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Pyramid of Power – A Hierarchy For A New Social Contract

Abstract:
A new social contract fit for a post-labor economy can be conceived as a five-tier "Pyramid of Power" built on cryptographic and institutional innovations. At its base lies an **Immutable Civic Bedrock**, a tamper-proof layer of digital identity, rights, and records that establishes inviolable personal sovereignty. On top of this foundation are **Open, Programmable Value Rails** – borderless financial networks and smart contract platforms that automate and democratize economic value flows. Above these, **Radical Transparency of Money and Algorithms** ensures that both financial transactions and decision-making code are auditable by all, instilling accountability and trust. The fourth tier, **Direct, Programmable Democracy**, leverages digital tools (from blockchain voting to decentralized autonomous organizations) to enable continuous, granular public participation in governance. At the apex stands **Forkable Constitutional Meta-Governance**, a meta-layer allowing communities to modify or entirely fork their governing rules – legally and technically – if consensus fails, thereby guaranteeing the *right to exit*. Each tier is examined in depth, with emphasis on its critical role, real-world implementations (from national land registries on blockchains to municipal e-voting trials), and how it integrates with adjacent layers. Together these layers enable **cryptographic self-ownership** (individual control of identity, data, and assets via cryptographic keys) and a **legal right to fork** one's social contract. The result is a system of credible exit that forces credible bargaining: institutions must serve their constituents or face peaceful schism, ensuring an adaptive, voluntary social order.

1. Immutable Civic Bedrock

Definition & Rationale: The Immutable Civic Bedrock is the foundational layer of a new social contract: a set of core civic data and rights secured by cryptography against tampering or deletion. This includes citizen identity registries, vital records (births, property titles, contracts), and fundamental legal commitments (constitutional rights) recorded on tamper-evident ledgers. The key innovation is **immutability** – once a record or rule is logged, no authority can unilaterally alter or erase it. This permanence creates a **bedrock of trust** in society's basic facts and entitlements. In the analog era, society relied on institutions (courts, bureaucracies) to guard records and rights; the cryptographic bedrock replaces or augments this with mathematical guarantees. For example, Estonia's government has since 2012 used a **blockchain-based integrity system** (the KSI ledger) to secure public records and logs. Every update to a citizen's health record or legal file is hashed and chained so that *"it becomes impossible to manipulate information and hide what was changed"* [1]. In embracing this approach, Estonia became *"the first government in the world to use blockchain in live production to ensure the integrity of records"*, making official archives independently verifiable [2]. The rationale is clear: a society cannot build higher-order trust (in money, laws, governance) without a reliable base of truth. An immutable civic ledger thwarts corruption and memory-holing; it encodes a public, **single source of truth** for key civic information.

Contribution in a Post-Labor Economy: In a post-labor economy, where AI and automation produce abundance but also concentrate power, an immutable civic bedrock protects individuals' *intrinsic claims*—identity, personal data, and entitlements—regardless of employment status. Historically, one's social

standing and access to resources were often mediated by employers or state discretion. In a future with less formal employment, individuals need direct, inalienable guarantees over their identity and rights. Decentralized digital identity (often called *self-sovereign identity*) is one emerging component: cryptographic ID allows people to prove who they are and what credentials they hold, without relying on central authorities that could exclude or surveil them [3]. For instance, World Bank pilots in developing regions have explored blockchain-based identity for refugees and the unbanked, ensuring even those outside formal jobs or nation-state systems can have a recognized persona and claim benefits. More concretely, an immutable land registry on blockchain can secure property rights for citizens irrespective of their status in the labor market. The Republic of **Georgia's blockchain land-titling system** is a case in point. Beginning in 2016, Georgia layered a blockchain timestamp onto its national land registry; by 2017 over 100,000 property titles were anchored on the Bitcoin blockchain [4] [5]. This made property transfers tamper-proof and transparent, eliminating the historical scourge of backdoor edits that dispossessed owners. The CEO of the Bitfury group noted that especially for something as fundamental as owning one's home, *"it's important to have that added layer of security that's provided by blockchain validation"* [6]. In a post-labor world, such security of basic assets is crucial to give every individual bargaining power and dignity not tied to a wage.

Empirical Deployments: Beyond Estonia and Georgia, numerous governments have trialed or implemented components of an immutable civic bedrock. **Brazil** is developing a blockchain for public documents (the *RBB* network) to ensure *"greater protection, transparency and integrity in public databases"*, per a former minister [7] [8]. In **Honduras**, an effort to record land titles on a blockchain was driven by the need to prevent document forgery by elites. **Dubai** has pursued a strategy to put all government documents on blockchain to create an incorruptible record for everything from business licenses to wills. On the identity front, **Catalonia** announced the IdentiCAT program to give citizens a self-sovereign digital ID that the central government in Madrid could not override – a direct response to concerns of political disenfranchisement. Even in large nations, pieces of this bedrock are emerging: **India** uses Aadhaar (a centralized biometric ID) for citizen authentication, but efforts are underway to add cryptographic audit trails to Aadhaar transactions to detect tampering. Likewise, the **European Union** is rolling out an **EBSI (European Blockchain Services Infrastructure)**, part of which is a self-sovereign identity framework so that credentials (like educational degrees or licenses) are digitally signed and immutable, checkable across borders. These deployments remain partial, but they signal momentum toward a world where each person's core records and rights are *digitally memorialized and inviolable*.

Integration with Other Layers: The immutable civic bedrock underpins all higher layers by providing *trustworthy primitives*: Who is a citizen? What do they own? What rules were agreed to? Without consensus on these basics, higher-level governance or economic programs would collapse. This bedrock integrates upward with **Open Value Rails (Layer 2)** by linking identities to wallets and assets in a secure way. For instance, a decentralized universal basic income (UBI) system (Layer 2 functionality) critically depends on a Sybil-proof identity system (Layer 1) to ensure one person cannot claim multiple UBI shares [9]. Immutable identity registries combined with novel proofs of personhood (e.g. Proof-of-Humanity protocols) address this by providing one unique ID per human, preventing exploits in open financial systems. Conversely, it integrates backward (downward) conceptually by drawing strength from the cryptographic technologies historically developed for digital money (Bitcoin's blockchain being repurposed to secure other civic data). As we move to Layer 2, we will see how this reliable identity and records substrate enables complex economic coordination on open rails.

2. Open, Programmable Value Rails

Definition & Rationale: The second tier consists of **open, programmable value rails** – the infrastructural networks that move economic value (money, assets, credits) in a permissionless, automated fashion. These are the *"financial arteries"* of a cryptographic social contract, analogous to today's banking and payment systems but radically more open (anyone can participate) and programmable (business logic is enforceable in code). In practice, this means blockchain and distributed ledger platforms (like Ethereum, Bitcoin, or others) that allow the creation of digital currencies, tokens, and smart contracts executing on those tokens. Unlike legacy financial rails (which are intermediated by banks, limited by borders, and opaque), open value rails are **borderless** and run by transparent protocols. *"If it's in the public domain, put it on-chain"* becomes the ethos for public finances [10]. The rationale for this layer is to hard-code fairness and efficiency into economic flows. Smart contracts – self-executing code on the blockchain – can automate transactions based on predefined rules, removing middlemen and ensuring commitments are kept. This is essential for implementing complex policies like conditional transfers, public investments, or resource sharing in a trustworthy way. A basic example is a decentralized UBI contract that automatically disburses a fixed crypto stipend to every verified citizen each month, without any government agency in the loop. Such automation slashes administrative overhead and corruption. Indeed, **blockchain-based welfare systems** have demonstrated cost reductions by replacing bureaucracy with code: *"smart contracts automate distribution, drastically reducing costs and ensuring direct, reliable payments"* in UBI pilots [11]. The open nature means that anyone with an Internet connection (and a verified ID from Layer 1) can access these rails – an antidote to the exclusion of 1.7 billion unbanked people from the traditional financial system [12]. In short, Layer 2 establishes a **commons of value transfer**: like a public highway system for money that is equally open to all and governed by transparent rules.

Contribution in a Post-Labor Economy: As automation decouples work from livelihood, societies are exploring how to distribute the bounty of AI and robots in absence of wages. Open value rails furnish the mechanism for *"predistribution"* – proactively allocating income or resources to people as a right, rather than as compensation for labor. For example, suppose an AI-driven economy generates tremendous profits from data or autonomous production. Smart contracts could be coded to automatically channel a share of those profits into citizen wallets as a social dividend. Traditional welfare states struggle to do this efficiently due to complex eligibility checks, fraud, and overhead. By contrast, blockchain UBI projects like **GoodDollar** or **Circles** have shown that *global* basic income schemes can be bootstrapped by code. GoodDollar uses DeFi (decentralized finance) protocols to collect yield from staked assets and disburse it as a daily income token to thousands of participants worldwide [13] [14]. This is all executed transparently on Ethereum smart contracts – an early glimpse of post-labor redistribution without centralized tax-and-transfer bureaucracy. Another facet is *unconditionality*: open value rails enable payments that are censorship-resistant and unconditional, aligning with the principle that in a post-labor society, everyone deserves a basic means of subsistence. In a decentralized UBI trial, *"payments can be sent peer-to-peer without an intermediary blocking or imposing conditions, upholding the core UBI principle of unconditionality and individual financial freedom"* [15]. This resilience is vital when political winds shift or when traditional governments deadlock; the code keeps paying out as long as funds are there. More broadly, open value rails empower **new forms of economic agency** for individuals. A gig-worker in one country can directly provide a service to a DAO in another and get paid trustlessly in cryptocurrency – a labor market beyond nation-state limits. Micro-entrepreneurs can launch tokenized projects and raise capital globally (e.g. via crowd sales or NFTs), breaking the monopoly of large capital owners. In a post-labor world, many may derive income not from formal jobs but from creative or community endeavors monetized via these platforms (think of play-to-earn

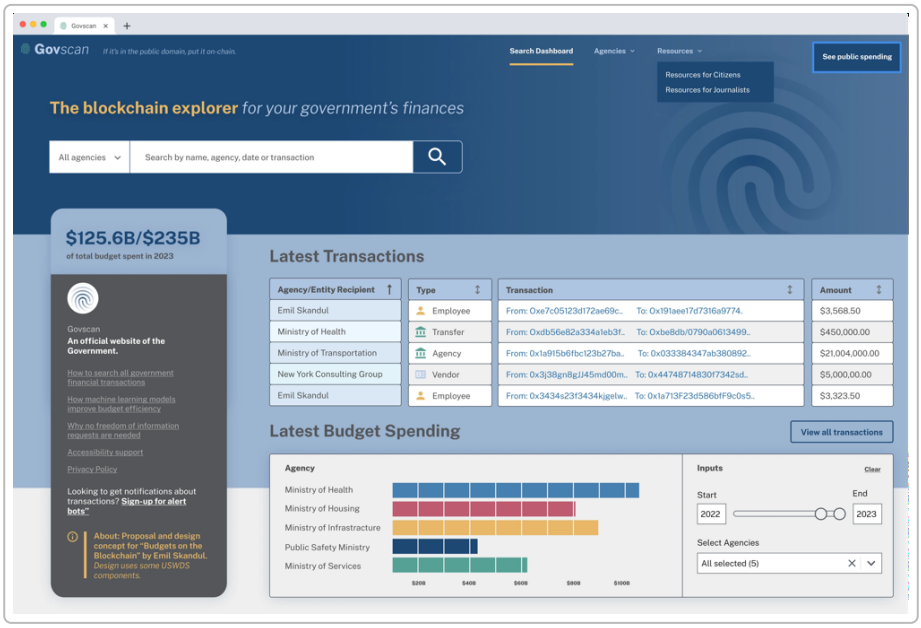
games or content creation paid in tokens). By lowering barriers and transaction costs, open rails let people capture value from activities that were previously not remunerated.

Empirical Deployments: The most prominent deployment of open value rails at a national level is **El Salvador's adoption of Bitcoin** as legal tender in 2021. El Salvador made the Lightning Network (Bitcoin's layer-2 for fast payments) a national payment rail alongside the US dollar. In the first month, millions of Salvadorans began using the Chivo wallet, with President Bukele noting that *"in less than 3 weeks, Chivo has more users than any bank in El Salvador – and is on track to have more users than all banks combined"* [16] [17]. This was a striking real-world test: citizens transacting daily with an open, decentralized currency network. The result has been significantly cheaper remittances – migrants in the US can send money home for essentially zero fees via Lightning, instead of losing 10% or more to Western Union [18] [19]. The World Bank confirmed that Lightning transactions of even $0.02 cent are feasible with no cost [20], an outcome unimaginable on legacy rails. While El Salvador's experiment has risks (volatility, adoption hurdles), it demonstrated that open crypto rails *can* operate at a national scale, banking the unbanked (70% of Salvadorans lacked bank accounts) and routing around incumbent fee-extractors [21] [22]. Other deployments include **Nigeria**, where despite a government ban, cryptocurrency use became widespread for commerce and remittances, prompting the central bank to eventually launch the eNaira CBDC. In **Ukraine**, during the 2022 crisis, the government used open value rails to raise donations in crypto and even to pay for critical supplies when banking systems faltered. On a city level, **Miami** and **New York City** experimented with "CityCoins" – tokens mined by supporters that provided a revenue stream to city governments (though speculative elements made these trials short-lived). There are also decentralized mutual aid groups: e.g. in **Brazil's favelas**, grassroots organizations created community coins on simple blockchain ledgers to facilitate local exchange during COVID when national support lagged. And outside government, the entire realm of **DeFi (Decentralized Finance)** – lending, trading, insurance protocols on Ethereum and beyond – serves as a sandbox for how a financial system might operate without traditional banks. Billions of dollars in loans and liquidity are programmatically managed by smart contracts (e.g. Compound, Aave protocols), accessible to anyone with an internet connection and collateral. This shows the power of neutral, open infrastructure: as long as rules are met (like posting collateral), funds flow, no credit officer needed.

Integration with Other Layers: Open value rails directly build on the **Immutable Bedrock (Layer 1)**: secure identity and records. For example, to prevent fraud in a global UBI, each person must be unique – the Proof-of-Humanity registry (a smart contract that links an Ethereum address to a verified unique person via web-of-trust and crowdsourced verification) is an integration of Layer 1 identity into Layer 2 token issuance [9] [23]. Conversely, the economic activity on Layer 2 feeds data back into the bedrock as civic records – e.g. transactions relevant to public services can be logged immutably, and smart contracts themselves can be considered a new form of law codified at Layer 1 (there is conceptual bleed-over, as code and law converge). The open rails also set the stage for **Radical Transparency (Layer 3)**: by conducting transactions on public ledgers, you inherently create transparency. Every expenditure of a public fund on an open blockchain can be inspected by citizens in real-time, something that will be discussed next. In fact, the value rails are a *prerequisite* for full financial transparency – you need public infrastructure to get public accountability. Moreover, open rails enable *programmable incentives* that tie into governance (Layer 4): e.g. quadratic voting or funding uses payment tokens and matching funds on these rails to guide democratic decisions. Finally, the ability to fork (Layer 5) extends to this layer: communities can fork a currency or deploy a new token if they disagree with monetary policy, analogous to a local government starting a complementary currency if the national one no longer serves (something seen in past crises). Thus, Layer 2 provides the *liquidity of power*: making sure that rights and decisions from other layers have material force through the flow of economic value.

3. Radical Transparency of Money and Algorithms

Definition & Rationale: The third tier introduces **radical transparency** in two critical domains: (a) money – the flows of public funds and economic value, and (b) algorithms – the decision-making logic encoded in software that increasingly governs our lives. *Radical transparency* means that, by default, these processes are open and inspectable by the public (subject only to narrow privacy exceptions). In the new social contract, "sunlight" is not a vague principle but a built-in feature of the technology and institutions. For money, this manifests as **on-chain public finance**. If Layer 2 made digital money programmable, this layer makes it **auditable in real-time**. Government budgets, expenditures, contracts, and even central bank operations can be put on a public ledger visible to all. A 2023 report by the Tony Blair Institute summarizes the vision: *"Blockchain is a public ledger – a radically transparent tool for recording transactions in real time. On-chain accounting and tokenization directly address public distrust from misappropriation of funds… Real-time tracking of public spending can minimize corruption and rebuild trust in government."* [24] . In practical terms, every taxpayer dollar (or its tokenized equivalent) could be tracked from collection to allocation: when your city spends $5 million on a contract, you see the transaction on a block explorer along with who the recipient is and what it's for. Several initiatives prefigure this: for example, **New York City's** open data portal publishes every municipal expenditure each day, and projects like **Brazil's Public Budget Blockchain (RBB)** aim to log government payment data to a tamper-proof chain [25] [8] . In a fully realized model, something like a *"GovScan" blockchain explorer* would exist for state finances – an interface where anyone can query how much has been spent on health or which vendor got paid yesterday [26] . *Figure 2* below illustrates a design concept for such a system, showing a dashboard of latest transactions and budget spending by agency



. *The principle: if it's public money, it should be on a public ledger.* This level of transparency not only deters corruption (since corrupt actors know their actions are visible) but also improves policy by enabling data-driven oversight. Researchers have shown that analyzing open spending data with machine learning can reveal corruption red flags – for instance, irregular patterns in Italian road contracts were detected by algorithms once the data was standardized and made open [27] [28] .

For algorithms, radical transparency means **open algorithms** and *"algorithmic accountability."* As governments and large firms deploy AI and decision systems (for welfare eligibility, parole decisions, credit scoring, content filtering, etc.), the new social contract requires that their logic be exposed to scrutiny. Where possible, the source code or model of public algorithms should be open source; where not (due to privacy or complexity), at least their decision criteria and data usage should be documented and explainable to those affected. Several jurisdictions have started down this path. **France** passed a Digital Republic Law requiring that any administrative algorithm that contributes to a decision must be transparent to the citizen: the individual has the right to know an algorithm was used and how it influenced the outcome [29]. This includes providing an explanation of the factors considered, though not necessarily the full code if that could enable gaming the system. Similarly, the **EU's GDPR** grants individuals the right to an explanation of algorithmic decisions in certain cases, and the forthcoming **EU AI Act** will mandate disclosure and assessments for high-risk AI systems [30]. Radical transparency goes further – envision not only reactive disclosure but proactive participatory scrutiny. For example, the city of **Amsterdam** maintains a public registry of algorithms used by its municipal government, describing their purpose, datasets, and biases. And civic tech groups have created tools to audit algorithms for fairness if given access to their inner workings. The rationale is that algorithms effectively exercise power (e.g. deciding who gets a loan or which news you see); thus, they must be subject to democratic oversight just like legislation. Moreover, transparency enables *better algorithms*: errors or biases can be spotted by independent experts, and more minds can contribute to improving the code. A notable case of transparency improving trust is **Estonia's Data Tracker** system [31] [32]. Estonia logs every time a government official queries a citizen's data (say a police officer looking up your license). Citizens can log into a portal and see *"what data was accessed, by whom, and for what purpose,"* including inter-agency data sharing [33]. This way, if an algorithm or official misuses data, the citizen knows. Far from harming security, Estonia found this transparency *increased* public trust without enabling significant abuse.

Contribution in a Post-Labor Economy: In a post-labor scenario, vast wealth may be generated by AI-driven enterprises, and governments may play a bigger role in redistributing income or providing social services (since traditional jobs no longer distribute purchasing power). Radical transparency ensures that this expanded role does not devolve into unchecked technocracy or rent-seeking by those in control of algorithms. If a universal basic income or social dividend fund is distributing trillions of dollars, the public will demand absolute clarity on how funds are flowing. **Real-time budget transparency** can function as the next-gen "town hall meeting": instead of waiting for annual reports, citizens continuously monitor and even directly veto or adjust spending via Layer 4 democratic mechanisms. For instance, people could subscribe to alerts on their phone whenever the city makes a purchase above $50k, or whenever an official changes an AI model's parameters. This fosters an environment of **continuous accountability**, which is critical when citizens are effectively shareholders of an automated economy rather than wage-earners. They need assurance that the "managers" of the commons (AI systems, public officials, etc.) aren't diverting resources. Additionally, transparency of algorithms is pivotal in a world where **AI replaces many human roles**. If an AI algorithm selects candidates for the remaining jobs or decides how to ration healthcare, only radical transparency can legitimize those decisions. Everyone must see that, for example, a welfare AI isn't biased against certain groups – ideally, the algorithmic rules would be debated and set via democratic input (bridging to Layer 4). Another angle: as personal data becomes a prime resource (fueling AI), citizens might collectively negotiate how their data is used and monetized. Radical transparency would require any entity using citizens' data to openly show what they are collecting and how algorithms leverage it, enabling individuals or communities to claim fair compensation or impose limits. In summary, transparency prevents the emergence of a new opaque "algorithmic elite" in the post-labor era. It democratizes information that

was historically asymmetrical (insiders vs public), thereby flattening power hierarchies even when specialized technology is at play.

Empirical Deployments: We have seen early signs across different scales. **Municipal:** New York City's Algorithm Management and Policy Officer now maintains an **AI Registry** where agencies must list their automated decision tools. **Helsinki** and **Amsterdam** launched public AI registers detailing each algorithm used by city government, including problem description, data inputs, and risk mitigation. **National:** As mentioned, France's law (2016) and **Canada's Directive on Automated Decision-Making (2019)** both mandate transparency and assessment for government AI systems [34]. Canada's is notable for requiring each federal algorithm to be assessed for impacts and assigned a risk level that dictates the required level of explanation and human oversight. **UK:** The NHS (health service) released the code of its COVID triage algorithm after public pressure, allowing outside experts to spot biases in how it prioritized patients. **Private sector with public reach:** After outcry about social media algorithms' influence on democracy, various proposals (like Twitter's Bluesky project) have been to open up recommendation algorithms or allow user choice among transparent algorithms. Twitter (pre-2023) open-sourced parts of its feed ranking code, a gesture toward algorithmic transparency. Also, **OpenAI** has convened discussions about *"democratic input"* for setting AI behavior, acknowledging that these models perform quasi-governance. **Algorithmic transparency laws** are now under consideration in the EU AI Act and the U.S. (Algorithmic Accountability Act bills), which would require impact assessments and disclosures for AI in sensitive applications. On financial transparency: **Ukraine**, amid rebuilding, put its procurement system (*ProZorro*) on a public blockchain ledger to ensure foreign aid and reconstruction funds can be tracked by donors and citizens. **Georgia (the country)** not only did land titles on blockchain but is expanding to a blockchain system for government procurement contracts, to publish every bid and invoice immutably (a response to past corruption). And **Brazil**'s pilot RBB (noted above) is explicitly designed to be a *"TCP/IP of public finance"*, making all public expenditure auditable by design [35]. These implementations are nascent but growing, as technology and political demand converge to make radical transparency feasible.

Integration with Other Layers: Radical transparency critically *links Layers 2 and 4*. It takes the **Open Value Rails (Layer 2)** and shines a light on them, making their data accessible for **Direct Democracy (Layer 4)**. In practice, this means the public can directly see the outcomes of governance decisions (e.g. where budget allocations went) and can react or legislate accordingly in a tighter feedback loop. Conversely, it provides the informational substrate for direct democracy: informed citizens are a prerequisite for meaningful direct participation. With every government transaction on-chain, **budget literacy improves** and citizens can make data-informed votes [36] [37]. Integration with **Direct Democracy** can be institutionalized: for instance, if an expenditure exceeds a certain threshold and triggers public concern (as seen on the blockchain explorer), it could automatically prompt a referendum or a review by a citizens' assembly. Transparency also supports **Forkable Meta-Governance (Layer 5)** – by lowering information asymmetries, it ensures that if a group chooses to fork off with a new system, they understand exactly what resources and rules they are taking or changing. Importantly, this layer is enabled by the **technologies of Layer 1 and 2**: without an immutable ledger and open digital money, radical transparency is either impossible or untrustworthy (paper records can be cooked; banks can hide flows). In the new pyramid, each transaction is anchored immutably (Layer 1) and thus when exposed at Layer 3 it has credibility – you're not just seeing what *should* have happened, you're seeing what *did* happen, indelibly [38] [39]. Similarly, algorithm transparency often relies on open-source software principles and reproducible data – requiring the kind of open collaboration ethos that underpins blockchain development itself. In sum, Layer 3 is a connective tissue that illuminates the lower layers' workings to empower the higher layers of democratic control and systemic adaptability.

4. Direct, Programmable Democracy

Definition & Rationale: The fourth tier is **Direct, Programmable Democracy** – a form of governance where citizens themselves directly propose, debate, and decide on policies, with digital systems facilitating this at scale. Traditional direct democracy (e.g. town halls, referenda) has limits of scale and frequency, but *programmable* democracy leverages software (including blockchain smart contracts, secure digital voting, and online deliberation platforms) to enable continuous and fine-grained participation of the populace. The "programmable" aspect means democratic processes can be *encoded as algorithms*: for example, votes can be automatically tallied and enacted by smart contracts, or complex voting schemes (like quadratic voting or liquid democracy) can be implemented to capture richer preferences. This layer recognizes that as society becomes more automated and fast-moving, governance must also accelerate and become more inclusive. Representative democracy with multi-year election cycles may be too sluggish or unresponsive. Instead, citizens could vote directly on issues in real time, or delegate their votes in a fluid way, using cryptographic tools to ensure security and verifiability. We see early prototypes in Decentralized Autonomous Organizations (**DAOs**), which use tokens to represent membership and allow token-holders to vote on decisions instantly from anywhere in the world. In an expert audience context, think of this layer as bringing **GitHub's collaboration model to law and policy** – anyone can propose a "pull request" (policy proposal), others can debate and modify it, and ultimately the community "merges" or rejects it via votes. Several successful instances inform this concept. In Switzerland's small city of **Zug**, authorities tested a blockchain-based voting system: residents used their digital IDs on a mobile app to vote on local civic questions (e.g. whether to allow fireworks at a festival). The trial showed that even for minor issues, direct digital voting is feasible and secure [40]. The act of *programming* the vote on a blockchain meant results were instantly and verifiably counted, and only eligible residents (as identified by their crypto-ID) could vote. Another example is Taiwan's **vTaiwan** and **Pol.is** platform, which, while not blockchain-based, demonstrated large-scale digital consensus-building – thousands of citizens deliberated online on Uber regulation, reaching a rough consensus that was then implemented. The rationale behind direct programmable democracy is to dramatically **flatten the governance hierarchy**, reducing agency costs and making governance more adaptive. When citizens can directly steer policy, there is less gap for special interests or bureaucratic inertia to hijack the process. Moreover, the "wisdom of the crowd" can be harnessed, especially if enhanced by novel voting methods that mitigate tyranny of the majority. For instance, *quadratic voting* gives citizens a budget of vote credits to allocate to issues they care more strongly about, reflecting intensity of preferences. This method, when trialed for budgeting in Colorado, allowed a more nuanced public prioritization of projects (each person could put multiple votes on issues they value) and has been championed for its ability to amplify minority voices while still aggregating collective choice. **Programmability** means such innovative voting schemes are easy to deploy: a smart contract can implement quadratic voting or ranked-choice or liquid delegation as per the community's choice.

Contribution in a Post-Labor Economy: In the post-labor future, the nature of civic engagement and political legitimacy will change. With jobs automated, people will have more time to participate in civic life, and indeed **purpose and social contribution** may come more from civic participation than economic labor. Direct democracy provides an outlet for meaningful involvement. It also matches the fluid, networked structure of a digital economy: just as production becomes decentralized, so can decision-making. Specifically, direct programmable democracy can address the **rapid policy challenges** a post-labor economy brings. Consider the pace of AI development – waiting years for legislators to catch up could be disastrous; instead, citizens (including domain experts) could continuously vote on adapting regulations for AI, essentially "steering" the economy in real-time. This layer also ensures that the tremendous redistribution and restructuring required in a post-labor world has public buy-in. If an AI dividend or UBI is

to be funded by taxing capital or data, people must directly shape those mechanisms or risk backlash. We might see *"citizen assemblies in code"*: thousands of people directly allocating a national budget via online votes, or adjusting immigration and education policies dynamically as conditions change. Another angle is **localism and choice**. Freed from having to live near jobs, people could form or join communities aligning with their values, and direct democracy allows those communities to govern themselves internally. One could envision charter city communities or network states where members vote on their micro-constitution or community rules through DAO-like systems. For example, the **CityDAO** project in Wyoming purchased land and is experimenting with governance by its citizen token-holders, who vote on land use and development issues through snapshot votes on Ethereum. Likewise, **Kolionovo** in Russia (an agricultural community) issued its own crypto-token and had local token holders vote on communal investments. In essence, direct democracy provides the flexibility needed when society is in flux: rather than fixed, infrequent electoral mandates, governance can iterate, *fork*, and improve like open-source software. This fluidity is crucial when AI may force sudden reallocations of resources or retraining of populations – decisions can be made as needed by those affected.

Empirical Deployments: While we haven't yet seen a nation fully run by direct programmable democracy, numerous limited deployments point the way. **Estonia** uses e-voting nationwide (since 2005) for elections, and while that's representative democracy, the secure digital vote infrastructure could easily support more frequent referenda. In **Brazil**, participatory budgeting has a 30-year history in cities like Porto Alegre – now digital platforms (e.g. **Decidim** as used in Barcelona or **Better Reykjavik** in Iceland) allow citizens to propose and vote on budget items online, effectively binding city councils. **Liquid democracy** has been tested by the German Pirate Party via the LiquidFeedback platform, allowing party members to either vote directly on policies or delegate their vote to a trusted peer for that issue. This resulted in thousands of proposals being debated and many adopted as party positions, though it also revealed challenges (e.g. low participation and delegate accumulation of power) that newer designs are trying to solve. **Quadratic voting** was used by the Colorado Legislature in 2019 to prioritize bills for the session – each legislator allocated 100 virtual credits across various proposals, yielding a collective prioritization that many felt better captured true preferences. Outside government, **Gitcoin's quadratic funding** rounds (a form of democratic funding for public goods) have distributed tens of millions of dollars to open-source projects by matching community contributions with a pool in a way that emphasizes broad support [41] [42]. This mechanism is essentially voters (donors) directing funds, and has been proposed as a way cities or states could allocate portions of budget to community projects (with residents contributing small amounts that get quadratically matched to reveal consensus priorities [43] [44]). Another example: **Taiwan's Joii democracy platform** which during COVID allowed citizens to propose ideas (like mask distribution methods) and vote them up; many top-voted ideas were adopted by the government within days – a rapid direct feedback loop. **Blockchain-specific governance** offers case studies too: projects like **Tezos** and **Polkadot** have on-chain governance where all token holders can vote on protocol upgrades, and if passed, the code automatically updates the network. This mirrors how a direct digital democracy might not just vote on laws but automatically "execute" them (for example, a vote to increase carbon tax could directly update IoT sensors to enforce new limits). These experiments, while in specific domains, validate that large-scale secure voting and decentralized governance can work when powered by modern tech.

Integration with Other Layers: Direct programmable democracy thrives on the inputs from **Layer 3 (Transparency)** and in turn feeds into **Layer 5 (Forkable Meta-Governance)**. The integration with transparency is straightforward: informed voting is effective voting. If all money flows and algorithmic decisions are transparent, citizens can make choices based on evidence rather than propaganda. The blockchain explorer data, open datasets, and algorithm registries from Layer 3 become the informational

commons that citizens draw on when voting or proposing policies. For instance, before voting on a new infrastructure project, citizens could see the government's past spending efficiency on similar projects (via on-chain records) and the model projections of cost (with open algorithms) – this reduces the knowledge gap that often let elites control narratives. On the output side, direct democracy decisions can themselves be *implemented via the open value rails of Layer 2*. A concrete example is the concept of **"algorithmic governance"**: imagine a city where the council is replaced by a DAO, and citizens vote (with digital ID + tokens) on proposals that are encoded as smart contracts. When a proposal passes, funds from the city treasury (a multi-sig wallet on Layer 2) are automatically released to execute the project, without bureaucratic delay or interference. This was partially demonstrated by **The DAO** in 2016 (the first large-scale DAO, which let token holders vote to fund various proposals – until a hack intervened). Although The DAO failed, it proved that self-executing direct governance is technologically possible. Integration with **Forkable Meta-Governance (Layer 5)** is perhaps the most interesting: direct democracy at Layer 4 gives people the *voice* to change policies, but Layer 5 ensures people also retain the *exit* option to create a new polity if needed. However, these are complementary, not contradictory. Ideally, the easier it is for communities to fork (Layer 5), the more incumbent systems will use direct democracy to remain responsive and avoid losing members. In practice, a group that is unhappy with how a direct democracy is working (perhaps they are a permanent minority on certain issues) might propose meta-changes (like adopting quadratic voting or raising supermajority thresholds) within the system. If that fails, they could fork off entirely and start a new community with a variant of the rules. Direct democracy's decisions at Layer 4 are thus constrained and incentivized by the knowledge that a disgruntled faction can legally and technically exit (the essence of credible bargaining). Finally, direct democracy is built on Layers 1 and 2 as well: secure digital identity (Layer 1) to ensure one person-one vote (or one token-one vote, as the design may be), and the financial/value rails (Layer 2) to possibly reward participation (imagine earning tokens for voting or using staked tokens to prevent spam proposals). Some advanced proposals even consider **vote markets** or **futures** (a Layer 2 concept) to let people trade or hedge policy outcomes – though controversial, these illustrate how deeply integrated governance and economic mechanisms can become in a cryptographic society.

5. Forkable Constitutional Meta-Governance

Definition & Rationale: The apex of the pyramid is **Forkable Constitutional Meta-Governance** – a design principle that the governance system itself is subject to change and even schism through a lawful, transparent process. "Meta-governance" refers to the rules about making rules (who can amend the constitution? how do new governance mechanisms emerge?). Making it *forkable* means building in the freedom for subsets of the community to exit and form a new governance system (a "fork") if they so choose, taking with them their share of communal resources or at least their identity and data. In open-source software, *forking* is the act of copying the codebase and starting a new project when disagreements arise. In blockchain networks, forking the chain (hard fork) creates two networks with shared history up to the split, after which they diverge. Applying this to political economy: a forkable constitution allows a polity to split into two or more, each inheriting the history (e.g. property ledgers, member identities) up to that point, and then governing themselves separately under modified constitutions. Crucially, this is *a right, not a rebellion*: it's a pre-agreed option so that "exit" is always credible. The rationale is rooted in avoiding tyranny and fostering competitive governance. If citizens can credibly leave with their assets and form a new jurisdiction, then governments have strong incentives to be responsive (the "credible exit, credible bargaining" principle). The idea has classical antecedents (secession rights, federalism allowing state exit) but cryptographic technology vastly lowers the friction of exit: digital communities can copy their data and organize elsewhere without physical movement. Economist Albert Hirschman noted that **Exit** and **Voice** are two forces keeping organizations healthy. Forkable governance supercharges exit as a last-resort correction

when voice (Layer 4) fails. It embeds a kind of *constitutional libertarianism*: no authority can permanently lock a collective into a social contract—they must continuously earn loyalty, since members can fork away. This does *not* mean community cohesion is weak; rather, it's akin to divorce in marriage – rarely used if things go well, but the possibility ensures fairness and negotiation in the relationship. A real-world exemplar is the Principality of **Liechtenstein's 2003 Constitution**, which explicitly grants each municipality the right to secede and form its own state or join another [45]. This legal right to fork the state at the local level is unique. Prince Hans-Adam II advocated it as a means to keep governance truly serving the people: if a village feels underserved, it can peacefully leave. On the blockchain side, the 2016 **Ethereum hard fork** demonstrates the concept in a digital community. After the contentious DAO hack, the Ethereum community split – the majority "forked" the ledger to reverse the hack, while a minority refused and continued the original chain as **Ethereum Classic**. As Investopedia summarizes, *"a dispute caused a split: the majority chose to reverse the hack while Ethereum Classic did not accept the reversal"*, resulting in two parallel communities with a shared origin [46] [47]. This event epitomizes forkable governance: it resolved an irreconcilable philosophical conflict by forking into separate rule-sets, each legitimate to its adherents. Forkable constitutionalism generalizes this: *every* rule in the system (even the process of making rules) is ultimately up for peaceful re-negotiation or departure. No decision is ever absolutely final – dissenters always have the option to form a new covenant, which in turn pressures the initial group to perhaps accommodate them to avoid the split.

Contribution in a Post-Labor Economy: In the volatile socio-economic landscape ahead, forkable meta-governance provides *structural agility*. The post-labor transition might lead to sharp divides in how communities think society should be organized (e.g. some might prefer AI-generated technocracy, others might want minimal tech communes). Trying to enforce a one-size-fits-all social contract could lead to unrest or authoritarian clampdowns. But if we embrace the right to fork, different models can be tried in parallel, and citizens can sort themselves into systems that match their values, without bloodshed or revolution. Think of it as *"government as a choice, not a geographic accident"*. This also dovetails with the rise of **Network States** or cloud communities – groups forming collective identities online and negotiating recognition in meatspace (as described by Balaji Srinivasan and others). A forkable constitution would allow, say, a large metropolitan region unhappy with federal policy on UBI to digitally declare a new jurisdiction that implements its own UBI funded by local AI industries, while still coexisting in the same physical area. On a more everyday level, legal right to fork means individuals have more **bargaining power in their civic relationships**. For example, an association or cooperative in a post-labor economy (maybe a gig worker cooperative) could fork off from a national union if they feel unrepresented, carrying with them their pension funds or data records because the law ensures those are portable. Indeed, cryptographic assets and identities (Layer 1) make it easier to "pack up" one's social capital and move to a new system. Another contribution is **resilience**. If one governance approach fails (say a guaranteed income system fails fiscally, or an AI regulatory scheme fails catastrophically), the whole society need not collapse – another fork that took a different approach is still running, providing a lifeboat or at least a comparison to learn from. This mimics biological evolution or software forking: multiple versions can be live, and the better ones attract more members over time (governance as competitive service). Crucially, credible forking forces those in power to negotiate in good faith with citizens (hence "credible bargaining"). We might see something like *"constitutional upgrade offers"*: governments offering policy changes or autonomy concessions to restive regions to dissuade them from seceding. In a post-labor world, where the state's role might expand (managing AI, providing income), this check prevents ossification or exploitation. It ensures that even if labor isn't disciplining capital (through strikes, etc., as in the past), the *threat of exit* disciplines the powers that be.

Empirical Deployments: Explicit forkable meta-governance is still largely aspirational, but there are notable steps. We mentioned **Liechtenstein's secession clause** [45] – interestingly, no municipality has seceded yet, but the country claims it leads to very attentive local governance. **Native American tribes in the US** have a limited form of forkability: they operate as sovereign nations within the US, and some have even *exited* state jurisdictions by winning federal recognition or by renegotiating treaties. While not a fork in the code sense, it shows layered sovereignty where sub-entities can change allegiance. In the digital realm, **blockchain governance frameworks** increasingly bake in fork processes. Bitcoin's community, for example, treated the 2017 SegWit2x scaling dispute by basically saying "if you want bigger blocks, you can fork off to Bitcoin Cash, we aren't changing" – which is exactly what happened, and each chain went its way with its constituency. A scholarly analysis from RMIT university coined the term **"institutional fork"** to describe how societies can split like open-source projects. *"An 'institutional fork' occurs when a society splits into two divergent paths with shared histories… The parallel between institutional choice and software forking is made clear by the function of forking in blockchain implementations"*, they note, drawing analogy that Australia was once a fork of UK governance, etc [48] . On-chain, projects like **Polkadot** allow for *"forkless upgrades"* (the code can upgrade without splitting) but also accept that if consensus utterly fails, a fork is a legitimate outcome. We also see precursors in **corporate law**: corporate spin-offs and the ability of shareholders to split a company can be seen as a fork of governance in the economic sphere. Some advanced legal scholars propose *"programmable charter cities"* where communities opt into a charter and can later fork into two cities if disagreements on that charter arise (this ties with Layer 4 direct democracy: the vote to fork is itself a democratic act). Lastly, the idea of **constitutional convention by smart contract** has been floated – e.g. writing national constitutions in version-controlled documents (like Git) so that amendments (pull requests) can be transparently debated and even lead to two versions if consensus breaks (a peaceful constitutional fork). Although no nation has done this yet, Uruguay in 2022 crowdsourced constitutional amendment proposals via an online platform (with thousands participating), hinting that more participatory and flexible constitutional processes are coming.

Integration with Other Layers: Forkable meta-governance is the capstone that ties all layers together by *offering an escape hatch if any layer becomes oppressive or unsatisfactory*. It most directly interacts with **Layer 4 (Direct Democracy)**: ideally, the decision to fork or to modify constitutional rules is itself made by direct democratic methods among the subset that contemplates exit. One could imagine a smart contract that says: if 60% of a municipality's residents vote to secede (perhaps after a series of dialogues), then automatically that municipality's share of national funds and assets is carved out to a new DAO representing the new state. The **legal and cryptographic underpinnings (Layers 1 and 2)** are crucial here: property records and personal identities must be portable to the new fork. Because of the Immutable Bedrock, citizens can carry their **self-sovereign ID** and credentials to a new community; because of open value rails, they can convert their assets into the new community's currency or token (or even duplicate their account balances on a forked ledger, as happened with Ethereum/EthClassic where holders got coins on both chains). This portability greatly lowers the friction of exit compared to historical secessions (which often involved physical relocation or violent asset grabs). Integration with **Transparency (Layer 3)** is also important: for a group to decide to fork, they need clear information on what's gone wrong in the current system and what resources they have. Transparent ledgers would let a would-be breakaway region audit exactly how much it has contributed in taxes versus received, bolstering a factual case for exit if imbalance is seen. Moreover, transparency about algorithmic governance might show, say, that a certain community's values are being overridden by some global algorithm – they could fork to have their own variant of that system. Finally, forkable governance feeds back as a correcting mechanism that keeps **the entire pyramid adaptive**. If a certain governance innovation in one fork proves superior (say one fork tries a new AI oversight board and it leads to better outcomes), other forks can learn or even merge back. The possibility

of re-merging or cross-fork collaboration exists too, analogous to open-source projects that sometimes reconcile. Thus, Layer 5 ensures *evolutionary learning*: multiple governance approaches can be tried in parallel, with cryptographic proofs maintaining continuity of rights, and unsuccessful ones can fade without dragging down those who forked away. In essence, this top layer encodes a meta-right: **the right to choose your governance**. It enforces the ultimate form of *self-ownership*: not only do individuals own their data and assets (Layer 1), but collectively they own the social contract itself and can rewrite or exit it. This is the keystone that guarantees all the other layers remain aligned with the people's will – because if they don't, people will build a new pyramid next door.

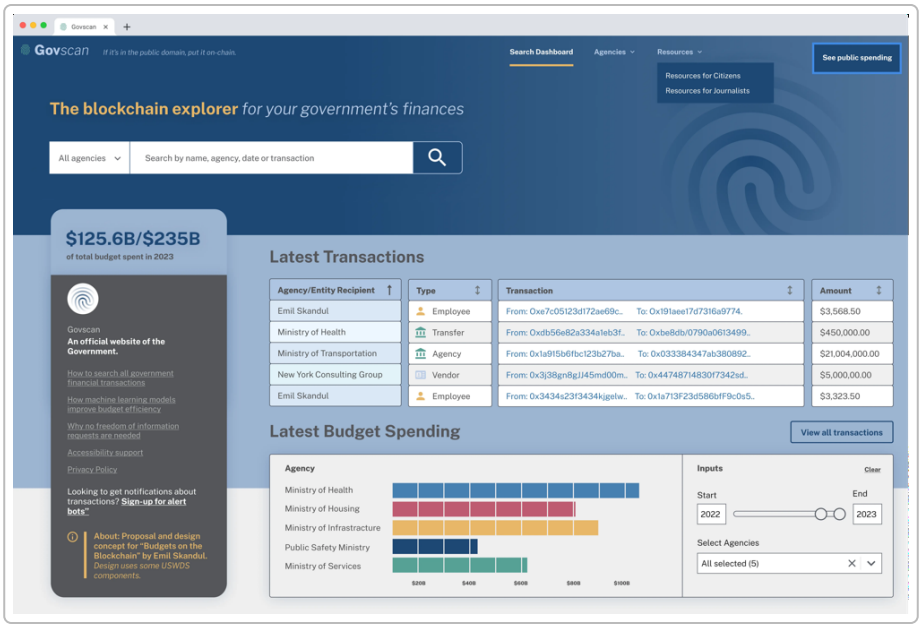


Figure: Concept design of a blockchain explorer for government finances ("Govscan"). Such a system would allow citizens to search and monitor all public transactions in real-time, enhancing transparency and accountability in Layer 3 [26] [38] *. It exemplifies how open data and on-chain records enable radical transparency of money flows.*

Conclusion

The Pyramid of Power outlined above represents an interlocking hierarchy of innovations that together enable **cryptographic self-ownership** and the **legal right to fork** one's social contract. Each layer contributes a necessary facet to this overarching goal:

- **Immutable Civic Bedrock (Layer 1)** guarantees that individuals *own their identity, data, and key records* via cryptographic means. One's personhood and basic rights are cemented in an untamperable ledger, forming the non-negotiable ground truth of the social contract. This gives every member of society an inviolable stake – a form of self-ownership anchored in math and law (e.g. "not your keys, not your identity" becomes as important as "not your keys, not your coins"). By securing property titles, personal credentials, and constitutional commitments on immutable records [1] [6], individuals are protected from arbitrary seizure or revision of their status. This base empowers people to engage in higher layers as true sovereign agents, since they can always fall back on the bedrock to assert who they are and what they are entitled to.

- **Open, Programmable Value Rails (Layer 2)** ensures that individuals *own and control their economic value* through direct cryptographic custody and participate in a commons of exchange that is not gate-kept by banks or states. Value rails like public blockchains and smart contracts put people in charge of their funds (self-custody wallets) and enable automated agreements reflecting the social contract's promises (like UBI distribution or community-investment pools). This amplifies self-ownership into the economic realm: if Layer 1 gives you identity, Layer 2 gives you capital and the means to transact with autonomy. Moreover, these rails being open-source and permissionless means communities can create new economic instruments at will (complementary currencies, tokens for local resources), exercising a collective self-determination in economic design. In a post-labor economy, such rails allow the *decoupling of livelihood from formal jobs*, e.g. via tokenized dividends or globally crowdsourced incomes [11] [15]. By making these rails programmable, society encodes its values (fairness, sustainability, etc.) into the movement of money itself. For example, a smart contract could automatically impose a micro-tax on polluting transactions and channel it to a green fund, operationalizing societal choices in code.

- **Radical Transparency of Money and Algorithms (Layer 3)** in turn ensures that *self-ownership and governance are exercised in the light*. It aligns the informational asymmetries so that no hidden leverage can undermine individual or collective choices. With all public finances and important algorithms transparent [24] [29], citizens effectively *own the knowledge* of how their society runs. This is crucial: one cannot be sovereign (self-owning) if one is ignorant of the systems affecting one's life. Radical transparency gives individuals the data to hold institutions accountable and to make informed decisions in Layer 4. It also provides a safeguard on layers below – immutability (L1) and open money (L2) reach their full potential only if we can see them working (or malfunctioning) in real time. If an immutable ledger records corruption, transparency exposes it so that the mere immutability of the record becomes a tool for justice rather than a quietly kept truth. Similarly, open value flows that were transparent allowed El Salvador's people to witness Lightning's impact (millions onboarded, fees saved) and build trust [16] [49]. For algorithms, transparency gives individuals *partial ownership of the algorithms' outcomes*: when you can contest or improve an algorithm's decision because you see its guts, you reclaim agency that is otherwise ceded to a black box. In sum, radical transparency operationalizes the ethic "nothing about us without us" – it is the sense-organ of a society of self-owners.

- **Direct, Programmable Democracy (Layer 4)** elevates self-ownership to collective self-governance. If layers 1–3 gave individuals robust control over their identity, resources, and information, layer 4 gives the *demos* control over the rules and policies that govern them, on an ongoing basis. It closes the loop of the social contract: those who abide by the laws are the ones who directly make or consent to them, not just via representatives but through continuous participation. In doing so, it treats citizens as autonomous principals rather than managed wards – the ultimate respect for personhood in political economy. The programmability of this democracy means it can be tailored to maximize fairness and inclusivity (using new voting systems) and can be scaled to millions via cryptographic voting, fulfilling the ancient ideal of self-rule in a modern, large-scale setting. Empirically, we see this in the way Swiss citizens in Zug directly voted on local matters via their e-ID [40], or how DAO members allocate funds globally – geography no longer limits collective action. Direct democracy also acts as a real-time error-correction mechanism for the social contract: bad policies can be overturned by the people without waiting for an election cycle; good ideas from the grassroots can quickly gain binding force. Thus, it enhances the *responsiveness and legitimacy* of the whole pyramid.

- **Forkable Constitutional Meta-Governance (Layer 5)** provides the *escape valve and competitive environment* that keeps the entire pyramid adaptive and aligned with human values. It is the guardian of last resort for self-ownership: if every preceding layer fails – say identities are secure, money is open, information is transparent, democracy is practiced, yet a group still finds themselves fundamentally at odds with the system – they have the right to exit and create a new order. This is essentially the right to *self-determination* (up to now a principle between nations) brought down to smaller scales and encoded in legal-technical structures. By making the constitution forkable, we acknowledge pluralism and avoid the violence or stagnation that comes from trying to enforce uniformity. **"All systems are forkable"** becomes a norm [50] [51]; no authority can say *"there is no alternative"* because an alternative can always be born. Importantly, the existence of this right means it often needn't be exercised: much like credible threats in bargaining, the power of exit ensures better voice and loyalty. Blockchain governance research observes that *"forking provides a credible exit option for disgruntled users, so core developers are driven to build consensus preemptively"* [52]. In political terms, governments knowing that citizens can leave (taking their digital lives with them) will strive to address grievances before it comes to that. This dynamic leads to what might be called **"consent-based governance"** in the true sense – not just one initial consent to a constitution, but ongoing consent, continually negotiated. It makes the social contract an explicitly *voluntary association* of self-owning individuals.

Together, these layers realize the formula *"credible exit, therefore credible bargaining."* Each person holds the keys (literally, cryptographic keys) to their own identity and assets, and each community holds the legal-technical right to reconstitute itself. Therefore, any negotiation – be it over public policy, economic distribution, or the design of an algorithm – takes place under the shadow of that credible exit. Power-holders cannot assume automatic compliance; they must persuade and include, because the governed always have the option to fork to a better deal. This greatly equalizes bargaining power in society, remedying the imbalances that historically arose (employers over workers, states over citizens) especially in a post-labor scenario where conventional leverage (labor strikes, etc.) might diminish. In effect, the Pyramid of Power creates a meta-egalitarian order: it's not a coercive hierarchy but a scaffold that *empowers individuals at every level* – from data to money to voice – and ultimately lets them reshape the scaffold itself if needed.

In conclusion, this hierarchical model offers a vision for a new social contract that is *dynamic, decentralized, and durable*. It is dynamic because each layer can evolve (via democratic input and forkability) as society changes, rather than locking us into 20th-century institutions ill-suited for AI and globalization. It is decentralized in that it pushes authority and autonomy to the edges: individuals and local communities gain far greater direct control, with blockchain and AI serving as coordinators rather than centralizers. Yet it is durable because the core rights (the bedrock) are hardened against whims, and transparency provides a constant self-correcting feedback. Ultimately, by enabling cryptographic self-ownership, we reinforce the moral premise of democracy (the individual as sovereign) with actual tools, and by guaranteeing the right to fork, we extend the market's evolutionary competition to governance itself, yielding a polity that can learn, adapt, and negotiate with its citizens rather than coerce them. The endgame is a world of *voluntary association*, where exit is as feasible as voice, and where governance providers compete to offer the most just and prosperous society. In such a world, the social contract is not a static document but a living, forkable codebase – one that citizens collectively maintain, and can branch and merge as needed, to secure the blessings of liberty and well-being in the digital age.

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