

The Rising Problem of Crypto Theft, and How to Protect Yourself

 visualcapitalist.com/problem-crypto-theft

By Jeff Desjardins

Part of the appeal of cryptocurrency is that it exists “outside” of the system.

Using complex cryptography and decentralized ledgers, a blockchain can operate independently from the world’s most powerful countries, corporations, and banking institutions.

While this detachment from authority is extremely powerful, existing almost exclusively in the digital realm does have its drawbacks.

Preventing Crypto Theft

Today’s infographic from [CryptoGo](#) shows that as cryptocurrencies rise in prominence, so does its appeal to hackers, criminals, and other bad actors.

With millions of dollars being stolen via crypto theft, investors and other dabblers in cryptocurrency must take precautions to protect their assets for the long haul.

CRYPTOTHEFT

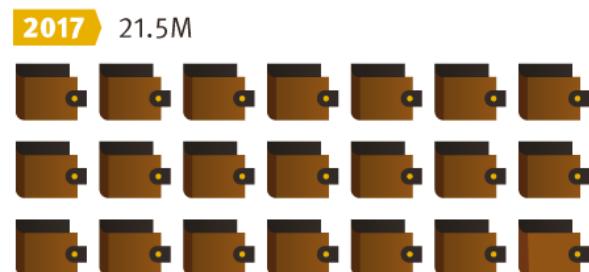
HOW TO STAY SAFE AND SECURE IN THE CRYPTO-TRADE



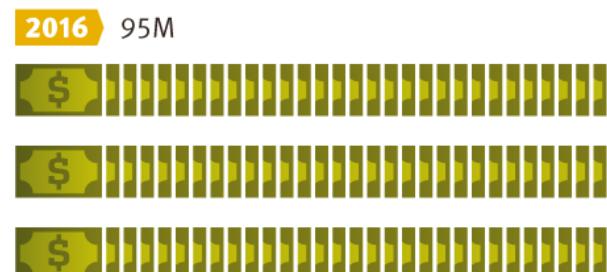
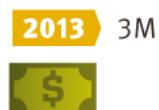
Cryptocurrencies are going up in value and popularity, but **OVER \$225M WORTH WAS STOLEN AS OF AUGUST 2017** —which raises the question, **CAN CRYPTOCURRENCIES BE TRADED SAFELY AND SUCCESSFULLY?**

SECURITY CONCERN AND THE STATE OF CRYPTO THEFT

BLOCKCHAIN WALLETS IN EXISTENCE



THEFT OF BITCOIN HAS GONE UP EXPONENTIALLY



THE RISE IN THEFT

Bitcoin exchanges hacked in 2009-2015

33%

ICO funds stolen or lost in hacks

10%

WAYS CRYPTOCURRENCIES WERE STOLEN IN 2017



\$115 MILLION

Phishing



\$103 MILLION

Exploitation of
software and storage



\$7.4 MILLION

Hacks



\$4,000

Ponzi Schemes

BIG HACKS OF MAJOR EXCHANGES

2014

MT. GOX



\$473 MILLION

Allegedly stolen by Russian
hacker and owner of BTC-e
exchange, Alexander Vinnik

2016

BITFINEX



\$72 MILLION

Stolen through
vulnerabilities in
multi-signature wallet

2018

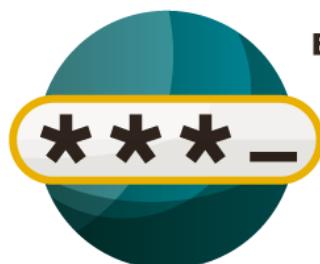
COINCHECK



\$530 MILLION

Stolen due to hot wallet
storage without
multi-signature protection

STRATEGIES CRYPTO THIEVES USE



BRUTE FORCING

Automated software uses
trial-and-error to guess every
possible password until solved

Hacker breaks into the back end
and has **full access to funds**

Example

Wallet Recovery Services
uses brute forcing for good
by helping people recover
lost or forgotten passwords



PHONE-PORTING

- Hacker gains **access to a phone number** by calling customer service and having number transferred to their phone
- Resets** crypto account password and access funds

Example

Instances rose from about **1,000 in 2013** to **2,700 in 2016**



PHISHING

- Hacker sends **suspicious emails** and social media messages
- Dispenses malware** that hacks into insecure files

Example

North Korean malware attack leaked 36,000 accounts and stole \$7 Million, now worth \$83 Million



PONZI SCHEMES

- Multi-level marketing structure loans users coins and gives **bonuses for getting others to sign up**

Example

2018: BitConnect collapses after 20% drop in all cryptocurrencies and denying it's a Ponzi scheme



MINING MALWARE AND CRYPTOJACKING

- Hacker **hijacks computer power or a user's miner**
- Embeds **power jacking miners in ads and extensions** from sites like Coinhive that mine using visitor CPUs

Example

55% of businesses around the world are attacked this way

With **1,500 CURRENCIES ON OVER 8,000 MARKETS** being unpredictable from one day to the next, you've got to know how to **TRADE SAFELY AND STRATEGICALLY**

WITH SO MANY TO CHOOSE FROM, HOW DO CRYPTOS, EXCHANGES, AND STORAGE METHODS STACK UP?

CURRENCIES



BITCOIN



ETHEREUM

✓ Advantages

Has larger store of value, proven security, and wider accessibility than altcoins

⚠ Disadvantages

Susceptible to a 51% attack, where a hacker or user gains majority computing power of all miners and control of all transactions

✓ Advantages

Uses smart contracts and distributed apps for fast, safe, and secure transactions

⚠ Disadvantages

July 2017: Weaknesses in Smart Contracts have led to major hacks like the \$30 Million Parity hack

EXCHANGES



COINBASE

✓ Secure?

The exchange itself has not suffered a major attack

⚠ Hacked?

Individual accounts have been hacked



BITFINEX

✓ Secure?

Daily encryption, archiving, and dispersal of data

⚠ Hacked?

\$66 Million taken when hackers broke through multi-authentication wallet BitGo

STORAGE



HOT WALLETS

Connected to the internet with small amounts of money and either high or low transaction volume



ONLINE WALLET

LOW VOLUME AND LOW VALUE

Log in from any secure device with email and protected password

Blockchain.info is a popular hot wallet



MOBILE WALLET

HIGH VOLUME AND LOW VALUE

Phone with updated OS and power



COLD STORAGE

Offline storage for protecting large sums and private keys from hackers



PAPER WALLET

LOW VOLUME AND HIGH VALUE

Create yourself a seed code on paper and then shut off computer

Keeps no data and wipes memory



HARDWARE WALLET

HIGH VOLUME AND HIGH VALUE

Ledger

Trezor and FIDO U2F key



AIR-GAPPED COMPUTERS

Log in from any secure device with email and protected password

Blockchain.info is a popular hot wallet

Even the veterans of crypto-trading can get robbed blind—the trick is to **STAY A STEP AHEAD OF THE GAME**

LIFEHACK: HOW TO CRYPTO THE SMART WAY

ENCRYPTION

BACKUPS

Generates and holds private keys transaction records, addresses, and access codes



ANTIVIRUS SOFTWARE

Bitcoin Miner Virus and other crypto malware are fileless



Regular antivirus software is **ineffective**



Manual removal requires above average computer skill

Popular antivirus software for cryptosecurity



Comodo



Spybot Anti-Beacon

MULTI-FACTOR AUTHENTICATION

Hardware token

Authentication apps generate codes safely on your phone



Authy



Google Authenticator



Password managers offer free and premium password generation and storage



Yubikey USB



LastPass



KeePass



1Password

TIPS AND TRICKS AGAINST ALL TYPES OF CRYPTO THEFT



Be wary of sloppy or



Turn off SMS



Diversify using multiple

	buggy copycat pages used for jacking		authentication and email account recovery		exchanges with different access codes for each
	Lock up, remove power, and install port locks on air-gapped computers		Use a safe or safety deposit box to store USB and paper private keys		Use hardware wallets or cold storage and keep only small amounts on hot wallets

Whether you're new to cryptocurrencies or a seasoned investor,
PROTECTING YOUR ASSETS FROM THEFT IS THE KEY TO SUCCESS

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Crypto theft comes in many different forms, and at least \$225 million of cryptocurrency has been stolen as of mid-2017.

There are various forms of crypto theft that have made this possible, including brute forcing, phishing, phone-porting, mining malware, and Ponzi schemes.

Strategies Used by Crypto Thieves

Here are the most prominent forms of crypto theft:

Brute Forcing

This is the form of hacking that most are familiar with. It involves automated software that simply tries different passwords until one works.

Phone-Porting

Using your phone number and a little “social engineering”, a hacker can convince a customer service rep that they are actually you. This allows them to reset your password and access your funds.

Phishing

In this case, a hacker will send you suspicious links through email or social media messages. By clicking on one of those links, malware is installed.

Ponzi Schemes

Multi-level marketing schemes that provide signing bonuses. These eventually collapse when prices change or signups stop. Once over, the thieves takes the money and run.

Mining Malware

Hackers hijack a computer's power to mine cryptocurrency remotely.

Protecting Yourself

Crypto theft can be prevented by taking appropriate precautionary measures.

These include using encrypted backups to hold private keys and other data, using proper anti-virus software for crypto, and opting for multi-factor authentication.

Further, other general measures can also be taken to protect assets, such as holding only small amounts of cryptocurrency in hot wallets, using safety deposit boxes to store USB and private paper keys, turning off SMS authentication and email recovery options, and diversifying holdings through various exchanges.



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Technology

Long Waves: The History of Innovation Cycles

Why are innovation cycles and business growth linked so closely? We explore waves of creative destruction across history.

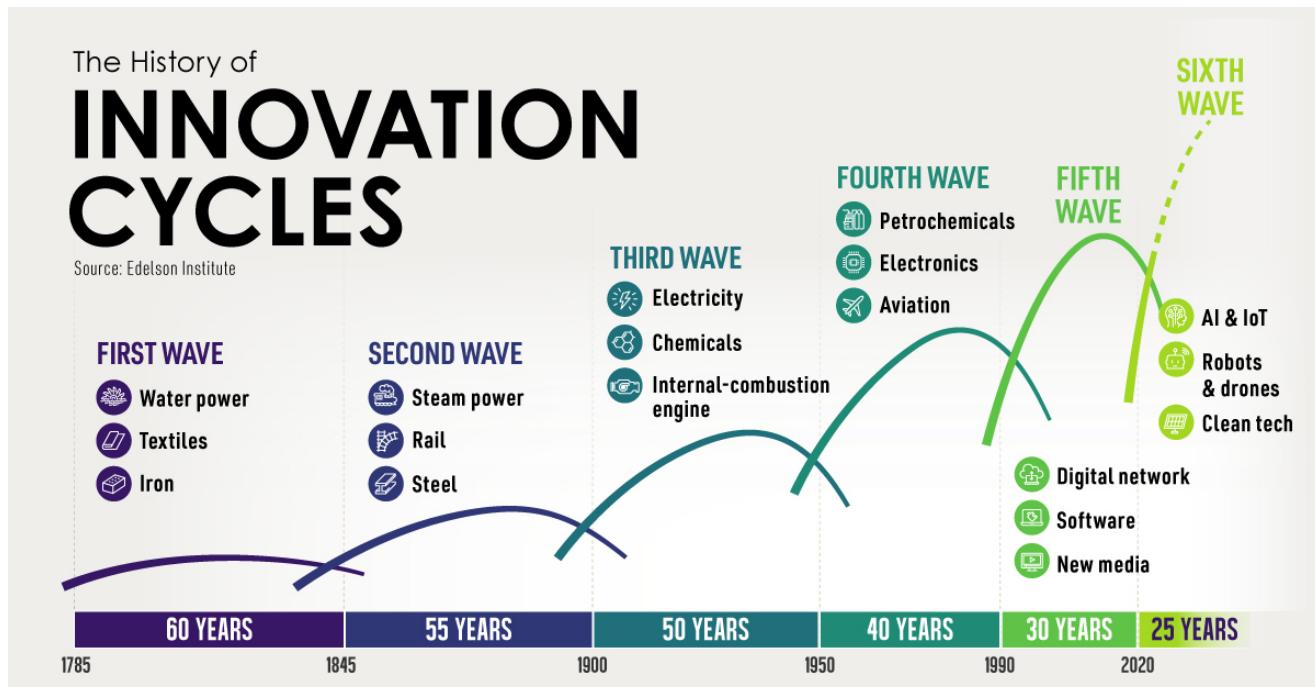
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Long Waves: How Innovation Cycles Influence Growth

Creative destruction plays a key role in entrepreneurship and economic development.

Coined by economist Joseph Schumpeter in 1942, the theory of “creative destruction” suggests that business cycles operate under long waves of innovation. Specifically, as markets are disrupted, key clusters of industries have outsized effects on the economy.

Take the railway industry, for example. At the turn of the 19th century, railways completely reshaped urban demographics and trade. Similarly, the internet disrupted entire industries—from media to retail.

The above infographic shows how innovation cycles have impacted economies since 1785, and what's next for the future.

Innovation Cycles: The Six Waves

From the first wave of textiles and water power in the industrial revolution, to the internet in the 1990s, here are the six waves of innovation and their key breakthroughs.

First Wave

Second Wave

Third Wave

Fourth Wave

Fifth Wave

Sixth Wave

First Wave	Second Wave	Third Wave	Fourth Wave	Fifth Wave	Sixth Wave
Water Power	Steam Rail	Electricity Chemicals Internal-Combustion Engine	Petrochemicals Electronics Aviation	Digital Network Software New Media	Digitization (AI, IoT, AV, Robots & Drones) Clean Tech
Textiles	Steel				
Iron					
60 years	55 years	50 years	40 years	30 years	25 years

Source: Edelsen Institute, Detlef Reis

During the **first wave** of the Industrial Revolution, water power was instrumental in manufacturing paper, textiles, and iron goods. Unlike the mills of the past, full-sized dams fed turbines through complex belt systems. Advances in textiles brought the first factory, and cities expanded around them.

With the **second wave**, between about 1845 and 1900, came significant rail, steam, and steel advancements. The rail industry alone affected countless industries, from iron and oil to steel and copper. In turn, great railway monopolies were formed.

The emergence of electricity powering light and telephone communication through the **third wave** dominated the first half of the 1900s. Henry Ford introduced the Model T, and the assembly line transformed the auto industry. Automobiles became closely linked with the expansion of the American metropolis. Later, in the **fourth wave**, aviation revolutionized travel.

After the internet emerged by the early 1990s, barriers to information were upended. New media changed political discourse, news cycles, and communication in the **fifth wave**. The internet ushered in a new frontier of globalization, a borderless landscape of digital information flows.

Market Power

To the economist Schumpeter, technological innovations boosted economic growth and improved living standards.

However, these disruptors can also have a tendency to lead to monopolies. Especially during a cycle's upswing, the strongest players realize wide margins, establish moats, and fend off rivals. Typically, these cycles begin when the innovations become of general use.

Of course, this can be seen today—never has the world been so closely connected. Information is more centralized than it has ever been, with Big Tech dominating global search traffic, social networks, and advertising.

Like the Big Tech behemoths of today, the rail industry had the power to control prices and push out competitors during the 19th century. At the peak, listed shares of rail companies on the New York Stock Exchange made up **60%** of total stock market capitalization.

Waves of Change

As cycle longevity continues to shorten, the fifth wave may have a few years left under its belt.

The **sixth wave**, marked by artificial intelligence and digitization across information of things (IoT), robotics, and drones, will likely paint an entirely new picture. Namely, the automation of systems, predictive analytics, and data processing could make an impact. In turn, physical goods and services will likely be digitized. The time to complete tasks could shift from hours to even seconds.

At the same time, clean tech could come to the forefront. At the heart of each technological innovation is solving complex problems, and climate concerns are becoming increasingly pressing. Lower costs in solar PV and wind are also predicated on efficiency advantages.

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Technology

Explainer: How Synthetic Biology is Redesigning Life

Synthetic biology (SynBio) is a field of science that involves engineering life for human benefit. Here's an in-depth look at how it works.

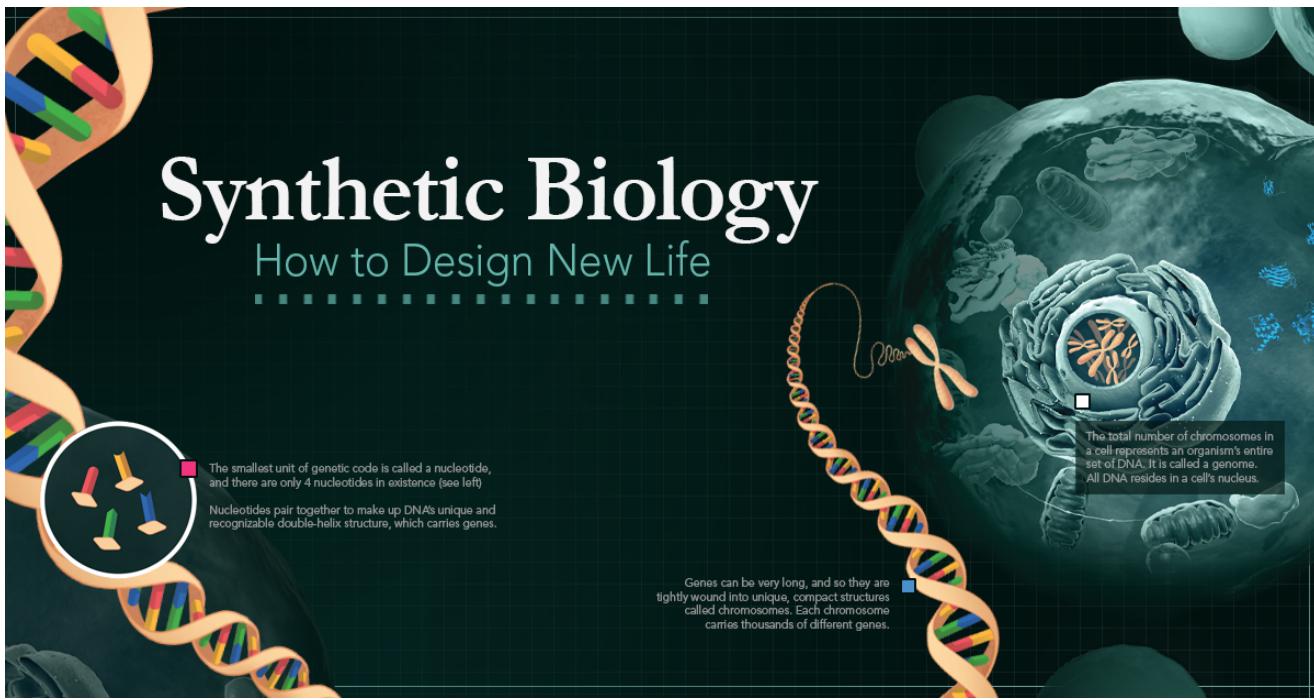
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[Carmen Ang](#)



Explainer: How Synthetic Biology is Redesigning Life

Synthetic biology (SynBio) is a field of science that involves engineering life for human benefit. It has the potential to reshape many facets of society—from the ways we produce food, to how we detect and cure diseases.

It's a fast-growing field of science. In fact, by 2026, the SynBio market's global revenue is expected to reach **\$34.5 billion**, at a CAGR of **21.9%**.

While this fascinating area of research is worth paying attention to, it might be daunting to wrap your head around—especially if you don't come from a scientific background. With this in mind, here's an introduction to synthetic biology, and how it works.

What is Synthetic Biology?

As we touched on in the introduction, SynBio is an area of scientific research that involves editing and redesigning the biological components, systems, and interactions that make up life. By doing this, SynBio can grant organisms new abilities that are beneficial to humans.

It's similar to genetic engineering, however, it's slightly more granular. While genetic engineering transfers ready-made genetic material between organisms, SynBio **builds** new genetic material from scratch.

SynBio has applications across a myriad of fields, with research covering everything from space exploration to drug discovery. Here's a look at five of its real-world applications:

1. Medical Technologies

SynBio has a wide range of medical applications, including drug discovery, antibody production, and vaccine innovation (it's been key in the fight against COVID-19). It also plays a significant role in “living drug” development, which is the use of living microbes to treat chronic or severe illnesses.

2. Sustainable Energies

Biofuel, which is renewable energy that’s derived from living matter, could replace petroleum and diesel in the near future—and synthetic biology technology is helping develop fermentation processes that will produce biofuel more efficiently.

3. Bioremediation

Bioremediation uses living organisms to restore polluted sites to their original condition. This field uses SynBio to try and make the decontamination process more efficient, and to expand the list of contaminants that bioremediation can target.

4. Food and Agriculture

SynBio plays a significant role in cellular agriculture, which is the production of agricultural products directly from cells rather than livestock or plants. These modified foods might have higher nutritional value, or might be void of allergens. For instance, this can be used to make plant-based burgers taste more like meat.

5. Space Systems and Exploration

Synthetic biology and 3-D printing have huge potential to sustain life during space exploration. Using SynBio technology, cells and bacteria could be modified to produce a myriad of materials—from plastic to medicine, and even food—and astronauts could print these synthetically engineered materials on-demand while in space.

Zooming in: the Science Behind Synthetic Biology

Now that we’ve touched on SynBio’s use in a wide range of industries, let’s dive into the science behind it. In order to understand the mechanics of SynBio, it’s important to explore the relationship between **DNA** and **protein production**.

Proteins are the drivers of life in a cell—they’re responsible for carrying out all of life’s functions. They are created through a process called protein synthesis, which relies heavily on DNA. Why is DNA so important in protein production? Because it houses all the information a cell needs for protein synthesis.

Once a protein is formed, it embarks on a complex journey throughout the cell, interacting with a number of other proteins and cellular components to perform functions needed for the cell’s survival.

This process of protein production and cellular interaction is an example of a biological system. And it's this biological system that synthetic biologists investigate, and try to manipulate.

The Five Main Areas of Research

After combing through the literature, we identified five major areas of SynBio research:

- ***In silico Synthetic Biology***

Meaning “via computer”, this area of SynBio research uses computational simulations to design and predict new biological systems. It’s like using a drawing board before starting a project.

- **“Unnatural” Molecular Biology**

An area of research focused on altering the smallest unit of DNA—nucleotides.

- **Bioengineering**

This area of research deals with larger segments of DNA like genes or chromosomes, and sometimes other cell components that interact with DNA. It aims to create new proteins or protein systems and is the most popular area of SynBio research.

- **Synthetic Genomics**

Focused on altering and manipulating whole genomes (which is the complete set of a cell’s DNA).

- **Protocell Synthetic Biology**

This field of research aims to construct whole cells. This is a step towards creating organisms that are entirely synthetic

While early research in SynBio struggled to finish real-world projects, innovation in this field has ramped up quickly in the last decade.

Synthetic biology products are becoming increasingly more pervasive in everyday life—so much so that by 2030, some scientists believe most people will have eaten, worn, or used something created through synthetic biology.