Process Alpha: How to Construct and Manage Optimized Venture Portfolios

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KEY FINDINGS

- The venture industry remains a guild/apprenticeship model that lacks a standardized body of knowledge, best practices research library, formal training, and/or a certification requirement to become a general partner of a fund.
- A body of research exists that defines the optimal level of nonsystematic risk management (diversification) at the Seed, A, and B rounds of financing, as well as capital deployment optimizations to manage systematic risk.
- Long overdue innovation is finally coming to the venture fund model. Analysis of the current and likely direction of the innovation will result in the venture industry looking less like the private equity industry (also an asset class) and more like the public markets structures and portfolio approach, thus developing into a more clearly defined asset class.

ABSTRACT

The author provides a specific strategy to design and manage an optimal venture investment strategy, regardless of the venture thesis. The author first discusses the contributing factors that have contributed to the consistent underperformance of the median venture capital fund performance and highlights the recent research findings and actions taken by Sequoia Capital to frame the direction of the innovation in the venture fund model. He then offers specific examples of how an optimal fund would be structured and managed, presuming there is proper reporting and analytics available on the individual portfolio companies. Last, the author makes a case for professionalizing the venture industry with recognized training, curriculum, and a certification and continuing education requirements to parallel other recognized professions.

The process of funding entrepreneurial ventures has come under scrutiny, again. We are now experiencing the second major bubble in venture funding cycles, with the first major bubble occurring during the late 1990s. The need to improve how we fund innovation to accommodate more diverse business models, more diverse entrepreneurial profiles, and more diverse geographies besides Silicon Valley and Boston/NYC has become acute. Cities and states across the country are launching startup ecosystems, and educational institutions are incorporating entrepreneurial curriculum to train new entrepreneurs. But there is not an effective funding mechanism to mobilize the necessary capital to support the expanding activities. As well, China and Israel are surpassing the United States in producing deep technology. In effect, the United States is effectively losing its innovation advantage. Moreover,

while there is no shortage of capital seeking to invest in the venture asset class, there has not been sufficient innovation in the venture funding model itself to accommodate the level of interest from institutional capital allocators, particularly in the earlier stages of the startup life cycle. The industry remains largely stuck in a transactional approach to portfolio construction—until recently.

There are lessons to be learned from the public markets' experience in portfolio design. Risk management practices offer a way to reexamine the design of the venture fund model itself, as well as evaluating how the decision model determines the holdings that go into the new fund model. Incorporating more public market practices by both startups seeking funding and the investors funding startups will result in a more efficient access and a lower cost of capital for more startups, as well as more consistent risk-adjusted returns for investors, at scale.

The purpose of this article is to provide a specific strategy to design and manage an optimal venture investment strategy, regardless of the venture thesis.

PERCEPTION VERSUS REALITY

Notwithstanding the media attention given to high-profile startups and the investors supporting their success (valuation bubble or not), the conventional perception surrounding the venture industry's historical returns is optimistic. Most venture funds don't deliver real alpha for their investors when proper benchmarks (Russell 2000 + 400 basis points) are incorporated into the analysis. This optimistic view of returns is also compounded by the inherent survivorship bias in any industrywide index or asset-class performance computation. For example, while Cambridge & Associates has a robust effort in tracking over 2,000 venture funds in their database, Pitchbook has as few as 44 funds comprising some of their index return calculations. The lack of reporting from angel groups and the increasing volume of special purpose vehicles (SPVs)/syndicates also contribute to the distorted view on the returns from venture investing when considering the (likely) returns of all the current/active participants.

The Kauffman Foundation's analysis of its realized venture returns summarizes well the false narrative surrounding venture investing (Mulcahy, Weeks, and Bradley 2012). They list the following findings:

> - The average VC fund fails to return investor capital after fees.
> - Many VC funds last longer than ten years—up to fifteen years or more. We have eight VC funds in our portfolio that are more than fifteen years old.
> - Investors are afraid to contest GP terms for fear of "rocking the boat" with general partners who use scarcity and limited access as marketing strategies. (p. 4)

Fees Impact Risk Taking

The conventional wisdom on the venture asset class is that to provide a compelling return for the investors, venture capitalists need to have a big winner in the portfolio. This is often called the "power law" (Neumann 2015). This wisdom is partially right, due mainly to high fees and suboptimal risk and portfolio management practices.

Because of the typical 2/20 fee structure and the subsequent impact on the capital account for the limited partners (LPs)—high fees and a lack of any meaningful early returns—the J-curve reflects the decline in the account value for LPs of venture funds. The need to reach for sizable enough returns to get out of the negative J-curve hole oftentimes leads investors to take on undue risk, making inappropriately risky investments in individual companies at the expense of the overall risk metrics of the fund/portfolio.

Bat for Average

By simply expanding the definition of success beyond the conventional venture fund model cited earlier and incorporating more of a data-driven "Moneyball" approach (as described in the 2003 book by Michael Lewis), the universe of fundable startups would also expand. Work done by Cambridge & Associates suggests that failure rates in truth look quite different, as proffered by Erin Griffith (2017) from the *A Boom with a View* blog by Fortune.com

> Cambridge Associates, a global investment firm based in Boston, tracked the performance of venture investments in 27,259 startups between 1990 and 2010. Their research reveals that the real percentage of venture-backed startups that fail—as defined by companies that provide a 1X return or less to investors—has not risen above 60% since 2001. Even amid the dotcom bust of 2000, the failure rate topped out at 79%.
>
> But startup failure isn't a natural law like gravity. It's not a given. Normalizing the failure narrative only conceals the truth, misleads founders, and in certain cases, explains away bad behavior.

Why more venture firms haven't adopted a more objective, data-driven, diversified portfolio approach to venture investing can be explained by the body of work in behavioral economics. More specifically, venture capitalists, like all humans, can be anchored in explicit or implicit biases that validate their status and role,[1] much like the traditional baseball scouts that populated Major League Baseball before Sabermetrics.

Or it could be as simple as the sentiment in a quote attributed to Upton Sinclair: "It is difficult to get a man to understand something, when his salary depends on his not understanding it."

Lack of Innovation

One of the contributors to the chronic underperformance (negative alpha) in the venture asset class is that there has been a remarkable lack of innovation in the venture fund model and funding process itself. According to Professor Tom Nicholas (2019) of Harvard Business School,

> .... the VC industry has been remarkably devoid of organizational innovation (emphasis provided) since Draper Gaither and Anderson (the first venture fund in partnership form) was founded as a limited partnership in 1959. (p. 311)

When the venture due diligence and funding process is contrasted with how securities analysts/portfolio managers conduct their securities research, the lack of professional practices come into proper light; for example,

- the in-person (analog) due diligence process versus data-driven, objective/remote research;
- the general absence of standardized data across companies under consideration for investment or across individual companies over time versus audited, GAAP-compliant financials/10Ks/10Qs, ample research databases, and analytical tools;

[1] In behavioral finance, anchoring (cognitive bias) is a term used to describe an irrational bias toward an arbitrary benchmark figure, previous experiences, or current perceptions.

- weeks or months to complete due diligence versus real-time decision making;
- few requirements for evidence of good corporate governance, transparency, or operational risk controls versus audited, publicly reported financials, and SEC compliance oversight;
- reliance on social capital to source deals versus databases;
- social signals having an outsized influence on investment decisions ("Who else is in the deal?") versus little/no knowledge or interest in who else is buying the stock;
- little or no importance placed on the venture fund's back-office, auditable track record, documented and repeatable investment processes, governance practices, disaster recovery plans, etc., versus SEC audits on said topics of registered investment advisors every five years.

Sequoia Capital Rang the "Innovation Bell"

Finally, Sequoia Capital acknowledged the absence of innovation in the venture model when they announced in October 2021 why they are changing their venture fund strategy:

> Ironically, innovations in venture capital haven't kept pace with the companies we serve. Our industry is still beholden to a rigid 10-year fund cycle pioneered in the 1970s. As chips shrank and software flew to the cloud, *venture capital kept operating on the business equivalent of floppy disks* [emphasis added]. (Boetha 2021)

Innosight Consulting, Clayton Christensen's consulting firm was commissioned in 2021 to study the venture industry (see Parker et al. 2021). Innosight identified four key shifts impacting how portfolios will be architected and managed:

1. *Democratization*: the entry of new investors and startups;
2. *Deal growth*: significant capital being poured into venture capital;
3. *Diversification*: diversity of investments in both type and geography;
4. *Digitization*: the use of data, artificial intelligence, and automation in venture investments.

Their analysis concluded that venture capital firms of the future will move further from the traditional model and will change in the following ways:

- adopting diverse strategies,
- becoming increasingly available to diverse investors,
- becoming more data driven.

Patronage to Apprenticeship—But Not a Profession

Investing in creative or entrepreneurial ventures is part of the human condition and goes back as far as recorded history. The patronage of the Medici family of Florence supported the work of Leonardo de Vinci, Michelangelo, and Galileo. Queen Isabella was essentially a venture capitalist, supporting Christopher Columbus in his exploration of the New World. Many of the critical inflection points in modern history that had dramatic impacts on the human condition resulted from entrepreneurial initiatives supported by wealthy individuals and families. The history of modern venture capital was catalyzed by efforts at mobilizing capital for the many companies

emerging after World War II, in part from both necessity and opportunity—the need to support the GIs returning from the war and the opportunity to commercialize the new technologies that resulted from the war effort.

Unfortunately, the process of underwriting an entrepreneurial venture remains much like it was in the time of Leonardo de Vinci and Columbus: Energetic entrepreneurs convince a supporter (investor) of their vision and seek to share the rewards with the supporter, should there be any rewards to share. Investing was, and largely continues to be, transacted on a case-by-case basis.

The individuals who launched the first firms in the early 1960s essentially invented the industry, because they were figuring it out themselves. These early firms interacted more as a collegial trade than a formally built industry because they knew each other, compared notes, invested together, and generally operated as an apprenticeship model.

There were no (and remain no) academic achievements required to enter the industry, no formal licensing or certification for getting hired, no training, documented processes, or industry oversight/best practices, and no federal or state oversight, to be a general partner of a venture fund, with full discretion over the LP's capital.

Simply stated, the venture capital industry has never been professionalized—which is why the industry has no established body of best practices research, why the National Venture Capital Association (NVCA) has not developed a professional certification curriculum and path, and why institutional consultants and investors have not pressured the venture industry to establish such standards.

PROFESSIONALISM = PROCESS

To steal a quote from Christopher Schelling, chief strategist at Venturi Wealth Management: "Pros construct portfolios, amateurs chase deals."

The conventional venture model relied on the power law to rationalize overly concentrated portfolios, and "hot deal chasing" when basic portfolio management theory emphasizes (non-systematic) risk management through diversification. A study of 500 startups by McClure (2015) and 500 Startups (now 500 Global) defined proper diversification at each of the early funding rounds, where non-systematic risk is the most critical. Based on their work, properly diversified venture portfolios would have the following:

- *Seed Stage*: 100 to 200 companies,
- *A Round*: 60 to 120 companies (60% of the seed round),
- *B Round*: 30 to 30 companies (50% of the A round).

Each company should have the same amount of dollars across the funds at each stage to avoid unconsciously magnifying nonsystematic risks.

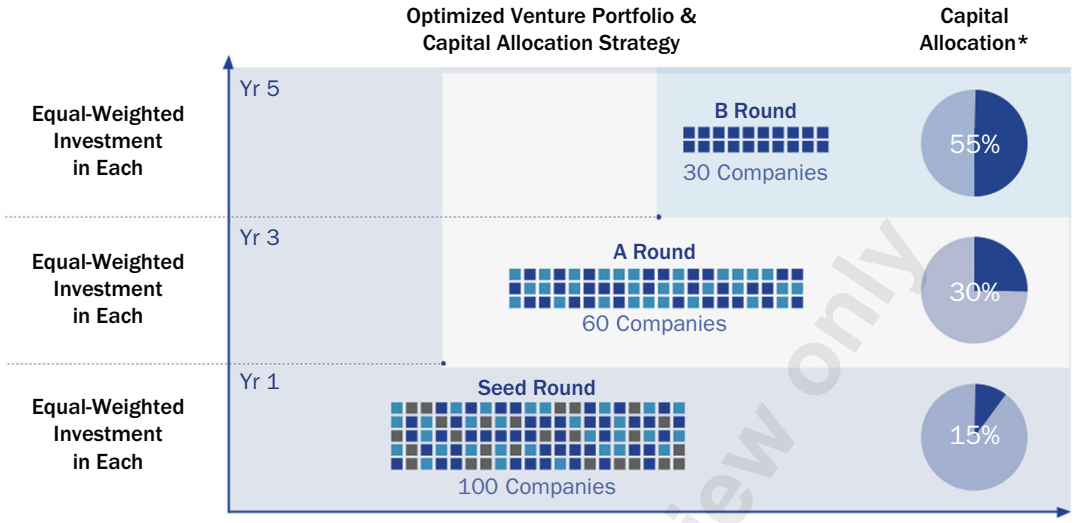
Given the body of work showing that stock picking and/or timing the market (systematic risk) is difficult or nearly impossible with any degree of consistency, we must recognize that managing market/timing/systematic risk in the venture fund context is equally difficult, if not impossible.

Work done by Bill Gross, founder of Idealab (not the PIMCO Bill Gross), shows the number one determining factor for startup success or failure is *timing*.[2] For investors,

[2] See Bill Gross's 2015 TED Talk titled "The Single Biggest Reason Startups Succeed," https://www.ted.com/talks/bill_gross_the_single_biggest_reason_why_start_ups_succeed.

EXHIBIT 1

Optimized Venture Portfolio and Capital Deployment Strategy



NOTES: *The Kelly Criterion Analysis Suggest no more than 15%–20% of capital placed in 'intial bets'.

the way to manage timing or systematic risk is through staged capital deployment—dollar cost averaging. But how much of the LP's capital should be deployed at each stage?

Poker players and statisticians sorted this out years ago, and the economics of gambling and venture capital are similar: If you are wrong (particularly at the seed stage of investing), you lose all your money. A recognized optimization framework that is instructive as to how much investor capital to deploy at each stage of the startup life cycle (or funding round) is called the Kelly Criterion,[3] also referred to as "The Scientific Gambling Method". Another is the Multi-Armed Bandit game theoretical framework. Both seek to optimize capital deployment strategies with multiple rounds of capital deployed when initial "bets" are made with incomplete information. Exhibit 1 illustrates what a multi-round venture strategy, maintaining optimal diversification at each round, would look like.

Relative to the conventional early-stage (Seed to B Round) venture fund strategy that is 60% to 70% of capital deployed over 20–30 companies and 30%–40% held back for follow-on funding of better deals, this model would do the following:

- minimize nonsystematic risk via proper diversification at each round,
- minimize systematic risk via the staged capital deployment,
- maximize the time-weighted and dollar-weighted returns for the investors via the weightings of deployed capital in the later (and presumably) less risky portfolios.

Need for Reporting Standards

To execute this strategy, standardized reporting and performance analytics on the underlying companies would be necessary to inform the selection of the better 60 companies from the Seed portfolio for inclusion in the A Round portfolio, and likewise, to identify the best 30 from the A Round portfolio to populate the B Round portfolio.

[3] Further statistical work using both the Kelly Criterion and Multi-Armed Bandit would be invaluable to optimize the targeted allocations across multiple venture rounds.

The necessity of proper reporting and analytics across all the portfolio holdings remains a material barrier to implementing an optimized portfolio approach to venture investing and is often the reason (or excuse) investors offer for their suboptimal portfolio construction and performance. This barrier is magnified by the necessity to manage another risk, which has a growing audience of practitioners: decision-process risk.

Decision-process risk can be best understood as the degree to which decisions are made with a construct or process that fails to minimize the various cognitive effects, heuristics, and tendencies inherent in decision making as recognized in the field of behavioral economics or behavioral finance. These effects include anchoring, herd behavior, framing effects, narrative fallacy, confirmation bias, familiarity bias, and status quo bias.

Daniel Kahneman was awarded the Nobel Prize in Economics in 2002 for having integrated insights from psychological research into economic science, especially concerning human judgment and decision making under uncertainty. In 2018, Dr. Kahneman was the keynote speaker at the CFA Institute's 71st Annual Conference in Hong Kong, discussing the impact on bias and "noise" in decision making, particularly financial decision making (see Kahneman 2018). Some of his observations included the following: 1) When somebody tells you that they have a strong hunch about a financial event, the safe thing to do is not to believe them. 2) Don't trust people, trust algorithms. 3) Algorithms beat humans about ½ the time, match humans ½ the time. But simple algorithms beat complex ones.

This "simple algorithm" construct is consistent with the conclusions drawn from Malcolm Gladwell's book *Blink*, where studies on multiple industries revealed that the optimal number (it's four) of data points, when processed "in the blink of an eye" by a trained/accomplished professional in the studied field, produced the optimal results for a collection (portfolio) of decisions.

Entrepreneurial Funding Needs Innovation

The elements perpetuating the inefficiencies in entrepreneurial funding that are keeping the cost of equity unnecessarily high for startups (i.e., the length of time it takes to secure sufficient funding and resultant term sheets entrepreneurs accept) are principally: 1) a lack of standardized information from startups covering the relevant operating activities and progress within the private company and 2) an efficient and transparent path to funding.

The JOBS Act of 2012, the first time US federal securities laws were updated since the Securities Act of 1940, was a first attempt to address these elements. Arguments can be made whether they were the best first step. The mere passing of the laws is evidence of the necessity to address these inefficiencies.

Need for Standardized Information as the First Step

Nonstandardized and inefficient access to information, concentrated in few organizations when available, is a principal source of inefficient markets—and rent-seeking behavior. Without standardized reporting from startups, inefficient capital flows to startups will perpetuate the high cost of equity. A simple examination of the efficiencies of the public markets supports this hypothesis.

Imagine if there were not the GAAP accounting standards and SEC-mandated reporting expectations. Standard & Poor's, CapIQ, Bloomberg, ValueLine, and the like, would not exist. Investors would be beholden to opinions from those individuals and firms claiming an information advantage on individual companies and would be charged accordingly. This is in fact the way Wall Street operated—with commensurately high commission and investment banking costs—until technology allowed for more efficient information processing and distribution.

Professionalizing Venture Investing

Milam (2018) not only examined what might have led to the chronic underperformance of venture funds but proffered the following five possible solutions for funds to deliver real (after-tax) alpha: low fees/high hurdle rate, diversified portfolios, transparent/disciplined selection process, managed risk/smart beta strategy, and emphasize after-tax returns (for taxable investors). When looking to the public markets for guidance, these features look more similar to a typical index fund than a typical venture fund.

Low fees. As shown in the Milam (2018) that the typical 2/20 fee structure creates a major impediment to alpha creation due to the J-curve/capital account drawdown for limited partner investors and perverse incentives for general partners to take undue portfolio risk (concentrated portfolios, "potential unicorn" security selection). By simply adopting a lower fee schedule, the GPs would not have as deep of a performance hole to dig out of. This would allow for a high(er) hurdle rate (the annualized preferred return distributed to investors before the carried interest/profit participation is calculated), thereby improving the odds for a reasonable risk-adjusted return for LPs.

Diversified portfolios. Because of the perverse incentives, the lack of standardized reporting from startups, and the syndicate/co-investment nature of the industry, venture capital funds tend to concentrate their capital, neglecting the fundamental benefits of diversification.

Transparent/disciplined selection process. A transparent, disciplined selection process would seem obviously (and maybe not so obviously) a necessary component to optimize outcomes for the three constituents in the venture funding ecosystem: startups, investors, and fund managers. For startups, the inconsistent expectations and fluid milestones necessary to attract funding are a major cause of the unnecessarily high cost of equity. For investors, performance metrics could finally be compared with relevant benchmarks to calculate risk and return. "Style boxes" could be created, fund profiles could be applied, and manager skill could be measured.

Managed risk/smart beta strategy. The goal of properly diversifying portfolios is to mitigate the nonsystemic, company-specific risks at the fund level. The next level of proper risk management once transparency and discipline are also embraced is defining the actual security selection strategy. Again, taking a lesson from the public markets, it is clear that "stock picking" doesn't outperform benchmarks or indices over time. Just as most venture firms don't outperform the Russell 2000 over material time periods. And given that the commonly accepted principal reason startups succeed and fail is *timing* (or when asking long-time, successful venture capitalists, *luck*), trying to pick winners is simply not an equation for success.

Smart beta/multifactor filtering represents a more scalable method to deploy more capital quicker, it also insulates the portfolio from the inherent biases of the fund managers (e.g., fear of missing out or FOMO, syndicate/club deals, the next big thing,). Simply stated, nobody knows what a good deal looks like until after the fact. But there is an opportunity for pattern fit of bad deals, as there is ample data to examine on many companies, many times perceived and funded as hot deals that failed, sometimes spectacularly.

By defining those necessary milestones and character traits of "not bad deals" given the stage of the life cycle of the startup, investors can manage the beta of the portfolio instead of relying on their fund getting lucky.

Emphasize after-tax returns. While institutional investors don't need to care about the tax implications of investment decisions, individuals should. Unfortunately, most don't, or can't, in the venture asset class. The two tax laws that lower the after-tax risks and raise the after-tax returns of venture investing for individual investors have been grossly (and egregiously) overlooked and underutilized.

Qualified Small Business Stock (QSBS) treatment under Section 1244 of the IRS Code allows for losses taken by individual investors (when investing under their individual tax id/SSN) to be deducted against ordinary income, and the deduction is above the Adjusted Gross Income line. This means the losses are a better write-off than an equivalent charitable contribution.

Read that again. To qualify as a Sec. 1244 allowable deduction, the company is required to be a C Corp., and the investment has to have been part of the first $1 million of outside investment, and the term sheet has to be equity-like. QSBS treatment under Sec. 1202 allows for the following:

- Gains from exit proceeds to be 100% tax free for the first $10 million of profits, or 10x the cost basis, per individual investor with a five-year holding period on their investment.
- Gains from exit proceeds not held for five years can be rolled over into another 1202-qualified term sheet (just like 1244, but for later rounds of financing) *pre-tax* under a 1045 exchange.

Why more investors don't utilize these laws is a mystery.

There is little knowledge sharing on these laws from the organizations advising angel investors or the organizations helping startups get funding, such as incubators, accelerators, crowdfunding platforms, or investment bankers/fundraisers. Nor are most venture firms tracking the implications of these tax laws on their portfolio companies and reporting it on the K-1s for their taxable LPs that could utilize either 1244, 1202, or both. This is potentially in violation of the governing principles of general partnerships: to report all relevant tax implications that result from their investment activities on behalf of their limited partners.

WHAT THE FUTURE OF ENTREPRENEURIAL FINANCE COULD LOOK LIKE

What if entrepreneurs had an efficient way to deliver timely operating information to a wide audience of existing and potential investors, even those elusive family offices? Moreover, what if entrepreneurs knew those updates were standardized around relevant and objective operating milestones that 1) elevated the credibility of the CEO, 2) enhanced the value of the business, 3) helped the CEO execute better, and 4) were rewarded for their professionalism and transparency with easier access to initial and/or follow-on funding. The cost of equity would clearly decline.

What if investors had 1) access to a venture fund that *actually* managed portfolio risk using institutionally rigorous diversification and security selection strategies; 2) confidence the activities of the fund were optimizing use of the tax laws that lower the after-tax risks, making profits potentially tax free, and the fund was properly reporting those implications; and (3) complete transparency into the portfolio, such that if individual companies within the portfolio were executing particularly well, the investor would have the chance to invest additional capital. Then investors would have an opportunity to invest confidently across multiple themes, including their geographic location (place-based impact investing), new technologies (internet of things, artificial intelligence, blockchain), and conventional diversity and inclusion or impact/sustainable development goals criteria. More capital could be mobilized to fill the funding gap facing startups around the country. These investors would be rewarded for the enlightened nature of their strategy and motivation, recognized as civic leaders and smart investors.

Entrepreneurs would have an efficient, objective, merit-based path to funding. The cost of equity/equity risk premium would decline, and the efficient frontier on the asset class would move "up and to the left."

SUMMARY

The very manner in which we fund innovation is finally innovating. The logic—and benefits—of proper risk management have not permeated the conventional narrative on venture fund management. This is due in part to the absence of any best practices library, professional training or certification requirements, as well as no continuing education expectations placed on aspiring or existing general partners at venture firms. The direction the innovation takes would benefit from the lessons learned by professionals managing portfolios in the public markets. Managing risk—all risk—matters. Diversification is important. Staged capital deployment is critical to manage systematic (timing) risk, given that timing is the number-one contributing factor to an entrepreneur's success. But managing all risks properly, including decision process risk, requires quality, standardized information on startups. Should entrepreneurs communicate better, and should investors invest better, how we fund innovation, and the resulting wealth creation will improve—for all.

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