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How does a marketplace start up initiate the demand and supply side to achieve network effects?

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Abstract

The evolution of consumption has evolved over the time, and so have consumer habits. Over the last two decades, the volume and variety of online markets has been staggering, and it is now a must-have for almost any type of company providing services or products. These marketplaces are changing people's lives, pushing the boundaries of traditional businesses, and reshaping how startups raise funds to develop new projects within their organizations. Online marketplaces must then be carefully designed in order to fully realize their potential. However, every new business entering a market faces a significant challenge in determining how to generate demand and supply on a platform in order to achieve long-term stability and operational success.

Keywords: marketplaces, networks, liquidity, supply, demand, decentralization, blockchain, metrics.

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Introduction

The internet has altered everything. In just 30 years, the Internet has become so widespread that it's difficult to recall how things were done before. This is especially true when it comes to the exchange of goods and services. Two centuries ago, the marketplace was strictly a local affair. Artists and farmers brought their products to the local market to sell. However, when the marketplace went online, it shattered the very concept of local and global. With a few clicks, you can now buy anything and vendors have unlocked unprecedented access to a global audience. The online marketplace connects buyers and sellers in ways that were previously unimaginable making the marketplace business model attractive to a large number of entrepreneurs. W When a marketplace works properly, it can unlock a flywheel effect that at scale can found high potential for long-term profits making it difficult for others to compete. However, many entrepreneurs have discovered that it is difficult to bring the virtuous cycle of supply and demand to reach the desired liquidity. Some previous examples include eBay's launch in 1995, which sparked the first wave of product-focused marketplaces, and Uber's success in 2010 which sparked a second wave of marketplaces for product and services combinations. Nowadays, we are now on the verge of a third wave of information marketplaces powered by blockchain technology._For the purpose of this research, we are going to take as real case the company Molecule, which connects life sciences research projects to funding with the help of blockchain technology to overcome various barriers that appear on the pharmaceutical industry.

What defines a marketplace

"Per definition, a marketplace is a place where buyers and sellers meet to conduct commerce. In the online setting, that definition still holds true — online marketplaces give buyers a choice in what they would like to buy and sellers a variety of people to sell to. In recent years, the definition of a marketplace has stretched to include on-demand models that are considered marketplaces because of the independent contractor relationship on the seller side." (Golden, 2018) Every marketplace is fundamentally the same. On one side, there is a seller/supply and on the other side, there is a buyer/demand side. Then the marketplace serves as an intermediary between these two parties, however, marketplaces differ in how they handle transactions and engage their seller and buyer's communities. Marketplaces are having tremendous influence, they are reshaping our economy by altering how goods and services are discovered, priced, and delivered. They provide services ranging from digital goods, food deliveries, temporary accommodation and so on. Marketplace startups are unique in that they don't only meet the needs of a single customer segment, instead they bring together buyers and sellers, service providers and customers while making sure that users have a positive experience with one another as well as with the company.

Platforms

To complement we have to come up with what platforms business are, and as Bill Gates said "A platform is when the economic value of everybody that uses it exceeds the value of the company that creates it." (Hagiu, 2021) Platforms can be one sided, or they can be multi sided. They enable direct interactions between the affiliated costumers. For example, eBay makes it easy for buyers and sellers to find each other and trade directly without a lot of involvement on eBays side. This holds true for other online marketplaces like the Chinese company Tmall connecting consumers and merchants, an App Store linking consumers and developers or different business with local governments and even investors and firms like Kickstarter does. Molecule, brings together researchers at universities, biotech startups, and others to collaborate with patient collectives, well established biotech or pharmaceutical companies, VCs, investment funds and many more who would like to take part on the different projects available in the platform. Molecule is one of the first organizations that aims to get research dollars in the hands of scientists with the help of web3 funding mechanisms, rather than going through all the bureaucracy that they had to go in the present days and cutting out some profit seeking enterprises that are in between.

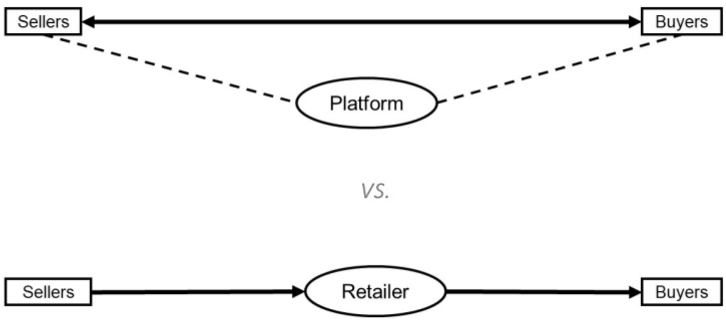
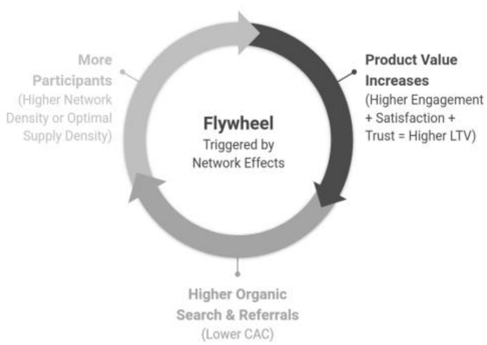


Figure 1: Direct interactions, (Wright, 2021)

Two of the most important features we encounter on marketplaces are;
First, *network effects*, where the more costumers join the platform the greater the value for the other participants who are already in, consequently making more costumers join the platform. Second, *value creation* is made through direct interactions between customers, making platforms have low-cost structures. Thus, the combination of these two factors generates enormous leverage and that’s primary reason for today's successful digital platform businesses along with unparalleled *scale*, *growth*, and *defensibility*.



How to grow a marketplace

Network effects

But what exactly are *network effects*, “It’s more than just a large number of users using a network. Network effects kick in when the value of a product depends on how many other users there are. When a new user is added to the network, it increases the value of the product or service to all other users. This increased value can come in the form of cost reduction in user acquisition as an example, higher liquidity in a marketplace, stronger community or deeper relationships in social networks etc.” (Tran, Webster, and Wertz, 2020) In Molecule's case, the more research projects are uploaded, the more investors will visit Molecule to discover and fund projects and vice versa. It is therefore mission-critical for the Molecule team, to cold start the supply side and make Molecule attractive for investors. Therefore, the Molecule team works on automated license agreements and onboarding processes for researchers and technology transfer offices (TTOs).

Figure 3: What are network effects? (CFI, 2019)

Direct and Indirect Network effects

In general, network effects are divided into two types: *direct and indirect.* The most basic network effects are *direct*: an increase in usage directly leads to an increase in value for all other users. *Indirect* network effects occur when more people use a product or network, stimulating the creation of complementary products and goods while elevating the value of the original product. A common example is the relationship between hardware and software: the more people who use a hardware product, the more likely it is that developers will create software and apps for that type of hardware. Marketplaces can also experience indirect network effects when a myriad of services springs up to support popular platforms, some developers frequently build applications and products on top of an existing marketplace and platform APIs (Application Programming Interfaces). An advice when building your marketplace is to don't fall by confusing network effects with virality. We have *virality* when information can be shared quickly and widely from one user to another, or when the rate of adoption increases with implementation. In other words, as more users adopt the product, its growth accelerates to a certain limit. While the type of marketplace influences virality, network effects are critical to scaling and sustaining a marketplace. Start considering how users benefit each time someone else participates, and whether this benefit is direct or indirect. Understanding how network effects can affect your startup brings you one step closer to developing a more robust product. We can consider that Molecule is using global network effects, as any person with a research project aiming to solve a medical issue can apply to publish his/her work on the platform, making it available for all participants around the world to work together and to accelerate the process of bringing novel therapeutics to patients. In that sense, communities that really care about seeing a drug come to market have a way to finance that therapeutic and help govern how it's addressed and how it's developed, so at the end drugs that wouldn't be discovered or developed have a higher chance to come to market.

Liquidity Drivers

To maximize the return on marketing investment, we have to align the marketing and liquidity strategies, so we can monitor their evolution. "We define *liquidity* as the number of transactions filled out of the total potential transactions in a marketplace. We refer to *density* as the number of participants within a certain geographic area." (Borja, 2017)

Density and *liquidity* have a strong relationship. The greater the number of participants within a relevant radius, the greater the marketplace's liquidity. Transactions will go unfilled if a marketplace does not have the right number of buyers per listing or the right number of items listed per buyer. An analysis of a balanced marketplace in terms of demand and supply can help, and we can look at some ratios, for example;

- The average number of buyers relative to the number of sellers required to complete a transaction,
- Number of bids required per buyer to complete a transaction and,
- The average number of items listed per seller required to complete a transaction.

Problems, challenges and strategies to solve them

Chicken and egg problem / Cold Start

One of the most common drawbacks to overcome is the *chicken-and-egg problem* of marketplaces also known as *Cold Start*. The use of network effects is a two-edged sword. On one hand, they are the primary source of *exponential growth* and *market defensibility*. However, this occurs only once the marketplace has gathered a critical mass of users on both sides, and getting those early users is significantly more difficult than for conventional enterprises. Indeed, the marketplace's entire value proposition for buyers is that it allows them to discover vendors, and vice versa for sellers. Buyers have no motivation to join if there are no vendors, and merchants have no reason to join if there are no buyers. This is where the chicken-and-egg dilemma arises.

Figure 4: Overcoming the Chicken and Egg problem, (Chekalin, 2019)

Solutions

So then, how does a newly created startup like Molecule will be able to overcome this issue? One of the many strategies is to *start seeding a marketplace by aggregating supply.* In most circumstances, it's beneficial to prioritize supply first, this is due to the fact that there is a stronger incentive for vendors to devote their time for broader distribution in the early days. Customers have little incentive to come without any inventory. In a world of plentiful supply, the only true difference is a trusted relationship with demand.

One of the best ways to start this is to *aggregate supply* with the next 5 approaches:

- *Identify unique inventory;* The benefit of focusing on unique inventory is that once providers are aware of your site, it won't take much work to persuade them to join. Furthermore, these types of merchants will generally bring some of their own consumers, assisting you in expanding your customer base at the same time.
- *Convince existing sellers to list on your platform;* if your potential suppliers already have an online presence, you'll have to be more imaginative and expend more effort to persuade them to join your new marketplace.

- *Bring customers to a provider;* one of the simplest methods to establish early liquidity is to approach a provider with a customer opportunity already in hand.
- *Pay for inventory;* artificially producing supply improves the way the market functions from the start. It's a quick way to collect inventory in the early stages, but it's not scalable as it quickly becomes expensive.
- *Capitalize on referrals and brand ambassadors;* You can encourage your current supply to refer new supply. But ambassadors referring users on the ground are key to a launch strategy.

As we can observe there is no one size fits all solution and in the same way there are other types of strategies to *aggregate demand* into a marketplace taking into consideration size, frequency and geographic characteristics.

- *Word of mouth;* Nothing surpasses an unsolicited referral from a trustworthy friend to another. This is also the most sustainable growth approach because there are no upfront costs.
- *Referrals and brand ambassadors;* as mentioned before, these programs offer double value by referring a friend to sign up, so both can get a reward.
- *Offer value in single player mode;* providing a tool that offers a lot of value to users in single player mode, turns into more value as the network grows around it.
- *SEO and performance marketing;* Once you've identified a specific consumer segment for whom you're solving a specific problem, the challenge becomes locating that customer online. Search Engine Optimization is a fantastic long-term tool, but it must be updated on a regular basis. Paid marketing is the most straightforward, but it can be prohibitively expensive for long-term growth. Early rounds of SEO optimization and paid growth, may be useful starting moves to kickstart a flywheel.

- *Create a brand and mailing list;* The most difficult thing to create is trust in a brand, it may make sense to start cultivating those ties before creating a marketplace.

Mailing lists, blogs, or podcasts that distributes free and valuable information linked to a customer's pain point is one of the most successful methods to do this. In final consideration, the basic line is that if you are creating a marketplace, you must create a successful supply-side strategy, therefore, for any new market, is crucial to find the correct business model to break into an established industry. Any newcomer should focus on the incumbent's most significant weakness, which will vary depending on the situation. Some strategies our partner Molecule did was to leverage with twitter and influencers marketing to drive attention to the project. And to kickstart the organization VitaDAO, they conducted an interview with the founder of Ethereum Vitalik Buterin, who was considered one of the most influential persons in 2021 by Time Magazine and Aubrey de Grey, a well-known author in the longevity space. Further, they host some conferences and workshops.

Web3 incentives to overcome the chicken and egg problem

Token Based Acquisition

Web3 and tokens offer an alternative to approach the chicken and egg problem in the way they can bootstrap new networks. Instead of allocating big amounts of money to old marketing strategies in order to acquire possible new costumers, nowadays developers can use those issued tokens to bring out users in early stages. Early users can get benefitted and rewarded for their contributions even when the network effects aren't manifesting yet. In the same way the early participants of your platform are acting as propagandist in how they are bringing more people into the network as those who want to enter want also to be remunerated for their early contributions. This is one reason pioneers for any platform in web3 are considered more powerful than those that are involved more in standard web2 businesses.

Social Communities

Organizations need to clarify the reason of their existence. Today's focus shouldn't be only on how to raise money to achieve its ends, but more on answering what they try to solve and on how to build a strong and engaged community. For DAOs that share the same culture and purpose, a strategy to get into the market is building a community around it and grow it organically by locating believers of the same purpose and diminishing the lines that separate owners, stakeholders and users. What differentiates these communities to the ones build around Web2, is that they need to be considerably more specific about how they plan to achieve a goal from the top to the down levels. Aim is crucial in a web3 model, but the techniques, on how finances will be used, the product roadmap, and the schedule, are normally determined at a later time. In the end what grants long term success is a clear purpose, an involved high-quality community and fit the organizations governance to that community purpose and governance.

Airdrops

"An airdrop is when a project distributes tokens to users to reward certain behavior that the project wants to incentivize, including testing the network or protocol. These can be distributed to all existing addresses on a given blockchain network, or targeted (such as to specific key influencers); often, they are used to solve the cold start problem — to bootstrap early adoption, award or incent early users, and more". (Hsu, 2022) Airdrops are a proactive way to generate acknowledgement for a new project, motivating people to have a look on it and at the same time get paid for their participation. Other type of stimulus comes in the form of grants to developers, similar as the airdrops these are targeted to people contributing to improve the protocol the platform is using, enduring the overall protocol success.

Success Factors

Following this further, to answer the question, which is the best market to fit your market place? We have to consider other factors to evaluate how successful a digital marketplace can be.

- Total Available Market - Evaluate the size of the market opportunity and take in consideration the proportion of the market that is likely to use another online alternative. A TAM analysis must be combined with the likelihood of market success and penetration.
- *New Experience* – Great marketplaces use connections to provide the costumer a new user experience that wasn't possible prior the arrival of a new intermediary.
- *Technology* – Because the marketplace also functions as a work-flow mechanism, technology improves experience for all parties, reducing the amount of work for participants while also increasing switching costs.
- *Improved Economic Benefits* – some models support buyers in obtaining a less expensive options while also offering a brand-new economic benefit to the business. Both parties enjoy a financial benefit also by creating money that did not exist previous the creation of your marketplace.
- *Fragmentation* – High levels of buyer and supplier fragmentation are beneficial to an online marketplace. Concentrated supplier or purchase base will be more cautious to welcome new intermediaries into the market.
- *Frequency* - Higher frequency is obviously preferable. Many failed marketplaces target purchasing cycles that are simply far too infrequent, making brand awareness and word-of-mouth customer growth far more difficult.
- *Efficiency* – in order to expand the market and create value we have to make it easier for

buyers and sellers to connect and complete transactions. Some of the best marketplaces can attract new participants and increase the overall number of transactions.

Marketplace structure

Now there are a few underlying questions, who your market players are? Are they individuals, small enterprises, or giant corporations? How much of the marketplace experience should be made by the provider, how much should be created by the user? In every area of the marketplace, decide if the user should shape the experience. It is decentralized if the user does the job, and it is centralized if the platform does the task. At a high level, decentralization provides speed, but at the expense of an uneven and potentially bad user experience. Two examples: "eBay centralizing customer support and payments and decentralizing everything else, including ratings, reviews, photos, pricing, and transaction terms. And there is UBER the platform determines pricing, not the driver, plus the platform centralizes payments, driver verification, vehicle location, transaction terms, and customer support. On the side of Molecule, they are building a bridge to fill the gap between universities and biopharma by creating an exchange of biotech intellectual property assets and providing the ability to market assets to be appreciable by biopharma companies. To onboard researchers, Molecule takes the centralized route and provides them assistance, for example through pre-drafted legal agreements, price discovery mechanisms, a modern curated UI and design assets.

Finding the right business model

Many entrepreneurs have a great idea for a marketplace but fail to find the right business model to turn their activity into profits. The difficult part of monetizing a marketplace is that buyers and sellers want to complete transactions with one another, and fees add friction to the process.

Whenever possible, whichever party is charged a fee will try to conduct the transaction off-platform. Finding the best business model is entirely dependent on the characteristics of your market. If customers are comfortable buying in the marketplace with little tradeoffs, seller transaction fees are most likely the best option. Most marketplaces charge their sellers fees in the form of listing fees, lead generation fees, or transaction fees. *Listing fees* make more sense if the marketplace functions solely as a classifieds site with no transactions. Then we have *transaction fees* that motivate more suppliers to enlist in the platform, increasing its liquidity of supply for two reasons. First, removing the upfront fee makes it easier to join, and second, charging only when a sale is made reduces the supplier's risk of losing money. A transaction fee model scales well because the more sales your platform produces, the more revenue you generate. Listing fees, on the other hand, could have the opposite effect, charging suppliers to list on your website will inevitably deter some from doing so. A freemium model works best for businesses that serve a large market even if only a small proportion of suppliers pay for additional seller services, the base is large enough to support the business. While most marketplaces charge sellers a fee, a few charge buyers a subscription fee. This strategy can limit the number of potential customers who join your site. To persuade customers to pay a subscription fee in order to purchase a product or service, your value proposition must be extremely compelling. Additionally, companies acting as marketplaces or exchanges can generate revenues with “Takes” that normally are a fee or a percentage of the transaction made, businesses like Amazon or eBay utilize this model. For companies using “Takes”, its revenues come from increasing the listings and the number of users on their platform that would lead to a bigger volume of transactions, filling the marketplace with more variety and liquidity. A feature Web3 marketplaces has made possible is the possibility to obtain royalty distributions to the creators of content and this can occur thanks to usage of smart contracts that can encode a percentage of the deal upfront, allowing creators to keep earning percentages from secondary sales they could have. This feature also acts as a solution to the cold start problem because creators are incentivized to become promoters of the same marketplace they are involved.

Marketplace trends

Specialization

Specializing in a product or service has always been a great approach for gaining competitive advantage. Indeed, digital platforms, through their algorithms and rating systems, make it much easier for consumers to find their ideal product. They also greatly expand a seller's reach by breaking down geographical barriers and accumulating very large user bases. Taken together, these characteristics imply that the returns on becoming the highest-quality or lowest-cost provider in a narrowly defined product or service category are significantly higher for sellers who conduct business on platforms than for those who do not. Platforms, in other words, reward *hyper-specialization* through a self-reinforcing cycle. The more closely a product matches what customers are looking for, the higher its ratings, increasing the likelihood that the platform's algorithms will direct target customers to it. This means that more customers will buy and rate the product, ramping up its value even further. True, this cycle operates to some extent outside of platforms via search results and possibly ratings on specialized sites, but centralized platforms end up making it far more powerful. This explains why large platforms have allowed product, services and content niches to emerge and succeed, which previously would not have been viable. “Hyper-specialization is part of a more general trend that has arisen due to the power and reach of the Internet. It is the reason behind Kevin Kelly’s 1000 true fans concept, that every kind of quirky creator becomes viable because all they need is 1000 true fans somewhere in the world.” (Wright, 2021) Because of the Internet, these fans can discover and pay for the creator's creations from wherever they are. The point is that platforms that aggregate users and aid in discovery greatly amplify this process, increasing the rewards for hyper-specialization for their participants.

Blockchain built-in Marketplaces

Another topic is the introduction of marketplaces built on blockchain and the usage of smart contracts. That have changed the way regular firms used to be organized, replacing the principal-agent problems between investors and managers and manager with employees.

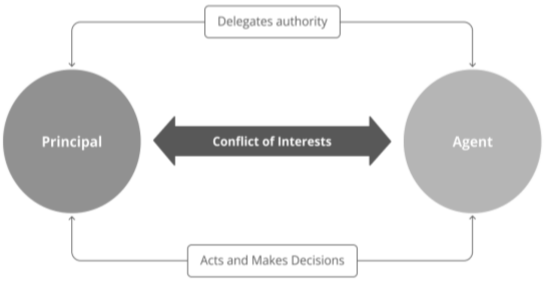


Figure 5: Principal Agent Problem, (Cointelegraph, 2022)

Decentralized platforms

Newly created decentralized platforms or Decentralized Autonomous Organizations (DAOs), solve issues regarding how traditional centralized platforms and marketplaces manage the introduction of additional fees, changes in governance rules and their rules reinforcement. In contrast, decentralized platforms can commit to clear and transparent design and governance rules that can only be altered in limited ways through majority of voting. Other matter in question is how centralized platforms used to align its incentives between founders and employees often issuing equity. Decentralized platforms on the other way can use tokens for a similar role, this is due to the fact that tokens can be distributed to a much broader range of stakeholders, including users and developers, not only employees. The ability to hold tokens and vote in governance elections can facilitate the formation of vibrant communities, encouraging stakeholders to invest time and resources to improve and promote the platform's long-term interests. For example, this could be one solution to the typical chicken-and-egg problem of launching a marketplace. At a high level, there are two major conditions that create a particularly favorable environment for the success of decentralized platforms: The first, a market in which network effects push winner-take-all competition among platforms will have a high risk that users will be exploited by the winning platform, via higher fees or the adverse changes in governance rules. This makes decentralized platforms especially attractive to potential users, especially if they are capable at addressing the implicit chicken and egg problem. And secondly a platform where participants have similar preferences and interests. Evidently, there are numerous reasons why people may seek decentralization, including a strong aversion to any form of censorship, a strong preference for transparency, and a strong preference for transaction security. Blockchains and smart contracts enable unprecedented decentralization while also allowing for monetization, which was a challenge for previous centralized platforms. As we can see a decentralized model manifest to be more suitable for several types of business. Acting as a decentralized platform, Molecule is democratizing ownership, financing and governance processes with pioneering approaches to fractionalize and decentralize IP data. At the same time they creating liquid IP markets with the help of AMM (autonomous market makers) and DeFi (decentralized finance).

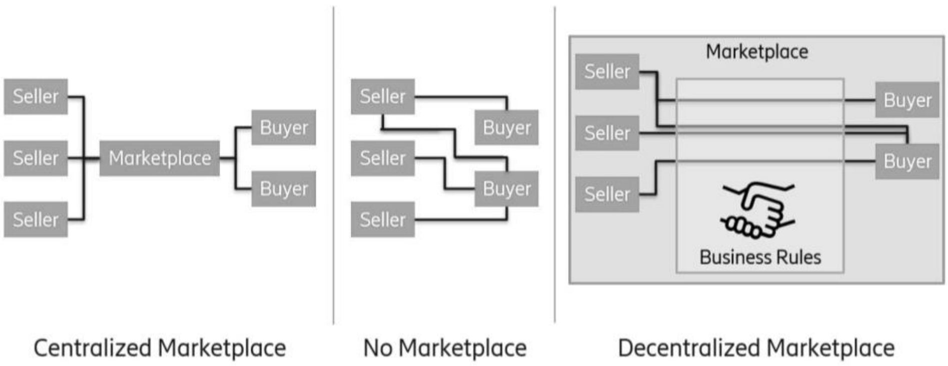


Figure 6: Designing a marketplace, (Robert, 2020)

Marketplace metrics

“Network effects are one of the most important dynamics in software and marketplace businesses. But they’re often spoken of in a binary way: either you have them, or you don’t. In practice, most companies’ network effects are much more complex, falling along a spectrum of different types and strengths. They’re also dynamic and evolve as product, users, and competition changes.” (Jin, 2018) It’s crucial to understand where the network effects of your company are coming from, as well as the metrics that will allow you to comprehend what is working and what isn’t. there is no solution that fits all, all network effects are unique and can change depending on the type of product, the targeted audience and the conditions. A way of measuring success for web3 marketplaces is using several metrics like TLV (Total Value Locked) that represents any form of assets using a network or a protocol. Other critical metrics we can mention are the number of token holders and the community engagement measured by frequency and opinions. DAOs can also measure its engagement with the number of members they have active, the ones that attend calls, participate in its governance and are actually having work being done.

Conclusion

Every business faces some form of the "cold start problem": How do you start from scratch? How do you get customers? How do you generate network effects that encourage more customers to sign up? In a nutshell, how do you "go to market" and persuade potential customers to spend their money, time, and attention on your product or service? Most organizations' response in the web2 era of the Internet was defined by large centralized products and services in which the vast majority of value accrued to the platform itself rather than to the users. Then a significant amount of investment in sales and marketing was required as part of the traditional go-to-market strategy, which focuses on generating leads and acquiring and retaining customers. However, in recent years, a new organizational building model has emerged. Rather than being controlled by corporations with centralized leadership making all product or service decisions, this new model leverages decentralized technologies and empowers users to be owners through tokens or other digital assets. While some traditional customer acquisition frameworks remain relevant, the introduction of tokens or NFTs, as well as novel organizational structures such as DAOs, has altered how these new types of companies can approach different go-to-market strategies. Decentralized technologies are changing the way we work, interact and collaborate. One of the primary changes we have seen from web2 to web3 is really the strength of communities and how people are able to organize around a common goal and achieve something that wouldn't be possible by a single company, Molecule is really playing into this idea of leveraging a decentralized future, they see a future where academics researchers and patient communities come together to develop therapeutics that can be funded and brought to market without the interference of a pharmaceutical company. At the intersection of different industries lies the opportunity to have ground breaking innovation, for Molecule is by combing the health sector with technology. Creating a big opportunity to disrupt the industries of health care and blockchain together to have a greater impact on the world. Molecule is one of the first organizations that is actually making it easier to get research dollars in the hands of scientist, rather than going through all the bureaucracy they had went and disintermediating the interface between patients and all the profit seeking enterprises that are in between. Research has to be tokenized and DAOs around research are an amazing way to move forward, making it interoperable. The future of life science research will be driven by open, liquid markets for intellectual property powered by web3 technology.

Resources

Tran, Angela, Max Webster, and Boris Wertz. *A Guide to Marketplaces*. 3rd ed. San Francisco, California: Version One Ventures, 2020.

Golden, Jonathan. "Four Questions Every Marketplace Startup Should Be Able to Answer | by Jonathan Golden | Medium." Medium. medium.com, August 31, 2018. https://medium.com/@jgolden/four-questions-every-marketplace-startup-should-be-able-to-answer-defb0590e049.

Hagiu, Andrei. "What Are Platform Businesses?" What are platform businesses? platformchronicles.substack.com, January 26, 2021. https://platformchronicles.substack.com/p/what-are-platform-businesses?s=r.

Hagiu, Andrei. "Seven Questions to Evaluate Network Effect Moats." Seven questions to evaluate network effect moats. platformchronicles.substack.com, December 2, 2020. https://platformchronicles.substack.com/p/network-effects-and-defensibility?s=r.

Hagiu, Andrei. "The Chicken-and-Egg Problem of Marketplaces." The chicken-and-egg problem of marketplaces. platformchronicles.substack.com, October 19, 2021. https://platformchronicles.substack.com/p/the-chicken-and-egg-problem-of-marketplaces?s=r.
Rothman, Simon. "How to Structure A Marketplace – TechCrunch." TechCrunch. techcrunch.com, August 19, 2020. https://techcrunch.com/2012/08/19/how-to-structure-a-marketplace/?guccounter=1.

Wright, Julian. "Why Platforms Reward Hyper-Specialization." Why platforms reward hyper-specialization. platformchronicles.substack.com, September 7, 2021. https://platformchronicles.substack.com/p/why-platforms-reward-hyper-specialization?s=r.

Brasoveanu, Andrei. "10 Marketplace KPIs That Matter. Marketplaces Are Incredibly Powerful… | by Andrei Brasoveanu | Medium." Medium. medium.com, October 24, 2016. https://medium.com/@algovc/10-marketplace-kpis-that-matter-22e0fd2d2779.

Moreno, Borja. "Marketplace Liquidity – TechCrunch." TechCrunch. techcrunch.com, July 11, 2016. https://techcrunch.com/2017/07/11/marketplace-liquidity/.
Chekalin, Dmitry. "How to Attract New Users to Your Online Marketplace: 7 Smart Strategies." Medium. medium.com, August 5, 2019. https://medium.com/codica/how-to-attract-new-users-to-your-online-marketplace-7-smart-strategies-3b40a94f0ca6.

Boris, Angela. "Marketplace KPI Dashboard - Version One." Version One. versionone.vc, July 13, 2015. https://versionone.vc/marketplace-kpi/.

cointelegraph. "DAO Es El Gran Concepto Para 2022 Que Transformará Muchas Industrias." Cointelegraph. es.cointelegraph.com, February 27, 2022. https://es.cointelegraph.com/news/dao-is-the-major-concept-for-2022-that-will-disrupt-many-industries.

Jin, Li. “How To Measure Network Effects | Future.” Future. future.a16z.com, December 14, 2018. https://future.a16z.com/how-to-measure-network-effects/.

Hsu, Maggie. “Go-to-Market in Web3: New Mindsets, Tactics, Metrics | Future.” Future. future.a16z.com, February 4, 2022. https://future.a16z.com/go-to-market-in-web3/.