GA-Courtenay Special Situations Fund

GA-Courtenay Special Situations Fund is managed within Green Ash Partners LLP
11 Albemarle Street, London, W1S 4HH, UK. Green Ash Partners is regulated by the FCA.

Capitalising on AI: A Venture Framework for the Intelligent Investor

March 29th, 2024

"AI is a universal technology. And any time when there are breakthroughs in a universal technology and the frontier is meaningfully shifted then there exists the ability to create a Renaissance."

Satya Nadella, Microsoft CEO, speaking at Davos, January 2024[1]

"You have to keep learning if you want to become a great investor.

When the world changes, *you* must change."

Warren Buffett, Berkshire Hathaway letter to shareholders, 2022[2]

"Being first mover doesn't do you any good if someone else comes along and unseats you.

It's much better to be the last mover – that is, to make the last great development in a specific market and enjoy decades of monopoly profits."

Peter Thiel, Zero to One, Notes on Start Ups, 2015[3]

"Jack [Ma]'s theory is that whoever controls data, controls the world."

Masayoshi Son, SoftBank CEO, speaking to Nikkei Asian Review, 2016[4]

Executive summary

Prompt: Anthropic[5], summarise the core contentions of this white paper.

Ans: The white paper provides a comprehensive and in-depth analysis of the implications of artificial intelligence on investment strategies. It delves into how AI represents a universal technological shift, comparable to past transformations such as the rise of the internet, and how this shift influences business growth and capital allocation principles.

The white paper advocates for the integration of a Venture framework within the traditional Buffettian investment approach, particularly in the context of AI's transformative impact.

To identify investments poised to capture AI's transformative economics, investors need accurate information, focusing on simple, understandable businesses, and accurate forecasts guided by the Lanchester Square Law, Metcalfe's Law, and last mover advantage. These laws dictate that numerical superiority translates to market dominance, network value grows exponentially with users, and the final significant innovation achieves enduring monopoly profits.

The white paper also emphasises the Venture framework's requirement for candidate businesses to be led by executives with profound motivation, deep technical expertise, and the ability to attract and lead top-tier teams – crucial qualities for navigating the multi-decade journey to displace established incumbents. Such leaders must be visionaries, pragmatists, and agile learners, capable of calibrating their confidence to reality and adapting as their business grows.

The white paper contends that it is those companies monopolising vast datasets that will be uniquely positioned to develop advantaged AI tools and platforms, becoming the "Googles" and "Amazons" of the AI era. The paper names Uber, Airbnb, Spotify, Adobe, Autodesk, and Dassault Systemes as examples of data monopolists that are well positioned to scale by launching numerous and unique AI-powered verticals, and become amongst the era's dominant businesses.

Finally, the paper argues that AI will drive an economic boom through productivity gains, disinflation, reduced rates, higher profits and increased money supply. But in this new era, it is investors themselves that must also master using AI to expand their own thinking while maintaining insight, courage and individualistic reasoning.

Prompt: Anthropic[6], in greater detail, summarise the top 20 conclusions of this white paper.

1. Universal technological shifts such as AI redefine selected operating principles relating to optimal capital allocation. Intelligent investors must adapt by integrating a Venture framework while adhering to Buffettian first principles.

2. The internet era showed the importance of adapting to new types of businesses with unprecedented growth, monopolistic tendencies, and network effects. Flexibility and a first principles-based approach were key.

3. To identify investments poised to capture transformative AI economics, investors need accurate information by focusing on simple, understandable businesses, and accurate forecasts guided by the Lanchester and Metcalfe Laws.

4. The Lanchester Square Law dictates numerical superiority translating to market dominance in AI-era market share battles.

5. Metcalfe's Law states a network's value is proportional to the square of its number of users. This creates a positive feedback loop that compounds the Lanchester Square Law's effects.

6. Last mover advantage – the company introducing the final significant innovation – can achieve enduring monopoly profits. The combination of Lanchester Square Law, Metcalfe's Law and last mover advantage creates unassailable business positions.

7. Companies monopolising the capture of vast, unique datasets will be uniquely positioned to develop advantaged AI tools and platforms, becoming the "Googles" and "Amazons" of the AI era.

8. The Venture framework targets businesses with significant scaling potential. Success probability has a proportional relationship to the displaceable market size.

9. Exceptional business leaders with profound motivation, technical understanding, and team-building abilities are crucial for leading multi-decade efforts to replace established competitors.

10. Electrical power availability, especially for power-efficient AI chips, will constrain AI growth. ARM Holdings' low power RISC chips are both crucial and competitively advantaged for this reason.

11. Software platforms such as Uber, Airbnb and Spotify that capture unique customer datasets can develop valuable AI assets for upselling, new product verticals, and enhancing user experience.

12. Uber's vast driver data enables incorporating flexible work opportunities beyond ridesharing on its platform.

13. Uber's geospatial data capture allows the development of AI routing and efficiently integrating autonomous deliveries.

14. AI enhances Airbnb's ability to blur residential and leisure properties and offer premium, personalised concierge services surpassing hotels. It also enables Airbnb to facilitate real-world social experiences for travellers seeking community.

15. AI lowers image/video production costs and enhances capabilities, benefiting software design platforms like Adobe and content monopolies such as Formula One who can increase output and pricing without facing new competition.

16. Industrial software design platforms such as Autodesk and Dassault Systemes benefit as AI powers "digital twins" for more efficient product prototyping and development.

17. AI drives an economic boom through productivity gains, disinflation, reduced interest rates, higher profits and increased money supply. Benefits are dispersed as solar power distribution cannot be hoarded, and data gathering is optimised only through human collaboration.

18. Investors must master using AI to problem solve, expand thinking, yet maintain insight, courage, individualistic reasoning.

19. AI's rigidity in conformist data analysis may amplify existing information bias and herd behaviour. Investors seeking excellence must pursue non-conforming individual reasoning.

20. By monopolising the economic uplift from AI in their domains and launching numerous AI-powered verticals, certain data monopolies will undergo a transformational economic uplift to become the era's dominant businesses.

Introduction

The advent of the artificial intelligence “AI” era represents a universal technological shift, comparable in its breadth of impact to the spread of colour television and the rise of the internet. In each case, the emergence of the new paradigm influences the primary forces driving business growth and therein redefines selected of the *operating principles* for advantaged capital allocation.

To navigate the AI era, investors should consider the same adaptation that has proved optimal in prior technological shifts: integrating the selected and thoughtful use of a Venture framework while maintaining loyalty to the *first principles* that underpin the Buffettian approach. It is by this route that this white paper provides a comprehensive methodology for identifying the "Googles" and "Amazons" of the AI era.

The case of the internet is contended as a valuable guide, illustrating the challenges and opportunities faced by investors during a period of universal change. The emergence of businesses exhibiting unprecedented growth trajectories, a trend to monopoly, and a reliance on network effects challenged traditional capital allocation rule sets. Achieving the flexibility to adapt to this historic shift prioritised a *first principles*-based approach and thoughtful forward reasoning, at the same time as not abandoning the use of conservative principles.

To identify the investment allocations poised to capture the transformative economics of the AI era, investors must prioritise both *accurate information* and *accurate forecasts*. The Buffettian *first principle* of removing bias from information gathering and focusing on *simple and understandable businesses* remains crucial for obtaining accurate information. However, when it comes to making accurate forecasts in the context of AI, the Lanchester Square Law and Metcalfe's Law emerge as additional guideposts.

The Lanchester Square Law, adapted from military theory to corporate strategy, provides a mathematical foundation for understanding and predicting outcomes in the market share battles that will define the AI era. It highlights the significance of numerical superiority and its translation into market dominance. Metcalfe's Law, on the other hand, dictates the exponential value growth of software networks as their user base expands, creating a positive feedback loop that compounds the effects of the Lanchester Square Law.

The white paper also contends the necessity for investment allocations as we enter the new era to possess "last mover advantage", contextually a form of innovation-defence. In a rapidly evolving market it is the last mover, being the company which introduces the final significant innovation, which stands to reap long-term monopoly profits. The combination of the Lanchester Square Law, Metcalfe's Law, and last mover advantage has the potential to create unassailable business positions and generate decades of monopoly profits.

The white paper argues that it is largely those companies that dominate the capture of vast and unique data sets that will be uniquely positioned to develop advantaged AI tools and platforms, becoming the "Googles" and "Amazons" of this new era. Amongst these data monopolies we name Uber, Airbnb, Spotify, Autodesk, Adobe and Dassault Systemes. Outside of this group, the white paper also reviews ARM Holdings, an additional yet uniquely positioned beneficiary for the AI era.

Finally, the white paper examines the importance of scalability and exceptional management within the Venture framework, variables that will remain critical in the AI era. By providing a comprehensive analysis, this white paper aims to equip the intelligent investor with the insights and tools necessary to thrive in the new AI paradigm.

1. At the commencement of a universal technological shift, the intelligent investor adjusts by incorporating a Venture framework into the Buffettian approach

1.1. The periodic focus on the investment implications of a universal technological shift is not a deviation from the Buffettian approach, it is instead embedded within its origin

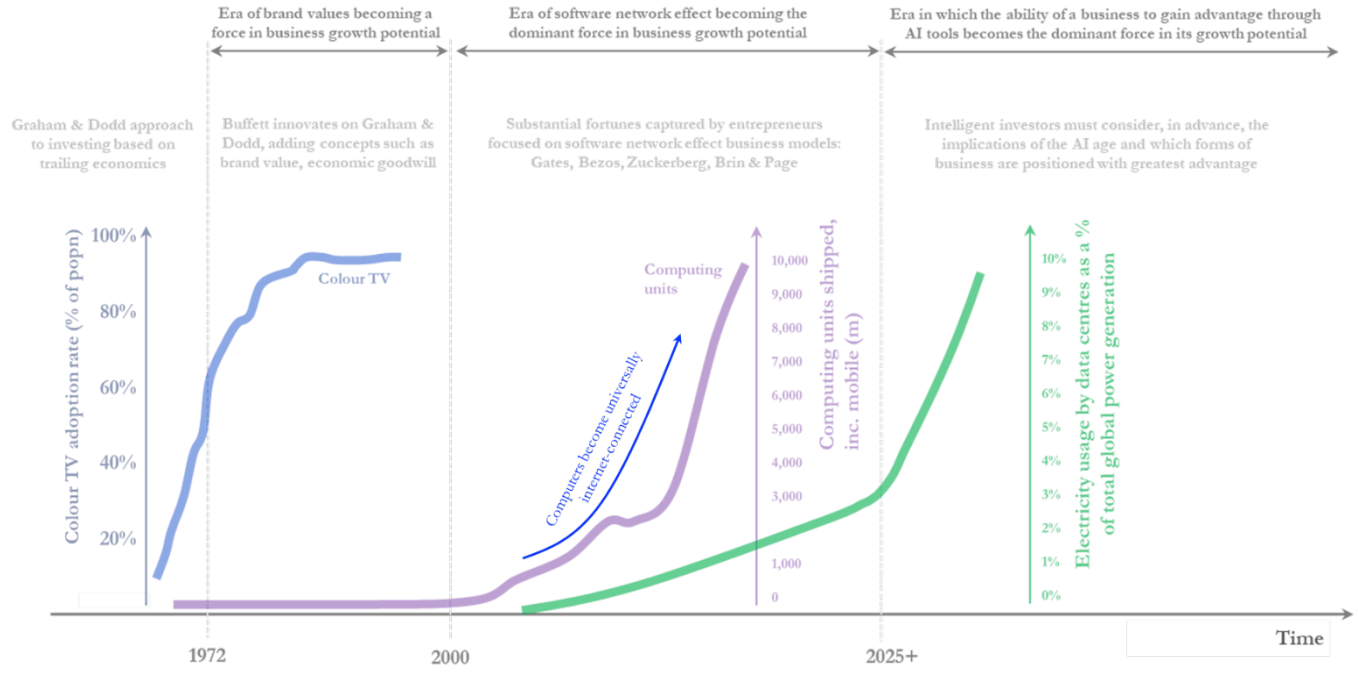
As detailed in Figure 1 below, there have been three main technological shifts over the last half-century. And in each case, the emergence of each new paradigm influenced the primary forces driving business growth.

Warren Buffett originated the approach we today refer to as *Buffettian* in the 1970s when he broke away intellectually from Ben Graham[7]. Recognising the transformative impact from the penetration by colour television of most households, Buffett adapted his capital allocation strategies. He placed a capitalised value on brands that could leverage television to expand from regional to national dominance, capturing value beyond Graham's focus on net assets. Buffett's distinction between "economic goodwill" and accounting goodwill was a key aspect of this new approach[8].

However, the breakaway can also be contextualised in the context of Buffett recognising the properties of an emerging paradigm, which in the 1970s was the installation of colour television in homes nationwide, and adjusting his investment methodology by incorporating what this white paper refers to as the *Venture framework*. In this context our contention is that the periodic recognition of a universal technological shift leading to a change in investment rule sets is not a deviation from the Buffettian approach, it is instead embedded within its origin.

A second, and two-pronged, universal technological shift occurred in the 2000s. The colour television in every home shifted to first a desktop computer and then smartphones in every home, and this was co-incident with computing devices becoming universally internet connected.

Figure 1: Universal technological shifts influence the primary forces driving business growth[9]



Whilst Buffett avoided internet stocks, it is important to note that his disclosures revealed that this was based his on own self-awareness as to *his relative advantage*, and not because he rejected the requirement for intelligent investors to focus on the implications arising from universal technological shifts. Buffett stated in the Berkshire Hathaway shareholder meeting in 2017, "*we avoided the tech stocks, because we felt we had no advantage there and other people did, and I think that's a good idea not to play where the other people are better*."[10] In other words, Buffett's broad avoidance of internet stocks was led by the Buffettian principle to remain within one's own circle of competence, and not to operate in areas which require the trust of outside experts.

1.2. Buffettian investors should seek to identify the "Googles", "Amazons" of an emerging technological shift: the monopolistic gatekeepers with understandable, inside circle of competence, business models

However, Buffett's public statements also reveal his acknowledgment that, had he identified areas within the technological shift where he could gain a deep understanding of emerging business models *close up*, or within his circle of competence, he should have incorporated a Venture framework during this period in the selected instances where the other aspects of the Buffettian approach still applied.

> *"What was our worst mistake in the tech field? I think we were smart enough to figure out Google.*
>
> *Those ads worked so much better in the early days than anything else. We were their customer very early on with GEICO, for example. And so we were close up, seeing the impact of that."*
>
> Warren Buffett, Berkshire Hathaway annual meeting, 2017[11]

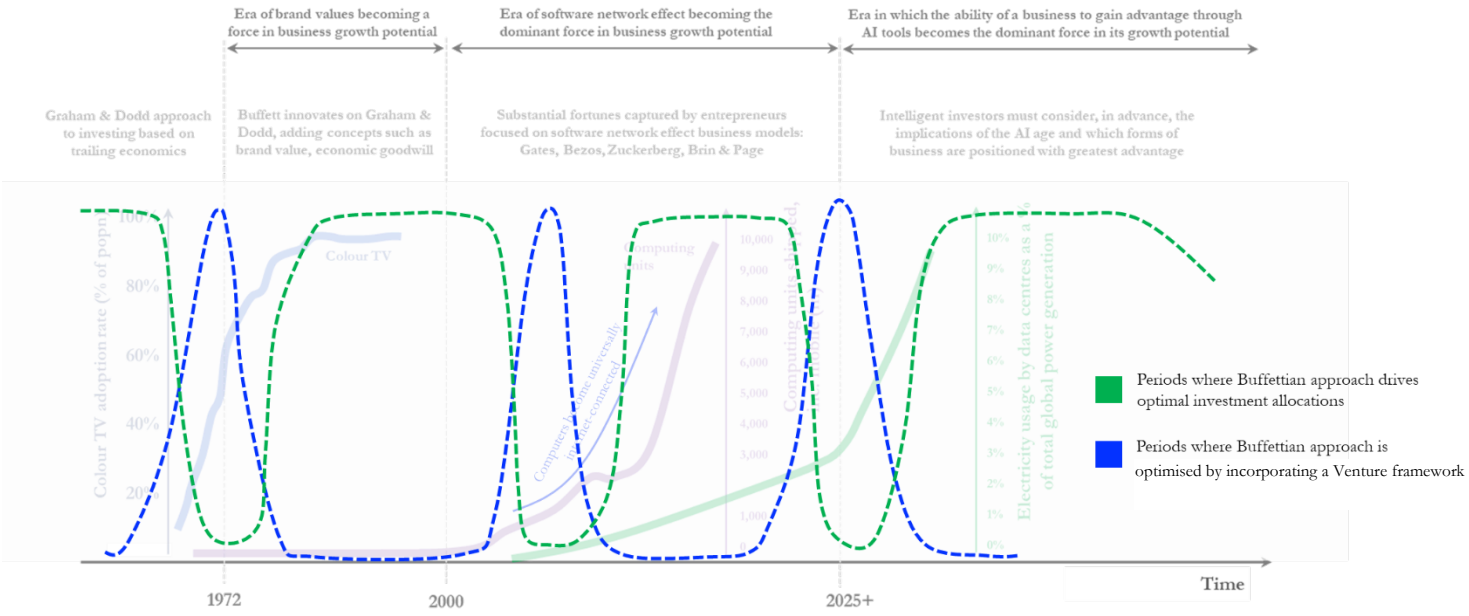
The observation that during times of widespread technological change, there is an intersection between the Buffettian approach and the Venture framework is further supported by studying those individuals who accumulated the largest fortunes during the internet era. In Google's IPO prospectus, founders Larry Page and Sergey Brin, who followed a Venture framework, also incorporated elements of the Buffettian approach. This included creating a Google version of Berkshire Hathaway's "Owner's Manual" and quoting Buffett's advice that management should not aim to "*smooth*" quarterly results[12]. Likewise, the shareholder letters of Jeff Bezos, who led Amazon using a Venture framework, also reference other aspects of the Buffettian approach. Bezos even remarked about Buffett, "*he's a hero to me, I read all his books*."[13]

Buffett and Munger themselves can also be observed to be deploying a Venture framework in selected instances where they had achieved *an advantaged understanding of the business in question*. Examples include the Berkshire Hathaway investment in the convertible bonds of Amazon in 2002[14], and in electric carmaker BYD in 2008[15].

> *"I have never helped to do anything at Berkshire that was as good as BYD – our $232 million investment in 2008 has soared in value by more than 30 times within 15 years. That's a pretty good rate of return."*
>
> Charlie Munger, interview with CNBC, 2023[16]

Today, our contention is that investors seeking to optimise the Buffettian approach must target similar adaptability by recognising that we are entering a new universal technological shift, the AI era. During this period, investors will gain advantage by incorporating a Venture framework into appraising opportunities where the *first principles* of the Buffettian approach, described in the next section of this white paper, are also met.

Figure 2: At the beginning of a universal technological shift, an intelligent investor recognises the paradigm that is coming, and adapts their approach by deploying a Venture framework[17]



1.3. The *first principles* that are the fundamental underpinnings of the Buffettian approach

The Buffettian approach is perhaps most commonly recognised in terms of its operating principles. These can be summarised as 1) the business must be simple and understandable without reliance on trusting outside experts, 2) the business must be valued in terms of the present value of cash return relative to cash outlay, with low conditionality to macro variables, 3) a dominant company with high returns on equity, with good governance and 4) a conservative financial position, the low risk of the business must correspond to low risk for its equity[18].

However, in our appraisal the Buffettian operating principles are not reconcilable with investment advantage unless one understands their underlying drivers – the more elusive *first principles* that underpin them. Tellingly, even Buffett himself admits to broadly avoiding public discussion of these first principles, focusing his discourse on the more straightforward "*what*" in investing and rarely delving into the more elusive "*why*."

> *"Let your approach be misunderstood by outsiders. They can't compete with what they don't understand."*
>
> Warren Buffett, comments to Roger Lowenstein, The Making of an American Capitalist, 2008[19]

Nevertheless, it is the *why*, relating to the more elusive *first principles* of the Buffettian approach, that is the same set of first principles that must remain upheld when the Buffettian practitioner deploys the Venture framework.

> "First principles – what that really means is you boil things down to the most fundamental truths. And it takes *a lot more mental energy*."
>
> Elon Musk, Tesla and SpaceX CEO, comments on first principles, speaking in 2014[20]

1.3. i) First principle one: The investor's critical competitive advantage lies in access to accurate information. However, humans also pass on information with bias, and therefore investors must prioritise opportunities where information can be gathered independently of outside 'experts'

> *"A lack of information can be dangerous. Competitively it can be disastrous.*
>
> *Proper information at the right time – at proper cost – accurately evaluated and used correctly.. is a tremendous competitive asset."*
>
> Georges Doriot, Manufacturing Class Notes, Harvard Business School 1937-1966[21]

The core of the *first principles* underpinning the Buffettian approach is the recognition that humans often introduce bias into their communications, aligning with their incentives. As a result, much of the enthusiastic guidance provided by corporate management has limited value. For listed companies, which frequently generate more cash flow from issuing new equity securities than from core business operations, the incentive for biased communication is particularly high.

> *"I do not understand why any buyer of a business looks at a bunch of projections put together by a seller or his agent – it is naïve to think that that has any utility whatsoever. We are just not interested.*
>
> *If we don't have any idea ourselves of what we think the future is, to listen to someone who is trying to sell us the business or get a commission on it and tell us what the future is going to be – it is very naïve."*
>
> Warren Buffett, Berkshire Hathaway shareholder meeting, 1994[22]

> *"Many people think that if they just hire someone with the appropriate labels they can do something very difficult.*
>
> *That is one of the most dangerous ideas a human being can have."*
>
> Charlie Munger, Berkshire Hathaway shareholder meeting, 1994[23]

That the possession of accurate information is an essential component to competitive advantage also dictates the 'circle of competence' operating principle of the Buffettian approach, specifically that the investor should independently understand the facts and reasoning that relate to a *simple and understandable* business without reliance on outside experts.

The Buffettian approach consequently rejects the Venture framework *during most periods*. The rationale for this rejection is that *the majority of Venture framework situations, in most periods, do not occur within universal technological shifts* but rather in niche sectors. These niches often require investors to undergo a steep learning curve and rely on others for information, which is problematic in a market where information is inherently biased.

1.3. ii) First principle two: Humans act with a gambling mentality. First principle three: Humans act with a herd mentality. These principles lead to recurring opportunities stemming from unintelligent security pricing.

Two additional first principles that form the foundation of the Buffettian approach are that humans exhibit both gambling mentality and herd mentality. Gambling mentality refers to the willingness to wager on outcomes in situations with low predictive accuracy, and appears to be amplified when the possibility, irrespective of probability, of large payouts is suggested. By contrast, herd mentality, which is a decision-making process heavily influenced by the choices made by others, significantly increases under stressful conditions[24]. This effect is further amplified when the group of humans being followed is also guided by an authority figure or concept.

> *"Investors behave in very human ways, which is that they get very excited during bull markets, and during bear markets, they just say this is a lousy place to be so they don't care what is going on in the underlying business. It is astounding, but that makes for huge opportunity, just huge opportunity."*
>
> Warren Buffett, lecture at University of Georgia, 2001[25]

Both of these principles, when activated, appear to override the normal judgment of most humans in decision-making. In other words, under conditions that stimulate either or both of gambling or herd mentality, humans can become *unintelligent*. It is in these circumstances that the Buffettian investor takes action.

> *"The secret of life is weak competition.. in securities markets, if you have an IQ of 100 and everybody else has an IQ of 80, you are way better off than if you have a 140 IQ and all the rest of them also have 140"*
>
> Warren Buffett, Berkshire Hathaway annual meeting, 1998[26]

The drawbacks that would otherwise arise in investment from the existence of these biases can be mitigated, in a reductive sense, by focusing on simple and understandable businesses (to overcome information bias) that have been unintelligently priced (due to a combination of gambling and herd behaviour). Additionally, employing a working method that broadly isolates the investor from the inputs of other humans (such as a provincial location, removal of stockbroker input, and emphasis on high-aptitude independent thought) are further Buffettian steps taken to address these issues.

As illustrated in Figure 3, the Buffettian approach argues that when its methodology is perfected, the resulting financial performance can be significantly enhanced to the point where it surpasses what might traditionally be described as Venture or growth-type investment. This is often exacerbated because most Venture investments will have already been priced at high valuations due to their capital requirements incentivising promoter activity.

Figure 3: Formulaic contention of the Buffettian approach[27]

The growth of simple and understandable, yet advantaged, businesses,

plus **the additional shareholder return from instances of their undervaluation**

is, on average, greater than

The growth of promoted businesses

less: **the extent to which their promoted share price already discounts their growth**

less: **the failure of their growth to match the bias within its original guidance**

1.4. Buffettian first principles also result in the intermittent recognition of the Venture framework

The *first principles* of the Buffettian approach position Buffett as much as a social scientist as he is an investor.

However, the Buffettian approach also implicitly acknowledges an additional feature of the social sciences – the existence of the disruptive protagonist in new business emergence. By demanding a dominant company with high returns on equity, the Buffettian approach also accepts that weak businesses will be displaced by these disruptors. The Buffettian as such contends the Venture framework. As Bill Ackman puts it, "it happens".

> *"Buffett talks about a great business like a castle surrounded by this wide moat. But you also have barbarians trying to cross the moat and steal the treasure. And it happens, Kodak for example."*
>
> Bill Ackman, Pershing Square Capital Management, interview with Lex Fridman, February 2024[28]

That the Bufffettian approach implicitly contends the Venture framework also implies, as this white paper argues, that the *operating principles* of the Buffettian approach *during intermittent periods* may be subject to further optimisation by incorporating Venture framework principles.

These periods include those market circumstances where:
1. The breadth of the universal technological shift offers new avenues to address the Buffettian first principles.
2. The magnitude of impact of the universal technological shift also presents unusually high return scenarios.

In such circumstances, incorporating a Venture framework can further optimise the Buffettian operating principles.

1.4. a) The means by which a universal technological shift opens new routes for the Venture framework to address the Buffettian first principles

The Buffettian first principle of information bias dictates that investors should understand a business model's facts and reasoning independently, without relying on outside experts. This typically excludes niche technological cases where dependence on external experts is necessary.

However, when a technological shift is universal rather than niche, a number of businesses that benefit from the shift will still meet the Buffettian criteria of being simple and understandable. For example, Buffett's consumer-facing investment in Amazon illustrates that a business in a fast-growing internet sector with a tech focus can still be understood without reliance on outside 'experts' or potentially biased company guidance.

The second, albeit duo, of *first principles* of the Buffettian approach are that humans exhibit gambling mentality and herd mentality. Again, this normally rules out the narrow niche of technological cases which are typically co-incident with promoter advocacy to take advantage of the gambling and herd mentality of market participants. However, when a technological shift is universal, the abundance of, or amplitude of impact of, information can overwhelm the volume which can be subjected to promotion. And this results in a sufficient frequency of investment opportunities where the Venture framework practitioner can also benefit from the market's gambling and herd behaviours.

Buffett likes to remind Berkshire Hathaway investors that his approach takes advantage of *unintelligent* market participant behaviour. However, unintelligence can also defined by the market's failure to thoughtfully recognise and analyse emerging paradigms and their associated impact on the changes to operating principles that may be required. As such, the Venture framework also allows the thoughtful investor in these instances to follow Buffett's principle of acting only when they possess an intelligence advantage.

1.5. The Venture framework: a summary

Before delving deeper into the analysis provided by this white paper, it is instructive to review the Venture framework's fundamentals. The framework targets the capture of a leadership position in an emerging industry, and uses that position as a base to displace the economics from a large, incumbent player within the market.

The intermittent relevance of the Venture framework demands a study path dedicated to the selected pool of elite investors who have more consistently specialised in this area of investment outside of universal technology shifts. Our study of these investors concentrates on those who have extensively shared their decision-making processes publicly. These investors include:

- Tom Perkins, the founder of the venture capital firm Kleiner Perkins and arguably also the founder of the modern approach to venture investing.

- Masayoshi Son, the founder of SoftBank and who has achieved extraordinary success in selected venture investments, yet in others, also recorded a higher loss rate than other venture practitioners. As such, with Masa, there is a broader path of learning possible – not only from his successes, but also from his mistakes.

- Benchmark Partners, a Silicon Valley venture firm that remains active today and in many ways sets the most recent standard for venture investment, as alluded to in its company name.

The white paper will also review why the leadership attributes of the founder or CEO of the business matters more in circumstances where the Venture framework is applied than for situations suited to the Buffettian approach. The venture analysis focuses on judging both a business leader and the business, and emphasises "entrepreneur-picking" to almost the same degree as it does "stock-picking". This is unlike the Buffettian approach, which weights to a far greater degree the determination that the robustness of a business is within reason independent of its management team, and that has been priced unintelligently.

The Venture framework looks for the unique and highly skilled business leader who will oversee what will be a multi-decade campaign in displacing an incumbent. This leader needs to possess deep motivation, extraordinary self-belief, science/technical competency, excellent communication and marketing skills, combined with business mindedness in the pursuit of profit[29].

The divergence in the criteria which define the Venture framework relative to the Buffettian approach may explain why so few investors master both approaches in a co-incident manner. However, our contention is that not only are the *first principles* that underpin each approach consistent, but the rareness of the practitioner being able to master both approaches in a co-incident manner also results in a meaningful competitive advantage when achieved.

Figure 4: In instances of universal technological shift, the Buffettian approach and a Venture framework can become unified as adhering to the same set of *first principles* [30]

Figure 5: A study of the selected, elite investors (Tom Perkins, Masayoshi Son, Benchmark Partners) who have specialised in the Venture framework results in a productive set of learnings applicable during the current era of universal technological shift

"Over the years, Kleiner Perkins has been the most successful venture capital partnership. Well, I can go beyond that. It's been the most successful financial institution in the history of the world.

We might have to modify that statements if the Medicis and the Rothschilds make their data available. But until they do, I'll stand on that statement.

We've had returns of about 40% per year, compounded, for coming up on thirty years next year. Nobody else has done that well."

Tom Perkins, co-founder Kleiner Perkins, interviewed in 2001[31]

"For the investment business we have an IRR of 44%.

I think in this scale of investment, compared with any private equity company or any venture capitalist, over the last 18 years, I have not known any other companies which beat this 44% compounded return on investment."

Masayoshi Son,SoftBank, 2016[32]

For Uber, a Quiet Investor Becomes a Sudden Thorn

Bill Gurley, Mitch Lasky, Eric Vishria, Matt Cohler and Peter Fenton outside of Benchmark's offices in San Francisco.

The New York Times

article date: August 2017

Benchmark invested in Uber in 2011, putting in an initial $12 million at a valuation of around $60 million. (That stake is now worth more than $8 billion.) Mr. Gurley, Benchmark's most prominent partner, also took a board seat at the company. He has since promoted Uber on his blog, Above the Crowd, and on social media.

"Over the years, Benchmark's eight funds have paid out $22.6 billion to investors. Its backers received a 1,000% gain – net of fees – over the past decade."

Forbes article on Benchmark Partners, 2015[33]

2. The counter-intuitive mathematical law underpinning the Venture framework

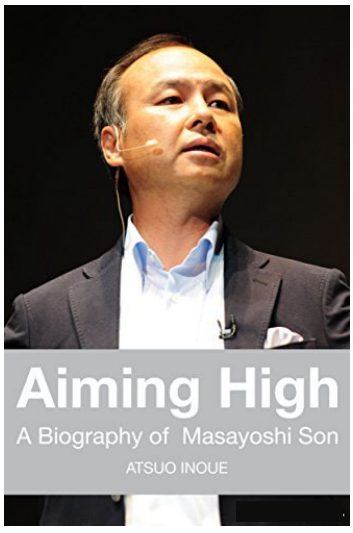
2.1. The properties of corporate battles for market share, and the Lanchester Square Law

Warren Buffett states, as per section 1.3, "*let your approach be misunderstood by outsiders, they can't compete with something they don't understand.*" His intention appears to be that whilst his public statements may reveal the *what* of the Buffettian approach, he does not make these statements in a way sufficient for most investors to derive the *why*, or the *first principles* underpinning his approach.

The Buffettian *first principles* – information bias, gambling, and herd mentality – may also remain elusive to most investors due to inherent human evolutionary programming[34], which limits our awareness of self.

However, at least one practitioner of the Venture framework, Masayoshi Son, has recognised an additional rigidity in human programming, and one that leads to a miscalculation by humans of the outcomes of modern corporate battles for market share. Unlike the Buffettian *first principles*, which are derived from social science, Masa's recognition is derived from mathematics.

Figure 6: Masayoshi Son adapted the Lanchester Square Law to evaluate modern corporate battles for market share[35]



According to Frederick W. Lanchester, the British engineer, a fleet with a strong force and a weak force must take different strategies. In this case, Son belonged to the latter. Breaking through from a single point of focus—it was a bold, yet meticulously thought out strategy.

Generally speaking, if one aims to establish oneself as a major IT infrastructure provider, one should maintain neutrality. One should not patronize a certain brand or manufacturer. However, Son adopted the 'Lanchester strategy,' in which one concentrated one's resources in a specific area within the shared battlefield.

"One of the persons I respect the most is Mr Lanchester, in mathematics."

Masayoshi Son, SoftBank CEO, Softbank annual meeting of shareholders, June 2018[36]

Lanchester's Square Law[37]:

Combat Strength = [Army Size]^2 x Weapon Effectiveness

British engineer Frederick W. Lanchester, working in the early 20th century, developed a ground-breaking set of mathematical formulas to model and calculate the outcomes of military conflicts[38]. The success of his formulas in battle commensurately revealed the intuitive error humans were previously making in battle outcome assessment. Conditioned by the vast majority of human evolution occurring over periods where hand-to-hand combat predominated, innate human programming judges battle outcomes as linearly proportional to army size. However, Lanchester's insight was that since the development of projectile weapons, war fighting ability has become proportional to the square of the size of the army.

Masa's perceptiveness was not only that the Lanchester Square Law also applied to corporate battles for market share, but additionally that humans were also innately misjudging these corporate outcomes as a result of our evolutionary programming still directing us to use linear thinking in such battle analysis.

Our comment: The Lanchester Square Law emerges because the ability of one army, in a projectile-based battle, to inflict a percentage rate of change onto the opposing army is not only proportional to its own size but also to the size of the opposing army, because as the opposing army reduces in size the same volume of projectile firepower applied to it has a larger percentage impact. This leads to an exponential increase in the advantage for the larger force.

And as the opposing force gets smaller, it not only loses its own ability to inflict damage but also becomes increasingly vulnerable to the firepower of the protagonist force.

Conclusion: numerical superiority is exponentially advantageous in battle scenarios

2.2. Lanchester Square Law dictates that a new market entrant is likely to succeed only with a completely new invention, not just an improved version of an existing product

The Lanchester Square Law dictates that in a monopoly market where the incumbent holds a 95% market share, a new entrant with a 5% share would need a product 9,000 times (i.e. 95^2 less 5^2 = 9,000x) superior to the incumbent's to succeed.

Yet we find this is counter-intuitive to the modes of thought of humans: most in our experience would contend that a new entrant that had established a 5% market share and yet possessed a 5x advantage in product superiority would have reasonable odds of further success, even against an otherwise monopolist.

However, a 5x superior product is insufficient; only a ground-breaking innovation offering a customer advantage thousands of times greater than the incumbent's solution succeeds. As such, *a market entrant should not be attempting to grow by possessing a differentiated product within a new technology wave; instead the market entrant must have originated the technological wave as the monopolist*.

> *"The clearest way is to invent something completely new. If you build something valuable where there was nothing before, the increase in value is theoretically infinite.*
>
> *A drug to safely eliminate the need for sleep, for example, would certainly support a monopoly business."*
>
> Peter Thiel, Zero to One, Notes on Start Ups, 2015[39]

2.3. Lanchester Square Law also dictates that market entrants should target a small segment of an incumbent's position and grow from there

The Lanchester Square Law also dictates battle strategy. An assault that splits the enemy into smaller units gains a relative advantage at the exponential power of the reduced size of each separated enemy unit relative to the whole.

This strategy is represented by both Nelson's splitting of the Spanish fleet in the Battle of Waterloo as much as it is represented by Amazon's initial splitting of the retail market. Amazon initially focused solely on books, where its online model offered a vast selection in the millions, a ground-breaking innovation with an orders of magnitude advantage over the limited inventory of physical bookstores it competed against.

"Books were great as the first best to sell online because books are incredibly unusual in on respect – and that is that there are more items in the book category than there are items in any other category by far.

In the book space there are over 3 million different books worldwide active in print at any given time across all languages, more than 1.5 million in English alone.

When you have that many items you can build a store online that couldn't exist any other way."

Jeff Bezos, Amazon founder and CEO, public domain interview, 1997[40]

2.4. Lanchester Square Law dictates that the Venture framework should target businesses with "last mover advantage" products

That the Lanchester Square Law dictates a new market entrant will only succeed if it is able to deliver an entirely new innovation has a corollary implication: *the intelligent application of the Venture framework should also target businesses whose products exhibit "last mover advantage".*

Last mover advantage exists when no new radical innovation seems possible. For example, one-touch ordering from smartphones or smartwatches, as is offered by Uber or Spotify, leaves little room for significant improvements, especially considering that voice ordering could easily be added by the existing market leaders.

When no further innovation appears feasible, last mover advantage is attained, and the Lanchester Square Law implies that the market leader is now unassailable. In other words, when a product's current form is indistinguishable from all conceivable future forms, the final significant advancement has been made, allowing the market leader to enjoy long-term monopoly profits.

Interestingly, public statements from both venture capitalist Peter Thiel and Warren Buffett both recognise the appeal of market leaders with enduringly homogenous end products, again highlighting a stronger connection between the Venture framework and the Buffettian approach than that which may be commonly recognised.

"A monopoly is only a great business if it can endure in the future.

You've probably heard about first mover advantage: if you're the first entrant into a market, you can capture significant market share while competitors scramble to get started. But moving first is a tactic, not a goal.

[And] being the first mover doesn't do you any good if someone else comes along and unseats you.

It's much better to be the last mover – that is, to make the last great development in a specific market and enjoy years or even decades of monopoly profits."

Peter Thiel, Zero to One, Notes on Start Ups, 2015[42]

"I have always been attracted to the low cost operator in a business and, when you can find a combination of:

(i) an extremely large business,
(ii) a more or less homogenous product and
(iii) a very large gap in operating costs between the low cost operator and all of the others in the industry,

..then you have a really attractive investment situation."

Warren Buffett, discussing GEICO, 1976[41]

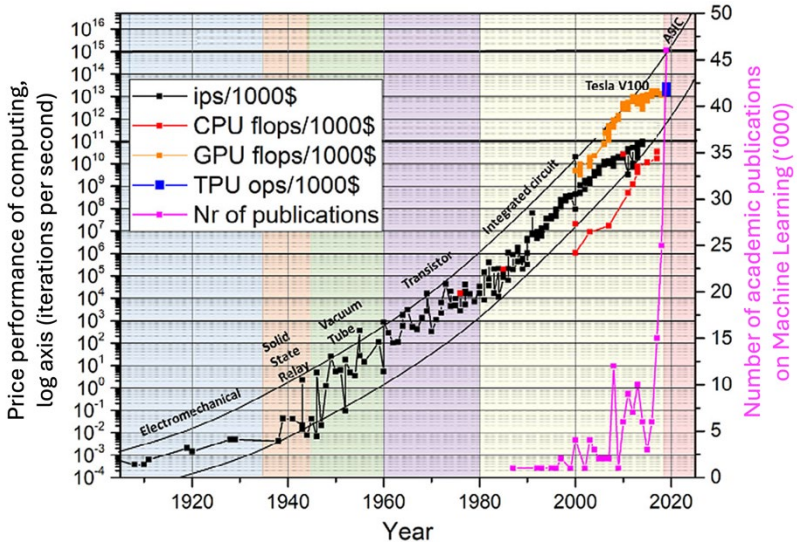
3. Properties of the last universal technological shift: computers in every home, and mobile computing, rapidly become connected – the Internet era emerges

3.1. Ongoing price-performance increases, a function of the incentives resulting from modern political design, drive universal technological shifts in computing

Modern political systems incentivise the continuing development of productivity-enhancing technologies by *tying human monetary rewards to human productive output*, while prohibiting more primitive forms of resource gathering such as combat and unrestricted foraging.

The modern incentive for increased productive output thereon drives investments in computer processing, leading to improving computing price-performance.

Figure 7: An enduring exponential in price-performance of computation over the last 100 years (Y axis is log)[43]



Popular discussion tends to focus on the so called Moore's Law – a contention that increasing throughput is driven by the *density* of transistors per microchip[44] – however, as of the 2010s and into the 2020s, the increases in density of transistors per chip has slowed due to physical limitations at small scales, such as heat dissipation and quantum effects[45].

However, despite the slowdown in the increases of transistor density per chip, the *incentive* for even higher computations per dollar remains. The result is that price-performance improvements appear to be accelerating[47], driven by the shift towards data centres that leverage parallel computing and multi-core chipsets unsuitable for desktop or mobile devices[48].

> *"Show me the incentive and I will show you the outcome."*
>
> Charlie Munger, The Psychology of Human Misjudgement, 1995[46]

3.2. Universal technological shifts occur sporadically, often decades apart, favoring those who understand the historical patterns of these shifts

Although computing price-performance has improved exponentially and consistently, the universal technological shifts themselves have been sporadic, frequently occurring decades apart.

The intermittency of universal technological shifts is likely due to a dependence on "breaking point" developments, where the accumulation of multiple innovations leads to a foundational breakthrough. For instance, recent AI advances result from the combination of increased computational power, improved neural network architectures, big data availability, enhanced algorithms, transfer learning (fine-tuning models trained on one task for another), and open-source software contributions[49].

These cycles also often coincide with market and economic conditions. Innovations require significant investments, and investors' willingness to support new technologies can vary based on the economic environment. Additionally, the time needed for adoption and adaptation of new technologies contributes to the intermittency of these shifts.

However, the intermittency of universal technological shifts is also the cause of the lack of familiarity among most market participants regarding the optimal response, creating opportunities. Our contention is that the sporadic nature of these shifts will persist as a feature of human progress. Therefore, those who study the historical patterns of these shifts and are prepared to wait years, or even decades, for the next opportunity to act will have a lasting advantage.

3.3. Exceptional reasoning should be based on *first principles*, not rules

The internet's emergence exemplifies how thoughtful analysis and reasoning, applied as a new technological shift becomes apparent, can guide investors in adapting the Buffettian approach to the new paradigm.

The lesson is that rigidly adhering to Buffettian *operating principles* can hinder strong investment performance. Instead, investors should remain true to Buffettian *first principles*, which are based on enduring human characteristics. At the same time investors may need to adjust their *operating principles* to accommodate changes in the environment caused by universal technological shifts. In essence, *exceptional reasoning should be guided by first principles rather than rigid rules*, allowing for adaptability in operating principles while remaining grounded in social science, business and market fundamentals.

> *"When we become rule-driven we stop investing.*
>
> *Exceptional means the exception to the rule."*
>
> Peter Fenton, Benchmark Partners, public comments[50]

3.4. The internet era: rapidity of business growth, market leadership trends to monopoly, a low capex requirement, and a counter-intuitive re-prioritisation of the importance of the human herd

Our assertion is that the underlying dynamics of the internet companies – prior to unseen rapidity of business growth, businesses which trend to monopoly, a low capex requirement, and a counter-intuitive re-prioritisation of the importance of the human herd – were indeed foreseeable early in the technological shift so long as one conducted thoughtful forward analysis and reasoning.

3.4. a) The internet's software networks reduced software replication costs to zero, replication speed to instantaneous

The transition from physical distribution of software using boxed CD-ROMs to internet-based software downloads or browsing reduced the cost of software replication to zero and made replication instantaneous. Consequently, software networks could achieve massive business values much more rapidly than traditional industries.

Figure 8: The internet era resulted in a change in the cost of software replication to zero[51]

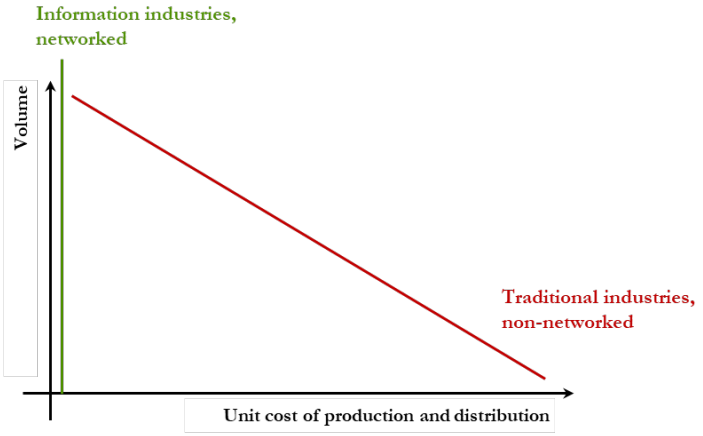
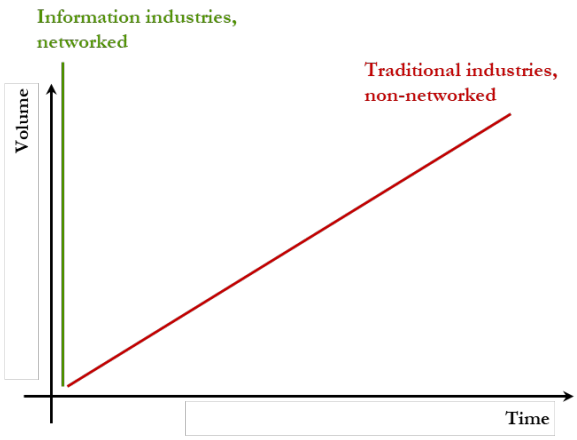


Figure 9: The internet era resulted in a change in the speed of software replication to instantaneous[52]



3.4. b) The internet significantly expanded the number of businesses exhibiting network effects, where network value grows proportionally to the square of user count, leading to monopolistic outcomes

The internet also greatly increased the number of businesses that exhibited network effects, which occur in software networks and geographic density networks. These networks followed *Metcalfe's Law*, stating that the network's value is proportional to the square of the number of its users[53].

Figure 10: The demand from customers to become a user of a network is proportional to the square of the number of users of that network[54]

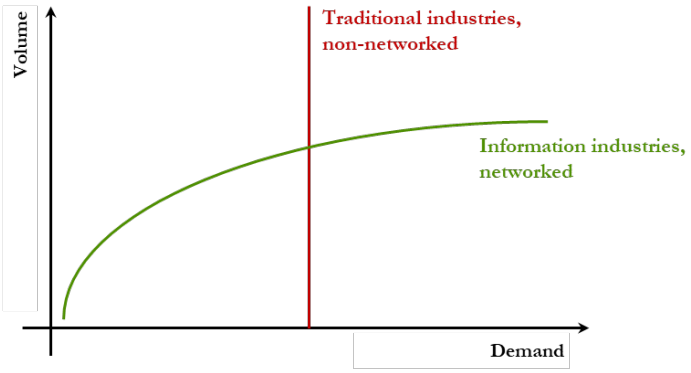
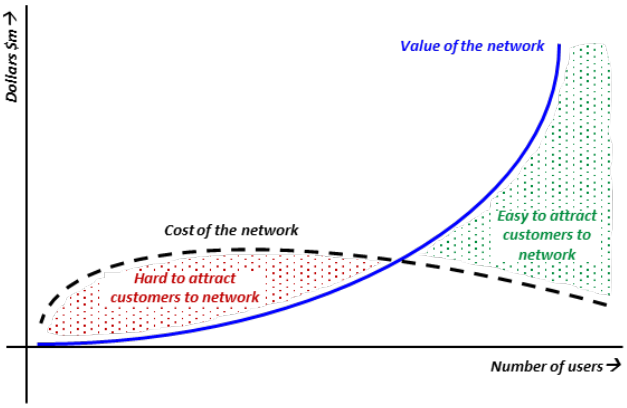


Figure 11: The per user monetisation is proportional to per user demand; as such the value of the network becomes proportional to the square of its no. of users[55]



Our comment: Metcalfe's Law and the Lanchester Square Law act independently yet can also occur at the same time, compounding each other. When both laws apply, they further reinforce the unassailable position that a market leader can attain.

Mathematically, Metcalfe's Law is expressed as: Value of Network $\propto$ (Number of Users)^2

As the network grows, the value per user begins to surpass the acquisition cost per user, and the network begins to have a positive value that increases exponentially. This dynamic results in a positive feedback loop. Moreover, Metcalfe's Law operates independently of, and compounds the effects of, the Lanchester Square Law. When both laws act in tandem, they further strengthen the unassailable position a market leader can achieve, potentially leading to decades of monopoly profits.

This relationship differed from the relationship between scale and the dominant industrial oligopolies before the internet's emergence. For these more traditional industry business models, *negative feedback* became the primary force once a certain size was reached. Unlike software networks, traditional industries didn't experience a change in customer demand proportional to the volume of their customer count. Moreover, without the benefits of zero cost and instantaneous replication found in software networks, these companies faced growth limitations due to the complexity of managing large enterprises.

Many investors likely failed to recognise in advance the different *end games* between internet-era businesses (monopoly) and traditional industries (competitive market) because they lacked a thoughtful, first principles-based analysis rather than relying on established doctrine. Consequently, investors who were able to identify these differentiations early on had access to highly lucrative opportunities.

Figure 12: For traditional industries, whose business models exhibit negative feedback as they scale, the outcome is a competitive market[56]

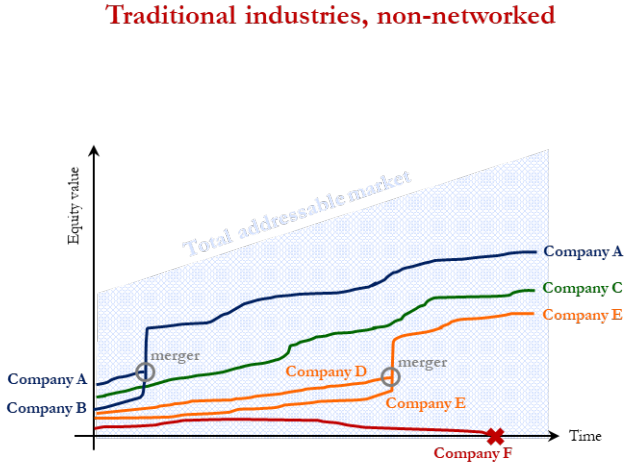
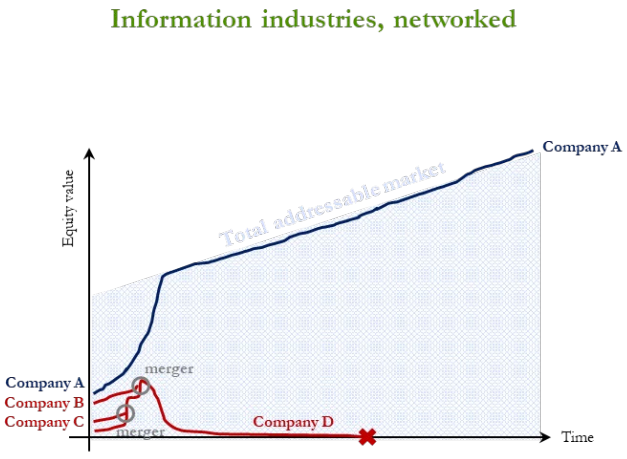


Figure 13: For networked industries, whose business models exhibit positive feedback as they scale, the outcome is a dominant monopolist[57]



3.4. c) The internet's development provided a ground-breaking innovation yet that leveraged existing infrastructure, and therefore without requiring significant new capital expenditures

The growth of internet businesses was further accelerated by the fact that customers only needed to connect their computers, which they were already familiar with, to existing telephone lines. This eliminated the need to purchase entirely new devices or learn how to use them. Moreover, since the software networks themselves also leveraged existing telecoms infrastructure, their growth required significantly lower capital expenditures compared to traditional businesses. So called Net Neutrality laws further exacerbated winner-takes-all outcomes.

3.4. d) Lastly, internet business dynamics led to an otherwise false proposition: the human herd's perception of a business became a relevant factor in determining the investor's own stance

The value of a network being proportional to the square of its user count means that achieving early user adoption is exponentially important, even when the network is still in development.

Early user commitment to a network may stem from relatively intangible factors, such as beliefs, expectations, or simply following others. However, if consumers anticipate a network becoming popular, it is in their best interest to become early adopters. The benefits of their early adoption will grow as the user base expands, which in turn funds the cycle of product improvement.

Conversely, if consumers expect the network to flop, regardless as to its actual merits, the network will lack momentum and lack of reinvestment, and the vicious cycle will take over, and expectations will be self-fulfilling.

The implication is that for software networks, success and failure were significantly influenced by the human herd's beliefs and expectations, and not just by the product's initial utility. This contrasts with the Buffettian approach, which emphasised thinking independently of others' beliefs and expectations.

> *"Any year that passes in which you don't destroy one of your best-loved ideas is a wasted year."*
>
> Charlie Munger, interview with Becky Quick, 2024[58]

Therefore, as the internet era emerged, it was crucial for Buffettian investors to recognise the increased signal value from the herd's early adoption of selected software networks, a significant departure from the traditional Buffettian approach.

The key insight was to identify networks that focused on attracting pioneering and influential users first, using this base to ignite a herd mentality or bandwagon effect driven by self-fulfilling consumer beliefs in the network's inevitable success. Early networks had to convince customers of their future dominance, and previous victories and an iconic brand name were crucial tools in this process.

Naturally, this observation about the herd's utility in networked situations did not invalidate the *general Buffettian first principle* that the herd is often unintelligent. Rather, it specifically recognised the value created by early-stage businesses specialising in software networks that attract the herd.

4. The dominant orientation of the Venture framework is a focus on the business opportunity with the potential to scale

4.1. The exceptional venture investment is that which targets a meaningfully scaled market

The venture business targets a scaled opportunity. As Tom Perkins puts it, "*there is a big difference between just a good idea and a good idea that will make you a huge amount of money.. so.. I'm saying.. opportunity is the thing you look for – scale.*"

> "People say, how do you write a business plan?
>
> My answer is, I can't tell you; I can only tell you how we read one.
>
> We start at the back, and if the numbers are big, we go to the front to see what kind of business it is.
>
> [laughter]
>
> So, I'm answering your question by saying *opportunity is the thing you look for — scale*.
>
> In other words, there is a big difference between a good idea and a good idea that will make you a huge amount of money."
>
> *Tom Perkins, co-founder of Kleiner Perkins, interview by Sally Smith Hughes, 2009* [59]

In an analogous manner, the venture entrepreneur who achieves extraordinary success will also be the entrepreneur who has obsessed over the opportunity with the *potential to scale*.

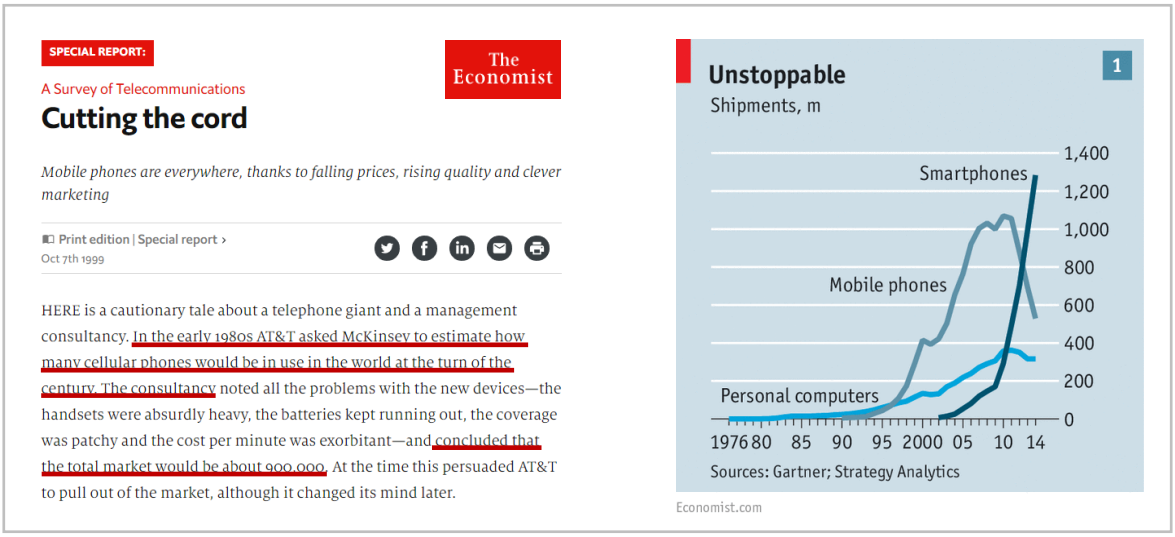
The result is another area of commonality between the Venture framework and the Buffettian approach. When assessing the potential to scale, the Venture framework also dismisses the "expert" view, noting that experts tend to be biased towards risk aversion when evaluating previously unrecognised opportunities. Experts are observed as prioritising protecting their reputation over demonstrating *true intellectual insight, temporal recognition, judgment, and experience*.

> *"Experts – who are they, where and how did they get their experience?*
>
> *Experts will take no chance on their reputation. What can they really advise about?*
>
> *The answer is that experts can only advise about "what it is". What they cannot offer is true intellectual insight, temporal recognition, judgement, experience, money, time, courage, patience, and faith."*
>
> Georges Doriot, Manufacturing Class Notes, Harvard Business School 1937-1966[60]

Consequently, the venture entrepreneur's assessment of an opportunity's scaling potential *will be differentiated*, as they must reject the "expert" view that is already ingrained in the assumptions of established incumbents.

Our contention is that the venture entrepreneur's differentiated perspective relating to scaling potential stems from recognising the presence of a self-reinforcing feedback loop that will both transform and significantly expand the market opportunity. In essence, *the expert's assessment is flawed because it erroneously assumes a static addressable market size instead of a market that evolves and grows throughout the product life cycle*. To put it another way, the expert prioritises data above reasoning.

Figure 14: Venture entrepreneurs differentiate themselves by recognising self-reinforcing feedback loops, leading to a future market outlook that differs from "expert" assessments[61]



SPECIAL REPORT:

A Survey of Telecommunications

Cutting the cord

The Economist

Mobile phones are everywhere, thanks to falling prices, rising quality and clever marketing

Print edition | Special report ›
Oct 7th 1999

HERE is a cautionary tale about a telephone giant and a management consultancy. In the early 1980s AT&T asked McKinsey to estimate how many cellular phones would be in use in the world at the turn of the century. The consultancy noted all the problems with the new devices—the handsets were absurdly heavy, the batteries kept running out, the coverage was patchy and the cost per minute was exorbitant—and concluded that the total market would be about 900,000. At the time this persuaded AT&T to pull out of the market, although it changed its mind later.

4.2. For a business opportunity to exceed the growth implied by static conditions, a self-reinforcing feedback loop must exist to transform and expand the market

4.2. a) The initial venture business design's disruption of an incumbent is just the first part of a positive feedback loop that further propels growth

The expert's bias towards the assessment of a static addressable market size, rather than a market that evolves throughout the product life cycle, may also stem from an intuitive forecasting error humans make due to the majority of our evolutionary programming having taken place in simpler times. Using a superior weapon David *disrupted* Goliath. It was quick and it was over, and the victory captured a static opportunity: David was king.

However, such rapidity in mission completion is not seen in the growth trajectories of modern companies. Instead of being instantaneous, the process unfolds over decades: the initial venture business design's disruption is merely the first part of a positive feedback loop that continuously reinforces an ongoing and lasting displacement.

> *"Look for a product or business model which can come into a market and reshape and grow that market in the way that ultimately leaves the company in a position of competitive strength."*
>
> Matt Cohler, Benchmark Partners, Silicon Slopes Tech Summit 2017[62]

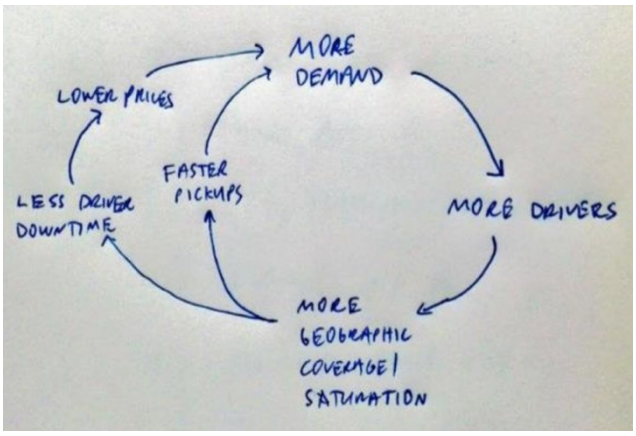
Figure 15: The path to Venture success is achieved when the initial disruption event forms the first part of a positive feedback loop which thereon successively reinforces an enduring and continuing disruption

> *"What we targeted was a business design that had a feedback loop, where as we change something, changing that thing is actually going to further draw in more customer behaviour toward our business."*
>
> Jeff Bezos, Amazon CEO, public lecture, The Virtuous Cycle of Customer Centricity[63]

> *"Uber's virtuous cycle – geographic density is the new software network effect"*
>
> David Sacks, Craft Ventures, on Uber's virtuous circle, 2014[64]

Figure 16: In 2001, Jeff Bezos scribbled onto the back of a napkin Amazon's positive feedback loop[65]

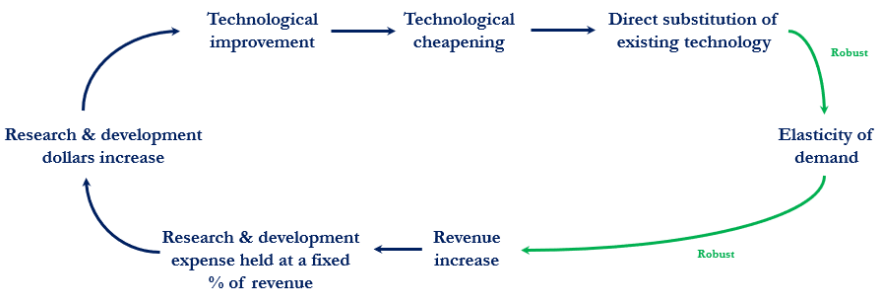
Figure 17: In 2014 venture capitalist David Sacks tweeted the following napkin sketch of Uber's network model laying out the positive feedback loop of the ride hailing network[66]



4.2. b) A robust growth trajectory for the Venture opportunity requires the displacement, by substitution, of an incumbent

For an innovation to transform and significantly expand the market opportunity consistently, regardless of economic cycles, it must leverage its superior attributes to displace an incumbent product. By reinvesting the revenues generated from this displacement process into continuous product enhancements, the innovation's attributes will consistently improve over time. This improvement cycle enables the product to expand its market opportunity in a robust manner, independent of economic fluctuations.

Figure 18: Venture opportunities achieve independence from economic cycles when their superior products displace incumbent offerings, and the resulting incremental revenue is reinvested in product improvements, further expanding the market opportunity[67]



> *"The nature of the business we're in is that we want to destroy the incumbents.. and we're collectively aligned around being anti-authoritarian to destroy the incumbent."*
>
> Eric Vishria, Benchmark Partners, 2022[68]

4.3. Once a self-reinforcing feedback loop is established, a new law emerges: the probability of venture success is proportional to the scale of the business opportunity

Let's consider the qualities of the business orientation that the Venture framework targets:

1. The venture has brought to the market an entirely new innovation,
2. The venture possesses a monopoly on the innovation,
3. A self-reinforcing feedback loop exists which both changes and meaningfully grows the market opportunity
4. The market opportunity grows because the venture's innovation:
   a) displaces, by substitution, an incumbent product, and progresses independent of the economic cycle, and
   b) incremental revenues from displacement are reinvested into product improvement, and this both upgrades the product and grows the market opportunity.

Meeting these conditions implies that since revenues from displacing the incumbent provide the funding for the product's self-improvement cycle, the magnitude of product improvement is proportional to the magnitude of the business opportunity created by displacing the incumbent.

Figure 19: For a feedback loop business model, the duration of product improvement is proportional to the size of the displaceable market[69]

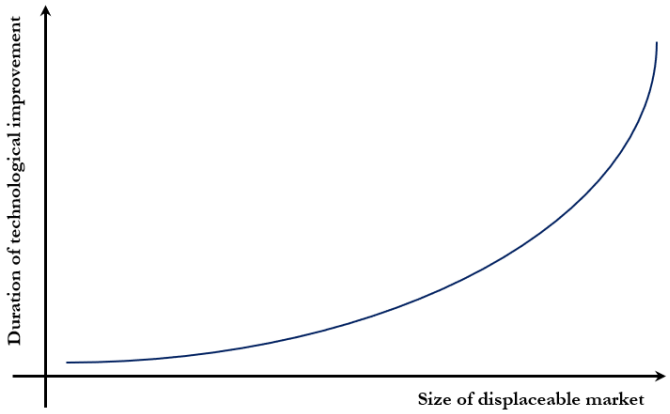


Figure 20: A correlation is observed between successful venture capitalists and their focus on the scale of opportunity

> *"All the capital in our portfolio is directed to companies with audacious visions seeking enormous markets.*
>
> *If they succeed, their technology will be extraordinarily valuable."*
>
> Peter Thiel,
> Founders Fund, manifesto, 2017[70]

Thereon, logic dictates that the duration of product improvement forecasts the magnitude of product improvement, and therefore, business success. A new law arises for venture opportunities under these conditions:

> *The probability of venture success is proportional to the scale of the business opportunity* [71]

The implication for the venture entrepreneur is: pursue a big idea, as its success is as a function of the product improvement that the product will achieve over its lifespan. This also provides an unexpected additional principle relating to capital allocation strategy in the context of the Kelly Criterion, a formula which maximises allocation when both forecast accuracy and asymmetry are high[72].

In situations where the Venture framework principles are met, forecast accuracy is also *dependent* on asymmetry (asymmetry being greatest for big ideas). Therefore, in Venture scenarios, the Kelly Criterion simplifies to the essence of the section title of this white paper: the primary focus of the Venture framework is on the business opportunity with the potential to scale.

5. The Venture framework demands an exceptional leader for the successful, enduring campaign to supplant established incumbents

5.1. The Venture opportunity requires an exceptional business leader

As introduced in section 1.5, the requirement for *an exceptional business leader* is a differentiation possessed by the Venture framework relative to the Buffettian approach due to the varying types of opportunities each targets.

> *"There's some common patterns in breakthrough companies.*
>
> *First is just an incredible, extraordinary, exceptional entrepreneur."*
>
> Matt Cohler, Benchmark Partners,
> Silicon Slopes Tech Summit 2017[73]

> *"They say in the stock market, buy into a business that's doing so well an idiot could run it, because sooner or later, one will."*
>
> Warren Buffett,
> interview with the FCIC 2010[74]

The Venture framework focuses on emerging businesses led by individuals who have created and monopolised a new innovation, growing by possessing a positive feedback loop. However, the business leaders must still possess unique qualities to lead a multi-decade effort to displace established competitors. Thus, the Venture framework sets a high standard for exceptional business leadership.

Acknowledging the exceptional leadership and combatant quality required by the Venture framework reflects the understanding that these leaders will be engaged in an enduring campaign for market share, necessitating skills akin to corporate warriorship.

> In a 2017 interview, journalist Takashi Sugimoto spoke with Tadashi Sasaki, co-designer of the world's first microchip, former vice president of Sharp, and mentor to Masayoshi Son. Sasaki also transformed Sharp into a global electronics powerhouse.
>
> *Sugimoto: "As I was about to leave, Sasaki took out a magazine. It was an issue of Nikkei Electronics that carried a feature on SoftBank's acquisition of ARM Holdings, with Masayoshi Son's photo on the cover.*
>
> *Sasaki looked down on it and fell silent for a moment, and said, '**Masa will continue his fight, nothing has changed about him from the earliest days.**'*
>
> *There was a glitter of pride in Sasaki's 101-year-old eyes that he had helped shape what Son is today."* [75]

By contrast, the Buffettian approach focuses on established businesses with barriers to entry sufficient to defend against the business protagonism from such exceptional leaders, and which are priced unintelligently. *Competent* management is often sufficient, and as such the Buffettian approach does not require the same level of leadership excellence as the Venture framework.

"Poetry, unlike prose, expands our perception of the universe because of its breaking from the norms of discourse.

I love Wallace Stevens poems – and when you read his poems they slow down time. They expand your understanding of the universe in a way that changes it.

Great founders also slow down time. And when a great founder comes in, I felt this about Travis Kalanick, and even in his own way when Mark Zuckerberg presented the Series A when I was at Accel Partners - it has that 'once you've seen it you can't unsee it' feeling, and it changes your eyes in a way that it is arresting.

I've done this job 25 years and for the founders that have been the manifestation of a great poem, I remember every part of the meeting, I remember even the smell of the coffee.

So why does time slow down? Well time doesn't actually slow down, but you are recording more information – there's something about a great entrepreneur for investors, where the slowing down of time, the expansion of awareness, and it's the density of truth that that you feel in reflection on those moments.

It is rare. And I can spend unfortunately three years to four years and never feel that way. But then I remember meeting Nicolas Julia [founder of Sorare], and it is not only rare but it is weird because you know you are going to invest about three minutes in to the meeting, so it's this is sort of strange sense of okay we have to do due diligence now and we have to ask good questions, but Nico expresses it in a way that's so pure you just sit there and think ah okay well that probably won't happen again for another five years so I should enjoy this moment."

Peter Fenton, Benchmark Partners, interview by Jeannette zu Fürstenberg, 2022[76]

Benchmark Partners, 2014, three years after investing in Uber. Peter Fenton sits on the left.

5.2. The exceptional business leader is deeply motivated and dedicated to creating a best-in-class product that they believe can significantly improve the world

5.2. a) The exceptional business leader possesses an authentic, profound, and deep motivation, a purpose

Exceptional entrepreneurs possess "*a real sense of purpose and it is authentic, and it is usually not about them,*" as Peter Fenton notes. The entrepreneur leader's belief in their product's potential to better the world not only fuels their own motivation but also inspires the same throughout their company, including employees, customers, and financial partners, creating a shared sense of captivation and commitment "*if you're fascinated, I'm fascinated*".

"Great entrepreneurs have a motivation that runs so deep that it feels insatiable. There is just a profound deep innate motivation.

That is infectious, it lets other people around them have that motivation, and you know how often I ask the question of a company – "what is the purpose and why are you doing this?"

And you would be amazed at how few entrepreneurs can readily answer that question, but the great ones can. They have a real sense of purpose, and it is authentic, and usually not about them.

Absent an iconic narrative of a different path, people fall back into what they know. It isn't pre-determined, there must be a hero's journey, so to speak."

Peter Fenton, Benchmark Partners, speaking in 2023[77]

"If there are no new entrants in the space arena with a strong ideological motivation, then we were on a trajectory to never be a space-based civilisation.

We need to inspire humanity, and this is also a way to inspire. The value of building inspiration is very much under-rated, no question. As we show that this is possible, and that this dream is real, it is not just a dream, it is something that can be made real – the support will snowball over time."

Elon Musk, speaking in 2017[78]

5.2. b) A relentless dedication to creating a best-in-class product aimed at making a positive impact on the world

The exceptional entrepreneur exhibits an obsessive commitment to developing a top-tier product with the potential to significantly improve the world.

> *"That was the theory that Steve Jobs had, he said the best way to reveal your love for the human species is to put your heart and soul into a product and give it to them."*

Brian Chesky, Airbnb CEO, quoting Steve Jobs, 2023[79]

Realising exceptional product status is of course challenging, involves competition, and as such there will be a history of struggle by the venture leader to attain product superiority, embodying a type of corporate "hero's journey."

The narrative of struggle preceding success not only validates the achievement of a superior product but also adds a magical, mystical allure, further captivating consumer interest.

Figure 21: Elon Musk's example of sleeping at Tesla's production line during critical times illustrates the exceptional entrepreneur's focus on creating and upholding an iconic best-in-class product, combined with a theme of struggle before success[80]

5.3. The exceptional business leader possesses remarkable self-confidence yet which is also calibrated to reality

5.3. a) The entrepreneur's self-belief often emerges in tandem with tutelage under an iconic mentor

The exceptional entrepreneur gains wisdom from mentorship, including insights into competitive advantage, principles of social science, and truths derived from focusing on selected principles in mathematics and physics.

As such, when an iconic mentor with advanced knowledge imparts it to a young entrepreneur, it logically boosts the entrepreneur's self-belief, which may appear as over-confidence but is actually well-calibrated confidence based on the knowledge acquired.

> *"It wasn't until I got to Harvard Business School where I met Professor Doriot that I think the light really went on.*
>
> *Doriot was an extraordinary man and I would visit him when I'd go to Boston. And we'd talk for hours, and so he was a big influence and then, just sticking on this mentor thing, the most important of all was Dave Packard and we can get into that a little later as we talk about Hewlett-Packard but it was the combination of all of that that made me think I really wanted to be an entrepreneur..*
>
> *A young person needs a mentor, and I think an older man in a way needs a protégé. It's a mutually beneficial arrangement that has gone on for millennia and I think it will continue.*
>
> *So you're lucky to have such older men that are willing to devote a lot of energy and time to bringing along younger people. I've tried to do that. Whether I'm as good as the ones I had I have no idea, but I've also spent time, doing that.."*
>
> Tom Perkins, co-founder of Kleiner Perkins, interviewed by John Hollar, 2011[81]

Takashi Sugimoto, regarding Masayoshi Son: "I thought this young man was somehow different from others, and I wanted to help him."

When SoftBank ran into financial difficulties soon after its establishment, Sasaki used his prestige to help Son secure a loan, calling a bank director and personally vouching for his young protege.

"I vouch for this young man called Masayoshi Son. I ask you to grant the loan. I can offer my retirement money and my home as collateral," Sasaki said.

Masayoshi Son: "Sasaki-sensei was my saviour, like my Buddha, because he believed in my future and supported me although I offered nothing in return.

I can say nothing, but lower my head for such pure kindness."

Profile of Takashi Sugimoto's tutelage of Masayoshi Son, Nikkei Asian Review[82]

"He used to say to me – listen, you have the chance to change your life, your family's life, you could be something very special. Don't you want to be champion? You could be champion of the world.

And I didn't pay attention to it. But he kept on saying – really, you could be champion of the world, you could devastate the world. No man can take what you can take, you've just gotta believe it.

I looked at this guy, and then I started thinking – really, and I said, this guy is really crazy. But he said – he said you do what I tell you to do, and if it doesn't work, then you can leave. So I said ok – bet.

And so I did everything he told me to, and um, I won. I won every um championship, from the amateur championships, I won all the championships.. um, I am going to cry. So um, I won every championship, um [voice breaking up], that he told me, because, he told me what do to."

Mike Tyson on Cus D'Amato, 2008[83]

From the perspective of the protégé, excellent mentorship can be also contextualised as their achieving of a much higher efficiency in acquiring the necessary information for success than that possible through trial and error.

This path to knowledge acquisition also reduces the need for the social skill handicap that can otherwise result from the protégé's social withdrawal needed to attain a similar level of scientific, technical, or business expertise. And as we shall see, it is in social interactions that exceptional business leaders must also excel, demonstrating outstanding leadership and marketing skills.

5.3. b) Extraordinary self-confidence, which manifests itself through a workaholic and fearsome personality type

The path of the successful venture entrepreneur, as described in section 4.1, begins with rejecting the "expert" view, which is already embedded in the assumptions of the target industry's incumbents, while seeking opportunities with the potential for unusually large scale.

Therefore the venture entrepreneur will – simply by their initial position – be already making a highly confident stance that from a currently small position, vast scale can be achieved. This can seem over-confident to outsiders, however, from the perspective of the successful venture leader, it is a rational and accurate forecast.

To the extent the mentor and mother nature has gifted to the entrepreneur both this self-confidence and science/technical aptitude, these then provide for *rational workaholism*, that is, accepting a perhaps even unreasonable workload yet with the knowledge of a unreasonably impactful outcome.

Figure 22: Reality-grounded yet extraordinary self-confidence rationalises workaholism

"I probably have an abundance of self-confidence, which I think some people would say is arrogance,

[laughs] but I don't see it that way.

So, I had no doubt that [my partner, Eugene] Kleiner and I could do this."

Tom Perkins, interviewed by John Hollar, 2011[84]

"20% of the effort gives you 80% of the answer.

But 80% of the answer isn't enough.."

Tom Perkins, 2011[85]

Exceptional entrepreneurs also exhibit fearsomeness and indefatigability, attributes which stem from their combination of extraordinary self-confidence and workaholism.

"Fearsome, you should feel a little uneasy.

If the entrepreneur makes you feel safe and calm, they are not likely to profoundly change the world."

Peter Fenton, public comments[86]

"I always say this, it's a habit, and maybe a kind of disease.

I won't rest until I am number one. I just hate not being first.

People want to sleep well at night, but I lose sleep thinking – 'Why am I not yet number one, what more do I have to do'."

Masayoshi Son, SoftBank CEO, interview in 1987[87]

5.3. c) The confidence of the entrepreneur remains reality-calibrated; with learning ability also retained

Exceptional entrepreneurs mitigate the delusional risk associated with high confidence by linking their confidence to first principles, most often related to the science or technical aspects driving their product's competitive advantage, exemplified in the modern era by Elon Musk.

However the exceptional entrepreneur must not only have confidence that is calibrated to reality but also possess a personality type that enables them to learn dynamically as their venture navigates a potentially multi-decade path of displacing incumbents in an ever-changing world.

Figure 23: Elon Musk historically displayed seemingly excessive confidence, mocking BYD and dismissing SpaceX competition, but the course of time revealed his confidence was calibrated with reality

Betty Lui (Bloomberg news): There's competitors now, BYD, they're ramping a production of their electric vehicles and Warren Buffett owns 10% stake in that..

Elon Musk: Ha ha ha ha.

Lui: BYD is.. trying to compete with you, why do you laugh?

Musk: Have you seen their car? Ha ha ha

Lui: I have seen their car, in fact back at the Berkshire Hathaway meeting I saw their cars, why are you laughing?

Lui: You don't see them at all as a competitor? They offer a lower price point

Musk: I don't, I don't think they have a great product, I don't think it's particularly attractive the technology is not very strong and BYD has pretty severe problems in their home in China so I think they that their focus is and rightly should be on making sure they don't die in China

Elon Musk, interview regarding Tesla, 2011[88]

Interviewer: There's the European Space Agency, Boeing, Lockheed Martin, the Chinese, the Russians

Elon Musk: You've listed a wide range of entities there and I think the differences are really divergent depending upon which one you're referring to

Interviewer: Well let me ask you this question, who is your competition?

Musk: We have no serious competition. And if you mean who is chasing us and who and has a serious chance of catching us, then, none that I am aware of either.

Elon Musk, interview regarding SpaceX 2007[89]

Figure 24: The exceptional entrepreneur must also possess a personality type that enables dynamic learning in a changing world

"The problem with being a founder entrepreneur CEO is that your business is changing on you radically every year. So as you scale from 0-30 it is very different at 30 than it is at zero, and to 300 all over again and then at 3,000 all over again. And if you don't have that curiosity and ability to learn you can get left behind – the company will grow faster than your ability to grow with it.

So there is a common trait that we look for that I would call – ability to learn. And my partner Bob likes to say "be a learn it all, not a know it all". And being a "learn it all" means you have to be very self-effacing around what you do and don't know, apply critical thinking, and don't assume that what you have been told is right.

And that trait I think is a muscle that you need to continually work on and sometimes people lose that as they achieve success. They become know it alls, and they are full of advice, and one of the things we aspire to do in our business is accept humbly that we don't know a whole lot, but we do have the ability to learn quickly."

Peter Fenton, Benchmark Partners, the approach of great entrepreneurs is 'learn-it-all' not 'know-it-all,' 2016[90]

5.4. The educational background of the exceptional business leader is science/technical

> *"The scientist can displace the economist. It is the man who understands the future that is the man who will move up. I repeat – the man who moves up is the man who sees the future and works for it!"*
>
> Georges Doriot, Manufacturing Class Notes, Harvard Business School 1937-1966[91]

The exceptional business leader in almost all cases also has a science/technical background while maintaining excellent social interaction skills, which a technically focused early life might typically hinder.

The early life of Tom Perkins provides an instructive case study of the uncommon set of conditions by which a strong technical ability, normally co-incident with social withdrawal, can instead achieve a path of leadership in social situations. In Perkins' case it was his rarely seen combination of technical interest, business instinct, and yet with natural sporting talent.

> *"I was not in any way athletic in high school, quite the reverse. I was the guy that always knew the answers to the technical stuff but didn't get invited to the parties. But in the early days of television, you could buy a kit and build your own set. I was good at putting those things together and selling them for a profit. So I built kit television sets to sell to neighbours and friends, and I also enjoyed my own little experiments in physics, in my tiny little laboratory in my closet in my bedroom.*
>
> *And when I arrived at MIT, the first weekend I was there, I tried out for the swimming team, and in the tryout I nearly broke the pool record. So of course the coach insisted I became captain of the team, and I swam for four years at MIT. I went from being a nerd in a school of jocks to a jock in a school of nerds, which was pretty amazing [chuckling]. So it changed my life."*
>
> Tom Perkins, co-founder Kleiner Perkins, interview by Sally Smith Hughes, 2009[92]

5.5. The exceptional business leader also excels at communication, attracting top talent to their venture

As such the rare mix of skillset observed – deep motivation, self-belief, and a science/technical background, is combined with social expertise. And it is the use of communication, at the outset, that is the critical social tool used to attract highly talented professionals to join the emergent venture.

This requirement is in the context that it will most likely not be clear that a role joining a then small, and normally within a science/technical-based venture, would compete with the social benefits that will also be accessible to highly talented professionals who instead elect to join larger firms. Yet the exceptional business communicator will be able to convincingly convey to counterparties, be it prospective employees, finance partners, or customers, as Huey Lewis sung, *it's hip to be square*.

> *"Ultimately, people can and will be drawn in by the recognition of technological advantage."*
>
> Georges Doriot, Manufacturing Class Notes, Harvard Business School 1937-1966[93]

A further attribute is required. For the exceptional entrepreneur to attract an outstanding team that uniquely strengthens their own abilities, the entrepreneur must possess a rare combination of both humility and courage. The humility to acknowledge their weaknesses and the courage to select individuals who complement those weaknesses. Having already taken the high-risk decision to embark on a venture project, bringing in people who may be superior to the entrepreneur in certain areas requires not only great self-awareness but also bravery.

"The word team must have a superior positive meaning.

The weak connotation of levelling down to the lowest common denominator, of hiding deficiencies – must be rejected."

Georges Doriot, Manufacturing Class Notes, Harvard Business School[94]

"It is not as simple as build a great team, great entrepreneurs need to find complements. So if you look at yourself and you reflect on your skills and your talents and your unique abilities, you will see – everybody has their gaps. I learned this from some great entrepreneurs, who were really very different, but each of them found a complement in other people, that allowed them to be more of who they are.

And so – acute self awareness reveals what you need in your partner, and I think that self awareness is humbling because you have to admit what you are not great at, and you have to play your game.

The great entrepreneurs figure that out, that is what Steve did at Apple, with Tim Cook, a person that really balanced the stuff that he wasn't great at, so he could be obsessive about the stuff that he was."

Peter Fenton, Benchmark Partners, interview with Semil Shah, 2013[95]

When evaluating the team-building qualities of an exceptional entrepreneur, venture investor Peter Fenton also suggests that the investor should feel such a strong sense of iconic magnetism to the entrepreneur that they could theoretically be persuaded to join the venture themselves. This level of attraction serves as an indicator that the entrepreneur possesses the necessary charisma and leadership skills to attract and retain top talent for their venture.

> *"I think it's always useful to say – is there some part of me that would quit what I'm doing right now to go work with this person, and if the answer is no, you probably shouldn't invest [in the venture]"*

Peter Fenton, Benchmark Partners, interview with Logan Bartlett, 2023[96]

The final necessity to building the outstanding team is *retention*, requiring a recognition by the business leader of the conditions that result in loyalty. As Perkins highlights, world class people in a technical area need to be treated extremely well, and in an atmosphere that is better than any university laboratory.

> *"There needs to be an understanding that to do world class work you had to have world class people and treat them extremely well, and create an atmosphere that was better than in a university laboratory."*

Tom Perkins, co-founder Kleiner Perkins, interview with Glenn Bugos, 2001[97]

5.6. The exceptional business leader is also a brilliant, high energy, marketeer

In today's increasingly networked economy, achieving early adherence is crucial for entrepreneurs. Having the best product alone is insufficient: entrepreneurs must also excel in marketing, including building the strongest brand. The software network age has significantly amplified the importance of marketing in ensuring a venture's success.

"Dave Packard came back, and he had a fit. He said, 'Look, the way you get market share is you build the best product you can build, and you'll get the market share.'

Well, you know, it doesn't quite work that way, but anyway.

I think I originated the joke at Hewlett Packard that if we were in the sushi business, we would advertise it as 'cold, dead fish'

[laughs] So I just changed everything. And I got full support from Dave Packard too."

Tom Perkins, interviewed by John Hollar, 2011[98]

"This is a very complicated world it's a very noisy world and we're not going to get a chance to get people to remember much about us, so we have to be really clear on what we want them to know.

One of the greatest jobs of marketing that the universe has ever seen is Nike. Remember, Nike sells a commodity – shoes.

Yet when you think of Nike you feel something different than a shoe company as their ads don't ever talk about their products. They don't tell you about their air soles, why they're better than Reeboks air soles.

Where Nike is doing their advertising is they honour great athletes and athletics – and that's who Nike are and that's what they are about.

Apple is about something more than that Apple as well. Our core value is that we believe that people with passion can change the world for the better. And we believe those people that are crazy enough to think they can change the world are the ones that actually do."

Steve Jobs, Apple's Think Different campaign, September 1997[99]

A strong understanding and implementation of branding is necessary. In previous white papers we have reviewed that the criteria for excellence in branding is achieved by the possession of four 'super brand' attributes: 1) the communication of a compelling message at low cognitive load, 2) an authentic claim of primacy in performance, 3) brand values conveying aspirational beauty through a noble mission, calling, or purpose, and 4) the potential for above average growth by the marketing process itself also embedding a process of positive feedback.

> *"[The super brand should precipitate amongst its customers] something like an autocatalytic reaction in chemistry, precisely the sort of multi-factor triggered lollapalooza effect we need."*
>
> Charlie Munger, Practical Thought About Practical Thought, 1996[100]

Exceptional business leaders thereon employ a high energy marketing strategy that includes public 'stunts', leveraging their energy and media savvy to achieve advantageous economics. This approach, arguably pioneered by Richard Branson, frequently garners front-page news coverage. Not only does this result in highly efficient marketing, but it also leaves a more memorable impression on consumers compared to the more mundane strategies employed by peers.

"I once [1994] drove a tank into Times Square — before 9/11 that is — and we had 'pyrotechnics up' the Coca-Cola sign the night before without telling anybody ... the tank sort of went onto the sign ... it looked like the whole thing blew up when we 'fired' the tank and the police didn't look too happy."

Richard Branson, founder Virgin Group, speaking to CNBC in 2017[101]

Elon Musk, a modern archetype of an exceptional entrepreneur, has employed similar 'stunt'-based marketing, such as launching a Tesla car into space in 2018 with the words "Don't Panic" from Hitchhiker's Guide to the Galaxy displayed on the dashboard. The entrepreneurs combine humour, shock value, and physical stunts to maximise attention. As per figure 26, Musk has also provocatively chosen the lettering sequence for Tesla's first three cars, comparable to Branson's use of the provocative 'Virgin' brand name.

Figure 25: In 1994 Richard Branson launched Virgin Cola with a stunt driving a tank into Manhattan, and a 'pyrotechnics up' of the Coca-Cola sign[102]

Figure 26: Elon Musk targets stunts in marketing: a Tesla car is launched into space; Tesla also letters its cars using a provocative marketing approach[103]

Brian Chesky, the co-founder of Airbnb, exemplifies another modern-day entrepreneur who has employed attention-grabbing stunts, albeit with less bravado than Branson or Musk. One notable example is Chesky's floating of a 70-tonne, two-bedroom house down London's River Thames to promote Airbnb's unique accommodations.

And of course Steve Jobs not only delivered excellence in branding and advertising but also mastered the concept of the stunt publicity event. Jobs' signature approach involved a publicly broadcast presentation showcasing each breathtaking new product, a format that has since been widely mimicked across the technology industry.

Figure 27: Brian Chesky floats a 70-tonne, two bedroom house down the Thames in Airbnb marketing stunt[104]

Figure 28: For Steve Jobs, the stunt was the product launch show, now mimicked (albeit with some of the magic lost) across the tech industry[105]

5.7. Exceptional business leaders prioritise early profitability as business-minded protagonists

Lastly, exceptional entrepreneurs are business-minded, understanding the importance of prioritising early profitability. This recognition can be seen as evidence of their deep motivation: a mission of such vital importance cannot afford to rely on the kindness of strangers within the financing cycle. Therefore, the venture must prioritise becoming self-funding as quickly as possible.

"The only reason to make any investment is to make money, period, full stop. And with a sense of urgency to get on with it, to get it done, do it quickly, do it efficiently, with a full understanding of the importance of the bottom line. All companies should have that, but some are pretty casual about it.

This is where I entered the picture. I never apologised for the urgent need to make a profit, to get on with it, and commercialise these ideas."

Tom Perkins, co-founder Kleiner Perkins, interview 2001[106]

"Think about the biggest winners in venture: Amazon, Google, Facebook, Apple, go down the list, Uber, Stripe.

Every single one of those companies, before they took branded venture capital, was working.

You know Amazon was doing 20 plus million in revenue, you might say okay it's tiny, but it was working it was up and running.

If you look at the winner's circle the top 10 venture investments ever, they were all up and running and working, not threatened."

Peter Fenton, Benchmark Partners, interview with MIT Venture Capital & Private Equity Club, 2021[107]

(white paper continues on following page)

6. The investment opportunity set arising from the AI era

6.1. Value transfer in the AI era will be to those companies that monopolise one or more of the three building blocks of AI systems

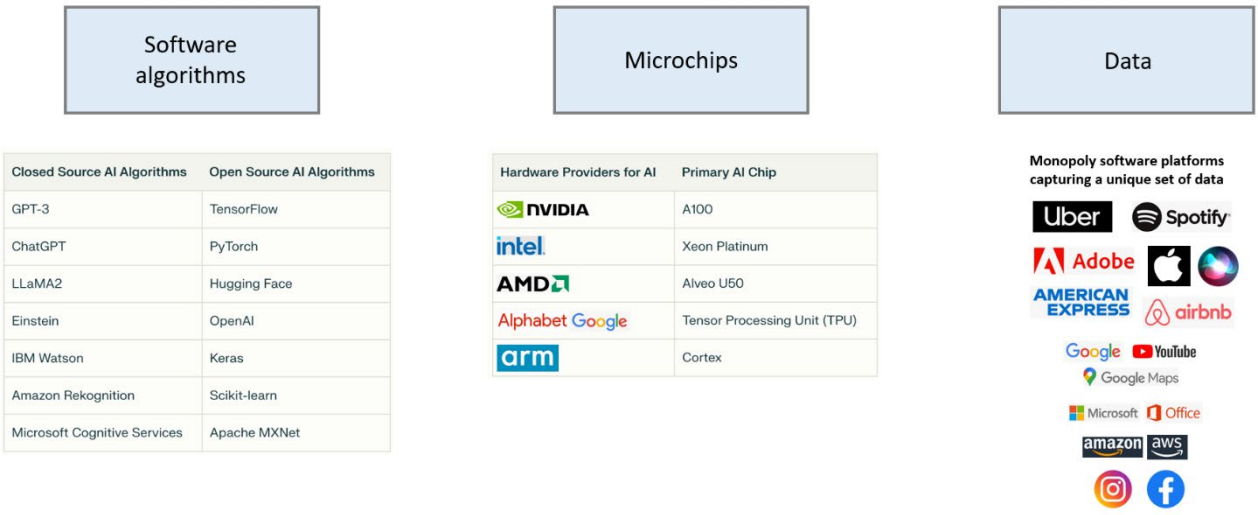
A core contention of this white paper is that by thoughtful analysis and reasoning, as a new technological shift becomes visible, the investor should adapt the Buffettian approach to address the nature of the new paradigm.

> *"In the game Go, the experts do not put the stones right next to the earlier stones.*
>
> *They put them in a completely different part of the board.*
>
> *That is what I do. I try to look into the future and think backwards."*
>
> SoftBank CEO Masayoshi Son, interview with Financial Times, 2016[108]

The AI era shares some key drivers with the internet era, in that both are universal technological shifts driven by computing and centred around the properties of software network effect. Consequently, our contention is that the most likely *end game* that investors in the AI era should target is also similar: identifying those software platforms that, through network effect economics and last-mover advantage, possess the potential for decades of monopoly profits – essentially, the "Googles" and "Amazons" of the AI era.

These opportunity types are primarily identifiable today in the form of those software platforms prospectively monopolising the capture of the data used for training of AI systems. To understand why, it's helpful to first review the three building blocks of AI systems: 1) AI software algorithms, 2) AI microchips (hardware), and 3) the software platforms that capture the data used for training of AI systems.

Figure 29: The three building blocks of AI: 1) AI software algorithms, 2) AI microchips (i.e. hardware), and 3) the software platforms that capture the data used for training of AI systems[109]



Regarding the first building block, AI software algorithms, our contention is that accurately forecasting and identifying the future dominant platforms today is challenging. There are multiple AI software algorithms currently available, many of which are open source, and the high rate of innovation makes it difficult to determine with certainty whether *any* current player has achieved a definitive *last mover advantage*.

> *"ChatGPT is not going to be the only player here, there's going to be many players.*
>
> *We will be one of many actors building sophisticated systems.*
>
> *I think the magic of capitalism is doing its thing and a lot of other people are trying and we'll see where it all shakes out."*
>
> Sam Altman, ChatGPT CEO, interview with Wall Street Journal, November 2023[110]

In terms of the second building block, AI microchips, NVIDIA GPUs (paired with ARM CPUs) clearly hold the dominant position in AI microchips. However, GPUs are not unique to NVIDIA, and other companies such as AMD offer competitive products. Moreover, from the perspective of *the outsider* rather than *the insider*, there is limited transparency regarding chipmaking market share developments and future competitive advantages.

Furthermore, the power-hungry nature of GPUs not only threatens to constrain GPU-based growth due to limited electricity availability but also may shift a greater throughput of AI processing to reduced instruction set chip "RISC" based CPUs, which are already the CPUs twinned with NVIDIA GPUs in data centres. In this context, ARM Holdings is notable for its monopoly (99% market share) in these RISC-based processors that also power mobile phones and all Apple desktop computers. As such, ARM may be the only company *robustly identifiable today* as having achieved an enduring monopoly sufficient to *rule chips* with last-mover advantage.

> *"Those who rule chips will rule the entire world.*
>
> *Those who rule data will rule the entire world.*
>
> *That's what people of the future will say."*
>
> SoftBank CEO Masayoshi Son,
> SoftBank World Event, May 2017[111]

However, it is the third and final building block, the software platforms that capture the unique data sets necessary for training AI systems, that have in many more cases already possess domain-level monopoly status through software network effect economics. Our assessment is that it is these platforms that offer the greatest number of prospective AI software network effect monopolies that the intelligent investor can identify today.

Companies in this category can also be selected which are *simple and understandable*, as is the reason their business advantage – through the Lanchester Square Law and Metcalfe's Law – leads to a monopolistic *end game*. These companies include Uber, Airbnb, Spotify, Adobe, Autodesk, and Dassault Systemes.

6.2. AI monopolies will emerge from software platforms that monopolise the *data capture* necessary for AI training

Value capture from the AI technological shift will be concentrated in instances where an AI building block is monopolised, and in the greatest number cases that are *robustly identifiable today*, our statement is that that building block is *data*.

> *"The precondition for AI success is data.*
>
> *In that it's not just the algorithm, it's the amount of data that you expose those algorithms to.*
>
> *So for an AI to identify a cat in a video it's not just about the algorithm to identify the cat, it's about feeding the algorithm millions of photos of cats to be able to actually understand, what does it mean to see a cat."*
>
> Lior Ron, founder, Uber Freight, December 2023[113]

> *"What really will matter in the future is access to particularly valuable data."*
>
> Sam Altman, OpenAI CEO, interview with WSJ, Nov 2023[112]

While the intelligence (algorithms) and hardware (microchips) aspects of AI are necessary building blocks, their interchangeability means they also will not in most scenarios surpass the far more substantial economic benefits to be gained by the entity with monopolised access to the critical AI training data.

A scene in the Bond movie Goldfinger simplistically illustrates this point: Goldfinger *pays Jill Masterton,* his agent, to spy on a card game and report his opponents' cards to him via radio during the game. In essence, money is transferred by Goldfinger to the *monopoly possessor of the crucial data*.

Whilst the *intelligence* of Goldfinger and Masterton and their *hardware* (binoculars and a radio) are necessary in order to carry out their scheme, the substitutability of these first two building blocks stops them being the variables that dominate economic capture. Alternative intelligent protagonists and hardware providers could be substituted. Instead, it is the *monopoly access to privileged data* that in reaps the economic benefit.

Figure 30: The only reason to make an investment is to make money, and money is transferred to the entity with *monopoly access to privileged data*

James Bond: Tell me Jill, why does Goldfinger do it?

Jill Masterton: He likes to win

Bond: And why do you do it?

Masterton: He pays me[114]

6.3. The AI era leads to an economic boom

The AI era also precipitates accelerated, and broadly distributed, economic growth.

The electricity generation required for AI – ultimately solar power – is available to all, and its capture in the form of low cost panels which can be installed at the per household level disallows centralised AI hoarding as electricity generation cannot be commensurately hoarded.

And, while certain domains of *data* may be monopolised, the data most valuable to humans will remain that most relevant to their lives, and as such that also collected cooperatively with human communities.

The result is that humans will use AI to achieve a significant increase in data-throughput-based intellectual tasks at a considerably lower cost than previously possible. As a result, AI drives a substantial improvement in productivity per individual, allowing humans to focus on tasks they are uniquely suited to perform.

The outcome is a productivity surge, higher per-employee profit and increased corporate profits.

> *"AI will create a lot more jobs than it destroys"*
>
> Brian Chesky, CEO, Airbnb, interview July 2023[117]

Figure 31: AI utility will be distributed for all: 1) solar power cannot be hoarded, 2) only human-permissioned data to train AI is valuable, dictating symbiosis[115]

Figure 32: Dystopian outcomes are rejected as the default forecast: a centralised authority cannot hoard power, and would be competitively handicapped in data for AI training without human community co-operation[116]

AI developments of course also may lead to job rotation, but AI also reduces the friction cost of this rotation by enabling more efficient re-training programs.

By increasing productivity, AI also has a disinflationary effect, which in turn reduces upward pressure on interest rates. This is positive for the capitalisation multiples applied to asset prices. The investment opportunities created by the technological shift also increase the demand for capital to be deployed into new investments and capital expenditures, thereby reducing the demand for short-term bonds. The reduced demand for short-term deposits prospectively results in a decline in the price of these instruments and, consequently, an increase in their yields, all else equal. Thereon, to maintain interest rates, the Federal Reserve purchases short-term treasuries by issuing new currency. As a result, disinflationary technologies such as AI also lead to an increase in the money supply.

Higher profitability, higher multiples, and increased money supply, leads to an economic boom.

7. The need for greater energy efficiency for AI growth accelerates demand for RISC architecture

"The ability to run AI compute at scale – people still don't appreciate the energy needs of this technology.

There's no way to get there without a breakthrough: we need fusion, or we need radically cheaper solar plus storage, something at massive scale and a scale that no one is planning for.

The two important currencies of the future are compute machine-learning intelligence, and energy."

Sam Altman, CEO of OpenAI, interview with Bloomberg, January 2024[118]

"The next shortage will be electricity.

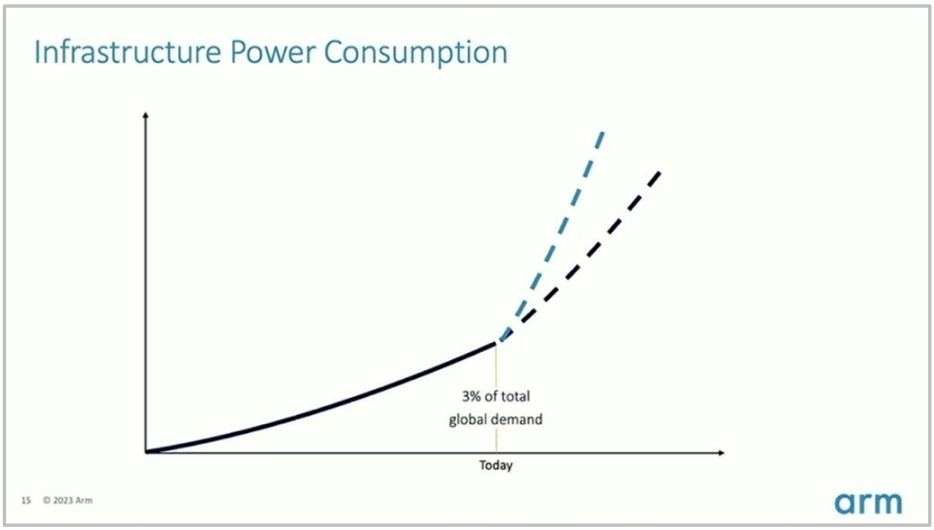
I think next year you'll see the electricity shortage that they just can't find enough electricity, to run all the AI chips."

Elon Musk, public comments, February 2024[119]

7.1. Electrical power becomes the constraining factor on the growth of AI

Electricity use by data centres as a percent of total global power generation is estimated to rise from 3% in 2023 to in the region of 10% by 2030 (represented by the light blue line in the figure below), as power demand by AI increases what was already an accelerating consumption resulting from data centre growth (dark blue line).

Figure 33: The constraining factor on the growth of AI will become the availability of electrical power[120]



As such, a constraining factor on the growth of AI is likely to become the availability of electrical power, and therefore also, an acceleration in the demand for power efficient AI microchips.

7.2. The need for power-efficient AI leads to an accelerating demand for RISC architecture; ARM Holdings becomes crucial for AI scaling

"One of the things that people don't realise about AI is that it requires a lot of computing power, but at the same time it needs to be very energy efficient. Now, what we see in the datacentre, is a CPU being used with an accelerator, most typically, and those CPUs are increasingly ARM-based.

As AI moves to the edge, efficiency requirements result in a higher demand for ARM chips
When you move into an automobile, more AI workload will take place on the CPU, some on the accelerator, and again, more and more of the modern applications that run AI on the automobile are all ARM-based CPUs.

But when you start to move to the applications such as the mobile phone or the IoT device, essentially all of the AI workflows run on the CPU. And the bottom line is that CPU efficiency is critical for any AI workloads. AI requires a significant amount of power, but in our planet that now needs all kinds of sustainable types of solutions, so having the most power-efficient application, is of utmost importance. And that is really what ARM excels at. We are a company that was born 30 years ago from building devices that run off of batteries. We understand power efficiency like no other company on the planet.

As data centre power usage increases, ARM chips will also be increasing demanded in the data centre
Going forward there is going to be an even greater demand for energy efficiency. When we look at what the demands are in terms of overall power consumption needed for the cloud, we estimate that about 3% of the world's total energy production is being used for the cloud today in terms of powering that.

Now, when there were projections going forward relative to what the workload increases looked like – in terms of power the projections were based on compute workloads that we would see an exponential increase in terms of power. Now this was just for conventional cloud computing. When we consider what is going on with AI, that will even increase more.

So, as we go forward it is going to be important to not only have the world's best computer, but the most power-efficient, low power solution. And that is where ARM is going to be able to really solve the problem going forward.

ARM believes that an increasing frequency of its CPUs will be paired with third party GPU accelerators in data centres which will be the most power efficient overall solution for the future
Generative AI needs ARM to scale. Today's conventional applications that use a CPU and an accelerator or a GPU are very very very poor on power. This is why, as these leading data centres that are leading with these types of solutions, you are seeing more and more emphasis on power efficiency. And the conventional application or approach to solving the problem, we think is going to really run out of runway.

Going forward we see a more modern architecture, where a CPU combined with an accelerator, in a much more heterogenous application, is going to be able drive not only the best AI workflow performance, but the most power-efficient solution in the future. And that is why going forward we are very very excited about the AI opportunity.

AI is going to find its way into every walk of life, every end application, every device that we touch will be AI enabled in some way. So as a result we are going to need not only the highest compute capability, but the lowest power solution, and that is where ARM excels."

Rene Haas, CEO of ARM Holdings, October 2023[121]

Figure 34: Independent studies have shown, at equivalent power usage, ARM CPUs achieve 70% higher computational throughput than CPUs from AMD, and 130% higher than Intel[122]

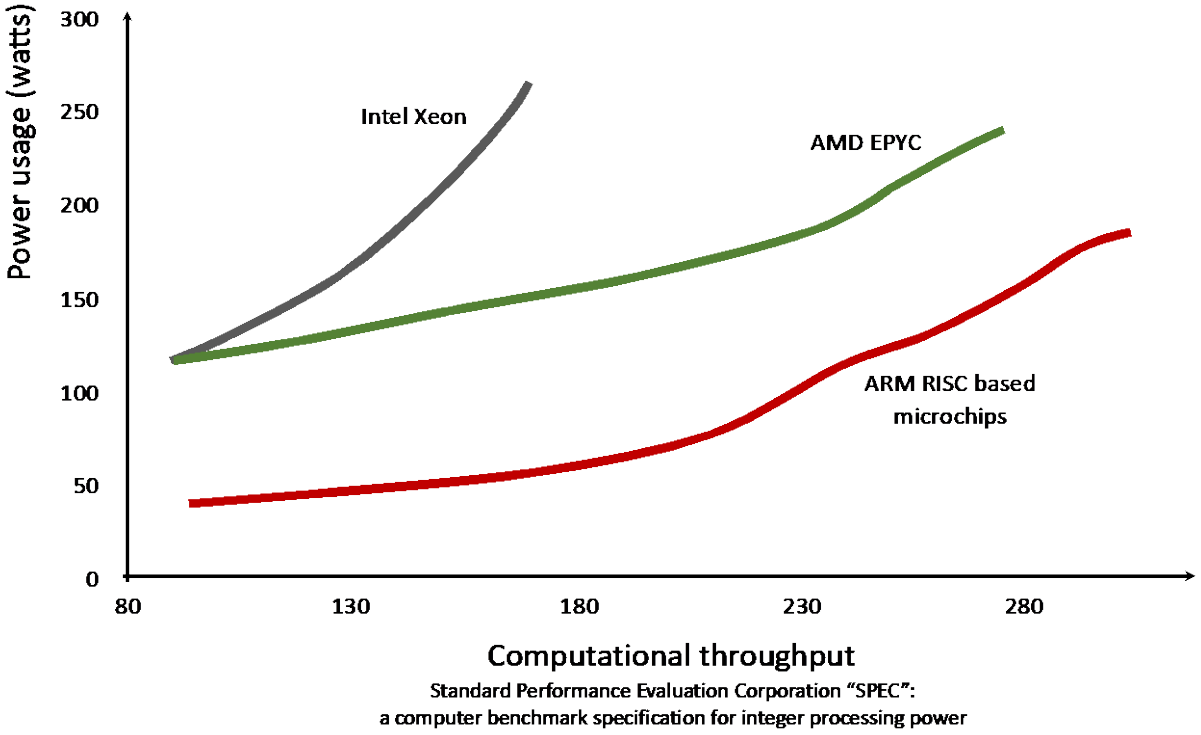
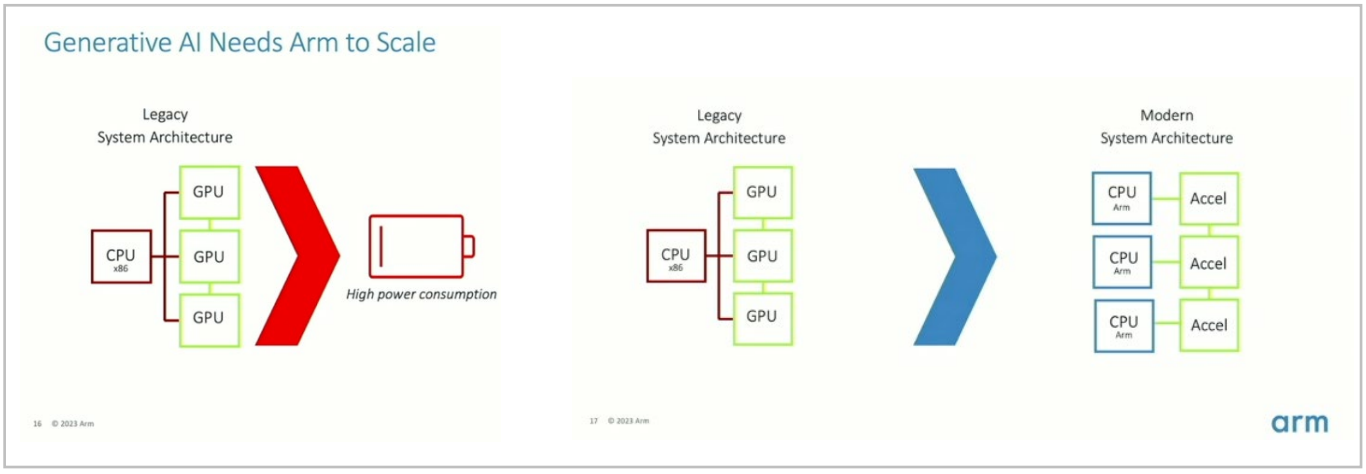


Figure 35: ARM Holdings forecasts that power-efficiency needs will drive the designs for AI data centres to shift from a single ARM CPU linked to multiple third party GPUs, to multiple ARM-based CPUs each linked to only a single third party GPU accelerator[123]



7.3. ARM's business opportunity grows as AI expands beyond data centres to edge computing

AI powered text-prompt-to-code generation is universalising software coding, an already visible development in the AI era. Prior, the gating factor on the volume of software programming was the number of software engineers.

The rational implication is that the volume of software produced has the opportunity to significantly expand, and cheaply, such that all devices become embedded with software. This can already be seen happening in varying degrees with the automobile, the smart home, the smart office, retail destinations, and public spaces.

> *"Almost everything around us will one day have software, because the biggest inhibitor for a designer is that not everyone speaks a computer programming language. The moment AI can write that language, it can be that translator and you can prompt it. Suddenly anyone can build software. So many things will be alive, I will not say sentient, but many things will be alive and they will be able to communicate."*
>
> Brian Chesky, CEO, Airbnb, interview July 2023[124]

To the extent that all devices become embedded with software this will also increase the demand for processing which is local to the device, using so called *edge computing,* such as the processors in smartphones.

> *"More and more AI is running on more edge computing – end devices, and that's all running on ARM."*
>
> Rene Hass, ARM Holdings CEO, November 2023 conference call[125]

Edge infrastructure is also scaling globally as a result of demand factors including optimisation in latency and real-time operations, and privacy of data. Additionally, demand factors include a lack of available space at, and the high cost of, data centre rentals, particularly in urban areas[126].

Currently just 5% of AI processing is undertaken by edge computing, however, some estimates predict this will rise to 50% of processing at the edge[127]. This prospectively results in a vast win for ARM Holdings, which monopolises the RISC microchips empowering computing at the edge.

> *"People still wonder, still debate whether that new paradigm shift is coming or not. Sometimes people think it is too risky, too fragile, but I see the future paradigm shift is coming, so at the beginning of the paradigm shift we decide aggressively to make the investment.*
>
> *And who is the key player, core of core, for that paradigm? I will say one company, that is ARM."*
>
> Masayoshi Son, SoftBank CEO, speaking to Nikkei Asian Review, 2016[128]

> *"Reduced Instruction Set Chip 'RISC' architecture is going to change everything. Yeah, RISC is good."*
>
> Angelina Jolie playing the character Kate Libby, in the 1995 movie Hackers[129]

7.4. The monopolistic market share of ARM Holdings implies Lanchester Square Law unassailability

> *"ARM is a design house, they design all the microchips. They have 99% market share for the smartphones that you have in your pocket.*
>
> *This is the company, this is it! Nobody can live anymore without microchips. Chips are everywhere, in the car, in your refrigerator, everywhere. I think the company is going to be more valuable than Google."*
>
> Masayoshi Son, SoftBank CEO, interview with David Rubenstein, 2018[130]

ARM Holdings has a unique business position, focusing on RISC microchips with exceptionally low power consumption, and in contrast to most chip manufacturers which have prioritised processing *throughput* as the primary design variable. This focus has led ARM to achieve a 99% market share in mobile phone chips. Moreover, ARM's low-power advantage is driving share gains in other areas, such as powering all Apple desktop computers and in its CPU pairings with the latest NVIDIA chips in data centres.

Figure 36: ARM Holdings has a unique business position, holding a monopoly on RISC microchips with exceptionally low power consumption. As the demand for both edge computing and power efficiency chips in the data centre grows, a vast new addressable market size opens up for ARM[131]

The growth trajectory of ARM as such matches a number of the criteria that this white paper has laid out as consistent with the Venture framework. The company's product has grown by, and continues to grow by, displacement of a less energy efficient substitutes. And, whilst this results in ARM entering new segments of the microchip market, ARM enters as the monopolist of low power usage microchips.

Thereon, as the demand for both edge computing and power efficiency chips in the data centre grows, potentially exponentially, a vast new addressable market opportunity opens up for ARM. And, due to their existing 99% market share, it is extremely difficult for an existing player to compete with ARM in low power chips.

Assuming the Lanchester Square Law, a company with a 99% market share, if a new entrant achieved a 1% market share with even an equal technology, its disadvantage would be equal to the square of its numerical strength handicap. In the case of ARM, a new entrant faces a handicap of 9,800x (i.e. $99^2 - 1^2$). To put it another way, a new entrant would need to develop a technology advantage of more than 9,801x above ARM to displace ARM.

Masayoshi Son: "So, many other vendors, they know ARM is power efficient – why can they not just copy the ARM architecture, the know how of the power efficient architecture?"

Rene Haas: "Well, it is one thing to try to copy an architecture, but the real magic in ARM besides the fact that we are incredibly power efficient, we also have a gigantic software ecosystem. The company was born from this personal digital assistant, we then moved into smartphone era. What that meant was that all of the applications on the operating system whether it was around iOS or Android, the millions of applications that were written, were written to run on the ARM architecture. And not only were they written to be on the ARM architecture, but they were optimised, there were made more power efficient, and they were perfected onto that.

That takes a long, long time to try to duplicate. It is a very very large task – this is the most complex work to do on the planet. And because ARM has over 15 million developers worldwide who have developed on ARM, and the largest number of applications, it is just a huge huge amount of work for any alternative architecture to match what we have."

Masayoshi Son in discussion with Rene Haas, CEO ARM Holdings, SoftBank World 2023[132]

8. Companies that monopolise customer data can uniquely develop AI assets

8.1. Intelligent investors can identify a number of prospective monopoly opportunities with software platforms that capture unique datasets suitable for AI training

"Every company and every industry are fundamentally built on their proprietary business intelligence, and in the future, their proprietary generative AI."

Jensen Huang, NVIDIA CEO, Q4 conference call February 2024[133]

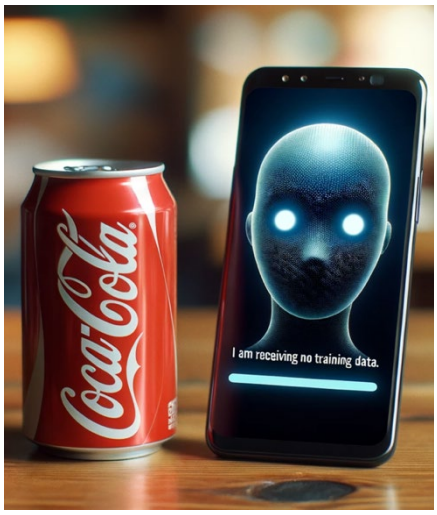
It is those software platforms that capture the unique set of *data* necessary for the training of AI systems, and whose network effect economics already has resulted in domain-level monopoly status for many of these companies, where the investor can today identify the larger number of prospective AI monopoly opportunities.

A prerequisite for a company to use its user data commercially for AI development is also that the data collection must be welcomed by its users. If a company's technology allows for user data collection, but its users would be uncomfortable with this practice, the business model does not meet this criterion. Establishing user trust and protecting user privacy are essential preconditions for a company seeking to leverage user data for AI development.

To illustrate this point, consider two well-known blue-chip companies: Coca-Cola and American Express. American Express is well-positioned as its existing business model already revolves around gathering extensive customer data. This data can be leveraged to develop powerful AI tools, and the company benefits from a customer base that is already familiar with data collection practices used to present personalised offers. By contrast, Coca-Cola's normal operations do not involve acquiring an equivalent data feed from its customer base.

However, in this case a lack of premium valuation with regard to American Express suggests that the majority of investors – including potentially the largest investor in these two companies – may not have yet recognised the differentiation between the positioning of the two companies in terms of their positioning for the new AI era.

Figure 37: American Express is well positioned for prospective AI tool building by leveraging its extensive collection of unique customer data, and with customers accustomed to this data collection[134]



"Could I create a better worldwide business than these two enjoy? As Bertie will tell you: 'No way.'

The lesson from Coke and American Express? When you find a truly wonderful business, stick with it. Patience pays, and one wonderful business can offset the many mediocre decisions that are inevitable."

Warren Buffett, shareholder letter, 2023

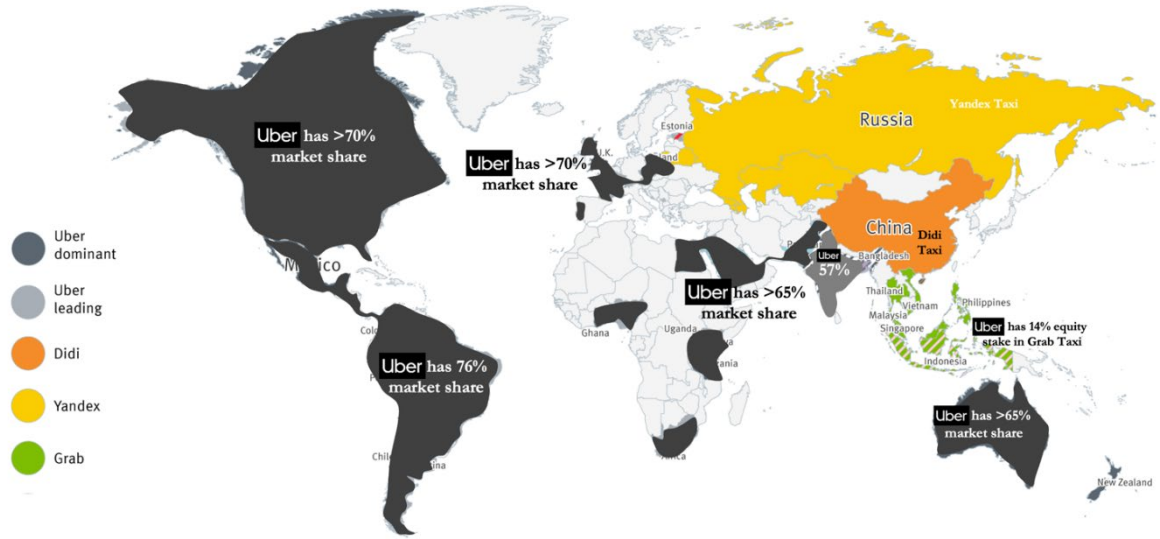
8.2. Monopoly software platforms such as Uber and Spotify are collecting unique and vast datasets on customer purchase decisions, and using this data to build proprietary AI tools

8.2. a) Uber's global, diverse operations provide it with vast data on customer purchases, meaningfully enhancing its growth potential through its resultant ability to develop proprietary AI tools

Similar to American Express offering deals based on spending habits, Uber's customer AI agent has evolved from its upsell engine, and also suggests offers to users based on their spending patterns.

Uber's extensive customer data – covering travel habits, neighbourhood socio-economic profiles, food and non-food preferences – combined with its global dominance, creates a uniquely vast and valuable AI training environment.

Figure 38: Uber's global ride-hailing market share of 70% or more results in a Lanchester Square Law and software network effect monopoly, also benefiting newer ventures like Uber Eats, which holds a no. 1 or 2 share position in each of its top 10 markets, and is gaining share in every of its top 10 markets[135]



The outcome in the case of Uber is that the unique capture of customer data, combined with AI, offers the ability to adhere to the Steve Jobs mantra – *get closer than ever to your customers, so close that you tell them what they need well before they realise it themselves*. This enables effective upselling of existing services and the launch of new product verticals that meet customer demands, increasing the likelihood of successful business expansion.

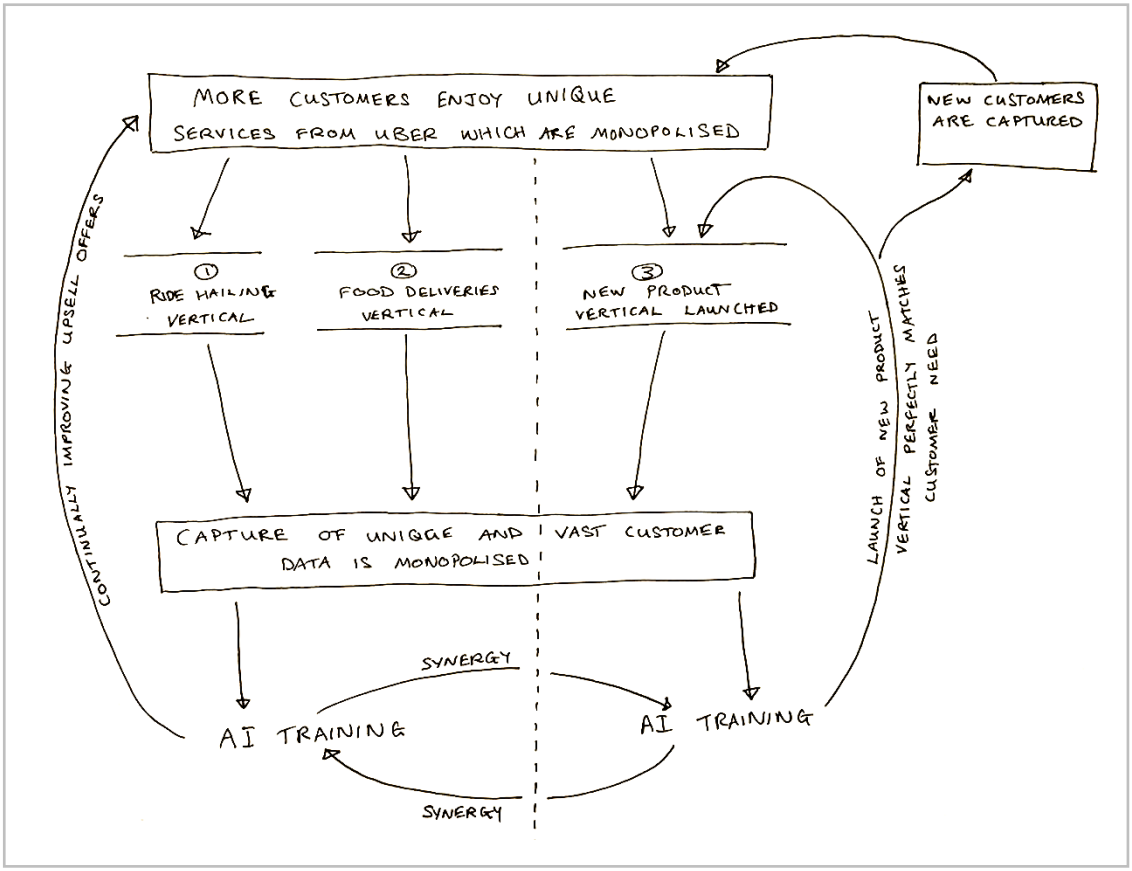
Many of Uber's new verticals will be incremental, yet AI also ensures these additions, such as Uber Eats expanding into supermarket deliveries alongside its core delivery from restaurants service, have strong business merit.

> *"Some people say, 'Give the customers what they want.' But that's not our approach. Our job is to figure out what they're going to want before they do.*
>
> *Get closer than ever to your customers. So close that you tell them what they need well before they realise it themselves."*
>
> Steve Jobs, Apple CEO, speaking in the late 1990s[136]

Uber's unique data also enables the creation of AI tools for sale to third parties. For instance, expanding restaurants can already purchase data analytics from Uber Eats for staff planning, menu, inventory management, site selection, and forecasting. This combination of vast data and AI provides valuable services to businesses considering expansion, and charged at premium pricing, naturally.

(white paper continues on following page)

Figure 39: Uber's AI flywheel captures extensive customer data, enabling successful upselling and launching of new product verticals (our illustration)[137]



"We're constantly upselling people from a regular Uber ride to a reserve ride

Or from a ride with Uber to Uber Eats – 'just got home why don't you have dinner, we will give you $5 off'

What's fun about those kinds of upsells is it used to be a bunch of people sitting around a table having ideas, let's do this upsell, let's do that upsell, and then it's like let's put this percentage of our inventory to upsell.

All of that is now being driven by AI.

All of it is being targeted so we have algorithms figuring out, will Bill he take that upsell going to work for a coffee, and will Brad take that upsell from Eats because he's got a family he's got kids $50 order you get 10% off.

And I have no idea what the algorithms are going to come up with, but we've now got more consumers on more services than anyone else, more upsells than any other player, and that combination is a potent combination."

Dara Khosrowshahi, Uber CEO, speaking in January 2024[138]

Figure 40: Uber is already gaining experience in adding new product verticals, building adjacencies which are naturally synergistic with the existing advantages provided by their AI data platform

"There might potentially be a new leg at some stage added to Uber, but I don't have an agenda.

I want growth, I want innovation, I want to build.

The majority of the growth that you see for example in our mobility space we already have added a bunch of new verticals like New York City taxis, Uber Reserve, Uber for business, low cost high capacity vehicles.

All of these businesses have been built in the past five years it's about an additional $9 billion worth of gross bookings that literally has been built in the past 5 years by our engineers by our product folks.

And that kind of innovation is adjacencies that you have natural rights to win at. Who would have thought that Uber would now be powering New York City taxis, but that's a very natural adjacency for us.

And it's exciting, it scales, it's much less expensive to go into. It is the same thing with Uber Eats getting into grocery or getting into the Direct business where we deliver for an Apple or a Walmart. These are greater adjacencies and the great thing about Uber is, they're big.

Groceries is a five plus billion dollar business but it could be a $50 billion business, and Direct you know is a multiple billions of dollars business."

Dara Khosrowshahi, Uber CEO, speaking in January 2024[139]

8.2. b) Spotify's extensive data on customer media choices, coupled with its market dominance, has uniquely positioned it to develop AI tools that both strengthen customer relationships and aid in launching new product verticals

Like Uber, Spotify benefits similarly in the AI era, with its vast user base and leading global market share in music streaming. Spotify offers users unlimited access to music, either free with ads or via a paid, ad-free subscription. Spotify has 500 million monthly users in total, and with 188 million of those paying subscribers. The volume of paying subscribers is more than twice as many as its nearest competitor Apple Music.

Figure 41: Spotify leads the music streaming market with 500m users in total, and with 188m of those premium subscribers[140]

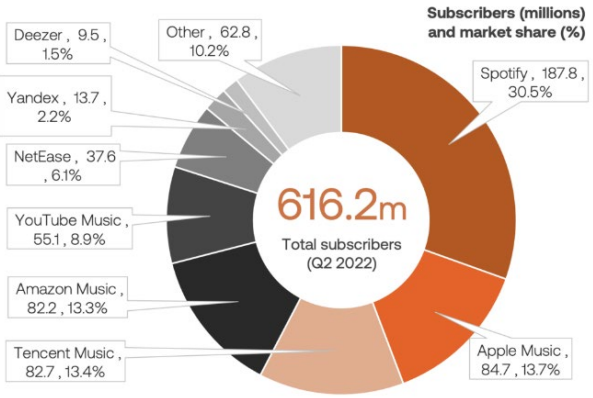
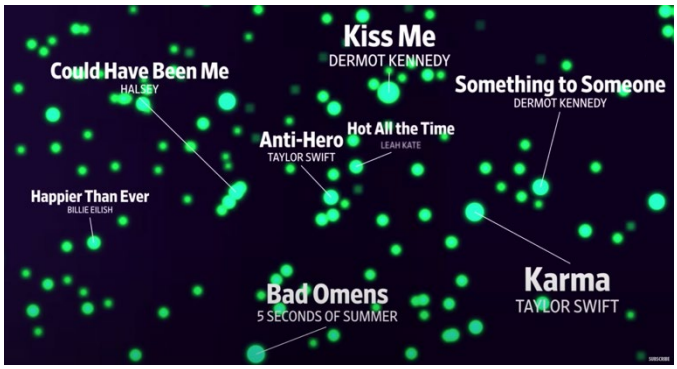


Figure 42: All music listened to at Spotify is matched onto an AI algorithm, using *collaborative filtering*, *content-based filtering*, *temporal structure analysis*[141]



Spotify's AI algorithm matches each user's music choices with similar preferences of other users to suggest songs. And like Uber, Spotify customers accept their data being used for personalised recommendations, recognising the mutual benefits from such data sharing. However, Spotify has taken Uber's transition from a basic upsell engine to an advanced AI tool even further by evolving to a refined AI agent which makes conversational voice-based recommendations.

Spotify's AI journey began in 2014 with the acquisition of The Echo Nest, a music analytics firm specialising in machine learning and natural language processing[142]. This was crucial in transforming its recommendation system into today's sophisticated AI tools. Starting with a text-based *'you liked this song, try this one'* engine, its AI has since evolved into a much more advanced system.

Spotify's AI utilises *collaborative filtering* to identify why users frequently play certain tracks together, *content-based filtering* that considers release dates, labels, and raw audio analysis metrics like danceability and loudness, and *temporal structure analysis* to understand music patterns in beats, bars, and sections.

Spotify's AI subsequently further evolved its recommendation engine into a virtual DJ named "X", enhanced by conversational voice capabilities. "X" interacts with listeners, explaining the next set of song choices every five songs or so. If listeners are dissatisfied, they can skip, prompting "X" to make new selections. This ability by the listener to intervene also introduces *reinforcement learning*, allowing the AI to learn automatically based on feedback.

Spotify's use of AI has uniquely transformed music listening by introducing a personalised, conversational voice-based AI guide. This guide not only recommends songs but also explains why they are relevant, using a realistic voice that adds passion, charisma, and warmth to the experience. The scale of Spotify's user base gives its AI an unmatched training competency, creating a streaming product with an AI enhancement unparalleled elsewhere. This then results in a unique user lock-in for Spotify.

Figure 43: Initially, Spotify's software algorithms offered only a recommendation engine, based on analysis of a user's existing song preferences[143]

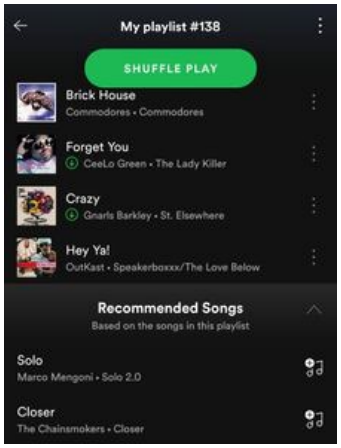


Figure 44: Spotify's AI has now evolved into an interactive DJ, "X", who converses with listeners, explaining the upcoming song selections[144]

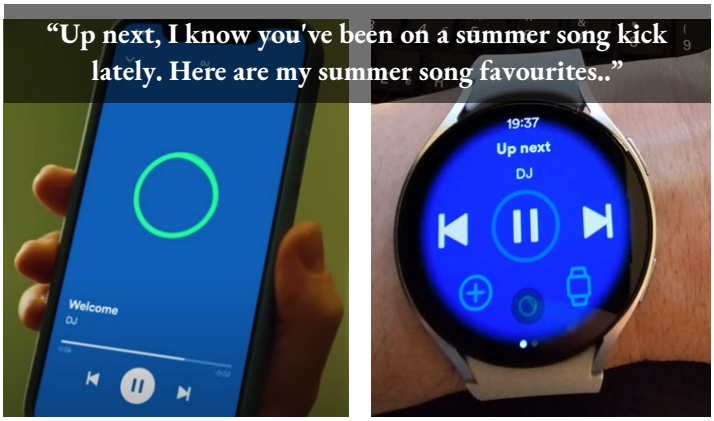
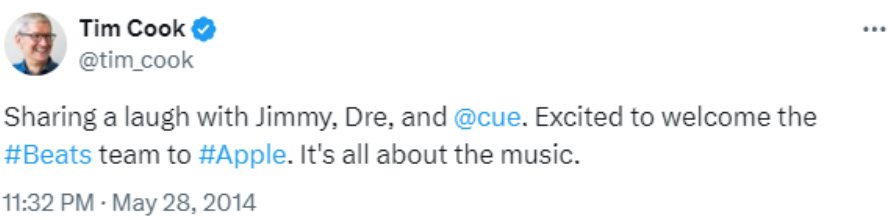


Figure 45: It's conceivable that Spotify's AI DJ, with its realistic and charismatic voice, will evolve even further, additionally enhancing customer loyalty to the streaming platform[145]

The market opportunity for a ubiquitous service such as Spotify, with 500 million users already, to thereon launch new product verticals is meaningful. And the fact that Spotify's initial dominance is in music is relevant: as Tim Cook said when Apple purchased the Beats headphones company, "It's all about the music".

Figure 46: "It's all about the music" – attracting and retaining users on a universal media content platform is achieved by first dominating their daily engagement through music[146]



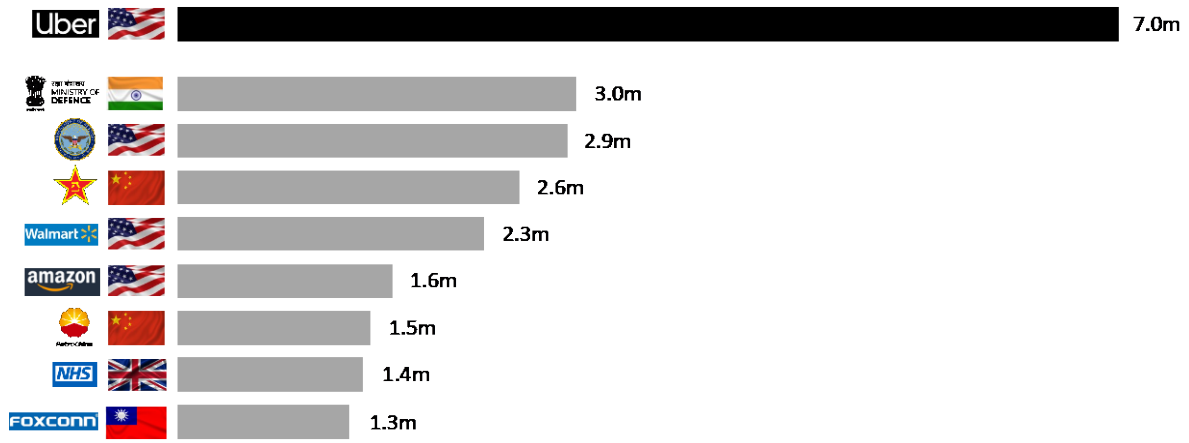
Cook's insight was that Apple's desired dominance in daily music listening was key to drawing and retaining users on a streaming platform, rather than initially focusing on sporadic streaming choices like movies or audiobooks. Subsequently, the more intermittent streaming choices – such as movies and audiobooks – can then be launched as new product verticals, and thereon the platform has a path – by bundling – to take share in these intermittent choices also.

In 2019, Spotify launched podcasts, and by summer 2022, Spotify became the no.1 podcast publisher in the US[147], illustrating the success which Spotify is achieving when new verticals are bundled. In 2022, Spotify also launched audiobooks, and by February 2024 Spotify had already taken an 11% share of the US audiobooks market, ahead of Apple and behind the only dominant remaining player Audible[148].

8.3. Monopoly software platforms that gather a vast volume of unique worker data can also leverage this information with AI to create additional work opportunities on the platform

Certain large data platforms, including Uber, may also gain significant advantage during the AI era by capturing data related to their workers, a less recognised but potentially valuable pool of data. Uber's AI-enhanced data collection includes information from its vast group of nearly seven million flexible drivers and couriers, the largest workforce globally.

Figure 47: Uber's active driver and courier base of 7 million is significantly larger than the workforce of any prior corporate or government entity, positioning the company as the world's largest employer[149]



The Uber platform's workforce has already been vetted through existing work, with ratings in customer service, reliability, productivity, and work rate (potentially indicating ambition), alongside traditional disclosures like professional and academic background.

Uber's work platform can grow in value by offering workers the flexibility to work from home for part of the day. For example, a worker dropping off their kids may complete two Uber rides, then return home and seek additional work opportunities. The Uber app can recognise this opportunity and alert the worker, offering them two hours of work from home at, say, $20 per hour while their kids are doing homework or sleeping.

By leveraging AI and Uber's extensive workforce data, the company can increasingly predict worker performance in non-driver tasks based on their field-specific domains. This allows Uber to offer projects to the most suitable workforce members, ensuring efficient task completion.

As the CEO of Uber highlights, its drivers already have access to work-from-home projects such as AI labelling. Given the size of Uber's workforce and the wide range of tasks that can be completed remotely, the advantage possessed by Uber to become the leading global work platform is not insignificant.

> *"We do have a global work platform, it's better than any other work platform and what we found is the more flavours of work we can offer someone the more engaged they get with our platform. So for example we have some of our drivers now working on artificial intelligence labelling. Right. Work from home, or work driving for Uber during the day.*
>
> *It's a nice adjacency I'd love for it to get to a nice big adjacency and so we definitely working on different kinds of work because we do have this flexible work platform that's absolutely second to none.*
>
> *Our driver app is the closest thing to a Western super app there is, but most investors don't see it."*
>
> Dara Khosrowshahi, Uber CEO, speaking in January 2024[150]

9. Monopolised geospatial data enables the build of unique AI systems for durable competitive advantage in routing

9.1. Uber not only captures geospatial transportation data proportional to population density but uniquely directs transportation unit-level action based on this data

Uber's competitive advantage also lies in its collection and utilisation of geospatial data. At its core, Uber exchanges highly efficient, short-term control over transport infrastructure for money. Whilst customer demand drives this control through taxis and delivery services currently, Uber captures real-time, continuous geospatial transportation data proportional to human population density.

The uniqueness of Uber's geospatial data collection is its ability to combine its data with action by instructing its riders to serve specific needs. This sets Uber apart from other collectors of geospatial data, for example – mobile phone service providers – which may possess similar geospatial data but cannot direct a vast transportation-linked workforce within the data collection vicinity into action based on customer demand.

9.2. Advantaged geospatial data collection plus action, with AI, unlocks valuable efficiency and service

Uber collects geospatial data related to the physical environment, including traffic, navigation, and proprietary data from their drivers and riders for both taxi and delivery services. The dataset also incorporates driver reliability information, assuring customers that Uber rides and home deliveries are safe and will receive high ratings.

Uber's possession of this data, which is used with AI to optimise response times, economic efficiency, and customer service standards for their deliveries, further increases the company's already high barriers to entry. As a result, Uber can thereon raise prices without realistically facing equivalent new competition, creating the potential for supernormal profitability.

Figure 48: Uber's platform integrates geospatial transportation data proportional to population density with the ability to direct transportation workforce based on customer demand, leading to efficiency and service advantages, raising barriers to entry and introducing launch prospects for new business verticals

"You know these smartphones they're actually kind of like remote controls for real life. You take this thing out of your pocket you push a button and something magical happens.

I happened to be living in San Francisco I was driving around a lot I was just an early user of Uber, and I just felt like wow this is one of these things more than anything I've ever seen which really is speaking to this idea of being like a remote control for real life. You pick your phone up out of your pocket you press a button the car comes picks you up drops you off it's kind of this magical thing.

And you can't unsee that and your mind starts to race and think, ok, what's possible here. The rapture is there as is the sense of purpose."

Matt Cohler, Benchmark Partners, Silicon Slopes Summit 2017[151]

Uber's network scale and the data it provides to AI to optimise route recommendation algorithms also benefits its drivers and couriers. This combination allows Uber network drivers to maximize their earning potential more effectively than on a smaller network. The resulting higher wage rates attract more drivers to Uber, creating a positive feedback loop that further enhances the value of the platform for both Uber and its drivers.

"We have been working with machine learning, artificial intelligence systems, for years and years – every time you get matched up with a car, these systems are powering that.

With a courier there are machine learning algorithms that match the pricing. That matching occurs based on time of day, distance, and that is driven by machine learning algorithms and those algorithms only get better.

The datasets that we work with are the largest such datasets globally and the more data we have the smarter we get, the better we get.

Also don't forget about the drivers on our marketplace they also want help 'where should I go what route should I accept'. So we're also working on AI to empower drivers and couriers so that they can make smarter decisions every day not only to be able to earn flexibly but to maximize their earnings based on their time."

Dara Khosrowshahi, Uber CEO, interview with Bloomberg October 2023[152]

9.3. Geospatial data linked to demand for action enables progressive robotic integration, facilitating a learning curve process to greater introduce automation over time

As section 4.2 outlines, for an innovation to grow the market opportunity, independent of economic cycles, *the product must grow by the displacement of an incumbent*.

Uber's unique combination of geospatial data linked to its ability to dynamically adjust transportation and workforce action enables the efficient integration of robotics into the Uber Eats platform. This creates an environment suited to the learning curve process required to develop the AI necessary for autonomous deliveries.

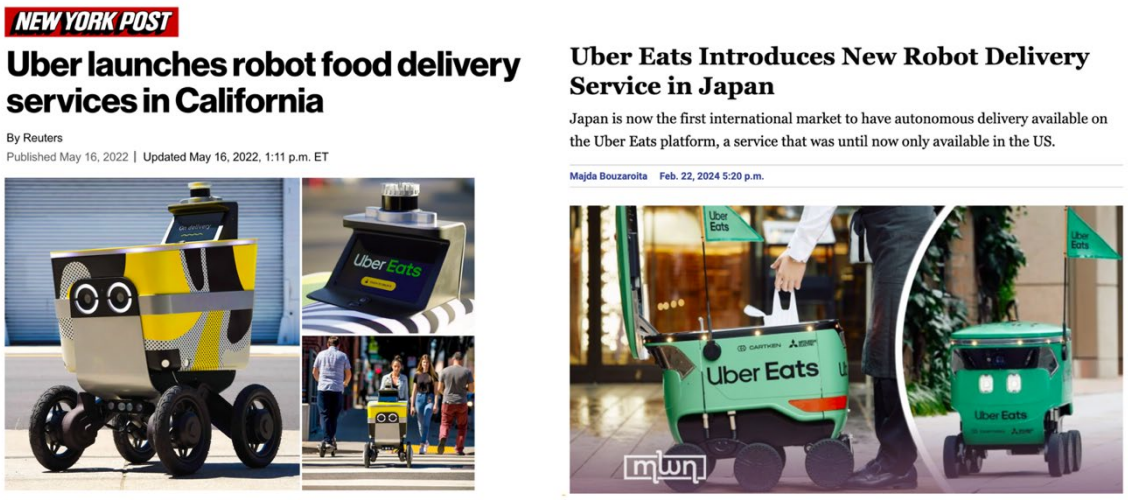
The challenges faced by autonomous cars, including their lack of true autonomy in difficult driving conditions, which creates road safety issues, are compounded by their high cost. However, Uber Eats does not require autonomous *cars*. Instead, small, slow-speed autonomous bots can deliver food using only sidewalks.

The use of delivery robots can also be selected for those optimal times determined by Uber's AI, such as when pedestrian footfall or severe weather do not create challenging conditions. The routes can be limited to homes within a pre-defined catchment area and along pre-defined paths, further reducing the need for truly autonomous decision-making by the robot.

This solution, which involves simpler decision-making, smaller size, and slower speeds, allows for greater margins of error and results in significantly lower costs compared to fully autonomous cars. When conditions are not suitable for autonomous delivery, Uber's traditional driver and courier network can seamlessly handle any orders that would otherwise be routed to the autonomous system.

Through this approach, Uber is taking steps in autonomous delivery that align with the growth by displacement feedback loop, gradually replacing human couriers for selected delivery routes. As the technology improves over time through a self-reinforcing feedback loop, Uber can remain at the leading edge in terms of the level of penetration by food delivery robots, increasing profitability in a robust manner.

Figure 49: Uber Eats can leverage its geospatial and customer order data to selectively integrate delivery robots, employing a pragmatic approach to greater introduce automation over time[153]



10. AI is emerging in a world where home and travel dynamics are also evolving, with travellers increasingly seeking community

10.1. The rise of Airbnb has blurred the line between residential and leisure properties, a trend positioned to accelerate in the AI era

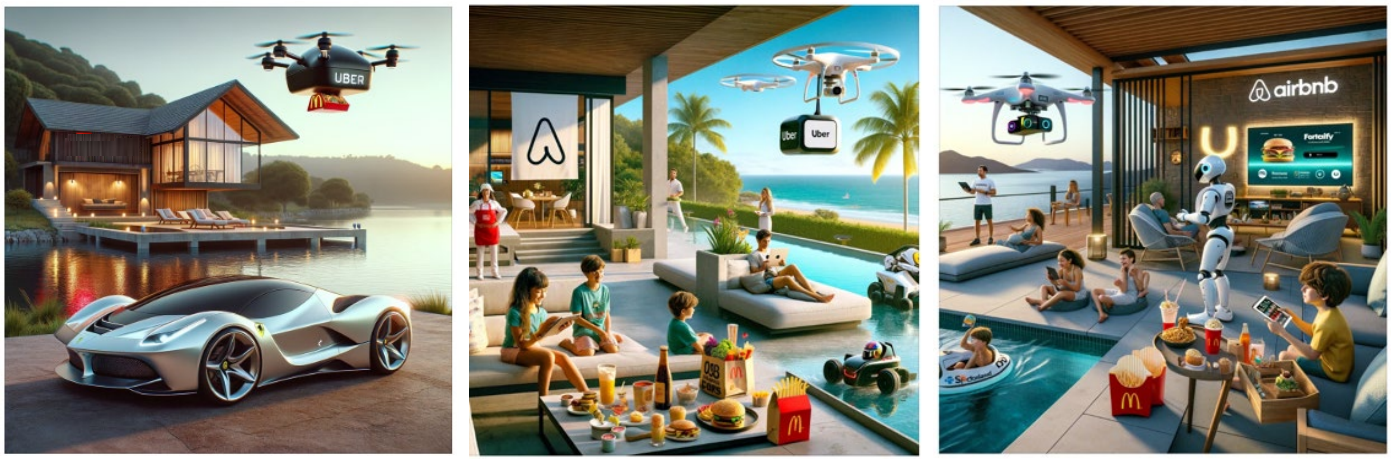
The AI era is intensifying the blend between residential and leisure properties, a shift already commenced by the internet.

> *"Whatever road you are going down, AI will accelerate that road."*
>
> Brian Chesky, CEO, Airbnb, interview July 2023[154]

Previously, hotels relied on brand trust to offer vacant rooms. However, Airbnb has digitised trust through its reputation system, efficiently connecting hosts and guests, and scaling data capture related to trust. And as Airbnb has grown, the reliability of its trust ratings proportionately increase, adding to Airbnb's strong winner-take-all effects, with its service improving proportional to the number of homes it serves globally.

Additive to this trend, the AI age is resulting in the availability of previously premium hotel services to leisure homes. For example, Uber providing transport services, Uber Eats delivering various foods, and media platforms such as Spotify offering movies, music, podcasts and gaming. Physical leisure goods like sports equipment can also be easily ordered for on-demand delivery and use. On top of this, many Airbnb hosts also now offer guidance services comparable to a hotel information desk, with nearly half of Airbnb guests in the last year visiting host-recommended local destinations and experiences they otherwise would not have known about.

Figure 50: The rise of Airbnb has blurred the line between residential and leisure properties, a trend likely to accelerate in the AI era[155]



10.2. The AI era further enhances Airbnb with concierge services surpassing those of traditional hotels.

The AI era, leveraging Airbnb's extensive data and digitisation of trust, further positions Airbnb to empower an increasing number of leisure homes with experiences more appealing than even premium hotels.

Imagine a leisure experience where AI algorithms aggregated data from a vast number of previous guests in the area to recommend the best experiences that uniquely suited your profile. This is the advantage that Airbnb's capture of vast data, combined with AI, brings, unlike traditional hotels with fewer per region guests and therefore absent the ability to efficiently capture a competitive volume of data.

Airbnb already recruits local workers as tour guides, much like Uber does with drivers, offering services beyond that which a single hotel can. As Airbnb greater embeds AI into its services, the company has the mission to add an AI concierge – making conversational voice-based recommendations in a similar manner to the Spotify "DJ" – and acting as a deeply informed concierge, personalising connections to places and experiences based on user likes, budget, and travel preference criteria.

Figure 51: Airbnb's vast data collection can empower both remote workers working as tour guides, and an AI concierge that learns about places, experiences and users over time, and providing personalised recommendations[156]

"The challenge with an app like ChatGPT is that when you ask it a question and when I ask it a question we get the same answer.

That's great for some questions but for travel we should all not be getting the same answer, we should all not be going to Paris on the same date that we're told.

We have different budgets, we have different dreams, we have different desires, we have different reasons for going, and what if an app could get to know you, to understand you, to understand your preferences, and then almost be like a concierge matching you to tour guides, places, experiences, and services, all over the world."

Brian Chesky, Airbnb CEO
at Skift Global Forum September 2023[157]

10.3. The application of AI to leisure-based, trusted platforms such as Airbnb also has the potential to facilitate real-world social experiences, extending its services beyond online property matching

The utility from the extensive data on locations, guests and hosts collected by Airbnb is not only in the self-reinforcing feedback loop achieved by the digitisation of trust across its network effect business model.

Airbnb's trusted network can be further leveraged to launch new business verticals. The mutual trust between guests and hosts facilitated by the platform's data capture can be extended to empower trust among guests themselves. This positions Airbnb to offer a unique service: connecting like-minded travellers for real-world social experiences, essentially functioning as a physical manifestation of a service such as Facebook.

In a world where loneliness is prevalent, exacerbated by remote work and dwindling community spaces, there is significant latent demand for a service that efficiently aggregates individuals with shared interests for in-person gatherings during their travels. In major cities, Airbnb hosts hundreds of thousands of guests. With detailed user data and user trust, Airbnb can launch and refine such in-person social community offerings, and capture a powerful new positive feedback loop.

"More and more people are working remotely. But Amazon is not the mall. Netflix is not the theatre. And many other community spaces do not exist anymore like the bowling alley or the church. We are living in the loneliest time in history. We still need community. We need to be physically together.

I think our opportunity is to build the definitive AI interface around personalisation. Instead of Airbnb just asking where are you going, what if we also ask bigger questions like who are you? Where are you going today, tomorrow and next year? The more we understand you, the better we can be like an AI concierge. Pointing you to places, community, concierge all other things.

Instead of solving a search problem like Google, we can solve more of a matching problem."

Brian Chesky, CEO, Airbnb,
interview July 2023[160]

"We want to make it better for people to meet each other. In Paris we have 500,000 people staying in Paris at any one time. Imagine if those people could connect with one another based on their preferences. These are some of the things that we can do and I think Airbnb will be at its best when it's about bringing people together not just connecting your spaces."

Brian Chesky, CEO, Airbnb,
at Skift Global Forum Sept 2023[158]

"We're going to make some very very big steps forward with the community aspect – Airbnb will become much better for say group travel, a lot of people travelling with their family and friends.."

Brian Chesky, CEO, Airbnb,
interview July 2023[159]

11. AI's ability to lower costs in producing images, videos, and vectors, enhances software network effect, winner-takes-all economics for design platforms

11.1. AI transforms the utility from stitching together still images, increasing ease of use of and traffic to platforms that benefit from this capability

The AI era also enhances the ability of platforms to use still images uploaded more intelligently, especially when multiple images contribute to a larger composite.

For example, in the future, AI on Airbnb will organize house photos by room, stitch photos together and infer visuals for missing areas, create a floor plan, write descriptions, list amenities, and suggest prices, all based on the photos.

These features all transform ease of use from the host's point of view and the delight in using the service from the point of view of the guest, further enhancing the platform's experience relative to the hotel alternative.

> *"We were able to create an AI model that scanned 100 million photos not so long ago from now.*
>
> *Our building of this AI model means that in the future you'll be able to go on Airbnb, take photos of your house, and not only will it organise your house by room but it can read all the photos it can actually create a floor plan.*
>
> *It can write a description, it can list all the amenities, and it can even suggest a price based on the photos.*
>
> *It can also take all the photos you upload, and change them by time of day or season. So if it is winter it can show you how the home looks with snow. And so that is just one of just like a hundred things, there's going to be so many ways to be able to update Airbnb."*
>
> Brian Chesky, CEO, Airbnb, interview December 2023[161]

11.2. The use of AI also reduces the costs of, and enhances, video production, shifting value to dominant video software platforms and away from traditional stage and set design

Figure 52: AI also both cheapens and enhances video production, transferring value to the dominant video production software platform tools and away from stage and set design[162]

AI-powered features within the leading video platform, Adobe, streamline and accelerate video production, enabling efficient, high-quality content creation with less human effort and expense. AI, coupled with Adobe tools, also expedites adding advanced special effects to videos, significantly reducing production costs while also enhancing output quality.[163]

AI can also automate repetitive post-production tasks such as creating thumbnails and platform-specific summaries for TikTok or Instagram, enhancing efficiency by reducing manual content adaptation. In this manner, Adobe's integration of AI in video production tools boosts efficiency, allowing content providers to focus on creativity as AI manages time-consuming tasks.[164]

The precondition for AI success is data. That is, the development of AI tools in a specific domain over time becomes dominated by the entity that holds the principal position in data collection within that domain. In the case of video production, the software platform with the largest user base has the significant data collection advantage. As users regularly upload video and video-related tasks to the AI-powered video production tools, this data serves as the AI training input, leading to the continuous improvement of the interfacing AI tools.

As a result, Adobe, being the market leader in creative video tools, stands to benefit greatly from a shift in value towards their business position. The company's extensive user base and vast collection of data give it a unique edge in developing and refining AI-driven video production tools, further solidifying its leadership position.

11.3. Producers of monopoly video content enhance production quality whilst facing no new competition, allowing a shift to greater premium pricing, while simultaneously reducing costs

AI also delivers an outsize benefit to monopolistic content producers such as Formula One and Live Nation, as lower video production costs and enhancements respectively improve their volume of output and premium pricing, and therefore bottom line, without attracting new competition.

Cheaper production means the volume of content from live sports or live music can significantly increase, not only for example with Formula One races, the Drive to Survive series, but a video series for each team, for each driver, for each junior series, as well as the potential for viewership of each race with user-directed edits.

AI integration also enhances the product presentation, adding dramatic intros, fantasy elements, personalised advertising, and also allowing low cost adaptation to new presentation formats such as the Apple Vision Pro. The more dramatic the experience, the closer to (or superior to) the actual experience of being at the race or concert, the greater the increase in per event streaming revenue that can be achieved.

Figure 53: By the cheapening, and enhancement of, video production that AI provides for, iconic live events remove their gating item on the volume of video output, enabling a meaningful revenue increase[165]

11.4. AI empowers a new form of industrial software platforms for creating "digital twins," allowing virtual prototyping before physical construction

The AI era is also revolutionising industrial design software, enabling advanced product design, testing, and refinement. These applications output and maintain "digital twins," virtual simulations predicting performance under various conditions, identifying potential flaws or improvements at a lower cost than real-world prototyping.

AI-powered digital twins can also learn from ongoing real world data, adapting and updating the simulation in real-time. This capability allows for the continuous refinement of models based on actual performance, leading to more reliable and effective designs and again resulting in a positive feedback loop in the improvement of these software platforms.[166]

The fusion of AI with digital twin technology is revolutionising the prototyping process, making it more accurate, efficient, and conducive to innovation. This change is also self-reinforcing in continuing to drive its adoption through the need for cross-industry compatibility.

The digital twin software market, despite offering significant cost-saving opportunities, is primarily controlled by two major players: Autodesk with its Fusion 360 platform and Dassault Systems with its Solidworks platform[169]. This market structure exhibits both duopolistic and monopolistic characteristics, with certain sub-domains being dominated by each single company. For instance, Solidworks holds the dominant position in the use of digital twins within the aeronautical industry[170]. As a consequence of this market structure, Autodesk and Dassault Systems are positioned to capture a substantial portion of the economic benefits generated by the adoption of digital twin technology.

Figure 54: Digital twin software uses AI to simulate industrial product real world performance[167]

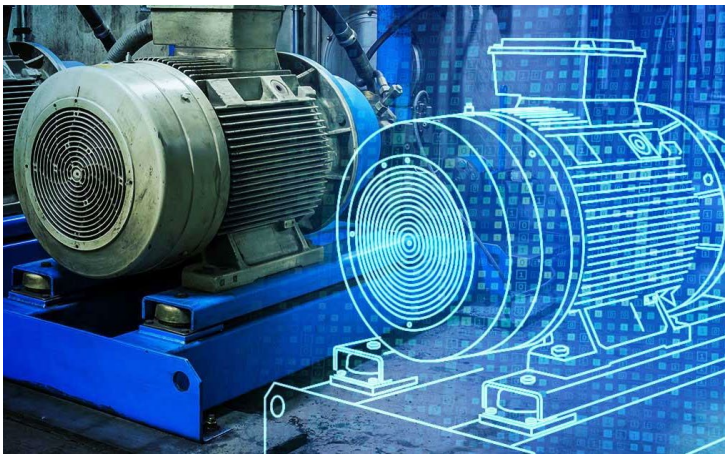


Figure 55: Digital twin software with AI is revolutionising and cheapening prototyping processes[168]

Conclusion

History has shown that universal technological shifts – the advent of colour television, the internet, and now AI – redefine selected *operating principles* relating to optimal capital allocation. This white paper has argued that at the onset of these shifts the intelligent investor must consider the merits of a thoughtful forward analysis, the linked recalibration of their approach, and integrate a Venture framework into what will remain the underpinning Buffettian *first principles*, and at an agility sufficient to capitalise on the shift at hand.

The case of the internet provides valuable insights. Here, investors faced a new breed of businesses that exhibited rapid growth trajectories, a trend towards monopolisation, and a business path dictated by network effects, challenging traditional valuation models. Achieving the flexibility to adapt to this historic universal technological shift demonstrated the importance of a *first principles* based, rather than rule-based, approach.

To identify those investment allocations today that stand to capture transformative economics in the AI era, both *accurate information* and *accurate forecasts* are required. For accurate information our advocacy is to prioritise the Buffettian first principle of removing bias from information gathering by focusing on *simple and understandable* businesses. However, for accurate forecasts relating to the AI era our contention is that it is the Lanchester Square Law, and Metcalfe's Law, that become additional and necessary guideposts.

The Lanchester Square Law underpins a successful implementation of the Venture framework. Adapted from military theory to corporate strategy, Lanchester Square Law provides a mathematical foundation for understanding and predicting outcomes in the market share battles that will also define the emerging AI era. In this context, the Lanchester Square Law underscores the importance of numerical superiority, which translates into market share dominance.

By comparison, Metcalfe's Law dictates the value of a software network as proportional to the square of the number of its users, and therefore, as an earlier stage network grows its value per user begins to surpass the acquisition cost per user, and the network begins to have a positive value that increases exponentially. This dynamic creates a positive feedback loop. Moreover, Metcalfe's Law operates independently of and compounds the effects of the Lanchester Square Law.

Another critical insight put forward by this white paper is the concept of *last mover advantage*. In a market shaped by rapid innovation and technological advancement, being the first mover offers no guarantees of sustained success. Instead, it is the last mover – the one who brings about the final significant innovation in a specific market – which reaps long-term monopoly profits. When both the Lanchester Square Law and Metcalfe's Law act in tandem with last mover advantage, a market leader can achieve an unassailable business position, potentially leading to decades of monopoly profits.

Thereon, our analysis has considered what *type* of prospectively unassailable business will uniquely capture a transformational value uplift from the AI era. Our answer is that in the AI-driven marketplace, *data is the new gold*. Those software platforms that monopolise the capture of vast and unique data sets are also those companies that can monopolise the development of uniquely advantaged AI tools and platforms.

In the case of ARM Holdings, we contend that whilst this company also has achieved a monopolistic position uniquely empowering it to be a leader of the AI era, its position represents a one-off. Our assessment is that most

other monopolistic businesses that can be *robustly identified today* as poised for upward transformation from the AI era will be those software platforms that monopolise domain-specific data capture with last mover advantage. This white paper has named Uber, Airbnb, Spotify, Autodesk, Adobe and Dassault Systemes.

An important characteristic of the Venture framework is also the prioritisation of those businesses that have the potential to significantly scale upward. There is a probability of venture success linked to product improvement, which thereon links to the duration of the feedback loop that occurs as the business displaces incumbents. Smaller companies also possess the potential for larger returns, as they grow over time to mega cap status, and this is also why this white paper has focused on companies outside of today's so called "magnificent seven". As Tom Perkins states "*there is a big difference between a good idea and a good idea that will make you a huge amount of money...*".

Additionally, the Venture framework advocated for in this white paper necessitates that each selection should possess an exceptional business leader – one with profound motivation, a deep understanding of technology, and the ability to attract, retain, and lead a top-tier team. These leaders must be not just visionaries but also pragmatists, capable of calibrating confidence to reality and possessing the agility to adapt as their business grows.

The term "AI" is obviously provocative, but it is also misleading. It signals to a type of competition with the breadth of human intelligence and behaviours yet which is not the destination implied by the current technological path nor that which is, we would contend, incentivised. A clear differentiating factor is that the utility of AI responses are dependent on their training data, whereas humans respond based on a far greater series of inputs and drivers which are not limited to simply training data, nor even to the more uniquely human characteristics of reasoning, intuition and intellectual courage, and also are defined by other concepts such as will to gather resources, and will to power. In essence it is only humans that possess the yearning to explore and make impact *beyond the data*.

"What is mind? No matter. What is matter? Never mind." Punch magazine, 1855[171]

We would put forward that so called AI should instead be more clearly named as *a revolution in the throughput volume and analytic sophistication that can be applied to a trailing data series*. Contextualising the technology as such helps forecast its impact – not "AI" but "II" – *information intelligence*. Had such a nomenclature been popularised it may also have directed market participants to greater understand the identifiable and optimal opportunity set arising from this universal technological shift: *it is the data monopolists that are positioned to launch numerous unique AI-powered verticals and become the era's dominant businesses*.

These data monopolies – which we contend as the "Googles" and "Amazons" of the AI era – in many cases will undergo *transformational* economic uplift, and in several stages. Firstly, AI is a universal technological shift which will transform human productivity, yet it is the monopolists where the economic capture from this transformation will be concentrated. However, the transformation in favour of these companies arises not only through their monopolisation, in their domain, of the economic uplift from AI, but also from the advantage that their resulting AI technology then uniquely empowers them with to launch new AI-powered business verticals.

"We are on the edge of the biggest technology revolution that has ever existed."

Elon Musk, public comments, February 2024[172]

In the AI era, investors themselves must also consider the qualities they will need to prosper in this *revolution in the throughput volume and analytic sophistication that can be applied to a trailing data series.* The first quality that we would contend is time allocation to the development of the investor's own excellence in using AI tools. AI can push human knowledge beyond traditional limits, processing and analysing data at otherwise unattainable scales and speeds, identifying prior imperceptible patterns, and leading us to originate new hypotheses and innovative approaches. However, AI cannot read human minds nor possess true self-orientation, requiring humans, including investors, *themselves* to guide AI tools to achieve extraordinary outcomes *for them*.

"AI, by definition, doesn't have an intrinsic set of goals. Humans must instruct how AI is used."

Stephen Wolfram, CEO, Wolfram Research, public comments, March 2024[173]

Secondly, to gain an investing advantage in an AI-driven world, *investors must focus on obtaining exclusive, accurate information, and unique insights, that no AI system possesses*. Whilst not an end point in itself, in our contention the start point remains a focus on *simple and understandable businesses*. By directly inspecting these businesses and their products, humans can develop a unique understanding that goes beyond the potentially biased information available in the public domain. This approach also avoids the handicap of relying on information that will often have already been processed by AI systems. Ultimately, the key to successful investing will lay in the investor's ability to accrete their decision-making by *acquiring knowledge and insight that remains inaccessible to AI*.

The key to capturing this accretion requires the investor to reflect on the reasons behind human duality. Humans possess a range of seemingly contradictory traits that appear to test the bounds of reasonableness, from cruelty to kindness, from harsh judgment to our capacity for worship, from cowardice, avarice and bias, to courage, self-sacrifice, and truth-seeking. However, human dualism is not a design flaw but a sophisticated evolutionary safeguard. It protects us against the risks of over-simplification, over-extrapolation and rigidity in conclusion that can arise from perceiving sample data as a complete representation of a world that is not static but ever changing.

Any data series including those used to train AI will be an incomplete sample of the truth, and in the same way that the successful entrepreneur reasons beyond the 'expert' assessment of market opportunity, it is through our human dualism that we continue to "push" and "pull" on the static curtain of data relied upon by AI, and the means by which we effectively break through the limitations imposed by a singular perspective.

This flexible, context-dependent strategy is embedded in the human as a result of our differentiation from AI – our mortal struggle for survival – and is crucial in an ever-changing world where sample data remains incomplete. It is our humanity that attracts us to the path of continuous learning and yet also results in our discomfort with claims of absolute truth, and this sets us apart from AI's monolithic approach to data interpretation. And it is our human approach, driven by our curiosity to break with orthodoxy, which ultimately reveals our unreasonableness as reasonable by underpinning our significant advancements that require foundational breakthroughs.

"AI is outputting a sort of statistical the average of the average. But progress is made by humans when we do things that are not the average of the average."

Stephen Wolfram, CEO Wolfram Research, public comments, March 2024[176]

As AI has become more prevalent, it is already apparent that its rigidity in drawing conclusions from sample data may amplify several of the Buffettian first principles, including the trust by AI in potentially biased information and its often conformist conclusions also acting as an amplifier of herd behaviour. However, this also prospectively amplifies the unique human advantages of intellectual daring, non-conformity, and courage.

The contrast between AI's efficiency and consistency in processing data based on predefined parameters and models and the human capacity for dualistic, creative, and often paradoxical thinking underscores the unique strengths of both approaches. It suggests that AI and human cognition work best together in a complementary manner, leveraging the strengths of each approach in the world of investing and beyond.

Figure 56: By harnessing AI's power while maintaining insight, courage, and individualistic reasoning, investors can navigate the AI era and achieve extraordinary outcomes

The result is that success in the AI era will be gifted to those investors who dedicate themselves to learning to master AI tools and combine this successfully with the pursuit of truth through intellectual courage, charting new possibilities of excellence. By harnessing AI's power while maintaining insight, courage, and individualistic reasoning, investors can navigate the new era and achieve extraordinary outcomes.

Footnotes

1. Satya Nadella, speaking at Davos, January 2024 [link]
2. Warren Buffett, Berkshire Hathaway letter to shareholders, 2022 [link]
3., 39., 42. Peter Thiel, Zero to One, Notes on Start Ups, 2015 [link]
4. The long story behind a big deal, Nikkei Asian Review, 2016 [link]
5. Image generated by ChatGPT, white paper summary by Anthropic
6. The top 20 conclusions of this white paper, summary by Anthropic
7. Warren Buffett and Charlie Munger discussing how Buffett saw further than Ben Graham, comparing Buffett's evolution to Newton's "standing on the shoulders of giants". Buffett "*I've pursued the game quite a bit differently than Ben Graham did.*" Munger: "*Graham had some blind spots.. there was a lot of reality he did not go into.*" [link]
8. The Investment Value of Goodwill, Lawrence Bloomberg, 1983 [link]
9. Figure: GA-Courtenay research and public domain disclosures
10., 11. Berkshire Hathaway annual meeting, 2017 [link]
12. Google IPO prospectus, 2004 [link]
13. Jeff Bezos, all Amazon shareholder letters [link], Jeff Bezos states he reads all Buffett's writings, CNBC [link], Jeff Bezos comments on his advice from Warren Buffett [link]
14. Warren Buffett buys Amazon's 6 7/8 convertible bonds, August 2002 [link]
15. Warren Buffett Invests In Chinese Company Developing 'Green' Cars, CNBC, September 2008 [link]
16. Charlie Munger: "*I have never helped do anything at Berkshire that was as good as BYD*" [link]
17. Figure: GA-Courtenay research and public domain disclosures
18., 24., 27., 34. GA-Courtenay white paper, How Far Away to Berkshire Hathaway [link]
19. Buffett: The Making of an American Capitalist, Roger Lowenstein [link]
20. Elon Musk comments on first principles, speaking in 2014 [link]
21., 60., 91., 93., 94. Georges Doriot, Manufacturing Class Notes, Harvard Business School 1937-1966 [link]
22., 23. Berkshire Hathaway shareholder meeting, 1994 [link]
25. Warren Buffett, lecture at University of Georgia, 2001 [link]
26. Warren Buffett, Berkshire Hathaway annual meeting, 1998 [link]
28. Bill Ackman, interview with Lex Fridman, February 2024 [link]
29. GA-Courtenay research contentions
30. Image generated by ChatGPT
31. Kleiner Perkins, Venture Capital, and the Chairmanship of Genentech, 1976-1995 [link]
32. Masayoshi Son, SoftBank Q2 earnings conference call, November 2016. Source: CapitalIQ
33. The Benchmark Way: Five Partners Who Make Other VC Firms Look Outgunned And Overstaffed, Forbes [link]
35. Aiming High, A Biography of Masayoshi Son, Atsuo Inoue [link]
36. Masayoshi Son, SoftBank CEO, Softbank annual meeting of shareholders, June 2018, Source: CapitalIQ
37., 38. Aircraft in Warfare: The Dawn of the Fourth Arm, Frederick Lanchester [link]
40. Jeff Bezos, interviewed in 1997 [link]
41. Buffett's Private Analysis of Geico in 1976: 'Extraordinary' But 'Mismanaged', WSJ [link]
43. Artificial Intelligence in Process Engineering, research paper, Institute for Particle Technology [link]
44., 45. Moore's Law [link], however as transistors reach atomic scale, the classical technological driver that has underpinned Moore's Law for 50 years is failing [link]
46. Charlie Munger, The Psychology of Human Misjudgement, 1995 [link]
47., 49. GPU performance has increased roughly 7,000 times since 2003 and price per performance is 5,600 times greater, source: Stanford's Human-Centered AI group [link]
48. Understanding the Role of Parallel Programming in Multi-core Processor Based Systems, 2019 [link]
50., 86. Peter Fenton, public domain comments, source: GA-Courtenay research archive
51., 52. GA-Courtenay research
53. Scaling Laws of Network Traffic Load: A Theoretical Explanation of Metcalfe's Law, Cheng Wang, 2021 [link]
54., 55., 56., 57. GA-Courtenay research
58. Charlie Munger, interview with Becky Quick, 2024 [link]
59., 92. Tom Perkins, interview by Sally Smith Hughes, 2009 [link]
61. Cutting The Cord, A Survey of Telecommunications, The Economist, 1999 [link]
62., 73., 151. Matt Cohler, Benchmark Partners, Silicon Slopes Tech Summit 2017 [link]
63. Jeff Bezos, public lecture on the Virtuous Cycle of Customer Centricity [link]
64., 66. David Sacks' post on Uber's virtuous circle, 2014 [link]
65. Jeff Bezos scribbled onto the back of a napkin Amazon's positive feedback loop [link]
67. Feedback loop figure source, GA-Courtenay research contention
68. Interview with Benchmark Partners, 2022 [link]
69. GA-Courtenay research
70. Founders Fund, What happened to the future? 2017 [link]
71. GA-Courtenay research
72. The Kelly Criterion and the Stock Market, Edward O. Thorpe, 1992 [link]
74. Warren Buffett explains why a good business is one 'your idiot nephew' could run [link]
75. How 'Rocket' Sasaki helped shape billionaire Masayoshi Son, Nikkei Asian Review, 2017 [link]
76. Peter Fenton, Benchmark Partners, interview by Jeannette zu Fürstenberg, 2022 [link]
77. Peter Fenton, Benchmark Partners, 2023 [link]
78. Gold and Glory: 21st-Century U.S Space Exploration, School of Engineering and Applied Science University of Virginia [link]
79. Brian Chesky, Airbnb CEO, quoting Steve Jobs, 2023 [link]
80. GA-Courtenay research, pubic domain images
81., 84., 85., 98. Tom Perkins, interviewed by John Hollar, 2011 [link]
82. Tadashi Sasaki, 1915-2018: Mentor to Masayoshi Son, Nikkei Asian Review [link]
83. Mike Tyson on Cus D'Amato, 2008 [link]
87. Masayoshi Son, 1987 interview with Bloomberg [link]
88. Elon Musk interview with Bloomberg news, November 2011 [link]
89. Elon Musk interview regarding SpaceX 2007 [link]
90. Peter Fenton, arguing that the approach of great entrepreneurs is 'learn-it-all' not 'know-it-all,' 2016 [link]
95. Peter Fenton, comments in interview with Semil Shah, 2013 [link]
96. Peter Fenton, interview with Logan Bartlett, 2023 [link]
97., 106. Tom Perkins, interview with Glenn Bugos, 2001 [link]
99. Steve Jobs, Apple's Think Different campaign, September 1997 [link]
100. Charlie Munger, Practical Thought About Practical Thought, 1996 [link]

101., 102., Richard Branson, speaking to CNBC in 2017 [link]
103. Elon Musk launches a car into space, 2018 [link], Musk "*Model 3 was going to be called Model E, for obvious dumb humour reasons, but Ford sued to block it*" [link]
104. Airbnb's Floating House on London's River Thames, Mail Online [link]
105. The real legacy of Steve Jobs, showman and futurist, AFR [link]
107. Peter Fenton, interview with MIT Venture Capital & Private Equity Club, 2021 [link]
108. SoftBank CEO Masayoshi Son, interview with Financial Times, 2016 [link]
109. GA-Courtenay research
110., 112. Sam Altman, interview with Wall Street Journal, November 2023 [link]
111. SoftBank CEO Masayoshi Son, SoftBank World Event, May 2017 [link]
113. Lior Ron, founder, Uber Freight, December 2023 [link]
114. Goldfinger, original 1964 screenplay [link]
115., 116. GA-Courtenay research contentions, images created using ChatGPT
117., 124., 154., 159., 160. Brian Chesky, CEO, Airbnb, interview July 2023 [link]
118. Sam Altman, interview with Bloomberg, January 2024 [link]
119. Elon Musk, public comments, February 2024 [link]
120., 121., 123., 132., Masayoshi Son in discussion with ARM CEO Rene Haas, SoftBank World 2023 [link]
122. ARM power usage versus Intel Xeon and AMD EPYC [link]
125. Rene Hass, ARM Holdings CEO, November 2023 conference call, source: CapitalIQ
126. Edge Computing and the Future of the Data Centre [link]
127. Why 50% of AI Data Processing May Move to Edge Computing [link]
128. Masayoshi Son talks about how Steve Jobs inspired SoftBank's ARM deal, Nikkei Asian Review [link]
129. Hackers movie screenplay, 1995 [link]
130. Masayoshi Son interview with David Rubenstein, 2018 [link]
131. GA-Courtenay research, images created using ChatGPT
133. Jensen Huang, NVIDIA CEO, Q4 conference call February 2024, source: CapitalIQ
134. Warren Buffett shareholder letter 2023 [link], images created using ChatGPT
135. Source: public domain disclosures, Uber FY results 2023 conference call, source: CapitalIQ
136. Steve Jobs quotes, late 1990s [link]
137. Image is GA-Courtenay sketch and contention
138., 139., 150. Dara Khosrowshahi, Uber CEO, speaking in January 2024 [link], image created by ChatGPT
140. Spotify dominates market share, IMS Business Report 2023 [link]
141. How Spotify's AI-Driven Recommendations Work, WSJ [link]
142. Spotify Acquires The Echo Nest, TechCrunch, 2014 [link]
143., 144. Image source: GA-Courtenay research
145. Images created using ChatGPT
146. Tim Cook tweet, "*It's all about the music*" [link]
147. Spotify becomes #1 podcast publisher in US, 2022 [link]
148. Spotify already has an 11% share of the US audiobooks market, ahead of Apple and behind only dominant player Audible, February 2024 [link]
149. Source, public domain disclosures, GA-Courtenay research
152. Dara Khosrowshahi, Uber CEO, interview with Bloomberg October 2023 [link]
153. Uber launches robot food delivery services in California, NY Post 2022 [link], Uber Eats Introduces New Robot Delivery Service in Japan 2024 [link]
155., 156. Source, GA-Courtenay research, images created using ChatGPT
157., 158. Brian Chesky, Airbnb CEO at Skift Global Forum September 2023 [link]
161. Brian Chesky, CEO, Airbnb, interview December 2023 [link]
162., 165., 168., 173. Image created using ChatGPT
163., 164. Adobe Summit 2024 Investor meeting [link]
166. What Is the Role of AI for Digital Twins? Predictive Society and Data Analytics Lab, Tampere University 2023 [link]
167. Public domain images
169. Autodesk, digital twin software platform [link], Dassault Systemes, digital twin software platform [link]
170. The Virtual Twin Experience for Aerospace & Defense [link]
171. Punch Magazine, 1855 [link]
172. Elon Musk, public comments, February 2024 [link]
173., 176. Stephen Wolfram, public comments, March 2024 [link]

Legal Disclosure

This white paper is an independent analysis conducted by *GreenAsh Partners* and is intended for educational and informational purposes only. It aims to explore and discuss the potential applications and implications of artificial intelligence (AI) technology for various industries and companies, including those whose logos or trademarks may appear within. This white paper is distributed to a limited number of subscribers and is not for public distribution, reproduction, or use without the express written permission of *GreenAsh Partners*.

This white paper is for discussion and informational purposes only. The views expressed herein represent the opinions of *GreenAsh Partners* as of the date hereof. *GreenAsh Partners* reserves the right to change or modify any of its opinions expressed herein at any time and for any reason and expressly disclaims any obligation to correct, update or revise the information contained herein or to otherwise provide any additional materials.

The inclusion of any company logos, trademarks, or brand names within this document does not imply any affiliation with, endorsement by, or direct involvement of these entities in the preparation of this white paper. These logos, trademarks, and brand names are the property of their respective owners and are used herein for illustrative and analytical purposes only, under principles of fair use. The analysis and auto generated images presented in this document are based on hypothetical applications of AI technology and do not reflect the current or future plans, capabilities, or strategies of the companies mentioned. All information contained within is provided on an "as is" basis without warranty of any kind, express or implied, and any use of this information is at the sole risk of the reader.

The views expressed in this white paper are solely those of *GreenAsh Partners* and its authors and do not necessarily reflect the views of the companies whose logos, trademarks, or brand names are included. No representation or warranty, express or implied, is made as to the accuracy, completeness, or reliability of the information contained in this document.

The information contained herein is based on publicly available information, including filings made with the securities and exchange commission ("SEC") and other sources, as well as *GreenAsh Partners'* analysis of such publicly available information. *GreenAsh Partners* has relied upon and assumed, without independent verification, the accuracy and completeness of all data and information available from public sources, and no representation or warranty is made that any such data or information is accurate. *GreenAsh Partners* recognizes that the companies referenced herein may possess confidential or otherwise non-public information that could lead them to disagree with *GreenAsh Partners'* views and/or conclusions and that could alter the opinions of *GreenAsh Partners,* were such information known. No representation, warranty or undertaking, express or implied, is given as to the reliability, accuracy, fairness or completeness of the information or opinions contained herein, and *GreenAsh Partners* and each of its directors, officers, employees, representatives and agents expressly disclaim any liability which may arise from this white paper and any errors contained herein and/or omissions here from, or from any use of the contents of this white paper.

Except for any historical information contained herein, the information and opinions included in this white paper constitute forward-looking statements, including estimates and projections prepared with respect to, among other things, anticipated company performance, the value of company securities, general economic and market conditions, and other future events. You should be aware that all forward-looking statements, estimates and projections are inherently uncertain and subject to significant economic, competitive, and other uncertainties and contingencies, and have been included solely for illustrative purposes. Actual results may differ materially from the information contained herein due to reasons that may or may not be foreseeable. There can be no assurance that any securities referenced in this white paper will trade at the prices that may be implied herein, and there can be no assurance that any opinion or assumption herein is, or will be proven, correct.

This white paper and any opinions expressed herein should in no way be viewed as advice on the merits of any decision with respect to any of the companies or securities referenced herein. This white paper is not (and may not be construed to be) legal, tax, investment, financial or other advice. Each recipient should consult their own legal counsel, and tax and financial advisers as to legal and other matters concerning the information contained herein. This white paper does not purport to be all-inclusive or to contain all of the information that may be relevant to an evaluation of the companies or securities referenced herein, or the matters described herein.

This white paper does not constitute (or may not be construed to be) a solicitation or offer by *GreenAsh Partners* or any of its directors, officers, employees, representatives or agents to buy or sell and securities referenced herein, or an offer to sell an interest in funds managed by *GreenAsh Partners*. This white paper does not constitute financial promotion, investment, advice or an inducement or encouragement to participate in any product, offering or investment, or to enter into any agreement with the recipient. No agreement, commitment, understanding or other legal relationship exists or may be deemed to exist between or among *GreenAsh Partners* and any other person, including the parties and individuals referenced herein, by virtue of furnishing this white paper. No representation or warranty is made that *GreenAsh Partners'* investment process or investment objectives will or are likely to be achieved, or successful, or that *GreenAsh Partners'* investments will make any profit or will not sustain losses. Past performance is not indicative of future results.

Funds managed by *GreenAsh Partners* currently beneficially own and/or have an economic interest in, and may in the future beneficially own and/or have an economic interest in the securities of any of the securities named in this white paper, as well as securities in adjacent industries. *GreenAsh Partners* intends to review its investments on a continuing basis and depending upon various factors, including without limitation, their financial position and strategic direction, the outcome of any discussions with them, overall market conditions, other investment opportunities available to *GreenAsh Partners*, and the availability of their securities at prices that would make the purchase or sale of such securities desirable, *GreenAsh Partners* may from time to time (in the open market or in private transactions) buy, sell, cover, hedge or otherwise change the form or substance of any of its investments to any degree, in any manner permitted by the law, and expressly disclaims any obligation to notify others of any such changes. *GreenAsh Partners* also reserves the right to take any actions with respect to its investments as it may deem appropriate.

GreenAsh Partners has not sought or obtained consent from any third party to use any statements or information contained herein. Any such statements or information should not be viewed as indicating the support of such third party for the views expressed herein. All trademarks and trade names used herein are the exclusive property of their respective owners.