

DANIEL BURRUS'

# TECHNO TRENDS

THE BIG IDEAS THAT ARE  
CHANGING EVERYTHING

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## Bitcoin: Here To Stay or Gone Tomorrow?

By Daniel Burrus, CEO of Burrus Research

Let's take a look at a phenomenon that's likely to have consequences for the way you do business for many years to come: digital currency. There has been a lot of talk about the future of digital currency, and specifically Bitcoin, the first digital currency to attract mainstream attention.

But are digital currencies an overhyped fad or part of our new reality?

Answering that question gets to the heart of my work, which is to teach people how to properly examine the trends and facts on the ground in order to gain valuable insight into what will actually happen in the future.

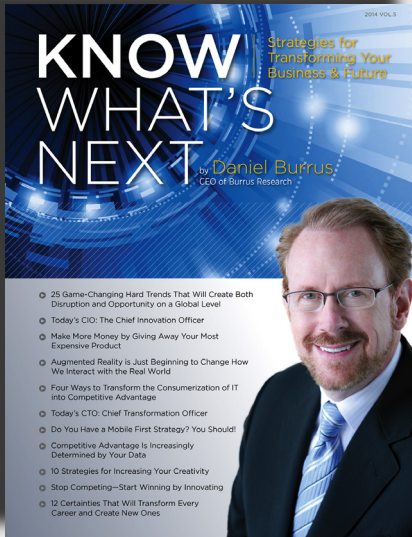
### A Bitcoin Overview

If you've heard of digital currencies, it has probably been in the context of a discussion about Bitcoin. But what is Bitcoin? Bitcoin is a virtual, decentralized, crypto-currency. This means that no one is in charge of it and it isn't backed by any hard asset or government. Bitcoin's value is protected only by a distributed network that maintains its ledgers and protects its transactions by means of cryptography and the faith of those people who accept Bitcoins for goods and services.

The concept behind Bitcoin was proposed by an anonymous programmer (or programmers) using the pseudonym Satoshi Nakamoto. The open-sourced concept was proposed in 2008 and the first Bitcoin client emerged in 2009. A single Bitcoin is today valued at \$222, while the value of all Bitcoins in circulation tops \$3 billion. Currently, the protocol is overseen by Bitcoin.org, with many different parties contributing to the integrity of the currency.

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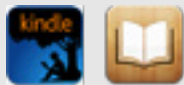
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## TECHNOLOGY NEWS HIGHLIGHTS

### 3D Printed Buildings

A company in China is taking 3D printing to a whole new level. After demonstrating the viability of their process by constructing ten printed homes in Shanghai about a year ago, they recently completed a 5-story apartment building using their proprietary "ink" mixture and an enormous printer.



The latest building to be completed is an 1100-square meter villa, complete with 3D-printed ornamentation inside and out. The structure, which measures 20 feet high, 30 feet wide and 132 feet long, was prefabricated in less than 24 hours and then assembled on site.

The process uses recycled construction waste, glass fiber, steel and cement mixed with special additives. The printing spray nozzle and automatic material feeding system was developed back in 2004 and 2005. The resulting material is 50 percent lighter than traditional construction materials, self-insulating, non-polluting, and flexible yet structurally strong enough to withstand earthquakes and high winds.

The company plans to build up to 100 recycling facilities around the country to supply the raw materials needed to meet demand for these new, cost-effective structures.

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### World's Strongest Natural Material

For years, spider silk has been regarded as the strongest known natural material, but British researchers have discovered a new substance that is even more durable – a hard mineral known as goethite. The material is found in the teeth of limpets – small, snail-



like aquatic creatures that use their tiny, but strong, teeth to remove algae from rock surfaces.

In another example of “bioinspiration” (making structures based on natural designs), the researchers used atomic force microscopy to examine the mechanical behavior of limpet teeth at the atomic level. They discovered that the fibers make up a resilient structure which exhibits the same strength regardless of size. This is unlike many materials in which increased size generally increases the number of flaws and, therefore, reduces strength.

These fibrous structures can be copied to create lighter, more resilient materials for many applications including race car bodies, ship hulls and aircraft bodies.

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## Wastewater Treatment

Nearly one percent of total energy expenditures in the U.S. are spent on wastewater treatment. So when one Missouri engineer came up with a method that actually produces more energy than it uses, it's no wonder that people started to take notice. Most of the energy for current wastewater treatment processes is used to aerate the tanks to maintain an



oxygen concentration of about 2 milligrams per liter. It has long been believed that this was necessary to keep the microorganisms alive and working at an optimum level. However, it was found that lower concentrations (about 0.5 milligrams per liter) produced the same results while using about 30 percent less energy. In addition, the microorganisms lived longer and enriched more.

A second system has also been designed which converts the sludge and organic matter by-products of wastewater treatment into biogas. The self-mixing, anaerobic digester operates totally on its own with no external power.

When used in combination, the technologies have been calculated to produce a net energy gain. Although the current systems are designed for producing water suitable for irrigation, it is possible to generate potable water as well.

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## Pothole Solution

A solution to Canada's perennial pothole problem may be found in a 14-year-old's science fair project. Inspired by the fact that his mother experienced yet another blown tire, the young inventor set out to





find a patch mixture that would work for the long term – and he did.

The first step was to consult a few experts who advised him that the main problem with patching materials is that water seeps into the surface, so that cycles of freezing and thawing eventually break apart the asphalt. This led the 9th grader to search for hydrophobic materials that were also cheap and environmentally friendly. The answer? Chicken feathers!

Experiments showed that regular asphalt allows about half the water that hits the surface to pass through, while asphalt mixed with two percent chicken feathers allowed almost no water to pass through. The project earned the inventor first prize at the science fair, and may earn him a patent as well.

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## Hyperloop Closer to Reality

In 2013, the CEO of SpaceX and Tesla Motors outlined a revolutionary plan for a high speed transportation system between San Francisco and Los Angeles. Known as the Hyperloop, it eliminated the typical



obstacles to high speed rail (namely friction and air resistance) by incorporating “capsules” or “pods” suspended magnetically inside partially evacuated tubes.

Now that pipe dream is destined to become a reality as plans for building the first full-scale track are underway to begin next year. The five-mile circuit will be constructed in Quay Valley, a new planned development located off of Interstate-5 in central California. It’s an ideal place for the high-speed transit project since the community developer’s vision includes non-polluting options for public transportation. In return, Hyperloop won’t need to deal with right-of-way issues that have halted many high speed rail efforts in other parts of the state.

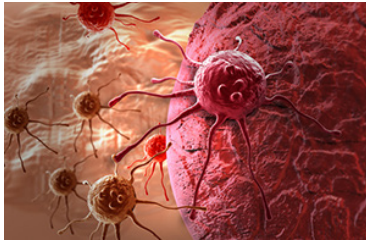
Although the five-mile track won’t be long enough to produce speeds anywhere near the theoretical limits of 800 miles per hour or more, it will be an important step in testing and refining many practical elements of the project, such as boarding procedures, pod design, and station layout. These designs represent the collaborative efforts of nearly 200 engineers and 25 UCLA graduate architecture students, many of whom provided their expertise in exchange for stock options.

*For information: Dirk Ahlborn, CEO, Hyperloop Transportation Technologies; Web site: <http://jumpstartfund.com/#!/p/hyperloop-1/overview> or [www.spacex.com/hyperloop](http://www.spacex.com/hyperloop)*

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## Nanotube Cancer Therapy

U.K. researchers recently discovered a means to launch a 3-way attack on cancer using nanotechnology.



They found that gold nanotubes (tiny tubular structures that are shaped like drinking straws, only much, much smaller) can not only be used to enhance diagnosis through high resolution imaging, but also to treat tumors by delivering drug therapy and actually destroying cancer cells with heat.

The key to their research is a technique that allows control of the nanotube length. When the dimensions are correct, the tubes will selectively absorb near-infrared light. By simply adjusting the intensity, they can then perform multiple functions. Under low brightness, human skin is rendered virtually transparent, allowing for direct visualization of tumors using an imaging technique known as “multispectral optoacoustic tomography” (MSOT). However, at higher intensities, the nanotubes will heat up enough to kill neighboring cancer cells. The tubular shape also enables them to be loaded with therapeutic drugs to be delivered directly at the tumor site, reducing or eliminating the need for chemotherapy and/or radiation. Testing indicates that the nanotubes are harmlessly excreted from the body with no toxic side effects.

This is the first time gold nanotubes have been used within a living organism. To date, laboratory tests have been conducted only in mouse models, but early clinical studies are planned for the future.

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## Internet of Moving Things

A new smartphone app is now available that's designed to improve urban mobility using data



and information from vehicles and people as they move around. The free app combines mapping, visualization, analytics and reporting functions to automatically generate directions and provide augmented reality views of how to navigate.

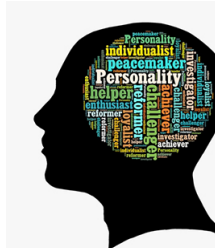
A unique X-ray mode uses the smartphone camera to superimpose maps, bus routes, trains and stops over an image of the city as the user views it. It offers online and offline access for use even when connectivity is limited, and gets smarter with every trip. The same service can also help municipalities better understand how commuters are utilizing public transportation systems, identify inefficiencies and reduce congestion.

The app is a product of a new kind of database called a space-time engine which addresses many of the problems associated with mapping data in motion, such as inaccuracies, inadequate information and poor signals. Obvious applications for the system include delivery and logistics services, as well as a carpooling tool that would allow users to identify fellow commuters along their route. The data-intensive mapping service is currently available for 20 U.S. cities plus Toronto, Vancouver and Singapore, with more cities being added.

*For information: Shiva Shivakumar, Urban Engines; Web site: [www.urbanengines.com/about/](http://www.urbanengines.com/about/)*

## Personality Insights From AI

Watson, IBM's artificially intelligent computer system, is now capable of providing insights into personality characteristics from communications like emails, text messages, blog posts and social media. The goal is to help businesses improve customer service and satisfaction by better understanding client needs.



The service, known as IBM Watson Personality Insights, looks at three distinct types of traits. First, it can build a portrait of how a person engages with the world using five different metrics: openness, conscientiousness, extroversion, agreeableness and neuroticism. Second, it can deduce which specific aspects or features of a product will appeal to a given individual based on twelve measures of need: excitement, harmony, curiosity, ideal, closeness, self-expression, liberty, love, practicality, stability, challenge and structure. Finally, it identifies the values that influence a person's decision-making: self-transcendence/helping others, conservation/tradition, hedonism/pleasure, self-enhancement/achievement and openness-to-change/excitement.

Insights into such traits should allow businesses to strengthen their relationships with existing customers as well as attract new clients.

The service is available on IBM's open cloud development platform, known as Bluemix.

*For information: IBM Corporation, 1 New Orchard Road, Armonk, NY 10504; phone: 914-499-1900; Web site: [www.ibm.com/analytics/watson-analytics/](http://www.ibm.com/analytics/watson-analytics/)*

## Bitcoin: Here To Stay or Gone Tomorrow

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Proponents of Bitcoin claim that transactions using Bitcoin are not anonymous. However, Bitcoin transactions are actually as close to anonymous as you can get. Every Bitcoin is connected to an address and every Bitcoin is sent or received by a digital wallet attached to the address. Names aren't associated with the transactions. These factors combine to create a system that is wholly transparent while remaining functionally anonymous, and that's both the genius and the appeal of Bitcoin.

### **Bitcoin: Hard Trend or Soft Trend?**

So, what exactly can you do with Bitcoins? It's a currency, so spending them seems to be the immediate answer. However, in order to spend Bitcoins you need someone to accept your Bitcoins. While there are a growing number of businesses that accept them, the bad news is that most popular merchants and service providers (Amazon, iTunes, etc.) do not accept Bitcoins.

Currencies have failed before, often due to political upheaval or hyperinflation. Bitcoin is the canary in the digital currency coal mine: It can seem like an awfully risky enterprise because it's so reliant on technology and users' faith in its longevity. So is Bitcoin built to last?

Before we answer that question let's look at a few definitions of terms from my New York Times best-selling book Flash Foresight. These terms are going to help you understand the future of digital currency, and separate what's certain to happen from what's merely likely to happen.

A Hard Trend is a trend that will happen and is based on measurable, tangible, and fully predictable facts, events, or objects. Hard Trends represent future facts that cannot be changed.

A Soft Trend, on the other hand, is a trend that might happen and is based on an assumption that looks valid in the present, and it may be likely to happen, but it is not a future fact. Soft Trends can be changed.

All Soft Trends are based on either a Hard Assumption, an assumption based upon good, hard data making it more likely to happen, or a Soft Assumption that is not grounded in research or data, but rather they are based on gut instinct, intuition, and guesswork, making them far less likely to happen.

Keeping those distinctions in mind, we can see that Bitcoin is a Soft Trend. Its future is at best uncertain. Bitcoin has not achieved widespread recognition. Many people use it not as money, but as a speculative venture. Bitcoin's association with illegal online enterprises does further harm to the currency's reputation. Like the French Franc or Italian Lira, Bitcoin could very well end up in the dustbin of discarded currencies.

But digital currencies, or crypto-currencies to be specific, are examples of a Hard Trend that isn't going away. Here's why:

### **Digital Currencies: A Hard Trend**

Bitcoin's survival is uncertain, but the technology driving it is here to stay. What digital currency like Bitcoin represents is a radically new idea in finance: a decentralized system for exchanging value. Bitcoin itself is a young technology, but, due to its open-source and copyright-free core program, it

is constantly being improved and developed into other, more functional, and desirable currencies. Programmers around the world have already developed military-grade encryptions and new ways to trade, thus stabilizing the prices. The wrinkles with digital currencies are being smoothed out.

Digital currencies exist as mere entries in an accounting system. That system acts as a transparent public ledger that records transactions among "addresses." Owning digital currency isn't analogous to having paper money in your pocket. Instead, it means a personal claim to an address, with your own password, and the right to do with it as you see fit. The ingenious system behind digital currencies will increasingly disrupt traditional models and global currencies.

What I'm saying is that, whether it happens with Bitcoins, Digital Dollars, or Digital Euros, digital currency will play an important role in the digital transformation ahead.

### **The Future of Currency: Digital Payments**

What is a future where we all use digital currency going to look like? Imagine you want new shoes, and your favorite shoe store only accepts some form of digital currency. If you don't already possess digital currency, you purchase some from an online exchange and assign it to your "wallet" (an online account).

When it's time to pay, you open your smartphone app, possibly with your smart watch, which uses your biometrics as a password to unlock an address. The currency network is then publicly informed that you've transferred \$100 worth of digital currency to the store. All of this happens in a matter of milliseconds'. There are almost no fees and no personal information was divulged. Compare this to the three days or so that a debit or credit card

transaction usually takes, and the amount of sensitive personal information that must be exchanged in order for those more conventional kinds of transactions to happen. When you think about it this way, the benefits of upgrading to a digital currency are clear.

### Other Virtual Currencies

Bitcoin introduced a decentralized currency. It's the trendsetter. It's the first, but not the last, and it almost certainly won't be the best. Other digital currencies now exist, and the list is expanding. As of this moment, there are over 150 digital currencies available. Here's a brief look at two other digital currencies already making waves:

**Litecoin:** Litecoin is the second-largest digital currency in the world. Created by former Google engineer Charlie Lee, it was launched in 2011. It too is open-sourced and decentralized.

**Darkcoin:** As the name suggests, Darkcoin is a much more secretive version of Bitcoin. While Bitcoins are already anonymous, there is still a record of transactions recorded in a ledger. That ledger can reveal a lot of information. Darkcoin works on a decentralized mastercode network that makes transactions nearly untraceable. In the short time since its launch in January 2014 it has amassed a large and dedicated following.

### In Conclusion

When we separate the issue of Bitcoin's future from the future of decentralized digital currency at large, we get a clear example of the difference between

Soft Trends and Hard Trends. Hopefully you can apply these tactics to gain foresight into the future of your own industry.

Think about it this way: there's a general thought in the air right now (a Soft Assumption) that Bitcoin might be going places, but there's very little hard data to support that thought. It's just an opinion, a hunch. This means that Bitcoin's influence is a Soft Trend. Following that risk involves more risk because it's based on a Soft Assumption rather than a Hard Assumption.

Meanwhile, there's incontrovertible evidence that the tech driving digital currencies will continue to evolve and proliferate. Decentralized digital currencies are going to become a part of the landscape of our economy and everyday life. This means that the ongoing development of decentralized digital currency is a Hard Trend.

It's important to know how to make this distinction in your field. What's the emergent technology that everyone says is "the big new thing"? Is it really all it's cracked up to be? Or is it just the first iteration of a larger phenomenon?

When you're able to distinguish between the Soft Trends that are grabbing everyone's immediate attention and the underlying Hard Trends that are the real engines of change, you'll be able to make the moves that keep you ahead of the game. You'll be anticipating change instead of reacting to it, and that's what it takes to succeed.



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