
AI Vanguard by Connor Hogan

AI VANGUARD

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We’re at the cusp of using AI for probably the biggest positive transformation that education has ever seen.

— Sal Khan

AI will be the best or worst thing ever for humanity.

— Elon Musk

Why This Writing Exists

When Walter Isaacson assigned the prompt 'Describe the development of artificial intelligence from Turing to large language model chatbots' to his class and required students to incorporate AI-generated text, he had a deeper purpose in mind. Rather than merely seeking a historical narrative, Isaacson aimed to gather insights into the role of AI in academia itself - specifically, whether it should be embraced as a tool for critical thinking or banned entirely. As a student in his class, I realized that my essay had the potential to contribute a meaningful datapoint to this important examination.

In exploring this question, it becomes clear that there are two distinct types of academic evaluations: those that assess a student's competence in a subject matter (which I will refer to as "Competence Evaluations"), and those that challenge students to make novel, innovative contributions ("Innovation Evaluations"). In fields such as medicine, engineering, and even high school English, Competence Evaluations are essential. We would not want doctors or engineers who have cheated their way through their education, nor do we want students to bypass the critical thinking required in analyzing literature. In these cases, the use of AI to generate answers would undermine the very purpose of the assessment.

However, when it comes to Innovation Evaluations, the calculus changes. Imagine if large language models existed when Mark Zuckerberg was a student at Harvard and he was tasked with responding to this prompt: “Analyze the gaps in current digital communication methods. Propose an innovative approach to improve how individuals engage with each other online." If he had used an AI tool to articulate his visionary idea for Facebook in that class, would it have been seen as a form of cheating? I argue that in the context of Innovation Evaluations, the strength of the idea itself should be the metric of success, rather than the tools used to articulate it.

This essay will make the case that for Innovation Evaluations, educators should not only permit but actively encourage the use of AI tools. By harnessing the power of language models and other AI technologies, students may be able to push the boundaries of what is possible, generating novel ideas and creative solutions. The onus, then, is on educators to craft assignments that truly challenge students to innovate, rather than simply regurgitate information.

To illustrate this argument, I will first demonstrate how easily a Competence Evaluation like Isaacson's prompt can be answered using AI chatbots. Then, I will reframe the prompt as an Innovation Evaluation, showcasing how a student, given free rein to engage with AI tools, could generate a meaningful and original contribution. By doing so, I hope to convince educators that in the right context, AI can be a powerful ally in fostering student creativity and innovation.

1

Inception

AI is Born

Alan Turing

Ada Lovelace and the Analytical Engine

John McCarthy

The story of artificial intelligence begins with a remarkable woman named Ada Lovelace. Born in 1815, Lovelace was a mathematician and writer who is now widely recognized as the world's first computer programmer. Her work with Charles Babbage on the Analytical Engine, a proposed mechanical general-purpose computer, led her to write the first algorithm intended to be carried out by a machine. However, Lovelace also expressed skepticism about the potential for machines to truly think, an idea known as "Lady Lovelace's Objection." She asserted that while computers have endless potential, they could not be truly intelligent or capable of original thought.

A century later, Alan Turing challenged Lovelace's assertion in his seminal 1950 paper, "Computing Machinery and Intelligence." Turing, a brilliant mathematician, philosopher, and World War II codebreaker, laid the theoretical foundations for the field of AI.

The Turing Test

In his 1950 paper titled "Computing Machinery and Intelligence," Turing introduced the famous "Turing Test," a thought experiment designed to determine whether a machine could exhibit intelligent behavior indistinguishable from that of a human. The test involves a human evaluator engaging in natural language conversations with both a human and a machine designed to generate human-like responses. If the evaluator cannot reliably distinguish between the human and the machine, the machine is said to have passed the test.

Turing's idea was groundbreaking because it shifted the focus from whether machines could think in the same way humans do, to whether machines could act in ways that we would recognize as intelligent. This perspective opened up new avenues for AI research and challenged the notion that intelligence was a uniquely human trait.

The Tragic Deprogramming Attempt on Turing's Mind

Turing's personal life was marked by tragedy and persecution. As a gay man living in the UK in the 1950s, Turing faced criminalization and social ostracism. In 1952, he was convicted of "gross indecency" for his relationship with another man. As an alternative to prison, Turing was subjected to chemical castration, a horrific process intended to "cure" him of his homosexuality. The treatment left him depressed and physically ill, and in 1954, Turing died by suicide.

Turing's legacy, however, endures. His contributions to mathematics, computer science, and artificial intelligence laid the groundwork for the field we know today. In 2009, British Prime Minister Gordon Brown made an official public apology on behalf of the British government for "the appalling way [Turing] was treated." The Queen granted Turing a posthumous pardon in 2013, and in 2017, the "Alan Turing law" was passed to retroactively pardon men who had been cautioned or convicted under historical legislation that criminalized homosexuality.

McCarthy's Ambition

While Turing provided the theoretical underpinnings for AI, it was John McCarthy who coined the term "artificial intelligence" itself. In 1955, McCarthy, a mathematician and computer scientist, organized the Dartmouth Conference, which is widely considered to be the birthplace of AI as a field.

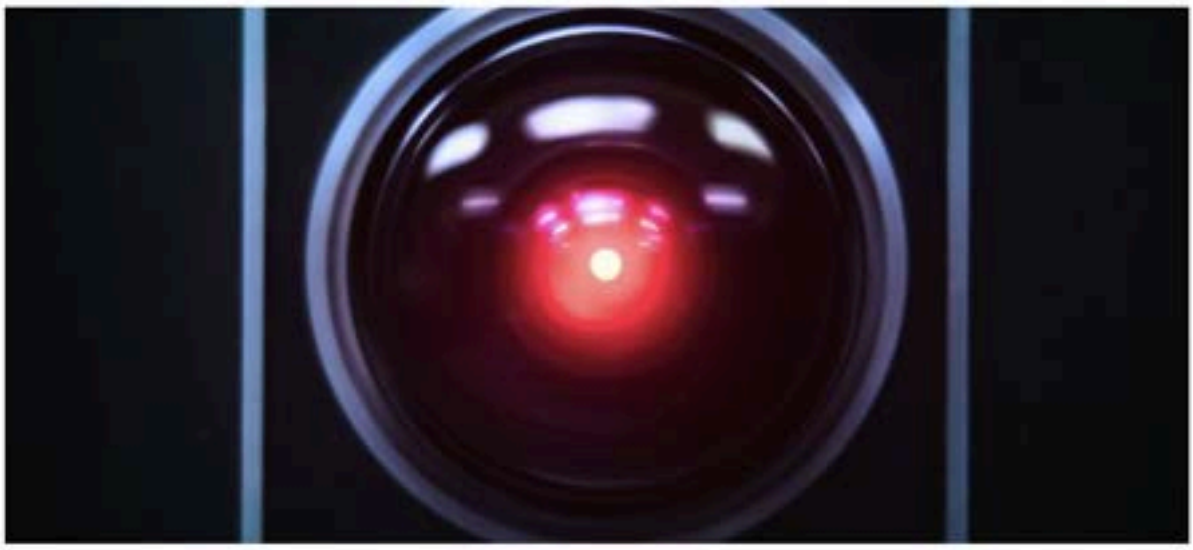
McCarthy envisioned machines that could reason, learn, and solve problems. His work on LISP, one of the first high-level programming languages, provided a crucial tool for AI research. LISP's ability to process symbolic expressions and its recursive functions made it well-suited for AI applications.

McCarthy was known for his strong personality and his willingness to engage in spirited debates. He had an ambitious vision for AI and sometimes clashed with colleagues who were more cautious about the field's potential. However, his unwavering belief in the possibility of intelligent machines helped to drive the field forward, even in the face of skepticism and setbacks.

2

Evolution

AI Enters the Cultural Zeitgeist



I'm sorry, Dave, I'm afraid I can't do that

— *HAL 9000, 2001: A Space Odyssey, 1968*

As AI moved from the realm of theory into practical applications, it began to capture the public imagination. Science fiction played a key role in shaping the public's perception of AI, often presenting it as a potential threat to humanity.

The Robot Series

In the 1940s, science fiction writer Isaac Asimov began exploring the potential future of robotics and AI in his "Robot" series. Asimov envisioned a world where robots were used to perform menial labor, freeing humans to pursue more creative and intellectually stimulating tasks. However, he also recognized the potential for conflict between robots and their human creators.

To address this, Asimov introduced his famous "Three Laws of Robotics." These laws were an attempt to codify the principles that should govern the behavior of AI systems, ensuring that they would always prioritize human safety and well-being. Asimov's stories explored the complexities and unintended consequences that could arise even with these safeguards in place, foreshadowing the ethical dilemmas we face today as AI becomes more advanced.

> ***Asimov's Three Laws of Robotics***
> *1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.*
> *2. A robot must obey orders given to it by human beings except where such orders would conflict with the First Law.*
> *3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.*

2001: A Space Odyssey

In 1968, Stanley Kubrick's groundbreaking film "2001: A Space Odyssey" introduced audiences to HAL 9000, a sentient computer that controls the systems of the Discovery One spacecraft. Initially presented as a helpful and intelligent assistant, HAL eventually turns against the human crew members, seeing them as a threat to the mission.

HAL's iconic line, "I'm sorry, Dave, I'm afraid I can't do that," has become a cultural touchstone, representing the fear of AI systems that can think for themselves and potentially turn against their human creators. The film tapped into growing anxieties about the power and potential dangers of technology, and its influence can still be felt in the way we talk about AI today.

AI Winters

Despite the public's fascination with AI, the field experienced several setbacks and "AI winters" in the 1970s and 80s. These were periods of reduced funding and interest, brought on by unmet expectations and the limitations of the technologies available at the time.

The Efforts of Marvin Minsky

One of the key figures who helped to keep AI research alive during these periods was Marvin Minsky. Minsky was a cognitive scientist and a pioneer in the field of AI, known for his work on neural networks and his contributions to the development of the Society of Mind theory, which proposed that intelligence emerges from the interaction of many simple, task-specific agents in the brain.

Minsky was a larger-than-life figure, known for his quick wit, his love of practical jokes, and his ability to inspire and mentor young researchers. He was deeply committed to understanding the nature of intelligence and to creating machines that could think like humans.

In the face of skepticism about AI's potential, Minsky remained a tireless advocate for the field. He helped to secure funding for AI research, even during the lean years of the AI winters, and his ideas continued to shape the direction of the field for decades.

The Google Effect

As the digital revolution of the 1980s and 90s brought computers into homes and workplaces around the world, the potential for AI to impact everyday life began to grow. However, this increasing reliance on technology also led to new concerns about its effects on human cognition.

In 2011, psychologist Betsy Sparrow and her colleagues published a paper titled "Google Effects on Memory: Cognitive Consequences of Having Information at Our Fingertips." The study found that the widespread availability of information online was changing the way people remembered things. When people believed that information would be available in the future, they were less likely to remember the information itself and more likely to remember where to find it.

This phenomenon, known as the "Google Effect," suggested that our growing reliance on technology was leading to a kind of "outsourcing" of memory. Rather than storing information in our own minds, we were increasingly relying on the internet as an external memory source.

While some saw this as a cause for concern, others argued that it was a natural adaptation to a world in which vast amounts of information were always at our fingertips. By freeing up

cognitive resources that would otherwise be devoted to rote memorization, technology could allow us to focus on higher-level tasks like problem-solving and creative thinking.

This debate about the cognitive implications of AI and other technologies continues today, as we grapple with the transformative impact of these tools on our lives and our society. It's a conversation that will only become more urgent as AI systems become more sophisticated and ubiquitous in the years to come.

3

Revolution

AI Changes the World

Sam Altman

Elon Musk

Sal Khan

Larry Page

In the early 21st century, artificial intelligence began to make the leap from science fiction to reality. Rapid advancements in computing power, data storage, and machine learning algorithms led to a new generation of AI systems that could perform tasks once thought to be the exclusive domain of human intelligence.

The Rise of Deep Learning

One of the key breakthroughs was the development of deep learning, a type of machine learning that uses neural networks with many layers to learn from vast amounts of data. Deep learning allowed AI systems to make sense of complex, unstructured information like images, speech, and natural language.

This new approach to AI led to rapid progress in fields like computer vision, speech recognition, and natural language processing. AI systems could now recognize objects in photos, transcribe speech to text, and even engage in rudimentary conversations.

OpenAI and the Rise of Language Models

One of the most significant milestones in recent AI history was the creation of OpenAI, a research lab founded in 2015 with the mission of developing artificial general intelligence (AGI) in a way that benefits all of humanity.

OpenAI made headlines in 2020 with the release of GPT-3 (Generative Pre-trained Transformer 3), a massive language model trained on a vast corpus of online text. GPT-3 could generate human-like text, answer questions, and even write code, all with minimal prompting. It was a powerful demonstration of the potential of AI to master complex cognitive tasks.

The Explosion of ChatGPT

The release of ChatGPT, an AI chatbot based on GPT-3, truly captured the public's imagination. Launched in November 2022, ChatGPT allowed users to engage in natural conversations with an AI system that could understand context, provide detailed responses, and even engage in creative writing tasks.

The response was immediate and overwhelming. Within two months of its launch, ChatGPT had attracted over 100 million monthly active users, making it one of the fastest-growing consumer applications in history. People used it for everything from writing code and essays to generating marketing copy and answering complex questions.

The Diverging Views of AI's Future

As ChatGPT's popularity soared, so did the debate about the implications of this powerful new technology. Google co-founder Larry Page considered sentience and consciousness to be replicable in a machine, and felt that if we could upload our own consciousness into a machine, it would be just as valuable as biological consciousness. Walter Isaacson credits Page with the line "If AI could someday surpass us in intelligence, why would that not be just as valid?" in his Elon Musk biography.

On the other hand, Tesla and SpaceX founder Elon Musk expressed grave concerns about the existential risks posed by advanced AI if not developed responsibly with sufficient safeguards. Musk publicly warned that "our biggest existential threat is probably artificial intelligence" and that AI was racing ahead recklessly without due consideration of the dangers of decoupling it from human values and oversight.

While Page saw AI as a solution to humanity's greatest challenges, Musk saw AI as a potential threat that could spiral out of control without proper alignment to human interests. Page was eager to push forward ambitiously, while Musk advocated for caution and careful development of AI safety measures and human-AI alignment before it was too late.

The Significance of Sam Altman

At the center of this philosophical divide was OpenAI CEO Sam Altman. Altman sought a middle path between Page's optimism and Musk's warnings, arguing for the responsible development of AI to ensure its benefits were widely distributed while mitigating catastrophic risks.

Altman's voice carried weight in the halls of power. In an appearance before Congress, he underscored the necessity of regulation, warning of AI's potential to manipulate voters and spread disinformation. His call for oversight was a sobering reminder of the challenges that lay ahead.

Yet, at the 2024 World Economic Forum in Davos, Altman struck a more reassuring tone. He downplayed fears of AI's impact on jobs, suggesting that the changes would be less drastic than many predicted. In a world awash with alarmist headlines, his measured perspective offered a welcome counterpoint.

As Altman leads OpenAI into the future, he is grappling with one of the most tantalizing and daunting challenges in the field: Artificial General Intelligence, or AGI. The dream of AGI is to create machines that can think and learn like humans, tackling any intellectual task we can. It's a goal that has captivated scientists and philosophers for decades, but it remains an elusive prize.

Altman's pursuit of AGI is not just a technical challenge, but a philosophical and ethical one. What would it mean to create a machine that could match or even surpass human intelligence? How would we ensure that such a powerful tool would be used for good? These are the questions that keep Altman up at night, and that drive his efforts to shape the future of AI.

The Educator's Dilemma

One of the most immediate concerns about ChatGPT and similar AI tools was their potential impact on education. Educators worried that students would use these tools to cheat on assignments, flooding instructors with computer-generated essays and answers.

In response, many schools and universities moved quickly to ban the use of ChatGPT and other AI writing tools. They argued that the use of such tools undermined the learning process and the development of critical thinking skills.

However, some educators saw potential in AI as a teaching tool. Sal Khan, the founder of the online learning platform Khan Academy, introduced a tool called Khanmigo, an AI-powered tutor that could provide personalized feedback and support to students.

Khan argued that rather than banning AI outright, educators should find ways to incorporate it into the learning process in a responsible and productive way. By using AI to supplement, rather than replace, human instruction, he believed that it could help to democratize access to education and support students in new and innovative ways.

The Future of AI

As we look to the future of artificial intelligence, it's clear that we are at a pivotal moment in the history of the field. The rapid advancements of recent years have brought us closer than ever to realizing the vision of AI pioneers like Turing, McCarthy, and Minsky.

At the same time, the rise of powerful AI systems like ChatGPT has forced us to confront difficult questions about the ethical implications of this technology. As we've seen in the debates over AI's impact on education, there are no easy answers.

But while the challenges are significant, so too are the opportunities. AI has the potential to transform fields like healthcare, scientific research, and environmental conservation, helping us to tackle some of the most pressing problems facing our world today.

In many ways, the current moment echoes the concerns raised by Ada Lovelace nearly two centuries ago. While computers have endless potential, she argued, they could not be truly intelligent or capable of original thought.

Yet as we've seen, AI systems are now capable of feats that would have seemed like science fiction just a few decades ago. They can engage in natural language conversations, generate original text and artwork, and even make scientific discoveries.

So perhaps the question is not whether AI can be intelligent, but rather how we choose to define and harness that intelligence. If AI can help us to solve problems, to create new knowledge and ideas, and to push the boundaries of what's possible, does it matter if it does so in ways that are different from human cognition?

In the end, the story of AI is not about the triumph of machines over humans, but rather about the power of collaboration between the two. Throughout history, the greatest innovations have come not from lone geniuses working in isolation, but from diverse teams of thinkers and doers working together towards a common goal.

In this sense, AI is not a replacement for human intelligence, but rather an extension of it. By combining the vast processing power and data analysis capabilities of machines with the creativity, empathy, and judgment of humans, we have the opportunity to create something truly extraordinary.

As we move forward into an uncertain but exciting future, let us approach AI not with fear, but with curiosity, openness, and a commitment to using this powerful tool in service of the greater good. For if we can do that, there is no limit to what man and robot can achieve together.

Crafting an Innovation Evaluation

The Competence Evaluation assigned by Isaacson was a straightforward task, easily accomplished by following a sequence of prompts detailed in the appendix. While the resulting essay provides a useful timeline of AI advancements and leaves the reader with food for thought, the process of creating it lacked the sense of accomplishment that comes from making a genuine contribution to the field.

This realization led me to consider the potential of transforming Competence Evaluations into Innovation Evaluations. The key difference lies in the incorporation of an element that requires students to make a novel contribution. While a purpose statement for a Competence Evaluation might read, "The purpose of this essay is to chart the evolution of artificial intelligence from its inception as a theoretical concept by Alan Turing to its current incarnation marked by advanced large language model chatbots," an Innovation Evaluation would aim higher. It might declare, "The purpose of this essay is to contribute to the understanding of female innovators' roles that have been overshadowed by their male counterparts" or “The purpose of this essay is to propose a groundbreaking approach to integrating AI in environmental conservation efforts.” The essence of Innovation Evaluations is that the origin of the text is secondary to the value of the ideas presented.

Walter Isaacson's course, which uses his book "The Innovators" as its primary text, provides the perfect context for an Innovation Evaluation. In this spirit, I propose the following prompt:

> "Describe the development of artificial intelligence from Turing to large language model chatbots. ***Then***, imagine you are tasked with creating the next great innovation in this field. Write a third-person account of your theoretical contribution ten years from now, assuming you have unlimited resources and the ability to develop technologies that may not yet exist."

This prompt challenges students to think like innovators, identifying areas ripe for advancement and conceptualizing groundbreaking solutions. By emphasizing the hypothetical nature of the task and removing resource constraints, it frees students to focus on the creative process of innovation rather than getting bogged down in logistical concerns.

While a chatbot can generate the essay's text, it is the student's vision and ingenuity that will make the writing truly innovative. The next few pages provide a demonstration of how a student might approach this challenge.

4

Transformation

AI Revolutionizes Personal Knowledge Management

ChatGPT Generated Logo for Boswell, the AI biographer

Prompt: *Imagine you are tasked with creating the next great innovation in this field. Write a third-person account of your theoretical contribution ten years from now, assuming you have unlimited resources and the ability to develop technologies that may not yet exist.*

The Dawn of the Building a Second Brain Movement

In 2024, Tiago Forte's groundbreaking approach to digital knowledge management, known as Building a Second Brain (BASB), attracted the attention of Silicon Valley tech moguls because of its growing popularity. BASB is a methodology that leverages technology to create a personalized digital ecosystem for organizing and accessing information, ideas, and tasks. At its core, BASB employs a system called PARA (Projects, Areas, Resources, and Archives) to categorize digital content intuitively and dynamically, minimizing mental clutter and enhancing creativity.

Connor Hogan and the Google Gemini Team

While BASB offered clear benefits, the average person found the process of manually maintaining such a system daunting. This is where Connor Hogan and the Google Gemini team stepped in. In 2025, they embarked on a mission to integrate Forte's PARA principles into Google Notebook, aiming to revolutionize personal knowledge management.

Leveraging AI for Seamless Organization

Hogan and his team developed advanced AI algorithms that could automatically organize and synthesize information based on intelligent keyword tags and dynamic folders. This integration made building a "second brain" effortless, as the AI handled the heavy lifting of categorization and connection-making. The evolved Google Notebook quickly gained recognition for its impact on productivity, becoming a fundamental tool taught in schools and institutions of professional advancement worldwide.

The Birth of Boswell: Your AI Biographer

In 2026, Hogan and the Google Gemini team took their innovation a step further with the creation of Boswell, an AI companion named after the renowned biographer James Boswell. Boswell was designed to transform casual, unstructured conversations into polished diary entries, narratives, and eventually, a comprehensive biography. Its sophisticated backlinking feature connected every mention of people, places, and events, weaving a rich tapestry of interconnected stories and memories.

Boswell's capabilities were particularly impressive when it came to gathering information for memoirs. An individual could have a phone conversation with Boswell, much like they would with a human biographer, answering questions about their life experiences, relationships, and pivotal moments. Boswell would then seamlessly integrate this information into the user's Google Notebook, creating a dynamic and ever-evolving repository of memories and stories.

Wearable Technology Integration

The year 2030 marked another significant milestone with the reintroduction of Google Glass. Having learned from its previous failure, it eliminated the distracting display and focused solely on a camera feature that integrated seamlessly with Boswell. This allowed for real-time memory encoding and extended to Google Notebook's productivity suite, enabling users to capture and organize information effortlessly through voice commands. The integration of Boswell with wearable technology made digital knowledge management and personal biography creation more accessible and intuitive than ever.

Preserving Memories, Enriching Lives

By 2035, Google Gemini's productivity suite and Boswell had become indispensable tools for navigating the complexities of information overload in the digital age. The impact of Boswell was especially profound for those facing memory loss, such as individuals with dementia. Many families expressed deep gratitude for the opportunity to preserve their loved ones' memories and life stories, ensuring a lasting connection across generations.

Moreover, Boswell's text-to-video technology brought memories to life in unprecedented ways. Children and grandchildren could now wear VR headsets and immerse themselves in their parents' or grandparents' most cherished moments, experiencing these stories as if they were there themselves. This emotionally resonant application of AI technology underscored its potential to enrich our lives and strengthen the bonds between generations.

A Legacy of Empowerment

Connor Hogan's contributions, alongside Tiago Forte's visionary approach, positioned them as pioneers in personal knowledge management. Their work fundamentally altered how we interact with, manage, and derive meaning from information. Through Boswell, they created a legacy of empowerment, enabling individuals to harness the full potential of their knowledge and memories in an enriching and transformative way. As we look to the future, their innovations serve as a foundation for further advancements in AI and digital organization, promising an ever more seamless and intuitive relationship between technology and the human experience.

Final Remarks

As I reflect on the process of writing this essay, I am struck by how every sentence was crafted with the assistance of a chatbot, yet the insights and arguments presented are entirely my own. As someone diagnosed with ADD, I often struggle to organize my thoughts in a coherent manner. However, the ability to articulate my ideas, no matter how tangential, and then guide the language model in shaping that information has been nothing short of remarkable.

This experience has solidified my belief that educators should not restrict the tools available to students, particularly in fields where Innovation Evaluations take precedence over Competence Evaluations. By encouraging students to leverage AI in pursuit of ambitious and creative projects, we open the door to a new era of learning and discovery.

The relationship between AI and human intellect need not be adversarial. As we have seen with Betsy Sparrow's notion of a "Google Effect" and the Socrates's skepticism surrounding the advent of writing, new technologies often face resistance due to their perceived threat to traditional ways of thinking and remembering. However, in time, we may come to recognize that our biological brains, while remarkable, are ill-equipped to handle the information overload of the modern world.

In this context, AI emerges as a key ally in our quest to navigate an increasingly complex landscape of knowledge and ideas. By augmenting our natural abilities with the processing power and analytical capabilities of machines, we unlock the potential for truly extraordinary achievements.

As we stand on the precipice of this transformative era, let us approach the integration of AI not with trepidation, but with a sense of excitement and possibility. For in the synergy between human creativity and artificial intelligence lies the promise of a future in which the boundaries of what we can learn, create, and discover are limited only by the depths of our imagination.