Blog Post #2

By: Helena Ilic

What's the point of me separating my recyclables from my trash when billionaires are taking 7 minute private jet rides? While it may seem that one's own actions don't have a measurable impact on the environment and/or the ever growing threat of global warming, that ChatGPT query you typed out earlier today is wasting more energy than you think. On average, a ChatGPT query needs nearly 10 times as much electricity to process as a Google search. How many queries does one individual produce per day? How many individuals are doing the same thing?

After finding out just how much it takes to upkeep these large language models and learning more about the applications of AI in the business and technology world through my T&M Seminar class, my discussion topic was born: the modern day energy mosquito, a discussion on how LLMs strain the power grid.

As I'm writing this article and I take a look around the library, I see reflecting from almost every individuals' screen around me that holy glow of the ChatGPT interface asking *What can I help with?*. Case in point, everybody is firing out more queries daily than we can imagine.

Just as neurons fire in your brain to create connections and think at the cost of the breakfast you ate this morning, ChatGPT does this at the expense of a lot of electricity coming from data centers and power grids. The combination of proliferating AI data centers and the advent of electric vehicles has already supercharged demand and could potentially double it over the next few decades. However, unlike electric vehicles which haven't quite outweighed the negatives of lithium mining for their creation, generative AI's societal benefits are much more apparent despite this power cost.

Regardless of the inventive revolution we are experiencing through AI, it is undeniable that it costs a lot- both from our own pockets and to the environment. I personally felt it this past semester when my consulting group and I were tasked with developing a Retrieval Augmented Generation AI Chatbot for a ticket brokerage company's personal needs and had to pay money just for the OpenAI API Key in order to be able to use the LLM in our own code. Not to forget the cost of the Claude AI subscription my dad so kindly pays for (At the price of revoking my Netflix account monthly payment, no less).

Yet this energy problem isn't new. Estimates in 2019 found training one large language model produced as much CO2 as the entire lifetime of five gas-powered cars. Google's latest environmental report showed greenhouse gas emissions rose nearly 50% from 2019 to 2023 in part because of data center energy consumption. Just like the ticket brokerage company that came to my consulting organization, all businesses are hoping to "DIY their AI" to be better optimized for their business

needs. This topic was actually explored by our latest T&M speaker when he discussed how although we think of ChatGPT as a generalized model, it is just like Watson, the model who was only good at winning Jeopardy, in a lot of ways, as it must be tremendously tweaked or reworked in order to yield accurate results for more niche real world applications. This arts and crafts DIY frenzy simply leads to larger data centers with each new company that adds an AI feature to their website, which while negative for our power grids is a positive for another unique business case: companies like Nvidia who rather than digging for gold, decided to start selling shovels.

Looking into this issue further, I stumbled upon Jevon's Paradox,the idea that an increase in a resource's efficiency increases its overall use instead of decreasing it. Even if power grids become more robust or data centers become more efficient, if demand for AI continues to increase, improvements in efficiency will only make it easier to use more of it on a daily basis!

To serve the world or to not serve the world? Will this be the push to invest in renewable resources by big companies, solely because at this rate there isn't enough energy using our conventional methods? OpenAI's Salm Altman has begun investing in renewable energy startups, Microsoft began investing in fusion electricity, and Google has partnered with geothermal startups in order to run data centers, but only time will tell whether these investments make it to the mainstream and continue to be invested in. Now, does this mean we as individuals should stop using AI? No, but it's important to remember that each technological advancement comes at the cost of one thing or another, be that the Pyramids of Egypt being built on the backs of servants or the AI revolution exacerbating an already prompt global warming issue, remaining mindful of serving our human community is most important of all.

Blog Post #1
By: Helena Ilic

What makes people happy? Puppies, Coffee, Free Stuff- Free Food! -- In the TEDTalk "Choice, happiness, and spaghetti sauce" presented by NewYorkTimes bestselling author Malcolm Gladwell, Gladwell dives deep into just how oblivious we can be to our own desires-sure, like our food cravings- but also when it comes to our happiness. Despite this obliviousness, he argues that when given more choices, we are able to experience a heightened form of happiness.

The above is the introduction of one of my speeches I presented during my time in high school as a part of the speech team, which, like mentioned in the introduction itself, was about Malcolm Gladwell's TEDTalk, "Choice, Happiness, and spaghetti sauce." While at the time I chose this

TEDTalk in particular due to its more personable nature, I hadn't thought about it much after the fact until I was pleasantly surprised to see it this semester as one of the assigned weekly watches in my Technology & Management Seminar class. Rewatching the video reignited my curiosity in two concepts in both a personal and professional context: happiness and choice.

Going into college, I felt like I had no choice. To be more precise, I had about three outlined for me by my parents. However, once I got to college I realized just how truly gray life is and how beautiful that can be. There is no right or wrong path, there is just my path. In Gladwell's terms, there is no such thing as the "platonic dish" (a dish that tastes and looks just right), there are just an assortment of preferences around any topic, be that about what spaghetti sauce one likes or about what career and life one hopes to lead.

What choices somebody takes outlines their life, and as a result their happiness. Beyond just our assigned weekly work, the T&M class exposes us to many speakers who are industry leaders and have had to make many choices in their own lives. Through them, I gained a lot of wisdom on how to maintain a professional identity that is both professional and authentic to me, thus ensuring my happiness.

In a more professional context, many of these speakers dove deeper into what Gladwell was getting at in his TEDTalk, that gathering consumer preferences in order to predict consumer choice is a crucial part of any business or technological venture. A lot of the time the consumer themselves doesn't even know what they want, so it's the job of the company, entrepreneur, designer, and engineer to recognize a market gap or societal problem and then provide a valid solution. Something I learned from all these speakers was that in order to solve a problem, you need to work backwards from consumer opinion while also keeping an open mind. A consumer wants something that can drill a hole, not the drill itself. One of my favorite gathered quotes: If an engineer only wonders how to create a faster horse they never would have come up with the automobile.

Going one step further from just capitalizing on knowing what consumer's want, the T&M class taught me a lot about what it takes to not only make a choice, but see it to fruition. I had the opportunity to read and watch literature I otherwise wouldn't have been exposed to discussing all the "don't dos" when pursuing one's dream as well as all the reasons great ideas can get lost before making it to market. As an aspiring computer scientist, this greater knowledge of the market is invaluable information regardless of whether I end up applying my passion at a bigger technology company or through an entrepreneurial lens.

All in all, this TEDTalk along with the T&M class have provided me with more resources than I could've ever imagined in order to start analyzing what choices I have and gaining a network that can help me explore what choices for me would lead to the most personal happiness. I love the way Gladwell ends his TEDTalk too, with an interactive activity with the audience to prove his point. So, I'll end my own blog post by paraphrasing Gladwell's ending stunt.

Reader, if I asked you to come up with a type of coffee for a group of people and then asked them all to rate that coffee, the average score would be about 60/100. If, however, the group was broken into coffee preferences, and I made coffee for each of those groups, your scores would go from 60 to 75 or 78. This difference- the difference between coffee at 60 and coffee at 78- is the difference between coffee that makes you wince, and coffee that makes you deliriously happy. That is the final, and I think the most beautiful lesson. That in embracing the diversity of human beings, we will find a surer way to true happiness.