innovate effectively due to the analytics skills gap.

The shortage of business analytics talent is expected to continue for the foreseeable future. As such, salaries and career trajectories for graduates in business analytics are attractive.

AVERAGE SALARIES FOR BUSINESS ANALYTICS ROLES

The earnings potential in the field is significant. The information below depicts average salaries as of April 2020, from Payscale.com for various analytics roles. These figures include all degrees and U.S. geographies.

Marketing Analyst
$55,000 avg
($40,000 - $79,000)

Analytics Consultant
$83,000 avg
($60,000 - $116,000)

Senior Business Analyst
$85,000 avg
($63,000 - $114,000)

Financial Analyst
$61,000 avg
($46,000 - $81,000)

Quantitative Analyst
$85,000 avg
($57,000 - $131,000)

Data Scientist
$96,000 avg
($66,000 - $134,000)

Operations Research Analyst
$78,000 avg
($50,000 - $119,000)

Financial Planning Manager
$96,000 avg
($71,000 - $122,000)

Business Analytics Manager
$98,000 avg
($67,000 - $126,000)

AVERAGE SALARIES FOR MASTER'S DEGREE GRADUATES

Payscale.com data indicates the average salary of someone with a master's degree related to business analysis is $73,000. The 2019 Graduate Management Admissions Council Corporate Recruiters Survey (GMAC, 2019) found that the average starting salary for graduates with a master's degree related to analytics was $85,000.

While entry-level salaries for analytics roles may be similar for those with undergraduate and master's degrees, Burtch Works' nationwide 2019 Salary Survey found that the salary gap widens in favor of analytics professionals holding master's degrees for roles requiring more experience or seniority.
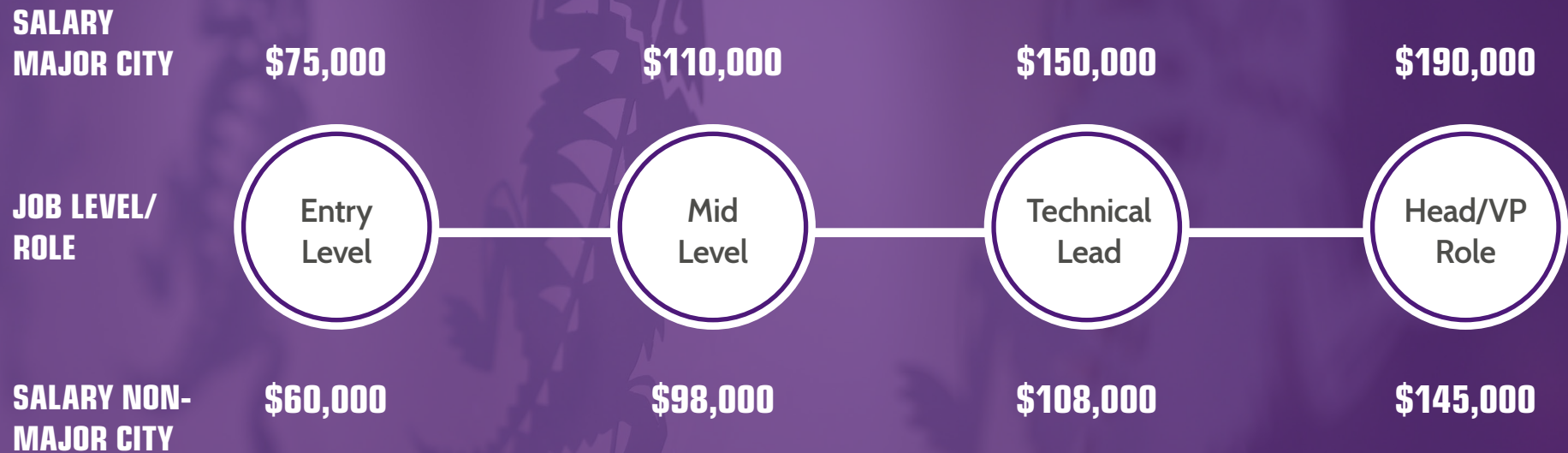
After about five years of experience, analytics professionals with a master's degree earn on average $14,000 more per year than those holding an undergraduate degree only. At the highest end of the salary scale, the gap is even more pronounced, at about a $17,000 difference.

Burtch Works also found that 70 percent of analytics professionals hold a master's degree, noting that it is still the "traditional way to get your foot in the door" (Burtch, 2019).

GEOGRAPHICAL SALARY DIFFERENCES

Salaries vary across geographies in the United States. In the 2019 U.S. Salary Report, Harnham Recruiters found that salaries varied significantly between major U.S. metropolitan areas and other regions, as depicted below.

SALARY MAJOR CITY	$75,000	$110,000	$150,000	$190,000
JOB LEVEL/ ROLE	Entry Level	Mid Level	Technical Lead	Head/VP Role
SALARY NON-MAJOR CITY	$60,000	$98,000	$108,000	$145,000

Comparison of average salaries for analytics roles in major and non-major cities

SALARY GROWTH PROSPECTS

Career and salary growth possibilities are sizable in the field of analytics. The information below summarizes data from Burtch Works' 2019 Salary Survey and is an indicator of salary growth potential. The information depicts the average salary for a predictive analytics professional at different career levels.

Within a few years of graduation, analytics professionals are earning $100,000+ per year on average. The 4 percent salary growth for entry level analysts in 2019 is indicative of growing demand in this field.

Likewise, the 4 percent growth in average salaries for senior analytics managers reflects the growing importance of analytics at the C-Suite level and a need for managers to oversee growing advanced analytics teams.

Salary growth for analyst roles according to experience

JOB DESCRIPTION/LEVEL	AVERAGE SALARY	YEAR ON YEAR GROWTH
Entry-Level Analyst	$80,000	+4%
Mid-Level Analyst	$97,000	+2%
Senior Analyst	$132,000	+2%
Junior Manager	$130,000	0%
Mid-Level Manager	$180,000	0%
Senior Manager	$240,000	+4%

Due to the shortage of analytics talent, job seekers with a background in analytics are in an advantageous position to negotiate salary and compensation. This is especially true for non-salary benefits, such as work-from-home options, learning and development, bonuses, and other benefits. **On average, when changing jobs in 2019, analysts negotiated a salary increase of 14 percent (Harnham, 2019).**

As the information below shows, Burtch Works (2019) also found that analytics professionals could negotiate salary increases of largely 10-20 percent, and sometimes more when changing jobs.

DISTRIBUTION OF ANALYTICS SALARY INCREASES WHEN CHANGING COMPANIES
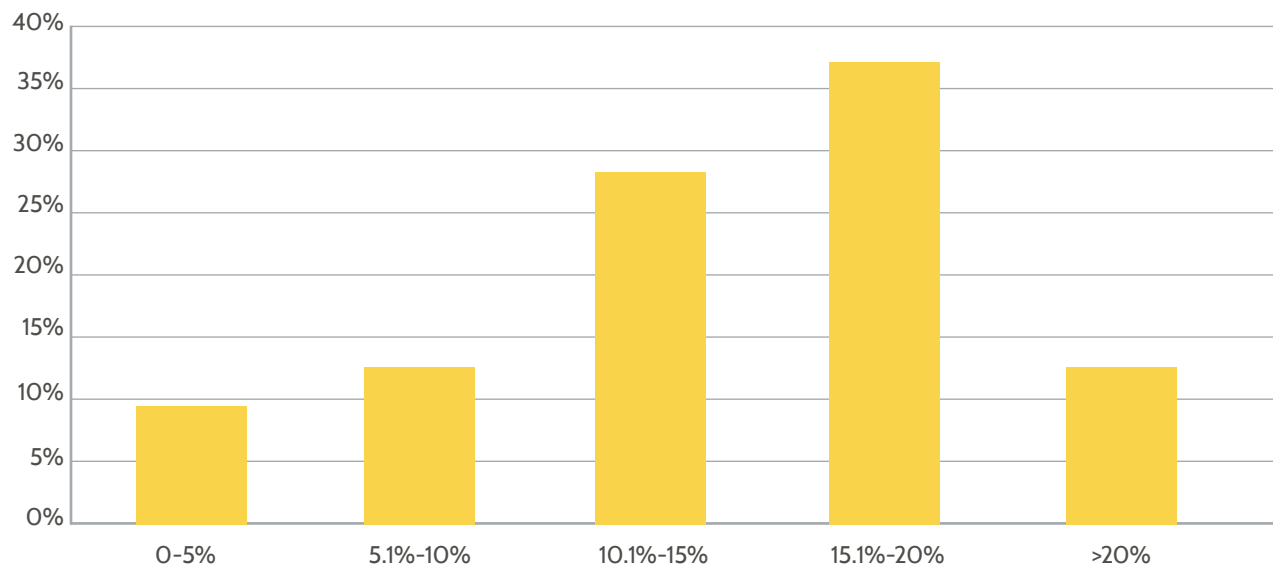
Distribution of salary increases for predictive analytics professionals when changing jobs in 2019

WHAT IS THE OUTLOOK FOR BUSINESS ANALYTICS JOBS?

Evidence points to a promising outlook for graduates in business analytics. In GMAC's 2019 Corporate Recruiters survey, 58 percent of employers surveyed said that data analysis and interpretation was the most important or next most important skill for recent business school graduates.

In January 2020, the World Economic Forum came out with a report, "Jobs of Tomorrow: Mapping Opportunity in the New Economy." The report examined the outlook for future job creation by reviewing the shifting focus of traditional jobs to emerging professions of the future. It also determined what skills would be required in the future workforce.

The report found that data from the 20 highest-growth jobs in the past five years showed that jobs falling under the umbrella "data and AI" would be the second fastest growing cluster of new job opportunities by the year 2022. By then, 123 out of every 10,000 job opportunities will fall into this category. Data and AI jobs were forecast to provide 384,000 new jobs in 20 major economies by 2022 (Ratcheva, 2020).

The information below lists the top emerging jobs in the Data and AI cluster identified by the World Economic Forum. Several of these analytics-related emerging job roles indicate areas of growth, such as data consultant, insights analyst and business intelligence developer.

Top 10 emerging jobs in data and AI for 2022. Jobs with a light purple circle will exhibit especially strong growth.

1 Artificial Intelligence Specialist

2 Data Scientist

3 Data Engineer

4 Big Data Developer

5 Data Analyst

6 Analytics Specialist

7 Data Consultant

8 Insights Analyst

9 Business Intelligence Developer

10 Analytics Consultant

Source: LinkedIn

Just as it has for decades, business analytics is forecast to continue evolving. Several new trends in the field are on the horizon, such as continuous intelligence, conversational analytics and augmented analytics. These new trends will further fuel a need for talented analytics professionals.

ANALYTICS WILL BE THE BACKBONE OF THE COVID-19 CRISIS RECOVERY

CORPORATIONS UNITE AGAINST RECESSION USING ANALYTICS

In early April, 2020, during the worst of the COVID-19 crisis, Rolls-Royce announced that it was creating a cross-industry group, dubbed EMER2GENT, with a mission to leverage data and analytics to mitigate the economic impact of COVID-19 and help jumpstart economic recovery. By combining large datasets that are not typically shared, such as sentiment and behavioral data, it hopes to find new and practical ways to support the global response to the virus" (Clark, 2020).
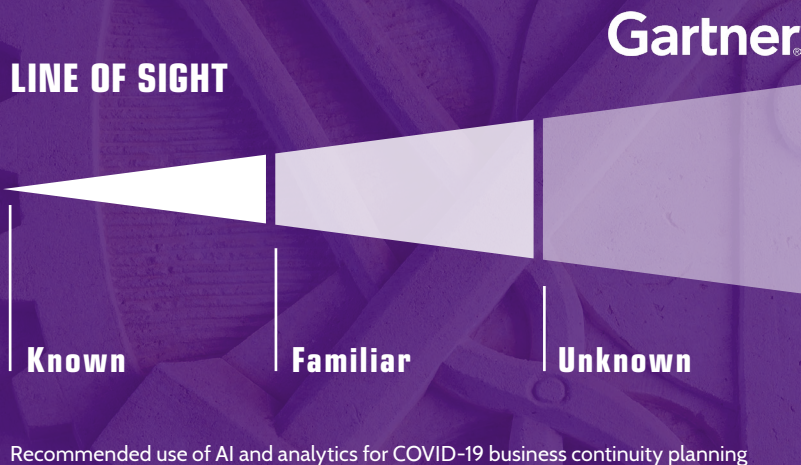
EMER2GENT has several aims. The organization will develop predictive models to develop lead indicators of economic recovery. By combining large datasets, such as sentiment and behavioral data, that are not typically shared, it hopes to glean insights and practical applications for companies, governments, and industries responding to the crisis. EMER2GENT also aims to identify and support budding recovery opportunities amidst potential economic devastation.

Rolls-Royce's initiative is just one example of how invaluable data analytics has become for business continuity planning and economic recovery. Lost revenue streams, panicked customers, disrupted supply chains and cash flow shortages have created unprecedented business uncertainties. The COVID-19 pandemic has shone a spotlight on the critical nature of corporate business continuity and risk management planning using business analytics.

DATA AND ANALYTICS FOR ORGANIZATIONAL RESILIENCE

Business intelligence and analytics allow companies to plan for uncertainties and predict future outcomes. These practices have become the core of every major organization's plan for survival and post-coronavirus recovery. Gartner is advising business leaders that they need data and analytics as part of their business continuity management efforts, suggesting that they view the COVID-19 crisis as "a way to get internal buy-in for data and analytics." Gartner added that "There's a case here for using data and analytics to be providing a value benefit during the epidemic" (Lui, 2020).

Gartner's recommended approach for using AI and analytics to prepare a COVID-19 response is depicted in the graph below, showing data analytics can help generate business and recovery scenarios and facilitate early discovery of business trends and alternate paths for goods, people and services.

LINE OF SIGHT

Gartner

Known **Familiar** **Unknown**

Recommended use of AI and analytics for COVID-19 business continuity planning

USE ANALYTICS AND AI TO:

• Tell the story of impact with data.

• Generate business and recovery scenarios — forecasts and predictions of impact on operations, products and services, supply and demand.

• Early discovery of business trends, alert generation, and sharing vital information across the organization, including suppliers and third parties.

• Spot alternate pathways and work flows for goods, people and services.

• Pinpoint further points of automation.

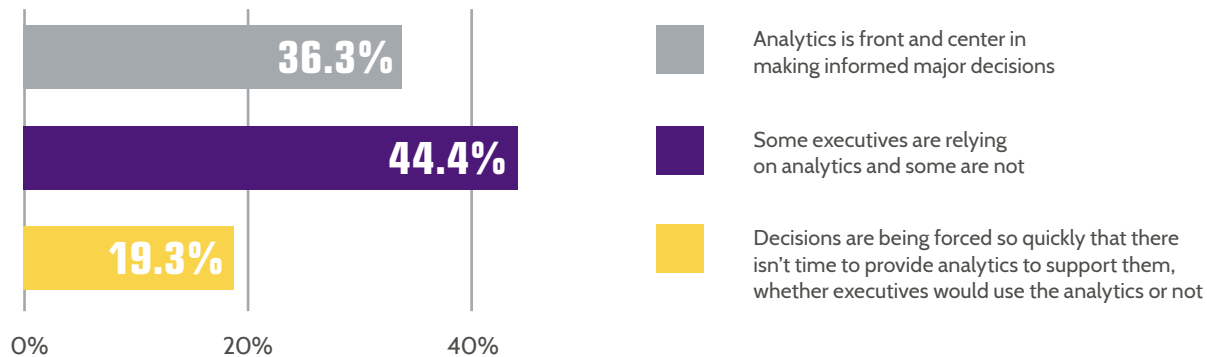• Facilitate organizational daily planning now and for use in longer term.

The economic crisis is highlighting the many ways in which companies can leverage data to build more resilient business models in the face of change. They are using analytics to analyze every source of revenue and costs; gain visibility into their operations and the impact on cash flow; identify supply chain bottlenecks; and understand the degree to which customers are disappearing and how to keep them engaged. Scenario planning and forecasting based on data is also aimed at supporting crisis management decisions and teams in the face of a constantly changing situation that can have varying degrees of business impact.

BUSINESS ANALYTICS JOB SECURITY IS AN INDICATOR OF ITS VALUE

An indicator of the value of analytics to businesses is the relative lack of unemployment in the business analytics field compared with the mass unemployment in other sectors. As of April 2020, firms such as JP Morgan, Bank of America and Citi were still hiring in analytics and data science (Butcher, 2020). According to Burtch Works, 70 percent of firms surveyed either put analytics front and center in helping to inform major COVID-19 related decisions, or were relying on analytics for decision making during the COVID-19 crisis (Burtch Works, 2020).

HOW ARE ORGANIZATIONS USING ANALYTICS TO ADDRESS THE COVID-19 CRISIS?

36.3%	Analytics is front and center in making informed major decisions
44.4%	Some executives are relying on analytics and some are not
19.3%	Decisions are being forced so quickly that there isn't time to provide analytics to support them, whether executives would use the analytics or not

0%   20%   40%

How organizations are using analytics as it relates to dealing with the COVID-19 crisis.

ANALYTICS HELPS GOVERNMENT AND NONPROFITS MANAGE A COVID-19 RESPONSE

Data analytics is at the core of a global business response to COVID-19 and also helps governments and health organizations around the world understand and respond to the coronavirus crisis. Among other uses, data and predictive modeling is being used to establish policies to slow the spread of COVID-19 and prepare hospitals for the flood of patients who need medical attention.

The power of analytics is at work on several large-scale nonprofit efforts to analyze large, disparate and extensive data sets. One example is the COVID-19 Open Research Dataset (CORD-19). The dataset was created by scientific researchers from the Allen Institute for AI, the Chan Zuckerberg Initiative, Microsoft, the U.S. government, and several other academic and nonprofit institutes. CORD-19 is an extensive, machine-readable collection of more than 29,000 pieces of literature related to the coronavirus that can be mined using AI and natural language processing techniques for insights and answers to pressing COVID-19 questions (Palachy, 2020).

The COVID-19 pandemic has shown for both business and the world at large that business and data analytics will be at the forefront of overcoming the pandemic and the ensuing the economic crisis by enabling organizations to ask better questions, make better decisions and prepare responses based on what the data presents.

TCU NEELEY MASTER OF SCIENCE IN BUSINESS ANALYTICS

A one-year applied master's degree with an emphasis on the use of analytics in business. Gain actionable insights and transferable skills involving data science, platforming and management.

Work with technical and statistical software through experiential learning, case study analysis and project immersion.

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Transition from the undergraduate environment or early professionalism to the next phase: a master's degree with a focus on upskilling and career advancement. Fundamentals provide the foundation necessary to perform well in the field of business analytics.

- Foundation for Statistics (waived for TCU Neeley graduates)
- Accounting Fundamentals
- Marketing Fundamentals
- Finance Fundamentals
- Supply Chain Fundamentals
- Simulation
- Business Analytics
- Statistical Models
- Data Visualization

PERSONALIZATION

Electives will take you beyond the theory and allow you to tailor your studies based on your future career goals.

- Accounting Analytics
- Business Processes and Risk
- Business Intelligence and Analytics
- Financial Modeling
- ERP Simulation
- Marketing Research
- Predictive Analytics with SAP
- Data Analytics Simulation
- Marketing Analytics
- Analytics for Innovation
- Customer Relationship Marketing
- Digital Marketing Analytics
- People Analytics

IMPLEMENTATION

This phase will take you outside the classroom, giving you the opportunity to integrate, apply and expand the concepts and tools learned throughout the MS in Business Analytics curriculum. Choose different experiential learning options and solve real business problems to gain the confidence and knowledge necessary to advance your career.

- Capstone Project

HOW TO APPLY

ADMISSIONS REQUIREMENTS

- All official undergraduate and graduate (if applicable) transcripts

- Personal Statement (500 words) answering the following questions:
    - Why do you want to pursue the TCU MS in Business Analytics degree? Briefly describe your short-term and long-term career goals.
    - What makes you a strong candidate for this program?

- Contact information for two academic/professional references (at least one faculty reference required)

- Professional resume

- SAT/ACT scores or GMAT/GRE scores

- Eligible candidates will be invited to a 30-minute interview with a member of our admissions team

Begin your application process now at neeley.tcu.edu/msba
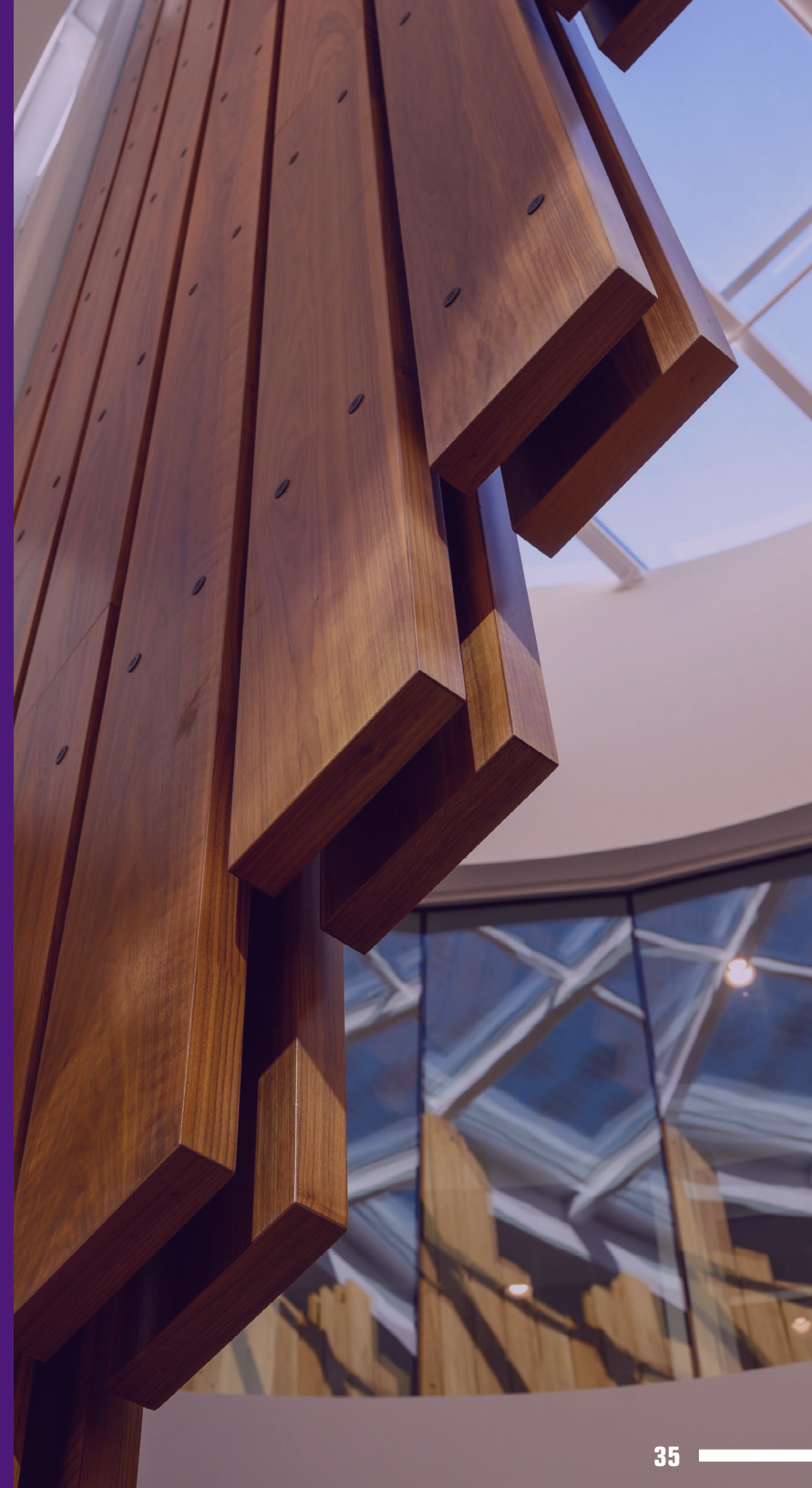
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