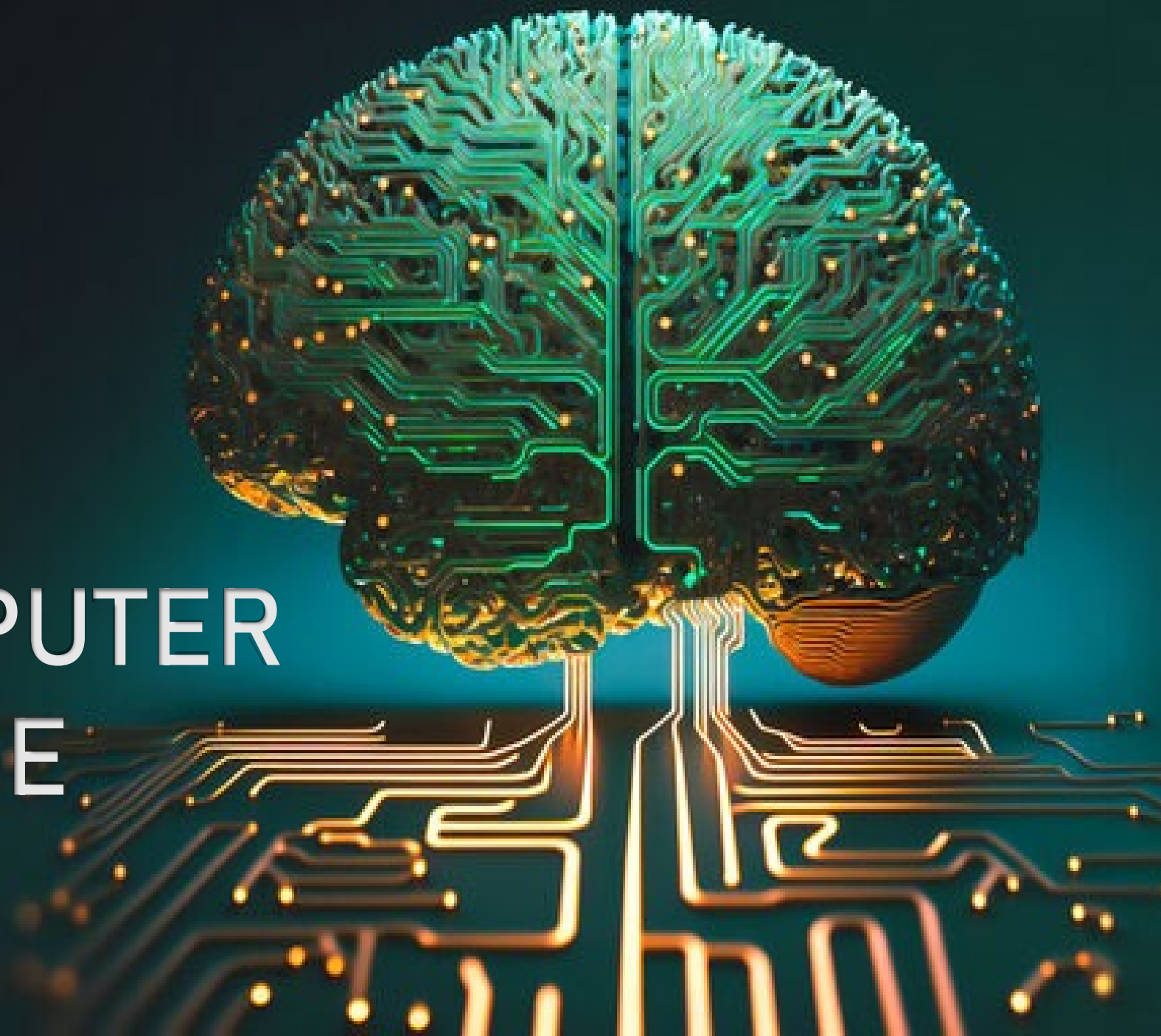
BRAIN – COMPUTER INTERFACE

GROUP 04



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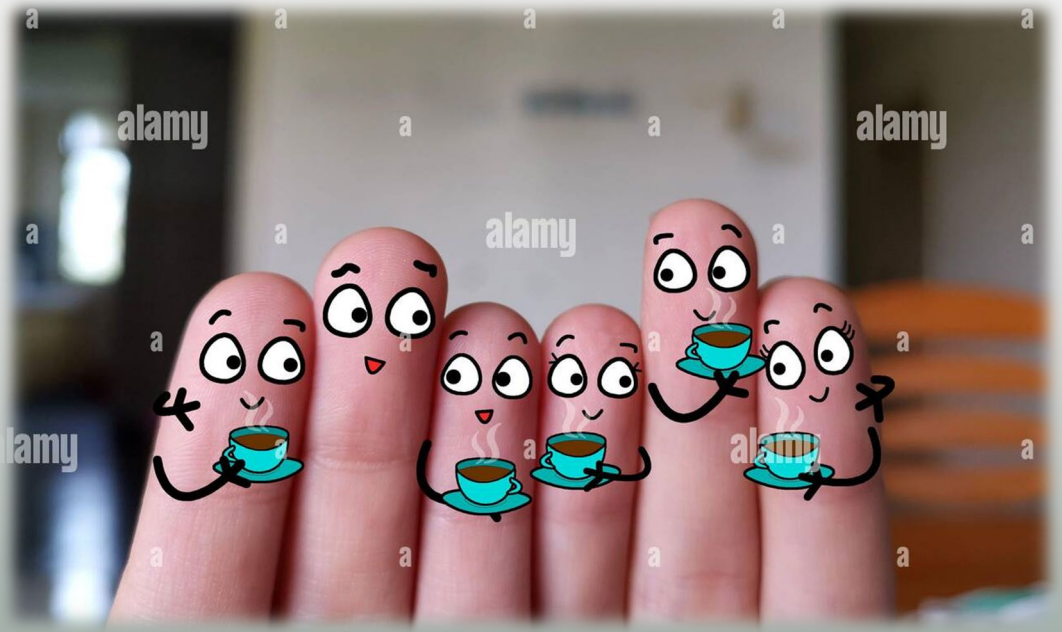

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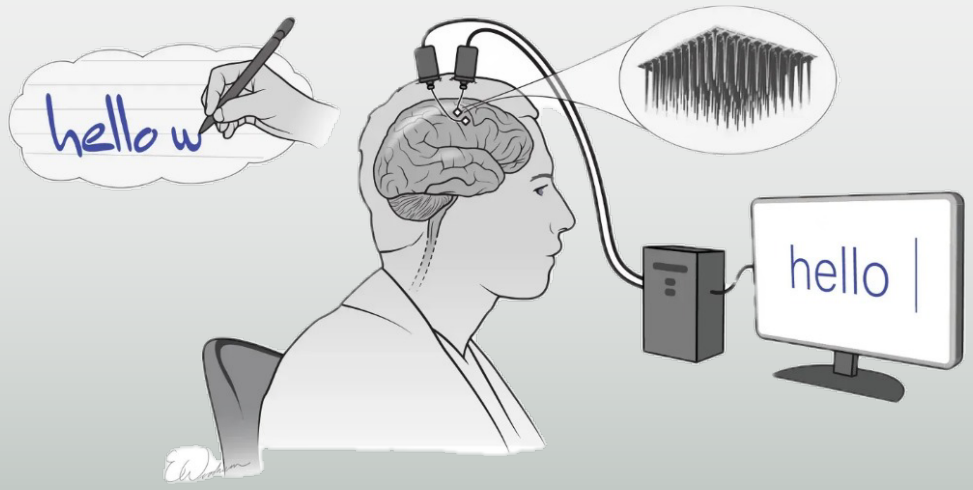
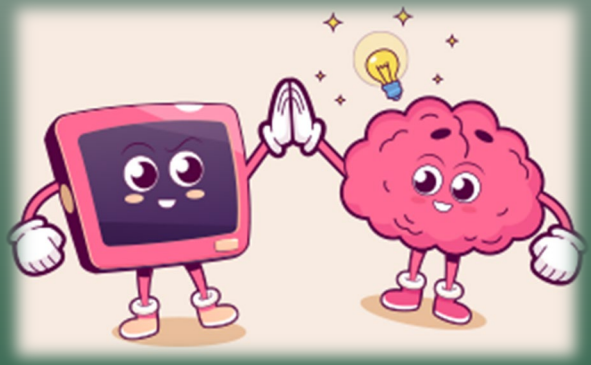
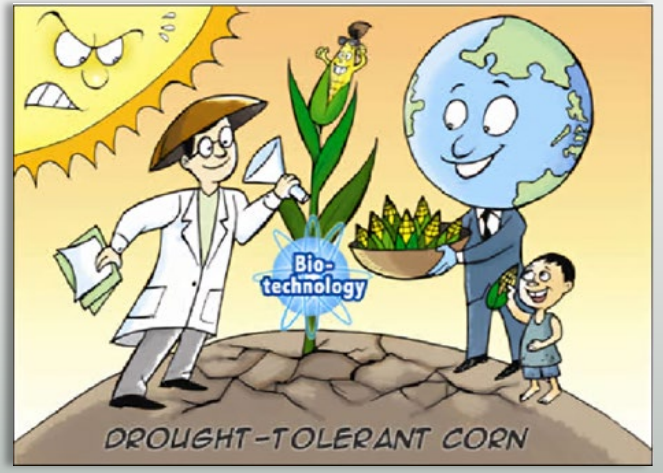




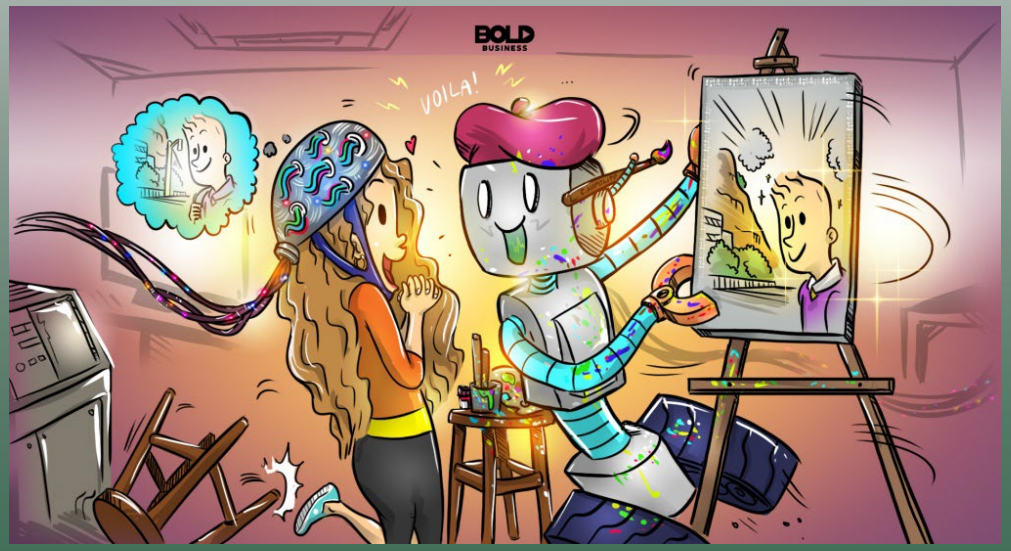
WHAT IS BIOTECHNOLOGY?

- Biotechnology is the use of biology to develop new products, methods and organisms intended to improve human health and society.
- Biotechnology harnesses cellular and biomolecular processes to develop technologies and products that help improve our lives and the health of our



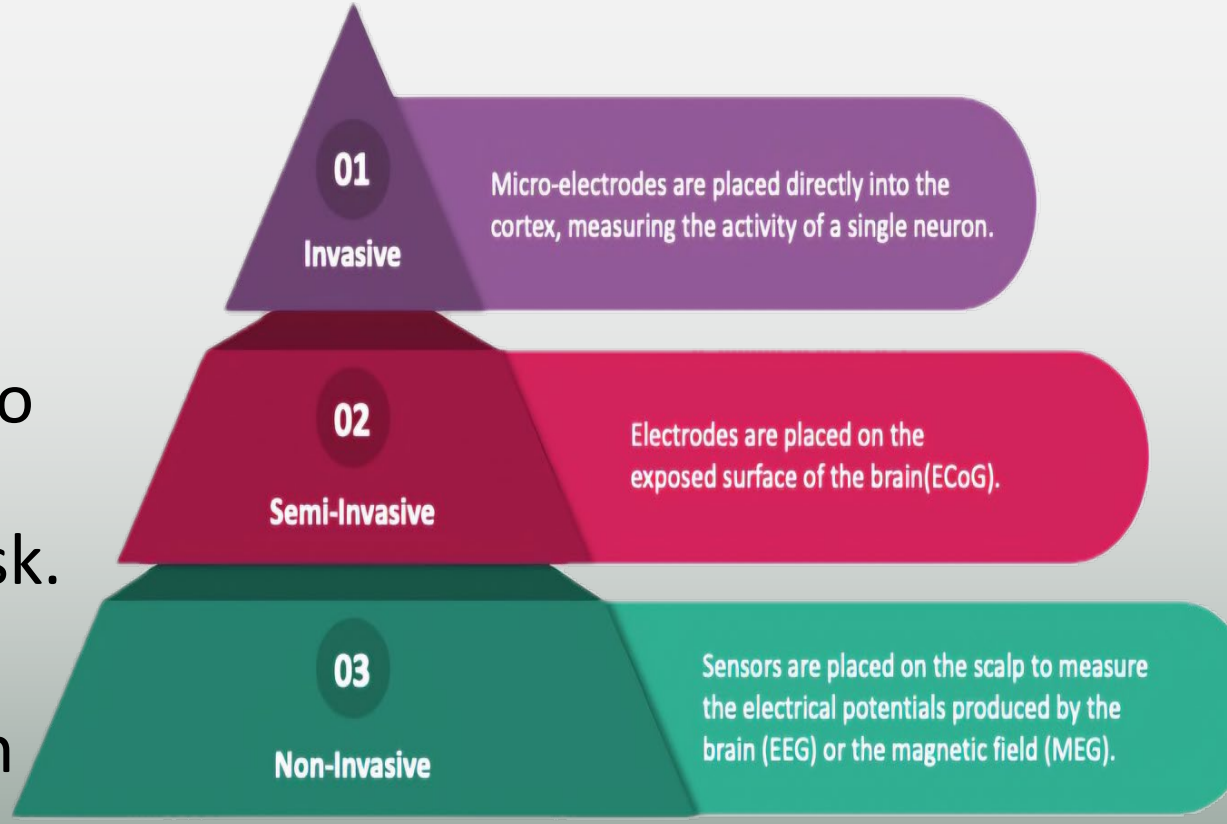
WHAT IS BRAIN-COMPUTER INTERFACE?

- BCIs allow the brain to communicate with computers or other devices without the need for physical movement.
- This is achieved through sensors that detect brain activity and translate it into commands.

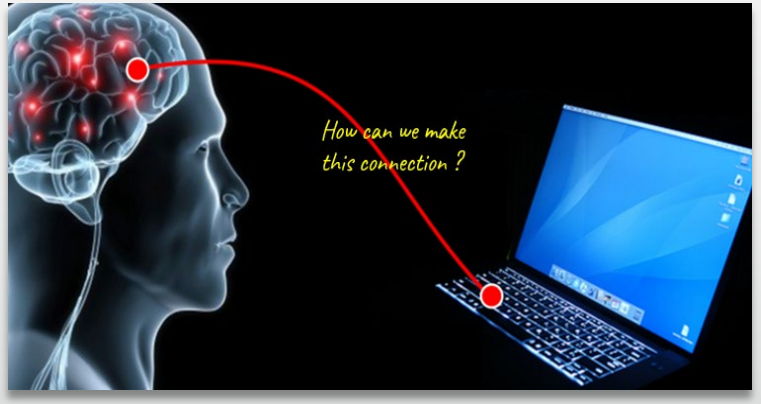


TYPES OF BCIs

- **Invasive BCIs**: Implanted directly into the brain tissue, providing high-resolution signals but with higher risk.
- **Partially Invasive BCIs**: Implanted inside the skull but outside the brain tissue.
- **Non-Invasive BCIs**: Use external sensors like EEG (electroencephalography) to monitor brain activity, less risky but with lower signal quality.



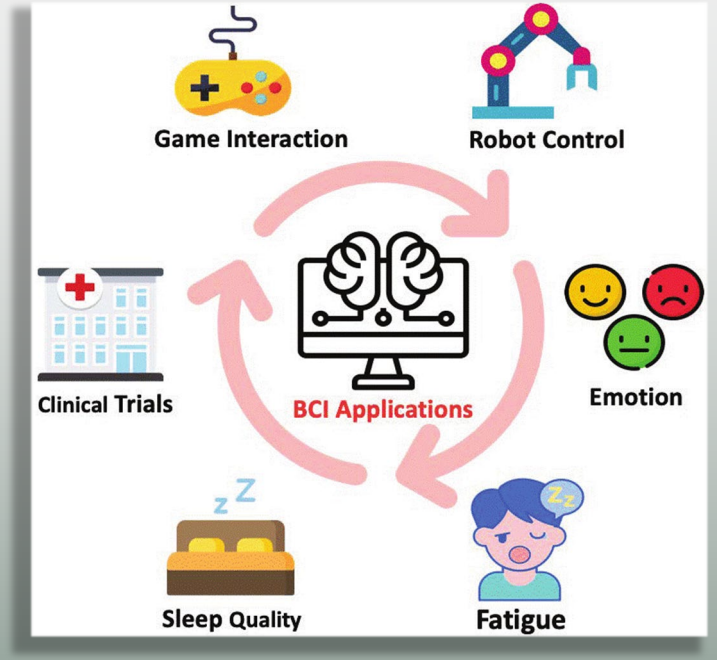
SCIENCE BEHIND BCIs



- **Neural Activity:** Detects brain waves (Alpha, Beta) to interpret mental states.
- **Signal Acquisition:** Uses EEG (non-invasive) or intracortical recording (invasive) to capture brain signals.
- **Signal Processing:** Filters and classifies signals to translate thoughts into actions.
- **Neuroplasticity:** The brain improves control with practice, adapting to BCI use.
- **Real-Time Feedback:** Continuous feedback refines user interaction with the BCI.

REAL WORLD APPLICATIONS

- Medical Rehab
- Assistive Communication
- Cognitive Enhancement:
- Mental Health
- Gaming
- Military
- Smart Homes
- Research

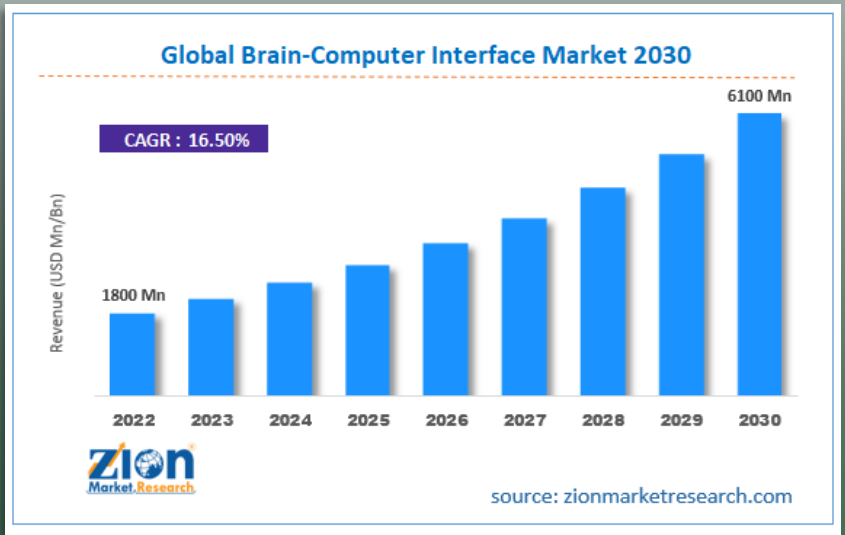


ETHICAL & SOCIAL CONSIDERATIONS

- Could **reveal information** about a person's truthfulness, psychological traits, and attitudes, leading to workplace discrimination or other unethical uses.
- **Human dignity**, **personhood and autonomy**, **user safety**, **stigma** and **discrimination**, **privacy and security**, **responsibility**, **research ethics**, and **social justice** (including access to this technology)

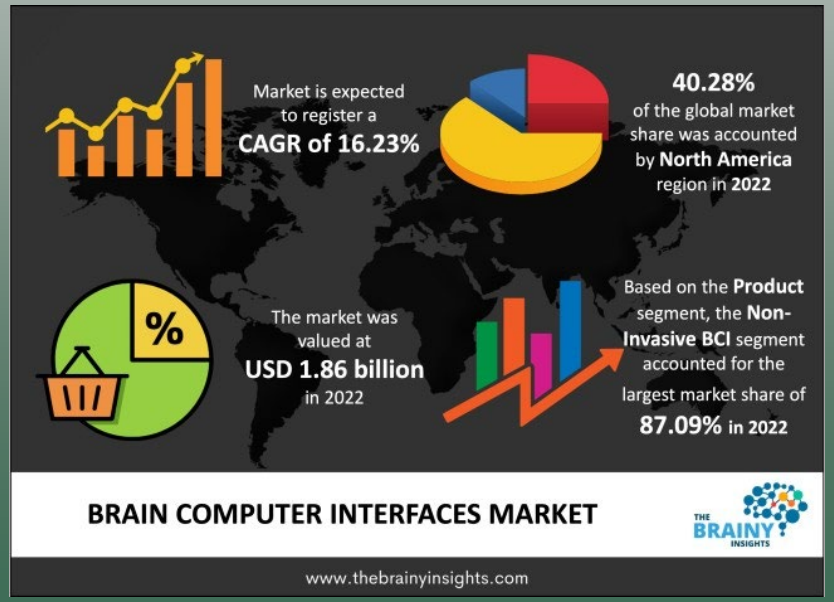
MARKETING POTENTIAL

Emerging Market
Diverse Applications
Personalization and User
Innovation and Differentiation
Potential for Collaboration



ECONIMICAL IMPACT

Market Growth
Job Creation
Healthcare Savings
Investment Opportunities
Impact on GDP

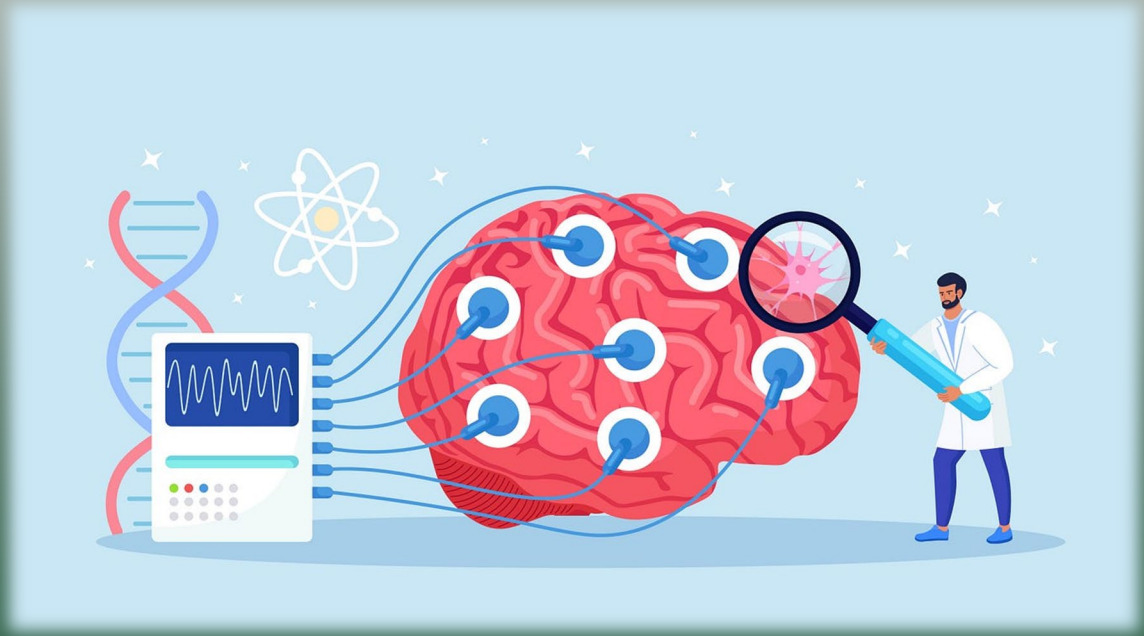


FUTURE OUTLOOK

- Technological Advancements
- Improved Accessibility
- Enhanced Communication
- AI Integration
- Medical Applications
- Ethical Concerns
- Cognitive Augmentation
- Consumer Uses
- Technology Integration

CONCLUSION

BCIs are set to transform human-computer interaction, offering breakthroughs in communication, medical treatment, and cognitive enhancement. While promising, addressing ethical and privacy concerns is essential as this technology evolves.



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THANKYOU!