# Decentralization Factors for Tokenized Smart Contract Protocols

| Category | Type | Factor | Centralized | Partially Decentralized | Significantly Decentralized | Decentralized |
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| Computation | T | **Blockchain Decentralization** — Is the blockchain to which the smart contract protocol is deployed decentralized? | • Underlying blockchain is centralized. | • Underlying blockchain is at least partially decentralized (see companion matrix). | • Underlying blockchain is at least significantly decentralized (see companion matrix). | • Underlying blockchain is decentralized (see companion matrix). |
| Computation | T | **Oracle Decentralization** — If the protocol relies on oracles, are such oracles decentralized? | • Oracle(s) are centralized. | • Oracle(s) feed relies on multiple data sources. | • Oracle(s) feed relies on many data inputs.<br>• Oracle data aggregation occurs in a partially trustless way, potentially with some limited centralized oversight. | • Oracle feed relies on many independent data inputs.<br>• Oracle data aggregation occurs in a primarily trustless way, potentially with some centralized fail-safes. |
| Development | T & L | **Completeness of Protocol** — Is the protocol fully functional? | • Protocol may still require significant additions.<br>• May not be fully functional. | • Protocol is fully functional and includes the features expected at token launch.<br>• Company may have publicly discussed minor upcoming developments or improvements. | • Protocol is fully functional and includes all material features publicly discussed by the Company.<br>• Company has not promoted upcoming developments or improvements, but industry participants may expect some ongoing contribution from the Company.<br>• Smart contracts of protocol may be immutable (i.e., not upgradeable). | • Protocol is fully functional and includes all material features publicly promoted by the Company.<br>• Company has not promoted upcoming developments or improvements, and industry participants could have no reasonable expectation that material improvements could only be pursued and implemented by the Company.<br>• Smart contracts of protocol may be immutable (i.e., not upgradeable). |

*\* There are three different but interrelated lenses through which to view decentralization: Technical (T), Economic (E), and Legal (L). For a more in-depth discussion, <u>see this article.</u>*

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| Development | E & L | **Ongoing Development** — If ongoing development of the protocol is being undertaken, what proportion of such development comes from one entity or a group of related entities? | • Company is responsible for virtually all of the protocol's ongoing development. | • Company is primarily responsible for the protocol's ongoing development, but implementation of such new code is subject to governance/ community approval.<br>• Additional code is sourced from independent third parties. | • Foundation is primarily responsible for coordinating the protocol's ongoing development.<br>• Independent third parties are responsible for a majority of new code created for the protocol, whether at the direction of the Foundation, community, or otherwise.<br>• Implementation of all new code is subject to governance/ community approval. | • Foundation or community is responsible for coordinating the protocol's ongoing development.<br>• Independent third parties are responsible for vast majority of new code created for the protocol at the direction of the Foundation, community, or otherwise.<br>• Implementation of all new code is subject to governance/ community approval. |
| | T & L | **Protocol Roadmap** — If ongoing development of the protocol is being undertaken, who defines the roadmap of future protocol improvements or expansions? | • Company is solely responsible for defining the roadmap of the protocol. | • Company has completed much of the initial roadmap and the community largely looks to the Company for future developments.<br>• Community feedback helps drive Company decisions, but the community itself minimally dictates the roadmap. | • Foundation or community primarily drives the roadmap of future developments of the protocol.<br>• Company and/or its founders may be influential community members but do not effectively control direction. | • Foundation or community entirely drives the roadmap of future developments of the protocol.<br>• Company and/or its founders are one of many community members. |
| | T | **Risk Management** — Who is responsible for audits of new code deployments and who is responsible for protocol state monitoring? | • Company directly hires third parties to perform code audits.<br>• Company is primarily responsible for monitoring protocol state and identifying and fixing any hacks, bugs, or irregularities. | • Code is public and Company ensures updates are audited before implementation.<br>• Public bug bounty programs may be implemented.<br>• Company is primarily responsible for monitoring protocol state but independent third parties may also help monitor. | • Code is public and the Foundation or community implements code audits for updates.<br>• Public bug bounty programs may be implemented.<br>• Independent third parties are paid by Foundation or from protocol treasury to monitor the protocol state. | • Code is public and the Foundation or community implements audits for new and existing code.<br>• Public bug bounty programs may be implemented and payments are honored by governance.<br>• Independent third parties are paid by protocol treasury or otherwise incentivized such that non-Company community is primarily responsible for monitoring the protocol state. |

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| Development | E & L | **Ongoing Development Funding** — How is ongoing protocol development and third-party application development funded? | • Company may operate an ecosystem fund designed to incentivize third-party development and/or participation.<br>• Fund may include cash raised through equity financing or a token sale. | • Company has deployed most of its allocated funds to third parties for ongoing development.<br>• Small number of third-party applications are independently financed.<br>• Independent ecosystem fund may be operated by the Foundation, community, or an independent third party to incentivize ongoing development.<br>• Native token may be awarded by governance mechanism to incentivize some ongoing development. | • Large number of third-party applications are independently financed.<br>• Independent ecosystem fund is the primary funding mechanism for the protocol's ecosystem, including continued development, and is operated by the Foundation, community, or an independent third party.<br>• Native token may be awarded by governance mechanism to incentivize some or most ongoing development. | • Large number of third-party applications are independently financed.<br>• If any ecosystem fund exists, it is directly or indirectly controlled by a highly decentralized on-chain governance mechanism.<br>• Continued community development is properly incentivized without any centrally managed fund. |
| Governance | E & L | **Voting Control** — Who has the ability to vote and what is the distribution of voting power? | • Company has 100% control of governance.<br>• On-chain governance mechanism may be established but not implemented. | • Neither the Company or its employees unilaterally control governance (potentially through restrictions on voting under applicable company policies or delegations).<br>• Insiders may collectively control governance if acting in concert. | • None of the Company, its employees, or its other Insiders unilaterally control governance (assuming no voting restrictions apply).<br>• The votes of a number of unaffiliated parties are necessary in order to approve or block any governance proposal. | • None of the Company, its employees, or its other Insiders can control or significantly influence governance.<br>• The votes of a number of unaffiliated parties are necessary in order to approve or block any governance proposal. |
| | T | **Protocol Development Control** — Who controls the process for protocol code implementation? | • Company retains 100% control over code implementation decisions. | • Code implementation decisions primarily require on-chain governance approval.<br>• Company or the Foundation may retain veto/triage power over third-party proposals. | • All code implementation requires on-chain governance approval.<br>• Any veto/triage capability is narrowly structured and held by the Foundation or a distributed group elected by on-chain governance. | • All code implementation requires democratic approval from on-chain governance and/or protocol has limited or no upgradeability. |

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| Governance | E & L | **Features and Functionality Control** — What protocol features and functionality are controlled by decentralized governance? | • Company retains 100% control over all features and functionality of the protocol. | • Company retains control over updates to its own application/ frontend/user interface (UI). Other application/frontends/ UIs may be operated by third parties.<br>• Company may retain some control over any off-chain software or network utilized by applications/frontends/UIs accessing the protocol.<br>• Company may retain control over emergency pause ability for the protocol. | • Applications/frontends/UIs operated by a number of third parties, which may include the Company.<br>• Foundation may retain some control over any off-chain software or network utilized by applications/frontends/UIs accessing the protocol.<br>• Foundation may retain control over emergency pause ability. | • Applications/frontends/UIs operated by a number of third parties, which may include the Company.<br>• Community retains all control over any off-chain software or network utilized by applications/frontends/UIs accessing the protocol.<br>• Unaffiliated group elected/ nominated by the community may retain control over emergency pause ability. |
| | E | **Significant Influence** — Do any stakeholders have significant and outsized power over key decisions? | • Company has final say over key decisions, including decision-making not subject to on-chain governance (i.e., community management, grant programs, etc.). | • Company and its founders relinquish control over key decisions but may exert significant influence over such decisions.<br>• The Foundation may exert some influence over key decisions.<br>• The community may exert limited influence over key decisions. | • The Foundation and community exert significant influence over key decisions.<br>• Company and its founders continue to exert influence over key decisions. | • The Foundation and community exert significant influence over key decisions.<br>• Company may have dissolved, or its influence and the influence of its founders may be no greater than other participants in the protocol's ecosystem — may be viewed as advisors or thought-leaders but not possessing outsized power/control. |
| | E | **Communications** — Who controls the protocol's social media, community channels, and communications? | • Company controls all of the protocol's social media accounts, its community channels, and its communications. | • Company may control primary social media accounts and community channels, but additional accounts may be controlled by the Foundation.<br>• Company primarily responsible for public communications but Foundation and active community members may promote the protocol. | • Foundation or community controls the primary protocol social media accounts and community channels.<br>• Majority of public communications are Foundation- or community-driven.<br>• Company may have separate social media accounts distinguished from Foundation/ community accounts. | • Foundation or community controls protocol social media accounts and community channels.<br>• Public communications are largely or entirely community-driven.<br>• Company may have separate social media accounts distinguished from Foundation/community accounts. |

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| **Value Accrual** | E & L | **Token Value** — What are the sources of value accrual to the tokens of the protocol? | • The protocol may not have a token; or<br>• The protocol may have a token and the Company is the sole source of value accrual (through development, implementation, etc. of the protocol). | • If the token has a mechanism for explicit value accrual (buyback, fee distributions, etc.), a significant majority of value accrues to the tokens through activities of the Company, including the operation of applications.<br>• If no explicit value accrual mechanism, Company may be perceived as the primary driver of value. | • If the token has a mechanism for explicit value accrual, a significant amount of value accrues to the tokens of the protocol through activities of independent third parties (excluding the Company), including the operation of applications.<br>• If no explicit value accrual mechanism, market forces and independent third parties are significant drivers of value. | • If the token has a mechanism for explicit value accrual, a majority of value accrues to the tokens of the protocol through activities of independent third parties (excluding the Company), including the operation of applications.<br>• If no explicit value accrual mechanism, market forces and independent third parties are the drivers of substantially all value. |
| | E | **Token Ownership** — How concentrated is ownership of the token of the protocol? | • The protocol may not have a token and Insiders may have contractual right to a future token; or<br>• The protocol may have a token and the tokens are held by the Company, affiliates, and Insiders. | • Insiders may own a significant portion or even a majority of the outstanding tokens of the protocol.<br>• Independent third parties own a substantial number of the outstanding tokens of the protocol (via airdrop, early adopter rewards, token sale, etc.). | • Insiders own less than a majority of the outstanding tokens of the protocol.<br>• Independent third parties own a significant majority of the outstanding tokens of the protocol.<br>• Development funds, staking rewards, and other incentives are in place to continue increasing the disbursed ownership of the tokens of the protocol by independent third parties. | • The outstanding tokens of the protocol are widely distributed.<br>• No person or group of related persons (including the Company and its employees) holds 20% or more of the outstanding tokens of the protocol.<br>• Development funds, staking rewards, and other incentives are in place to continue increasing the disbursed ownership of the tokens of the protocol by independent third parties. |
| | E | **Outstanding Tokens** — What proportion of the tokens of the protocol are outstanding and in circulation as opposed to being locked up (due to contractual agreements) or unreleased? | • The protocol may not have a token; or<br>• The tokens may be issued but are not yet in circulation or are entirely subject to lockups. | • A small portion (less than 25%) of the tokens of the protocol are outstanding and in circulation.<br>• The tokens of the protocol held by Insiders may be mostly locked up or unvested.<br>• Any tokens of the protocol earmarked for an ecosystem fund, staking rewards, or protocol incentives remain largely un-deployed. | • A significant portion (at least 33%) of the tokens of the protocol are outstanding and in circulation.<br>• A portion of the tokens of the protocol held by Insiders have been vested and released from any applicable lockups.<br>• Any tokens of the protocol earmarked for an ecosystem fund, staking rewards, or protocol incentives have been partially deployed. | • A majority (at least 50%) of the tokens of the protocol are outstanding and in circulation.<br>• A majority of the tokens of the protocol held by Insiders have been vested and released from any applicable lockups.<br>• A majority of any tokens of the protocol earmarked for an ecosystem fund, staking rewards, or protocol incentives have been deployed. |

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| **Value Accrual** | E | **IP Rights** — Who owns any intellectual property (IP) relating to the protocol? | • Company owns all IP rights relating to the Protocol. | • The majority of the protocol's code is open source, but may be subject to certain use restrictions.<br>• Company may hold residual IP relating to the protocol, such as trademarks, domain names, and its proprietary application. | • All of the protocol's code is open source, but may be subject to certain use restrictions (controlled by the Foundation or community).<br>• Foundation or community owns most residual IP relating to the protocol, including trademarks.<br>• Company may hold residual IP relating to the domain names and its proprietary application. | • All of the protocol's code is open source and can be used/ forked by third parties.<br>• Foundation or community owns residual IP relating to the protocol, including trademarks.<br>• Company may hold residual IP relating to the domain names and its proprietary application. |
| **Usage, Participation, & Accessibility** | E | **Liquidity** — How liquid are the secondary markets for the tokens of the protocol? | • There is no secondary market for the tokens. | • A small amount of liquidity for the token of the protocol is available on secondary markets, but token price and trading volumes remain volatile.<br>• Company or the Foundation may be directly funding or incentivizing liquidity by paying market makers or conducting buybacks. | • A substantial amount of liquidity for the token of the protocol is available on secondary markets.<br>• Company or the Foundation are not directly funding or incentivizing liquidity by paying market makers or conducting buybacks. | • A robust and diverse secondary market exists for the token of the protocol.<br>• The market for the token is seasoned and is not unduly influenced by any third-party. |
| | E & T | **Application Diversity** — Who hosts applications (i.e., frontend websites) that facilitate access to the protocol? | • Company operates the only application providing access to the protocol; no other access available. | • Company operates the main application providing access to the protocol, but additional applications are operated by independent third parties.<br>• Access to the protocol for developers may be permissioned. | • Independent third parties and the Company operate several applications providing access to the protocol.<br>• More than 25% of transactions executed on the protocol are initiated through applications not operated by the Company.<br>• Access to the protocol for developers is permissionless. | • Independent third parties and the Company operate several applications providing access to the protocol.<br>• Greater than 50% of transactions executed on the protocol are initiated through applications not operated by the Company.<br>• Access to the protocol for developers is permissionless. |

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| Usage, Participation, & Accessibility | E | **Protocol Adoption and Participation** — How broad is adoption of the protocol and participation with the protocol? | • No or limited adoption. | • At least some adoption, but likely concentrated among Insiders or early users. | • At least meaningful adoption and usage outside of Insiders and early users.<br>• Significant community engagement and participation.<br>• Likely one or more protocol-level service provider agreements, such as independent third-party treasury management, provision of custom oracle feeds, or protocol state monitoring. | • Network has become a core/foundational development in its particular ecosystem, with many independent users and contributors.<br>• Insiders account for a negligible percentage of usage.<br>• Rich and robust community engagement and participation.<br>• Likely several protocol-level service provider agreements, such as independent third-party treasury management, provision of custom oracle feeds, or protocol state monitoring. |

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