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Government & Regulatory

How serious is the FDA in pursuing blockchain for food safety?

Despite talk, US Food and Drug Administration has not explored blockchain for food safety in meaningful ways, according to a Forkast.News investigation

By Sam Reynolds · October 28, 2020 (Updated: November 4, 2020) · 5 minute read

A "new era of smarter food safety," an initiative by the U.S. Food and Drug Administration to "modernize how it honors its commitment to help protect consumers from foodborne illness" won't be including blockchain technology for food safety for now — despite 2019 comments from a top agency official indicating that integrating the technology into the nation's food supply

"It's a new approach to food safety, one that recognizes and builds on the progress made in the past, but also incorporates the use of new technologies that are being used in society and business sectors all around us," said Frank Yiannas, the FDA's deputy commissioner for food policy and response, said just over a year ago, in September 2019. "These include blockchain, sensor technology, the internet of things (IoT), and artificial intelligence to create a more digital, traceable and safer food system."

Yiannas is the FDA's "chief ambassador to reduce food safety risks," according to the agency.

But it looks like blockchain for food safety didn't make it past the high-level interest stage, and the agency didn't appear to formally pursue a study of the technology's feasibility. According to a Freedom of Information Act request put forward by *Forkast.News*, the FDA has not pursued or solicited any requests for proposals from technology vendors nor have they discussed the issue internally. According to *Forkast*'s FOIA request, Erik Mettler, the agency's assistant commissioner for partnerships and policy — the official that would be in the middle of any sort of research or negotiation with suitable technology vendors to develop such a system — had not been sent any memos, internal presentations, emails or marketing materials on the topic of blockchain and food security between 2018 and July 2020.

A spokesperson for the FDA said that the agency continues to study "the unique features and tradeability functions of blockchain technology" and said that emerging technologies are promising when it comes to building a more transparent food system. The spokesperson did not comment on what formal steps the agency was taking (such as pilots) to assess the technology's potential in real-world scenarios involving food safety.

The New Era of Smarter Food initiative builds upon the existing Food Safety Modernization Act (FSMA), which focuses on a proactive approach to preventing food-borne illnesses through technology by building a fully traceable food supply chain.

Within the United States, the FDA oversees food inspection with the exception of meat, poultry and eggs *products* (think shelled egg vs. egg whites). In addition, the FDA would oversee food processing while the United States Department of Agriculture (USDA) would regulate the farm

To be sure, the FDA is not the USDA. The USDA's Food Safety and Inspection Service (FSIS) contracted IBM to design a blockchain proof-of-concept project to modernize the FSIS food export certification process. That project wrapped up in late June.

So for the FDA, it's all talk for now with no serious pursuit, as of yet, of blockchain technology for food safety. While officials like Deputy Commissioner Yiannas might mention the technology as a potential solution to alleviate issues in the food supply chain — as he did in June when discussing Covid-19's impact on the food industry — there's nothing formal to indicate the agency is seriously considering integrating blockchain into its tech stack for food safety.

"The concept of from farm or factory to face tracing has long been a desire of the FDA and with good reason. There is also the complexity of the food brokerage business. Food brokers buy crops and sell crops through forward contracts as well as buying produce for their customers on the spot market," said Burke Files, a technology consultant and commercial due diligence expert. "The problem was the cost in computing power to implement. Blockchain technology is slow and requires a great deal more computer power. Blockchain is the Model T of distributed ledger technology. They are amazing but now dated."

Files explained that new platforms using Asynchronous Byzantine Fault Tolerant (aBFT) or Directed Acyclic Graph (DAG) technology are faster and use less computer power — and are likely better candidates than blockchain technology anyhow for a use case that requires such scale.

"The FDA has seen that "liability" in the private sector has also driven many different models of track and trace that are already far superior to what a centralized model might look like," Files added.

John Roberts, a San Diego-based blockchain consultant and developer, believes the agency's reluctance to engage with blockchain for food safety may be based on its own cost-benefit analysis.

"It's a new technology that they are having trouble balancing the cost to develop something *net*

problem with blockchain, and why I don't see many clients using it now outside finance, is that there hasn't been a solution that's used it and left a path to replicate how they did it."

"There's a lot of promise with blockchain, but there's also not a lot that's been proven out with the exception of it's initial use case, finance," Roberts added. "Until there's a big win, I think a lot of these other applications of it will be going this same way."

Other places have shown greater interest in blockchain for food security

Outside the U.S. FDA, the private sector as well as other government regulators have shown much more interest in exploring and integrating blockchain technology for food safety.

The E.U.-funded Food Safety Market (FSM), which is overseen by the European Food Safety Authority, is currently studying blockchain technology as tool for enhancing certification quality and traceability, but this hasn't evolved from the pilot stage.

In Australia, which has a vibrant agricultural exporting industry, the country's Trade and Investment Commission — not the food regulator — highlights the industry's blockchain efforts to ensure a clean supply chain. The commission highlights fruits and vegetables exporter Fresh Supply Co's involvement with SproutX, a blockchain accelerator, in developing a blockchain powered traceability system that uses QR codes. Latitude 28, an exporter of red meat, is also using blockchain-based traceability technology to give consumers confidence in being able to track their food from farm to table.

China likely has the most comprehensive approach coming top-down from Beijing, which has identified blockchain technology as a key strategic tool. The government-backed China Animal Health And Food Safety Alliance has encouraged firms in the agriculture and food business to integrate the technology. China's VeChain is working with WalMart in building out a traceability system, and Bright Food's Cupids Farm Milk, allowing customers to trace their milk from cow to cup.

But the FDA is interested in blockchain technology to track prescription

While the FDA hasn't shown much formal interest in blockchain technology for food security, it has studied the technology's effectiveness for the integrity of the pharmaceutical supply chain.

According to a post on IBM's blockchain blog, the company wrapped up a pilot in May with the FDA and the Merck drug company to study the ability of "blockchain to connect disparate systems and organizations in order to record a common view of product traceability."

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Enterprise, Government & Regulatory

Chinese tech titan Jack Ma: digital currencies may be wave of future

Poised for historic IPO, Ant Group reveals via patent filings its business strategies for China's new DCEP digital yuan — including how it would help enforce government regulations

By Bryan Michael Galvan · October 27, 2020 · 4 minute read

Alibaba's billionaire founder Jack Ma. Photo: Jolanda Flubacher, World Economic Forum

Chinese tech giant Alibaba Group's founder Jack Ma said digital currencies are likely indispensable to the financial system in the decades to come. Alibaba affiliate Ant Group — whose imminent IPO could be the largest in history yet — is now gearing up for that future through patents related to China's new DCEP digital yuan.

"Digital currencies may play an important role in building the type of a financial system that will be needed in the next 30 years," Ma said at the recent Bund Summit in Shanghai, according to *Bloomberg*. "Digital currency could create value and we should think about how to establish a new type of financial system through digital currency."

Ma did not specify whether he was referring to cryptocurrencies such as bitcoin or central bank digital currencies (CBDCs), which a number of countries around the world are now racing to develop.

> The literal translation of the word he used is “digital currency”. In the Chinese culture, the meaning is up for interpretation. That’s pretty much as far as he can push without getting into serious trouble for such a speech. He did push a lot of buttons though. Respect!
>
> — CZ Binance (@cz_binance)
> October 25, 2020

In his remarks, the billionaire behind Ant Group’s Alipay, the popular mobile payments platform, also railed against global financial regulations that he says has stifled innovations.

Ma’s comments are coming as Ant Group prepares for a massive initial public offering that will be jointly listed in the Shanghai as well as Hong Kong stock exchanges. The IPO date in Hong Kong is scheduled for Nov. 5. A date hasn’t been officially announced for the Shanghai listing but it is expected to be on the same day as the Hong Kong IPO.

According to a document released by the Hong Kong Stock Exchange this week, shares of Ant Group could be priced at around US$10.30, meaning that the company could raise around $34.5 billion and be worth about $310 billion. That would place Ant Group’s market value among some of the world’s largest banks.

In comparison, affiliate e-commerce company Alibaba raised US$25 billion in its 2014 IPO on the

raised US$29 billion.

China's DCEP digital currency

Despite Ma's remarks against government regulations, his comments on digital currencies and Ant Group's approach toward DCEP — shown through the company's patent filings — reflect that a CBDC is integral to China's financial future and the company is already preparing to be a part of it.

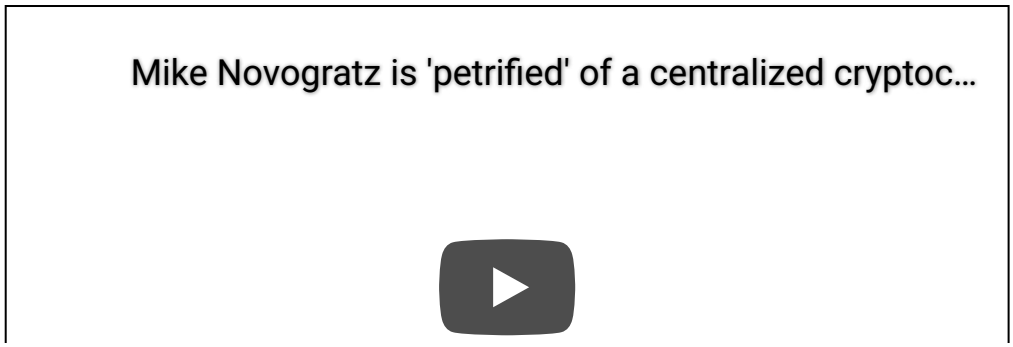
Earlier this month, China ramped up testing of its new CBDC, the Digital Currency Electronic Payment (DCEP) by distributing 10 million digital yuan (US$1.4 million) to 50,000 people to spend at over 3,000 retailers and restaurants.

Delivered via electronic "red packets" in a dedicated mobile phone app to lottery winners in the Southern Chinese city of Shenzhen, the digital currency wallets containing 200 e-yuan bore close similarities to Alipay and Tencent's WeChat Pay's red packet features. These apps' red packets are commonly used as a digital version of the popular Chinese gifting custom.

Mobile payments are nearly ubiquitous in China through private platforms such as Alipay, reaching 277.4 trillion yuan (US$39.07 trillion) in 2018, according to the People's Bank of China.

Alipay's patents for DCEP digital yuan

While Alipay does not currently use the DCEP, it has already filed a number of patents this year related to the digital yuan, according to local media site *Interchain Pulse*.



The first two patents published show that Alipay may be a secondary issuer of a digital currency as a third party agent. The filings specify a method and device for executing digital currency transactions through electronic equipment.

Another patent details methods for controlling digital currency transactions. That patent shows that accounts may be restricted depending on agreements between regulators and the account operators via controls of users' wallets on the company's servers.

"If a supervisor finds that the target account is suspected of violating laws or regulations in economic activities, it can send account restriction instructions to the wallet server," reads the patent's description. These accounts can be shut down immediately based on rules determined by regulators and enforced by Alipay.

These controls over the digital currency differentiate the DCEP from normal fiat currency or digitized representations of the yuan currently used on platforms like Alipay, as they allow regulators greater access and control to how the money is spent, and when.

The next patent lays out how Alipay would be able to open different types of digital currency wallets depending on user behavior.

Upon a user's request to create a new wallet, Alipay would obtain user behavioral data based on the user's identification. Depending on the results, Alipay would calculate the type of digital currency wallet suitable for the user and open the relevant wallet.

Alipay leads in mobile payments in China with 55.4% market share, according to a recent report

including behavioral, biometric, banking and phone information may give the company a large cache of information to assess how users use digital currencies.

Despite these DCEP-related patent filings, Ant Group has been cautious in publicly discussing how the company would integrate China's new digital currency into its payment technology.

"We do not have sufficient visibility as to the impact of the DCEP on consumers' payment behavior and the payment industry," the company said in its IPO prospectus. "It is not clear how the DCEP will fit into or change the current digital payment industry landscape."

Bryan Michael Galvan

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Economy, Enterprise

How blockchain could remix the music industry (and why it hasn't yet)

Most artists earn a pittance and have little bargaining power against record labels and streaming platforms. But blockchain could level the playing field.

To celebrate the end of 2020, here is a Forkast.News editors' pick from our archives, a story that still rings fresh, true and — in a world now measured in nanoseconds — timeless.

What you'll learn in this article:

- What effect streaming has had on the music industry and earnings by artists
- How blockchain can give artists greater control over publishing, distribution and monetization of their music
- How much artists make from their streamed songs
- Why smart contracts and cryptocurrency could make payments to content creators faster and more transparent while stemming illegal downloads

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In the era of streaming, the likes of Spotify and Apple Music have been paradigm-shifting for how the world listens to music. The next big disrupter for the music industry, experts say, may be

Though the market is still nascent, blockchain-powered streaming platforms have recently cropped up, with backing from power players like ConsenSys and Warner Music Group.

Fueling the emergence of blockchain upstarts has been the reaction against the big music streaming platforms that favor established artists, with independent musicians having little opportunity to gain the audience needed for monetization.

What independent artists do earn on the major streaming platforms bring little in cash, as record labels and the platforms take the majority of revenue earned. As the music industry continues to change and grow, blockchain technology — as record players and radios once did — could upend and redistribute power and the industry's earnings.

"We hope that in five years, the power is back in the hands of the audio content creators," said blockchain streaming platform Audius' founder and CEO, Roneil Rumburg. "In our eyes, we see this meaning they'll have full control of publishing/distributing/monetizing their work, and will own the relationship with their fans in an unmediated fashion… As this new music economy matures, replacing existing constructs like advances and distribution with decentralized equivalents, there won't be a need to sign deals with major labels; artists will be able to scale their reach and grow their fans without giving up the rights to their music."

Streaming revolution

Streaming now accounts for 79% of U.S. music industry revenues, the biggest in the world, according to the RIAA. Though the market is already saturated with streaming services, a subset of blockchain-powered platforms are trying to join the mix with varying success.

Within the music streaming industry, Spotify dominates subscriber numbers, accounting for 35% of total subscriber share, with Apple Music, Amazon, Tencent and Youtube lagging behind at 19%, 15%, 11% and 6% respectively. Yet the streaming giant is not without its controversies. Complaints have been made that — contrary to its claims — Spotify does not do enough to "democratize" the music industry, with 87% of the content on the platform coming from the top four music labels in the business.

Accusations that Spotify underpays its artists also abound, with Taylor Swift famously pulling her entire discography off the platform in protest, in 2014.

"Music is art, and art is important and rare. Important, rare things are valuable," Swift told the *Wall Street Journal*. "Valuable things should be paid for. It's my opinion that music should not be free, and my prediction is that individual artists and their labels will someday decide what an album's price point is."

See related article: Are PewDiePie, Manny Pacquiao and Spencer Dinwiddie riding the blockchain wave?

Pop star Taylor Swift has had issues with the music streaming platform Spotify. Photo: Eva Rinaldi, CCASA 2.0

But even an artist as popular as Taylor Swift was no match against Spotify. Swift caved in 2017 (notwithstanding her deals with other streaming platforms) and quietly put her catalogue back on

Time for massive disruption?

Just as radio, record players and compact discs once caused seismic changes to the music business, mainstream internet music streaming is now almost into its third decade. The industry may be overdue for another big shift in tectonic plates, industry insiders, in this new era of blockchain.

Former Hollywood film producer Steven Haft, currently the head of global partnerships at ConsenSys and treasurer of the Blockchain Social Impact Coalition, told *Forkast.News* that music is "an industry that is controlled by labels, mega-publishers and streaming platforms [that] are, by nature, centralized gatekeepers in the music supply chain… Blockchain introduces a remedy with its decentralized platforms and databases."

Although the music industry would not exist without its content creators, the way that recording industry copyrights are structured, coupled with the dominance of recording labels, result in a system that does not pay artists very much. Musicians are paid only 12% of industry revenues — and current streaming services aren't helping. Spotify's average pay-per-stream ranges from a measly US$0.006 to $0.0084, which is then distributed among "rights-holders" — including "labels and publishers" — the same people who gobble up the lion's share of the revenue before leaving musicians their 12%.

Unless an artist is an already established pop star garnering streams in numbers like Ariana Grande's, they make only a negligible amount from streaming services. This is why even Taylor Swift got upset.

For their part, the streaming platforms claim to be struggling financially as well. Despite its outsized market share and raking in US$2 billion in revenues in just the first three months this year, Spotify still operates at an annual loss — which it has done since its inception in 2008. Spotify says it has prioritized growth over profit and has lost royalties to illegal downloads.

Enter blockchain — a technology that experts say could help stem illegal downloads while alleviating or even breaking the big players' chokehold on the music industry.

One way that blockchain could redistribute power within the music industry is through the use of smart contracts. If recording contracts are recorded on the chain, lawyers and record label executives might find it harder to claim the lion's share of profits, perhaps making room for the artists themselves to claim more than 12% of the revenue.

Let's return to Taylor Swift as an example. The megastar moved record labels last year after a drawn-out, publicized spat with her previous label and its executives. The dispute over whether or not the terms of Swift's initial contract — signed when she was just 15 years old — were fair could have benefited from transparency. Despite celebrities weighing in left and right on the controversy, the original document itself was never disclosed.

Cryptocurrency could further allow artists to be paid more directly and efficiently, instead of having to wait up to six months as they do now. And blockchain doesn't just benefit artists. A publicly visible registry on the chain showing the various copyright ownership of certain works could address the lack of a verified universal database may help stem illegal downloads and piracy, which costs the music industry an estimated US$2.7 billion in revenues annually.

While blockchain could take power away from record labels, Haft is hopeful that open-minded and forward-thinking music companies would be willing to get on board.

"The labels know they will lose overarching dominance over what music gets listened to when the artist becomes an entrepreneur," Haft said. "We can, however, look to innovative labels such as Minerva to show the rest of the industry what a win-win looks like for label and artist."

Getting in the blockchain act

Minerva is a blockchain platform launched last year by dance artists RAC and Goldroom, following the former's successful release of his music on Ujo, an Ethereum-based platform backed by ConsenSys. The company aims to streamline the release and payments process and take greater control over the commercialization of artists' intellectual property.

Even Spotify has jumped on the blockchain technology train. After relinquishing US$20+ million

2017, a blockchain startup whose Attribution Engine promises to remediate the legitimacy and lineage of copyright claims to reduce chances of neglecting royalties owed.

Open Music Initiative is a similar project aiming to create "an open-source protocol for the uniform identification of music rights holders and creators," backed by labels such as Universal, Sony and Warner, and streaming services such as Spotify, Pandora Radio and YouTube alike.

Blockchain streaming platforms have started cropping up in recent years as well. There are now upwards of 25, and many of them serve the same purpose — connecting artists with paying fans while cutting out the middleman.

Platforms such as PeerTracks, Musicoin, and Dsound are platforms similar to SoundCloud but backed by blockchain, paying their artists instantly in cryptocurrency (Soundac token XSD, MUSIC and STEEM respectively). They are, naturally, more popular with independent musicians who not only are the fastest-growing demographic in the recording industry but also don't stand to gain much from the lower-paying mainstream platforms.

Warner Music Group also wants a share of this action. The music giant has joined a group of investors including Silicon Valley venture capital firm Andreessen Horowitz to invest US$11.2 million into Flow, a DapperLabs project using blockchain to authenticate non-fungible tokens such as signed digital album art, as well as "looking into how cryptocurrency could be used to let fans tip its favorite artists, and testing two different blockchain platforms for directly connecting musicians with their fans without the need of intermediary distributors."

Another blockchain-based music streaming platform is Audius. Having raised US$5.5 million in August 2018, the app claims to be "the first truly decentralized, community-owned and artist-controlled music-sharing protocol" that pays artists immediately for streams via smart contracts. As of October 2019, Audius had "a combined monthly audience of 10 million people," and was lauded by Yahoo Finance as "adequately addressing the most pressing needs within the industry." The dApp most recently hosted #AudiusFest in May, taking advantage of pandemic-induced global quarantines to attract audiences — much like many Instagram Live concerts. However, Audius is not without its problems, and copyright infringement is perhaps the most pressing one. The Verge has explained how "there is no content ID system in place to catch potential infringement," and that by design, even if copyrighted material is identified, its creators do not have the power to remove it.

Audius did not return requests by *Forkast.News* for comment.

Challenges ahead

based platform attracted "over 12,000 artists uploading over 45,000 original songs, and 22,000 registered users with over 5,000 monetized playlists" in just over a year and was called "the largest and fastest growing music streaming platform on the blockchain." It enabled smart contracts between artists and song contributors, and paid them per stream instantly, in $NOTES, its cryptocurrency. In August 2019, it was paying over 13x more than Spotify, with a Choon 2.0 in the works. Yet a mere four months later, Choon's cryptocurrency had devalued to the point of worthlessness, prompting investors to pull out and the site to close.

With the rise and fall of many early streaming platforms, the future of blockchain in the music industry is difficult to predict. While the technology may seem poised to topple a long-standing, inequitable market, the challenges it faces in penetrating a saturated market are considerable, as are copyright and payment issues.

But failures — even colossal ones — may be part of the normal growing pains of any new technology. The automotive industry had its Edsel. The internet's early days saw Pets.com come and go. However, from Limewire to Napster to Spotify, technology has always been a crucible for innovation, and people's demand for music and convenience has never flagged.

"Blockchain continues to demonstrate its ability to create opportunities for independent artists and challenge traditional gatekeepers within the industry," said Haft, of ConsenSys. "Defi is simultaneously making inroads on the enterprise side, where the bulk of the industry revenues are generated."

Kristie Chan

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