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Family Ties
The Internet and Crypto

JANUARY 2024

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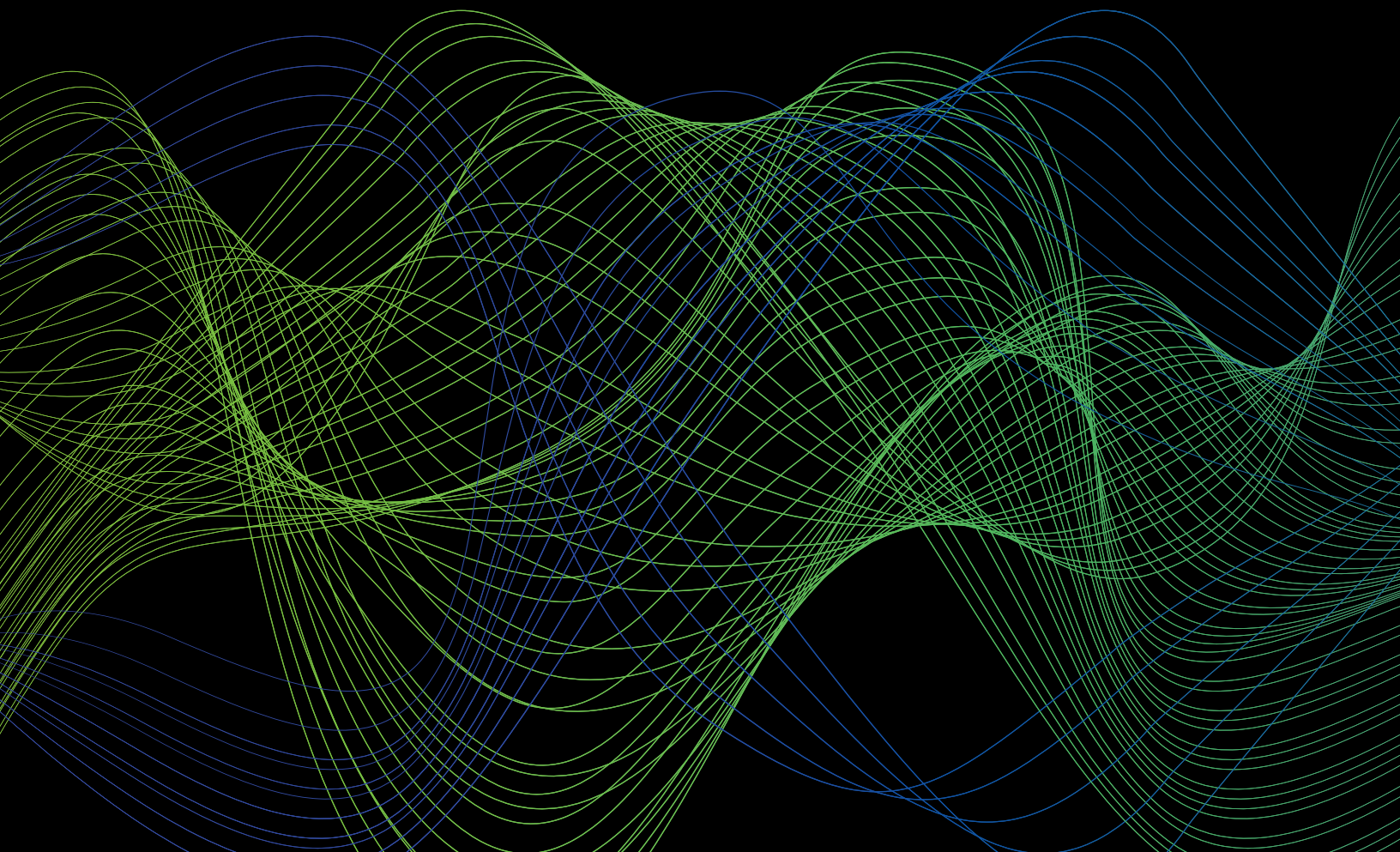

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Shared DNA

The Internet and crypto share remarkable similarities. Both are global computer networks. Both provide blank canvases to inspire innovation. And analogous to family, both share a legacy of building upon foundations created over decades, not years.

With this shared DNA, the Internet provides a guiding light to help understand crypto's future. Architect Partners is not the first to suggest this link; however, we believe we are the first to carefully consider the history of each, building both the narrative and gathering the data to help make this metaphor come alive.

Will crypto be embraced like the Internet or remain a rebellious outlier?

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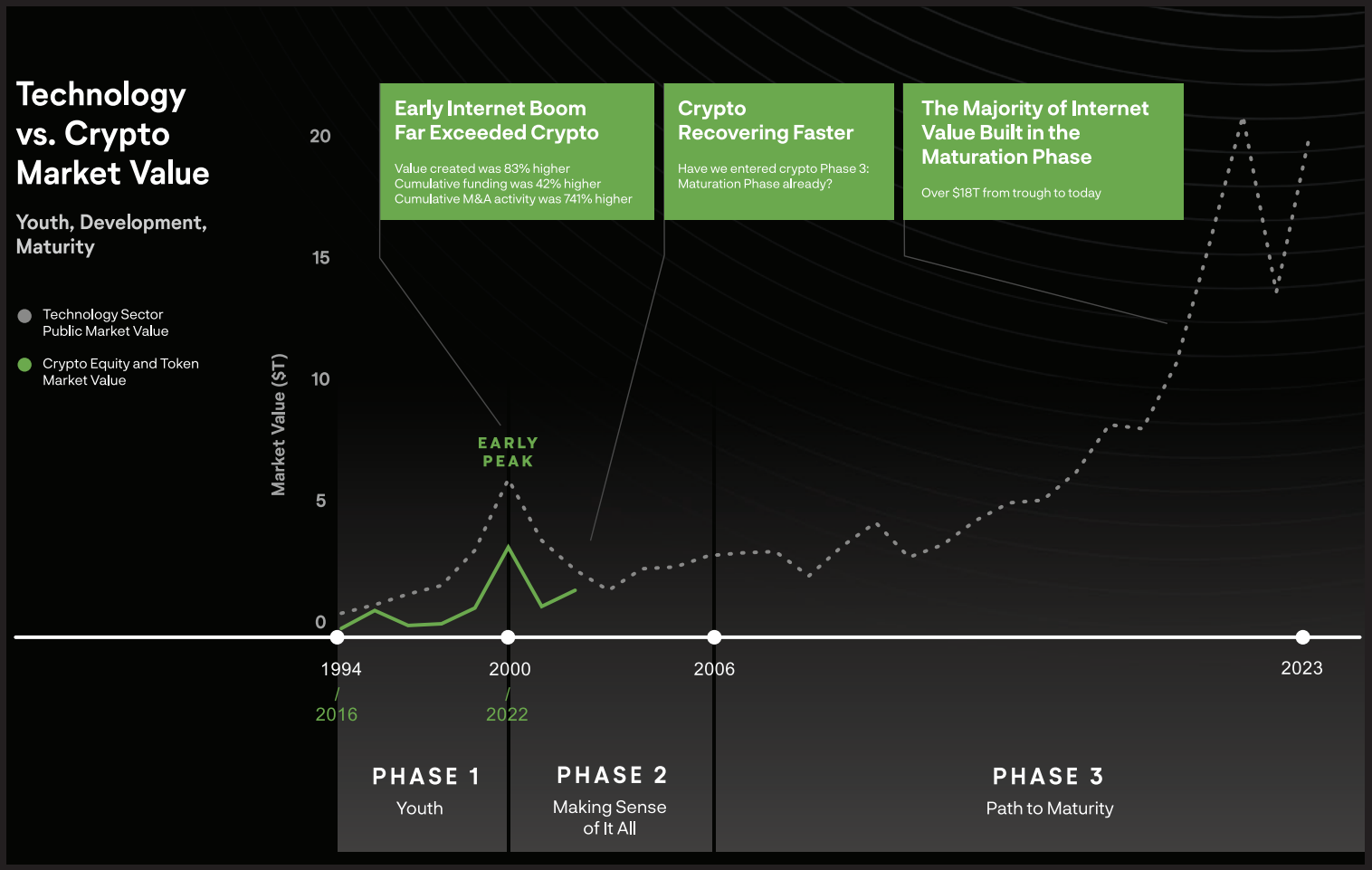
WHAT DID WE LEARN?

— Each shares familial DNA as independent, global computer networks that offers a blank canvas of possibilities.
— Both are platforms upon which to build software applications.
— It takes decades, not years, for full value to blossom.
— Each has undergone parallel phases of development with remarkable similarities.
— Today, crypto appears to have its own version of the 2000 Internet crash in the rear-view mirror.
— Despite being a generation apart, the Internet and crypto are experiencing very similar growth characteristics and growing pains.
— The history of the Internet offers a guiding light for the future of crypto.

Let's dive in.



The Technology Sector Public Market Value is based on the enterprise value of companies within the Nasdaq 100, using unpublished data provided to Architect Partners. Funding and M&A activity data represent the cumulative activity for the six years prior to the early peak.

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Family Ties: The Internet Helps Illuminate Crypto's Future

Can crypto follow the Internet's path to global ubiquity?

Well, their familial DNA is remarkably similar.

Crypto and the Internet are both independent, global, computer networks governed by their own unique families of languages or protocols. These networks alone offer little practical value. But just as a blank canvas inspires art, these networks have inspired the creation of countless software applications. These applications, apps, cloud-based applications, DApps, etc. are the tools that do "useful things", thus adding immense value.

The Internet today is useful for both work and personal enjoyment. A few examples of "useful things" includes search, email, social media, entertainment, storage, chat, text, video collaboration, and of course, purchasing and selling products. However, it took decades for this ubiquity to unfold and for the now-obvious use cases to become self-evident.

/ Today, crypto is still in its infancy.

Today, crypto is still in its infancy, but its common DNA with the Internet can help us understand where it's headed. Let's rewind to the Internet's early days and see what we learn.

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Meet the Late Bloomer: The Internet

The 30-year-old Infant

Many of the foundational developments supporting the Internet were first created in the 1960s. The critical missing ingredient, however, was an accepted, consistent way for connected computers to communicate. Thirty years later, in March 1992, TCP/IP arrived and ignited a virtuous cycle.

Internet Phase I: Youthful Enthusiasm to Early Peak

Phase I started with infrastructure. Powerful computers were connected via a global physical network of copper, coaxial, and fiber optic cables. These were supplied by already-established companies like Sun, Cisco, and IBM and newcomers like Ciena, Nortel, Lucent, and Nvidia.

It started with simple web pages in varying forms, online communities, search, access to news and information, and email. By the mid-1990s, tens of millions of users were using applications from companies like CompuServe, Prodigy, AltaVista, GeoCities, AOL, Yahoo, and Netscape; the Web1 era.

By the second half of the decade, the pace accelerated. This is when investment boomed, bringing with it technology innovation, network and compute capacity infrastructure buildout, the proliferation of personal computers, and a myriad of software development tools and experimentation that resulted in rapid software application development of all types. Bandwidth ballooned to allow for a series of new software applications. Some of today's most notable leaders were founded, including Amazon, Google, Salesforce, Equinix, Expedia, and Netflix. Many companies

Before TCP/IP, the Internet was just a promise. With it, the promise became reality. It sparked a global dialogue, ignited innovation, and changed the very way we live, work, and think."

Mark Andreessen,
Co-Founder Netscape

The New Yorker,
The Man Who Made the
Web Work, 2001

experimented with novel revenue and business models, often starting with "give it away free" to quickly build users and network effects. By the end of the decade, over 400 million people responded by actively using the Internet as a normal part of their daily lives.

The enthusiastic investment of capital-fueled growth resulted in over $117 billion being invested to build Internet-related companies between 1995 and 2000. This capital and user growth propelled the value of the technology sector to a dizzying $5.6 trillion by the end of 1999, becoming the largest growth industry in the world.

However, plenty of skeptics remained, and they sure looked prescient when it all came crashing down in 2000.

Internet Phase II: Making Sense of It All

The year 2000 represented a major turning point for the Internet, followed by a reset that lasted more than half a decade. Risk capital became scarce and naysayers had a point. After all, what was the Internet actually good for? Themes like capital efficiency, real-world use cases, user metrics, unit economics, and a clear path to revenue generation and eventual profitability were now de rigueur. In fact, well over 74% of the illusory value that had been created previously simply vaporized by the end of 2002.

/ Innovation didn't die. It just evolved.

Author Carlota Perez elegantly discusses how over-enthusiastic investment of capital and optimism is virtually always present. She describes this as "the frenzy phase" in her book Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages. What inevitably follows is a turning point, accompanied by a financial crash. Everett Rogers' "Diffusion of Innovation" theory and Geoffrey Moore's concept of "crossing the chasm of adoption" capture a similar cycle. Many believe that nothing important is created without an inevitable crash. This premise certainly held for the Internet.

> **"At the craze's zenith, Priceline, the money-losing online ticket seller, was worth more than the airlines that provided its inventory."**
>
> New York Times, 12/24/2000

> **"The Internet was supposed to be the answer. Instead it turned out to be just another way to lose money."**
>
> Tom Wolfe, Author
> A Man in Full, 2000

Despite all this, innovation didn't die. It just evolved. Stand-out successes such as Facebook, YouTube, Skype, Workday, and DocuSign emerged. Each shared a common theme: they didn't invent the Internet but they crafted their entire business around its capabilities. Companies like YouTube transformed the Internet into a global stage where musicians like Justin Bieber and Ed Sheeran could be discovered by new fans without seeking the "permission" of a record label overlord. This was the start of the era of Web2 user-generated, shared content. This period was defined by Internet-based companies that leveraged the infrastructure investments that were made in the 1990s.

The Internet escaped its existential crisis with new clarity.

Internet Phase III: Path to Maturity

By 2006, remaining doubt had vanished. The Internet was the "platform" upon which virtually all "useful things" were built. The Apple iPhone release in June 2007 poured gasoline on the fire, becoming a "first-class member" of the Internet. That same year, Netflix transformed its entire business with Internet-delivered video streaming, mobile apps became real thanks to Apple, and social media exploded with mobile-first applications like Twitter, hundreds of mobile games, and location-aware apps. Enjoying films, television, and music on any device, at any time, became normal. The Internet now serves as the foundation of virtually every consumer and business application and service.

What felt like breakneck innovation actually took 34 years – almost half a lifetime.

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Internet, Meet Your Cousin, Crypto

Crypto: From Ancient Codes to Financial Rebellion

Just like the Internet, crypto's building blocks have existed for decades or even longer. Crypto's namesake, cryptography, which is defined by the use of codes to protect information, has been found on clay tablets in Mesopotamia that date back to 1500 BC. It was also famously used to protect war communications in World War II and public-private key cryptography, which today is integral in crypto's design, was developed in the 1970s.

The Internet itself was necessary for crypto; crypto-dedicated computers use the Internet as their communication backbone. Similarly, the open-source software development movement, where communities of software developers collaborate both informally and formally, was an essential precursor.

Traditional financial services are on full alert.

Satoshi Nakamoto's publication of "Bitcoin: A Peer-to-Peer Electronic Cash System" in October 2008 was the "TCP/IP moment" for crypto. Three months later, in January 2009, the Bitcoin network was up and running. Since then, it's been active for 24 hours a day, with only two short interruptions in its early history.

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Fifteen years of the crypto emotional roller coaster have already passed, and it has begun to both disrupt and complement the world's financial systems. That said, it's hard to imagine a more formidable foe than the global financial system, one that is far more resilient than brick-and-mortar retailers resisting eCommerce.

Today, traditional financial services are on full alert and fighting back. Virtually every traditional financial services company is embracing and experimenting with implementations of crypto that are more palatable to their liking, often labeled "digital assets". Fidelity and BlackRock, the world's largest money managers, are embracing Bitcoin as an investable asset. Reminiscent of Microsoft's playbook for eliminating threats, we see a return of "embrace and extend". Legacy players co-opt innovation, morph it into something they control, and take the upper hand. In the case of Bitcoin, the world's largest money managers are using their preferred and defensible structure of exchange-traded funds (ETFs). The spokesperson for this battle is BlackRock's CEO, Larry Fink.

The "killer app" of crypto so far has been the experimentation, proliferation, and value speculation of new financial instruments, commonly called tokens. But is speculation a sustainable foundation for what comes next? Can blockchains emerge as a trusted, shared, and widely accepted "source of truth"? Where are the much-ballyhooed yet difficult-to-deliver sustainable applications beyond speculation, the so-called "Web3" phenomenon?

> **...If BlackRock's name is going to be on it, we're going to make sure it safe and sound and protected."**
>
> Larry Fink, CEO BlackRock
> CoinDesk, July 14, 2023

/ Despite the challenges, crypto has survived.

Many questions remain and grand promises have been made but fallen short. Still, evidence suggests that crypto has immense potential.

We have now lived through crypto's formative Phase I: "Youthful Enthusiasm to Early Peak" phase. Crypto's Phase II: "Making Sense of It All", started in early 2022 when greed, malfeasance, naive risk management, and outright fraud created an existential crisis, shaking the very foundation of trust and confidence.

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Recent months suggest we may be emerging from this phase, and time-proven themes like capital efficiency, real-world use cases, user metrics, unit economics, and clear paths to revenue generation and eventual profitability are again being spoken with conviction. Despite the challenges, crypto has survived and innovation continues, with tens of thousands of software developers engaged in advancing future promise. Over $1.6 trillion of crypto market value exists even after the crisis. Again consistent with shared DNA, this is within spitting distance of the lows for the Internet sector after the 2000s crash when its value was $2.2 trillion.

The fundamental question remains, **will crypto be embraced like the Internet or remain a rebellious outlier?**

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Crypto's Future— What Does the Data Say?

We have illustrated the shared DNA between the Internet and crypto. Now, let's turn to the data for illumination.

Four foundation-building factors act as valuable signals of innovation and maturation for emerging technologies. Each has reliable data and interacts in a reasonably predictable, albeit repeating, sequence. These are:

01 Capital invested
02 Number of users
03 Value created
04 Corporate strategy in action via mergers and acquisitions

We start our journey well past birth of the Internet and crypto, instead focusing on when each emerged into popular awareness and began to attract meaningful attention and capital. In each case, we start with the six years preceding their respective early peaks. This corresponds to 1994 and 2016 for the Internet and crypto, respectively. The full Architect Partners dataset is presented on page 15.

Capital Invested. Capital is necessary for innovation. By 2017, the crypto sector was beginning to attract significant risk capital, most notably via the novel financing technique of token sales, commonly referred to as Initial Token Offerings (ICOs). In 2017 and 2018, $5B and $15B of invested capital fueled a period of giddy optimism. During the equivalent period for the Internet, funding was modest – totaling only $1B and $3B.

However, as the Internet built momentum, particularly in 1999 and 2000, invested capital ballooned and peaked at almost three times that of crypto adjusting for inflation. Perhaps surprisingly, Internet investment and hype far exceeded anything we've seen in crypto so far.

		Capital Invested ($B)	
		INTERNET	CRYPTO
	1995 / 2017	$1	$5
	1996 / 2018	3	15
	1997 / 2019	5	6
	1998 / 2020	6	4
	1999 / 2021	32	27
EARLY PEAK	**2000 / 2022**	**75**	**29**
	2001 / 2023	28	9

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As we have muddled through during the "Making Sense of It All" stage, crypto funding has dropped 68% this past year, compared to a 63% drop in the first year after the 2000 crash. Again, eerily similar life story.

Demonstrating its resilience, the Internet began to recover capital investment levels in 2004 and, excluding the 2008 financial crisis impacts, rose strongly for over a decade.

Users. Capital is important but users are king. Fascinatingly, the user growth thus far is remarkably similar.

For example, the Internet and crypto had similar numbers of users when each achieved widespread awareness. The Internet had 39M users in 1995 relative to 25M users in crypto at its same stage of development, in 2017. Today, crypto counts at least 325M users, and the Internet wasn't too far ahead at that same stage, with 502M users. This is despite crypto's well-known user friendliness issues that are not yet solved. For the Internet, it was the Netscape browser that delivered a simplified, user-friendly experience.

Even through the 2000 crash, Internet users continued to grow, today totaling 5.5B or 70% of the world population, representing 1200% growth in the past 28 years.

Time will tell the ultimate scale of crypto, but the Internet certainly demonstrates the potential.

Value Created. The acid test measure of success is value created.

The emergence of the Internet profoundly influenced technology companies. The companies that comprised the Nasdaq 100 index represent an excellent proxy for Internet value created. Measuring crypto's value creation requires considering both traditional equity value as well as token value.

Working directly with Nasdaq, we built an unpublished dataset of the total aggregate value for Nasdaq 100 companies from 1994 to the present day.

The message is clear and again surprising. The Internet's early peak value far exceeded crypto's peak value by trillions of dollars: $5.6T vs. $3.1T, unadjusted for inflation. Inflation-adjusted, the Internet peak would have been $9.6T, more

	Users (M)	
	INTERNET	CRYPTO
1995 / 2017	39	25
1996 / 2018	77	45
1997 / 2019	120	60
1998 / 2020	188	80
1999 / 2021	281	130
2000 / 2022	414	190
2001 / 2023	502	325
≀		
2023	5,544	–

	Value ($B)		
		INTERNET	CRYPTO
	1995 / 2017	$902	$689
	1996 / 2018	1302	127
	1997 / 2019	1624	191
	1998 / 2020	2943	782
EARLY PEAK	**1999 / 2021**	**5,605**	**3,057**
	2000 / 2022	3,309	840
	2001 / 2023	2,211	1,630
	≀		
	2023	19,667	–

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than 3x higher! This is contrary to conventional wisdom that crypto has been a bubble like no other.

In aggregate, it took 16 years for the total value of Internet companies to return to previous peak levels achieved in 2000. As with all emerging industries, the success and failures of individual companies was apparent. For example, extraordinary innovation and value creation continued, as well represented by the so-called FANG (Facebook (now Meta), Amazon, Netflix, and Google) grew in value from $55B to $2,237B, or 4000% during this same period. While others, such as Webvan, struggled to survive and met their demise.

Mergers and Acquisitions. Time is required for businesses to mature to a stage where mergers and acquisitions become a valuable strategic tool.

In 1995 there were only 232 M&A transactions across the entire technology sector. That grew by 10x over the next 5 years, peaking at 2,325 transactions in 2000 with a total announced value of almost three-quarters of a trillion dollars.

Internet M&A declined post-2000 crash by 27% to its trough in 2002, but snapped back to exceed previous highs by 2005. Even more telling is that M&A levels today are 600% higher than that era.

Crypto remains an M&A toddler, but has demonstrated a similar dynamic. From 33 M&A transactions five years ago, it peaked at 203 in 2022 and fell by 30% in 2023.

	M&A Transactions	
	INTERNET	CRYPTO
1995 / 2017	232	33
1996 / 2018	328	60
1997 / 2019	415	58
1998 / 2020	620	59
1999 / 2021	1,019	174
EARLY PEAK **2000 / 2022**	**2,325**	**203**
2001 / 2023	1,803	148
≀		
2023	12,622	–

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Looking Forward

Today, in January 2024, crypto appears to be emerging from the "Making Sense of It All" phase and slowly entering the maturation phase. We see two fundamental themes at play, both are which are important for crypto to thrive:

— **Achieving Legitimacy:** Professionalizing a new asset class with an umbrella name called crypto and its complement, digital assets.
— **Discovering Valuable Use Cases:** Identifying, building, and scaling "useful things to do" that integrate the unique capabilities of crypto.

If these themes are achieved, we can anticipate what the path ahead will look like based on what we know about the Internet.

> **I believe crypto will play that role, as a flight to quality."**
>
> Larry Fink, CEO BlackRock
> Interview Fox News
> October 17, 2023

IT TAKES TIME

It takes time. One could argue the Internet took well over a decade to achieve ubiquity, spurred by far higher capital investment. We are seven years into the crypto experiment and ubiquity isn't yet a word we would use to describe the state of the industry. Is this the opportunity or the problem?

SUCCESS ISN'T LINEAR

Success isn't linear nor always apparent when only looking at the big picture. It took 17 years for the Internet to reclaim the total value lost after the 2000 crash. However, during that same time, trillions of dollars of value were created by the success stories.

IT'S WORTH IT

The results are worth it. Today over 70% of the world's population uses the Internet daily. Its value is undeniable in everyday personal and professional lives. Over $19T of value has been created over the past 28 years, driven by the existence of the Internet.

Crypto's value today is a modest $1.6T, certainly much upside remains.

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SOURCE DATA SET ● EARLY PEAK

	Capital Invested[a]				Users (M)[c]		Value ($B)[b]		Mergers & Acquistions[a]	
TIME PERIOD	INTERNET ($B)	CRYPTO ($B)	INTERNET DEAL COUNT	CRYPTO DEAL COUNT	INTERNET	CRYPTO WALLETS	NASDAQ 100 (NDX)	CRYPTO	INTERNET DEAL COUNT	CRYPTO DEAL COUNT
1991 / 2013	-	-	-	-	4	6	-	-	-	-
1992 / 2014	-	-	-	-	7	12	-	-	-	-
1993 / 2015	-	-	-	-	10	18	-	-	-	-
1994 / 2016	-	-	-	-	20	20	$585	$18	-	-
1995 / 2017	$1	$5	160	742	39	25	902	689	232	33
1996 / 2018	3	15	338	1,711	77	45	1,302	127	328	60
1997 / 2019	5	6	487	1,205	120	60	1,624	191	415	58
1998 / 2020	6	4	723	996	188	80	2,943	782	620	59
1999 / 2021	32	27	1,440	1,425	281	130	**5,605**	**3,057**	1,019	174
2000 / 2022	**75**	**29**	**2,847**	**1,766**	414	190	3,309	840	**2,325**	**203**
2001 / 2023	28	9	1,814	1,160	502	325	2,211	1,630	1,803	148
2002 / 2024	20		1,943		665		1,442		1,699	
2003 / 2025	18		1,925		781		2,250		1,815	
2004 / 2026	23		2,262		913		2,319		2,264	
2005 / 2027	36		2,628		1,029		2,740		2,644	
2006 / 2028	32		3,046		1,161		2,845		3,204	
2007 / 2029	46		3,891		1,372		2,895		4,929	
2008 / 2030	42		4,382		1,573		1,981		4,498	
2009 / 2031	33		4,217		1,771		3,097		3,675	
2010 / 2032	45		5,465		2,021		3,982		4,777	
2011 / 2033	54		7,400		2,219		2,681		5,412	
2012 / 2034	70		9,516		2,427		3,145		5,776	
2013 / 2035	63		13,319		2,802		4,059		5,927	
2014 / 2036	172		17,079		3,079		4,718		7,256	
2015 / 2037	180		21,882		3,366		4,818		8,410	
2016 / 2038	188		22,162		3,696		5,857		8,459	
2017 / 2039	199		24,000		4,156		7,643		8,797	
2018 / 2040	345		25,745		4,313		7,493		9,387	
2019 / 2041	284		27,076		4,536		9,922		9,294	
2020 / 2042	375		28,721		5,053		14,418		10,050	
2021 / 2043	688		35,250		5,252		19,206		14,714	
2022 / 2044	438		30,766		5,473		12,599		12,622	
2023 / 2045	261		22,015		5,544		19,667		9,032	

(a) Source: Pitchbook (1995-2023).
(b) Source: Nasdaq, proprietary information, utilizing data from December 31st of each year. CoinMarketCap, data as of December 31st of each year.
(c) Source: Deutsche Bank, "The Future of Payments" for 2013-2017. Chainalysis, "The Chainalysis Guide to On-Chain User Segmentation for Crypto Exchanges". Year one for the Internet is 1990 and for Bitcoin it is 2013, based on 2013 being Forbes' "Year of Bitcoin" and its full public knowledge. Users for Internet comes from both Internet World Stats" Internet Growth Statistics" and from Our World In Data, "Internet", which sources data from the Wolrd Bank and the UN.

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About Architect Partners:

Architect Partners is the leading M&A and strategic financing advisory firm serving companies on the front lines of crypto, blockchain, DeFi, fintech, and digital assets.

Architect Partners offers unparalleled senior judgment and expertise, delivering premium-value results for its clients. The Architect Partners team has completed over 350 transactions worth over $30B in value across the globe.

Architect Insights brings an informed perspective backed by hard-earned lessons from the early years of tech, crypto, and fintech. We don't have a content authoring department–every member of the team is responsible for analyzing key transactions and sharing our insights on industry dynamics. To date we've published over 400 M&A Alerts and Ecosystem Insights, all openly shared on our site and via email.

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