

From Proof of Family

ROOTS

to Proof of Personhood

A village in Southern Italy has verified human identity for four centuries through the oral tradition of family nicknames. We are putting it on-chain. And letting it grow.

NETWORK	Kusama · Asset Hub
ASSETS	ROOTS NFT + ROOTS Token
BUDGET	62,239 DOT gross
TAX	Crypto Tax Italy 33% included
DURATION	14 weeks / 3.5 months
GATE	OpenSquare · Dual quorum
CONTACT	Submit via governance channels

Submitted to the KSM Art & Social Experiments Initiative of the Kusama Vision Initiative via official governance channels. All figures in DOT at time of milestone confirmation.

The Oldest Anti-Sybil System in Human History

As artificial intelligence blurs the line between human and machine, the challenge of Proof of Personhood has never been more urgent. Current solutions — biometrics, zero-knowledge proofs, social graphs — are technically sophisticated but culturally hollow: they verify existence without verifying *belonging*.

In small villages of Southern Italy, every family carries a *'u nomme 'e casa* — a house name passed down orally for centuries. Invisible to official registries. Incomprehensible to outsiders. Impossible for any AI to fake. It is a proto-blockchain predating the internet by four hundred years.

"You cannot pretend to belong to a place if you do not know who the people are and what they are called."

What ROOTS Does

ROOTS takes this living oral tradition and anchors it on-chain — not to digitise a culture, but to use culture as infrastructure. Every attested family receives two non-transferable on-chain assets: an NFT that encodes their position in the lineage graph, and a token that gives them weighted voice in a community referendum. The experiment asks a single question: *can a 400-year-old oral identity system govern itself on a public blockchain?*

Every Attested Family Receives Two Distinct On-Chain Assets

The NFT is the identity instrument. The Token is the governance instrument. Neither can be transferred or sold. Neither has monetary value. They must not be confused.

Asset 1 — The ROOTS NFT (Identity)

Every ROOTS NFT is a generative artwork computed from the family's exact position in the lineage graph. The artwork evolves: every new sub-family that registers links to its parent, causing the parent

NFT to re-render with a new branch. Rarity is structural — it emerges from the actual age and size of the family in the real village, not from arbitrary assignment. The oldest family holds the rarest NFT because they *genuinely are* the oldest family.

Field	Value	Notes
roots_parent_nft_id	nft_id null	null for founding families
lineage_depth	integer	generations from graph root
branch_count	integer	direct sub-families
total_descendants	integer	all nodes in the subtree
token_allocation	integer (computed)	recalculated on every graph change
succession_address	ss58 null	designated successor wallet
status	active dormant succeeded	updated by succession protocol

Asset 2 — The ROOTS Token (Governance)

A fungible token minted on Kusama Asset Hub with `transfer: None` at protocol level. It cannot be sold, sent, or traded. **Zero monetary value.** The allocation is not static: it changes as the family grows, using a formula with diminishing returns that ensures no single family can achieve majority governance alone.

A Rule Explainable in One Sentence to a 75-Year-Old Patriarch

The rule is simple: every registered relative in the graph gives you more voice. If you are alone, you have 10 votes. If you have 54 registered family members, you have 73 votes. The square root ensures that growing large gives *diminishing returns* — a protection against dynastic dominance that requires no arbitrary cap and no administrator.

```
nodes = 1 + branch_count + total_descendants
# the patriarch himself + all nodes in his subtree

token_allocation = floor( sqrt(nodes) x 10 )

# Alone in graph: sqrt(1) x 10 = 10 tokens (1.2% of supply)
# 10 registered rel.: sqrt(11) x 10 = 33 tokens (3.8%)
# 54 registered rel.: sqrt(55) x 10 = 74 tokens (8.5%)
```

At the ceremony, one sentence is all that is said: "How many relatives you have registered, that is your voice." The formula is a technical detail invisible to participants. The governance weight updates automatically as the family graph grows.

Simulation — Village of 60 Families

Family	Nodes in graph	Tokens	% of supply
Founders A — largest family	54	73	8.4%
Founders B	39	62	7.2%
Founders C	28	52	6.0%
Average family	10	31	3.6%
New family (alone)	1	10	1.2%
Top 3 families combined	—	187	21.6% — not enough

Even the three largest families combined cannot reach 22% of supply. Winning a referendum requires a genuine village coalition — not a dynasty, not a bloc, not a purchase.

Winning Requires Both Weight and the Village's Presence

The square root formula solves weight concentration. But a second risk remains: a large family could win a low-turnout vote and claim a mandate the village never gave. The dual quorum separates *how much you weigh* from *whether the vote is legitimate at all*.

```
Platform: OpenSquare (opensquare.network)
Gate: ROOTS Token balance >= 1 (attested families only)

Quorum A: >50% of expressed tokens in favour
Quorum B: >33% of registered families have voted

# Both conditions must be met simultaneously.
# Snapshot: block at referendum launch (end Phase 3)
```

Quorum B is the popular legitimacy floor. A decision is not valid if two thirds of the community stays home. Even with 73 tokens (8.4%), a founding patriarch cannot govern alone: he must persuade at least 20 of 60 families to show up.

Why OpenSquare and Not Native Kusama OpenGov?

OpenGov uses KSM: whoever buys KSM commands. ROOTS requires a referendum gate restricted to attested members only, weighted by genealogical standing rather than economic power. OpenSquare reads arbitrary on-chain token balances with configurable quorum rules — including participant count quorums.

When the Patriarch Dies, the NFT Remains. The Tokens Do Not.

Every patriarch will die. The wallet becomes inaccessible. The tokens vanish — they are not inherited. What remains is the family NFT: the memory of the lineage, the root node from which children continue to branch. This is not a bug. It is the system's most important design choice.

Why tokens must not be inherited:

If tokens were split among six children at death, the family still holds the same aggregate power — just distributed across six wallets. The system would accumulate power dynastically across generations. Instead, tokens are burned at death and re-issued fresh to whoever the community designates as the new capostipite, computed from the existing graph. The family's size is its power — not its history of accumulation.

Succession Address ♦ Strongly Recommended

Designate an heir while alive

At the attestation ceremony, 2 minutes to sign the successor's wallet address on-chain. At death, the transfer is immediate. No waiting period. No community vote required.

- + Explicit, reversible, immediate. The patriarch's will is law.
- Requires proactive action. Facilitated at the ceremony.

When no address is designated

Tokens burned — NFT remains

The deceased's tokens are burned. The NFT stays at the top of the lineage graph. Each directly registered child receives +1 symbolic token in memory of the patriarch.

- + Power resets cleanly. No dynastic accumulation.
- The new capostipite starts from the graph, not an inheritance.

Community attestation — 30 days

Three witnesses from different quarters

Within 30 days: 3 token-holders from different village quarters co-sign the successor. Family members cannot attest their own kin. 15-day challenge window for the full community.

- + Decentralised. Formalises what the village already knows.
- Requires off-chain coordination across quarters.

Proof of Life — Annual

On-chain heartbeat

Every 12 months, every capostipite signs an on-chain remark. Negligible cost. If absent: wallet enters "silent" state, cannot vote. After 6 months of silence, the succession protocol activates.

- + Distinguishes inactivity from death. Cost is trivial.
- Requires sustained digital literacy from elderly participants.

At the ceremony, every capostipite hears three things:

- 1. Your tokens vanish with you — they are not inherited.*
- 2. Your NFT remains: the permanent memory of your family.*
- 3. Every registered child receives 1 token in your memory.*

From Oral Tradition to On-Chain Governance in 3.5 Months

Phase	Description	Weeks	Type
1	Oral Ethnography & Book of Names	1–4	Off-chain
2	The Attestation Ceremony	5–6	Bridge
3	On-Chain Registration	7–8	On-chain
4	The Social Experiment (OpenGov)	9–12	Hybrid
5	Report & Replication Framework	13–14	Documentation

Phase 1 — Oral Ethnography & Book of Names (Weeks 1–4)

Field researchers collect 60+ house nicknames through sessions in homes, bars, and village squares. The full lineage graph is mapped. 100 copies of the Book of Names are printed and deposited with the Municipal office as a permanent physical record. All sessions are video-documented.

Phase 2 — The Attestation Ceremony (Weeks 5–6)

A public event with a panel of village elders formally attests each family. Every capostipite is briefed on the succession protocol: designating an heir is presented as part of the responsibility of holding the token. A 20-minute documentary is filmed.

Phase 3 — On-Chain Registration (Weeks 7–8)

Wallet onboarding for all participants. ROOTS NFTs and tokens minted on Kusama Asset Hub. The lineage graph indexer goes live, computing and redistributing token allocations as new families link into the graph. IPFS pipeline operational. 100+ participants registered.

Phase 4 — The Social Experiment (Weeks 9–12)

An OpenSquare referendum opens with dual quorum active. Facilitated deliberation sessions in the village. Data collected on turnout, vote distribution, succession designations, and qualitative participant responses. Referendum closes end of week 12.

Phase 5 — Report & Replication Framework (Weeks 13–14)

Referendum result formally delivered to the Municipal office. 30-page research report published on Mirror.xyz. Succession protocol fully documented. Facilitator handbook published for other villages to

replicate the experiment.

62,239 DOT Gross — Three Milestone Payments

Payment Milestones

Milestone	Deliverable	Phases	Net DOT	Tax	Gross DOT	Release
M1 Project Start	Signed agreement. On-chain identity verified. Field coordinator engaged. Phase 1 collection underway.	Phase 1	7,500	3,694	11,194	Week 1
M2 100+ Tokens Live	100+ NFTs + tokens on-chain. Indexer live. Book of Names deposited. Ceremony documented. Referendum launched.	Ph. 2–3	17,500	8,619	26,119	End wk 8
M3 Final Delivery	Referendum closed. Result to Municipal office. Documentary. Mirror.xyz report. Succession protocol documented. Handbook.	Ph. 4–5 + Content.	16,700	8,226	24,926	End wk 14
TOTAL			41,700	20,539	62,239	

Budget by Phase

Phase	Activity	Net DOT	Crypto Tax Italy	Gross DOT
1	Oral Ethnography & Book of Names	7,500	3,694	11,194
2	The Attestation Ceremony	10,000	4,925	14,925
3	On-Chain Registration	7,500	3,694	11,194
4	The Social Experiment	9,200	4,531	13,731
5	Report & Replication Framework	4,200	2,069	6,269

Phase	Activity	Net DOT	Crypto Tax Italy	Gross DOT
—	Contingency buffer	3,300	1,626	4,926
TOTAL	14 weeks / 3.5 months	41,700	20,539	62,239

All amounts in DOT, paid at milestone confirmation. Crypto Tax Italy (33%) included in all gross figures and remitted at EUR conversion. Net operational budget: 41,700 DOT.

Two Layers, One Truth

ROOTS operates across two layers that must remain coherent: an off-chain layer where human attestation and oral knowledge live, and an on-chain layer where identity, governance, and succession are anchored permanently.

Off-Chain Layer

- Oral collection sessions — homes, bars, village squares
- Book of Names: physical archive, 100 copies, deposited with the Municipal office
- Lineage graph indexer: reads NFT metadata from IPFS, computes token_allocation, calls Asset Hub
- Succession event log: off-chain record of all claims and outcomes
- Video documentation of all five phases

On-Chain Layer — Kusama Asset Hub

Component	Description
Kusama Identity Pallet	Fields: house_name, village_quarter, attestation_hash, lineage_parent_id
ROOTS NFT	Non-fungible. Generative artwork. Lineage metadata on IPFS. Evolves with the graph.
ROOTS Token	Fungible. transfer: None at protocol level. Dynamically allocated via sqrt formula.
OpenSquare Space	Referendum with dual quorum: token weight (Quorum A) + family participation (Quorum B).

NFT Metadata Schema (IPFS)

The Most Unlikely Kusama Users Imaginable

This experiment belongs on Kusama. The Identity Pallet, native asset minting, and OpenGov infrastructure already exist — ROOTS builds no new tooling. It proves that Kusama's primitives work for a context their designers never imagined: elderly residents of a 500-person village in Southern Italy governing a centuries-old oral tradition.

If Kusama's identity infrastructure works for an 80-year-old patriarch in a village without a street address, it can work for anyone.

Replication Potential

The replication framework produced in Phase 5 is the project's most durable output. Any village with a living oral identity tradition can run this experiment: Southern Italy, Greece, the Balkans, Spain, Portugal, North Africa, indigenous communities across the world. The technology is already on Kusama. The social infrastructure is already in the village. ROOTS is the protocol layer between them.

Open Questions for Future Research

Quorum B verification on OpenSquare

The platform must be verified to support participant-count quorums natively in addition to token-weight quorums. Fallback: off-chain indexer validates Quorum B before a result is declared official.

Indexer trust model

In the MVP, token allocation computation is a trusted off-chain operation. A production version would use a Substrate pallet or on-chain oracle with direct IPFS reading, removing the centralised trust assumption entirely.

Quarter identification for succession attestation

The succession protocol requires witnesses from different village quarters. The `village_quarter` field must be encoded in NFT metadata at registration and verifiable on-chain by the indexer at attestation time.


Proof of life for elderly patriarchs

The annual remark is technically trivial but requires sustained wallet access. A local assistance protocol is needed — likely through the quarter representative established during Phase 2.



DISCLAIMER

ROOTS tokens and NFTs carry zero monetary value. They cannot be traded, sold, or transferred. The redistribution mechanism creates governance weight, not financial value. The project operates under Italian law. All crypto proceeds are subject to Crypto Tax Italy (33%) at the moment of EUR conversion.



ROOTS · Kusama Network · KSM Art & Social Experiments Initiative · 2026

Built in Southern Italy. Rooted in four centuries of oral tradition.