Fidelity Connects

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Voiceover: Hello and welcome to Fidelity Connects - a Fidelity Investments Canada podcast - connecting you to the world of investing and helping you stay ahead.

NFTs have skyrocketed in headlines for its million dollar works of art and its imprint in the digital space. But what do NFTs, or non-fungible tokens mean beyond the JPEGS making headlines? What does it mean for investors, financial service industries and society more broadly?

Matt Twigg, senior manager and lead researcher at Fidelity Labs, out of Tokyo, Japan joins Colin Randall, Fidelity Canada Director of Research on a program to provide his global perspective on NFTs. Matt discusses the new possibilities that blockchain technology presents to investors and the businesses that serve them.

Firstly, Matt breaks down what NFTs are. Put simply, he says, a token represents something for something else. Something that has value, but non fungible tokens also have scarcity attached to it as well. Blockchain technology facilitates these tokens and helps create its scarcity. Blockchain is a distributed ledger technology or record system. These tokens are tied to records in that ledger.

Matt also provides real-life examples of NFTs in the marketplace right now. Most think of music and the art space, but NFTs can also apply to the healthcare industry. For example, NFTs can track medical supplies like PPEs or even vaccines.

He also talks about the challenges and risks NFTs face, including market volatility, price swings and mergers.

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Colin Randall: Maybe we could start with some definitions. Matt, could you tell us what exactly is a non-fungible token?

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Matt Twigg: That's a great place to start, isn't it? Let me start with what a token is -at least for me- in a kind of storytelling way to make this make sense to everybody. There's a couple of ways you can think of a token. A token essentially is something that represents something else, and we can think of it in different ways. For example, you can think of it as something intangible made tangible. Here in Japan, if you visit someone's house -come for a visit- there's a kind of

favourable exchange and you may present somebody with a gift in exchange for visiting their home. That could be called a token of your appreciation. You're giving them a physical gift to represent that intangible thing of the appreciation for your visit time. That's one kind of a token that I think touches on what NTFs are.

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Another kind of token I like to talk about is, for example -something probably we all experienced when we were younger-, game tokens; we went to arcades. Some of us may remember going to video game arcades when we were younger. You could exchange your money for a game token. It was virtually the same as the quarter you exchanged it for, but it wasn't. It was specifically for playing games. It was a token which gave you certain rights or access to play a game. Because they are exchangeable -those tokens- you could play any game you wanted in the arcade. They are fungible, theoretically, right?

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But if that token only worked for Space Invaders but not for Asteroids and only that Space Invaders game over there, it would be non-fungible because you couldn't switch from any other token. I think those are some ways I like to think about to explain non-fungible tokens in a real-world scenario. At the end of the day, it's really something that represents something else that has value and, when we talk about non-fungible tokens, has scarcity to it. I think those ways is an easy way to think about what non-fungible tokens really are.

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Colin Randall: This is based on blockchain technology, and I guess that creates this ability to create scarcity. To your point, what is non-fungible, what is not necessarily, I guess, exchangeable for another token is being, I guess, facilitated by blockchain technology. Is that correct?

[00:04:49]

Matt Twigg: Right. We take that model of those tokens; the token of appreciation, the game token, and you extend it into the blockchain world. You have the blockchain, which is essentially a distributed ledger technology, which is a record system, and now those tokens can be tied to records in that ledger. Because they can be tied to a specific instance in that ledger, a single and only instance in that ledger, that gives it value. Once you're connected to something and you're exclusively the owner of whatever that item is -that's represented by a non-fungible token- that's where the value comes from.

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Another way to think about that is, for example, you have something that could be fungible. Let's take a photograph of your favourite actor or actress. Now, that photograph could be printed a million times, you can find it on the internet, it has no real value on its own. It's fungible. But if you see them in person, they autograph it to you exclusively; they've endorsed it, they've kind of ledgerized it. There's only one in the world like that now. Just like something in a ledger with a single entry or an endorsed photo with a single signature on it, now using the blockchain technology to tie that record to a single point and give it that implied value.

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Colin Randall: The blockchain really enables, I guess, in one instance, the ability to define provenance, where something came from.

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Matt Twigg: Exactly.

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Colin Randall: Whereas we can take an image off the internet, it could be copied an infinite number of times, but blockchain technology enables us to show who, ultimately is the owner of that image.

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Matt Twigg: Yeah. It's all about the ledger. It's all about the record system, which is the real value of blockchain itself. It's an open ledger visible to everybody. Whatever is recorded in there can be read by everybody and you can be seen as the exclusive owner of whatever this asset is be it digital, physical or otherwise.

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Colin Randall: With that nonfungibility of NFTs, what are the kind of use cases that this can be applied to?

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Matt Twigg: I think anywhere where exclusivity or uniqueness is usable in terms of record keeping particularly is where NFTs are going to give value to the average person. We know the cases, the NFT music or art; those are the ones we see in the media most often. You may buy a picture of a Bored Ape Yacht Club image or something like that and you're the only exclusive record holder of that piece of art that may be valuable to some, but those very same mechanics of the underlying blockchain record keeping, the ledgering, will allow you to tie other items to you exclusively, giving the owner or creator or otherwise a specific value through uniqueness. Again, it can be a piece of digital art, it could be a single piece of music, or it could be a part of a real estate investment either in the digital space or in the physical space. Anywhere where you can have that kind of implied exclusivity by a single ledger entry is where the value is going to come from with NFTs and underlies everything.

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Colin Randall: A number of different types of use cases are actually in place today. Could you give us some real-world examples of where NFT technology is being used in the marketplace right now?

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Matt Twigg: Besides the obvious ones around art and the creator economy -which I think is a great thing; I think it's given a real opportunity for some people to get known and get their pieces out there and be reimbursed for them amongst their friends directly-, there's a lot of other uses for NFT-type technologies utilizing the ledgers and the recordkeeping therein. One of the cases I like to look at is ... some of you may not think of ... we saw in COVID things like medical supplies and medicines being transported around the world to take care of the situations arising and mitigation needs. Where things are, where they came from, when they were manufactured, those can be difficult to track in a very complex and fast-moving situation.

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The NFT tracking, ledger entries of, let's say, PPE supplies or vaccines or any of the kind of medical or food supplies that are recorded on a ledger would instantly inform anybody looking at that ledger where something came from, how long

it's been in transit, where it passed through, its origin; all those things can be technically NFTs. Those are exclusive entries on a ledger. NFTs can be anything we want to track or keep note of something unique. It could be a piece of art, or it could be a vaccine.

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Colin Randall: That's excellent and I think there are huge efficiencies that can be realized through this open, transparent ledger that anyone can access, theoretically and we'll talk about that a little later on in the show. Could we maybe take a step back and talk more sort of practically, how does one acquire an NFT today?

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Matt Twigg: There's a few ways to acquire an NFT today. I think the most well-known example would be go to -again, we're talking about probably creator economy type NFTS, which are the ones most well-known - you go to one of the marketplaces such as OpenSea and you can browse and see all the different kinds of art there. All different kinds are there from the usual overpriced JPEGs or musical works, a large variety of created items. But before you can acquire any of those you have to have some ether. Ether is the main currency for NFTs, especially in the art space.

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Colin Randall: That's the Ethereum blockchain's currency.

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Matt Twigg: Yes, exactly. I'm sorry. The Ethereum blockchain's currency. If you're new to it, you have to go out and acquire some ether, some Ethereum currency. You might want to do that on any one of the platforms that offer that. I think in the States, for example, Coinbase is one of them; in Japan it's Coincheck, over here in the East. You acquire some ether, you put that in your digital wallet, and then you go to the marketplace, and you can buy things with that currency that you now have in your digital wallet. There are some things to consider with that. Obviously, the price of ether fluctuates, so you have to consider that, how much it's going to cost you and also any kind of transaction... because you're writing on an open distributed ledger blockchain that needs to be updated... every time you have a transaction there's going to be some overhead on that. We call that gas fees [indecipherable]. There's a little extra processing work [that] has to be done above and beyond your purchase. That's something to consider because more than half of the NFTs in the creator [indecipherable] that have been transacted are under $200 a piece. Fees that you pay on these different platforms is something that a new buyer, for example, is going to need to consider.

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One thing I should mention because I'm here in Japan -I mentioned Japan over here-, we have a unique arrangement getting set up over here with how to acquire NFTs. We have, I think I just mentioned, a vendor over here called Coincheck [indecipherable] and that's a place you can buy and trade online currencies. They have an arrangement now with a company called Animoca which helps new creators get online and create the art, kind of like a broker for artists that brings them in to the Coincheck place, and you can buy directly in that marketplace and leave them within that marketplace area. They can retain it for you, keep custody for you and you don't have to pay those gas fees unless you're [indecipherable/mover of the art?] which is a new experiment and I think it's turning out to be a fairly profitable one for the companies involved right now.

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Colin Randall: That's interesting. They're providing a service whereby they can facilitate a purchase of an NFT, but the gas fees, the cost of that purchase, is only realized once the individual effectively takes the NFT to be their own directly. Is that correct?

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Matt Twigg: Exactly. It's turning out to be a good model because what's happening is Coincheck, for example, is acquiring the NFT assets from Animoca; the creators get their things into the marketplace and then it works on that spread between what they bought it for and what goes to the customer to make their profits and they can pass it on to the customer with lower prices and, because the customer may choose in most cases to leave that NFT art in Coincheck as their custody agent, you don't have to pay any gas fees to move things in and out because it hasn't actually had been updated on the chain yet. It's all within the Coincheck space.

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Colin Randall: It's really interesting and I've done some experimenting myself. The self-custody experience, I'd say, is still a little clunky, I think, for most people. Some would say it benefits to have some engineering background in terms of some experiences. Having that provider that can provide sort of a trusted service in terms of the custody of those NFT sounds like a really interesting business opportunity. Are there sort of valuations that are currently available of how big the NFT market is today?

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Matt Twigg: Yeah. It's been a tumultuous year, obviously, for all cryptocurrencies and blockchain-related things. I believe the last numbers I saw as of about a month ago, early September, was an 11.3 billion market right now still for NFTs and that's still considerable thinking how much things have downturned in this current crypto winter we're experiencing right now. I think if you look at the end of 2021 projections, we're looking at a 36% CAGR between now and 2025-ish. Those numbers probably need to be adjusted right now with the market down about 92 -95% since January. But with the global market situation, volatile assets like NFTs and others will get hit.

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Again, I think we can look at these valuations and they are what they are, but I think that this volatility has some good in it. I like to think of it as... I remember back during the dot com crash in 1999, 2000 when I was a young investor and I remember things like pets.com and those kinds of things crashing and burning and there was some crash and burn, but out of that came so much great value. That's where we really got a mature Amazon and then mature Google, things like that. I wouldn't be too upset about volatile valuations right now. Look at the technology itself and what it can bring us, and I think there's a lot there, NFTs, and we're just starting to find out what the real value is.

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Colin Randall: That's interesting. I think it was just a couple weeks ago there was a sale of a CryptoPunk, it's called, which is a profile picture, [unintelligible], one of the original NFT profile pictures, that sold for $4.5 million. So, there's still demand for some of the scarcer NFTs out there.

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Matt Twigg: That's it, it's all about scarcity, isn't it? That CryptoPunk has a value within a community. An NFT is largely about community in the art space and there's people within that community who are willing to pay that.

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Colin Randall: You mentioned Ethereum as the leading blockchain that NFTs are being built on today … are there other blockchains that are moving into this space that have the same capabilities to produce these NFTS and what are some of those capabilities that's required of a blockchain to underly NFTs?

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Matt Twigg: Essentially, when you're looking at blockchains and you're comparing the more well-known blockchain of Bitcoin versus Ethereum; the key differentiator of them is it's programmable. And the key programming is a contract or a smart contract which represents your token. Actually, it says what your token is, who made it, who owns it, and actually points to where it's kept outside and off-chain. Technically, any blockchain that can carry that data could replace or supplant or augment Ethereum. Right now, there's other ones out there. I think the most popular one's probably Solana. There's Cardano. Binance itself has one as well. All these things are up-and-coming and being looked at as alternatives largely because before the Ethereum Merge, the costs might have been lower because they were layer 2 blockchains, which abstracted some of the work off-chain. But still, 90% is going to be in Ethereum.

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Colin Randall: Right. I guess with the others you mentioned -with the Merge that happened, and we can talk about that later in the show today- that's actually, perhaps given advantage to Ethereum as the leading blockchain for NFTs. Maybe that's a great segway into some of the challenges and risks involved with NFTs. We talked about volatility; we talked about really the significant price swings that we've seen this year versus where we were just a year ago. Maybe you could talk a little bit about some of the other risks and challenges that NFTs face. Resource consumption. Now, I think has been mitigated recently because of the Merge, but could you tell us a little bit about that…?

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Matt Twigg: Absolutely. The Merge happened fairly recently and went smoothly by all accounts. One of the main benefits of that, of course, was resource consumption because that merge brought Ethereum from a state-of-work where proof of the blockchain, a block, is done by computational work, which takes energy, to proof-of-stake. Proof-of-stake take doesn't require that energy. It's a stake. I tell people it's like putting your stake on the poker table. You're placing a bet on the table. Instead of doing a proof-of-work to win a contest on computation, now you're winning based on the stake you put forward. Maybe to help people think about that one a little bit -another story thing I like to think of for proof-of-stake to make it clear- is, instead of doing the computational work think of it like -they probably still have these- where they have like radio contests. You call up the radio station to answer the questions and win a prize. Many people will try to call in to get the radio station to receive them and enter that contest and answer some questions to win a prize.

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The same thing with staking. A lot of people put their stakes out there. One person will get selected and win that stake and then they get the reward of some coins, but no actual computation work is happening. So, energy has gone way, way, way down. I actually looked at it just recently how far that's come down. There are some trackers out there, there's one called Digiconomist I looked at recently that tracks the various chains. For example, I think blockchain is

running at about, I think, about 120 terawatts per year for blockchain. Ethereum was 93 to 94 before the Merge in mid-September and if this is to be believed, Digiconomist had dropped to zero the day after. Just straight line down in energy consumption. That's obviously a huge advantage for the energy consumption.

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Colin Randall: That's the Bitcoin blockchain proof-of-work you're comparing to the Ethereum blockchain now.

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Matt Twigg: Just to have a comparison. The blockchain is 120 terawatts per year, Ethereum was 94, post-Merge is zero. So, it gives you a sense of scale of how far you've come down. It's quite extraordinary. I think a lot of people had concerns about NFTs being energy consumption hungry, I think that's not really a concern anymore.

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Colin Randall: That's fascinating that one event can make such a significant difference on that front. Now, some of the other challenges that NFTs might face... You mentioned it earlier, gas fees is another consideration. I'm not sure whether the Merge affected gas fees quite as dramatically.

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Matt Twigg: I think some people were probably expecting that because it's such a big deal, the Merge, but I think we're going to see the real gains for gas fees when we get to sharding, which will come later, which will actually break up the blockchain into smaller pieces, which will reduce the amount of work required for each update. Right now, when you transact an NFT, it has to be written to the blockchain, the whole blockchain. It's a lot of work, so that's why you pay the gas fees. When it's broken into smaller pieces, the updates will be smaller, Think of it that way, smaller pieces, so there will be less overhead and less gas fees for the consumer. That's definitely a challenge that will mitigate in the future as well. There's other concerns, too, we can talk about outside of these technological ones, I think. Interesting, but those are the two that most people think about, especially the energy consumption.

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Colin Randall: Maybe we can shift over to sort of broader implications of NFTs for financial services, but for society as well. I think, really, the applications here are so broad, it would be great to delve a little deeper into them. You've written pretty extensively in terms of different applications and what these might mean for societal organizations and, as I say, financial services. Can we talk a little bit about NFTs and community? It's early days, but you've written about how NFTs are increasingly being used as social identifiers. What do you mean by that?

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Matt Twigg: This is where the promise of NFTs really lie. In utilizing, again, that blockchain record and a unique entry in that ledger, I think anything that can be recorded that way and be unique and be permanent and be visible and transparent is going to have tremendous value. The communities itself, you can think of again... You mentioned the Bored Ape Yacht Club, that's a big one. One of the values that comes from that is when you buy that token you don't just buy a picture; you buy entry into a community. So that NFT is basically a linkage that has a linkage not only to the piece of the art; it has linkage to access, to special events that are part of a community, exclusive places where people can meet each other and do things. You can layer many, many things into a single NFT that give the owner various rights.

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One of those things, of course, obviously, is identity. I think identity in the future is going to be something really interesting to do with NFTs. That can be identity as in personal identities. You can keep in your digital wallet, if you want, an NFT that says who you are, could have maybe your school records or your medical records or could have a CV or anything you want to have in there that is indelible and visible as much as you want it to be to the community. If you go for a job interview in the future or something like that or you go to a hospital and check in, those NFTs could carry all of your data and because they're on one distributed blockchain you don't have to worry about incomplete records here or there, this is missing and that's missing and not synchronized. It'll be automatically done. I think there's a lot of value to that as well. I see a lot of promise in there.

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I think NFTs, people think of trading and selling and buying and creating and that doesn't really apply in this space, obviously, because your identity is your identity, right? Something that was talked about in the early days of blockchain, Ethereum particularly, was soulbound tokens. I don't know if anybody's ever heard of the soulbound tokens, but these are things that are NFT records that are not meant to ever be sold or exchange hands. They're bound to your soul. I think they're called SBTs for short, soulbound tokens. These could be those personal identifiers, those medical records, those school records, whatever you want to keep on a ledger that you don't have to ever worry about being lost or disrupted or difficult to find or share with people that you need to. I think that these kind of things ... that's where you're going to see the real value in the ability to record things on a public ledger and have an NFT which is essentially a pointer to that to be shared with whoever you need to for business purposes or otherwise.

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Colin Randall: It is fascinating to imagine ... this is probably many years in the future, but the whole population of the world can effectively use a distributed, shared blockchain to manage identity records, etcetera. It's really, really fascinating. Can we talk a bit about creator economy applications? This is another, I think, really interesting space here where, whether it relates, say, to works of art or music royalties, can actually be effectively coded right into the contracts; provide, say, an income stream to the creators over time. Can you talk a little bit about that application?

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Matt Twigg: Yeah, absolutely. I think that is something that is unique to NFTs in the marketplace for a creator. Previously, if a creator, for example... we can go back to the initial value of NFTs for creators; they create the art, whatever it is, if it's graphic art and music or whatever, and they sell it directly to the buyer. There's no middleman; there's no agent. Previously, if you're a musician or something like that there would be an agent in the middle taking a cut, so you had to pay them. And then once it's gone, it's gone. But now you create NFT, the best example probably everybody knows about was the Beeple one that sold for ungodly amounts not too long ago. In that smart contract, the NFT is a contract, essentially. It was written that every time that's moved on, Beeple's owed another 10% cut off of whatever it sold for. In perpetuity he's basically set up a royalty system for himself without any agent needed to collect because it's in the blockchain; it is a smart contract and when the conditions are met of a seller and a buyer, it'll trigger that 10% that will go back to Beeple.

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I think that can be applied to anybody who wants to utilize NFTs as their mode of distributing their artworks. I think that is a tremendous value, if you will. Not only is it removing the middlemen in the distribution system, but it's also ensuring that in perpetuity they can get revenue from their artworks, which previously was not possible.

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Colin Randall: Maybe we can turn to some applications more germane to financial services. NFTs, I think, are already allowing access to both virtual and physical real estate today. Could you talk a little bit about this development?

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Matt Twigg: This, again, is a fascinating area for me. Again, showing the real value of NFTs, a non-fungible token or record in a ledger that points to a specific item that, in this case, is going to be definitely off-chain, unless it's a digital asset like digital real estate. But physical real estate it's going to be a pointer. That's a record that's going to point to someplace off-chain. That is a great application of real estate, for example. I think I read -might have been last year already- that already in California there was an apartment that was purchased and sold and transacted on the ledgers as an NFT. The NFT had all the records of that property in it. When the NFT changes hands from seller to buyer everything goes with that NFT and it makes it a very smooth, very easy transaction, regardless of the property acquired. All the paperwork you have to do, all the research, all the recordkeeping is all bound into that NFT that moves with it. So, in those single purchases like an apartment, it has great utility. Again, NFT utility is the real value. What it does for you, what it can be attached to that NFT.

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Another place that can be done is give investors an entry point into very large-scale real estate projects they normally wouldn't have access to, that might only be available to private equity. Say somebody wants to diversify their portfolio in real estate beyond REITs, they can go ahead and buy a fraction through fractionalized tokens in NFT of some large new industrial complex. If they're going to put up another huge tower here in Tokyo, I could go ahead and own a millionth of the share of that building via NFTs and then as the asset increases in value over time, so will my share. NFTs, in this case, increase the liquidity of normally illiquid assets and they also increase the accessibility so that people who normally couldn't get access to these things, because the point of entry was too high, now they're able to and it allows people to gain access to new markets, new flexibility, new diversification, which is probably something a lot of people would value these days.

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Colin Randall: You mentioned the tokenization of real estate or fractional ownership of real estate that's been effectively represented on a blockchain ledger. This can be, I believe, applied across various different securities in existing capital markets and there are real benefits there as well.

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Matt Twigg: Absolutely. Anything you can think of that has a large price tag that can be fractionalized and made more available to people is an excellent case study for NFTs. It goes into another area, which I don't want to get too deep into, decentralized autonomous organizations. One thing in there was there was a DAO, decentralized autonomous organization, that wished to purchase a copy of the U.S. Constitution. Now, normally that would be far out of the range of any normal buyer, but by fractionalizing it with tokens in that organization, it allowed people an accessible entry point.

You can fractionalize sports teams, billions and billions of dollars of sports teams into small chunks that can make people able to access these investment opportunities that were previously impossible. Anything. It could be a building, could be a sports team, could be the Constitution, could be a very, very expensive piece of art, could be anything you can imagine that could be a group ownership and fractionalized. Even NFTs themselves, original, very expensive ones, have been fractionalized. So now you have a thousand people who are part owners of a very expensive NFT that they normally couldn't access before.

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Colin Randall: It's fascinating. The fact that it's such early days today will be really interesting to see how each of these applications kind of develop and mature over time as the technology continues to evolve and adoption continues to increase. That's about all the time we have for. We'll absolutely love to have you back to talk about decentralized autonomous organizations and other fascinating developments in this space. Thanks again for joining us today, sharing your insights on these very interesting and certainly constantly evolving technology.

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Matt Twigg: Thank you so much. Great to talk to you again.

Ending: [00:31:38]

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