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Emerging Technologies

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Abstract

In today's rapidly evolving world, emerging technologies such as robotics, augmented reality, artificial intelligence, cloud computing, big data, and the Internet of Things are reshaping every aspect of daily life. These advancements are not merely futuristic visions but tangible innovations driving progress across industries, from healthcare and education to business and communication. As corporations and researchers continue to explore new technological combinations in 2025, the potential for groundbreaking discoveries and transformative applications grows. However, alongside these advancements come critical challenges, including ethical considerations, sustainability, and equitable access. Understanding and addressing these complexities will be essential to harnessing technology's full potential for a smarter, more inclusive, and sustainable future.

Keywords: *Robotics, Augmented Reality, Artificial Intelligence, Cloud Computing, Big Data, And The Internet Of Things, Green Technologies And Renewable Energy, Self-Contained Systems. Synthetic Biology, Beyond 5G and 6G, Genetic Engineering and Biotechnology, Technology in Space.*

INTRODUCTION

The list of new technologies is growing every day. Robots, augmented reality, algorithms, Big Data, Cloud approaches machine-to-machine communications, 3-D printing, IoT and autonomous vehicles help people with a range of different tasks.

These technologies are broad-based and are an important interface for businesses to cope with market demands, supply, and challenges in preserving a state-of-the-art system. They are broader in their existence, and scope, and significant in their ability to transform existing businesses and personal lives. They have the potential to ease people's lives with more significant reach and improve their personal and business dealings.

Advent of Robots

Having read the detailed report, the author would like to emphasize that the only emerging technology, which will most definitely have a high potential of taking over people's jobs is Robots. Robots are not human by nature and they don't feel the emotions, and feelings and also are less likely to get hurt in places where it's hard and hazardous for humans to work.

The robot will replace human's in this field for sure. As there is less likelihood of life involved. And there are many debates and discussions about robots' productivity will increase with greater output and costs will be cut down and profit margins will increase.

"A ROBOT uprising or revolution and movement could be closer than ever predicted according to royal astronomer Sir Martin Rees, who believes machines will replace humanity within a few centuries." (Petkar, 2017).

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Autonomous Vehicles

Out of all the emerging technologies discussed, and pointed out in the report, I think the autonomous vehicle has the lowest potential of taking over people's jobs. Google had covered 500,000 miles and never had any problem. Manufacturers such as Tesla, Honda, Toyota, Audi, and General Motors have found that autonomous cars have reported that they had only fewer accidents and have received a better mileage than vehicles driven by people. First of all, people would be under pressure and be filled with fear and confusion about the safety of the Driverless cars and it is a feeling safe of having own control of their vehicles, instead of driving in Driverless cars. "It is a long way to go and would take a while on the other hand, it will create more jobs than lost.

In the future, autonomous cars may not contribute to unemployment rates which are showing downward growth. The projected increase as estimated in the unemployment rate by autonomous vehicles is between 0.06 and 0.13 percent during the decade from 2045 to 2055.

This is an analysis made by economist Erica Groshen which was subsequently published in a June 2018 report by Securing America's Future Energy." (Reinicke, 2018).

As less paid jobs will decrease, there will also be an increase in high-paid jobs such as developers, architects, engineers, automobile engineers, and designers, and also testing the cars to operate them and make them safe for transportation needs.

"Whether it's maintenance technicians, operators, drivers, fleet oversight, remote oversight of the fleet, there's still going to be a need for service technicians, and to maintain and serve the fleet," (Reinicke, 2018).

Emerging Technologies Way to Go

It has been a positive impact all over as we see that daily life starts with technology and ends in technology. Our life has become much easier, more convenient, and comfortable for example; the gadgets we use in everyday life from using iPhones, and messaging to video chatting, streaming pictures, movies, and the likes due to all these means of communication and the distance has become shorter than before. Even we can be in touch with our family, relatives, friends, and loved ones overseas. Machines are wired using machine language a cross disciplinary approach based on algorithms, cloud, IoT, Artificial intelligence, Deep technologies, mathematics, computer science, psychology, and more. New software and digital transformation will create interactive experiences for new interfaces such as voice, computer vision, and augmented reality. Computers can predict crop yield better and diagnose and treat many types of cancer more accurately than elite physicians and this is so because technology has improved at all communication levels. As one of the biggest examples is distance education with online classes and projects that can be accessed at our comfort as we can study online.

Businesses can enable carbon-management strategies through the convergence of the Internet of Things (IoT), blockchain, and A.I. IoT sensors provide real-time environmental data sets that are captured through blockchain infrastructure to create immutable data records. Machine learning and A.I. are deployed on the data infrastructure to enable automated control and optimize performance across the system. This capability can create a new standard for the transparency and fidelity of data for climate disclosure reporting. While many companies were addressing these issues ahead of the pandemic, 89% of tech CEOs report that the pandemic accelerated their plans to transform. (Holt & Gibson, 2021)

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It's something of a cliché, but there is an app for anything, and they've rendered a lot of other mediums all but obsolete for many of us. Take GPS, for example – if you want to know how to get somewhere, it's simply a case of pulling up an app like Google Maps and choosing the best route, which will come complete with directions, as well as satellite imaging. There are even apps for businesses that vehicle route optimization can be launched alongside traffic, weather, safety, and legal information. App technology has also made learning, dating, dining, and almost anything else you can think of a lot easier for us. Not to be overlooked either are the actual devices that all these apps run on. The rise of smartphones has been exponential over the last decade, and daily web searches on mobiles now outnumber those on laptops or desktop computers. Improvements continue to be made to handheld devices, every year, without fail. (Turner, 2021)

Emerging technologies are transforming how we live, work, and engage with the outside world. They are a dynamic force that propels innovation across industries. The following provides a summary of some of the most significant new technologies available today, along with some possible uses and ramifications:

1. Machine learning and artificial intelligence (AI and ML)

Summary: Artificial intelligence (AI) systems that are able to reason, learn, and make decisions. Systems may learn from data without explicit programming thanks to artificial intelligence's machine learning (ML) discipline.

1. Applications include: o Self-driving cars.

- Supply chains, healthcare, and finance predictive analytics.
- Generative AI for design and content production (e.g., GPT models).
- Consequences include increased effectiveness and customization, but they also bring up moral issues like accountability and partiality.

2. Computers with quantum capabilities

- Overview: Quantum mechanical computations enable computers to do significantly more complex calculations than traditional computers can.

Applications include secure communications and cryptography.

- Logistics and material science optimization issues.
- The development of new drugs via intricate molecular models.
- Consequences: May transform sectors while upending current cybersecurity procedures.

3. MR, VR, and AR are all included in XR, or extended reality.

- Synopsis: Technology that merges the digital and real worlds. Mixed reality (MR), virtual reality (VR), and augmented reality (AR) are three crucial components.
- Uses include training simulations in the fields of education, healthcare, and the military.

Engaging entertainment and gaming.

- Virtual walkthroughs for real estate and retail.
- Implications: Improved experiences, but it also brings up issues with digital addiction and mental health.

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4. Distributed Ledger Technology and Blockchain (DLT)

Implications: Transparency and trust have grown, but scalability and energy efficiency issues remain.

Cryptocurrencies like Ethereum and Bitcoin are one example.

Smart contracts for transactions that happen automatically.

Anti-counterfeiting measures and supply chain transparency.

- Implications: Better trust and transparency, but difficulties with energy efficiency and scalability.

5. IoT (Internet of Things)

- Overview: A network of linked devices that exchange data instantly.
- Uses: o Intelligent cities and houses.

IIoT stands for industrial automation.

Medical monitoring equipment, such as wearables.

- Implications: Increased efficiency and convenience, but also increased cybersecurity and privacy risks.

6. Beyond 5G and 6G

- Overview: Next-generation wireless networks offer minimal latency and incredibly quick connectivity.
- Uses include: o Improved mobile broadband.

Live Internet of Things communications.

- Intelligent transportation systems and linked automobiles.
- Implications: Makes room for hyperconnected worlds, but necessitates a large investment in infrastructure.

7. Genetic Engineering and Biotechnology

- Synopsis: Technologies that allow genetic material and biological systems to be manipulated.

CRISPR for gene editing is one of the applications.

- Personalized treatments and medicine.

Drought-resistant crops are one example of agricultural advances.

- Implications: Genetic editing may be able to treat illnesses and ease food shortages, yet moral questions regarding it still exist.

8. Green Technologies and Renewable Energy

- Overview: Climate change mitigation strategies using sustainable energy.
- Uses include geothermal, wind, and solar energy.

Advanced batteries are examples of energy storage advancements.

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The capture and storage of carbon (CCS).

- Consequences: Less carbon footprint, but requires widespread adoption to have a major effect.

9. Self-Contained Systems

- Synopsis: AI and robotics-powered self-operating systems.

Applications include autonomous drones for surveillance and delivery.

- Trucks and autos that drive themselves.
- Industry-wide robotic process automation (RPA) driven by AI.
- Consequences: Increases safety and productivity while upsetting labor markets.

10. Models of the World and Embodied AI

- Synopsis: Artificial intelligence (AI) systems that possess an intrinsic knowledge of the world allow for interaction and reasoning in intricate settings.

Applications include: o Robots in healthcare and manufacturing.

The ability of virtual assistants to learn over time.

- Tools for making decisions based on simulation.
- Implications: Considerable progress toward AGI, although safety and alignment issues are brought up.

11. Technology in Space

- Overview: Advances in the commercialization and exploration of space.

Asteroid mining and space tourism are two examples of applications.

A satellite-based internet connection, such as Starlink.

Mars colonization efforts.

- Consequences: Broadens human horizons yet presents legal and environmental difficulties.

12. Synthetic Biology

- Summary: Adapting biological systems to new uses and purposes.

Biofuels and biodegradable polymers are two examples of applications.

Meat produced in laboratories and sustainable food sources.

- Progress in medicine through tissue engineering.
- Consequences: Harmonizes creativity with moral and environmental considerations.

IN CONCLUSION

Emerging technologies are not only instruments for creativity; they are also forces behind significant social transformation. Even if they have a lot of potential, overcoming obstacles like sustainability, equity, and ethics will be essential to maximizing their advantages.

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According to the author, there is no denying that these new technologies have improved our quality of life and brought about many changes in our daily lives.Our modern world is filled with cutting-edge technology, such as robots, augmented reality, algorithms, iPads, smartphones, cloud computing, big data, the Internet of things, and machine learning. Every element of our daily lives is somehow linked to the latest scientific discoveries.

The technologies mentioned above are not just for future visualization; they are also more valuable inventions, discoveries, and creative concepts. It will be interesting to observe how corporations continue to transform emerging technologies in 2024 and what technological combinations they employ. We look forward to witnessing a variety of innovations that hold promise for a brighter future.

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