WELFARE USE-CASE STUDY · ROCKR PROOF LABS · ROCKR PREUVES

Blockchain coming of age: no state, the United Kingdom included, can run a welfare system that is fraud-proof and fair, let alone imaginative, without running its own blockchain ledger

Counting People Present — welfare evidence for the United Kingdom, with Sweden as the reference and France alongside

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THE QUESTION THAT EVERY STATE WELFARE SYSTEM ASKS

Every welfare state pays against a condition – that a person is unfit for work, is looking for it, is in training, is attending the course a grant is for – and almost none can prove that the condition held. Britain has **3.9 million people on health-related benefits and 1.8 million waiting for reassessment**, and decides what each is owed by inference: an assessment made at a point in time, undone only by another. France has written a presence requirement into law, the RSA's fifteen hours a week, without a presence record, and runs a scoring algorithm over 32 million people to guess at fraud instead. Sweden, the reference case, decides on evidence, at a cost of £105–125 per claimant per month to reconcile four agencies' records, and with a weakness – and consequent fraud – it cannot design away: the training provider that is paid for a claimant's attendance is the one that records it. Three states, three answers, one missing fact: who was actually there.

This study sets out all three, then what a **proved, shared record of presence** would change. The finding is the same for each. **No state can run a welfare system that is fraud-proof and fair, let alone imaginative, on a record that it keeps itself.** The fact has to be written once, where it happens, on a **blockchain ledger of the state's own** – kept by several of its institutions under the same rules, with no personal data on it – and read by the paying agency from that one committed record. That ledger runs by itself, on open-source software, and needs nothing from ROCKR Proof Labs or Asso ROCKR Preuves beyond the proved ROCKR protocol, which is available open source on GitHub. Then the sanction becomes a taper by rule, the reassessment becomes unnecessary, the audit loop is never built, and the money a state saves can fund what it has never been able to afford: the imaginative part.

As additions that a state may choose or decline in order to flip welfare from provision of an efficiently delivered safety net into welfare as an imaginative trampoline into full participation in society, the additional open source add-on layer enabling the open source ROCKR application and its separate blockchain ledger is described afterwards.

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WELFARE, EVIDENCED

1. What this study is, and the one decision it turns on

A state cannot run a welfare system that is fraud-proof and fair, let alone imaginative, on a record that it keeps itself. Today the record of what a claimant did is kept by the agency that pays them: in Britain the Department for Work and Pensions, in France the Caisse nationale des allocations familiales (the CNAF, which pays family and housing benefits and the minimum income) and France Travail, the public employment service. Kept that way, every decision about what a person is owed is an inference drawn from paper and interview; every new idea about what a claimant's week could contain needs a new data link between two offices; and every check on fraud is a score that one party computed over data it holds and the same party acts on. That last point is not hypothetical: the CNAF's scoring algorithm is being tested before France's highest administrative court, the Conseil d'État, on precisely that ground. The way out is a record that the state's own institutions keep jointly and none of them can rewrite alone: an open source blockchain ledger of the country's own, running rules that have been mathematically proved, fraud-resistant by construction rather than by audit, with each person's identity supplied by the state's own digital identity wallet rather than stored on the open source blockchain ledger. Everything in this study follows from that one decision.

Three European states are trying to make welfare conditional on what a person does, and none of them can prove what a person did. France has written a presence requirement into law (the RSA's fifteen hours a week) without a presence record, runs a risk-scoring algorithm over 32 million people that is before the Conseil d'État, and pays student grants through

144 configurations that the National Assembly wants replaced by "tell us once"; these last few weeks its school students were in the street. Sweden halved sickness and disability dependency by making payment conditional on evidenced activity, and runs that evidence through a four-agency digital audit loop costing roughly £105–125 per claimant per month, with the provider that logs its own attendance as its weakest link. The United Kingdom has 3.9 million people on health-related benefits, 1.8 million waiting for reassessment, and no universal digital identity to anchor anything to. This study sets out the three systems, France first, then what a proved, shared record of presence, the subject of the ROCKR Proof Labs research programme, would change: first in general, then with the open source ROCKR application and the digital utility asset added. For a Bordeaux audience the French case is the concrete one: the ordering of students for places has been formally verified, at LaBRI, against the quotas the law imposes; the entitlement that follows the place, and the presence that conditions it, have not.

What we mean by an Exemplar Use-Case Study

A working document addressed to the people responsible for the UK welfare system and to the Times Welfare Inquiry, and to those following both. It is built on the public record — every date, figure and quotation sourced — and on the published ROCKR architecture, with the two kinds of claim visually separated throughout. Its heart is a set of interactive comparisons: the Swedish audit loop, step by step, beside what each step becomes on an attested record. This is not a sales document: it is written to be corrected and improved by the people who know the project best, in the open, with anyone welcome to follow. ROCKR is independent of the Department for Work and Pensions, the Times Welfare Inquiry and every institution named here, and has approached none of them; the “on an attested record” column is our proposal, built on the published ROCKR architecture, and nothing here should be read as implying the project's engagement or endorsement.

EXECUTIVE SUMMARY

2. The argument in one page

1. **Three states, and none can prove what a person did.** Britain decides what 3.9 million people on health-related benefits are owed by inference, with 1.8 million waiting for reassessment and no digital identity to anchor anything to. Sweden decides on evidence, through a four-agency audit loop costing about £105–125 per claimant per month, whose weakest link is the provider that logs its own attendance. France has written a fifteen-hour presence requirement into law without a presence record, and the fraud-scoring algorithm run by its family-benefits agency, the CNAF, is being challenged before France's highest administrative court, the Conseil d'État.

2. **The one decision.** A state cannot run a welfare system that is fraud-proof and fair, let alone imaginative, on a record that it keeps itself. The way out is a record that the state's own institutions keep jointly and none of them can rewrite alone: an open source blockchain ledger of the country's own. Its keepers are the state's paying agency, its audit office, its regions and its social partners, joined by at least one peer institution from outside the country, which holds a copy it cannot be made to alter, so that no government can quietly rewrite its own record. The open source blockchain ledger runs rules that have been mathematically proved, the same rules for every keeper, and it carries no personal data, because identity comes from the state's own digital identity wallet.

3. **What the open source blockchain ledger adds.** A claimant taps the wallet at the counter, the register desk or the classroom door; the institution's software signs for place and time; the attestation is written to the open source blockchain ledger within seconds; the paying agency reads it and releases what the rule says is due. No declaration, no reconciliation, no sanction regime to build first. **This stands alone.** The open source blockchain ledger needs nothing from the open source ROCKR application; the software is open source under Apache 2.0; and a benefits agency, a college or a training provider would adopt it first in exactly this form. This is the deliverable of ROCKR Proof Labs, and the four mathematical guarantees behind it (the 'four theorems') have been checked by machine: Model Zero v0.2.1, 18 of 18 statements proved.

4. **What can be added later, and only if a state chooses: two further options, each independent of the other.**

   4.1 The first is the open source ROCKR application. This is not a second copy for each state, and it is not the state's own open source blockchain ledger: that ledger stays where it is, holding the attestations and the entitlements. The open source ROCKR application is one global network, running on the ROCKR blockchain ledger, and what the state's welfare programme becomes is one instance on that network, alongside universities, cities and communities elsewhere. The state's instance is curated by its own people and organised around its own places, but anyone in the world with a verified identity can take part in what it offers, and its people can take part in what others offer. It lets a work coach, a college, a charity or a claimant propose a course or an activity that goes ahead once enough people have committed to turn up; it attests that the activity was delivered, by someone other than the party paid for it; and it pays the provider when delivery has been authenticated. The attestation of presence stays on the state's own open source blockchain ledger; the live experience is recorded on the ROCKR blockchain ledger; the two exchange messages. In this way the open source ROCKR application empowers a state to release a portion of a claimant's welfare payment, in the state's own currency, on attested attendance at a course, which is Sweden's rule enforced by the open source blockchain ledger instead of by declarations and audit. The open source ROCKR application also extends the curation of the course, a live experience, to the whole community, and to the world beyond it.

   4.2 The second option is the addition of a digital utility asset. The digital utility asset changes what presence is paid with. It is new value, also issued only against authenticated presence, always additional to the welfare payment and never withheld as a sanction, and spendable in any shop on ordinary goods. A state may run the open source blockchain ledger alone, the open source blockchain ledger with the open source ROCKR application, or all three. At every one of those tiers the audit loop is gone: presence is attested where it happens and read from the open source blockchain ledger, and nothing is declared, matched or reconciled afterwards. None of this is a condition of adopting the open source blockchain ledger.

5. **Honest scope.** The proofs are for a model, not yet for any state's own system; no public open source blockchain ledger yet runs them; nothing described here is deployed in any welfare system. The entitlement leg of a transaction, that a verified person was present and was paid what they

were owed once and to no one else, has, as far as the author can establish, no proved equivalent anywhere; proving it is the work package in the two applications currently submitted to ARIA, the UK's Advanced Research and Invention Agency. The internal test network is targeted for late January 2027. Clinical judgement stays human. Nothing has been awarded; nothing is payable by anyone unless it is.

6. **Five recommendations, in order,** each with Sweden's equivalent cost beside it in the Scope station. The first is a precondition for the rest; the second is what the ROCKR Proof Labs research produces; the third, fourth and fifth are properties of the open source blockchain ledger once it exists.

   6.1 Digital identity first, and for everyone. Nothing in Sweden works without BankID, its national digital identity. Britain has no equivalent yet. It needs one that is universal, free, usable at any counter, clinic, college or workplace, and that has a route in for people without the usual documents, who are over-represented among claimants.

   6.2 Presence, not declaration, as the condition of release. Where a benefit depends on attending, working or training, the fact should be recorded where it happens, by a tap of the wallet, and read by the paying agency from the open source blockchain ledger, rather than declared by the claimant each month and reconciled afterwards. This is the step the ROCKR Proof Labs research produces, and the one that removes Sweden's £105–125 per claimant per month.

   6.3 Taper by rule, not by reassessment. Adopt Sweden's principle that benefit is paid at 25, 50, 75 or 100 per cent, but drive the percentage from attested hours rather than from a claimant's own declaration or an assessor's interview. This removes the cliff-edge between "fit" and "unfit" and, over time, the reassessment queue of 1.8 million.

   6.4 Separate the witness from the payee. No provider paid for attendance should be the only record of it, and no party paid for delivering an activity should be the one who signs that it was delivered. Sweden's parking scandal, and the termination of six of its ten largest providers, is the cost of not doing so.

   6.5 Evidence by attribute, not by name. Report outcomes (into work, into training, into treatment, by district and by cohort) from a record that carries attributes rather than identities and from which any individual can be erased without disturbing the totals. This answers the privacy objection to any shared record and gives Parliament longitudinal evidence it has never had.

THE UK PROBLEM

3. Entitlement decided by inference

Around 3.9 million working-age people in the United Kingdom now receive the health element of Universal Credit or its predecessor, Employment and Support Allowance (ESA). The House of Lords Economic Affairs Committee put the figure at 3.7 million in 2024, 1.2 million more than before the pandemic and more than double the 1.51 million registered as unemployed. The Office for Budget Responsibility forecasts spending on incapacity and disability benefits rising to £100.7 billion, about 3 per cent of GDP.

The caseload is not, in itself, the problem the Times inquiry has identified. The problem is the machinery that puts people on the roll and takes them off it. Every claimant is there because of an inference made at a point in time, the Work Capability Assessment (WCA), and leaves only by another inference. The Times reports 1.8 million people waiting, some for years, for reassessment. In the meantime being signed off is, in practice, being written off.

The history shows what happens when the machinery is forced to run faster. Between 2011 and 2015, 1.3 million Incapacity Benefit claimants were reassessed for ESA and 250,000 were found fit for work. In pilot areas a third of those found fit appealed and 40 per cent of appeals succeeded. Channel 4 found claimants trapped in a revolving door of assessment and appeal costing £80 million. Citizens Advice found that general practitioners' evidence and prior assessments were routinely set aside.

Three structural facts sit underneath this:

- **The evidence exists but cannot reach the decision.** The GP's fit note, the employer's record of hours, the college's register and the rehabilitation provider's attendance log are each held in a separate system. They reach the Department for Work and Pensions (DWP) only by being *pushed* (an integration between every pair of institutions, which nobody has built) or *carried* (a claimant re-presenting paper at each office in turn).

- **The decision is therefore a reconstruction.** An assessor interviews the claimant to rebuild, from memory and documents, what a shared record would simply show.
- **There is no universal digital identity to anchor anything to.** Sweden has had BankID *(Sweden's national digital identity, used by 99 per cent of working-age adults)* in near-universal use for two decades; the European Union's Digital Identity (EUDI) wallet becomes available in every member state from December 2026. The UK's own digital identity remains a plan. Without it, even the Swedish loop described below cannot be attempted.

The result is a system that is slow to admit, slower to release, adversarial at every boundary, and blind to what claimants actually do between assessments.

THE REFERENCE CASE

4. What Sweden did, and what it cannot prove

Sweden is the reference case for Britain: the country that made payment conditional on evidenced activity and built the machinery to enforce it. The full account, with every figure sourced, is on its own page; the essentials are here.

WHAT SWEDEN DID

Dependency halved, employment up

From 1,067,188 full-year benefit equivalents (20.1 per cent of working age) in 2004 to 708,455 (11.9 per cent) in 2025, against a population 15 per cent larger. The reforms of 2006–2010: a rehabilitation chain with fixed test points, partial sick leave as the default, employer co-responsibility, standardised medical guidelines, tapering, and from October 2026 full-time activation for social-assistance claimants.

Read the full reference →

HOW IT IS ENFORCED

A four-agency audit loop

Providers log attendance daily; the claimant files two monthly declarations signed with BankID, Sweden's national digital identity; before paying, Försäkringskassan *(the Swedish Social Insurance Agency)*, the Social Insurance Agency, matches those against the employment service's database, the Tax Agency's payroll feed and the student and sickness registers. Cost: about £105–125 per claimant per month, plus a new data pipe for every new participant class.

The loop, step by step →

WHERE IT STRAINS

The provider logs its own attendance

BankID proves *who* filed the declaration. Nothing in the system proves *that the person was there*. So the provider paid for attendance is the provider that records it, which produced the "parking" scandal and the 2025–26 termination of six of the ten largest operators; quality is inferred by regression afterwards; and compliance is secured by escalating sanctions. The Swedish loop is the best that can be done when identity is proved but presence is not. The UK has neither.

Where the model strains →

WHAT THE ROCKR PROOF LABS RESEARCH PRODUCES

5. The attested record, enabled by the open source ROCKR protocol

Almost all economic activity requires a person to be present, somewhere, at some moment. That presence can be authenticated, and today it enters digital systems as an unverified assertion. The ROCKR research programme, carried by ROCKR Proof Labs Ltd in London and ROCKR Preuves in the Dordogne, proves the entitlement side of a transaction: that a verified person was present at an authenticated activity, and that what they were owed for being there was released to them, once, and to no one else. Every European institution studied proves the money side of its transactions; the entitlement side has no proved equivalent anywhere. ROCKR Proof Labs' and ROCKR Preuves' *"The four theorems (the four machine-checked guarantees: one verified person per record, value only against authenticated activity, erasure without loss, nothing released twice) of Model Zero (the programme's machine-checked model of issuance, transfer, erasure and conservation)"* are that other half. Model Zero v0.2.1 is public, with 18 of 18 statements proved in Lean 4.21.0 *(a proof assistant: software that checks every step of a mathematical proof)* and no custom axioms *(assumptions taken on trust; here there are none beyond the proof tool's own foundations)*.

The building block. Every institution already owns a attestation *(a short signed statement: this verified person, this place, this moment)*">point of attestation. Call it a gate, though most of them are not: the benefits office counter, the college register, the clinic reception, the employer's site, the training provider's door. From December 2026 the EUDI wallet *(the European Digital Identity wallet, the state-issued identity app on a phone, available across the EU from December 2026)* (and in time a UK equivalent) proves *who* is at that point. But the scan becomes a line in that institution's own database, trusted by nobody else and bound to nothing beyond the point where it was made. ROCKR Proof Labs' and ROCKR Preuves' *"The four theorems of Model Zero"* research produces a small, proved component that any institution can rely on, in the way every bank

card payment relies on the same few proved pieces of cryptography. A fact attested anywhere is a fact everywhere: written once, proved once, relied on by all.

Who signs, how, and when. At the simplest level, the claimant taps their wallet at the institution's door. Two things then sign. The claimant's wallet signs for *who*: that is what the tap is, a presentation of the state-verified identity. The institution's own system signs for *where* and *when*. That system runs the same open-source software as every other institution's (the open source ROCKR protocol), and the institution may host it itself or have a supplier host it; but it does not keep the record. It submits a short, signed pseudo anonymous *(carrying a stable identifier but no name)* attestation (*this verified person, this place, this moment*) to a shared open source blockchain ledger, which carries the data without knowing who anyone is. "Signing" on this open source blockchain ledger is a mathematical operation with a private key, which anyone holding the matching public key can check and nobody can forge; no one at the institution types a confirmation into anything. The attestation carries the time of the tap, and it is checked and written within seconds, not at the end of the month.

Who keeps the record. The open source blockchain ledger is a new hybrid Proof of Authority/Proof of Stake *(named institutions as keepers, each with a deposit to lose)* blockchain and ROCKR Proof Labs' Apache 2.0 *(a permissive open-source licence: anyone may run and adapt the software)* open source policy stance means that anyone can run their own. The blockchain in the plain sense is a single record kept jointly by a set of named, accountable institutions, admitted as validators *(the institutions that jointly keep the ledger and vote on every entry)* by a published rule and each with a stake to lose, who agree on every entry by a two-thirds vote and accept an entry only if it satisfies rules that are published, identical for every institution, and formally proved. For a public programme those validators would be the country's own: the paying agency, the audit office, the regions, the social partners, and at least one peer institution from outside the country so that no single executive can rewrite its own record. France, Sweden and Britain would not share one open source blockchain ledger with sports bodies and universities abroad, and should not; each would keep a sovereign record, fed by its own institutions' systems and anchored to its own identity wallet, running the

same proved rules. What this asks the reader to trust is therefore narrow. The institution is trusted for nothing but place and time, which it alone can witness and which it signs under a registered key, so a false attestation is a false statement by a named institution, visible to any auditor. Identity is the state's; the rules are everyone's; the record is no one's. That is the difference from the Swedish provider's log, which the provider kept, the provider could edit, and only the provider could read.

Where someone is paid for the activity, presence is not enough. The training provider, the contractor running the fifteen hours, the *Rusta och Matcha* operator: for these the party attesting would be the party paid, and it would be verifying its own claim. For them the record carries a second, stronger attestation, of delivery rather than presence, described in the Application station. Sweden's parking scandal is what the absence of that second tier looks like.

What this replaces in the Swedish loop. The wallet proves the person; the attestation proves the presence; a proved checker *(the small, proved piece of software that reads an attestation and releases what is due, once)* releases the right bound to it. Each step of Sweden's reconciliation then has nothing left to reconcile.

SWEDISH LOOP STEP	ON AN ATTESTED RECORD
Provider logs attendance daily in a supplier portal	Attestation signed at the point of attestation; the provider is not the sole witness
Claimant files two monthly BankID declarations	No declaration; the attestation is the evidence
Försäkringskassan cross-matches three registers before paying	The checker reads one committed fact; release is a theorem, not a match
New bespoke pipe per participant class (38–66m SEK/yr)	Every institution reads the same record; no pipe
Quality inferred by regression and IFAU audit afterwards	The record carries attributes (in training, in work, first-timer, regular) available at once
Sanctions for unexcused absence	Release conditional on presence; absence simply does not release

What each of the ROCKR Proof Labs' and Asso ROCKR Preuves' theorems do for a benefits system.

- *Attested transfer (T1).* Every record is a verified individual, not a duplicate, and a release happens once and to that person. Double claiming, the thing the payroll cross-match exists to catch, is impossible by construction.
- *Issuance against authenticated activity (T2).* Getting off the roll becomes a rule over the record rather than a reassessment. As attested hours worked and courses completed accumulate, entitlement adjusts continuously. This is Sweden's partial-benefit logic driven by evidence instead of by a claimant's own declaration, and it removes both the cliff-edge that keeps people on the roll and the reassessment queue of 1.8 million.
- *Erasure with asset preservation (T3).* The standing objection to any shared welfare record is privacy. Here a claimant can be erased without destroying the aggregate or anything already earned, and the aggregate carries attributes rather than names. The Minister's question for 2040 (how many residents of this district moved into work, into training, into treatment) is answered without any individual being identified. Sweden

compiles that answer afterwards from anonymised registers; here it is available as the record is written.

- *Conservation with halt semantics (T4).* What is released cannot be released twice; the open source blockchain ledger balances by theorem. The UK's recurrent overpayment-recovery problem is, at root, an unproved conservation property.

Entry to the roll, from the same record. The theorems above govern what happens once a person is on the roll; the record also changes how they get there. The fit note, the hours, the course and the rehabilitation appointment are each attested once where they happen and read by the institution responsible for Work and Pensions from the same record. Much of what an assessor reconstructs by interview is already there, and the interview can concentrate on the clinical judgement that remains a human one.

The same building block governs more than benefits. The checker binds the release of any right to authenticated presence: a benefit payment, a certified exam result, a prescription, a place on a course, a licence or permit, a wage for a shift worked, a seat at a match. The sectors in which EUDI wallet acceptance becomes mandatory from 24 December 2027 (banking, transport, health, education, telecoms, energy, social security, the largest platforms) are each a public or quasi-public entitlement programme where presence can be made the condition of release. Welfare is the one where the gap between what is evidenced and what is paid is widest.

THE OPTIONAL LAYER

6. What the open source ROCKR application adds

The attested record, i.e. the open source blockchain ledger, described in the Record station can be implemented in a stand alone fashion. To restate what that blockchain is: a shared ledger in a jurisdiction (eg: national) kept jointly by named, accountable institutions in that jurisdiction, with at least one validator from outside the jurisdiction as the Record station describes, every one of which runs the same open source ROCKR protocol software. This software means that each tap of a wallet produces one short signed statement, *this verified person, this place, this moment*, which the institution’s copy of the protocol submits to the open source blockchain ledger, and which every other institution on the open source blockchain ledger can then read as a fact. The blockchain carries no personal data: the attestation names a place, a moment and a pseudonymous verified identity, and who the person is stays with the state’s wallet. The record is the open source blockchain ledger; the open source ROCKR protocol is the set of proved rules by which the open source blockchain ledger accepts an entry.

A benefits agency, a college or a training provider can start using the attested record, and so the jurisdiction's own open source blockchain ledger, with nothing more than a wallet scan at the institution’s own point of attestation *(the counter, the register desk, the clinic reception, the classroom door)*: the counter, the register desk, the classroom door. Nothing else about the day changes. The claimant taps; the institution’s ROCKR protocol software signs for place and time and submits the attestation to the open source blockchain ledger; the agency responsible for payment reads the open source blockchain ledger and releases what the rule says is due. No form is filled in, no monthly declaration is made, and no caseworker reconciles anything afterwards. A benefits agency or a college would start using the jurisdiction's own open source blockchain ledger first in that form, because that form asks of the institution only what the institution already has (a door, a system, and from December 2026 a wallet to scan) and the one thing the open source ROCKR protocol supplies, which is a proved, shared way of writing down who was where.

That is the ROCKR Proof Labs' and Asso ROCKR Preuves' research deliverable, and the jurisdiction's own open source blockchain ledger needs nothing from the open source ROCKR application to do that job.

The ROCKR application is a separate, open-source piece of software: the one the ROCKR programme's own live-experience instances run, on a blockchain ledger of ROCKR's own that carries the record of those live experiences and the digital utility asset *(value issued only against proved presence, additional to any benefit, spendable like money)* and is kept, like the jurisdiction's own open source blockchain ledger, as a hybrid Proof of Authority/Proof of Stake blockchain. A state may join the open source ROCKR application's global network with an instance of its own, settling in its own currency, or not; its open source blockchain ledger does not change either way.

Because both the jurisdiction's own open source blockchain ledger and the ROCKR blockchain ledger run the same open source ROCKR protocol, they can exchange messages, and that is what makes the layering possible. Where a jurisdiction's own design allows the people on it to propose their own live experiences and so to create their own attested and authenticated activities, whether or not those activities earn the digital utility asset, the jurisdiction's instance acts, for that activity, as an instance of the open source ROCKR application. The live experience is recorded, and any digital utility asset issued, only on the ROCKR blockchain ledger; the state may settle what it owes in its own currency; the jurisdiction's own open source blockchain ledger carries only the attestation.

Joining the open source ROCKR application network enables three further capabilities, each widening what a jurisdiction can do to encourage its communities to take part. The first is a stronger kind of attestation, of delivery rather than presence alone, for the cases where the party attesting would otherwise be the party paid. The second is a way of organising the activities themselves, so that the week a claimant is asked to fill is made of things people have already committed to turn up to, and perhaps created themselves. The third is that whoever stages them is paid when delivery has been authenticated. None is a condition of adopting the open source blockchain ledger; all three are described below.

A second tier of attestation: delivery, not only presence. This first capability, the open source ROCKR application's authentication step (Step 7 of its nine-step experience creation process), is built on one rule: no party ever verifies its own claim. On the day, a steward *(the on-the-day role that runs check-in and submits the evidence, and never judges it)* on the provider's side gathers the evidence as it arises: the taps in and out, the devices' own record of being in the same room for the same hours, and short samples taken by two or three participants' phones at randomly chosen moments the steward cannot predict. Participants confirm from their own devices. The package then goes to an independent authenticator *(an accredited, independent person or institution that signs that the activity matched its published design)*. This is not the blockchain's validators, who check that an attestation carries the right signatures and never see the evidence; it is a person or an institution accredited for the role by the instance's governance (a college, a council, a venue, an individual with a track record), who has staked something that is forfeited for a bad call. The authenticator is assigned by the protocol rather than chosen by the provider, may not be the provider, the venue, the steward or a participant of that activity, may well sit in another district altogether, and need not have been present. They sign that the activity delivered matches its published design: this place, this duration, this attendance, the stated thing. Software sorts the evidence, flags what looks wrong and recommends; where the record is clean and the provider's history is clean, the signature may be given automatically, but always under a named authenticator's key and stake, so no decision is ever software's alone. The statement becomes "this person was present at an activity that qualifies as delivered," judged against the design, not against merit. This is the tier that pays the provider, and because the provider is not the signer, it is the tier that ends parking i.e. assigning a computer to participants who the provider assesses a low probability to workforce return.

Everything above that signature is proved; the signature itself is not. Blockchain engineers call this the oracle problem *(the point where a fact from the physical world enters a system that can prove everything except that fact)*, and formal verification *(proving a property holds in every case, with a computer checking each step)* calls it the trusted base *(the part of a verified system that is assumed rather than proved)*: the one assumption the theorems rest on and cannot discharge, and the place

where the hardest work in any system of this kind is done. The ROCKR programme’s answer to it is the design just described, built on one rule and reviewed adversarially against the attacks it names. It is the most careful treatment of the oracle in any entitlement system the author has studied; it is also unproved and untested, which is why it is specified now, and why it forms a work package in ROCKR Proof Labs' two current applications to ARIA, the UK’s Advanced Research and Invention Agency, and will be exercised first on the January test network, and why the Swedish provider’s log and the CNAF score, each an oracle trusted on say-so, are the comparison this study keeps returning to.

Committed demand before provision exists. Sweden fills a claimant's 40-hour week with a fortnightly coaching meeting and, by its own critics' account, automated busywork for the rest. The second capability works the other way round from Sweden. A work coach, a college, an employer, a charity or a claimant can propose an activity, and it goes ahead once enough verified people have committed to turn up. The coach in a district sees that forty claimants in one ward are prepared to turn up to a Tuesday welding course and twelve to a Thursday walking group, before either exists. Provision is designed from the bottom up as well as programmed from the top, with the knowledge a promoter with a research budget has today.

Paid on authenticated delivery. The third capability pays the college, the employer hosting a work trial, the care worker running a health programme and the community group running a Thursday evening when the activity has happened and been authenticated, not thirty days after an invoice and not on the strength of their own register. This last step rests on the first capability: without the delivery attestation there is nothing authenticated to pay against.

Any activity a district chooses to count. The activities a claimant's week can be made of are whatever a district says it wants more of, and the same record serves all of them: Education (training mornings, learner-chosen courses, proof of training on the open source blockchain ledger that an employer can check), Health (participation as prevention, care and coaching work priced and paid), Community (volunteering with a verifiable participation ledger instead of surveys), High Street Retail (a boarded-up

unit used as a training space, a shop hosting workshops), Sport and the Arts (the walking group, the community theatre on the same rails as the stadium). Ticket admission is one use among many and comes last.

A record that is also a route into identity. A claimant's attested history is a contemporaneous, multi-party record of activity. For the document-poor claimant who cannot pass conventional identity verification, that history is itself evidence of the kind the UK's own identity standard (GPG45 *(the UK Government's standard for proving a person's identity)*) treats as a confidence dimension. This gives the welfare system an inclusion pathway that the Swedish model, which assumes BankID, never needed and the UK badly lacks. This application remains to be pressure-tested before it is relied on.

REWARDING PRESENCE

7. What the digital utility asset adds

Sweden secures compliance by punishing absence: five, ten and forty-five days of lost income. The digital utility asset offers the opposite instrument to the sanction, and it can be read two ways. For Sweden it is an add-on: BankID, the rehabilitation chain, partial sick leave and the audit loop all stay, and the digital utility asset is layered on top for the activities that are attested, giving a reason to turn up that is not a penalty for staying away, and giving Sweden, uniquely, the means to measure whether rewarding presence reduces the need for sanctions. For France and the United Kingdom, which have the rules but not the loop, the record is what replaces the loop: presence attested where it happens, value released against it, and no reconciliation or sanction machinery to construct first. What the digital utility asset adds there is that the reward for turning up is additional to the benefit rather than a condition of it. In both readings the cash benefit for essentials continues beneath it. The digital utility asset itself: floating, issued only against authenticated live-experience activity, held only by verified humans, with supply invariants machine-checked. Every verified person holds two balances: a weekly participation allocation, use-it-or-lose-it, spendable only on committing to take part in something; and a permanent balance, credited when participation is authenticated, which is money in the ordinary sense.

Rewarding presence instead of punishing absence. The credit is issued only when activity is authenticated. A claimant who turns up to the training morning, the health programme or the community evening earns; one who does not simply earns nothing that week. There is no sanction to appeal, no warning letter, no caseworker decision to contest. The activation effect Sweden buys with an adversarial regime is produced by the issuance rule itself.

Graduated by construction. Issuance scales with authenticated activity, so partial return to work is rewarded in proportion, as Sweden's 25/50/75 per cent sick leave intends, without a declaration and without a caseworker setting the percentage.

No overpayment to recover. Because conservation is proved, the digital utility asset cannot be issued twice or released to a duplicate identity, and the weekly allocation cannot be hoarded. The recovery machinery the UK runs against its own claimants has nothing to work on.

Circulating where the activity is. The credit tends to be spent in the places that stage the activities, because that is where it is earned: the college, the community hall, the shop running workshops, the care provider. A district's spending on activation stays in the district rather than leaking to online platforms, and the people doing the undervalued work of coaching, caring and teaching are paid when delivery is authenticated.

Earned one way, spendable every way. The allocation is restricted; what it earns is not. The permanent balance can be transferred to any verified person, exchanged for sterling, or spent at any merchant through a verified intermediary. It pays rent. This is what separates a parallel value system from a voucher scheme: value enters by one rule, authenticated presence, and once in behaves as money. The cash benefit for essentials continues alongside it; the digital utility asset adds a second route by which value reaches the claimant, one they earn by being there rather than receive for being assessed.

A possible lever for government. A state that accepted the digital utility asset in partial settlement of tax would give it the strongest endorsement a digital utility asset can have, and would draw revenue from attested participation without touching the ordinary tax base. This is a governance decision for a state, not a feature of the design, and is noted here only because the design makes it possible.

CONCESSIONS, THEN RECOMMENDATIONS

8. Honest scope, and what the inquiry could recommend

- **Clinical judgement stays human.** The record evidences what a person did; it does not decide whether they are capable of work. Assessment is narrowed to the question only a clinician can answer, not abolished. Where the activity attested is itself an assessment, the record proves that it happened and to whom its result was issued; the result is the clinician’s signed opinion, formed with the claimant’s attested history in front of them, and contestable as it is today.
- **The wallet is assumed.** Every comparison here assumes a digital identity on both sides, EUDI in Europe and a UK equivalent when one exists. The ROCKR Proof Labs research proves what happens after the scan; it does not supply the scan. The UK's lack of a wallet is the first thing any inquiry must address.
- **The record binds presence, not merit.** An activity qualifies as delivered when it matches its published design. Whether it was any good is a separate question, answered the way it is answered today. An accredited AI assessment service, layered on the record and signing through a named human examiner, is a possible later development; it is described in a companion note on education and nothing in this study depends on it.
- **"Workfare tokens" is a reading to meet head-on.** The participation credit is additional to the cash benefit, cannot be withheld as a sanction, and is spent only on the claimant's own choices. It is the opposite of conditionality, and the note should say so wherever the digital utility asset is mentioned.
- **The proofs are for a bounded model.** Model Zero proves the four properties for its own model of issuance, transfer, erasure and conservation. Applying them to a national benefits open source blockchain ledger would require a refinement step *(the further proof that a real system is a faithful instance of the model)*, showing that the agency's own system is an instance of the model, and the generalised issuance class beyond live experience is not yet proved. Both are disclosed in every funding application.

- **The rules are proved; no public open source blockchain ledger yet runs them.** The programme has verified the rules a validator applies. It has not yet operated an open source blockchain ledger kept by public institutions, has not run a multi-validator test network, and has not specified how two sovereign open source blockchain ledgers would agree that the same person is not counted twice without either holding the other's personal data. A study would begin on a test network kept by the participating agencies and a university, and would say so.
- **The open source blockchain ledger for a public programme is not the ROCKR blockchain ledger chain.** The programme's own chain is kept by institutions with an interest in live experiences and carries the record of those live experiences and the digital utility asset. A welfare record would run the same proved rules on the open source blockchain ledger of the state's own, kept by its own institutions and at least one peer from outside the jurisdiction. The two can exchange messages where an attested activity is to earn the digital utility asset. The software is open source under Apache 2.0; nothing in the licence requires a state to use the digital utility asset.
- **Nothing described here is deployed in a welfare system.** The internal test network is targeted for late January 2027 and a public one for mid-2027. No benefits agency has been approached. The first instances will run in bounded communities, and a public programme would come later and through an operator of its own choosing.

What the inquiry could recommend

Read for UK: Sweden's lesson is that the rules are the easy part; the evidence is the hard part. The UK should not copy Sweden's audit loop, which depends on an identity infrastructure the UK lacks and on reconciliation the UK would have to build pipe by pipe. It should instead build the evidence layer once, on a proved building block, and let the rules follow.

1. **Digital identity first, and for everyone.** Nothing in Sweden works without BankID. The UK's digital identity should be universal, free, and usable at any counter, clinic, college or workplace, with a verification route for the document-poor, who are over-represented among claimants. Sweden's equivalent cost: nil, because it was built twenty years ago.

2. **Make presence, not declaration, the condition of release.** Where a benefit depends on attending, working or training, the fact should be attested where it happens and read by DWP from a shared record, not declared monthly and reconciled afterwards. Sweden's equivalent cost: ~£105–125 per claimant per month in tracking and audit, plus a new data pipe for every participant class.
3. **Taper by rule, not by reassessment.** Adopt Sweden's partial-benefit principle, but drive it from attested hours rather than from a claimant's own percentage. This removes the cliff-edge and, over time, the reassessment queue. Sweden's equivalent: the 25/50/75 per cent rule plus the rehabilitation-chain timetable.
4. **Separate the witness from the payee.** Any provider paid for attendance should not be the sole record of it, and any party paid for delivery should not be the one who signs that it was delivered. Sweden's parking scandal and the 2025–26 purge of six of its ten largest providers are the cost of not doing so.
5. **Evidence by attribute, not by name.** Report outcomes (into work, into training, into treatment, by district and by cohort) from a record that carries attributes rather than identities and from which any individual can be erased. This answers the privacy objection to a shared record and gives Parliament the longitudinal evidence it has never had.

These five steps are ordered. The first is a precondition for the rest; the second is what the ROCKR Proof Labs research produces; the third, fourth and fifth are properties of the record once it exists.

How this analysis would apply to France

The same five steps, in the same order, apply to France, with the first already half-done.

1. **Digital identity first, and for everyone.** France already has the wallet: *France Identité*, built on the electronic identity card, becomes the French carrier of the European Digital Identity wallet from December 2026. Step one is therefore a matter of coverage, not construction: every claimant must hold it and be able to use it at every counter, training centre and classroom door.
2. **Make presence, not declaration, the condition of release.** This is the RSA's open problem. The fifteen hours are a presence requirement, and a presence attestation at the training centre, the association, the *chantier*

and the France Travail office is the record the law assumes and the decree does not describe. France has adopted Sweden's rule without Sweden's audit loop; the open source blockchain ledger supplies the record without the loop.

3. **Taper by rule, not by reassessment.** *Suspension-remobilisation*, which withholds at least 30 per cent of the allowance for one to four months, is a sanction that exists because presence cannot be evidenced. Driven from attested hours, it becomes a taper by rule, with nothing to appeal.
4. **Separate the witness from the payee.** This is the CNAF question put the other way round: not whether a score may select whom to control, which is what the Conseil d'État is being asked, but whether the condition can be made a fact that needs no controlling. No party verifies its own claim, and no score releases value.
5. **Evidence by attribute, not by name.** The National Assembly's "dites-le nous une fois" for student grants, given a mechanism: the Crous *(the French bodies that pay student grants)* reads the attested record of attendance at the course the grant is for, and the 144 configurations and their threshold cliffs become a continuous release against a fact written once, reported by cohort without any student identified. Indexation, announced on 26 October 2026, changes what the grant is worth; this changes how it is earned and paid.

For a research audience the open problem is the one Parcoursup *(the French platform that allocates school-leavers to higher-education places)* left: the allocation's conformity to the law is proved; the entitlement that follows it, and the presence that conditions it, are not.

9. The people responsible

NAME	ROLE	RELEVANT COMMENTS / ACTIONS
Rt Hon Pat McFadden MP	Secretary of State for Work and Pensions	"The question we should ask is not just 'what are you entitled to' but 'how do we help you change your life.'" (speech, 16 March 2026). The entitlement question is the one this study answers with a record rather than an assessment.[P1]
Rt Hon Sir Stephen Timms MP	Minister of State for Social Security and Disability, DWP	Leads the Timms Review of Personal Independence Payment; its interim report (9 July 2026) found PIP "no longer fit for purpose" and he told the Commons "we are not looking for quick fixes here." Final report due autumn 2026.[P2]
Dame Sarah Healey	Permanent Secretary, DWP (from 1 Aug 2026)	Said on appointment she was "delighted" to lead a department that "touches millions of lives" and to lead its reform agenda. The department whose record this study proposes to change.[P3]
Debbie Abrahams MP	Chair, House of Commons Work and Pensions Committee	Wrote to the Secretary of State (11 December 2025) asking whether abolition of the Work Capability Assessment is still planned, noting "we understand the WCA will be continuing until 2029-30": the assessment this study calls an inference.[P4]
Lord Liddle / Lord Bridges of Headley	Chair, Lords Economic Affairs Committee (from 7 Sep 2026) / chair in 2024–25	Lord Bridges's letter of 20 January 2025 closed the committee's inquiry on economic inactivity, welfare and long-term sickness: the health-benefits system is "financially unsustainable, wastes human potential". The Problem station's caseload figures are from it.[P5]
Fraser Nelson	Leads the Times Welfare Inquiry	The six-month editorial inquiry launched in mid-October 2026 publishes its own recommendations and says it welcomes contributions from readers. This study is addressed to it.[P6]
Rt Hon Andy Burnham MP	Prime Minister (from July 2026)	Wrote for the inquiry (19 October 2026) that benefits should "become the backstop, not the starting point" and that youth inactivity is "an economic catastrophe and a moral failure. And it must change."[P7]

WHO WROTE IT

The study's authors

NAME	ROLE	RESPONSIBILITY IN THIS STUDY
David Clancy	Founder and chief architect of the programme; Principal Investigator, ROCKR Proof Labs Ltd; Président, ROCKR Preuves	Study author. Rules every design question in the attested record, the open source ROCKR application and the digital utility asset described here; wrote the evidence note this study reproduces; answers for every figure in it. david@rockrprooflabs.org
Colin Seaman	Director, ROCKR Proof Labs Ltd; lead developer of the open source ROCKR application	Implementing the industrial-strength deployment of the ROCKR applications. Twenty years in enterprise software; worked with the author at Digitalbrain plc.

A door that is open right now

The Times Welfare Inquiry, an editorial inquiry led by Fraser Nelson that runs for six months from October 2026 and says it welcomes contributions from its readers, is a door that is open now. This study is ROCKR Proof Labs' contribution to it: the three systems compared, the proved building block that would change them, and five recommendations in order, each with Sweden's equivalent cost beside it. It is published here so that the inquiry's readers, and anyone else, can check every figure against its source.

The timing

This study raises the question whether presence rather than declaration can be made the condition of release. Nothing in this study asks the Department for Work and Pensions to take a technology risk. No benefits agency has been approached; nothing described here is deployed in any welfare system, anywhere in the world, so far as we know.

The ROCKR Proof Labs research programme is the subject of two bids submitted to ARIA, the UK's Advanced Research and Invention Agency, in September 2026. The internal test network is targeted for late January 2027 and a public one for mid-2027, so that no partner will be invited to adopt anything that has not been tested, not only in Blue Team and Red Team environments such as ARIA's but also on a live test network. This study is offered without charge. Should a government or agency wish to commission advice on its response, or to fund the research, ROCKR — and the universities and institutions we aim to collaborate with — would welcome it, on the open terms set out here. Nothing has been awarded; nothing is payable by anyone unless it is.

PROVENANCE

10. Sources and status

UK

- House of Lords Economic Affairs Committee, incapacity and disability benefits inquiry (2024–25): caseload, spending forecast, comparison with registered unemployment.
- Office for Budget Responsibility, Welfare Trends Report (October 2024), as summarised by Benefits and Work: the 2011–15 reassessment figures.
- New Statesman on Work Capability Assessment pilots: appeal and success rates.
- Channel 4 investigation via Benefits and Work: the £80m appeals revolving door.
- Citizens Advice, *What the doctor ordered?*: GP evidence set aside in assessments.
- The Times Welfare Inquiry (October 2026): the 3.9 million caseload and 1.8 million awaiting reassessment, as reported.

Sweden

- Statistics Sweden (SCB), full-year benefit equivalents 2004 and 2025, and Labour Force Survey August 2026; Arbetsförmedlingen Annual Report 2025 and tariff schedules for *Rusta och Matcha*; Försäkringskassan declaration and payment rules; Swedish budget appropriations 2026–28 (Anslag 1:1, 1:3, municipal block grant). Figures as compiled in the author's research record of 12 October 2026; currency converted at 14.5 SEK = £1.
- OECD, *Sickness, Disability and Work: Breaking the Barriers — Sweden (2009–10)*: the pre-reform position and the OECD's assessment of implementation risk.
- Försäkringskassan response to SOU 2024:26 on the 2021–22 rule changes.

France

- *Loi n° 2023-1196 du 18 décembre 2023 pour le plein emploi*; décret du 30 mai 2025 on *suspension-remobilisation*; the 2026 rules as summarised by quelles-aides.fr and aide-sociale.fr (which reports the Conseil d'État's 21 September 2026 decision upholding the regime); figures for RSA households approximate.
- La Quadrature du Net, 20 January 2026: the CNAF scoring algorithm and the Conseil d'État case (filed October 2024; 25 organisations; Défenseur des droits opinion October 2025; source code published early 2026 without training data; no ruling reported as of October 2026).
- Assemblée nationale, rapport d'information n° 1567, 11 June 2025, Cazenave and Sitzenstuhl, on the reform of student grants: 677,000 holders, €2.41 billion, 144 configurations, threshold effects, "dites-le nous une fois".
- Euronews, 13 October 2026: the school-student protests (161,500 by the authorities' count, 480,000 by the unions').
- Castéran, P., Gimbert, H. et al., *Vérification de l'algorithme de calcul des ordres d'appel dans Parcoursup* (LaBRI / Ministère de l'Enseignement supérieur, 2022; HAL hal-03388671; parcoursup.labri.fr): the Why3 verification of the call-order rule against the boursier and non-resident quotas. The matching algorithm itself, and the quota policy, are outside the proof.

The programme

- Model Zero v0.2.1, Lean 4.21.0, 18 of 18 statements proved; the RP1 checker stated in Why3, 13 of 14 obligations discharged by automated provers; both Apache 2.0: github.com/rockr-proof-labs/model-zero. Exemplar studies at rockrproofstudies.org.
- Funding applications are with ARIA (UK) for the proof work; European applications follow in 2027. Nothing has been awarded; nothing is payable by anyone unless it is.
- Author: David Clancy, founder and chief architect of the programme; Principal Investigator, ROCKR Proof Labs Ltd; Président, ROCKR Preuves.

The people responsible (office-holders verified 26 October 2026)

- P1. "Welfare state to working state", speech by the Secretary of State, 16 March 2026; role from gov.uk.
- P2. Commons statement, "Timms Review: Interim Report", 9 July 2026 (Hansard); PA report, 9 July 2026; role from the DWP ministers page.
- P3. Civil Service World, 11 June 2026; DWP "Our management".
- P4. Letter from the Chair of the Work and Pensions Committee to the Secretary of State, 11 December 2025.
- P5. Letter from Lord Bridges of Headley to the Secretary of State, 20 January 2025, closing the inquiry "Economic inactivity: welfare and long-term sickness"; current membership from parliament.uk.
- P6. City AM, 14 October 2026; Disability News Service, 15 and 22 October 2026; Fraser Nelson, Substack, 19 October 2026. The inquiry is editorial, not statutory: no terms of reference or deadline had been published at the time of writing.
- P7. ITV News, 19 October 2026, reporting the Prime Minister's article for the inquiry.

PLAIN WORDS

11. Glossary

Every technical term used in this study, in the order a reader is likely to meet them. On the website each one opens in a tap; here they are collected.

EUDI wallet — the European Digital Identity wallet: a state-issued app on a person's phone that proves who they are to any service that scans it. Available in every EU member state from December 2026; private services in banking, transport, health, education and social security must accept it from 24 December 2027. France's carrier is *France Identité*. The UK has no equivalent yet.

Attestation — a short signed statement, *this verified person, this place, this moment*, produced when a wallet is tapped at a point of attestation and written to the blockchain ledger. It carries no name; who the person is stays with the state's wallet.

Validator — one of the named, accountable institutions that jointly keep the blockchain ledger. Validators check that each entry carries the right signatures and obeys the proved rules, and agree on it by a two-thirds vote. They never see the evidence behind an entry.

Checker — the small, proved piece of software that reads a committed attestation and releases the right bound to it (a payment, a place, a credit) once and to one person. Its rules are stated in Why3 and machine-checked.

Lean 4 — a proof assistant: software that checks a mathematical proof line by line and refuses anything that does not follow. Model Zero's four theorems are proved in Lean 4.21.0 with no custom axioms.

Steward — the on-the-day service role on the provider's side that holds the attested terminal, runs check-in and submits the evidence package. The steward produces evidence and never judges it, and may not be a participant or the authenticator of the same activity.

Authenticator — a person or institution accredited by the instance's governance, who stakes something and signs that an activity matched its published design. Assigned by the protocol, independent of the provider, and not required to be present. Distinct from the blockchain's validators, who never see the evidence.

The oracle problem — a blockchain can prove everything about what is written on it and nothing about whether a fact from the physical world was reported truthfully. The point where that fact enters is the oracle; formal verification calls the same thing the trusted base.

Digital utility asset — a floating asset issued only against authenticated live-experience activity, held only by verified humans, with its supply rules machine-checked. Earned one way (proved presence), spendable every way.

Proof of Authority / Proof of Stake — the two ways a blockchain decides who may keep it. Proof of Authority: named, accountable institutions admitted by a published rule. Proof of Stake: each has a deposit to lose if it misbehaves. The ledger described here uses both.

Apache 2.0 — a permissive open-source licence. Anyone may run, modify and deploy the software, including a state running its own ledger; nothing in the licence requires use of the asset.

GPG45 — the UK Government's Good Practice Guide 45, the standard for proving and verifying a person's identity. It scores several independent kinds of evidence, one of which is a contemporaneous record of the person's activity.

BankID — Sweden's national digital identity, run by the banks and used by 99 per cent of working-age adults to sign in to public services and sign declarations. It proves who a person is; it does not prove where they are.

Försäkringskassan — the Swedish Social Insurance Agency, which pays sickness, disability and activity benefits and runs the cross-checks before each payment.

Arbetsförmedlingen — the Swedish Public Employment Service, which registers the unemployed, contracts the coaching providers and holds their attendance logs.

Model Zero — the programme's mathematical model of how value is issued, transferred, erased and conserved on the ledger, with its four guarantees proved by machine. Version 0.2.1 is public on GitHub.

Why3 — a second proof tool, used to state and check the rules the checker applies; most of its obligations are discharged automatically.

Formal verification — proving, with a computer checking every step, that a piece of software or a set of rules has a stated property in every possible case, rather than testing it in some cases.

The four theorems — the four guarantees proved in Model Zero: every record is one verified person (attested transfer); value is issued only against authenticated activity; a person can be erased without losing what they earned or breaking the totals; and what is released cannot be released twice (conservation).

Custom axioms — assumptions a proof takes on trust. 'No custom axioms' means the proofs rest only on the proof tool's own built-in foundations and nothing the programme chose to assume.

Refinement step — the further proof that would show a particular real system (a benefits agency's ledger, say) is a faithful instance of the model the theorems were proved for, so that the theorems carry over to it.

Point of attestation — the place where presence is observed and recorded: the counter, the register desk, the clinic reception, the classroom door. Call it a gate, though most of them are not.

Pseudonymous — carrying a stable identifier that is not a name. The ledger can tell that two entries concern the same verified person without anyone on the ledger knowing who that person is.

Parcoursup — the French national platform that allocates school-leavers to higher-education places. The rule that orders candidates for a place was formally verified at LaBRI against the quotas the law imposes.

LaBRI — the Laboratoire Bordelais de Recherche en Informatique, the computer-science laboratory of the University of Bordeaux and the CNRS, where the Parcoursup verification was done.

Crous — the Centres régionaux des œuvres universitaires et scolaires, the French bodies that pay means-tested student grants and run student housing and catering.

Trusted base — the part of a verified system that is assumed rather than proved: here, that the attestation of presence is true. Everything above it is proved; it is where the hardest engineering lives.

THE FOUNDATION

12. ROCKR's philosophy: from black holes to ROCKR

It begins at a black hole

Penrose, 1965 — the point where physics stops

In 1965 Roger Penrose proved that when a massive star collapses, it must form a singularity — a point where gravity becomes infinite and the laws of physics simply stop working. The work earned him the 2020 Nobel Prize in Physics, and it left a question that shaped the rest of his career: what kind of theory could describe reality where our best equations fail? His answer, pursued over decades, was geometric — beneath space and time there is structure, and understanding it would take more than computation.

The mind that steps outside the rules

Gödel's theorem — and a proposal Penrose himself marks as speculative

Kurt Gödel proved that any sufficiently rich mathematical system contains truths that cannot be proven by following that system's own rules. Yet human mathematicians can step outside the rules and simply see that those statements are true. Penrose drew a bold conclusion: human understanding is not, at bottom, rule-following — not a computation.

His proposed physical mechanism for this sits at the speculative edge of physics, is contested, and he says so. What matters for this story is the door it opens: if minds can grasp truths no algorithm reaches, where do those truths live?

Platonic truths — the incorruptible kind

What cannot be propagandised

Euler's identity — $e^{i\pi} + 1 = 0$ — cannot be reinterpreted by a demagogue or twisted to justify a war. Its meaning is contained entirely within itself: sealed against misinterpretation. Plato held that such truths — and perhaps beauty, perhaps goodness — exist independently of us: the mind does not invent them, it discovers them.

Penrose takes that view seriously all the way down into the geometry of the universe. The moral extension is a hypothesis, not a result — but the mathematical core is plain fact: some truths cannot be hijacked.

Why every -ism can be hijacked

The translation problem

Democracy, capitalism, socialism, religion, science: none is intrinsically good or bad. They are built from language, and language is porous — a regime can imprison dissidents in the name of "protecting democracy", and no fundamental constant of the universe exists to expose the misuse. When we try to carry an absolute — justice, equity, meaning — into institutions, something is lost in translation: the ideal arrives as an "-ism", a vessel that saints and tyrants can pick up alike.

No system will save us by existing. Every system needs vigilant, ethical operators — and citizens with the disposition to look for what is true. As Plato taught, all anyone can do is inculcate the disposition to discover truth.

Where ROCKR stands in this story

Move the load-bearing parts out of language

ROCKR exists to create an environment where inculcating that disposition — the disposition to discover what is true — is independently possible, for every individual and every community. We cannot make an ideology intrinsically good; nobody can. What we can do is make two moves at once: move a system's load-bearing promises out of hijackable language and into mathematics, the one medium where truth survives translation — and move the system itself out of distant institutions and into the living spaces of the local community. The four theorems are the first move made real: the guarantees people must rely on — real people, real presence, erasure without expropriation, a supply that cannot lie — stated as machine-checkable mathematics rather than terms of service (WP 8.1, Background).

And the philosophy sets the purpose as well as the method: a community that curates its own live experiences — every kind, every genre, chosen bottom up — is an environment where the disposition to discover what is true can grow. RUIPA grants make that environment open to everyone; the theorems make the liquidity behind it incorruptible.

We do not claim ROCKR is intrinsically good; nothing built by people is. We claim its guarantees are written in the one language that cannot be hijacked — and that everything else stays, as it must, in the hands of the individual and the community.

Asso ROCKR Preuves · ROCKR Proof Labs Ltd

This Exemplar Use-Case Study is addressed to the people responsible for the UK welfare system and to the Times Welfare Inquiry, and to those following both. Every date, figure and quotation is drawn from the public record and sourced in the Sources station; the attested record, the ROCKR application and the digital utility asset are architectural specifications from the Model Zero proofs (v0.2.1, 18 of 18 statements proved), not measured outcomes. ROCKR's test network is grant-funded and open source by constitution; no token sale, no investor allocation, every unit of issuance mapped to verified real work. Nothing has been awarded; nothing is payable by anyone unless it is.

Corrections and enquiries welcome — david@rockrprooflabs.org. This document is intended to survive the most demanding scrutiny, and to be improved by it.