MONEY 20/20

A letter to our readers

If you work in the financial services industry, there's a good chance that you have come across a plethora of exotic new terms and acronyms in the last couple of years – blockchain, DeFi, NFTs, DAOs. For those of you who are minting your own NFTs, tracking gas fees for ETH, debating the merits of stablecoins versus traditional cryptocurrencies, and dabbling with the metaverse, this report is not for you. Sorry – there will be other reports that are more your cup of crypto.

If, on the other hand, you are like many of us who nod knowingly at conversations at dinner parties but don't truly understand the subject, this is your crash course. Call it Web3 101. It's designed to get you up to speed and provide you with the foundation you need to add to the conversation of what is to come.

In the following pages, we'll guide you through Web1, 2, and 3, unpack how blockchain, smart contracts, and tokens provide the architecture for a new form of internet, touch on how these innovations are impacting traditional financial services via decentralized finance (DeFi), and assess just how disruptive Web3 is likely to be, and when.

Money20/20 is the place where fintech conversations happen, and we invite you to participate in this Web3 discussion via dialogue with the authors directly, as well as via our social media channels (Twitter handles and email addresses at the end of the report). And, of course, our shows are THE place to have the conversation in person. We truly welcome your feedback and we look forward to being alongside you for the journey.

Read on to enter into the new frontier of a decentralized internet and all that that entails...

Best regards

Nick Holland
Global Head of Research
Money 20/20
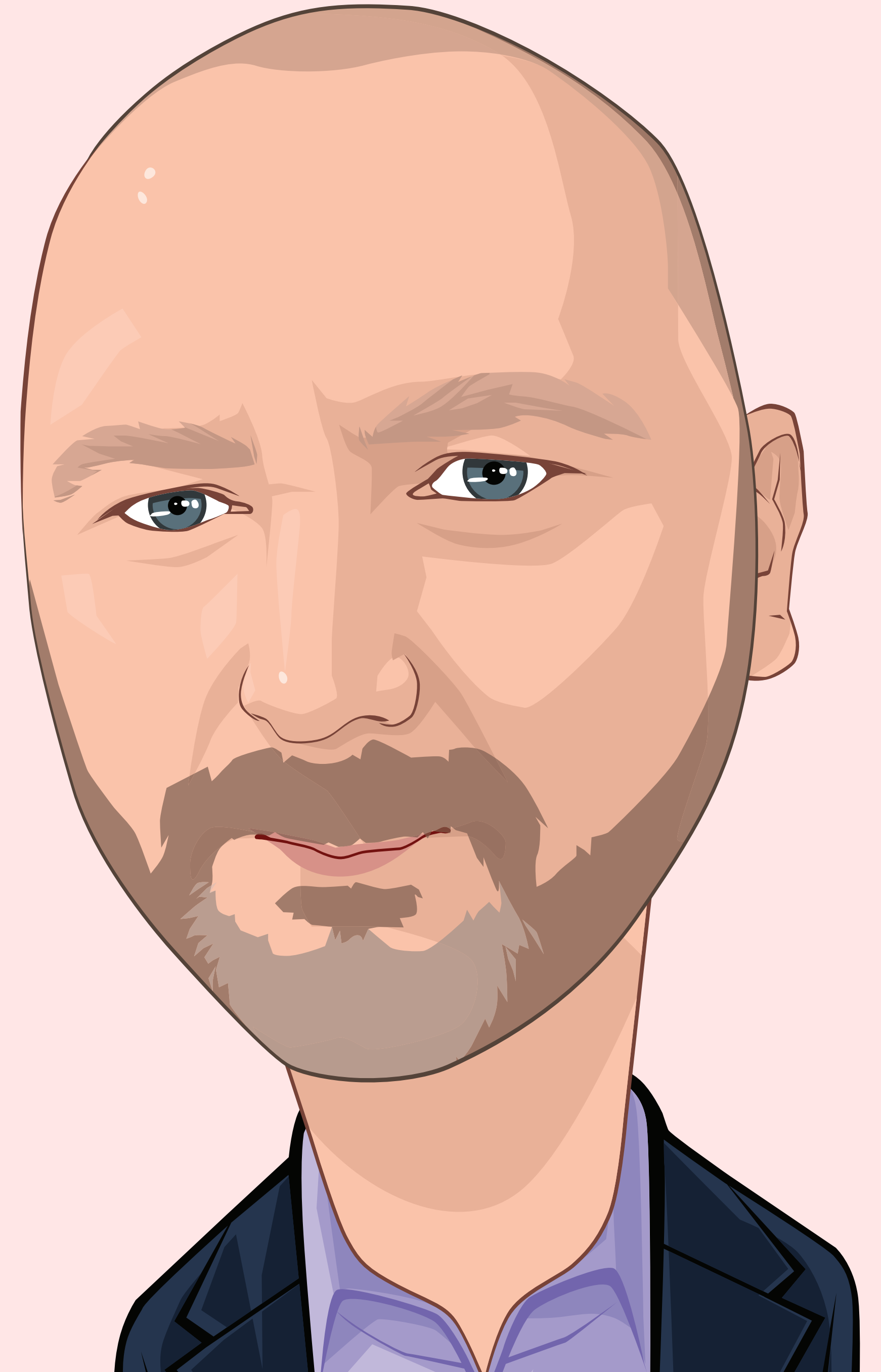
Web3 –
So What?

Already there are a myriad of descriptions of Web3 and its evolutionary path from Web1 and 2, but what were they, and how is Web3 important enough to denote a distinction from the previous iterations? Here's a brief history of how we got here...

Web1
Dancing Babies,
Screeching Modems

You may or may not remember a time when the internet was accessed via a wheezy dial-up modem on a bulky, creamy beige-colored desktop computer. Depending on your connectivity, web pages loaded painfully slowly, offering very much a read-only environment, assuming you were prepared to wait that long. Yes, you could write emails, but this was an era where connectivity to the recipient in real time was far from guaranteed - their connection was probably as slow and sporadic as your own. Nonetheless, there was a great deal of innovation at this time as companies and entrepreneurs explored the radical changes precipitated by having access to their peers all over the world via an often censorship-free ecosystem. This was Web1 and existed around 1990-2005. This internet was "read-only".

Web2.1
Mobile, Social, Global, Fun!

Around 2005, some radical changes began to reach the mainstream in the evolution of the infrastructure and hardware of the internet.

Broadband internet access to the home and office increasingly became de facto, meaning that there were some seismic shifts in the ways content could be delivered and monetized. Around this time, many digital service providers began moving towards streaming content since internet bandwidth could now (mostly) support this. In parallel, devices that could access the internet began the process of becoming untethered from physical cables and wires via the explosion of WiFi networks. Combined with the emergence of touchscreen and truly portable smartphones and tablets, the internet was now something that was likely to be with you 24/7 – the internet came to you, not vice versa.

With this newfound connectivity and portability, users were equipped with the ability to not just email and hope for a response when the recipient turned their computer on but could explore real time messaging one to one via services such as MSN Messenger and AOL, and with one to many platforms such as MySpace and the fledgling Harvard University startup, Facebook.

This could be considered a golden age of discovery for the internet – still highly anarchic and disruptive, but with the scale for people around the world to find their tribe, engage in new experiences, and to have fun. If Web1 was "read", web2, part 1 was "read / write", and lasted until around 2012.

Web2.2
You Are The Product

In 2012, a number of events happened that could be considered as pivotal in the second generation of Web2 –

/ Amazon Prime began embedding video streaming as part of service – this telegraphed the shift from being an online retailer to an online ecosystem for all things digital and physical.

/ Facebook launched its IPO, and hit its one billionth user – demonstrating the scale that the network had reached, along with a renewed focus on delivering to shareholders.

/ Samsung began using Google Android OS – a development that cemented Google's place as the de facto operating system for non-Apple devices globally, and a duopoly for almost all smartphones.

/ Apple launched Siri, demonstrating a new and more simplistic form of device interaction.

While these events may not seem that significant in their own right, they have had seismic implications for the way that the internet has developed over the last decade, placing control into just a handful of organizations that we have come to know as "Big Tech".
These behemoths, along with newcomers such as TikTok, have reached truly gargantuan levels of adoption, building ecosystems that are mostly impenetrable without partnerships or acquisitions with them.

This takes us to the present day – as users we are linked to digital ecosystems that would be hard to extricate ourselves from given how embedded these operating systems, search engines, social networks, and digital devices are in our daily lives.
This is the era of "read / write / engage" (arguably, enrage?)

Surely there is a better way?

Web3
Taking Back Control

Enter Web3 as the antidote to the centralized, walled gardens that have characterized the last decade of the online experience. Web3's rather lofty aims are to wrest the ownership and therefore control of the internet back to the end user. If web1 was "read", and web2 was "read / write", followed by "read / write / engage", then the central ethos of Web3 is "read / write / own".

The true potential of Web3 resides in the ability to cut out intermediaries and therefore simplifying transactions and interactions. We will get into the enabling technology in the next section, but for now, imagine a Web2 business such as a social network. The platform is the intermediary, connecting individuals via a central portal (webpage, app). The platform controls how you interact and with who, while serving up content and advertising that it believes fits your profile from data it is constantly harvesting about you.

A Web3 social network would operate very differently. Instead of being centralized around a third party platform, the network would now be based upon a decentralized web of users that directly connect to one another and collectively all own the social network. In many ways, this marks a return to the more egalitarian and open ethos of Web1, but with far more advanced and user friendly technology.
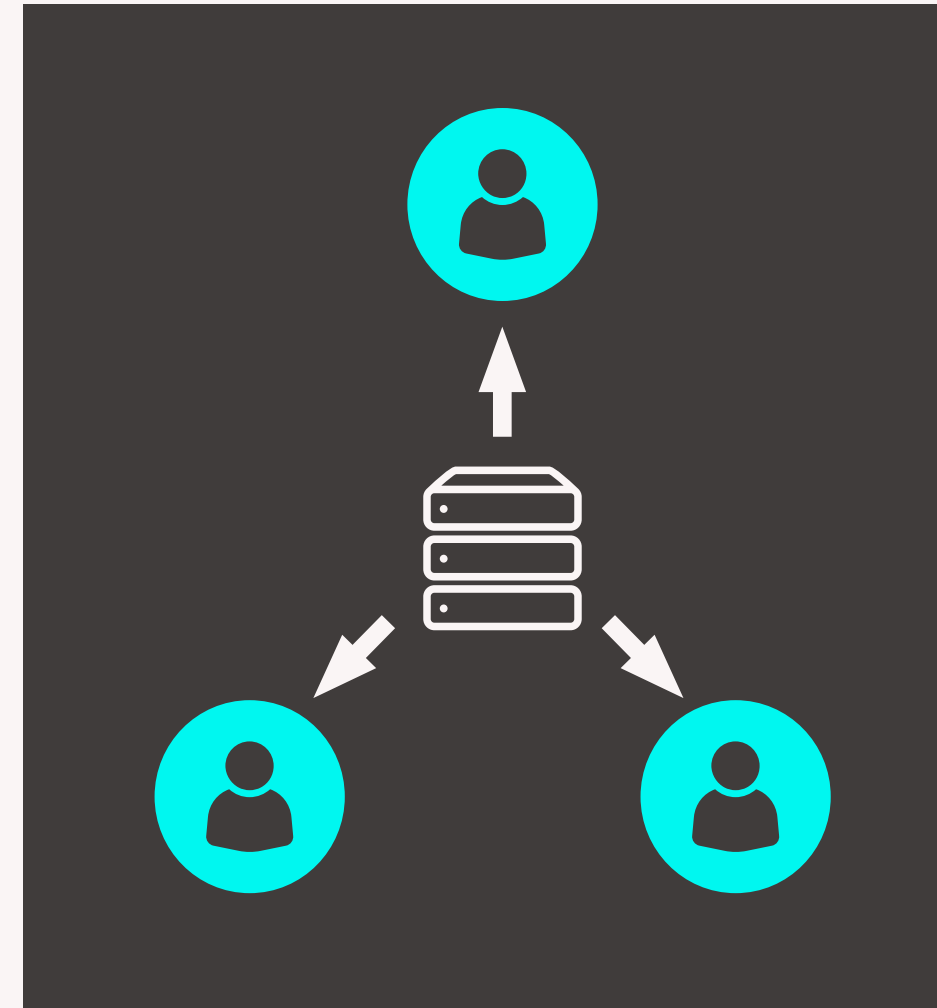
Web1

/ Decentralized

/ Built on open source protocols

/ Open to all users

/ 1 billion internet users in 2005

/ 0.08 connected devices per human in 2003
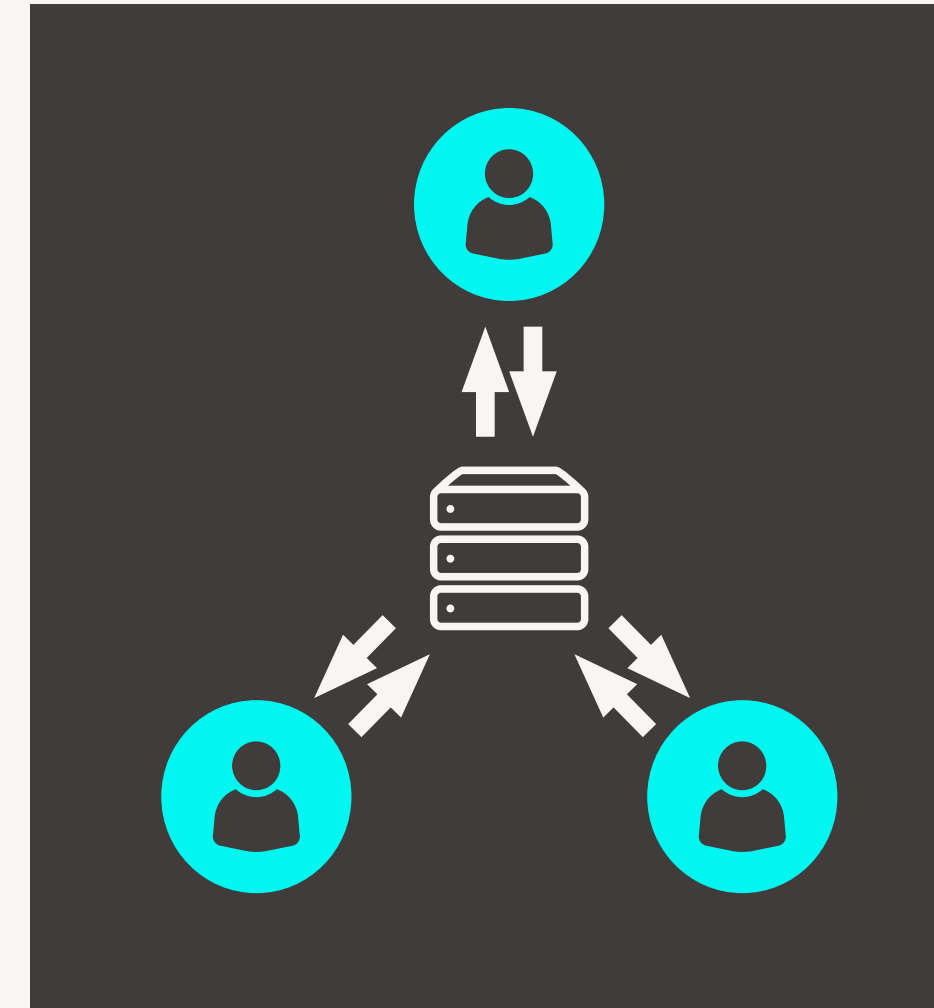
Web2

/ Centralized

/ Built on closed platforms

/ Free to users in return for personal data sharing

/ 2.3 billion users internet in 2012

/ 1.8 connected devices per human in 2010
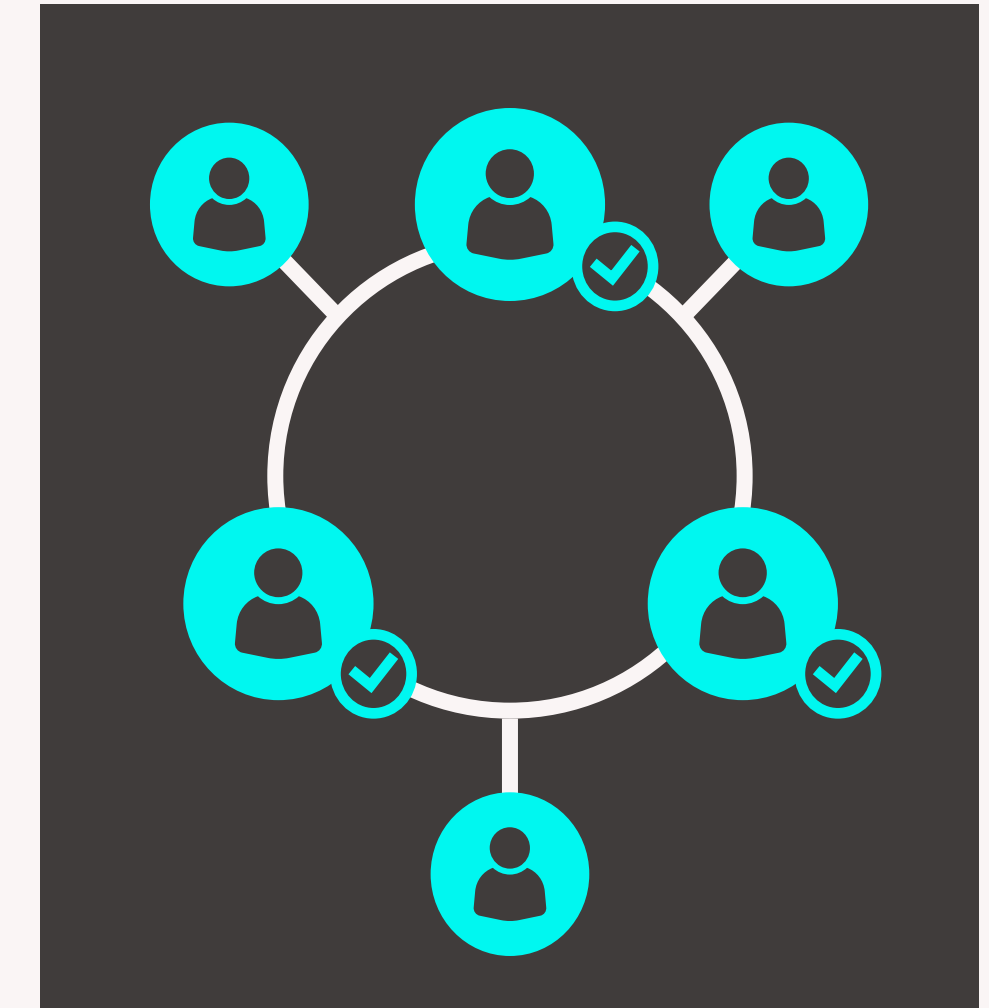
Web3

/ Decentralized

/ Built on open source blockchain based technologies

/ Open to all users, owned by users

/ Potentially 4.9 billion internet users in 2022

/ 6.5 connected devices per human in 2020

Sources: Statista / Researchgate, 2022
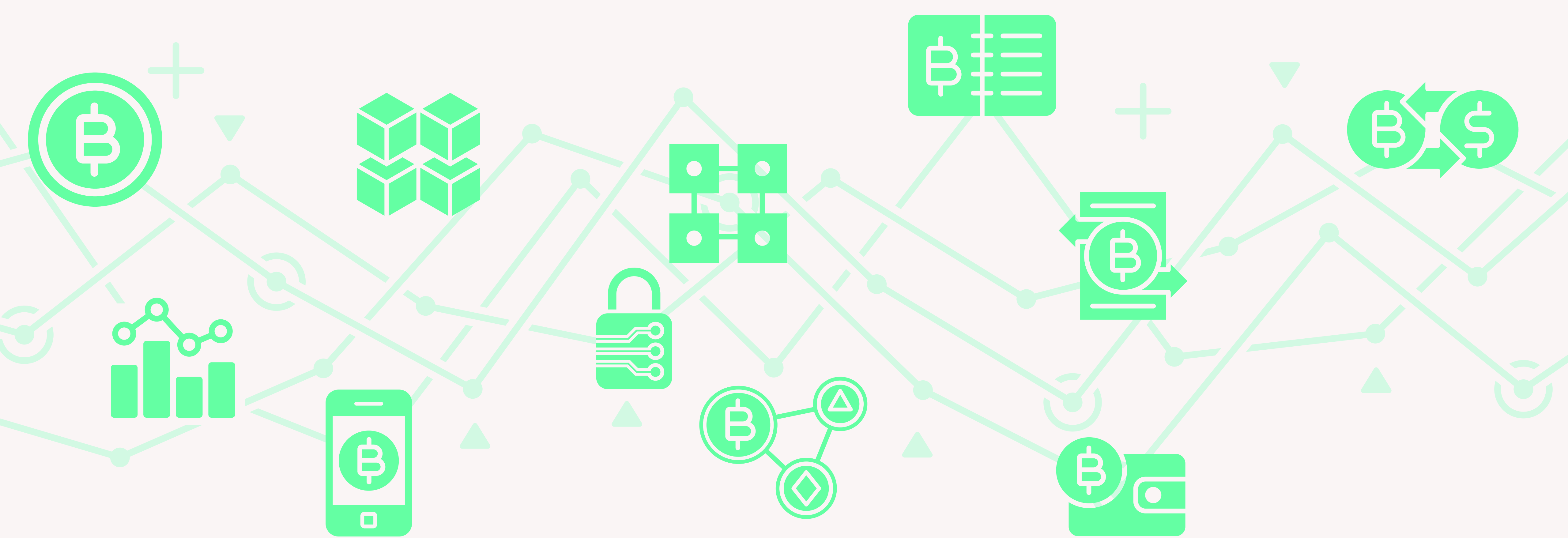
The Foundations of Web3

It would be impossible to discuss Web3 and its implications without some basic understanding of the fabric of what makes decentralization possible, the underlying technology – blockchain, smart contracts, and tokens (non fungible and otherwise). Collectively these form the foundations of key attributes that separate Web3 from previous versions – transparency, consensus, irrevocability, decentralization, and a system for monetization and equitable payment of participants.

Blockchain

While the term "blockchain" has become common in the fintech vernacular, its use cases may be somewhat misunderstood due to its association with cryptocurrencies. While blockchain has become synonymous with Bitcoin, it is not the only blockchain. At the foundation layer of Web3, there are numerous blockchains designed to have purposes well beyond the minting of digital currencies.

So, what is a blockchain? Let's start with a real world analogy – railways. Imagine a railway that is being built – the very first pair of rails and sleeper represent a "block", and are laid on the ground and permanently secured. In front of this, the next set is laid and again, secured to the ground. This is the beginning of our blockchain. In time, it becomes a vast network of tracks (blocks).

Here are some other attributes of our blockchain railroad –

/ Track (blocks) can never be removed, only added to.

/ Each track has a unique number – as each additional section of track is added, the sequence of these numbers is forever cemented one in front of the next.

/ The tracks and entire railroad are visible to all users of the network.

/ The track continues to grow to meet traffic requirements and new destinations.

/ The track has transparent rules for usage, such as standard rail gauges, timetables, and clear fee structures.

And, most importantly...

/ All users of the rail network are owners, unlike previous technology where stagecoach companies were an intermediary that had to be negotiated with and paid.
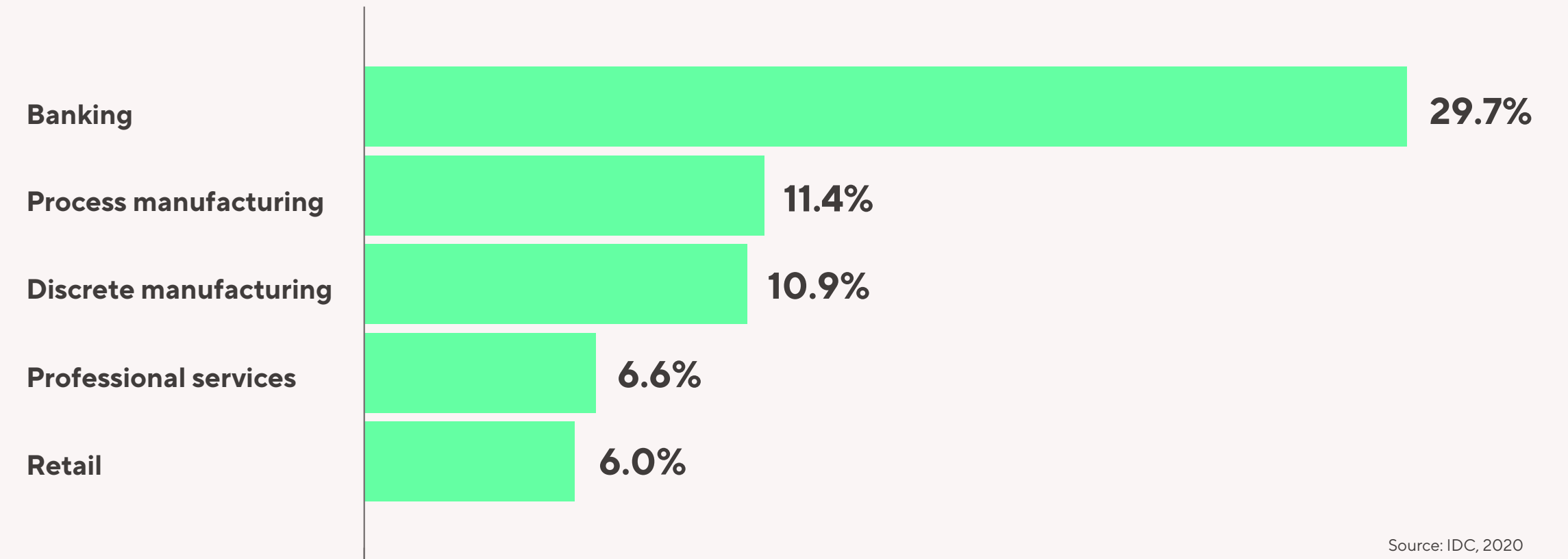
So, what prevents someone from tampering with the rails and messing up this unique sequence? In a word – decentralization. Every user of our railroad has access to a real time map that displays the entire network at that time, including precise details of every section of track. Because everyone has a copy of this map, any changes made would be immediately apparent to everyone.

A more relatable analogy? You have a really embarrassing photo of yourself on social media. Despite your numerous attempts to delete the photo, it keeps coming back to haunt you because all of your friends have their own copy of the photo and they relish the discomfort that this particular photo elicits from you every time it appears in public. That's the power of decentralization – data lasts forever and cannot be tampered with or erased.

Local Man Forever Known as "Hotdog Man"

Blockchain Spenders Worldwide

Banking	29.7%
Process manufacturing	11.4%
Discrete manufacturing	10.9%
Professional services	6.6%
Retail	6.0%

Source: IDC, 2020

Blockchain key attributes –

/ **Distributed** - the blockchain railroad is accessible to all users and all users have ownership.

/ **Global** - our blockchain railroad traverses the entire globe, accessible to anyone, anywhere with the means to connect to it via the internet.

/ **Security through transparency** - the railroad is tamper proof, given that all users have a current map and tampering would be immediately apparent.

/ **Immutable** - the blockchain railroad cannot ever be altered.

/ **Always on** - the blockchain railroad never goes out of service, and is available to all users 24 / 7 / 365.

Smart Contract

Another fundamental component of Web3 is smart contracts. Without getting into the weeds, a smart contract is a computer program that resides on a decentralized network, rather than a single computer. Combining these programs together forms decentralized apps (Dapps), similar apps running on your phone or laptop.
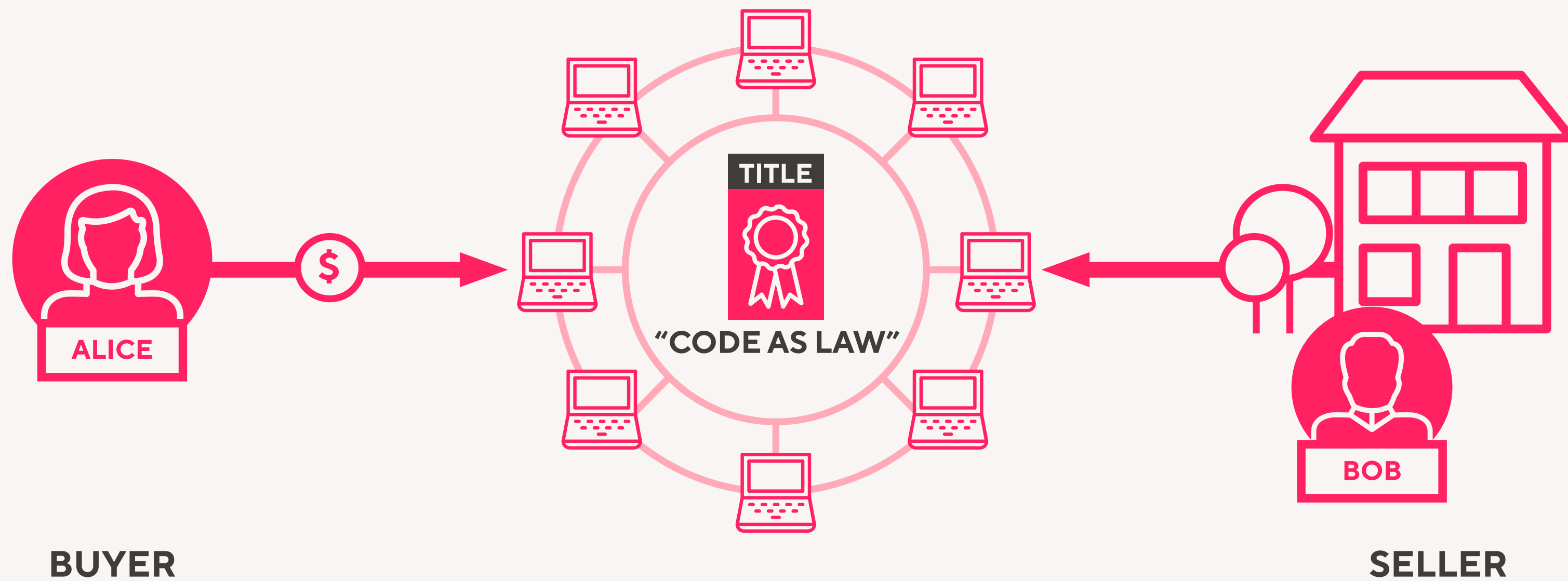
Let's extend our railroad metaphor further – smart contracts could be considered the engines that pull rail cars around our blockchain railroad, they are what makes Web3 happen.

Should we want an engine to run, we have to pay for "gas" that is purchased using the native currency for that specific blockchain railroad network. In a Web3 context, most smart contracts run on the Ethereum blockchain (there are also numerous other blockchains that are designed for smart contracts such as Solana, Polygon and Avalanche), and the cost of getting a smart contract to run is measured in "gas" that is purchased with Ethereum's native cryptocurrency – ether (ETH).

"Gas" fees represent payments made to the owners of the computers that are executing the smart contracts. As with the internal combustion engine, should you want your smart contract "engine" to perform faster, you may need to pay more for a higher octane fuel.

Unlike traditional contracts where there is typically a buyer, seller, and a broker in the middle, smart contracts are decentralized, directly connecting the buyer and seller with the blockchain acting as the broker by providing a permanent record of the transaction's occurrence.

BUYER

ALICE

LAWYERS, BROKERS, INSURANCE

TITLE

SELLER

BOB

BUYER

ALICE

TITLE

"CODE AS LAW"

SELLER

BOB

Smart Contracts key attributes –

/ **Autonomous -** smart contracts can run without any human intervention, continuously, until they are turned off.

/ **Decentralized** - running on the blockchain, smart contracts are visible to all users, making them tamper proof.

/ **Direct** - with no intermediary, smart contracts directly connect users.

/ **Equitable** - as is the case with our blockchain railroad, everyone with access to the blockchain can view the smart contract code.

/ **Revenue generatin**g - smart contracts require "gas" to execute.
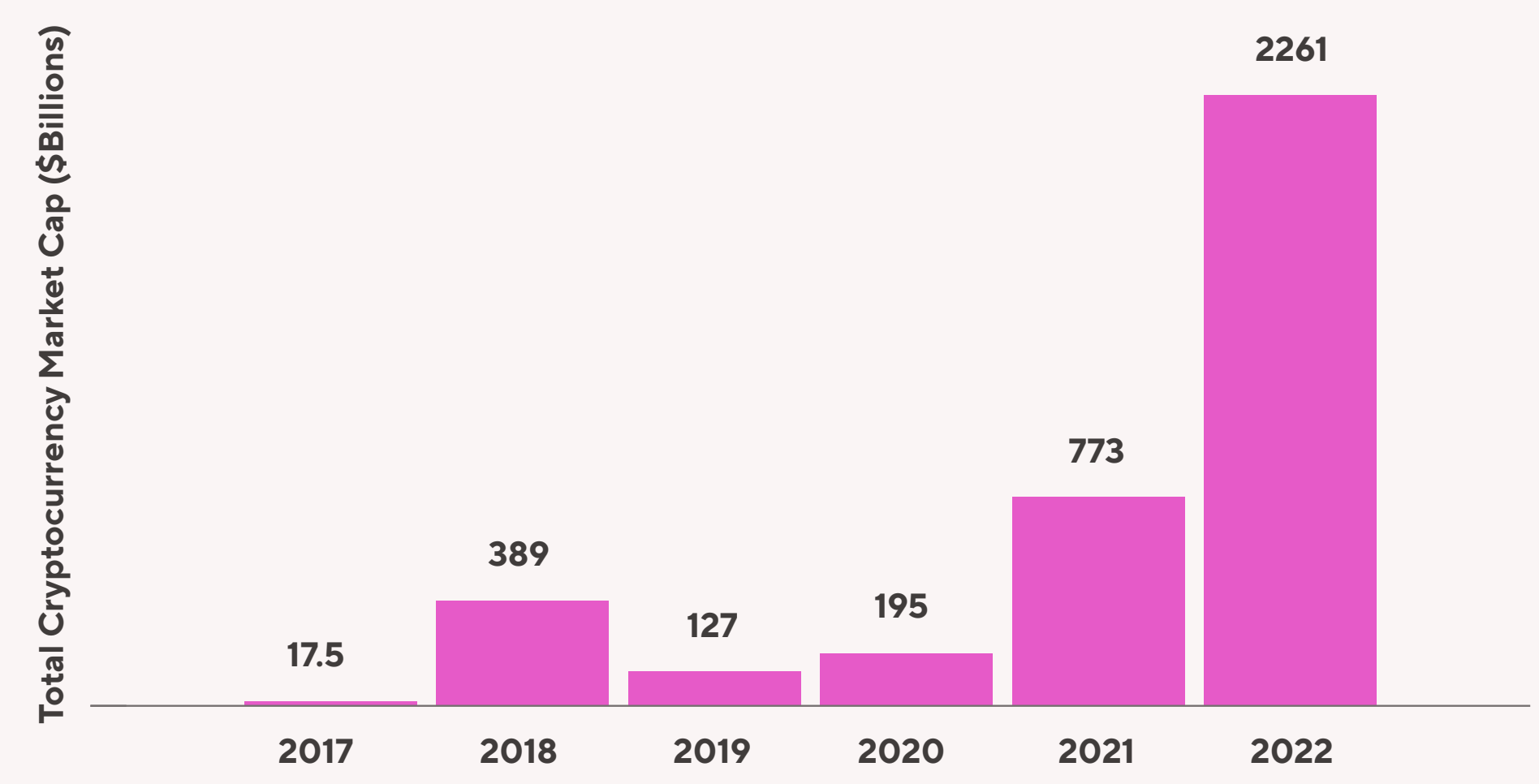
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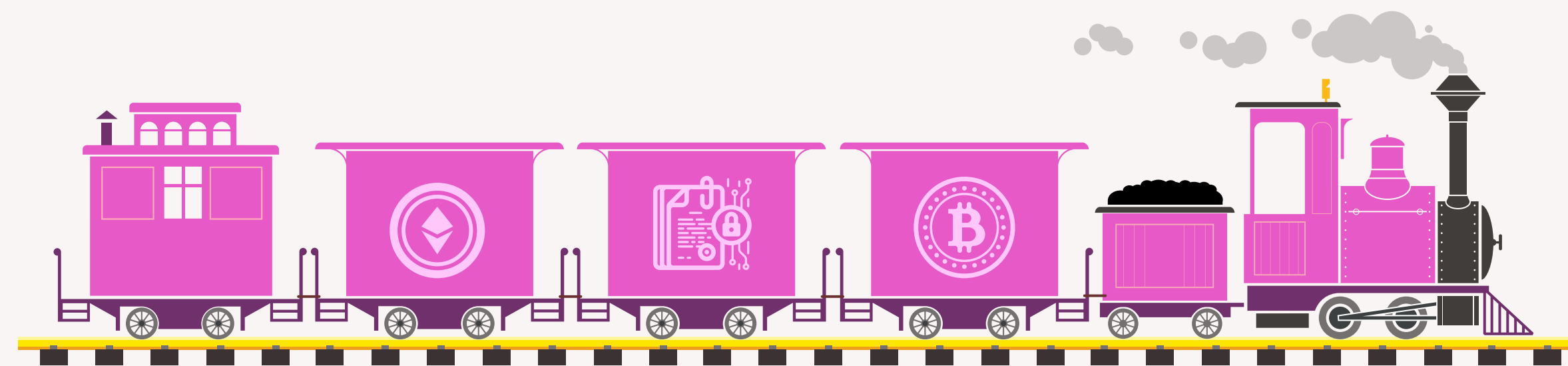
So what's the difference between coins and tokens? If a coin such as a penny or a bitcoin represents the ability to own something via purchase, a token is evidence of ownership. A physical world example of a token is a title for a car, or a deed to a property – it's not the actual car or the house, but proof that the car or house belongs to you, which can be transferred to another person if sold. In the Web3 world, tokens are the same – a representation of the ownership of an asset.

Cryptocurrencies and Crypto Tokens

Completing our railroad metaphor, we should consider the cargo that our rail network carries. Not all blockchain railroads are created the same – some are designed specifically for carrying currencies, others are more universal in their design and can carry currencies as well as digital tokens.

The Rise and Rise of Cryptocurrency Value

Total Cryptocurrency Market Cap ($Billions)

Year	Value
2017	17.5
2018	389
2019	127
2020	195
2021	773
2022	2261

Source: Statista, 2022

Fungibility

An important concept to understand relative to Web3 and tokens is that of fungibility and non-fungibility. Fungibility is the ability of a good or asset to be interchanged with other individual goods or assets of the same type. Fungible goods are items that are interchangeable because they are identical to each other for practical purposes. If exchanging two items would be meaningless, they are fungible.

In the physical world, a good example is paper bank notes. If you and I both give each other a dollar bill, the note is to all intents and purposes the same – a dollar bill, carrying exactly the same value as the one I previously had in my possession. In the Web3 world, this would apply to cryptocurrencies such as Bitcoin – a bitcoin swapped for another bitcoin has exactly the same value, one bitcoin.

Non-fungible goods have attributes that make them unique and therefore not interchangeable. Physical world examples could be diamonds, real estate, and collectibles such as signed baseball cards. Until very recently, digital content has been fungible – an MP3 recording or a JPEG image is not unique, being replicable and interchangeable indefinitely. For instance, if I do a web search for a famous painting, a Magritte maybe, I can copy and paste the image to a document of my own that is identical to the one I found. This image is fungible.

Recap - Web2 vs. Web3

Returning one last time to our railroad analogy, let's compare Web2 (horse and cart) to Web3 (rail network) ...
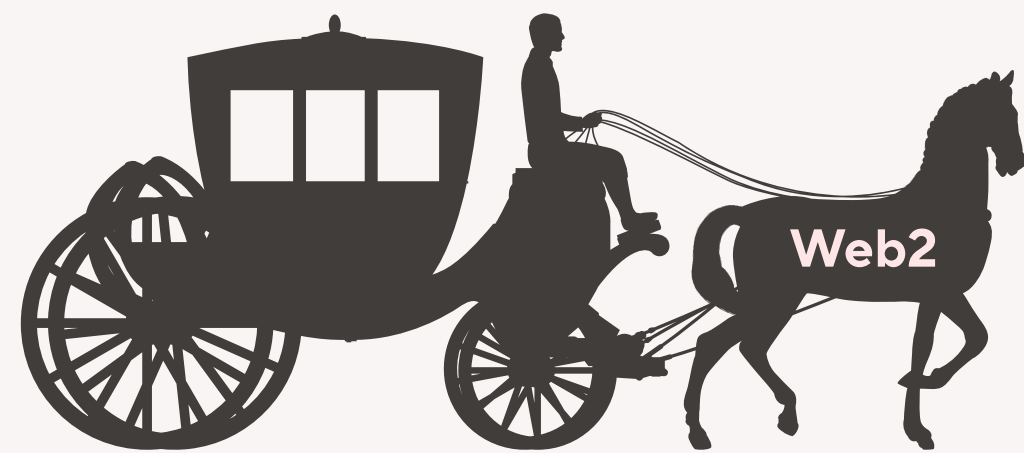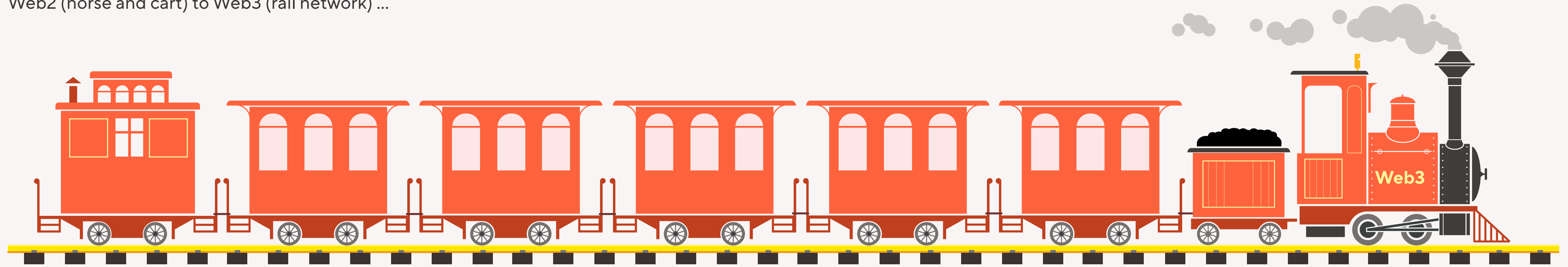
Advantages of Web3

/ A decentralized ownership – every user has a vested interest in maintaining the integrity of the rail network and planning for its future success.

/ The ever-expanding rail system encourages innovation and exploration of new destinations.

/ It's universally accessible – anyone can take a train. Horse carriage travel is somewhat more exclusive, possibly involving a fee to the owners, or the owners giving you free travel in return for favors.

/ It's clear who and what is traveling for all to see, reducing opportunities for nefarious activity.

/ Robust architecture – there are multiple routes and multiple trains. There is no single point of failure, unlike horses that are less reliable and more susceptible to highway robbery.

Disdvantages of Web3

/ It may not be the fastest route. Trains have specific timetables, stops, and are bound by the tracks they run on. The "Pony Express" is directly A to B, and therefore faster.

/ Fuel (gas) costs can be very high at times, and the cost of crypto used to purchase gas can fluctuate wildly. Horse travel will require buying tickets from, or giving favors to the stagecoach company, but the cost of horse feed isn't necessary.

/ Bad workmanship (bad coding, inaccurate data) at any point on the blockchain railroad is permanently recorded, potentially causing derailment at a future date.

Web3 Components & Financial Services

Given our new found knowledge and understanding of what Web3 is and how it works, let's apply this to current financial services and assess where it can impact incumbent services.

Obvious areas of disruption are where there has been a traditional intermediary. Credit and debit card networks are intermediaries between payment transactions, mortgage lenders are intermediaries between home buyers and sellers. In fact, much of the financial services

industry is built upon a trusted third party brokering an arrangement between two parties. Web3 provides a construct for the broker to be removed.

The table below is by no means exhaustive, but designed as an idea board for where current financial services could be either disrupted or augmented with Web3 technologies.

	Banking	Payments	Lending	Investing	Insurance
Blockchain	/ Identity / KYC & Fraud / Interbank clearance and settlement	/ Anytime, anywhere payments / Fraud mitigation / Transparent transactions	/ Repayment automatically forms a transparent, public credit history / Blockchain-enabled lending data dovetails with the aims of open banking	/ Trading infrastructure / Centralized, low-cost, transparent post-trade operations decrease the cost to trade for large & small investors	/ Certificate of Insurance Storage / Provenance management
Smart Contracts	/ Loyalty & rewards / Interest accrual / settlement	/ Streamline workflows / Remittance / P2P	/ Asset-backed loans / Supply chain financing / Loan closing workflows / Credit	/ Risk management / Smart contracts could automate many treasury functions in institutional trading	/ Crypto insurance / Claim Management / Processing
Tokens	/ Cross border accounts	/ CBDCs / Stablecoins / Identity management	/ Payment tracking / Underlying asset information and proof of ownership	/ Cryptocurrency / Fractional investing / NFTs / Tokenized Securities	/ Certificare of Insurance

Conclusion - Evolution, not Revolution

Web2 and Web3 will not be mutually exclusive – there will be middle ground, and degrees of decentralization befitting the required functions of the network. However, while there will be overlap and collaboration between Web2 and Web3, that does not inoculate from disruption occurring to traditional financial services.

Where disruption is most likely in financial services due to Web3 will be –

/ Networks that have overpriced transaction fees or exorbitant interest rates due to the assumption of exclusivity. E.g. banks that charge a fee for recurring transactions would be seriously undercut.

/ Networks that have relied on opacity and hidden fee structures for revenue generation. Interchange fees were built on the premise of scarcity of access, whereas Web3 rails would enable direct connections and thus undermine the rationale of scarcity for interchange.

/ Platforms with restrictive access requirements (credit score, proof of citizenship, etc.). Opening a bank account often requires a smorgasbord of documentation to prove identity. Web3 would not.

/ Networks where fund settlement is measured in hours or days. International remittance gives large institutions the chance to profit from the float, which reduces utility by lengthening the time to completion. In a Web3 world, international remittances would be P2P, decentralized and auto-executed via smart contracts. FIs could still make money from gas fees for processing the transaction on their Dapp, but they couldn't charge anachronistic fees or profit from the float.

If your organization resembles any of the above, Web3 could be an existential threat.

Eventually.

The transformation from Web2 to Web3 will be evolutionary, not revolutionary.

Many Web3 initiatives in financial services thus far can be characterized as lacking in fundamental user centric design principles that would make them accessible for most people – just the participation in any Web3 activity involves the convoluted purchase of the requisite cryptocurrencies. From here, the journey dives down a rabbit hole of gas fees, metamasks, and transactions where the more "wild west" elements of crypto come to the forefront.

There is unlikely to be a help desk number for transactions that are made in error – the cryptoverse is designed to be irreversible and hence can be unforgiving when fat fingered mistakes are made. Rookie missteps can have expensive consequences, with each month another story surfacing of an NFT being sold for painfully discounted prices due to pilot error[1].

There is also the advantage of trust that incumbent systems have cultivated over decades – people understand credit and debit cards, bank accounts, and mortgage lenders. The 2008 financial crisis notwithstanding, people trust financial institutions more than newcomers – according to a 2021 study, US consumers trust banks 30 percentage points more than cryptocurrencies, and probably with good reason – you can physically visit a bank branch and see the Corinthian columns and steel doors. The actual presence of banks is analog evidence that your money should be safe. By contrast, Web3 to most people is somewhere between science fiction and science project, and hasn't had the longevity to cultivate trust, particularly for financial transactions where actual money could disappear into the "ether" (pun intended)[2].

64%

34%

Banks

Cryptocurrencies

US Trust Financial Services Sectors

Source: Edelman Trust Barometer, 2021
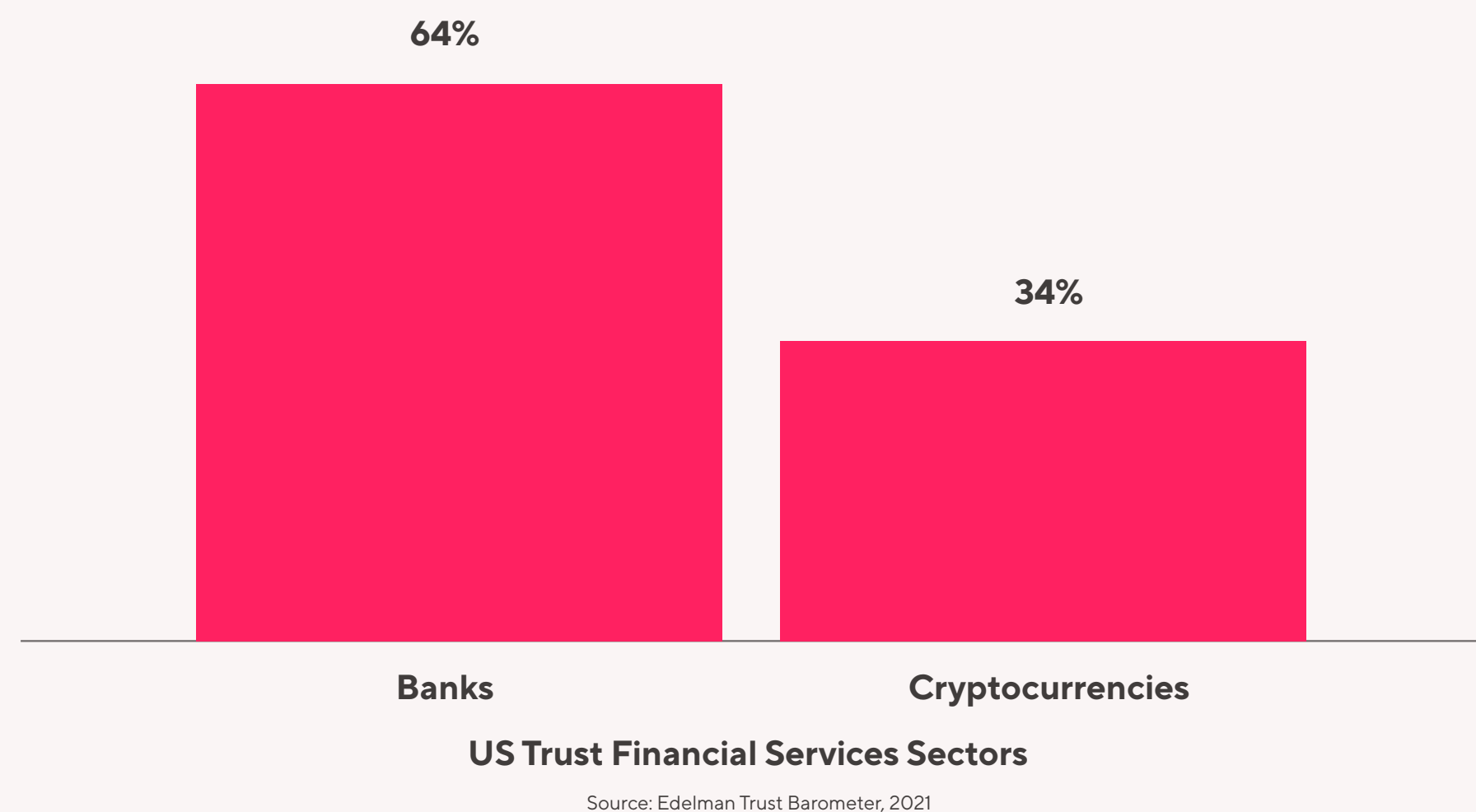
Finally, despite a veneer of innovation, under the hood the financial services industry is often heavily reliant on technologies that have been in place for decades. Pull any payment card from your wallet and you'll see an example of just how bound we are to legacy systems – a magnetic stripe, technology that goes back to the 1950s. This "if it works, don't fix it" attitude pervades the financial services industry, literally to the core. A 2021 report on mainframe computer usage highlighted that that 67 Fortune 100 enterprises – which includes 45 of the top 50 banks, still rely on such systems[3]. Displacement of the old with the new is rarely something that happens overnight in financial services.

In summary

Web3 is coming, but won't manifest into a decentralization revolution in a binary switch from Web2. Instead, we will see elements of Web3 be implemented into Web2 platforms in ways that will enhance efficiencies, expand global opportunities, and reduce costs.

As highlighted, companies that have built businesses on opacity, obfuscation and oligarchy will find Web3 particularly troublesome. Maybe not immediately, but Web3 could be as problematic for you as Voice over IP (VoIP) was for copper wire telephony. Current rumors of your demise are not overstated should you choose not to recognize the potential shifts from centralization to decentralization, and the power of smart contracts to remove intermediaries.

This will be a golden age of innovation in financial services as the latent potential of Web3 technologies (blockchain, smart contracts, tokens) cross pollinate with the ingenuity of the financial services industry. The true potential of decentralized finance (DeFi) is just beginning to be realized, and will be the focus of further research and analysis by Money20/20.

1. https://beincrypto.com/pricey-mistake-as-bored-ape-nft-sells-for-less-than-150/#:~:text=In%20November%2C%20a%20CryptoPunk%20NFT,a%20%20fraction%20of%20their%20prices.
2. Source: Edelman Trust Barometer, 2021
3. https://www.computerweekly.com/feature/Why-post-pandemic-reskilling-must-focus-on-mainframes

Web3 Glossary

Bitcoin
Bitcoin is a digital currency, or cryptocurrency, built on the bitcoin blockchain. While there were cryptocurrencies before Bitcoin, it is the most widely known and owned cryptocurrency in operation today.

Blockchain
A blockchain is a decentralized public ledger of all transactions across a peer-to-peer network. Data in a blockchain is stored in groups of 'blocks', with each of these blocks strung to a previous block, hence forming a chain of blocks or a blockchain. The chaining of new blocks of data to form ever longer chains of blocks means all transactions recorded on the blockchain are unmodifiable (or immutable) and visible to all participants on that blockchain network.

Cryptocurrency
Cryptocurrencies are currencies that only exist digitally and on a blockchain. Cryptocurrencies are characterized by the fact that transactions using them are verifiable and recorded on blockchain, as opposed to centralized maintenance that's a hallmark of traditional currencies.

DAO
DAOs, or decentralized autonomous organizations, are organizations without a central authority. In contrast to traditional organizational management structures, where limited groups likes boards run them, DAOs leveragege smart contracts to execute and enforce.

Dapp
Decentralized applications or Dapps are digital applications that are built and run on a blockchain. Because Dapps exist on a blockchain, they are not controlled by a single authority.

DeFi
Decentralized finance, typically dubbed DeFi, is an umbrella term applied to a wave of financial services and products built on public blockchains, predominantly on Ethereum, with the aim of disrupting traditional financial services. Because its foundation layer is blockchain technology, core to DeFi is the immutable, public, and decentralized features of blockchain. In theory, then, DeFi is antithetical to traditional financial services, where banks and other third-party institutions are necessary intermediaries.

Ether
Ether is the cryptocurrency or native transactional token that's deployed on the ethereum blockchain.

Ethereum
Ethereum is the second most popular cryptocurrency after bitcoin, and like bitcoin functions as a digital currency. However, where it differs from bitcoin is in that the ethereum blockchain also functions as a platform for building a range of decentralized applications (Dapps) and deployment of codes (smart contracts) that leverage blockchain technology.

NFT
NFTs or non-fungible tokens are unique data units that leverage blockchain technology to represent unique digital content – be it videos and songs to art – and provide provenance for that digital content.

Smart contracts
Stored on a blockchain, smart contracts are digital contracts that establish the terms of an agreement and are automatically executed when a set of predetermined conditions are met. Hence, smart contracts allow the execution of specified agreements between parties without the need for trusted intermediaries.

Web3
Web3 refers to the third iteration or era of the internet, defined in contrast to earlier versions dubbed Web1 and Web2. Web2, the current version of the internet, is characterized by closed-loop platforms owned by a handful of large corporations like Facebook and Google that monetize user data and content. In contrast to this closed version of the internet, Web3, built on blockchain technology, is a decentralized digital ecosystem owned by users, as opposed to central gatekeepers.

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