

*“This project has shown me a lot about real world corporate finance work and has made me realize that I really love it. This class has 1) helped me decide what type of career to pursue 2) has both challenged me and rewarded me 3) helped me develop leadership skills and finally 4) helped me develop professional presenting skills.”*  
 --Applied Financial Analysis Student, Drew Walz

## Recent Consulting Project Descriptions

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## Captis Aire: Cleaner air, less energy use, and new sources of sustainable chemicals all in one

Captis Aire is a startup that has developed a novel emissions control technology. The technology makes wood drying more efficient, cutting down on energy use, lowering greenhouse gas emissions, and recovering valuable biobased chemicals. This means cleaner air, less energy used, and more sustainable chemical supplies. That seems like a winning combination! To attract customers and investors, Captis Aire needed to show clear financial value benefits as well. Working with the founder, Kim Tutin, a team of Master of Finance students analyzed the numbers to create value propositions for customers and investors.



Ms. Tutin had a strong business plan from working with Oak Ridge National Laboratory's Innovation Crossroads program. This put her in an ideal position to give the team a great learning opportunity while generating value propositions for Captis Aire. For customers, the team had to turn the process of buying and using the technology into cash flows. They had to do the same with existing technology. Then, they could build the value proposition both outright and relative value propositions for customers. For investors, the team had to incorporate the market potential and Captis Aire's growth strategy and production capacity. Then, they built a corporate valuation model for potential investors. Both value propositions allowed variable inputs and included sensitivity analyses to allow Ms. Tutin to understand the important value drivers for both customers and investors.

Captis Aire Founder and CEO, Kim Tutin commented on the value of the project to Captis Aire: "Great students! We are thrilled with their valuation of Captis Aire substantiated by their thorough analysis of the business. Their easy-to-use custom spreadsheet, associated graphics, and pitch deck they prepared creates significant value by saving us time and improving the accuracy of the resulting opportunity analyses. Thank you!"

The project also provided a great learning opportunity. Team member Sophie Smith summarized it nicely: "This class has certainly been one that challenged me, but it is among the most beneficial and valuable courses I have taken in the MFIN program. I learned how to dig deep into a problem, how to effectively communicate key findings and recommendations, and how to showcase complex data. As a result of this project, I feel more confident in my ability to take on complex, challenging work and create a plan to come to a final solution or conclusion."

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## Optum: Making financial services products win-win propositions

Recent years have seen significant growth and evolution in financial service products, driven by regulatory changes and competitive dynamics. This has created opportunities for companies and individuals to access new investment, retirement savings, and healthcare coverage products. As a subsidiary of United Health Group, Optum is on the cutting edge of using technology and data to provide innovative health-related financial services products. To ensure success, a financial product must be a “win-win” proposition, not only benefiting consumers but also providing profits for the company offering it.



Optum asked a team of Master of Finance students to help them understand one of their products better. The product is popular with consumers and has obvious benefits for them. The team was asked to consider factors that determine whether the product was also profitable to offer or, if so, whether it might be offered at a better price point for consumers. Armed with a massive data set, the team set to work answering these questions. Along the way, they applied advanced econometric modelling and machine learning technologies. In addition to learning about the specific product, they learned about the entire health care payor system, how financial services companies view and price product offerings, and how to effectively communicate their findings.

The students really helped us understand the data we were sitting on and shed light on some of the shortfalls within our data,” said project sponsor and Optum senior pricing manager Jack Quinlan. “Their thorough and comprehensive analysis allowed us to get in depth understanding of the industries Optum Financial supports. They were able understand the complex world of Health Benefit Accounts and translate their findings to those not as versed in the data science world.”

“I was amazed at the tenacity and ingenuity of the team,” said project advisor Tom Rietz. “The answers they wanted were tied up in incredibly complex patterns of data. The team used all their analysis skills to draw their conclusions and did an excellent job communicating their findings to Optum in an understandable way.” Team member Mitchell Riggs agreed, saying “We had to learn how to problem solve and generate ideas for how to tackle a problem that didn’t have a clear answer.”

The project made team members grow in sometimes unexpected ways. Riggs continues: “For me I felt a lot of my personal growth came from me being a leader in our group meetings. I found myself in a unique situation that required me to be the one speaking and presenting our ideas and findings. This stretched me to get out of my comfort zone and required me to have a deep understanding of all facets of our project. I think this project has really helped my confidence and to be willing to speak up and take on a leadership role in the future.”

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## SIM-IA: Making EMT training self-supporting

Rural Iowa urgently needs high-quality healthcare. With 40% of Iowans living in rural areas, they depend on small hospitals, clinics, and EMS providers instead of larger urban health care centers. Assessments reveal a crucial need for high-quality continuing education for rural EMS and hospital providers in this network. While ongoing education is vital, many agencies lack sufficient funding for top-notch training. Fewer than 40% of Iowa hospitals and EMS agencies offer local, in-person, real-world simulation training for their staff, relying mostly on remote and online lectures for continuing education. Financial constraints, lack of equipment, and shortages of trained educators force many agencies to forego high-value simulation training. In fact, many of Iowa's



EMS agencies have no budget allocated for employee or volunteer education and training.

SIM-IA aims to solve this problem by providing high-quality, simulation-based training for EMS services free of charge. Initially funded by a grant, SIM-IA deploys state-of-the-art mobile simulation training units across Iowa. To sustain operations after the grant ends, they need to become financially self-supporting. They enlisted a team of Master of Finance students to help devise a plan. First, the team created a model to determine the annual funding required for ongoing operations. Next, they developed a way for SIM-IA to measure its impact on health care outcomes and costs. Finally, based on cost savings, they crafted value propositions that SIM-IA could pitch for financial support from specific payors, such as insurance companies, health care systems, or the state, depending on the patient populations.

“Having a team of “finance” professionals focusing on sustainability was incredibly helpful,” said project sponsor Cormac O’Sullivan. “We are all clinicians and educators. Our focus is on educating providers to deliver high quality patient care. Having an entire team of finance focused graduate students who are not front-line providers brought a needed viewpoint to sustaining this project. We feel they provided us with a solid framework from which we can model sustainable financing for the future. Our main goal is to keep SIM-IA going forever to improve the care received by all Iowans. These work these graduate students completed has made that significantly more feasible.”

“The students learned an incredible amount in this project,” said project advisor Tom Rietz. “Health care finance is extremely complex, but the team did a great job digging into it to understand how they might find funding for SIM-IA to continue their mission of improving health care for rural Iowans. It took students beyond their comfort zones and showed how they could make a difference.” The team seemed to agree that they learned a lot about themselves as well. Jacquyn Caspers said “I learned that I am much more capable than I originally thought. I can do things I never thought I could because of this project, especially when it comes to data analysis and interpersonal skills.” Puspa Mudireddy agreed: “This experience has instilled confidence in my capacity to contribute meaningfully to complex projects and has underscored the importance of adaptability and continuous learning in dynamic environments. Moreover, it has reshaped my perspective on collaboration, emphasizing the significance of diverse skill sets and effective communication within interdisciplinary teams.”

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## Vitriform3D: Turning Trash into Treasure

The United States recycles only about 1/3 of its waste glass. This is very costly. About 8 million tons of glass go to landfills each year, costing an average of over \$60 per ton to dispose. That adds up! More recycling programs would exist if waste glass could be turned into a high-value product. That’s exactly what technology developed by Vitriform3D does. It uses a unique binder and 3-D printing system to turn glass into highly durable building materials such as tile and siding. This is a promising solution for increasing recycling rates and reducing landfill waste.



To drive recycling program development and attract investors, Vitriform3D needed to show clear financial benefits as well. Working with the founder, Alex Stiles, a team of Master of Finance students analyzed the numbers to drive the financial value proposition. Mr. Stiles had a strong operating model from working with Oak Ridge National Laboratory's Innovation Crossroads program. The team started with this and worked on ways to estimate the potential markets for Vitriform3D products. Then, they structured a growth plan, translating this plan into cash flows using the Vitriform3D's operating model. Finally, they built a corporate valuation model to pitch to potential investors. All the models allowed variable inputs and included sensitivity analyses to allow Mr. Stiles to understand the important value drivers for the company.

Founder and CEO, Alex Stiles, commented on the value of the project to Vitriform3D: “The team from the Tipper College of Business worked hard to provide our small business with the tailored insights we needed to grow. They took the time to understand our technology, conducted extensive market research, and built a detailed model to project our potential revenue and business valuation. I was particularly impressed by the attention to detail and follow-on support we received from Professor Rietz. I can see why the students under his mentorship took such a professional approach to their work. I highly recommend this program for any start-up seeking a financial roadmap, and I would seriously consider hiring any student who has graduated from the program!”

The project also provided a great learning opportunity. Emily Lopata discussed how team members felt about the project: “Seeing that my team and I were able to help Alex solve business problems was a really fulfilling experience. It was a chance for me to prove to myself that I had learned a lot of financial concepts throughout my time in the program. It proved that I would be able to use and combine those concepts into real world applications. Overall, this was a great experience. It gave me a chance to help someone, prove my financial knowledge, be a leader, work with a team and overcome a variety of new challenges and evolving requirements.”

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## Electro-Active Technologies: Making Clean Hydrogen from Food Waste

In “Carbonomics: The clean hydrogen revolution” Goldman Sachs predicts a more than “400-fold increase in clean hydrogen installed capacity this decade” and a \$5 trillion investment in the clean hydrogen supply chain. They say this will be accompanied by a drop in the production costs for clean hydrogen. Electro-Active Technologies is taking a unique approach, combining biology and electrochemistry, to make use of abundant organic waste and renewable electricity to make carbon-negative, affordable hydrogen. This solution tackles another major green house gas emission source in food waste, which produces methane in landfills. Their modular, containerized design can be deployed onsite to minimize transportation. This results in lower production costs and reduction waste while creating and storing renewable energy is a win-win-win proposition.

To roll out and scale the technology, Electro-Active needs to prove its value to customers and to investors. Realizing this, Electro-Active worked with a team of Iowa Masters students to build financial



electro-active  
technologies

models for both customers and Electro-Active itself as a company. The team collected data about the process, capital costs, input costs, output values, and potential savings to build three valuation models. The first assesses the value for a customer who leases or buys the technology from Electro-Active. The second assesses the value from Electro-Active's

perspective. The third assesses the value of Electro-Active as a company from the perspective of potential investors. These models do more than simply value the company and its technology. They show the driving factors behind the valuations and allow Electro-Active to determine how sensitive valuations are to various inputs and arrangements for sale or leasing. This will help the company focus on the factors most critical for creating value.

“This project was very valuable for the students because they had to look at the project from three different perspectives: thus customer, the company, and the investors,” said project advisor Tom Rietz. “It helped them realize the value proposition has to be right for all parties for the business to work.”

Electro-Active Co-Founder and CEO, Alex Lewis commented on the value of the project to Electro-Active: “Working with the Iowa team was a great experience, we were very pleased with the results and our team is working to incorporate the models into our planning and business development efforts to narrow down our highest priority customers where we create the most value, which can help accelerate our time to market to bring this unique solution out into the world.”

Team member John Agraz notes that the team members learned a lot because “applying the concepts to a real business involves more than simply solving straightforward math problems in managerial finance.” In addition, the team had to “explain the ‘why’ behind inputs and results.” Austin Hamer put into words what many students come away from an experience like this with: “This experience helped instill more confidence in myself and what I know. I grew as a leader as a result of this experience.”

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## Catholic Foundation of Southwest Iowa: Sorting out Fees and Investment Performance

Details matter. Investment fees are details that really matter. While often ignored by investors, fees can have an enormous impact on long run performance. Given the differences in fee structures across investment options, it’s hard to make fair comparisons.

Private schools and churches often raise endowed and spendable funds to support their mission, investing them in portfolios for short-term and long-run horizons. The Catholic Foundation of Southwest Iowa’s (CFSWIA) mission is to connect philanthropy and investing to Catholic values. They provide opportunities for churches and schools in their Dioceses to invest funds following ethical investment principles at relatively low costs. Alternatively, churches and schools can invest on their own, often helped by local advisors.



CFSWIA wanted to find a way to help these groups make fair investment comparisons across the options they had and to be able to clearly communicate the tradeoffs across them. This proves challenging because of the range of investments made by churches and schools and the variance in fee structures across investment advisors. To meet the challenge, a team of Masters students dug into fee structures and performance evaluation. They found data sources that the CFSWIA could use and found ways to make fair comparisons. The students programmed a customizable spreadsheet that allows the Foundation to enter the current investments held by a church or school. The spreadsheet downloads information about the investments, summarizes them, and generates simple and comparable tables and charts including fees and performance. They developed a pamphlet, report and presentation templates that compare a church or school’s current investment strategies to similar portfolios of Foundation investments. These show clearly when the Foundation option is better and, just as important, when it’s not.

According to project sponsor Sue McEntee “As the client for this project, the experience was incredible. The students met with us early to go over the issues and the information available. The students quickly took that and began piecing together potential ways to evaluate how to best compare investment strategies. Our Investment Committee members and financial advisor also joined in on the conversations. With a threefold approach the students got a range of input on the project. While our partnership has ended, the result of the project are beginning to roll out and become a necessary tool for the advancement of our mission. This experience was beneficial for me professionally, as well as for our industry. We will be sharing this tool with like-minded entities within our diocese and other Catholic Foundations across the U.S. “

The team learned a great deal about performance evaluation and fees, the latter of which are seldom discussed in classes. The also learned about data sources and processing along with developing communication skills. Most importantly, they learned about themselves and teamwork.

Team member Ifeoma Anyaoha commented that she “learned about collaborating with others by listening to others, considering different perspectives, and working together towards a common goal. I

realized that I should have greater confidence in my abilities.” Derrek Bettendorf echoed the value of the experience: “I felt that this course taught me way more than I expected not only about consulting but about working in a group. I would recommend this class to anyone who doesn’t like group work as it makes you appreciate being able to work in a team.”

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## University of Iowa Facilities Management II: Valuing a Local Miscanthus Grass Pelletizing Plant

In partnership with the ENGIE North America and Meridiam, the University of Iowa pledges to run its utilities plant coal free by 2025. To help achieve this goal, they burn “energy pellets” made from miscanthus grass. While the grass is grown and harvested locally, it is trucked over 300 miles to a plant to be mixed with other ingredients and pelletized and then trucked back to burn in the utilities plant. This is costly and makes it significantly less green. One of the University’s goals is to attract a pelletizing plant to Eastern Iowa. The question is whether it makes financial sense.

A team of students from the Master of Finance program tackled this problem by developing a valuation model for a local plant. The model includes everything from location and real estate pricing to operating expenses and revenue. It includes sensitivity analyses to factors driving the valuation. It includes various potential ownership structures and models things from the perspective of the University and the perspective of the plant owner/operator to identify win-win propositions.



Project sponsor Ty Miller commented that “The students provided a great, easy to use modeling tool for UI Facilities Management to utilize in its evaluation of a local fuel processing plant. FM’s interaction with the student team throughout the project was accommodating and professional. The team worked together well, and produced a final product that was both insightful and valuable in making a decision to move forward with this project by issuing an RFP for this project.”

Project advisor Tom Rietz commented that “this is terrific opportunity for the student team to learn about all sides of corporate and project finance. It demonstrates how important financial viability is for making a difference in the world. The team did a superb job for the University.” The team pulled together skills developed throughout the program. As team member Nicholas Feldmann summarized just a few of the skills the team brought to bear from the entire Master of Finance program: “This was a lot of fun to do! I applied the bottom-up beta from Larry Cook’s Investment Banking class. I used general modeling skills from Amrita Nain’s Corporate Finance class. I used general DCF modeling acumen from Todd Hogue’s Financial Modelling class. I learned how to get the IRR from solver, and more.”

The team members also learned a lot from their teammates and valued the team experience. Sidney Jie said she could “never state enough that I have had the best team ever. We had great interaction among all members. We always have a positive attitude towards new tasks and goals and effective communication between members. We seek help from members, and everyone is willing and able to help within the group. In a such environment, everyone in the team has the motivation to accomplish the project well and I am so proud of everyone in the team.” Team members learned about themselves as well “This experience has provided me with the skills and knowledge to be better prepared and has given me confidence in myself and abilities,” said team members Atieno Kabwe.

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## Community Foundation of Greater Muscatine: Evaluating the Risk/Reward Tradeoffs for Investing in Affordable Housing

Employers often ask us to prepare students who know more than just the numbers. They want students with high emotional intelligence, interpersonal skills, and teamworking skills. They want to hire people who can “think outside the box.” The Community Foundation of Greater Muscatine (CFGM) had a project that would push the team in all these ways. It clearly required outside the box thinking for greater social good. In retrospect, team members learned a great deal about the soft skills needed in finance!

The Community Foundation of Greater Muscatine actively works to improve the quality of life in Muscatine County through philanthropy. They manage more than \$63 million in investments in 275 separate funds to support initiatives and non-profit organizations in Muscatine and Louisa counties. One of CFGM’s priority areas is affordable housing. Living in unaffordable housing creates increased risk of many adverse outcomes ranging from costly health conditions to lower high school graduation rates to food and energy insecurity. CFGM had a simple question: If a donor gives the foundation money today is it financially better to spend it on affordable housing for a family now or endow the funds to cover the expected future costs of adverse outcomes from the family continuing to live in unaffordable housing? This risk-return tradeoff question is at the core of finance. The answer would help guide CFGM’s decisions to maximize social benefit while giving them a novel way to communicate benefits to potential donor and community stakeholders.



That is true “outside the box” thinking! A team of Masters students worked with the College of Public Health to begin identifying outcomes associated with living in unaffordable housing. Then, they had to determine the potential cost of each outcome and the impact of moving a family from unaffordable to affordable housing on the likelihood of each outcome. Finally, they had to find a discount rate appropriate for comparing these future costs to the cost of moving a family to affordable housing today.

The team worked to do more than just answer the question. They developed a model so that CFGM and potential donors could understand the driving factors and add additional outcomes as needed. Along the way, the team learned about the costs and benefits of affordable housing and so much more. They applied their finance skills in novel ways and saw how their skills can help the social good, lower system costs, and strengthen communities. They learned an enormous amount about each other, teamwork and soft skills. Team member Dheeraj Lalwana summed this up: “After working with the team, I was also able to gain numerous soft skills, such as effective communication, problem-solving methods, listening skills, critical analysis, and collaboration.” “I no longer under value my work or my understanding and I found my voice when it comes to finance,” commented team member Arielle Saunders. Ryan Johnson “really enjoyed this experience and would highly recommend for future students of the program.”

“Societally, we often direct resources and attention to downstream outcomes rather than address the foundational upstream barriers that create them. This is true when we discuss the supply-side failure of housing. As we evaluate the financial outcomes of housing limitations, we typically calculate the multiplier factor of household spending, taxes, and job creation but fail to include the cascading intersectional system costs of health, education, and more. We would have been unable to compile and model this data without the dedicated University of Iowa team of students and Professor Tom Rietz. Their efforts and expertise arms us with the analytics to make informed, re-focused investment decisioning related to the economic catalyst of housing.” Charla Schafer, President, Community Foundation of Greater Muscatine.



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## Oak Ridge National Laboratory Center for Nanophase Materials Sciences: Giving Power to an Innovative Idea

The missions of Oak Ridge National Laboratory (ORNL) and the Tippie College of Business share a common theme: Research. ORNL's mission "is to deliver scientific discoveries and technical breakthroughs that will accelerate the development and deployment of solutions in clean energy and global security." This is complemented by Tippie's mission to "developing critical thinkers who will thrive in a world that demands innovative approaches to business education and practice." These two missions converge when attempting to commercialize ORNL's discoveries and breakthroughs.

When ORNL developed a groundbreaking new "nanospike" catalyst technology that directly converts Carbon Dioxide to Ethanol, they knew it had great potential value. Ethanol can be used as a fuel without modifying any infrastructure. Further, the technology can effectively store excess energy generated by wind farms or large solar installations. But, the nanospike technology requires a large upfront investment and a lot of electricity to create the ethanol. Was it economically viable? Could it attract the investment needed to implement it?



ORNL and a Tippie MBA team worked together to answer questions about economic viability. The team worked to translate the chemistry and physics into process cash flows for three possible implementations. For each, they developed valuation models and sensitivity analyses. They found that the key to economic viability lies in using otherwise wasted resources. For example, a solar or wind farm based nanospike ethanol plant might become economically viable if it uses excess electricity: the electricity generated by the farm that otherwise exceeds demand. Similarly, an installation at an existing ethanol plant might become economically viable if it uses excess carbon dioxide generated by the plant. The analysis helps ORNL assess potential partners for commercializing the technology.

Every team member learned about project management and team processes. Ryan Johnstone learned that "Establishing a timeline and benchmarks isn't just something you do on a project. It's everything. The timeline keeps you disciplined by holding you accountable." They also learned how to exploit their individual strengths while relying on each other on a collaborative team. "I don't need to be an engineer," said Evan Saunders, "all I needed to do was have a basic and foundational understanding of the process (and thus the potential cash flows) to understand how to construct this model and deliver a high-quality product to the clients. I think this has increased my confidence to take on tough projects/roles that are out of my comfort zone."

"This partnership was extremely valuable to our scientific team," said ORNL team leader Adam Rondinone. "We know the science but did not appreciate the economics, and it was gratifying to see that the technology appears viable under certain circumstances. Even more importantly, these results help us to understand the trouble spots – the areas that we must improve upon to increase the chances that our technology can make it to market."

Professor Tom Rietz served as an advisor to the consultant team. "This was an incredible learning experience for the students," he observed. "What better way is there to learn cash flow analysis than to take a process that has never been implemented before and learn how to convert it into cash flows for a financial analysis. It also happens to be a potential winning technology for the State of Iowa and the global environment."

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## National Ferret Resource and Research Center: Financial Modelling for a Cutting-Edge Research Facility

The National Ferret Resource and Research Center (NFRRC) is at the cutting edge of modern medical technology. Their mission is to inform and advance stem cell and genetic therapies to treat human diseases. Using unique genetically engineered ferrets that can mimic devastating human conditions such as cystic fibrosis and diabetes, the NFRRC is blazing paths to human gene and cell therapy clinical trials to treat diseases affecting the lung, brain, pancreas, liver and intestine.



With exploding research in these fields, NFRRC needs a new building with research space to capitalize on growing opportunities to develop new treatments and cures. The NFRRC wondered how it might structure itself to justify financing for a building, how much financing would cost, and whether it would be worthwhile. To answer these questions, they worked with a Tippie Master of Finance team to assess the financial viability of a new building. The team created a model that allows the NFRRC to enter cost and revenue information about their activities; anything from grants, to sponsored research, to working directly with companies on research and service contracts. The model aggregates all this information and converts it from grant and fund accounting into standard accounting statements. NFRRC can use these statements to assess the new building's value, estimate an appropriate cost of borrowing, and determine if scaling up is a worthwhile investment for the University.

Having heard the value proposition, the University of Iowa and College of Medicine leadership are highly supportive of transitioning the Center into an Institute. Working with the Office of the Vice President for Research and the Office of the Senior Vice President, an \$8M construction grant is now being submitted to the National Institutes of Health. In addition, aspects of the financial modeling clearly show the need for a for-profit business linked to the new Institute that assists rearing specialized ferrets.

The team was particularly excited about this project because it showcases how finance professionals can help further medicine and improve lives. In the end, the project changed team members' own self-images as well. "My perspective of myself was influenced by this project. Before, I had less confidence of what I had to offer to the financial world. However, from seeing the faith that my group took me, and from being a key part of my group, I found that I have a lot to offer groups of this kind moving forward," observed team member Erin Dowd. Team member Zoe Heimendinger felt similarly: "I have had to adopt a whole new mindset. I am more confident in my presentation skills. This course was an effective way to begin my financial applications outside of the classroom."

"Scientific approaches and vision got us to an inflection point, the student team helped translate and solidify that vision into financial reality," said NFRRC director John Engelhardt. "The team's analysis and projections were pivotal in decision making for the UI leadership and other partners to proceed with tangible plans for expansion of the National Ferret Resource and Research Institute. We were incredibly impressed with the team, and glad to be a first step for several future biotechnology CFOs."

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## VazTec: Giving Power to an Innovative Idea

Start-up technology company VazTec, based in North Carolina, had a big idea: a valveless engine design that would improve engine efficiency and durability *without losing engine power*. But cutting-edge technology has little impact on emissions and fuel consumption unless it can be brought profitably to market.



**VAZTEC.LLC**  
VALVELESS ENGINES

That's where Tippie came in. VazTec secured a team of Tippie MBAs to perform financial analysis that would help realize the owners' ambitions to commercialize their innovation. The project was part of Putting Finance into Practice, one of the two real-world consulting-based courses required for Tippie finance MBAs.

The student consultant team created a customized, flexible cost of capital model for the industry, and a valuation model for end users of the engine technology. They also completed financial projections based on a number of potential development situations.

Armed with this information, VazTec's leaders are now actively seeking equity partners and licensees. They are more confident now that their technology will become commercially viable. Money aside, there's a corporate social responsibility upside to this project: adoption of VazTec's technology will mean less reliance on fossil fuels and fewer greenhouse gas emissions around the world.

Professor Tom Rietz served as an advisor to the consultant team. "Working with a startup, and all the ambiguity associated with it, was a fantastic learning opportunity," he explained. "This experience gave them real-world practice on an open-ended ambiguous problem. They learned that profits don't necessarily conflict with environmentalism and social responsibility."

"Without a doubt, this experience has developed my technical and client relations skills, and I am confident that it'll be an asset to my career," said second-year MBA Valerie Bustle. "Doing complex forecasting meant we needed an intimate understanding of the industry to predict its value. I applied concepts that I learned here at Tippie, over the course of my MBA."

Abel Nazareth, second-year finance MBA, explained how the team accomplished their goal despite roadblocks. "Working with a lot of uncertainty and limited input from the client taught us to develop flexible models that could work with various inputs. Class time was used for brainstorming ideas, which helped us look at the problem from different perspectives. It was exactly the type of real-world experience I didn't expect from an academic environment, but it boosted my confidence significantly."

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## The University of Iowa Strategic Initiatives Fund: Investing for the University's Strategic Mission

Public higher education institutions must deal with mounting budgetary pressures while providing high-quality, affordable educations. In Iowa, the governor asked public universities to explore options for obtaining additional resources through partnerships. The University of Iowa entered a 50-year utility system operating agreement with ENGIE North America and Meridiam. The up-front payment from Meridiam and ENGIE left the University with a billion-dollar investment fund: The University of Iowa Strategic Initiatives Fund (UI-SIF).

The UI-SIF is invested to (1) make required annual payments to ENGIE/Meridiam and (2) provide funding for University strategic initiatives. Payments to ENGIE/Meridiam are expected total \$2.83 billion over the next 50 years. The University also targets spending nearly \$750 million on strategic initiatives over this time.

# IOWA

How do you invest a billion dollars to make the required payments and, hopefully, have enough left over to invest in strategic initiatives that will improve the University's future? How do you decide how much you can spend on strategic initiatives each year? What happens if the required payments change? How do you adjust if the investments go poorly or, what if they provide unexpectedly high returns? These are all critically important questions without easy answers.

In addition to their usual investment advisors, the board of the UI-SIF engaged a team of University of Iowa Master of Finance students to get a handle on these questions. The team engaged in two primary tasks. First, they analyzed the likely future risk and return of the UI-SIF portfolio and made recommendations about how to invest the funds. Second, they developed a simulation model for future investment returns that allows the UI-SIF board to see the likelihood of successfully meeting all future obligations. The board could also use the simulation model to try out various spending strategies conditional on the returns to any point in time. Finally, they could alter future expected payments to ENGIE/Meridiam to see how they affect the chances of success.

Team advisor Tom Rietz said that “This was an ideal project because it brought together corporate finance and investments and stretched the team members.” As team member Jaison Marks put it: “This project allowed me to gain increased perspectives in both the fields of portfolio management as well as corporate finance. During this project, it was very apparent that each individual person will not know everything so being respectful to new ideas will allow the collective group to be more successful in obtaining goals and objectives.”

Drew Walz summed up the value of such team projects nicely: “This project has shown me a lot about real world corporate finance work and has made me realize that I really love it. This class has 1) helped me decide what type of career to pursue 2) has both challenged me and rewarded me 3) helped me develop leadership skills and finally 4) helped me develop professional presenting skills.”

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## IDx I: Financing Medical Innovation

Regardless of the potential benefits, bringing a revolutionary medical technology to market can be costly. A medical technology company may require several rounds of financing before its products realize a return to investors. Someone has to do the analysis, prepare the financials and write the materials to make the financial case to potential investors.

IDx is an innovative medical technology company. It believes that information technology deployed in the right settings can vastly improve physician productivity. Through smart retinal imaging, IDx captures high resolution photos of the back of the eye, and then automatically analyzes these images for markers of diabetic retinopathy, glaucoma and cardiovascular diseases - all in real time. By automating the interpretation of images, IDx's products can help frontline providers detect measure and screen for disease more effectively and efficiently.



**IDx**

When it was considering additional financing to prepare for product launch, IDx chose a team of Tippie MBAs to write a Private Placement Memorandum that could be used to raise equity financing. The team put together the business description and financials; they undertook an analysis of IDx's future potential including forecasting demand, a competitive analysis and a risk analysis; and they put together a structure for IDx to describe its offering. Combined, this created a comprehensive and flexible tool that IDx can use as it finances its way forward.

Professor Tom Rietz served as an advisor to the consultant team. “In most MBA programs, the curriculum avoids private finance because private markets are a bit of a mystery relative to public markets,” he explained. “But, private equity is an extremely important tool for innovative businesses. Through this project, the students learned first-hand about making the case for private financing. They will graduate with more than a Tippie MBA; they developed an understanding of private financing that they could not have attained at any other MBA program.”

“This was a great project for me to work on,” said team member Jarom Dilworth. “I was able to work on an exceptional finance project. Few programs in the country give MBA students the opportunity and

autonomy in writing a PPM for a client as Tippiie does." Qi Cui, another team member, said "It's a great learning experience for all of us and a great team working experience as well. It is exciting to put what we learned in class into practice." Both Dilworth and Cui are MBA Finance Academy students.

According to Gary Seamans, the CEO of IDx: "In my career I have had the opportunity to work with the largest investment banks and mega law firms. The five talented team members created a document that would rival anything I have experienced from these national and global firms. Suffice it to say, the leadership team and I were most impressed. These fine men and women are ready to make their mark in the business world of their choosing. Their excellence reflects great credit upon themselves and the Tippe MBA program."

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## IDx II: Valuing New Technology in the Health Care System

IDx, a privately-held AI diagnostics company, received U.S. Food and Drug Administration (FDA) approval for IDx-DR, an AI diagnostic system that detects diabetic retinopathy, a leading cause of blindness. IDx-DR is the first autonomous AI diagnostic system authorized for commercialization by the FDA. Receiving approval is only half the battle. In order to become a commercially successful venture, IDx has to convince health care systems to invest in the technology and create a viable business model.

IDx engaged a mixed team of MBA and Master of Finance students to develop models that health care systems can use to assess the financial value of IDx-DR technology. The team investigated the cost structures across a range of health care system types and delivery models. They also considered reimbursement methods across types of insurance. Based on their analysis, the team developed a valuation model that can be used by health care providers ranging from small private practices to large integrated hospital systems. The model incorporates different types of costs and how they vary according to how the health system chooses to implement and operate IDx-DR. The model also varies based on insurance reimbursement methods and behavioral factors such as the fraction of patients who comply with recommended annual screenings for diabetic retinopathy.



To show the value of IDx-DR in practice, the team gathered information on a number of typical health care systems ranging from an academic hospital to large integrated managed care systems. The data collected formed the basis for a number of case studies that IDx could use to identify systems that benefit the most from IDx-DR technology. With the model, any health care system can assess the financial viability of adopting IDx-DR in addition to the obvious value of improving patient outcomes through early diagnosis and treatment of diabetic retinopathy.

Professor Tom Rietz served as an advisor to the consultant team. "Health care finance is incredibly complex, as are health care systems. This project allowed the team to get an inside look at a \$3 trillion dollar industry and make the financial case for a cutting-edge technology that can improve patient outcomes while reducing costs. This gives them invaluable experience in analyzing, developing and pitching a business case for using a new technology in a sophisticated industry. I don't know any other place where students graduate with this kind of experience."

As with all experiential learning projects, the students learn as much about working in a team and providing value to their employer as they do about finance. According to team member Ellen Badger, "My main takeaway on this is that it truly takes a multi-disciplinary team to create a quality product like this. Without input from both financial experts and those who know the product and the voice of customer (including environment in which the product is used), the model would not be as complete."

According to Ben Clark, the COO of IDx: “We were very impressed by the technical rigor of the model the MBA and Finance students created on our behalf. This document has been an invaluable resource for our go-to-market strategy as we launch the first autonomous AI diagnostic in U.S. healthcare. Everything we do here at IDx is brand new and has to be built from the ground up; true to form, the team that worked on this project started from scratch and were able to produce a valuable model we actively use today. We are grateful for that.”

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## RenewCO<sub>2</sub>: Turning CO<sub>2</sub> into Plastics and More

Where do plastics come from? Long, long ago, bacteria and plants turned carbon dioxide into complex carbon-based molecules through photosynthesis. As these died and decomposed, a fraction of a percent of them were trapped in just the right conditions to become oil millions of years later. Today, we pump the oil out and chemically convert it into the building blocks of plastic. The whole process is slow, energy intensive and dirty. Worse, it releases about 6 tons of CO<sub>2</sub> in the atmosphere for every ton of plastic produced, contributing to global warming. It's not sustainable.



What if we could convert CO<sub>2</sub> from the atmosphere or smoke stacks directly into plastics with green power? What if we could do artificial photosynthesis cleaner, faster and, importantly, cheaper? Researchers at Rutgers University developed an award-winning technology that does just that. It uses electricity to turn carbon dioxide and water into organic chemicals needed for plastics and more. Coupled with cheap renewable energy, it's a carbon-reducing game changer *if* their company, RenewCO<sub>2</sub>, is financially viable and attracts capital. Then, they could create a carbon-negative plastics industry!

RenewCO<sub>2</sub>'s founders asked a team of Iowa Masters students to build financial models based on cost and revenue estimates for producing specific chemicals. The team looked at different organizational structures and production arrangements to find the optimal combination for RenewCO<sub>2</sub>. They built a model that allowed RenewCO<sub>2</sub> to see the driving business case for their technology and understand tradeoffs. As team member Lucas Kane put it: “our goal was to find scenarios where RenewCO<sub>2</sub> would have the best chance of achieving financial viability moving forward.” Noting that “RenewCO<sub>2</sub> wants to capitalize their idea and also save the planet,” Yuan Zhang was honored to work on the project.

RenewCO<sub>2</sub>'s founder Anders Laursen said about the process: "Going into this, we thought it would be more feasible to raise capital to do every aspect of the technology ourselves. What we learned through the student team's modelling was that we can focus on the technical development in a business case that actually is more viable to raise capital than what we had previously estimated." he notes "The students came to this with an inspiring 'can do'-attitude that propelled us to ask questions we had put off for a while... We saw them develop their skill set and confidence while providing us with an invaluable tool to develop our company; it was a win-win situation!"

Team member Matt Mauser explains why this is valuable to students: “This project changed the way I view myself. I learned that I truly do understand certain concepts and how they relate to each other as long as I am thoughtful. This confidence will help me moving forward. One thing I will take away from this is the value of having a team that trusts each other and communicates well. I am looking forward to the next challenge that faces me and I know I am more prepared for it because of this.”

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## Veriown Global Inc.: Smart Power, Smart Analysis

Veriown Global Inc is innovating the way that energy and connectivity reaches people no matter where they are in the world. They are recognized innovative leaders in energy, fintech, and cloud-based software services to change the way energy is delivered and consumed. When their Application Solutions team was involved in evaluating innovative new micro engine technology to cogenerate electricity, heat and cooling on-site for potential U.S. applications, Veriown Global knew they had to understand the value and the risks in the business model before they could make decisions on a commercial strategy with the technology.



Assessing the potential of the technology along with the risks presented a challenging problem. Veriown turned to a team of Tippie MBAs to perform financial analysis, forecasting and risk assessment for Veriown's business model. The project was part of Putting Finance into Practice, one of the two real-world consulting-based courses required for Tippie finance MBAs.

The student consultant team created a sophisticated forecasting model for energy prices and integrated it into a cash flow model for Veriown. Then, they performed simulations to assess the risk to Veriown and its customers. Finally, they analyzed a range of potential hedging and risk mitigation strategies.

Armed with this information, Veriown can maximize the value of its micro CHP solution by adjusting its capital investment, pricing and risk management strategies. This will allow Veriown and its customers to benefit from the efficiency of distributed co-generation of electricity, heating and cooling, while minimizing risk. This will mean less reliance on fossil fuels and fewer greenhouse gas emissions around the world.

Steve Johanns is the CEO of Veriown Global. "Veriown is involved in pushing the envelope in when looking at innovating markets with new energy technology and strategies," he said. "The team of MBA's from Tippie did an outstanding job of helping us in assessing strategic financial approaches to risk assessment and future business models with some of the more advanced distributed generation solutions yet to be brought to market. They made very valuable and real contributions to our strategy going forward and I hope I'm fortunate enough to get some of them on our team when they complete their MBA."

MBA Team member Sanjay Mittal said that there were many insights in the project. "We helped Veriown understand and mitigate its downside risk to ensure that the distributed generation technology becomes successful and empowering for people around the world."

Professor Tom Rietz served as an advisor to the consultant team. "Developing the forecasting model and understand the risks was an incredible learning opportunity for the students," he explained. "I think the team significantly improved the business viability of an idea with a substantial positive environmental impact. These kinds of projects show how companies can make good economic decisions that are socially responsible."

Veriown Global is now recognized for their new innovative solutions for bringing electricity, connectivity, and commerce to the most remote parts of the world. New problems leading to new groundbreaking solutions and opportunities for more work with future Tippie MBA teams!

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## University of Iowa Facilities Management I: Power, Water and Risk Management

The University of Iowa's Utilities and Energy Management group knows its role is "mission critical" to the University. They provide water, electricity, steam, heating and cooling to the campus of a major research university and to the University of Iowa Hospitals and Clinics, the state's only comprehensive academic medical center. The utilities infrastructure is also a critical risk management tool for the University and the Hospitals. Losing power, even for a relatively short period of time, could be catastrophic.

The utilities are also costly: the facilities represent a major investment for the University. Does it represent an efficient investment? How much is the Utilities operation worth to the University? How much should the University invest to manage the risk of power outages? These are challenging questions that require expertise in finance, risk modelling and risk management.

To answer these questions, the University turned to the Tippie College of Business where a team of MBA students performed an analysis. First, they created a baseline valuation for the utilities from an outside perspective. Then they considered the financing, revenue and investment structure of the University.

Last, they turned to the risk management role of the utilities. They estimated both the value of risk management and asked whether investment in risk mitigation is worth the cost.



The basic utilities operations do create value for the University. But the real value lies in risk management; it far exceeds the basic operational value. Why? While the modern US utility system is extremely reliable, the special situation of a research university and hospital make potential losses extremely high. Thus, reducing even a small risk across time is enormously valuable. This provided a "great tool to evaluate the UI Utility's net worth," and "presented to the UI community the important steps Utilities takes for risk management and the impact that has on the value of our Enterprise," according to Marla Johnson, Sr. Energy Financial Analyst and Glen Mowery, Director, UI Utilities & Energy Management.

"Working on the UI Utilities project provided an invaluable opportunity to apply classroom learning to a real-world project," said Jim Kain, an MBA finance academy student and member of the project team. "Our team was able to show how different factors such as tax, debt, and risk management affected a critical university operation. Most rewarding was the knowledge that our team provided valuable and relevant information to our client."

Professor Tom Rietz served as an advisor to the consultant team. "This project was an exceptional learning experience for the students," he explained. "They took a very complicated problem and boiled it down to its essence. They learned about valuing an integrated asset as part of a complex system. Further, they learned firsthand about valuing operational threats to an institution. All of this applies to a non-profit institution working for the social good, not just for-profit businesses."

"The students were smart, engaging, asked very good questions during the data collection and analysis phase and were very professional in how the team presented its findings to University staff," said Terry Johnson University of Iowa Interim Chief Financial Officer and University Treasurer. "I was very impressed with the creativity exhibited by TCOB students. The students were able to present complex data graphically making it easy to understand the components of the valuation. I feel I now have persuasive and powerful data."



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## Two Projects for Carbon Conversion International: Changing the Face of Green Energy

Technologies can solve environmental problems. Edward Taylor developed and patented a game changer: a non-thermal plasma technology that dramatically reduces the carbon dioxide output from fossil fuel electrical generation plants. Initial testing showed a 95% reduction in carbon dioxide emissions from a diesel generator! It could make coal energy nearly as green as wind and solar. But, to have an impact, you have to convince power plants to install it. This requires both technical and financial feasibility.



“The new carbon conversion technology significantly reduces the amount of greenhouse gases produced from a power plant, outperforming any other technology on the market today,” observed Tippie MBA student Kristin Knudson. “However, in order to sell the technology, they needed a better understanding of the financial value of the technology, as well as what the business model would look like. This is where our team stepped in.”

A team of Tippie MBAs worked with Carbon Conversion International (CCI, then known as GST/PEPPL) to create a flexible financial model that shows the financial value of their technology. While easy to use, the model includes a wide range of options that cover most possible scenarios for implementation and financing of the technology. The end result is that the technology isn’t just green, it’s extremely valuable financially because it improves efficiency. Combined with proven technical efficiency, the financial model gives CCI a convincing package and a strong negotiating position as they work with energy companies to implement the technology.

For team members, the project also provided great educational opportunities to apply concepts and learn soft skills. “In addition to the end goals for the client, the project served as an opportunity to apply academic theories and principles learned during our first-year at Tippie to a real-world situation,” said Team member Kyle Wehr. “This project really taught me a lot about teamwork,” according to Team member Matt Ryder. Exchange student Marnix de Kool explained “I think I have grown a lot, especially concerning my confidence to speak, to share ideas and to comment on others.”

“I really like projects involving commercialization of new technology,” explained Team advisor Professor Tom Rietz. “The team members develop everything from scratch and have to communicate effectively with clients from a range of backgrounds.” The clients were happy with the project as well. Al Sikloski, President of CCI said they were “very impressed with the outstanding job done by the six students.”

CCI was so impressed with the outcome that they contracted for a second individual project on a related topic the next semester. The team compared how CCI technology stacks up against converting power plants to natural gas to meet clean air standards.

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## University of Iowa Foundation: Perspectives and Policies in Portfolio Management

In the classroom, Tippie MBA students learn the theory of portfolio management. You optimize the risk return tradeoff through diversification and asset allocation. In practice, managing a portfolio is a multidimensional problem with a variety of constraints. The University of Iowa Foundation manages a large endowment portfolio to meet the objectives of the University, the donors’ intentions and the interests of the state while fulfilling its fiduciary responsibilities. What better place for Tippie MBA students to learn about the real world practice of running a portfolio?

The University of Iowa Foundation worked with a Finance Academy team to address a specific investment policy issue. The team researched peers and best practices in the field; conducted analysis of the risk-return tradeoffs; and considered the real world issues of management fees and trading costs. They put the analysis in the context of the fiduciary responsibilities and constraints of the foundation.



Team member Lisa Ferguson noted the learning opportunity: “On the financial side, I gained skills analyzing large amounts of data. Throughout the course of this project, I learned not only about the policy issues and financial analysis, but also about interacting with clients and creating final deliverables.” Fellow team member Zach Garthoff said the project “forced us to step up and we wound up providing a lot of value for the UI foundation.” Thus, providing a great learning experience, it also gave the foundation valuable insights into the investment policy issue.

Jim Bethea, the Foundation’s Vice President and Chief Investment Officer worked with the team and also works with the Henry Fund. According to Jim, “This is the second project that I have worked on with the Finance Academy, and through my role on the Henry Fund Advisory Board, I can tell you that the students keep getting better.”

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## Two Projects for HNI: Managing Financial Complexity

HNI Corporation is an Iowa success story. The company is a leading supplier of office furniture and gas and wood burning fireplaces. Manufacturing numerous brands under multiple operating divisions while dealing with suppliers, customers, lenders and investors involves a wide range of complex financial decisions. Even companies that are doing remarkably well can use fresh insights and analysis from the cutting edge of financial research to inform their decisions.

Where does a company go to find fresh perspectives that are analytically rigorous, informed by research but still grounded in the “real world” of financial management?  
Answer: Get a team from the Tippie MBA Finance Academy!



HNI engaged a team to work on general capital structure policy. The team gathered and summarized academic research on the subject. Then, they applied standard classroom analysis techniques. But knowing that wasn’t enough, they took real world factors into consideration and devised a unique analysis that blended standard techniques, cutting edge research and practical considerations to give HNI valuable insights.

Team advisor Tom Rietz said “I can’t tell you how many times during this project I got to say ‘Welcome to the real world! Let’s figure out how to solve it.’ The team took it to heart, learned a lot and delivered a quality product to the client.” As team member Nirosh Dhital put it “I found the project very interesting because I was applying the finance knowledge that I gained from the class. At the beginning, I assumed it would be simple and the team just had to calculate things according to a formula. However, as the project progressed, there were many factors that I had never considered before. This project was truly a very good learning experience about real world finance.”

Marshall Bridges, a Group Vice President, Finance at HNI and a Tippie MBA Alum said, “We really appreciated the team’s work. They gave us fresh insight through both comprehensive analytics and practical understanding. The work was thoughtful, and we enjoyed the opportunity to provide some real world experience.”

HNI was so impressed with the outcome that they contracted for a second project on a similar topic the next year. Again, the students brought cutting edge research to a practical corporate finance problem and delivered unique insights to HNI.

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## Summit Agricultural Group: Ag is Serious Business

Agribusiness is a fundamental part of the economy. Feeding the world engages businesses ranging from family farms to fortune 500 companies operating under every ownership and financing structure imaginable. Founded in Alden, Iowa by Bruce Rastetter, Summit Agricultural Group is an international leader in agricultural business with operations in production agriculture, agricultural investments and farm management. Summit is committed “to protecting the traditions of our nation’s agricultural heritage while at the same time exemplifying the kind of bold innovation and progressive business practices that are required of the 21st century agricultural industry.”



When it came time to evaluate new business opportunities and financing structures, Summit followed its Iowa roots to the University of Iowa MBA program. Summit engaged two Iowa MBA groups to undertake analysis for it. The first interdisciplinary team worked with Summit through the Business Solutions Center under the direction of Mark Winkler. The team conducted an extensive analysis of the agribusiness landscape for Summit.

The project worked out well. Summit hired team member Nick Viner into a permanent position in Investment Development and continued with a Finance Academy team the next Fall. Nick was the primary liaison between Summit and the team. The finance academy team tackled two specific aspects of financing for Summit’s potential future opportunities.

According to Nick, working on both sides of a project creates value: “Having worked on a prior project for Summit, while a student at Iowa, it was interesting to manage instead of participate in a student led project. Watching a project develop from the opposite vantage point broadened my perspective and provided an excellent capstone to my student career at Iowa.”

“The nature of this project created significant growth opportunities for team members,” noted Finance Academy Director Tom Rietz. Brandon Cole noted his growth in leadership: “This is the biggest leadership role I have taken thus far in my classwork. This experience has shown me that I can effectively lead a group and has made me realize I should be more active in seeking leadership roles out.” Seetharam Yarlagadda noted his own personal growth and appreciation for other team members: “I pushed myself out of my comfort zone to overcome my weaknesses. I was always surprised to see how my solution gets better with the inputs from team members.”

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## US Bank I-VIII: Eight Financial Analytics Projects

As the fifth largest commercial bank in the United State, US Bank has relationships with millions of households. This includes lending billions of dollars to millions of families to buy homes. To maximize value for homeowners, US Bank needs to understand what drives home values and risk in lending. US Bank engaged joint Finance/Analytics teams over five semesters (so far) to provide analyses.



Each team dives into a treasure trove of data and uses programming skills and modelling techniques developed in Iowa MBA and MFin classes to analyze national and regional real estate markets. The analysis helps US Bank think about modelling in new ways.

Avi Sengupta from US Bank described the teams' work on the project as follows. "Mortgage modeling is one of the more difficult areas in the field of financial engineering. The teams from the University of Iowa use sophisticated statistical and quantitative tools to develop a framework for projecting housing price appreciation across the country. We plan to leverage the model to manage our mortgage portfolio. The students demonstrate a sound understanding of the mortgage industry and I am amazed at the speed of their learning curve. We expect to build on this momentum and continue to work with Professors Rietz and Blackhurst (faculty supervisors for the projects) on even more complex business issues in the future."

While the teams work on a highly complex, technical and analytic problem, they tout the projects for what they learn about process and teamwork. Team member Sameer Farooqi said he learned that "subject matter does not matter as much as the process" in projects like this. Because "consulting often has vague and shifting deliverables, we learned to do 'mid-air course corrections' which, I think, is a very important skill to have." Spencer Sorrell agreed: "We learned to accept failure and learn from it. I also learned how to work in a highly-diverse team on a very complex task. All the team members come from different backgrounds and contain different skill sets than myself. I gained a deeper appreciation for diversity because of this project."

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## Renewable Energy Group: Contributing to the Cutting Edge

Renewable Energy Group (REG) is on the cutting edge of the renewable fuels industry. Using by-products and waste oils, REG's proprietary technologies produce biodiesel that reduces carbon intensity up to 84% relative to traditional diesel.

In a competitive industry, REG works to maximize value at every point in its supply chain. REG decided to ask an Iowa MBA Finance Academy team to investigate possible uses and markets for its by-products.



The team conducted a market analysis, investigating alternative value propositions for REG and their potential customers. They analyzed how opening new markets could impact REG's bottom line and made recommendations.

The team was supervised by Finance Academy Faculty Director Tom Rietz. "This was a fantastic project," he said. "The students had to analyze the potential markets from both sides and make sure there was a value proposition for both parties. They had to consider all the messy issues related to new market development and implementation of a value added strategy. You couldn't ask for a better learning opportunity."

Team member Salik Gilani stated that the project "made me understand the importance of having a good team. If the team is strong and cohesive, no matter how difficult the goal is, it is still achievable. This was not something which I thought would be a decisive and core theme of the project, but it ended up being what defined the semester for me. There were points when the project got really tough, and we were at standstills, but the fact that we talked and shared those problems helped us get through the whole project and I am proud of what our final result was."

"It is great to partner with the University of Iowa and to provide real-world learning opportunities for students. These projects benefit both companies and students. REG appreciates the enthusiasm and innovation the students brought to the project and the opportunity to interact with MBA talent," said REG's Chad Stone, Chief Financial Officer and Tippie School of Management Advisory Committee member. "Students are able to lead projects, develop their skills and provide recommendations for real-business challenges."

Renewable Energy Group, Inc. is a leading provider of cleaner, lower carbon intensity products and services and is North America's largest producer of biomass-based diesel. REG utilizes a nationwide production, distribution and logistics system as part of an integrated value chain model to focus on converting natural fats, oils and greases into advanced biofuels and converting diverse feedstocks into renewable chemicals. With 12 active biorefineries across the country, research and development capabilities and a diverse and growing intellectual property portfolio, REG is committed to being a long-term leader in bio-based fuels and chemicals.

For more than a decade, REG has been a reliable supplier of advanced biofuels which meet or exceed ASTM quality specifications. REG sells REG-9000 biomass-based diesel to distributors so consumers can have cleaner burning fuels that help diversify the energy complex and increase energy security. REG-9000 biomass-based diesel is distributed in most states in the US. REG also markets ultra-low sulfur diesel and heating oil in the northeastern and Midwestern US. For more information on REG visit our website at [www.regi.com](http://www.regi.com).

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## Renewable Energy Group: Contributing to the Cutting Edge Project Update

After the University of Iowa MBA Finance Academy student team delivered its final report on alternative markets for low value REG biofuel co-products, REG analyzed the data, conclusions, and recommendations. REG continues to perform technical, financial, and market development due diligence on the business opportunity. The final report was a fantastic starting point and foundation to continue exploring and developing bottom-line optimization opportunities to enhance the profitability of REG's biofuels platform. The collaboration between REG and UI's Finance Academy in this project was a great example of how classroom experience can translate to practical business solutions.

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## Cover the CAP Project: A Win-Win-Win Proposition

Growing populations in Arizona and other Southwestern states create increasing needs for food, water and energy. What if you could meet these needs by creating more energy, while saving water and reducing pollution all at the same time? That would be a Win-Win-Win!



First some background: The Central Arizona Project (CAP for short, <https://www.cap-az.com/>) delivers nearly 500 billion gallons of Colorado River water to central Arizona annually via a 336 miles long, open-air canal. The water is essential to agriculture, towns, cities and Native American tribes. However, to pump the water, the

CAP uses electricity from the coal-fired Navajo Energy Station, which consumes water and creates greenhouse gasses. Further, more than 21 billion gallons of water evaporate from the canal itself. Meanwhile, the Colorado River basin has been suffering through a historic drought and Lake Mead water levels are falling. Projected water use is forecast to outstrip demand as the population grows.

Michael Garvin and David Tietgen had the Win-Win-Win idea: Cover the CAP with solar panels! This would generate about 5.7 million megawatt hours of clean electricity per year, more than double the amount needed to power the canal. This could eliminate about 6 million tons of carbon dioxide emissions per year. It would also save billions of gallons of water annually by reducing evaporation and saving water currently used generating electricity. All big wins.

They began exploring covering the CAP with Pradhan Energy Projects and quickly realized that their idea would only work if it made financial sense. So, they asked an Iowa MBA Finance Academy team to investigate the financial feasibility of their idea.

The team undertook a complex financial valuation, considering construction costs, the value of the electricity and water, the possibility of electricity storage and even considered a high voltage direct current line to ship the electricity to California. They identified the most salient value drivers, recommended ways to increase financial viability, analyzed various means of financing and considered pitches to various constituencies.

To provide a useful model, the team had to learn about a multifaceted industry and market for electricity while understanding the constituencies and political processes that would be crucial for implementation. Team member Sarah Belser-Ehrlich said she “learned a lot about the energy industry in the United States. As someone who is very interested in the renewable energy industry, this was useful to learn.” The project helped her “understand the importance of making informed assumptions to create financial models that enable a project to move forward.” This understanding comes with real world projects, not canned cases.

"Our company is so grateful and pleased with the hard work that the Iowa MBA Finance Career Academy students displayed in providing us a comprehensive financial overview of our Cover the Cap project. The research and development of this finance model is exactly what our company needed to proceed with confidence a \$2 billion construction project in Arizona." David Tietgen, Project Manager.

Finance academy directory Tom Rietz said “I don’t know anywhere else that students would get experience with a project this large and complicated. The nature of the CAP forced the team to think about alternative financing and governance structures as well. The team did a great job in boiling down a complex project to identify its most important aspects.”

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## John Deere Financial: Growing the Ag and Construction Economies

John Deere Financial (JDF) is a global finance company headquartered in Johnston, Iowa. By financing agricultural dealers and farmers, they provide cash necessary for an effective global food supply chain. Similarly, by financing construction and forestry dealers and companies, they provide cash that builds our global infrastructure and housing stock. Financing in both areas is competitive in rapidly changing markets. Sometimes fresh eyes can help a company get a fresh perspective of their competitive environment.



John Deere Financial decided to engage at Tippie MBA team to find fresh ideas that would be analytically rigorous, informed by research and grounded in the practice of finance. They asked the team to analyze the markets, work through some program and policy ideas and provide recommendations regarding the dealer value proposition of JDF. The team analyzed John Deere Financial’s own data, combined it with other market data, added some cutting edge insight from the classroom and provided a thorough analysis for the company.

Sponsor Mike Matera, Senior Vice President, Global Credit, Global Trade Finance, and Region 1 John Deere Financial said “I appreciate having a ‘fresh set of eyes’ looking into our business regarding the value proposition we provide our customers. The students gave us an external view of our business with no preconceived notions of how the business should operate. That independent thought process provided us unique perspectives to challenge the status quo.”

The team members said they learned a great deal about finance companies and how to work on problems facing the company. “Prior to this project, I had not given enough consideration to the need for a financial services company to understand its market,” said team member Ben Ertl. “This project helped me learn a great deal in that area. This experience taught me a great deal about how to tell the story so the client can immediately grasp your point.”

Professor Tom Rietz, team advisor, said “I don’t know another place where students can get inside experience with a finance company that is associated with an industrial company like John Deere Financial. While this is a common arrangement, it’s not one we commonly study in finance classes because we seldom have the “inside” view it really takes to understand such a company. As a result, this was a fantastic learning opportunity for the team.”

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## Oak Ridge National Laboratory Innovation Crossroads: Active Energy Systems

Innovation Crossroads (IC) at Oak Ridge National Lab is one of the Department of Energy’s Lab-Embedded Entrepreneurship Programs that place top technical talent within national labs as entrepreneurial research fellows with the express goal of subsequently launching businesses. The program’s dual focus on early-stage R&D and entrepreneurial development enables the innovators to transform their breakthrough ideas into U.S.-based companies. This takes two things: a great idea and a great business model.

Active Energy Systems, headed by Mitchell Ishmael and Levon Atoyan, was in the first cohort invited to join IC. Their technology, an extremely efficient means of making ice for use in an energy storage system, shows great technical and business promise. Active Energy’s fundamental innovation has the potential to bring ice energy storage to important new markets ranging from cooling commercial buildings to increasing the efficiency of gas turbine power plants to utility-scale electricity storage.



To realize the potential Active Energy Systems must convince customers that the systems are worth the investment. This is where a team of Tippie MBA and Master of Finance students helped. First, they researched electricity markets and pricing cycles. Then, they developed a model based on the properties of the storage technology and specific applications. Finally, they developed a means of optimizing energy storage and recovery based on the application’s needs and energy price cycles. The optimization shows how much money is saved by shifting electricity usage from peak pricing to off-peak pricing. Ultimately, this allows Active Energy Systems to show customers the financial value of the system and target the customers with the greatest benefits.

“Team members learned some incredible technical skills as a result of this project,” said the team’s advisor, Professor Tom Rietz. “They had to understand electricity markets, turn the technology into cash flows and develop an optimization model. I’m impressed with how much this solidified their technical understanding of business and finance. Further, as will all such projects, the team learned a great deal about working together.”

Team member Madison Hauge echoed this: “I learned many things throughout this semester, especially about being a team member and actively communicating with your client about updates and concerns. The most important thing I learned was taking what a business does and using that to create cash flows to show end-user benefits. This experience stretched me in turning my finance coursework into a real application. I was able to contribute more to my learning and really get an idea of what a consultant does and why finance and financial models are so important to companies.”

According to Levon Atoyan, the CCO of Active Energy Systems: “As a startup, we are focused on creating a product that strongly outperforms the competition. But that loses its purpose without the means to clearly communicate our product’s benefits for our end-users. The Tippie team provided us with just that: a communication tool that is flexible, reliable and easy to use. The team quickly

understood what we needed and did an excellent job at developing the model while keeping us informed and up to date throughout.”



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## Project Expectations

### From Clients, we expect:

- Clear objectives with information needed for producing the output
- Periodic contact regarding project questions and progress
- Opportunity to present final work to stakeholders

### Clients can expect from us:

- A team of 4-6 students dedicating 8-10 hours each per week for 16 weeks
- Project guidance and oversight by the Finance Academy Directors
- Periodic progress reports and a formal mid-project report
- A final report and presentation of the project output and conclusions
- Confidentiality

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## Contact Information



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