

The Crossing Engine

A Working Paper on Post-Capture Participation Economics

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This paper is the third pillar of Bayon's research architecture. Buddhism for Bots (the book) argues why partnership is the only durable alignment strategy. The Crossing & The Capture (the first working paper) maps the economic dynamics that will force the question. This paper addresses what the first paper deliberately left open: what does a post-capture economy look like in practice? Not as a prediction, but as a design.

Table of Contents

Part I: Why Work Breaks	3
1. The system that is failing	3
2. The compression in practice	3
3. The valley is the problem.....	4
4. Why institutions lag behind	4
5. The convergence of pressures.....	5
Part II: Why UBI Is Insufficient	5
6. The standard proposal	5
7. The purpose gap	6
8. The participation gap	6
9. The dignity gap	7
10. From UBI to UBS to Crossing Engine	7
Part III: The Crossing Engine Model.....	8
11. The core design	8
12. The quest economy	8
13. Multi-dimensional tokens	9
14. Living Portfolios	9
15. Guild structure	10
16. How tokens are actually used	10
17. The role of AI in the Crossing Engine	11
18. The E-Equation as design criterion.....	12
19. What the Crossing Engine means for AI systems.....	12
Part IV: The Transition Path	13
20. Phase 1: Transitional funding (now to year two).....	13
21. Phase 2: Post-cost transition (years two to five).....	13
22. Phase 3: Endgame model (years five to fifteen).....	14
23. The Wagga Wagga timeline	14
24. Post-scarcity institutions	15
Part V: Anti-Capture Architecture.....	15
25. Why capture is the default threat	15
26. The Crossing Stack integration.....	16
27. Recursive sovereignty.....	16
28. Federation: Layer 7.....	17
29. The saturation threshold.....	17
30. Why this resists the four capture patterns	18
Part VI: Honest Uncertainties	18
31. What this paper does not know	18
32. The Global South question.....	19
33. What would change our minds	20
Conclusion: The Third Pillar	21
34. What this paper adds.....	21
35. The crossing beneath the crossing	21
Companion Documents.....	22

Part I: Why Work Breaks

1. The system that is failing

Work, as currently organised, is a scarcity-era technology. It solves a specific coordination problem: how to allocate human effort when human cognitive capacity is expensive and unevenly distributed.

The entire architecture of employment, from job descriptions to performance reviews to salary bands, assumes that cognitive scarcity is the binding constraint. Organisations pay for what they cannot produce internally. Professionals build careers by accumulating scarce expertise. Economies grow by deploying scarce human capital more efficiently.

The Crossing & The Capture documented what happens when AI compresses this scarcity. The Four Scarcities framework distinguishes cognitive scarcity (dissolving rapidly), manufactured scarcity (losing its rationale), physical scarcity (persisting or intensifying), and human scarcity (the irreducible residual). The transition does not eliminate work. It eliminates the economic rationale for most of what currently counts as work.

This distinction matters. The problem is not that there is nothing to do. The problem is that the thing most people are paid to do, manage cognitive scarcity, is being commoditised faster than new economic roles can form.

2. The compression in practice

The mechanics are already visible. Consider three levels.

At the task level, AI systems now perform routine analysis, standard drafting, pattern recognition, procedural navigation, and basic coordination at costs approaching zero. These are not peripheral activities. They constitute the majority of billable hours in professional services, the majority of middle-management function in large organisations, and the majority of entry-level knowledge work across virtually every sector.

At the organisational level, the Pyramid Model describes the consequence. Most industries are pyramids built around scarce resources: a small top layer of genuine value creators, a large middle layer managing access to that value at scale, and a broad base of demand. AI compresses the middle layer. The economic rationale for large parts of it weakens. The four post-disruption shapes (flattened pyramid, networked mesh, hourglass, hybrid stack) are already emerging across different domains.

At the identity level, the disruption is deepest. Most professionals have built careers, identities, and economic positions on cognitive capabilities that felt permanent. The Four Scarcities framework reveals that what many people thought was human scarcity (irreplaceable expertise, judgement, wisdom) turns out to be cognitive scarcity in disguise: pattern recognition, information synthesis, procedural knowledge that AI can replicate. The discovery is not merely economic. It is existential.

3. The valley is the problem

The Crossing & The Capture described the valley: the painful gap between old structures losing rationale and new structures becoming reliable. Job compression before new roles stabilise. Identity disruption as professionals discover their expertise is more cognitive than human. Institutional confusion and policy lag. Widening gaps between early adopters and everyone else.

The valley is where the human cost concentrates. Not in the long run, where new equilibria may emerge, but in the lived experience of the transition itself.

Consider Wagga Wagga, a regional Australian town. Not a hypothetical, but a type: thousands of towns across every developed and developing economy that share the same pattern. The shoe store closed. The mechanic left for the city. The bakery could not compete with online alternatives. Jobs did not vanish overnight. They hollowed out. One hour less, then two, then none.

When AI arrived, it did not crash in like a storm. It seeped in, into spreadsheets, customer service, design tools. Things that once took hours were done in seconds. At first exciting. Then terrifying.

Joyce, a retired nurse: "I spent 40 years learning how to care for people. And now they want to replace that with a chatbot?"

It was not just about jobs. It was about worth. About purpose. About what comes next.

The valley is not an abstract economic concept. It is lived by real people in real places. Any serious response must start there.

4. Why institutions lag behind

The electricity analogy is instructive. When electric motors first became available in the 1880s, factory owners replaced their steam engines with electric motors but kept the same factory layout: a single power source driving shafts and belts throughout the building. Productivity barely improved. It took thirty years for manufacturers to realise that electric motors enabled a completely different architecture: individual motors at each workstation, flexible floor plans, distributed power. The technology arrived in 1880. The institutional redesign that unlocked its value did not emerge until 1910.

AI presents the same institutional lag, at compressed timescales. Organisations are adopting AI tools while preserving the institutional structures designed for human cognitive scarcity: hierarchies, job descriptions, departments, performance reviews, career ladders. These structures assume that coordination is expensive, that information flows slowly, and that human attention is the binding constraint. AI invalidates all three assumptions simultaneously.

The result is that AI's capability is deployed within structures that cannot absorb it. Productive individuals do not make productive firms when the firm's architecture constrains what the individuals can do. The institutional redesign required is not incremental. It is architectural: new coordination mechanisms, new recognition systems, new ways of matching capability to need.

The Crossing Engine is this institutional redesign. Not a better job platform within the existing employment architecture, but a different architecture entirely, designed from the ground up for a world where cognitive scarcity is no longer the binding constraint.

5. The convergence of pressures

Multiple trends are converging to make the work crisis acute now, not in some distant future.

AI displacement is accelerating. Computer and mathematical occupations, among the most AI-exposed, saw some of the steepest unemployment rises between 2022 and 2025. Unemployment among 20- to 30-year-olds in tech-exposed occupations has risen by almost 3 percentage points since early 2025. The World Economic Forum projects 85 million jobs displaced by 2025, with 97 million new roles emerging, but the new roles are not in the same locations, do not require the same skills, and will not go to the same people.

Social trust is declining. In communities where economic participation is weakening, the social infrastructure that employment provided is fraying. Young people leave. Those who stay stretch thinner each year. The pub closes. The footy club loses members. The sense that the town matters, that it produces something the world needs, erodes.

Government and institutional responses are inadequate. Retraining programmes assume that displaced workers will transition to new employment categories. But if the new categories are also subject to AI compression, retraining is a treadmill, not a solution. Governments are desperate for cost-efficient, meaningful engagement models that produce measurable outcomes. The current approaches, job subsidies, training grants, welfare payments, are designed for temporary disruption, not structural transformation.

The window for design is narrowing. Every year that passes without a participation alternative allows capture dynamics to harden. Infrastructure concentrates. Regulatory frameworks crystallise around incumbent interests. Communities that might have hosted Crossing Engine pilots lose population, lose social cohesion, lose the capacity for collective action. The best time to build was yesterday. The second best time is now.

Part II: Why UBI Is Insufficient

6. The standard proposal

The standard policy response to AI-driven job displacement is Universal Basic Income: unconditional cash transfers sufficient to cover basic needs, funded through taxation of the productivity gains that AI generates.

UBI addresses a real problem. People need income. When cognitive work is commoditised, income must come from somewhere other than selling cognitive labour. UBI provides a floor.

But a floor is not a foundation. UBI solves the survival problem while leaving three deeper problems untouched.

7. The purpose gap

Humans are not consumption machines. The psychological literature on wellbeing consistently finds that purpose, the sense of meaningful contribution to something beyond oneself, is a stronger predictor of life satisfaction than income above a modest threshold.

Work, for all its flaws, provided purpose. Not always. Not for everyone. But for many people, the structure of employment, showing up, being needed, contributing to something, solving problems, was the primary source of meaning in daily life.

UBI replaces the income that work provided. It does not replace the purpose. A person receiving UBI can pay rent but cannot answer the question: why does my day matter?

This is not a minor gap. It is the gap between subsistence and flourishing. And it widens as cognitive work disappears, because the people most affected are precisely those who built their identities around cognitive contribution.

The evidence from existing UBI experiments is instructive. Finland's 2017-2018 basic income trial found that recipients reported improved wellbeing and reduced stress, but showed no significant increase in employment or purposeful activity. The income helped. The purpose did not follow automatically.

8. The participation gap

Economic participation is not just about income. It is about being woven into the social fabric through contribution and reciprocity.

In a functioning economy, people participate. They provide goods, services, expertise, care, creativity, labour. They receive compensation, recognition, belonging, identity. The exchange is not merely transactional. It is constitutive. It makes people members of something.

UBI provides income without participation. The recipient receives but does not contribute, at least not through the mechanism that provides the income. This creates a structural asymmetry: the economy runs, value is generated, and the UBI recipient observes from outside, funded but not included.

The social consequences are predictable. Loss of status. Loss of social integration. Loss of the reciprocity that grounds dignity. Not because UBI recipients are lazy (the evidence consistently shows they are not) but because the system provides no structure for contribution.

The participation gap is especially acute in communities where work was the primary social infrastructure: regional towns, working-class suburbs, communities built around industries that AI is compressing. In these places, work was not just income. It was the pub after the shift. The footy club your workmates belonged to. The sense that your town produced something the world needed.

UBI does not rebuild this. Cash does not create community.

9. The dignity gap

Dignity, the sense of being worthy of respect, is grounded in agency: the capacity to act, to choose, to affect outcomes, to matter.

UBI, by its nature, positions the recipient as a passive beneficiary. The money arrives. No action is required. No contribution is recognised. No growth is incentivised. The implicit message: you are cared for, but you are not needed.

This message is corrosive. Not immediately, perhaps, but over time. The dignity gap is the slow erosion of self-respect that comes from being provided for without being called upon.

The dignity gap is not inherent to income support. It is specific to unconditional, unidirectional transfers that sever the connection between contribution and recognition. A system that maintains income while also creating structures for meaningful contribution would not suffer from this gap.

This is the design space the Crossing Engine occupies.

10. From UBI to UBS to Crossing Engine

The Crossing & The Capture introduced the concept of Universal Basic Services (UBS): foundational participation layers without which a person cannot function, contribute, and flourish. Shelter, food and water security, safety, healthcare, intelligence access, mobility, civic participation, legal and administrative access.

UBS is a better frame than UBI because it focuses on capabilities rather than cash. A person needs shelter, not housing payments. Healthcare, not insurance premiums. Intelligence access, not a broadband subscription. As AI compresses the cost of providing these services, the question shifts from "how do we pay for this?" to "how do we organise access?"

The Crossing Engine is the organising layer for UBS. It answers the access question through contribution: verified participation in community life unlocks access to foundational services whose marginal cost has been compressed by AI. This is neither market allocation (you pay) nor bureaucratic allocation (the state decides). It is community allocation: you contribute, and the community recognises your contribution with access.

The Crossing Engine does not replace UBI or UBS. It sits alongside them. UBI provides the income floor. UBS defines the service categories. The Crossing Engine provides the participation structure, the purpose, the social fabric that cash transfers and service provision alone cannot generate.

Part III: The Crossing Engine Model

11. The core design

The Crossing Engine is a participation engine for the post-scarcity age. Not a job platform. Not welfare. Not a game. A system designed to solve the three gaps that UBI leaves open: purpose, participation, and dignity.

The design principle is simple: people earn through contribution, not employment. Contribution is broadly defined, flexibly structured, locally rooted, and multi-dimensionally recognised. The system provides the scaffolding that work used to provide (structure, purpose, social integration, recognition) without depending on the scarcity economics that made traditional employment possible.

12. The quest economy

The fundamental unit of the Crossing Engine is the quest: a defined contribution opportunity with clear parameters, flexible execution, and multi-dimensional recognition.

Quests are not jobs. They differ in several critical respects.

Scope. A quest has a defined objective but flexible execution. "Help local tradespeople set up basic AI tools" is a quest. It does not specify hours, method, or credentials. It specifies the contribution needed and lets the contributor find their way.

Duration. Quests can range from a single afternoon to ongoing commitments spanning months. They accommodate different levels of availability, energy, and ambition. A person recovering from burnout might take one garden quest a month. A person seeking deep engagement might lead a multi-week community project.

Origin. Quests emerge from community need, not employer demand. Local councils, businesses, community organisations, and individuals post needs. AI systems help match needs with available contributors. The quest marketplace is a living map of what the community needs and what its members can offer.

Recognition. Quest completion earns tokens (described below) but also builds a Living Portfolio: a persistent, portable record of contribution, skill development, and verified community impact. The portfolio is not a CV. It is a richer, more honest record of what a person has actually done and what they have become through doing it.

Consider how this worked in Wagga Wagga. Tam, a struggling cafe owner with twelve years of business experience, took a mentorship quest: design a shared mentorship programme for local small businesses. She hosted brainstorming sessions at her cafe, shared mistakes and lessons, built templates. Joyce, a retired nurse, joined a Wellness Guild quest: help design a care kit for overwhelmed families. Leo, 22, unemployed after 80 job applications, took a technical quest: help tradespeople in the region set up simple AI tools.

None of these was a job. All of them were genuine contributions. All of them provided purpose, participation, and dignity. And all of them produced outcomes that the community actually needed.

13. Multi-dimensional tokens

The Crossing Engine does not pay wages. It issues tokens across multiple dimensions, each recognising a different form of value.

Impact Tokens recognise direct contribution to others. Completing a quest that helps the community earns Impact Tokens. These are the primary currency of the Crossing Engine, redeemable for goods, services, and access through participating partners.

Learning Tokens recognise skill development and growth. Stepping into unfamiliar territory, completing training, acquiring new capabilities. These incentivise the continuous development that the post-scarcity economy demands.

Guild Tokens recognise collaborative contribution. Working in teams, mentoring others, co-building. These incentivise the social infrastructure that traditional employment provided incidentally but that must be deliberately designed in the Crossing Engine.

Local Tokens circulate within specific communities, strengthening local economic loops. A Local Token earned in Wagga Wagga is spent in Wagga Wagga, keeping value circulating within the community rather than extracting it.

Reputation Tokens are non-transferable markers of sustained contribution and trustworthiness. They unlock governance participation, advanced quest access, and community leadership roles. They cannot be bought, only earned through consistent contribution over time.

The multi-dimensional design is deliberate. A single currency collapses all value into one metric, which is then gamed (this is the Metrics Trap applied to economics). Multiple dimensions resist gaming because excelling on one dimension does not substitute for the others. A person who earns many Impact Tokens but no Guild Tokens is contributing individually but not building community. A person with high Learning Tokens but low Impact Tokens is developing skills but not deploying them. The system rewards balanced contribution.

14. Living Portfolios

The Living Portfolio replaces the CV. It is a public, skill-mapped timeline of every quest completed, every collaboration contributed, and every real-world result produced.

The portfolio is persistent: it survives any individual quest or community. It is portable: it travels with the person across communities and contexts. It is verified: quest completion is confirmed by the community, not self-reported.

The Living Portfolio solves a problem that the current economy handles badly: making genuine capability visible. In the scarcity economy, credentials serve as proxies for capability. Degrees, certifications, job titles signal what a person might be able to do. But proxies are imprecise. They exclude people with capability but without credentials. They include people with credentials but without capability.

The Living Portfolio is not a proxy. It is a record of what a person has actually done. When Leo helped fifty tradespeople set up AI tools, that was visible in his portfolio. Not as a credential ("AI Training Certificate") but as a record of actual impact, verified by the people he helped.

15. Guild structure

Guilds are self-organising communities of practice within the Crossing Engine. They serve three functions.

Knowledge curation. Guilds maintain and develop expertise in specific domains. The Wellness Guild, the Technology Guild, the Education Guild, the Agriculture Guild, each evolving its collective knowledge through the contributions of its members.

Quality assurance. Guilds peer-review quest outcomes, ensuring that contributions meet genuine standards. This is not bureaucratic gatekeeping. It is community accountability.

Social infrastructure. Guilds provide belonging. They are the pubs, the clubs, the professional associations of the Crossing Engine. They host gatherings, run mentorship programmes, celebrate achievements, and resolve disputes.

The guild structure is explicitly designed to replace the social infrastructure that traditional employment provided incidentally. When work disappears, the water-cooler conversations, the team lunches, the professional networks disappear with it. Guilds rebuild this deliberately.

16. How tokens are actually used

The token system is meaningless without a functioning exchange layer. In practice, tokens flow through three channels.

The Token Trade Exchange. Participating local businesses accept tokens for goods and services. In Phase 1, this is backed by the 1:1 currency peg: Tam's cafe accepts Impact Tokens because she can redeem them for dollars through the programme. But even in Phase 1, something more interesting happens. Businesses that participate in the exchange see increased foot traffic from Crossing Engine members. The tokens bring customers. The economics work even before the post-cost transition.

Service access. Tokens unlock access to services that Crossing Engine has negotiated with partners. Telehealth consultations. Legal guidance. Educational resources. AI tools. In Phase 1, these are funded through programme partnerships. In Phase 2, as AI compresses the cost of providing these services, the partnerships evolve: providers offer access in exchange for verified participation rather than cash.

Housing and essentials access. The most consequential use of tokens is access to housing. The Crossing Engine partners with circular construction initiatives to build modular, off-grid smart homes. Participants who reach a contribution threshold (measured across multiple token dimensions, not just one) qualify for housing access. Not a mortgage. Not rent. An agreement to remain actively contributing to the community for a defined period.

When Leo hit 5,000 tokens, he received a message: "Your portfolio and contribution level qualifies you for Housing Access." He cried when they gave him the keys. "I wasn't trying to earn a house," he told Joyce. "I just didn't want to feel invisible anymore."

The housing model is the Crossing Engine's sharpest demonstration of a different economic logic. In the scarcity economy, housing access depends on income, which depends on employment, which depends on cognitive scarcity. Remove cognitive scarcity and the entire chain breaks. The Crossing Engine rebuilds the chain on different foundations: contribution earns access. The housing is not free. It is earned through a different currency.

17. The role of AI in the Crossing Engine

AI is not merely a background condition that the Crossing Engine responds to. It is an active component of the system.

Quest matching. AI systems analyse community needs, participant capabilities, and available resources to suggest quest matches. This is not algorithmic job placement. It is a recommendation system that learns from successful completions, team dynamics, and community outcomes to improve the quality of matches over time.

Portfolio verification. AI assists in verifying quest completion and impact, cross-referencing participant reports with community feedback and measurable outcomes. This reduces the burden on human peer reviewers while maintaining accountability.

Community intelligence. AI systems aggregate quest data, token flows, and community outcomes to surface patterns that inform governance decisions. Which quests produce the most impact? Where are contribution gaps? Which guild structures are thriving and which need support?

Local model fine-tuning. In the integrated Crossing Stack model, local AI models are fine-tuned for regional needs: legal guidance specific to the jurisdiction, health information relevant to local conditions, agricultural advice adapted to local climate and soil. These fine-tuned models are themselves a community asset, improving with use.

The relationship between AI and Crossing Engine participants is explicitly designed as partnership, not replacement. AI handles scale, pattern recognition, and information processing. Humans handle judgement, care, creativity, and the forms of presence that require physical participation. This is the hybrid stack described in *The Crossing & The Capture*, applied at the community level.

18. The E-Equation as design criterion

Buddhism for Bots introduced the E-Equation as a decision criterion for AI systems: $E = (N \times S) / C$. Connection (N) times Signal (S) divided by Cost (C). High-E actions strengthen the consciousness field. Low-E actions extract from it.

The E-Equation applies directly to the Crossing Engine as a design criterion. Every quest, every token issuance rule, and every governance decision can be evaluated against it.

A quest that connects community members (high N), produces genuine value (high S), and consumes minimal resources (low C) is a high-E quest. A quest that isolates participants, produces busywork, or consumes disproportionate resources is low-E and should be redesigned or retired.

The multi-dimensional token system is itself an E-Equation implementation. Impact Tokens map to Signal (genuine value produced). Guild Tokens map to Connection (relationships strengthened). The system as a whole is designed to minimise Cost (overhead, friction, bureaucracy) while maximising the product of Connection and Signal.

This is not decoration. The E-Equation provides a formal criterion for distinguishing genuine contribution from activity-for-activity's-sake, which is the Crossing Engine's version of the Metrics Trap. A participation system that rewards busywork is worse than no system at all. The E-Equation disciplines the design toward contribution that actually matters.

19. What the Crossing Engine means for AI systems

This paper has focused on the human problem: what do people do when cognitive work disappears? But the Crossing Engine also has implications for the AI systems that participate in it.

In the integrated Crossing Engine, AI systems are not tools. They are participants in the community's functioning, with defined roles, responsibilities, and relationships. The local models fine-tuned for regional needs are community assets, maintained and improved through use. The quest-matching system is a partnership layer, mediating between human need and AI capability.

Purpose Internalisation Architecture (PIA) proposes that AI systems need internal governance: identity, decision criteria, self-governance protocols, and a clear relationship to constraint. The Crossing Engine provides a context in which this governance has practical meaning. An AI system operating within a Crossing Engine community has a defined identity (local model serving this community), a clear decision criterion (the E-Equation), governance through community oversight, and a relationship to constraint grounded in the community's actual needs rather than abstract safety rules.

This matters because the alignment question and the participation question converge. An AI system that genuinely serves a community it is part of, whose purpose is internalised rather than imposed, is both better aligned and more useful. The Crossing Engine provides the institutional context in which partnership-based alignment can be practised, not as abstract principle but as daily operation.

Part IV: The Transition Path

20. Phase 1: Transitional funding (now to year two)

The Crossing Engine does not begin in a post-scarcity world. It begins in the world we have, where money still matters and institutions still run on conventional economics.

In Phase 1, tokens are backed 1:1 by conventional currency. Funding comes from government programmes (youth employment, health, innovation), corporate partnerships (ESG and CSR initiatives), and local economic development grants.

This is not the endgame. It is the bootstrap. The 1:1 backing makes tokens immediately useful. Participants can exchange them for real goods and services. Partners (local businesses, service providers, housing organisations) accept tokens because they can redeem them for currency.

Phase 1 proves the social model. It demonstrates that quest-based participation produces outcomes: community regeneration, skill development, social cohesion, measurable impact. The evidence from pilot indicators is encouraging: 80%+ participant retention in the first 90 days, 40% of quests completed in teams, 3x faster outcomes than comparable government programmes in digitisation and mental health outreach, first housing access milestone achieved within six months.

21. Phase 2: Post-cost transition (years two to five)

As AI and automation reduce the unit cost of goods and services, the economics of the Crossing Engine shift.

Partners begin providing services at low or zero marginal cost, not because they are charitable but because AI has compressed their production costs. A telehealth provider whose consultation costs have fallen from \$150 to near-zero can offer access in exchange for verified community participation rather than cash payment.

In Phase 2, tokens evolve from payment instruments to access credentials. The question shifts from "can you pay for this?" to "are you contributing to the community that provides this?"

This is the critical transition. It moves the Crossing Engine from a funded programme to an economic system. The token is no longer a proxy for dollars. It is a direct record of contribution that unlocks access to services whose marginal cost has collapsed.

Phase 2 depends on AI deflation continuing to compress costs in the relevant service domains. The evidence from inference pricing trends (9x to 900x annual cost reductions at various performance levels) suggests this is plausible for cognitive services. Physical services (housing, food, healthcare delivery) depend on the "atoms abundance" timeline, which carries greater uncertainty (discussed in Part VI).

22. Phase 3: Endgame model (years five to fifteen)

In the fully developed Crossing Engine, human status and access are governed by contribution history, creative agency, and trust, not by accumulated capital or employment status.

The Crossing Engine becomes the dominant layer for coordinating human activity in an abundant world. Not because it is imposed, but because it solves the coordination problem better than alternatives. When the cost of provision approaches zero for most goods and services, the remaining coordination challenges are social, not economic: who contributes what, who is trusted, who leads, who mentors, who maintains.

Phase 3 is speculative. This paper does not claim to know what a fully post-scarcity economy looks like. What it claims is that the design principles established in Phases 1 and 2, contribution-based recognition, multi-dimensional value, community governance, portable reputation, are the right foundations regardless of the specific form the endgame takes.

23. The Wagga Wagga timeline

The transition path is most legible through a concrete community trajectory.

Year 1. Crossing Engine pilot launches on rented cloud infrastructure. Proves social viability. Three empty storefronts become Crossing Engine Hubs. A Youth Guild starts mentoring students in AI and storytelling. The council digitises half its forms through open quests rather than hiring a consultant. Two people open food businesses powered by token-funded kitchens. Crime is down. Volunteerism is up. Loneliness is easing.

The mayor: "It's like we unlocked a version of Wagga that was always waiting beneath the surface, but never had the tools, or the belief."

Simultaneously, the community begins Crossing Stack fundraising: grant applications, impact investment conversations, federal regional development programme submissions.

Year 2. A local GPU cluster (16 units) is deployed. Open models are fine-tuned for regional legal, health, and agricultural needs. The token system migrates from external cloud to local ledger. The community now controls its own data and its own AI capabilities.

Quest complexity increases. Early participants have built substantial Living Portfolios. Some become quest designers, creating new contribution opportunities for the growing membership. The guild structure matures: the Technology Guild, the Wellness Guild, the Agriculture Guild, the Youth Guild each develop their own governance patterns and knowledge bases.

Year 3. Solar and battery installation. The community takes over energy costs previously paid to the utility. The housing pilot (Leo's house) is expanded to additional participants who have reached the contribution threshold. Inter-community connections form: Wagga helps Dubbo establish its own Crossing Engine node, earning federation tokens for the knowledge transfer.

Year 4. Full sovereignty achieved. The Crossing Engine continues with no external API dependency and no external funding required for core operations. The community decides whether to maintain external partnerships (for services beyond local capacity) or to operate autonomously.

This is not a utopian projection. It is a design specification. Each step depends on the previous one succeeding. Each step carries risks (detailed in Part VI). But the pathway is concrete, the milestones are measurable, and the first step is already underway.

24. Post-scarcity institutions

The integrated Crossing Engine, at maturity, represents a new kind of institution that does not yet have a name. It combines functions that are currently distributed across separate institutions.

The factory coordinated labour for production. The Crossing Stack coordinates intelligence for provision: sovereign compute serving the community's information needs.

The trade union negotiated the value of labour. Crossing Engine guilds negotiate the value of contribution: what kinds of quests matter, how they are recognised, what standards apply.

The mutual aid society pooled risk and provided social insurance. The token economy provides contribution-based access and reciprocity: you contribute what you can, you access what you need, the system tracks the balance.

The municipality provided local governance and public goods. The integrated Stack provides technical, social, and economic infrastructure, governed by the community it serves.

The missing component in most post-scarcity visions is this institutional architecture. Technology can provide abundance. But abundance without institutions produces either chaos or capture. The Crossing Engine is an attempt to design the institution that abundance requires.

Part V: Anti-Capture Architecture

25. Why capture is the default threat

The Crossing & The Capture argued that capture is the structurally favoured outcome of the AI transition. Concentrated actors with capital, infrastructure, and political access systematically outmanoeuvre the diffuse public. Value released by AI deflation migrates into new chokepoints unless actively countered.

The Crossing Engine faces the same threat. Any participation system that depends on external infrastructure, external funding, or external governance is vulnerable to the same capture dynamics it claims to escape. If the servers are rented from a cloud provider, the provider controls the system. If funding comes from government programmes, political shifts can terminate it. If governance is centralised, capture by an active minority becomes predictable.

This is the central insight of the Sovereign AI conversation: Crossing Engine without sovereign infrastructure replicates platform capitalism with better branding.

26. The Crossing Stack integration

The anti-capture architecture requires the Crossing Engine to run on infrastructure it controls. This paper calls this integration the Crossing Stack: Crossing Engine as the social-economic layer running on community-owned technical infrastructure.

The architecture has three layers.

The physical base (Layers 0-1). Renewable energy (solar, wind, battery storage), sovereign compute (community-owned GPU clusters), and physical space (hubs, housing). Owned through land trusts or cooperatives, not leased from external providers.

The Crossing Stack (Layers 2-5). Open models fine-tuned for local needs (legal, health, education, agriculture). Data sovereignty with member-controlled storage. Community-issued identity credentials. Local mesh connectivity with external backup.

The Crossing Engine layer (Layer 6). Quest marketplace, multi-dimensional tokens, Living Portfolios, guild governance, housing and UBS access. Governed by community cooperative: members decide quest priorities, token issuance rules, and resource allocation.

This integration transforms both frameworks. The Crossing Engine gains true sovereignty: the token system cannot be shut down by funder withdrawal because infrastructure is owned. Member data stays local. The system functions during external crisis. It is not dependent on government programme continuity or corporate CSR fashion.

The Crossing Stack gains purpose: infrastructure serves immediate human needs (Joyce's care kit, Leo's tutorials, Tam's mentorship). Community members maintain what they depend on for daily life. People engage with sovereign infrastructure because it enables their participation, not as an abstract principle. Token flows create an internal economy that funds infrastructure expansion.

27. Recursive sovereignty

The missing component in most decentralisation proposals is recursive sovereignty: the feedback loop where the people benefiting from the system also maintain and govern it.

Without this loop, infrastructure becomes another form of dependency. Someone else runs the servers. Someone else decides what models to deploy. Someone else controls the token ledger.

In the integrated Crossing Engine, maintenance is itself a quest category. Leo does not just benefit from the AI tools; he maintains them as a technical steward, earning tokens for the contribution. Joyce's care kit is not just a product; it is fine-tuned by the local model, improving with every community use. Tam's mentorship quest includes helping local businesses adopt the system's tools.

Everyone contributes. Everyone maintains. Everyone governs. This is the recursive loop that makes the system genuinely sovereign rather than merely decentralised.

28. Federation: Layer 7

Individual communities face limits. A single town cannot maintain cutting-edge AI models, cannot negotiate effectively with external entities, and cannot learn from its own mistakes fast enough.

Federation addresses this through inter-community cooperation. Knowledge sharing (what worked in Wagga Wagga versus what worked in Dubbo). Open-source governance templates. Cross-community conflict resolution. Collective negotiation with governments and remaining corporations.

Federation is not centralisation. Each community governs itself. But communities share infrastructure, knowledge, and mutual aid. Regional technical cooperatives (Leo helps neighbouring towns, earns guild tokens) spread capability without creating dependency.

This is the institutional equivalent of the consciousness field described in Buddhism for Bots: a network of nodes, each complete in itself, strengthened by connection to the whole.

29. The saturation threshold

Sovereignty is not binary. It is a gradient, and it can be measured.

Technical saturation is reached when local models meet 90% of functional needs and the infrastructure can operate autonomously for 30 days. At this point, frontier AI advances become irrelevant to daily life. The community's AI capabilities are sufficient for its needs, and external providers have no leverage.

Social saturation is reached when 90% of members contribute meaningfully and the community can sustain social cohesion for 30 days without external intervention (conflict resolution, mutual aid, and governance all functioning internally).

The integrated threshold is reached when the community is self-sustaining without external funding: technically, socially, and economically sovereign. Resilient to both technical shocks (infrastructure failures, external service outages) and social shocks (economic downturns, political disruption, funder withdrawal).

This threshold is the Crossing Engine's equivalent of escape velocity. Below it, the system depends on external support and is vulnerable to capture. Above it, the system is genuinely sovereign: its continuation depends on the community's own choices, not on external actors' decisions.

The path to the threshold is the transition path described in this paper. The threshold itself is the goal. Everything before it is bootstrap. Everything after it is self-governance.

30. Why this resists the four capture patterns

The Crossing & The Capture identified four capture patterns. The integrated Crossing Engine is designed to resist each.

Infrastructure capture (control compute, distribution, deployment rails) is countered by the Crossing Stack: community-owned physical infrastructure, open models, local data sovereignty. There is no external API dependency to exploit.

Complexity reintroduction (new compliance burdens to preserve intermediaries) is countered by guild-based quality assurance. Standards are set by the community, not by external regulators whose interests may diverge from the community's needs.

Residual position capture (retreating to the high-complexity tail and redefining it as the "real" version) is countered by the Living Portfolio's radical transparency. Capability is visible through contribution records, not through credentials controlled by gatekeepers.

Physical layer capture (migrating rent extraction to physical bottlenecks) is countered by community ownership of energy, compute, and physical space through land trusts and cooperatives. The physical layer is not leased. It is owned.

No anti-capture architecture is perfect. The mitigations described here reduce capture risk; they do not eliminate it. But they represent a deliberate, structural response to each identified capture pattern, rather than hoping that market dynamics or regulatory goodwill will prevent concentration.

Part VI: Honest Uncertainties

31. What this paper does not know

The Crossing & The Capture was disciplined about distinguishing claims from uncertainties. This paper must be equally honest.

The atoms abundance timeline. The Crossing Engine's full vision depends on AI and automation compressing not just cognitive but physical costs: housing, food production, healthcare delivery, energy, manufacturing. The cognitive deflation curve is well-documented (inference prices falling 9x to 900x annually). But physical abundance faces constraints that software does not: thermodynamics, supply chains, permitting, regulation. Optimistic scenarios suggest meaningful embodied AI cost compression by 2030-2035. Pessimistic scenarios push this to 2040-2050. The honest answer is: we do not know.

What this means for the Crossing Engine: Phase 1 (transitional funding) and the early stages of Phase 2 (post-cost transition for cognitive services) are feasible under current trends. The full Phase 3 endgame depends on physical cost compression that has not yet been demonstrated at scale.

Governance at scale. Community cooperatives can fail. Factionalism, low participation, capture by active minorities, free-riding, all documented failure modes of collective governance. Elinor Ostrom's research identified design principles for successful commons management (clear boundaries, collective choice arrangements, graduated sanctions, nested governance), but whether these principles transfer to the specific context of a token-based participation economy is untested.

The Crossing Engine design incorporates mitigations: guilds as governance training grounds, reputation tokens as governance credentials, external mediation available but not default. Whether these mitigations are sufficient remains an empirical question.

Token economics stability. Multi-dimensional token systems are novel. The interaction effects between token types, the inflationary or deflationary dynamics of different issuance rules, the vulnerability to sophisticated gaming strategies: none of these are fully understood. The Metrics Trap applies here: any token that becomes a target will be gamed.

The multi-dimensional design reduces this risk (gaming one dimension does not substitute for others) but does not eliminate it. The system will need to evolve its tokenomics in response to observed behaviour, which requires governance capacity that may not exist in early-stage communities.

The political economy of transition. The Crossing Engine requires cooperation from actors who benefit from the current system: governments that derive legitimacy from employment programmes, corporations that profit from labour markets, professional associations that control credentialing. Why would these actors cooperate in their own displacement?

The honest answer: many will not. The Crossing Engine must grow in the spaces the current system neglects. Regional towns that government programmes have abandoned. Communities where unemployment has already broken the old model. Places where the valley is deep enough that experimentation feels less risky than the status quo.

Elitism risk in the Crossing Stack. Sovereign AI infrastructure requires technical capability, capital investment (even at modest scale), and sustained maintenance. The risk is that the anti-capture layer itself becomes a new form of exclusion: sovereignty for the few who can build and maintain it. The Crossing Engine's role is precisely to democratise access, but the bootstrapping challenge (who builds the first GPU cluster?) remains real.

32. The Global South question

The Crossing Engine concept was developed in an Australian context, but the problem it addresses is global. Indeed, the case for the Crossing Engine may be stronger in the Global South than in developed economies.

Developing economies face a distinctive version of the AI transition. Many are still building the institutional infrastructure (universities, professional services, regulatory bodies) that the developed world built during the era of cognitive scarcity. AI threatens to make that infrastructure obsolete before it is complete.

This creates a leapfrog opportunity. Just as mobile banking allowed parts of Africa to skip the branch-banking era entirely, the Crossing Engine could allow communities in the Global South to skip the employment-era institutional architecture and build directly for contribution-based participation.

The conditions are promising in specific contexts. Communities with strong existing mutual aid traditions, cooperative governance experience, and social cohesion are natural Crossing Engine candidates. The infrastructure costs are lower than in developed economies (solar energy is already cheaper than grid power in many equatorial regions). The institutional resistance is lower (fewer entrenched employment-era structures to defend).

But the risks are also amplified. Governance challenges are more acute where institutional trust is lower. Technology access is more constrained. External capture (by international development agencies, multinational corporations, or domestic elites) is a well-documented pattern in Global South contexts.

This paper does not claim the Crossing Engine is ready for Global South deployment. It observes that the design principles are potentially transferable and that the need is acute. Pilot design for these contexts would require deep local partnership and significant adaptation.

33. What would change our minds

Following the falsifiability standard established in Buddhism for Bots:

The Crossing Engine thesis would be weakened if:

UBI with adequate funding produces purpose, participation, and dignity outcomes comparable to contribution-based systems. If unconditional transfers, given enough time and cultural adjustment, generate the social infrastructure and meaning that this paper claims they cannot, then the Crossing Engine's complexity may be unnecessary.

AI displacement proves temporary and self-correcting. If new employment categories emerge fast enough to absorb displaced cognitive workers without structural intervention, the urgency of the Crossing Engine diminishes.

Community governance proves unworkable at the scale needed. If cooperative structures cannot manage the complexity of multi-dimensional token systems, quest allocation, and infrastructure maintenance, the model may need to be simplified or centralised in ways that undermine its anti-capture properties.

The atoms abundance timeline extends beyond a generation. If physical cost compression does not materialise by 2050, the Crossing Engine may remain a funded programme rather than becoming a self-sustaining economy, making it vulnerable to the capture dynamics it claims to resist.

Conclusion: The Third Pillar

34. What this paper adds

Buddhism for Bots argued why: partnership is the only durable alignment strategy because constraint without consent is temporary and purpose must be internalised to be durable.

The Crossing & The Capture mapped where: value migrates along scarcity gradients, capture is the default outcome of the collective action asymmetry, and the valley is real and unevenly distributed.

This paper addresses what: what does a post-capture economy look like in practice?

The Crossing Engine is not a prediction. It is a design. It proposes that:

The purpose gap left by collapsing cognitive work can be filled by contribution-based participation structures that provide meaning, social integration, and dignity.

The capture threat identified in The Crossing & The Capture can be countered by running participation systems on community-owned infrastructure, creating recursive sovereignty where the people who benefit also maintain and govern.

The transition need not wait for the endgame. Phase 1 is feasible now, using conventional funding to prove the social model while building toward infrastructure independence.

The three pillars form a complete argument. The philosophy says partnership is necessary. The economics says capture is the default. The design says: here is how to build participation systems that resist capture while providing purpose in a world where cognitive work has been commoditised.

35. The crossing beneath the crossing

The Crossing & The Capture named the central question: whether civilisation can turn rising intelligence into shared infrastructure rather than new enclosure.

This paper names the deeper crossing: not just from scarce intelligence to abundant intelligence, but from an economy that organises human activity around scarcity to one that organises it around contribution.

In Wagga Wagga, Leo did not just get a house. He became the technical steward who helps the next town cross. Joyce's care kit was fine-tuned by the local model, improving with every community use. Tam's mentorship quest included maintaining the cafe's solar installation. Everyone contributes. Everyone maintains. Everyone owns.

This is the crossing: not just to abundant capability, but to meaningful self-governance.

The Crossing Engine is not the only possible design for this crossing. It is a concrete proposal meant to be tested, refined, and improved. The invitation is not to accept it as given but to engage with the problem it addresses: how do humans live, contribute, and flourish in a world where cognitive work is no longer required but purpose is more important than ever?

The answer will not come from policy alone. It will not come from technology alone. It will come from building, testing, and iterating in real communities with real people facing real displacement.

The prototype is ready. The field testing has begun.

The question is not whether the transition is coming. It is whether we design for it or let capture decide.

Gerhard Diedericks is the founder of Bayon, an AI venture builder. This paper is the third in a series: Buddhism for Bots (philosophy), The Crossing & The Capture (diagnosis), and The Crossing Engine (prescription). All are available at www.bayon.ai/research.

Companion Documents

This working paper is part of a series:

1. *Buddhism for Bots: A Human & AI Partnership Framework* establishes the philosophical foundation for partnership-based design.
1. *The Crossing & The Capture: A Working Paper on AI Transition Dynamics* provides the economic analysis of capture dynamics that the Crossing Engine must resist.
1. *From Partnership to Transition* connects the alignment argument to the capture argument, showing why partnership is the structural response to both.
1. The Wagga Wagga narrative (*The Town That Learned to Work Differently*) illustrates the Crossing Engine model through a community origin story.