Overview

The fourth industrial revolution is the current environment where disruptive technology trends such as the Internet of Things (IoT), Robotics, Artificial intelligence (AI), Future Cars/Autonomous Vehicles, Blockchain, Cloud Computing, Genomics and Social Media are changing the way we live and work.

Unlike previous industrial revolutions, these technologies are rapidly combining to create an accelerating, virtuous cycle of nearly unlimited disruption. While previous industrial revolutions were often localized, today’s is interconnected and global and its impact is already visible in homes and businesses across the world.

This is a short guide to help investors understand the main sectors of the fourth industrial revolution and their features, applications, and growth potential:

**Robotics & Automation**

**Future Transport**

**Cloud Computing**

**Cyber Security**

**Genomics**

**Social Media**

**Blockchain**

**Augmented & Virtual Reality**

Genomics Theme

From William Harvey and the human circulatory system, to Alexander Fleming and the discovery of penicillin to the first heart transplant; medical advances have gone hand-in-hand with a better understanding of the human body.

Medicine has come a long way in the 70 years since the first correct double-helix model of DNA was produced at Cambridge University in 1953, and the dawning age of healthcare sees a confluence of medicine and technology that offers the potential to fundamentally alter how we are diagnosed, treated and supported through illness.

Understand an individual's genetic make-up can help determine their predisposition toward certain diseases, guide the best course of treatment and contribute to new therapies for specific diseases (precision medicine).

Almost all human illnesses have some genetic basis, but it is only recently that doctors have been able to take genetics into consideration when diagnosing or treating their patients. It is even more recently that doctors have been able to tailor treatments based on a patient’s unique genetic make-up, or provide treatment for diseases at the genetic level.

A genome is the full genetic make-up of an individual. In 2003, The Human Genome Project – an international scientific effort to map the entire human genome – was completed at a cost estimated at over $500 million. Since then, the cost of genome sequencing has fallen to under $1,000, making it cheap enough for researchers and doctors to obtain large amounts of genetic data from a wide range of individuals.

1 [https://www.genome.gov/about-genomics/fact-sheets/Sequencing-Human-Genome-cost](https://www.genome.gov/about-genomics/fact-sheets/Sequencing-Human-Genome-cost)
A broader and more accessible research data set has accelerated scientific understanding of the effect that (combinations of) genes play in contributing to diseases that impact large swathes of the population – diseases like cancer, diabetes and cardiovascular disease, alongside other hereditable illnesses.

These advances opened the door to a new age of gene therapies and genetic editing technologies like CRISPR, whereby genetic abnormalities can be corrected by administering new DNA, or by editing out and replacing faulty sections of the patient’s DNA.

These remarkable new capabilities extend into both veterinary and agricultural areas with GM plants being a well-known example of a practical application for genetic research.

To capture these developments, the Genomics theme in ITEK focuses on companies that incorporate technological and scientific advancements in genomics into their business, including:

- **CRISPR** (genome editing tool)
- **Targeted Therapeutics**
- **Bioinformatics** – medical and genetic databases and research
- **Molecular Diagnostics**
- **Stem Cells**
Megatrends Driving the Genomics Market

The growth of the genomics market is expected to be driven by the healthcare and agricultural sectors as they respond to new challenges caused by long-term social and technological megatrends:

- **Technology**: Increasing computing power was critical in driving down the cost of DNA sequencing, providing the foundation for modern genetic research. Advances in Genomics have since been supported and accelerated by bioinformatic data sets that aggregate and analyse information from multiple sources, cloud-based research portals, machine learning, gene editing tools and new visualisation technologies.

- **Ageing populations**: continued advances in medicine mean that people are living longer and while they face declining risk of dying of communicable diseases, the risk of dying of illnesses with a genetic component such as heart disease or cancer is on the rise. Governments are seeking to reduce the economic cost of illness by funding new genomic research such as the UK’s £300 million ‘100,000 Genome’ project2.

- **Genomics also has significant potential in the provision of personalised medicines, whereby treatment is customised according to each individual’s unique genetic profile. Research in this area increasingly combines big data sets, machine-learning and AI to uncover previously unseen patterns in DNA that may yield new understanding of an individual’s susceptibility to various diseases. Individualised healthcare can lead to healthier patients, longer lives and a more productive existence.**

- **Food Security**: As human populations continue to grow and arable land becomes scarcer, the world is facing a significant food security challenge. Genomics may have a role to play in addressing this by helping to modify food crops to produce higher yields, be more disease and pest resistant or grow in different climates.

Against this backdrop, the Genomics market is expected to be a high-growth healthcare theme. In 2019, the market was estimated to be $19 Billion and is expected to grow to $39.7 Billion by 2024 - a CAGR of ~13.5% 3.

Genome-based research is already enabling medical researchers to develop improved diagnostics, more effective therapeutic strategies, evidence-based approaches for demonstrating clinical efficacy, and better decision-making tools for patients and providers.

**Investing in the Genomics Theme**

The growth potential, consumer interest and size of the addressable market of Genomics has spurred investor interest in this theme. Investors who see long-term opportunity can consider an allocation to the HAN-GINS Tech Megatrend Equal Weight UCITS ETF (ITEK). ITEK includes Genomics as part of 8 transformational technology trends that are reshaping the world alongside Robotics & AI, Cloud Computing & Big Data, Cyber Security, Future Transportation, Social Media, Blockchain, Augmented & Virtual Reality.

For investors who are interested in the Genomics theme specifically, HANetf offers a targeted healthcare themed ETF – The HAN GINS Indxx Healthcare Innovation UCITS ETF (WELL) that includes genomics alongside other important modern medical technologies.

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Fund Details

When you trade ETFs, your capital is at risk

- ITEK Factsheet
- ITEK Video
- ITEK Fund Page

About HANetf

HANetf is an independent ETF specialist working with third-party asset managers to bring differentiated, modern and innovative ETF exposures to European investors via unique white-label ETF/ETC platform.

Founded by two of Europe’s leading ETF entrepreneurs, Hector McNeil and Nik Bienkowski, HANetf provides a complete operational, regulatory, distribution and marketing solution for asset managers who want to successfully launch and manage UCITS ETFs.

HANetf’s full products list includes:

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