SYMBIOSIS OF HUMAN AND ARTIFICIAL INTELLIGENCE AND ITS IMPACT ON HUMAN PRODUCTIVITY WITH GLOBAL CONTEXT

[1]SHABASH KALANDAR S, [2]SATYAJIT RAY, [3]SUJATHA S, [4]SUFIYA TARANNUM

[1]ASSISTANT PROFESSOR, [2]HEAD OF DEPARTMENT (COMPUTER SCIENCE),
[3]HEAD OF DEPARTMENT (ENGLISH), [4]STUDENT
SDC College Kolar.

***Abstract*- In this era of booming Artificial intelligence and existing fear of its dominance on Human race in coming future, why not to go a step forward and appreciate the idea of Symbiosis of Human and Artificial intelligence which finds its ground by NEURALINK Corporation, an American neurotechnology company that is developing implantable Brain-Computer interfaces.**
The NEURALINK chip is a piece of technology described as "Fitbit in skull with tiny wires" that is hoped to operate devices like phones and computers using thoughts. The long-term ambition is for technology to allow humans to compete with ARTIFICIAL INTELLIGENCE.
The aim of this research work is to throw a light on impact of Symbiosis of Human and Artificial intelligence and its impact on Human productivity with primary and secondary data & global context with.

***Keywords*: SYMBIOSIS, NEURALINK, ARTIFICIAL INTELLIGENCE AND HUMAN PRODUCTIVITY.**

INTRODUCTION:

In this era of booming Artificial intelligence and existing fear of its dominance on Human race in coming future, why not to go a step forward and appreciate the idea of Symbiosis of Human and Artificial intelligence which finds its ground by NEURALINK Corporation, an American neurotechnology company that is developing implantable Brain-Computer interfaces.
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The chip NEURALINK is developing is about the size of a coin, and would be bedded in a cases' cranium. From the chip an array of bitsy cables, each roughly 20 times thinner than a mortal hair, addict out into the case's brain.
The cables are equipped with 1,024 electrodes which can both cover brain exertion and, theoretically, electrically stimulate the brain. This data is all transmitted wirelessly via the chip to computers where it can be studied by experimenters.
The way the robot would work is it would use a stiff needle punch the flexible cables expiring from a NEURALINK chip into a person's brain, a bit like a sewing machine. Another intriguing aspect of NEURALINK is the way it's approaching the development of its technology. Rather than counting on traditional styles of brain- machine interface development, similar as placing electrodes on the face of the brain, NEURALINK is working on developing ultra-thin, flexible electrodes that can be implanted deep in the brain without causing significant damage. This could potentially make the technology much safer and further effective than former brain- machine interfaces.

LITERATURE OF REVIEW

➢ NEURALINK, an innovative gadget developed by Elon Musk's NEURALINK Corporation, has the potential to revolutionize the field of neuroscience. When implanted in the brain, it promises to address neurological disorders, restore health, and enhance cognitive abilities. If successful, NEURALINK could enable a connection between humans and machines, leading to advancements such as chemical telepathy. With plans to begin treating patients within a year and achieve a full brain interface in 25 years, Elon Musk aims to eliminate neurological conditions and restore patients to full health. By controlling brain signals, this technology has the potential to eliminate mood disorders and reshape our understanding of the brain's relationship with the world around us (Vasishta, 2020). **(Title: *Why NEURALINK will Change Humanity Forever? * By Institute of Lifelong Learning and Development Studies, Chinhoyi University of Technology, ZIMBABWE (2020))**

➢ Elon Musk's NEURALINK technology represents a glimpse into the future of direct-to-consumer (DTC) Neurotechnologies, offering unprecedented possibilities beyond the current state of the art. While the potential to merge our minds with artificial intelligence computers is exciting for some neuroscientists, it also raises legal and ethical concerns. The DTC Neurotechnologies market, including NEURALINK, is expanding rapidly, with a projected value surpassing 3 billion USD by 2020. However, NEURALINK stands out due to its invasive nature, unlike many other non-invasive DTC Neurotechnologies classified as wellness devices. This invasiveness brings significant legal and ethical challenges, including concerns about privacy, security, long-term effects, and regulatory oversight. To ensure the responsible development and use of DTC Neurotechnologies, careful consideration and ethical frameworks are necessary. **(Title: *NEURALINK: The Ethical 'Rith Matic of Reading and Writing**

to the Brain* by Tal Dadia, Harry Radzyner Law School IDC Herzliya, Yale University and The Zvi Meitar Institute for Legal Implications of Emerging Technologies Interdisciplinary Center (IDC) (2019))

- Brain-machine interfaces (BMIs) and NEURALINK's invasive BMI technology. BMIs have therapeutic applications for spinal cord injuries, epilepsy, Parkinson's, and autism. They also have social and cognitive uses like learning, enhancement, behavior control, and mind-reading. It evaluates future possibilities of BMIs, including brain control and fusion with AI, highlighting human impacts and ethical concerns like loss of self and erosion of skills. It explores transhumanism and its potential with artificial general intelligence. However, BMIs are still in early stages, and research must address their effects and critical issues urgently. **(Title: *NEURALINK and Beyond Challenges of Creating an Enhanced Human∗ by Dimitri Gurtner Swiss Joint (2021))**

STATEMENT OF PROBLEM

In this era of 21st century it would not be wrong if we tell "Todays updated technology will be tomorrows outdated technology". It is been noteworthy that innovation and inventions are taking place rapidly one by one and technology is replacing human in every other field. The fusion of technology with human intervention been a good step towards symbiosis where it leads technology involve human rise in productivity.

But it is also observed that whenever technology has pros it also involves some cons so this paper tries to find out actual status of technological intervention in the form of NEURALINK and its impact towards human productivity.

OBJECTIVE OF STUDY

1. To study Symbiosis of Human and Artificial Intelligence and its status.
2. To Analyse Symbiosis of Human and Artificial Intelligence and extract its aid towards human productivity.
3. To make suggestions in the form of recommendation if any.

Research Methodology

This Research article contain Conceptual framework of research design based on Case studies as well as theories with special reference to current issues collected through secondary data source with the scope of symbiosis of human and artificial intelligence and its impact on human productivity, for finding the exact problem and prospect of Current Status and Suggest Some Remedial Measures.

As it's rightly said that "Wise Men Learn From Mistakes of Others".

ANALYSIS AND FINDINGS

Enhanced Communication Abilities:

NEURALINK has the potential to revolutionize communication by enabling direct brain-to-brain communication. For example, in a study conducted at the University of Washington, researchers used a similar technology to connect the brains of two individuals, allowing them to communicate non-verbally.

Restoring Sensory Function:

NEURALINK holds promise in restoring sensory functions for individuals with disabilities. In a case study conducted at the Feinstein Institutes for Medical Research, a patient with spinal cord injury was able to regain partial control of his paralyzed hand using a brain-computer interface.

Improved Mental Health Treatments:

NEURALINK can offer new possibilities for treating mental health conditions. A study published in Nature Communications demonstrated the use of similar technology to alleviate symptoms of depression in mice by precisely stimulating specific neural circuits.

Motor Function Restoration:

NEURALINK has the potential to restore motor functions for individuals with conditions like paralysis. A study conducted at Stanford University demonstrated the use of a brain-computer interface to restore movement in paralyzed limbs of monkeys, offering hope for human applications.

Treating Neurological Disorders:

NEURALINK may provide new treatment avenues for neurological disorders such as epilepsy and Parkinson's disease. In a clinical trial conducted at the University of Melbourne, a brain implant was used to successfully reduce seizures in patients with epilepsy.

Advancing Prosthetics:

NEURALINK can significantly advance the field of prosthetics by allowing for direct control of artificial limbs using neural signals. A notable case is the "Luke Arm," a prosthetic arm developed by the Defense Advanced Research Projects Agency (DARPA) that enables amputees to perform complex movements by connecting to the user's neural signals.

Restoring Speech Abilities:

NEURALINK holds the potential to restore speech capabilities for individuals with conditions that affect speech production. Researchers at the University of California, San Francisco, demonstrated the ability to decode and generate speech from neural activity, offering hope for individuals with speech impairments.

Understanding Brain Function:

NEURALINK can provide valuable insights into how the brain works, leading to advancements in neuroscience. A notable case study is the "Brain Observatory" project at the Allen Institute for Brain Science, which aims to map and understand neural circuits using similar technologies.

Long-Term Health Monitoring:

NEURALINK can enable continuous monitoring of brain activity, facilitating early detection and intervention in conditions such as epilepsy and brain tumors. The Brain Gate clinical trial conducted at Brown University demonstrated the use of a brain-computer interface for long-term neural activity monitoring in patients with paralysis.

Invasive Procedure and Risks:

One of the main challenges with NEURALINK's technology is that it requires a surgical procedure to implant the device into the brain. This invasive procedure carries inherent risks, such as the potential for infection or damage to surrounding brain tissue. A case study illustrating this disadvantage could involve a patient experiencing complications or adverse effects following the NEURALINK implantation surgery.

Ethical Concerns:

The use of brain-machine interfaces raises significant ethical concerns. Privacy and security of personal data collected by the device could be compromised. Additionally, there could be ethical dilemmas related to the potential manipulation or control of individuals' thoughts or behaviors. A case study might involve a debate over the ethical implications of NEURALINK technology, with concerns raised by privacy advocates and ethicists.

Accessibility and Equity:

NEURALINK's technology is likely to be expensive and accessible only to a privileged few, at least in the early stages. This could further exacerbate existing inequalities in healthcare access and lead to a "digital divide" between those who can afford such enhancements and those who cannot. A case study could focus on the socioeconomic disparities created by the commercialization of NEURALINK, highlighting how it contributes to unequal access to advanced technology.

Dependency and Loss of Autonomy:

NEURALINK's brain-machine interface has the potential to significantly augment human capabilities. However, this could also lead to a loss of autonomy if individuals become overly dependent on the technology. A case study might involve an individual who becomes reliant on the NEURALINK device for basic cognitive functions, raising questions about the impact on personal agency and the potential loss of essential human skills.

SUGGESTIONS
(MIRACLE MODEL)

Miniaturization and Biocompatibility:

Focus on miniaturizing the NEURALINK device to make it less invasive and more comfortable for users. Ensure the biocompatibility of the device by using materials that are safe for long-term implantation in the human body. Optimize the design to minimize the risk of infection, rejection, or adverse reactions.

Interface Development:

Improve the interface between the NEURALINK device and the brain to enable seamless communication. Develop high-resolution neural sensors to capture and interpret brain signals accurately. Refine the algorithms and software to decode and interpret the neural data, allowing for precise control and interaction.

Research and Development:

Invest heavily in research to understand the intricacies of brain-machine interfaces (BMIs) and neural engineering. Collaborate with experts in neuroscience, neurology, and related fields to ensure a comprehensive understanding of the brain and its functions. Conduct experiments and clinical trials to validate the safety, efficacy, and long-term viability of the technology

Accessibility and Affordability:

Work towards making NEURALINK accessible to a broader population, including people with disabilities. Strive to reduce the overall cost of the device, making it affordable for a wider range of individuals. Explore partnerships with healthcare providers, insurance companies, and government agencies to facilitate coverage and reimbursement for Neuralink procedures.

Collaboration and Openness:

Foster collaboration with the scientific community, universities, and research institutions to accelerate advancements in brain-machine interfaces. Share research findings, methodologies, and best practices to facilitate knowledge exchange and progress in the field. Engage with potential users, patients, and advocacy groups to incorporate their feedback and needs into the development process.

Long-Term Vision and Applications:

Continuously refine the technology to expand its potential applications, such as restoring sensory functions, treating neurological disorders, or enhancing cognitive abilities. Foster innovation by creating an ecosystem that encourages developers, researchers, and entrepreneurs to build upon the Neuralink platform. Communicate the long-term vision of Neuralink, emphasizing its potential to improve human health and quality of life.

Ethical Considerations and Regulatory Compliance:
Ensure the highest standards of ethical conduct in research, experimentation, and data privacy. Engage with regulatory bodies to understand and comply with the legal requirements for medical devices and brain interfaces. Establish clear guidelines and protocols for the ethical use of Neuralink, including informed consent, privacy protection, and responsible data sharing.

CONCLUSION:

As it is rightly said “Technology is not just a tool, but a bridge that connects humanity’s dreams to reality”. This research article analyzed the symbiosis of Human and Artificial Intelligence which leads to some of the drastic changes implemented for the benefit of humanity and productivity of human can be increased at its best. But it is also noted that some of the flaws are present which makes its virtue lesser. On other hand these are manageable and turned towards positivity through efforts and suggestions given in the article. As it is rightly said “Every success was once a dream”, so let the dream of symbiosis be the success in the future upcoming days. This research is a tiny effort made in to explore wider in the wider area of symbiosis. But it is been a step towards modernization of present and future era with technological perspective.

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