

Universal Human Infrastructure

(UHI)

A Post-Labor Social Contract for the AI Economy

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Abstract

The transition to an AI-driven economy challenges the labor-centered social contract. This paper proposes Universal Human Infrastructure (UHI) as a new institutional framework for post-labor societies. Unlike UBI models that prioritize monetary redistribution, UHI establishes a rights-based architecture guaranteeing access to automated infrastructure, universal basic services, and a universal income floor—structured as a three-layer system: Infrastructure, Support, and Sovereign. The economic logic is grounded in automation windfall allocation. Normatively, UHI is grounded in the Right to Flourish—the institutional guarantee that every individual possesses the conditions necessary to realize their inherent potential. The paper positions UHI not as a welfare reform, but as a foundational architecture for post-labor civilization.

1. Introduction

1.1 The Structural Challenge of Automated Economies

The emergence of artificial intelligence as a general-purpose technology marks a qualitative discontinuity in the history of labor and production. Unlike prior waves of mechanization, AI-driven automation exhibits the potential for broad-based substitution across cognitive as well as manual labor. Labor-centered economies distribute purchasing power primarily through employment; when structural demand for human labor contracts, the result is a systemic decoupling of economic productivity from broad-based human welfare.

1.2 The Limits of Existing Frameworks

Labor market adjustment frameworks do not address the structural dynamics of an economy in which the frontier of automatable work continuously expands. Universal Basic Income (UBI) proposals provide unconditional cash transfers, but most are premised on welfare replacement rather than automation surplus capture, raising unresolved questions of fiscal sustainability. Cash redistribution alone does not address the infrastructure conditions that determine whether income translates into genuine capability. Neither framework is adequate to the civilizational scale of the challenge. A systematic comparison is provided in Appendix A.

1.3 This Paper's Contribution

UHI reconceptualizes the policy problem as *access architecture*: systematic guarantee of the material, social, and infrastructural conditions for human flourishing. Three contributions are advanced: a three-layer institutional architecture; a multi-channel funding model; and a normative foundation in the *Right to Flourish*.

1.4 Structure of the Paper

Section 2 establishes the conceptual framework. Section 3 presents the three-layer architecture. Section 4 develops the economic logic. Section 5 examines ethical implications. Section 6 elaborates the Right to Flourish. Section 7 concludes.

2. Conceptual Framework: UHI as Access-Based Social Contract

2.1 From Income Distribution to Access Architecture

Industrial-era social contracts organized income distribution through labor markets. UHI reframes the policy objective: in an automated economy, the critical question is how access to the infrastructures that sustain human life is guaranteed. An access-based social contract ensures universal access to energy, healthcare, education, compute and AI systems, and automated logistics.

2.2 Infrastructure as a Rights Platform

UHI conceptualizes infrastructure as a rights platform: a shared civilizational substrate guaranteeing baseline access independent of market position. Near-zero marginal cost technologies make universal access economically feasible at scale.

2.3 From Welfare State to Capability Infrastructure

UHI advances a capability infrastructure model shifting policy from remediation to enablement. Universal Basic Services within the Support Layer form the developmental foundation for human capability, converting abstract rights into practical freedoms.

2.4 Social Legitimacy Beyond Labor Participation

UHI rejects labor-market participation as the sole basis of social membership, recognizing caregiving, cultural production, civic engagement, and community stewardship as legitimate forms of contribution.

2.5 Toward a Post-Labor Social Contract

Infrastructure ensures baseline access, services sustain human development, income security protects agency, and free time enables self-directed flourishing. Economic production becomes a means of supporting human potential.

3. The Three-Layer Architecture

UHI is not a single policy instrument but a systemic architecture comprising three interdependent layers. The Infrastructure Layer provides automated public commons. The Support Layer delivers social reproduction systems. The Sovereign Layer represents the domain of human agency, supported by a universal income floor. Figure 1 illustrates the architecture and its funding channels.

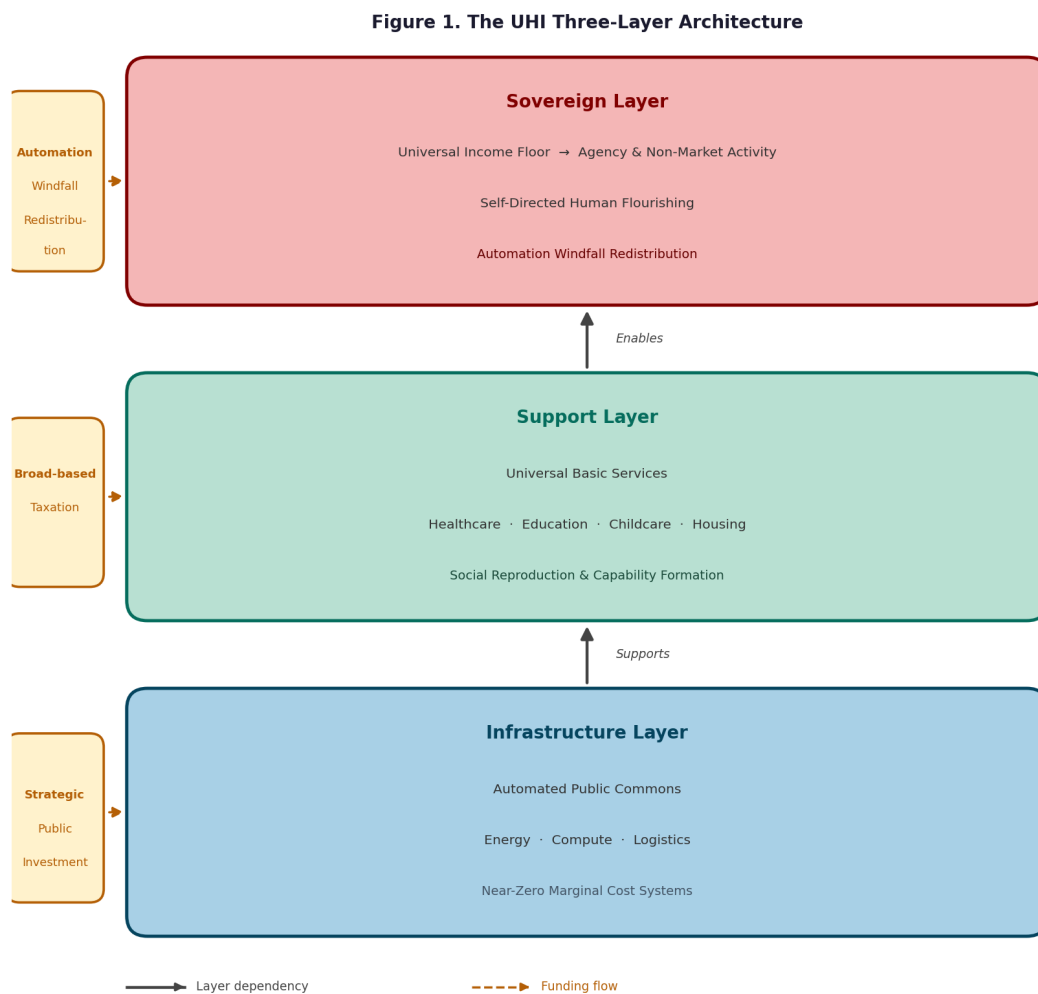


Figure 1. The Universal Human Infrastructure (UHI) Three-Layer Architecture. UHI is organized as three interdependent institutional layers. The Infrastructure Layer provides automated public commons with near-zero marginal cost characteristics. The Support Layer delivers Universal Basic Services for social reproduction. The Sovereign Layer secures self-directed human activity through a universal income floor. Solid arrows indicate upward dependency; dashed arrows indicate funding flows.

3.1 Infrastructure Layer

The Infrastructure Layer constitutes the material and technological foundation of UHI. It provides automated public commons—energy, compute, and logistics—exhibiting near-zero marginal cost characteristics at scale. Access is guaranteed as a rights-bearing domain. The economic rationale is grounded in natural monopoly characteristics: high fixed costs, declining average costs at scale, and network externalities.

3.2 Support Layer

The Support Layer provides universal basic services—healthcare, education, childcare, and housing—that sustain human development. UHI replaces means-tested welfare with a universalist approach: services guaranteed as a matter of right. Funded through broad-based taxation, the layer performs three roles: capability formation, risk mitigation, and social stabilization.

3.3 Sovereign Layer

The Sovereign Layer is the apex and philosophical center of UHI—the domain of self-directed human activity and the *Right to Flourish*. Its primary instrument is a universal income floor funded through automation windfall redistribution, calibrated not to subsistence but to agency. It performs three functions: agency protection, non-market value enablement, and reconceptualizing free time as a civilizational resource.

4. Economic Logic: Automation Windfall Allocation

4.1 The Structural Surplus Problem

As automation displaces labor, productivity gains accrue disproportionately to capital, producing *structural surplus concentration*. UHI addresses this through capture of *automation windfall*—the measurable productivity surplus generated by substituting automated systems for human labor.

4.2 Three-Channel Funding Architecture

Strategic Public Investment funds the Infrastructure Layer, reflecting its public goods character. Corporate and Consumption Taxation funds the Support Layer through broadly distributed mechanisms growing with economic output. Automation Windfall Redistribution funds the Sovereign Layer via a dedicated levy on AI-derived productivity gains, creating a direct and transparent link between automation benefits and the social contract.

4.3 Fiscal Sustainability and Macroeconomic Stability

By grounding the income floor in automation windfall rather than deficit spending, disbursement capacity ties directly to productivity growth—a self-reinforcing dynamic. Substantial service delivery through the Support Layer mitigates monetary demand pressure. Near-zero marginal cost infrastructure means expanding access requires no proportional expenditure increase.

4.4 Automation Windfall: Definition and Measurement

The automation windfall is the net productivity surplus after capital depreciation, operational costs, and reinvestment. It decomposes into: labor substitution surplus; compute-driven productivity gains; and capital concentration effects. Operationalization relies on task-level measurement, sectoral TFP accounting, and capital income decomposition. The windfall levy functions as a return on collective investment—society reclaiming a share of the value it contributed to producing.

5. Ethical and Political Implications

5.1 The Post-Labor Social Contract

UHI proposes a post-labor social contract in which material security and meaningful participation are decoupled from labor market status, recognizing individuals as civic equals whose entitlement derives from membership in a technologically productive society.

5.2 Freedom Beyond Market Participation

By guaranteeing material security through an income floor and universal services, UHI expands the domain of legitimate human activity beyond market exchange. The Sovereign Layer supports *positive freedom*: the real capacity to act, create, and contribute.

5.3 Democratic Legitimacy in the Age of Automation

Automation windfall redistribution aligns technological productivity with social membership, reinforcing the principle that gains of systemic productivity belong in part to the society that enables them.

5.4 From Welfare State to Flourishing State

UHI represents a shift from a welfare state to a *flourishing state*: designed not merely to prevent deprivation, but to enable the full development of human capabilities. Security becomes the foundation upon which autonomy, creativity, and social contribution emerge.

6. The Right to Flourish

6.1 Defining the Concept

The Right to Flourish is the institutional guarantee that every individual possesses the material, social, and infrastructural conditions to fully express their inherent potential—regardless of labor market status. It is unconditional and expansive: not merely survival, but the positive conditions for a self-authored human life.

6.2 Foundations in Capability Theory

The framework draws from Sen's distinction between *functionings* and *capabilities*. UHI operationalizes this institutionally: the three-layer architecture converts abstract rights into actionable freedoms. Nussbaum's central human capabilities—affiliation, play, practical reason—require positive institutional support, which the Sovereign Layer provides.

6.3 Uniqueness as a Social Value

Every individual configuration of ability and potential constitutes a form of value that market metrics cannot fully capture. UHI rejects the implicit eugenic selection of labor-market-centered contracts, recognizing caregiving, cultural production, and speculative inquiry as central expressions of human civilizational capacity.

6.4 Free Time as a Civilizational Resource

Bertrand Russell, in *In Praise of Idleness* (1932), observed that the reduction of necessary labor is a civilizational opportunity. UHI treats free time as a primary social good—the domain of self-directed inquiry, relational investment, creative production, and civic participation. The Right to Flourish is the right to inhabit this domain without material precarity.

6.5 Synthesis: UHI as Institutional Philosophy

Infrastructure exists because flourishing requires commons. Support exists because flourishing requires sustained development. Sovereign exists because flourishing ultimately requires freedom. Together they constitute a *civilization architecture*: technological productivity placed in service of human potential.

7. Conclusion: Toward a Civilization Architecture for the AI Economy

7.1 From Social Policy to Civilizational Design

UHI reconceptualizes social provision as an access architecture guaranteeing the infrastructural, developmental, and economic conditions for human flourishing. It is not a welfare reform but a shift from social policy to civilizational design.

7.2 Structural Coherence of the Three-Layer Model

By grounding each layer in a distinct funding mechanism—strategic public investment, broad-based taxation, and automation windfall redistribution—the model enhances fiscal resilience while preserving democratic legitimacy.

7.3 Democratic Claim on Automation Dividends

UHI establishes a transparent democratic claim on automation-derived productivity. It recognizes that the productivity frontier is a collective social product whose gains should expand the conditions of human freedom.

7.4 Free Time, Human Agency, and Social Stability

Societies that decouple material security from employment shocks are more resilient to technological disruption and less vulnerable to political polarization driven by precarity.

7.5 Implementation Pathways

Near-term pathways include: expansion of universal basic services; public investment in renewable energy and compute infrastructure; taxation frameworks targeting AI productivity gains; and pilot programs linking automation dividends to income floors.

7.6 International Applicability

High-income economies may prioritize automation dividend mechanisms; middle-income economies may focus first on infrastructure access. International cooperation is essential to prevent regulatory arbitrage.

7.7 Directions for Future Research

Further research is required in: quantitative modeling of windfall capture; macroeconomic simulations; governance models for compute commons; political feasibility studies; and comparative analysis across welfare regimes.

7.8 Final Reflection

Universal Human Infrastructure proposes that the gains of automation should be institutionalized as expanded human freedom; that material security should be unconditional; and that the ultimate measure of economic systems should be the extent to which they enable human beings to flourish.

If the industrial era organized society around production, the AI era must organize it around possibility.

Appendix A: Comparative Framework — UHI, UBI, and Welfare State Models

Dimension	Welfare State	UBI	UHI
Primary instrument	Targeted transfers	Unconditional cash	Access architecture
Eligibility	Need / employment	Universal	Universal
Funding	General taxation	Replacement / taxation	Three-channel
Fiscal logic	Expenditure-based	Replacement or additive	Self-reinforcing
Inflation risk	Low–moderate	Moderate–high	Mitigated
Capability dimension	Partial	Absent	Central
Labor assumption	Full employment	Labor optional	Labor decoupled
Normative basis	Risk mitigation	Income security	Right to Flourish
Non-market value	Minimal	Partial	Central
Long-run scalability	Constrained	Fiscally uncertain	Structurally scalable