

# Eyes and Orders: On Crypto Front-ends

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Web3 front-ends provide 2 services. They allow users to read from the blockchain

and to write to the blockchain

. Front-ends can monetize from both reads and writes.

Historically, we have been skeptical about the value capture of front-ends. Their primary challenge is their limited differentiation; every front-end is a different lens on the same shared back-end.

The switching costs between front-ends are low: users merely need to import their private key into another wallet or sign into another web app; all their information is preserved on the universal back-end. This gives users significant leverage over their front-ends, driving prices toward zero as they compete for users. Similarly, block explorers and analytics platforms pull data from a shared and transparent back-end. The back-end data can be displayed in various ways, but it is difficult to sustain an order-of-magnitude better UX than competitors with shared infrastructure.

These arguments have merit. However, we believe their conclusion — that front-ends will not accrue defensible value — is mistaken. On the contrary, we expect that front-ends will become some of the most valuable businesses in Web3

. Our conviction has been shaped by following new developments in the transaction supply chain, monitoring the latest innovations in front-end UX, and observing user behavior.

## Payment-for-Order-Flow

Prior to Flashbots and The Merge, MEV was a quiet, shadowy corner of Ethereum, only known to the select searchers and miners who extracted it. Flashbots was created to shed light on the industry, increase its competitiveness, and ensure the fair distribution of MEV revenue. As the MEV industry progressed, a [supply chain](#) emerged to facilitate better extraction and execution. Driven by proposer-builder separation, the supply chain outlined the intermediaries involved between a user and their transaction landing on-chain. In theory, each intermediary has an opportunity to extract value.

Over the next few years, this supply chain will morph into a more complex web of intermediaries as MEV extraction specializes.

While the [amount of MEV is not zero-sum](#) and indeed is expected to grow with on-chain activity, the distribution of that MEV across entities in the transaction supply network is zero-sum. Since the merge, most MEV has been accumulated by validators. In perfect competition, searchers and builders must bid up their entire profits to the validator to have their bundles and blocks included.

To sustain profits, searchers and builders have sought exclusive orderflow to give them [acompetitive advantage](#) over their peers. The effects of exclusive orderflow are most visible by comparing the profits of integrated builders (i.e. searcher-builders) like BeaverBuild and Rsync against neutral builders.

While integrated builders have been lucrative businesses, relayers are not. Indeed, Blocknative recently sunsetted their relayer and neutral blockbuilder, [citing](#) their lack of economic sustainability. Relayer incentivization remains an [open research area](#). What explains this difference in value capture?

The primary factor that determines which entities capture value in the transaction supply network is exclusivity.

Integrated builders capture value because they create exclusive orderflow. Validators capture MEV because of their exclusive ability to propose the next block. Relayers do not capture value because of their lack of exclusivity.

Flashbots arose to solve the issues inherent in MEV extraction, including the systematic exploitation of users via sandwiching and other economic attacks. To address this, they introduced [MEV-Share](#) to shift MEV away from the middlemen and validators, and toward the users and wallets who generate it. This is done through orderflow auctions (OFAs). Front-ends can direct their orderflow to these auctions, where searchers bid on the orderflow. Auction revenue is

then returned to the originator of the transaction. With orderflow auctions (OFAs) and MEV-aware front-ends, MEV will shift toward the front-end and user. [SUAVE](#) will accelerate this trend. Intent-centric protocols like [UniswapX](#) also shift MEV to the end user via auctions amongst solvers who compete on providing the best execution price, thereby returning MEV to users through price improvement.

Beyond the UX and ethical arguments for returning MEV to the user, front-ends have inherent leverage in the transaction supply network: all front-end orderflow is exclusive by definition.

Therefore, front-ends and their users will collect the overwhelming majority of user-generated MEV once we have mature OFAs and other MEV rebate infrastructure.

Of course, not all orderflow is equally monetizable, nor will all front-ends facilitate high-MEV activity. However, [MEV is more prevalent](#) than most people think. We expect that any front-end able to meaningfully monetize their orderflow, like trading platforms and application-agnostic wallets, will do so. The PFOF business model popularized by Robinhood in the traditional financial markets will be common in Web3.

Networks outside of Ethereum currently lack the MEV infrastructure needed to monetize their orderflow. As those ecosystems gain traction, MEV will inevitably arise, creating similar opportunities for front-end monetization.

## Exclusive User Experiences

Front-ends share the same blockchain back-end, which has historically limited their ability to create differentiated user experiences. This is changing. We have seen three recent innovations among front-ends that unlock UX network effects: fine-tuned LLMs, wallet extensions, and application partnerships.

With the rise of LLMs and [intent-based architectures](#), new front-ends are able to build [AI-powered experiences](#) tailored to each user. Proprietary LLMs allow front-ends to sustain their UX moat through data network effects. We are uncertain as to exactly how much AI can augment front-ends, but believe it will be an important differentiator, on the margin.

[MetaMask snaps](#) unveiled another opportunity for differentiated UX; front-ends can become platforms for third-party developers to add extensions in an appstore-like experience. Snaps build a network effect around MetaMask, entrenching its position as the dominant wallet. Standalone front-ends will struggle to maintain feature parity with an entire ecosystem of developers.

Lastly, front-ends can capture a pricing network effect. Front-ends with large user bases can leverage their distribution to negotiate with applications for discounted fees or [sponsored transactions](#) in return for promoting those applications ([h/tJai](#)).

## User Monetization and Behavior

The biggest factor in convincing us of the value of front-ends was observing user behavior. If switching costs between wallets are low, and they have not had much UX differentiation, how was MetaMask able to make \$200M in revenue through in-wallet swaps [in 2021](#)?

The short answer is branding.

Not all users are the same. While the switching cost between front-ends is technically low, there is complexity and uncertainty for the uninformed user. Although the crypto industry emphasizes the importance of trustlessness, a user is inherently in a trust-relationship when engaging with technology they do not entirely understand or have not personally audited

. A user must trust that their wallet is secure, for example. Given the financial risk of transacting over crypto rails, where scams are prevalent and irreversibility provides no margin for error, users highly value brand and reputation among front-ends. As one founder of a wallet company phrased it to us, “when it comes to wallets, users do not care about maximizing their upside [through additional features], they care about minimizing their downside.”

That is why MetaMask is still the dominant wallet. Users stick to MetaMask because they trust it, rather than a more feature-rich wallet. Downside minimization means that branding is essential for wallet providers and other front-ends.

There is a spectrum of sophistication among users. The more sophisticated the user, the more they will be comfortable interacting with different front-ends, moving around to wherever they have the best UX or the lowest fees. By contrast, unsophisticated users will be less price elastic — they may be willing to pay Metamask’s 0.875% in-wallet swap fee instead of using a cheaper alternative. To some degree, we can define a user’s sophistication as their price elasticity. The lower the user sophistication, the more they will rely on trust in a brand, irrespective of the associated fees. This extends even to some [large investors](#); investor size and sophistication are only weakly correlated.

## Front-end Monetization

As previously stated, front-ends provide 2 services: reads and writes. Some front-ends provide only read services, like analytics platforms. Others provide both reads and writes. For each respective service, how they monetize is determined by their customer's sophistication.

### Read Monetization

Assuming reads are monetized, they gravitate towards 2 business models. Mass market services like block explorers can scalably monetize via ad revenue. More complex enterprise platforms like Dune Analytics have SaaS business models. The most sophisticated users may host their own full nodes or infrastructure, bypassing the need for third-party front-ends altogether.

Platforms that service unsophisticated reads — reads that present basic information from the blockchain to retail users — look similar to Web2 businesses. They focus on high-volume traffic and monetize users' attention via ads. We expect low-MEV front-ends like some Web3 social platforms and games to monetize primarily through ads rather than through their orderflow. Alternatively, they may only monetize on the application level.

As Web3 gains adoption, the number of users reading from the blockchain will grow, as will their time spent reading that information. This trend will make ads-based Web3 businesses more prevalent. Owning users' attention has already proven lucrative in Web2. To sustainably capture users' attention, read-only front-ends must again have differentiated UX. However, branding is not as important for read-only front-ends since the user does not face as much risk as they do with front-ends that support writes.

### Write Monetization

The business models for front-ends that support writes are similar. Developers and enterprise customers are usually charged SaaS subscription fees. The most advanced users can self-host if they choose. Retail-oriented write front-ends will monetize through their users' orderflow. Like ads, PFOF revenue is largely abstracted away from the user.

Beyond PFOF, another orderflow monetization path is commissions. Commissions are per order fees imposed on the user by the front-end. These fees are proving to be lucrative. The recent [front-end fee switch](#) from Uniswap Labs is a clear example. Its small 0.15% fee is earning \$17M [annualized](#). Since these commissions are avoidable — users could use other front-ends without them — commissions are better thought of as convenience fees. Users either don't know about the fee, are willing to pay a UX premium, prefer to use a trusted front-end, or simply do not want to face the inconvenience of finding another suitable front-end.

So why was MetaMask able to make \$200M in 2021? Because for many users, convenience and safety beat cost competitiveness.

## Solving For The Equilibrium

Front-ends with large user bases are valuable. But is this a stable equilibrium? Users will become more knowledgeable over time. Front-ends will become more secure, limiting the need for trust and reducing the value of brand moats. Other competitors will arise with lower prices and competitive UX, which will be enough to win over some fraction of users.

Again, these arguments have merit. However, despite every front-end reading and writing to the same network, we expect brand moats to persist for years. If front-ends are able to build UX network effects, their defensibility may be even more robust. Our base case is that front-end competitive dynamics roughly track that of online brokerages, which have strong brand moats that have seen competition erode their fees slowly over time.

## Conclusion

The transaction supply chain is evolving. With heightened competition and the development of OFAs, an increasing fraction of MEV will flow towards front-ends and their users. Front-ends servicing retail customers will leverage their distribution to monetize via PFOF and convenience fees. As the crypto user base grows over the next few years, this revenue will be lucrative, especially given user price insensitivity. Front-ends can further defend their fees through proprietary AI and other UX network effects. The long-term equilibrium is more complex, and will likely see MEV revenue slowly bleed from the front-end to the user. Convenience fees will also be driven lower as front-ends compete for users. These fee cuts can be made up for with higher volumes.

We believe read-only and read-write front-ends designed for the retail market have exceptional potential. By monetizing eyes and orders, they have the ability to become some of the most valuable businesses in Web3.

If you're building an innovative new front-end for Web3, [we'd love to chat](#).

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