

The Future of Technology - Six remarkable advances in technology are coming soon and they will change the world forever

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Abstracts

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SUMMARY

There are many technologies and ideas throughout the world which are exciting in their potential but whose effects are mainly pipedreams that we never get to see in the flesh. However, in the world of tech there is currently a wave of industries that have real potential to change our world forever and they are likely to be realized within the next decade. These industries are inextricably linked and serve to augment the capabilities of each other, meaning that the rate of change is likely to snowball. From artificial intelligence, through to the space industry the rate of technological advancements in the last few years has been dramatic and this report examines and speculates on what is coming in the next decade and what their implications might be.

KEY HIGHLIGHTS

These technologies on their own are likely to be revolutionary once we have them, but the most change will come when they are functioning together. For instance, a world where an advanced AI is able to use a quantum computer to conduct its research is not far away.

Many of the world's biggest companies have invested heavily in these emerging tech markets and their desire for innovation, new products and understanding is driving these companies forward.

Not all of the side effects of this technological development can be predicted and some future scenarios may even be negative. There are organizations preparing for this scenario too, researching how to control AI for instance or developing less invasive neurological surgeries to try and make sure that the coming tech breakthrough is a positive one.

SCOPE

Examines six major technology areas where fundamental breakthroughs are only a few years away and what effect they might have on our world

Looks at artificial intelligence, who the major players are and what they want to achieve

Examines how driverless technology is creeping into the world's transportation systems and what this means for us

Looks at the big players trying to build quantum computers and what they want them for

Analyzes how factories are changing with robotics and automation

Examines how brain implant technology is starting to produce results

Looks at the space industry and the emerging competition for a new market

REASONS TO BUY

What major technology advances are coming soon and how will they effect businesses, society and learning?

Who are the big players that are chasing this technology and what do they seek to gain from it?

What could be the positive and negative outcomes of some of these technologies?

Are some of these technologies worth having? Or might they be a waste of investment?

Contents

Executive summary

Artificial Intelligence: revolutionizing industries across the world

Driverless vehicles: technology will change global transport forever

Quantum computing: using the bizarre tiny world of the quantum to solve humanity's biggest problems

Industry 4.0: billed as the fourth industrial revolution, factories are changing

Brain Implants: using advanced neurology to repair or enhance our brains

Cleaning up space: a new industry is born commercializing space

Artificial Intelligence is revolutionizing industries across the world

AI is potentially useful for a wide range of industries

Investment in AI has been significant over recent years

Machine learning has received the most investment over recent years due to Big Data increasingly becoming a huge focal point for businesses

Machine learning is apparent in an array of industries

The healthcare industry is in transformation thanks to AI developments

AI aims to save costs but instead will increase them for businesses

Although costs are associated with AI maintenance, soon AI will be doing the handling

Unemployment is a fear of the future, not so much right now

Teachers fear not as robots target other jobs instead

Driverless vehicle technology will change global transport forever

Long considered to be averse to change, shipping is about to transform

Technology is advancing towards full autonomy for large vessels but work still needs to be done

Developing the regulation for autonomous shipping will take time and likely fail to keep pace with technological development

Driverless cars face a steep development curve to become mainstream

Mapping and regulating problems hold back progress on autonomous cars

Technology needs to be refined for everyday purposes before driverless cars can become mainstream

Autonomous trucks are changing how mining is done today; transport must wait for development

Autonomous trucks for the road are being frustrated by lack of enthusiasm from multiple parties

Application for autonomy extends beyond freight into everyday menial jobs

Major aircraft manufacturers are moving ahead with autonomous planes

Boeing to test pilotless aircraft in 2018 as technology nears required level of sophistication

Airbus self-flying taxi is the transformative application of autonomous technology in personal transport

Quantum computing: using the bizarre tiny world of the quantum to solve humanity's biggest problems

Classical computers are limited to strict physical laws

Physics of the quantum world is very difficult to understand let alone tame

Qubits are the fundamental "bit" of information that quantum computers use

Quantum entanglement allows qubits to be "spookily" aware of each other no matter how far apart

Quantum decoherence is the main technical difficulty that is trying to be overcome

Quantum outclasses classical by many orders of magnitude

Quantum computing is getting ready to truly take off but there are some difficult barriers to overcome

Optimization and cryptography are the main draws of Quantum ability, applicable to many industries

Optimization is one of the key uses for a quantum computer

Predicting future problems using needle in a haystack searching

The quantum world provides advanced encryption possibilities

Using quantum combined with AI technology is where the future is headed

Companies involved are wide ranging and big investments have been made

DWave computer has been criticized as not Quantum which is a setback

IBM has commercial versions being readied approaching 20 qubits

China manages to achieve the longest ever sending of entanglement

Industry 4.0: Billed as the fourth industrial revolution, factories are changing

Autonomous technology forecast to achieve large gains in efficiency

Embracing industry 4.0, Audi introduces the automotive factory of the future at Ingolstadt

Advancement in high-tech material production driven by industry 4.0 improves production, reducing costs

Production line of the future sees workforce and technology working together closely

New robotic technology works alongside people on production lines in car manufacturing

New robotic technology is changing how humans interact with the movement of items in logistics

Robotic technology of the future will be worn by workers, helping them perform physical tasks

Brain Implants: Using Advanced neurology to repair or enhance our brains

Assisting brains that need repair is a key aim of neural implants and BCIs

Cochlear implants are very common place, non-invasive and can restore senses

Deep brain stimulation alleviates the symptoms of Parkinson's disease
Retinal implant technology is allowing the blind to see again through a bionic eye
Treatment of spinal injuries to allow patients with paraplegia to move again
Microfibers are becoming more advanced and this is opening up new possibilities
The next step for BCIs is human enhancement
DARPA has been working in this field for a number of years for defense purposes
Kernel is looking to find ways to improve human intelligence and cure disease
Neuralink is planning to create an AI interface between the brain and computers
Even successful programs have shown that side effects can be severe
Cleaning up space, A new Industry is born
Space exploration is on the up and protecting investments is key
Space junk has built up over decades, time for a clean-up
Junk that arrived there up to 50 years ago still orbits Earth
Entrepreneurs start thinking of ways to clear the junk yard
There will be little space for companies to clean up space
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