Geneva Challenge 2026: Challenges to the Future of Work

ANANTAKALA PROJECT

Protecting Artisanal Livelihoods in Indonesia's Batik Tulis Crisis

A draft proposal on the displacement of skilled handicraft by mass production and an integrated, worker-centred response.

Europe Representation
Engineering and Policy Analysis, University of Technology Delft
Bayu Jamalullael, Taufik M. Yusup, Zhafran Alif Sidik

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Abstract

Indonesia honours hand-drawn batik as heritage. UNESCO inscribed the craft on its list in 2009, and the country celebrates it every October. However, the people who draw it are walking away from the industry's own count. The batik workforce fell from 131,565 in 2020 to 78,939 in 2024. The pressure behind that fall is a future-of-work problem in concentrated form. Machine-printed textiles copy the motifs of hand-drawn cloth at a fraction of the price; a buyer at the point of sale cannot tell the two apart, and so the price of weeks of skilled handwork keeps falling toward the price of print. The cost falls on a specific group: batik tulis artisans are mostly women who work informally from home on piece rates, are invisible in labour statistics, and are outside any work-based social protection. Their children can read that wage ladder as well as anyone, and most decline to enter the craft.

Anantakala is our proposed response. It is a single platform, piloted over twelve months in Kota Pekalongan, Central Java, with roughly ten workshops and fifty artisans, and it does three connected jobs. Its passport function, Paspor Batik, gives every cloth a QR-linked record of its maker, process and classification (*batik tulis, cap or kombinasi*), so a buyer can finally see the handwork a print hides and pay for it knowingly. Its protection function ties that certification to enrolment in Indonesia's employment insurance through the informal-worker scheme, with the first year of contributions covered, putting a floor under work that currently has none. Its learning and community functions make the craft easy and social for the young to enter, from one-day group sessions to a paid apprenticeship for the few who commit. The design rests on our own fieldwork in Pekalongan and Bandung in July 2026 (six expert and artisan interviews and a student survey) and on the post-mortems of two local authentication schemes that died by asking too much of producers.

The impact that the pilot can bring is that the value of the human hand becomes visible to the buyer and payable to the maker, with the premium tied by written commitment to wages and insurance rather than stopping at the workshop door. And what it proves for batik is meant to travel: when machines learn to imitate a skill faster than wages and protections can adjust, the same reckoning reaches other crafts and other work. Anantakala is a tested, transferable way to protect not only the heritage but also the hands.

The team

We are three master's students at TU Delft combining expertise in energy policy, enterprise technology, and behavioural economics to tackle policy challenges.

Bayu Jamalullael is a trained mining engineer with experience in ASEAN energy policy research. He holds a BSc in Mining Engineering from Bandung Institute of Technology.

Taufik M. Yusup has a background in computer science and business from KAIST, South Korea. He works at the intersection of technology and policy, most recently on enterprise AI adoption at Microsoft.

Zhafran Sidik is a master's student with a double bachelor’s background in Econometrics and Economics from Erasmus University Rotterdam. He has spent over two years as a behavioural research consultant.

Table of Contents

1. Introduction

1.1 Batik Tulis and Its Artisans

Batik is a method of making cloth rather than a specific pattern. In the wax-resist process that defines it, the maker draws hot wax onto the fabric to block the dye, dyes the cloth, boils the wax out, and repeats the cycle until the design emerges. The national standard accordingly defines batik as a resist-dyeing handicraft that uses hot wax applied with a *canting* (a small wax pen), and it admits three types (Badan Standardisasi Nasional, 2014). A *batik tulis* cloth is drawn freehand with the canting over a matter of weeks, a *batik cap* cloth is stamped with a copper block within days, and the third type combines the two. A machine-printed textile that merely carries a batik motif, produced in minutes without any wax-resist process, is, by the same standard, not batik at all, only a "batik-motif textile" (Badan Standardisasi Nasional, 2014). M. Fauzi Hidayat, who chairs the batik artisans' association in Kauman, Pekalongan, put it to us more simply. "Batik is not a motif but a process. When the motif is *kawung*, *jlamprang,* or *parang*, but it is made digitally, that is not batik. And when the motif is contemporary, even Spider-Man, but the process uses wax and a canting, that is batik."

The trouble starts there, because a printing machine can copy the motif but not the process or the labour. What a buyer pays for in a true piece is the weeks of skilled handwork visible in small irregularities that no two cloths share.

Those hands belong to a particular workforce. *Batik tulis* is made overwhelmingly by women, working informally from home, fitted in around household care (Febriana et al., 2023; Soebaryo & Budianti, 2020). In a busy workshop, the work runs like a production line, one woman drawing the outlines in wax, others colouring, covering, dyeing and boiling out the cloth, and a single *kain* (a length of cloth) passes through many hands over two weeks to a month. It is skilled, patient work, and people who can do it well are already hard to find.

1.2 A Workforce in Decline

By the industry's own count, the workforce is shrinking fast. Speaking at a parliamentary hearing in May 2025, the chair of the Indonesian Batik Artisans and Entrepreneurs Association (APPBI) reported that across the country's main production centres, the number of working batik artisans (*pembatik*) fell from 131,565 in 2020 to 78,939 in 2024, and may have slipped to around 75,000. The enterprises that employ them thinned just as fast, from 4,171 to 2,503 (Nurdifa, 2025). That is roughly two in five gone in four years.

What makes the decline striking is that batik itself has not fallen out of favour. It is worn to offices and weddings, sold to tourists, and celebrated every 2 October on the national Batik Day, following UNESCO's inscription of the craft as intangible cultural heritage in 2009 (UNESCO, 2009). The cloth is everywhere, but the people who make it by hand are disappearing.

They are leaving because the work no longer pays enough to live on. That gap, between a tradition the nation honours and a livelihood it fails to protect, is the subject of this report.

1.3 The Pilot Site: Pekalongan

We are three Indonesian students studying in Europe, and we site the work in Kota Pekalongan, on the north coast of Central Java. The crisis in this report is happening at home. UNESCO named Pekalongan a Creative City of Crafts and Folk Art in 2014 and describes it as Indonesia's "Batik City", though the city itself goes further and brands itself the World's City of Batik (UNESCO, 2014). It hosts one of the country's densest concentrations of *batik tulis* artisans, and it sits in Central Java, the province where the decline bites hardest (Nurdifa, 2025). Just as important, the city has institutions through which a response can work. Kauman, the batik quarter this report focuses on, has an active artisan association, the municipal government has a record of showing up for the craft, and the local university runs a degree programme dedicated to batik; Part II returns to each. The crisis is at its worst here, and a response has something to stand on.

One of those artisans is Ibu Parokah, who tends the wax pots of one of the workshops in Kauman. She did not grow up in the craft. She worked in a tea factory until her children were born, then learned to batik at home, a month for the basics and years of piecework for the skill. Batik is now her household's main income. A standard *kain* takes her crew two to four weeks to finish, and the finest pieces move in batches of two or three. Her four children all chose the cigarette factory over the canting, and her two granddaughters are not interested. Her back aches from the years of sitting, and her health coverage comes through her neighbourhood office as a resident, not through her work. Asked why the young will not take it up, she does not really know. Maybe they just do not like it.

1.4 Problem Statement

People still want the cloth. What has collapsed is the living income its makers earn: machine-printed imitations have eroded the price of handwork faster than any institution has moved to protect it. If nothing changes, the ending is easy to foresee. *Batik tulis* survives as a museum piece and a festival costume, but the skill behind it, along with the livelihoods that depend on it, disappears.

The loss is cultural, but it is also a labour crisis that falls on a particular group. The artisans at its centre are overwhelmingly women who work informally from home, invisible in the labour statistics and beyond the reach of any work-based social protection. Protecting them is a decent work question (SDG 8), a gender question (SDG 5), and a responsible production question (SDG 12) at once. It is also a preview of a much larger question. When machines learn to imitate a skill, who bears the cost? A country that can protect the makers of a craft the world has recognised as part of humanity's intangible heritage has begun to answer it.

Understanding why the livelihood is collapsing, before proposing how to defend it, is the task of the next part, which traces through the Sustainable Livelihoods Framework how one pressure drains asset after asset from an artisan household, and closes by narrowing the diagnosis to the precise question a response must answer.

2. Problem Analysis

2.1 Methodology

This diagnosis draws on two sources of evidence: desk research, in which national and industry statistics, regulations, academic literature and sector reporting establish the scale and structure of the problem, and primary field research, which grounds that picture in the experience of the people the crisis affects.

The field research began with a scoping interview with an independent textile-and-fashion researcher, founder of the documentation initiative Cipta Garis Temurun, during the framing of this study. In early July 2026, we visited Pekalongan and interviewed a batik-village association, a premium producer who also serves as an officer of a national handicraft association, a working artisan, a university batik-education programme and the operator of a communal wastewater plant, then added an expert interview with an academic researcher in Bandung. Alongside the interviews, we surveyed the batik programme's active students anonymously, yielding 11 responses from 17 students. Together, these sources span makers, institutions, educators, and the young people who could succeed the artisans. We organise the analysis using the Sustainable Livelihoods Framework, introduced next.

2.2 The Sustainable Livelihoods Framework

It is tempting to read the disappearance of *batik tulis* as the natural ageing-out of an old craft. The Sustainable Livelihoods Framework (Chambers & Conway, 1992; Department for International Development, 1999) shows why that reading is wrong. It analyses how a household sustains itself by combining five forms of capital, human, social, financial, physical and natural, within a vulnerability context of shocks and trends, governed by the structures and processes (markets, institutions, policies) that control access to those assets. It is, in effect, the operational form of Sen's (1999) capability approach: assets are the means through which people secure the freedom to live the life they value, and a livelihood is sustainable when it can absorb a shock and retain those capabilities.

When applied to *batik tulis*, the framework turns a vague sense of decline into a specific diagnosis. A single external shock, mass-produced imitation, is draining all five assets at once. Meanwhile, the institutions that should cushion it are too partial, too firm-focused, or blind to artisans as a category, so the decline compounds rather than levelling off. The sections below follow the framework's own order, vulnerability context, assets, structures and processes, outcomes, because that sequence is also the causal chain.

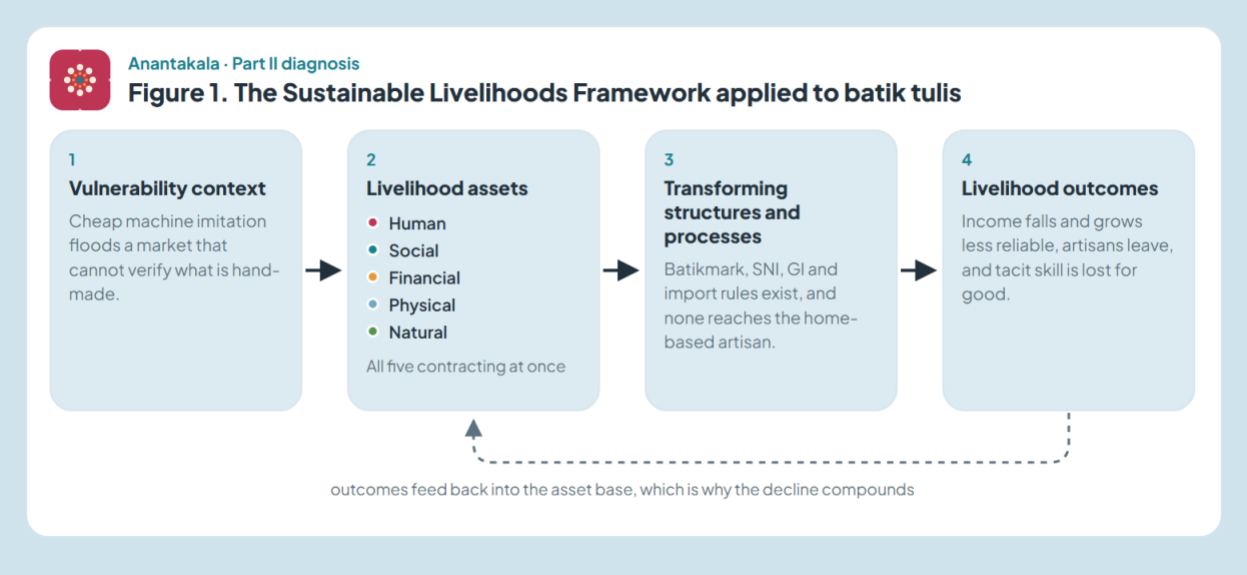

Figure 1. Sustainable Livelihoods Framework diagram

Source: Authors' adaptation of the Sustainable Livelihoods Framework (Chambers & Conway, 1992; Department for International Development, 1999), read left to right.

2.3 Vulnerability Context

The shock that shapes every other part of this livelihood is a market that no longer distinguishes batik from its imitations. Printed cloth with batik motifs, much of it imported, sells for under Rp 100,000 per piece; batik cap, still genuinely hand-made, runs from roughly Rp 100,000 to Rp 400,000; authentic hand-drawn tulis is another order of magnitude, from around Rp 750,000 to the millions (Pemerintah Kota Pekalongan, 2025), with the Kauman association head putting the floor for a fully hand-drawn cloth at roughly Rp 900,000.

Underneath the price gap lies an information problem. Reliably distinguishing hand-drawn *tulis* from print means handling the fabric, feeling how far the wax has penetrated, and checking whether the pattern reads on the reverse. Online, where a growing share of textiles is sold, the buyer sees only a photograph. This is what Akerlof (1970) called a market for lemons: when buyers cannot verify quality, price becomes the only signal they can act on, the better goods are driven out, and the market settles on the cheapest substitute. Our scoping interview revealed that the confusion does not stop at buyers. Sellers sometimes present printed cloth as handmade, so it runs the length of the chain. One Kauman producer we met had lived through the theory first-hand. Four of his hand-drawn sarong designs were copied exactly by a local printing workshop; his originals sold at about Rp 250,000, the printed copies at roughly Rp 125,000, and his resellers, unable to justify the difference to buyers who saw none, stopped reordering. At a Jakarta trade fair, he once placed a hand-drawn and a printed cloth side by side and asked visitors to tell them apart. Hardly anyone chose correctly, and even batik entrepreneurs guessed wrong. The artisans' exit is exactly what the theory predicts once authenticity becomes invisible.

Two trends deepen the shock. Batik exports fell 13.5 per cent year-on-year in 2023, from about US$ 683 million to US$ 591 million over January to November (Al-Fajri, 2024), and that overseas

market is exactly the premium segment authentic *tulis* is best placed to serve. A weaker rupiah has meanwhile raised the cost of imported inputs, so margins are squeezed from the cost side while imitation holds prices down on the revenue side. The government has now moved to limit the import and duty-free entry of batik-motif cloth (Kementerian Perdagangan, 2025); the need for such a rule shows how far the imitations have spread, and whether it actually protects artisans is a question we take up with the institutions below.

2.4 Eroding Livelihood Assets

The crisis is hard to fix with any single measure because the shock drains every asset in the livelihood pentagon at once, and each loss feeds the next.

Human capital: In batik, much of the skill and knowledge a household draws on is tacit. As Polanyi (1966) put it, we know more than we can tell. A master cannot fully explain how she judges the flow of the wax or the balance of a motif, because that judgement rests in trained hands and eyes. The skill passes down two channels, mother to daughter and master to apprentice, and both are narrowing. The workforce is ageing, with many artisans now elderly by the city's own account (Pemerintah Kota Pekalongan, 2022), and a young person can earn more in a factory than in a craft that takes years to learn. The dedicated three-year diploma in Kriya Batik at a Pekalongan university had just 17 active students across three cohorts in 2026, with one post-pandemic intake as low as three. Our anonymous survey sharpens the point. Of the 11 students, only two plan to become *pembatik*, and four plan to run their own batik businesses. All eleven would recommend the field, yet only five believe *batik tulis* can be a main livelihood in five to ten years. The programme is producing entrepreneurs, designers and instructors rather than makers. The loss runs deepest at the finest tier of skill. The head of the Kauman association described hand-drawn dotting once so precise it rivalled a machine print, a level now almost gone. Two independent sources, the association head and a working artisan, described the same pattern: women return to batik only after marriage and children, learning at home in spare hours, so their skill rarely reaches the previous generation's depth. When a master leaves the craft undocumented, her motifs and techniques leave with her.

Social capital: For batik artisans, the relationships that provide market access and bargaining power constrain more than they help. Home-based artisans reach the market almost entirely through collectors and coordinators, who control access and set the price at the workshop door. In the common *semi-maklon* arrangement we saw in the field, artisans work under a coordinator rather than as employees, so they have little say over their pay. The burden falls mainly on women, who make *batik tulis* overwhelmingly from home under informal arrangements (Susanti, 2019), and because pay is per finished cloth, the most intricate work earns the lowest hourly rate. These women are also largely unrecorded: they appear as no distinct category in labour statistics, and gender-targeted programmes, built around farming and trading, overlook them. A workforce that is not counted is difficult to protect.

Financial capital: The work carries almost none of the protections of a secure job. Artisans have no contract, no guaranteed wage, and for most no enrolment in the employment arm of the national

social insurance system (BPJS Ketenagakerjaan), the minimum the ILO calls decent work (International Labour Organization, 2008). What the work pays is harder to pin down. Earlier reports put daily piece rates for home-based artisans at roughly Rp 20,000 to 40,000, well below the regional minimum wage (Hidayat, 2021). The one piece-rate we could verify in the field comes from Cirebon, where an academic expert had asked the women directly: Rp 100,000 for a finished cloth that takes two weeks to a month of collective work. A fortunate few approach a living wage; the premium producer we interviewed claimed to pay Central Java's provincial minimum wage, about Rp 2.3 million a month for 2026 (Pemerintah Provinsi Jawa Tengah, 2025). The student survey cuts the other way. The students' median expectation for a starting salary is Rp 5 million per month, more than twice the minimum wage and far above the piece-rate ladder, yet two of the three respondents from batik families expected the least in the sample, Rp 1 million and Rp 1.8 million. The young people who know best what batik pays expect the least from it. Whatever the level, the structure is the same: income arrives only when a piece is finished, with no floor in slow months, no sick pay, and no savings to fall back on. The artisan we interviewed had health insurance only as a resident through her neighbourhood office, not through her work; she had no employment insurance and said she would take it if offered.

Physical capital: An artisan's productive assets are few, just a canting, a pan of wax, a few copper stamps, and a home that doubles as a workshop. The asset that could most improve her position is digital capability. Most batik enterprises lack the IT competencies to sell online (Al-shami et al., 2024), and in the wider informal economy, older workers are the least digitally literate and the wariest of new tools (Amin et al., 2026). But the gap can close. A participatory training programme with batik artisans in Lasem raised the adoption of generative AI tools from 10 to 70 per cent (Wibowo et al., 2026). The barrier is training rather than aptitude.

Natural capital: Competing on price against print pushed many artisans toward the cheapest synthetic dyes, and the residue reaches the water. In Jenggot, Pekalongan's largest batik quarter, wastewater sampling has detected chromium and lead in residential drains, and nearby wells and rivers are documented as contaminated (Budiyanto et al., 2018; Ismanto et al., 2024). Kauman has run a communal treatment plant since 2010, funded entirely by the city. But such plants are few, so in the printing-heavy quarters, much waste still reaches the river. Traditional dyeing is not automatically clean either. Our scoping interview cautioned that natural dyes are not always greener, since some need many more dye baths and far more water. Sustainability is therefore a qualified opportunity, not an inherent feature of the craft, and so far, no one has yet claimed it. Meanwhile, global demand for slow, traceable textiles is rising (Data Horizzon Research, 2025). Natural-dye *tulis* is well placed to serve it, but only if the process is genuinely cleaner and buyers can verify it.

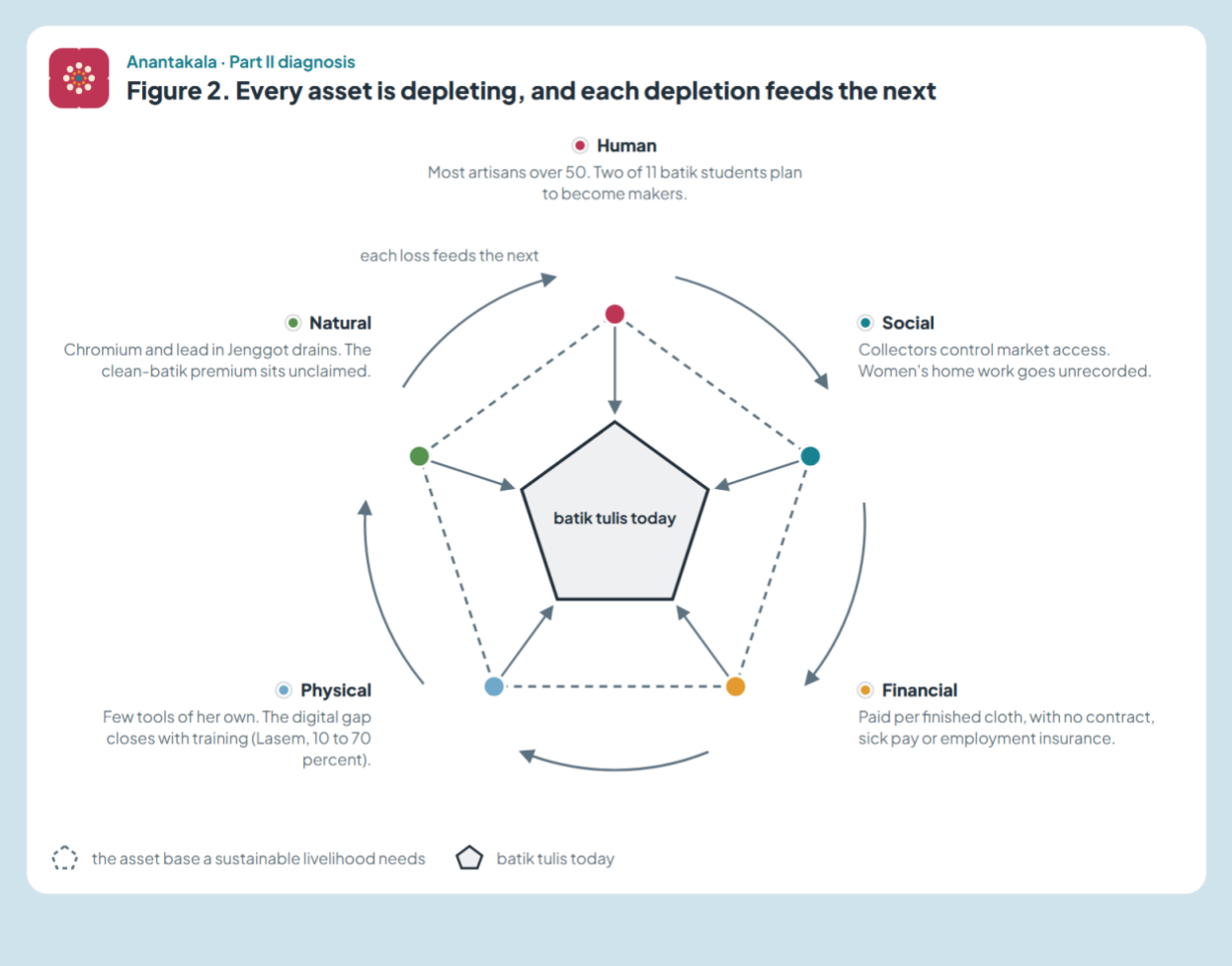

Figure 2. The livelihood pentagon.

Source: Authors' analysis of Pekalongan fieldwork (July 2026), adapting the DFID asset pentagon (Department for International Development, 1999); pentagon positions are illustrative rather than measured.

2.5 Transforming Structures and Processes

In the Sustainable Livelihoods Framework, assets are only as useful as the institutions governing access to them allow. For batik artisans, those institutions are the missing buffer. Indonesia has plenty of batik policies, and almost none of them reach the home-based artisan, because each instrument is built around the firm or around a category of beneficiary that leaves the home-based maker out. Table 2 sets out the main instruments and where each falls short.

Table 1. Instruments exist, but none reach the home-based artisan

Instrument	What it does	Why does it fall short for artisans
Batikmark (2007)	Authenticity label for hand-made batik	Voluntary; ~530 certificates in ~17 years, fees ~Rp 1.7 million, ~41 working days, so artisan uptake is minimal (Gayanara, 2024; Nugroho, 2019).
SNI 8302–8304:2016	National quality standards for batik, one per type	Voluntary, and rarely applied at the artisan level

Instrument	What it does	Why does it fall short for artisans
Geographical Indication	Marks regional authenticity	Needs an enforcing body; gains usually captured upstream by traders
Permendag 17/2025	Import licensing that bars free-zone batik-motif goods from the domestic market	New and enforcement-unproven
Permendagri 14/2025	Lets local governments fund insurance for vulnerable workers	Standard lists name farmers, fishers and traders, not artisans
Prakerja / BLK	Vocational-training subsidies	Batik tulis absent from curricula; no funds for master-to-apprentice transmission
Kota Pekalongan BPJS-TK subsidy	Subsidises first months of employment-insurance contributions	Stalls on semi-maklon (below)
Kota Pekalongan skills and school programmes	Certification, Dekranasda training, batik as a school subject (Pemerintah Kota Pekalongan, 2023, 2025b)	Bounded by the city line (below)

Source: Authors' analysis of the regulations named, with Kemenperin, BSN and Pemerintah Kota Pekalongan (2023, 2025) materials. Fieldwork: Pekalongan interviews, July 2026.

The clearest lesson comes from two authentication schemes that have already failed. According to the Kauman association head, Pekalongan once introduced gold and silver labels for handmade batik. Producers did not consistently attach them, buyers did not look for them, and the scheme lapsed. A national handicraft association ran a comparable barcode-and-sanctions system, and one of its officers told us it failed in the same way because producers found it too much trouble to maintain. In neither case was the technology the problem because compliance was voluntary, and the incentive was weak. Any future authentication effort has to begin with that fact.

Social protection shows the same pattern of a policy that exists but does not take root. The city already subsidises the first months of employment-insurance contributions for workers who present an identity card, but the association head explained, the scheme stalls on the structure of the trade: most artisans work under a coordinator in a *semi-maklon* arrangement rather than as direct employees, so no one continues the contributions once the subsidy ends. Permendagri 14/2025 allows local governments to fund insurance for vulnerable workers, but its standard lists farmers, fishers, and traders, not artisans (Kementerian Dalam Negeri, 2025). The artisan falls between the categories the system recognises.

Training misses through geography. When the city put 110 *pembatik tulis* through the national skills certification in 2023 (Pemerintah Kota Pekalongan, 2023), the association head observed that the participants were city residents, while the artisans who actually practice the craft live on the periphery and commute in. The school pipeline has the same boundary: batik is a local-content subject in the city's schools from kindergarten through senior high, but not in the neighbouring *kabupaten* (the surrounding regency), where most artisans come from, a gap two field sources pointed out independently.

Policy keeps missing the artisan for three reasons. Organised interests are heard, and dispersed ones are not: importers and manufacturers have a lobby, some eighty thousand home-based, mostly female artisans do not. No single ministry is responsible: batik is split across at least five ministries, covering industry, trade, employment, culture, and local welfare, and the home-based, piece-rate artisan fits cleanly into none of their mandates. And batik is treated as heritage rather than as work: the 2009 UNESCO recognition brought festivals, museums and rules requiring officials to wear batik, but changed nothing about how its makers are paid or protected.

2.6 Livelihood Outcomes

Follow the chain forward, and the result is the one the framework predicts: income falls and grows less reliable, the asset base thins, the institutions fail to absorb the shock, and households do the only thing left to them. They leave. The exit is steepest where batik is most concentrated. In Central Java, the largest of Java's four batik heartlands, artisans fell from 82,550 in 2020 to 49,530 in 2024 (Nurdifa, 2025), close to two-thirds of the documented national loss by our own computation from the source's regional table, and one reason we site the pilot there. (The provincial figures are association estimates, with a uniform 40 per cent decline applied to each 2020 baseline, not independent censuses.)

The most serious outcome cannot be reversed. Lost income can return if demand does, but a generation of unlearned skills cannot, because each master who leaves takes a unique set of motifs and techniques with her, and because the knowledge is tacit, it cannot be reconstructed from photographs. This is what separates the batik crisis from an ordinary downturn. Every year of inaction lowers the ceiling on what any later intervention can restore.

One case from our scoping interview says decline is not inevitable, for example, in Tuban, East Java, a law graduate took over her mother's *batik tulis* workshop after a government training and certification programme and keeps it running. The constraint, that suggests, is not a shortage of willing young people but the absence of a viable livelihood and a structured way to pass the skill on.

This, finally, is why the crisis belongs in a contest about the future of work. The displacement of *batik tulis* is not merely similar to automation because it is automation operating through an information failure, with machine production replacing skilled labour faster than wages, rules, or protections can adjust, and succeeding because buyers cannot tell the difference. Kauman's workshops are an early, unusually visible version of what automation threatens for other skilled work.

2.7 Where a Pilot Can Act

The diagnosis shows a livelihood losing all five of its assets at once, driven by a single shock and left unbuffered by institutions that do not reach the home-based artisan. A pilot cannot repair all five assets at the national scale, so this section narrows the picture to the points where a focused intervention can realistically have an impact.

Before narrowing, one genuine disagreement in the field is worth naming. A premium producer we interviewed argued that hand-made batik should move upmarket, where machines cannot follow, and the chair of the national batik association has cautioned against relying on the premium

segment, since most artisans cannot reach those buyers (Galeri Batik Jawa, 2024). Both are right in part. The premium market is real but narrow, and access to it is exactly what most artisans lack. The leverage point is therefore to make authenticity visible and fairly paid, rather than to declare batik a luxury good.

That leverage point also defines the scope. In scope are the failures a pilot can move: authenticity invisible to buyers, skill no longer being passed on, artisans outside the protection system carrying every shock alone. Out of scope are the forces that require national action, trade enforcement against imports, the exchange rate, and the reform of Indonesia's informal economy, which form the context in which the intervention operates rather than its targets.

From the diagnosis, any adequate response must meet four criteria: restore artisans' **agency**, widening real choices rather than only raising short-term income; close the **information** gap, so buyers can distinguish genuine batik and pay accordingly; sustain **transmission**, so tacit skill keeps passing from master to new maker rather than merely being documented; and extend **protection**, bringing artisans inside the social-insurance system the market leaves them out of.

Together, the four criteria restate the diagnosis as a single question.

> ***Main research question:*** *How can batik tulis be sustained as viable and dignified work for the next generation, in the face of forces that are making it economically and socially unsustainable?*

Part III sets out the intervention, returning to the four criteria to show how each is met, and to Table 2 to show how the design closes the gaps the existing instruments leave.

3. The Proposed Response

3.1 The Anantakala Platform

The diagnosis ended with four criteria. A response must restore artisans' agency, close the information gap between buyers and makers, sustain the transmission of skill, and extend protection to people the system currently cannot see. It also ended with a warning. Pekalongan has already buried two authentication schemes, and both died the same death: too much effort was asked of producers, and there was no reason for buyers to care. Any new instrument starts from that grave.

Our response is Anantakala, a single platform with three prongs. The name is Sanskrit, *ananta*, endless, and *kala*, art, for a craft made in weeks that should outlast imitations made in minutes. Its passport function makes authenticity visible, the direct answer to the market for lemons, the diagnosis named (Akerlof, 1970): once buyers can tell hand-work from print, price stops being the only signal they can act on, and hand-made work can command the value it already carries. Its protection function puts a floor under the people doing that work by tying certification to social insurance enrolment. And its learning and community function make the craft something a young person might actually want, which is where regeneration begins. Each job answers one failure scoped in Part II, and none works alone as a visible premium that never reaches wages changes nothing, a safety net under work nobody wants preserves nothing, and desire for a craft that cannot pay produces hobbyists rather than makers.

The theory of change: if authenticity is made visible at zero effort to the producer, the resulting premium is contractually tied to wages and protection, and the craft is made easy and social to enter, then the pilot artisans' livelihood becomes viable and protected and the maker layer begins to refill, because the binding constraints the diagnosis found, information failure, unprotected piece-rate work and a rational refusal by the young, require no new legislation to move. We are explicit about one thing, namely that the diagnosis cannot show that the three levers have never been pulled together in one community, so their combination is itself the hypothesis that the pilot tests. We sequence them accordingly, market first, protection riding on it, community throughout, and carry one field principle into every component. The platform is built with artisans rather than for them, and it asks society to adapt to the value of the process instead of asking artisans to produce faster (respect, not rescue, as our scoping interview put it).

3.2 What the Platform Does

Paspor Batik: authenticity made visible

Every cloth from a participating workshop carries a QR code printed on its brand tag, as part of the existing production flow. Scanning it opens the cloth's passport, which then provides information about the motif and its philosophy, the hands it passed through, the workshop, the region, and the stages of the wax-resist process, which a printed imitation skips. The passport is a story before it is a certificate, because verification alone does not move buyers. An existing QR label in Kauman links only to a website and changes nothing, while the cases where handwork wins its price, high-end *tulis* with waiting lists, woven cloth selling out over Instagram live streams, run on narrative and

connection. Inside the passport are the three process classifications defined in Part I: *batik tulis*, *batik kombinasi* and *batik cap*, all genuine hot-wax batik under the national definition and set apart from the printed textile that only borrows the motif (Badan Standardisasi Nasional, 2014).

The design directly answers the two precedents. First, the effort sits with us rather than the artisan. A digital artisan liaison, a trained student from the local university's batik programme, registers the workshop, records the stories and issues the codes. The producer talks, the liaison types, once per motif line rather than per transaction. Second, the buyer now has a reason to care and the producer a reason to keep the tag on, because the classification unlocks the protection incentive described below. Third, certification is what creates the premium, which a buyer sees the handwork a print hides and pays for knowingly, new value rather than a larger cut of an old one. The platform layers story and verification onto the WhatsApp and Instagram channels, workshops already sell through, working with the resellers rather than around them. To open the market to younger buyers, a curated line of simplified motifs, genuinely hand-drawn but priced around Rp 200,000 to 250,000, gives a first rung on the ladder of appreciation, an idea proposed by the academic expert we interviewed.

Learning and community: a craft worth choosing

The human-capital diagnosis showed the recruitment pipeline failing at every channel, and it showed why another training scheme would treat the wrong constraint. The barrier is not a shortage of places to learn. Young people read the wage ladder of Part II and see the craft as old-fashioned, so the work is not something they want.

This component works on that wantedness first. It teaches the public that batik is a process rather than a motif, opening the stages from *nglowong* through *nglorod* in every course and passport, so a buyer sees the labour a print leaves out. It makes existing courses easy to find through a tiered directory, one-day tasters to a three-month programme at a local batik campus, curating providers who already operate, so the effort asked of artisans stays near zero. And it makes learning social, leading with *membatik bersama*, group sessions hosted by a named artisan, because a craft learned alongside other people and shown off afterwards can become desirable again. The appetite is not hypothetical, as creative tourism in Kauman already invites visitors to make batik alongside the artisans (Wiyana et al., 2021), and the association runs such sessions on request.

Short sessions produce enthusiasts rather than masters, and we do not claim otherwise. The realistic output is an engaged ecosystem of young designers, sellers, buyers and advocates, and from it a thin, honestly counted stream of serious makers. The few who commit are matched to a working master through the human liaison, since many senior artisans cannot be reached through an app, and the match carries a modest apprenticeship stipend of Rp 1.5 million a month, the one place the pilot pays a learner, because a young professional still meets the wage wall the other two components exist to move. Our survey says maker intent is low today; we treat that as a consequence of what the work offers, and the pilot tests whether it moves when the offer changes.

Protection: a floor under the work

The diagnosis showed why the employer route into social insurance stalls. Most artisans work under a coordinator rather than a contract, so demanding formal employment would build the floor on

sand. The platform routes around the blockage instead. To carry any classification, a workshop must register its artisans with the employment-insurance system through the informal-worker scheme, which requires no employment contract (BPJS Ketenagakerjaan, n.d.). The pilot also covers the first year of contributions, extending the municipal subsidy that already covers the first months. Certification gives the workshop a reason to enrol people, and the subsidy removes its cost for doing so. For home-based artisans attached to no workshop, the complementary route is collective enrolment through the neighbourhood office or the artisan association, the same door through which our artisan informant already receives her citizen health coverage. Alongside enrolment, the pilot funds light workplace health measures, the seating and ventilation that her chronic back pain calls for. One boundary applies: only 1 of 11 surveyed students named a welfare guarantee as their priority, so protection is designed for the artisans working today, never sold as the reason for the young to join.

The second phase: co-created batik

One feature is deliberately held back from the pilot. Batik AI (Figure 5) will let a buyer compose a design from consented motif templates or a written prompt and commission it from a willing workshop at a premium. The design may be machine-assisted, but the cloth is made entirely by artisans, at a price that honours the labour. Composing a design is also a hook. It draws in people who would never sign up for a class, and some of them become the young designers and advocates that the pilot is trying to build. Its boundaries are fixed now. The system will never output print-ready patterns, and no motif enters the archive without documented consent, attribution and a licensing payout. The pilot only digitises consented motifs and runs the first supervised commissions; the full feature launches after the passport has established trust. Machines that imitate handwork created this crisis. The same capability, pointed the other way, routes demand back to the people who hold the skill.

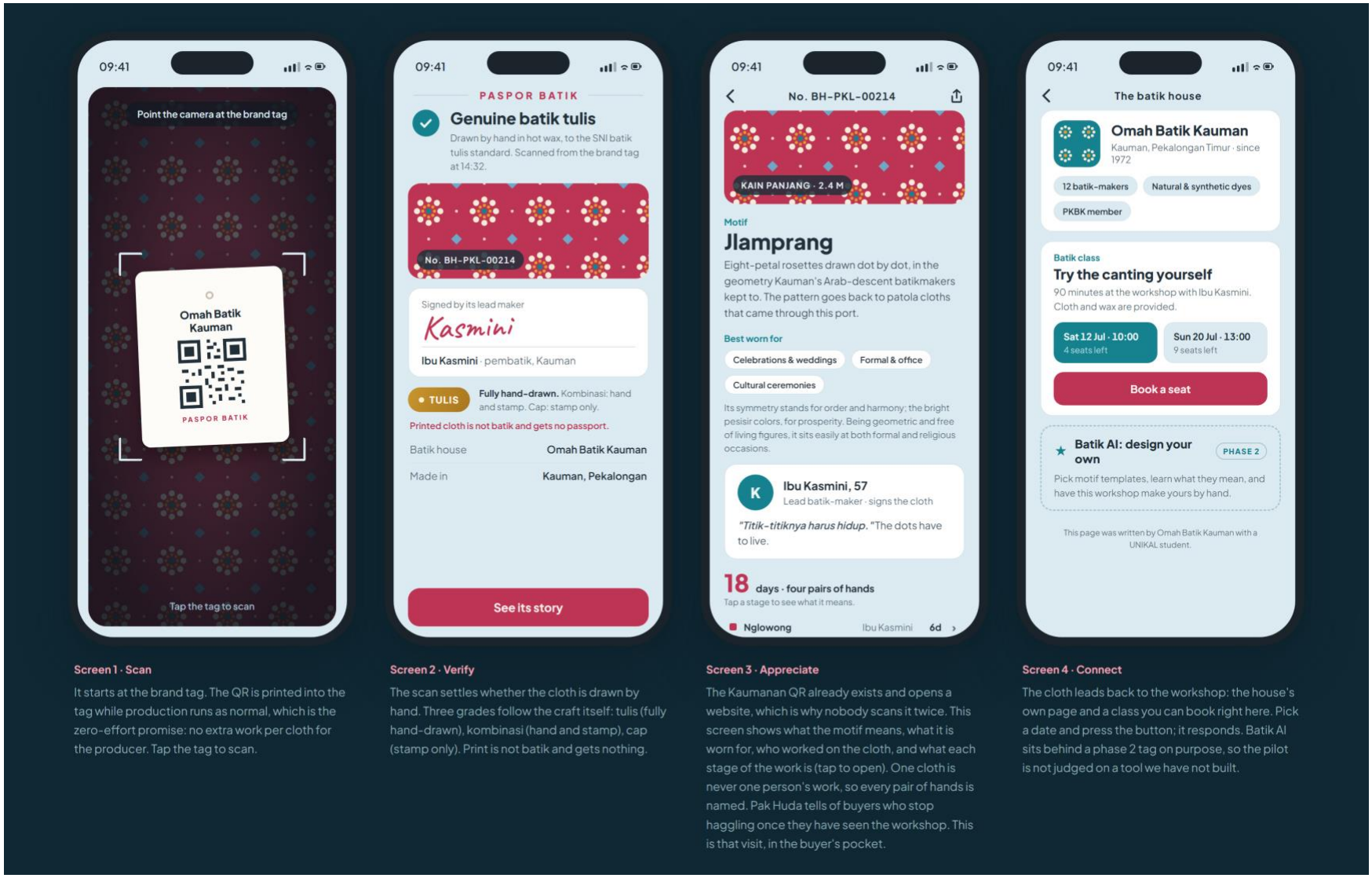

Figure 3. Paspor Batik, from scanning a cloth's QR tag to the passport that shows its classification, maker and process.

Source: Anantakala interface mockup; details shown are placeholders.

Figure 4. Learning and community, the course ladder, membatik bersama group sessions and the maker tail

Source: Anantakala interface mockup; details shown are placeholders.

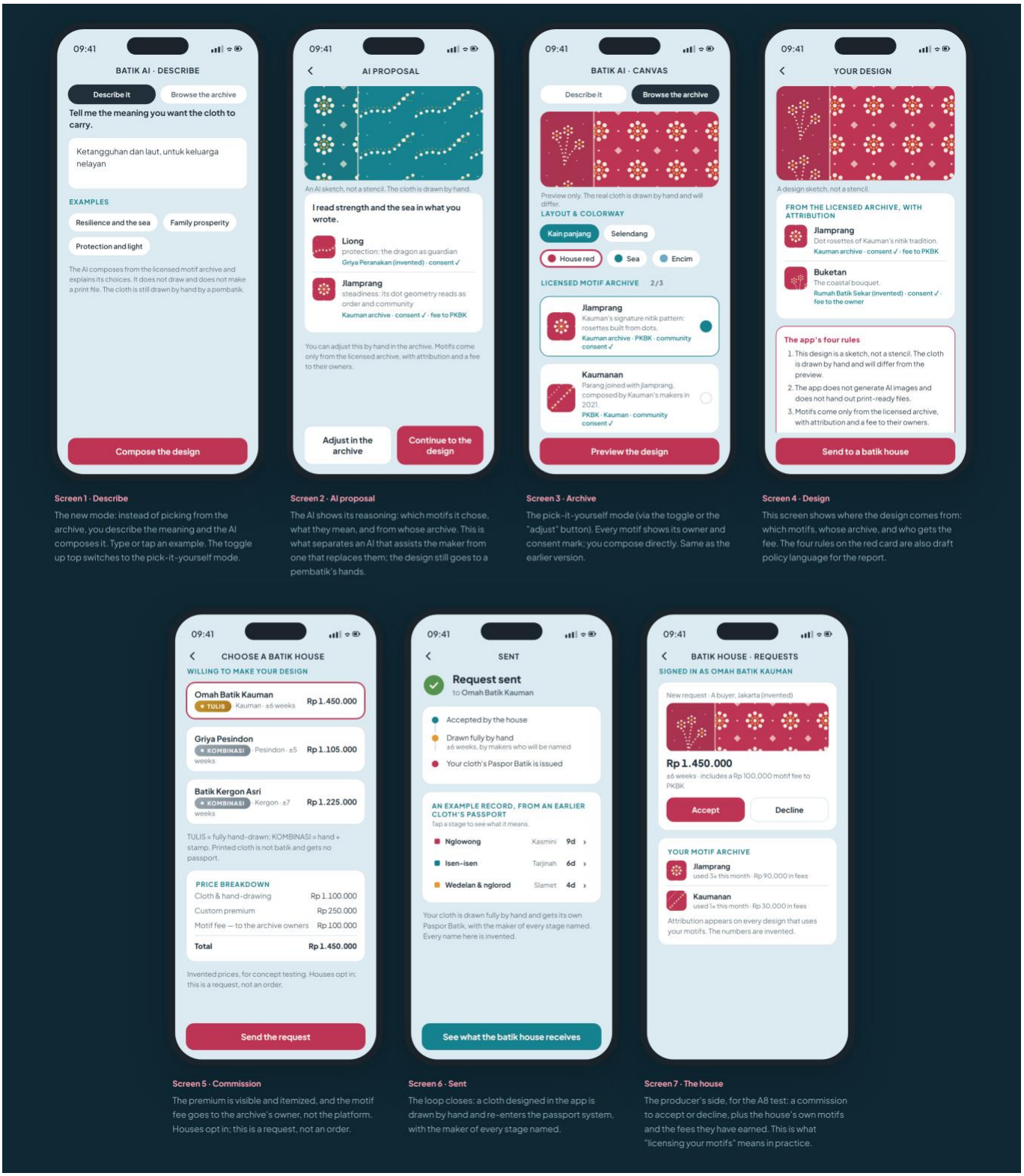

Figure 5. Batik AI, the phase-2 co-creation concept, from a described meaning to a hand-drawn commission

Source: Anantakala interface mockup; details shown are placeholders.

3.3 Implementation

The pilot runs twelve months in Kota Pekalongan, anchored on the Kauman artisan association and the local university's batik programme, with a core staff of three. It reaches roughly ten workshops, drawn from the association's thirty or so active members, and around fifty artisans working under them. Nothing launches unvalidated: the first quarter tests the passport walkthrough with the association and producers, using the same concept-test discipline that exposed the failures of the earlier labels. The market lever leads, protection rides on it, and the learning and community strand runs across the whole year. Figure 6 sets out the schedule.

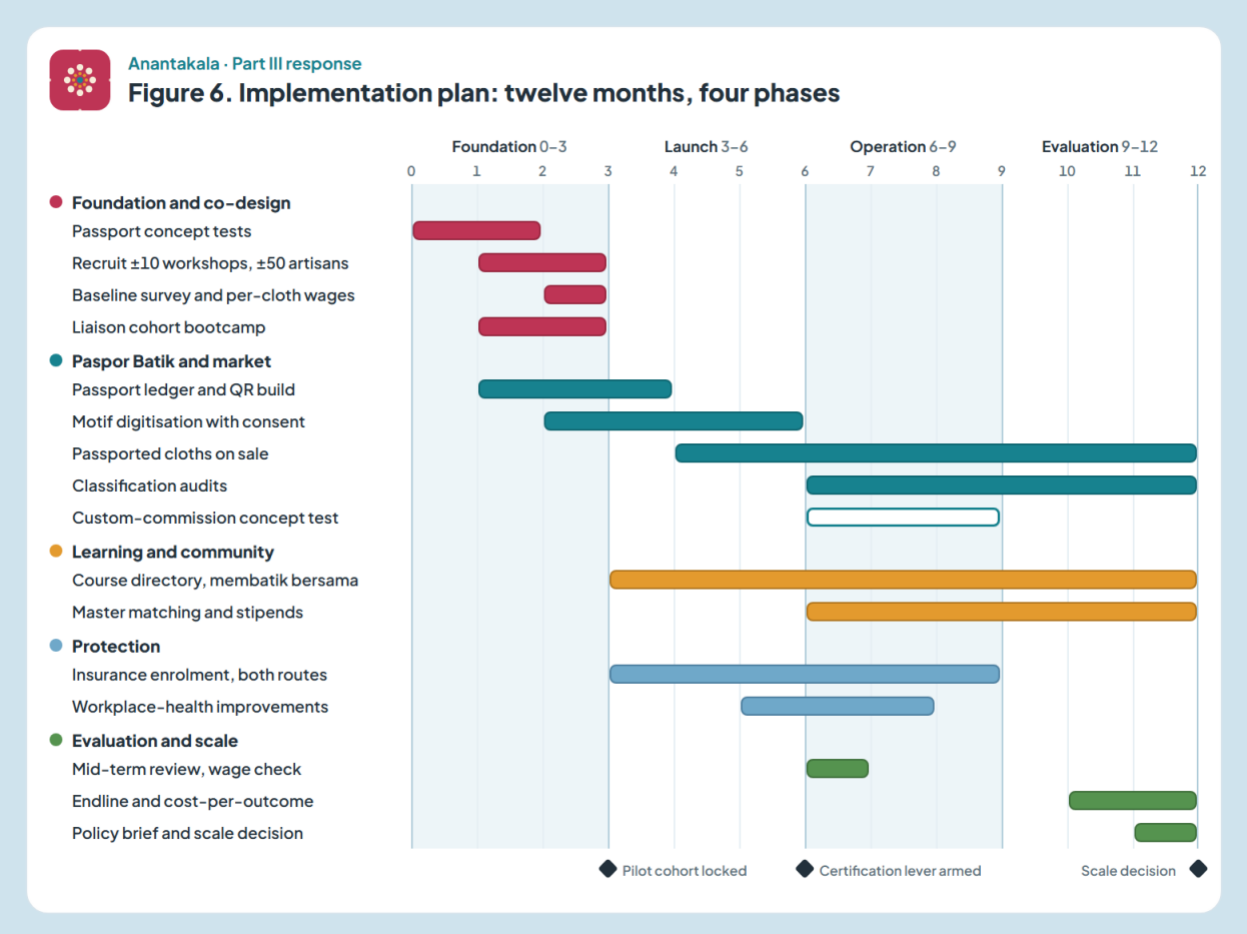

Figure 6. Implementation plan: twelve months, four phases

Source: Authors' design. The outlined bar is phase-2 groundwork, and diamonds mark decision points.

3.4 Budget

The pilot needs about US$ 65,700 over twelve months. The largest single line is the passport ledger, because the diagnosis identifies information failure as the binding shock. Wage money is deliberately small, one modest stipend line for the maker tail, because the pilot buys infrastructure and incentives rather than wage subsidies. A livelihood propped up by stipends ends with the grant, and one made visible, certified and protected does not.

Table 2. Pilot budget (12 months, US$, design parameters)

Cost centre	Item	USD	Detail
Technology and platform	Paspor Batik ledger and QR	18,000	Artisan registry, stage logging, secure code generation
	Custom-design canvas (phase-2 groundwork)	4,000	Interactive canvas and consented motif digitisation, full launch post-pilot
	API integrations	1,500	Payments, WhatsApp Business notifications, logistics
	Hosting, security, maintenance	3,000	Cloud infrastructure, SSL, 12-month storage
Education and training	Digital-marketing bootcamp	3,500	Course fees for the batik programme students who become liaisons
	Media equipment and software	4,000	Cameras, lighting, and editing licences for student creators
	Liaison stipends	2,500	Transport and meals for students recording stories and managing accounts
Regeneration and protection	Apprenticeship stipends (maker tail)	2,500	Rp 1.5 million monthly for ~5 committed learners over 6 months
	Insurance-enrolment incentive	3,000	Contribution subsidies that unlock the *tulis, cap and kombinasi* classifications
Operations and onboarding	Socialisation and co-design workshops	2,000	Town halls and workshops presenting the mock-ups to community heads
	Motif licensing payouts	1,000	Ethical payments for community-consented patterns
	Commission seed fund (phase-2 concept test)	1,200	Underwrites the first supervised custom loops at guaranteed artisan rates
Management and staffing	Core team	14,000	Project manager, designer, field coordinator, 12 months
Administration and legal	Legal, IP protection, translation	1,000	Licensing agreements, terms of use, bilingual outreach
Evaluation	Monitoring, evaluation and learning	2,000	Wage tracking, transmission tracking, endline
Contingency	Contingency	2,500	~4 per cent buffer
Total		**65,700**	≈ Rp 1.18 billion at Rp 18,000/US$

Source: Authors' design. Amounts are design parameters for the pilot, not quotations.

3.5 Impact, Measurement and Risks

The regeneration component targets an ecosystem first and makers second, so it is measured at two levels, never combined into a single headline. At the ecosystem level, we track participation, completions and how young people in the pilot area regard the craft, against the baseline our student survey provides. At the maker level, we track entries into the serious track, matches to a master, and who is still making batik at six and twelve months, with targets deliberately modest. A pilot that turns

a broad ecosystem into a small group of new makers has done what the evidence says is possible. The single most important indicator belongs to the market lever. Because a premium can stop at the workshop owner, partner workshops accept a written wage commitment as a condition of classification, and the per-cloth wage on passported cloth is measured from baseline onward. If wages do not move, the pilot has failed on its own terms, whatever else succeeds.

Table 3. Key indicators (targets are design parameters)

Indicator	Target at month 12	Method
Per-cloth artisan wage on passported cloth	measured rise over baseline (target +25 per cent)	Baseline and endline wage tracking, workshop records
Artisans enrolled in employment insurance	40 of 50	Enrolment records, both routes
Workshops holding a tulis, cap or kombinasi classification	10	Platform records, audits
Passported clothes sold	1,000	Platform ledger
Ecosystem tier, membatik bersama and taster participation	300 participants	Session records
Maker tier, serious-track entrants matched to masters	10 entrants, 5 matches, 3 still making at month 12	Liaison records, follow-up survey
Perception shift among surveyed students	improvement on the survey baseline (career confidence 5 of 11, optimism 3.4 of 5)	Re-survey of the same census

Source: Authors' design. Survey baseline: UniKAL student census, July 2026.

The pilot serves the three goals named in the problem statement: a wage floor and insurance for informal workers (SDG 8), visibility and pay for women's home-based labour (SDG 5), and buyers able to choose authentic cloth knowingly (SDG 12). Quality education (SDG 4) and sustainable communities (SDG 11) follow without being the design's targets.

The design's strength is that it targets the diagnosed root rather than a symptom, building on institutions that already exist rather than building parallel ones. Its weaknesses are that adoption cannot be assumed after two dead labels, that the core workforce is older and digitally hesitant, and that wage transmission through the *semi-maklon* structure is exactly the assumption the pilot must prove.

Table 4. Main risks and how the design answers them

Risk	Mitigation is built into the design
Producers do not adopt the passport, as with the two failed labels	Zero-effort issuance through liaisons; concept test before build; classification tied to the insurance incentive
The premium stops at the workshop owner and never reaches wages	Written wage commitments as a classification condition; per-cloth wages tracked; classification suspended where wages do not move
Resellers and coordinators resist a new channel	Verification layered onto the channels resellers already use; coordinators brought in as partners rather than bypassed

Risk	Mitigation is built into the design
The platform becomes a single point of failure	Passport works standalone as a printed code, features built in phases, data portable, university co-ownership beyond the grant
A motif enters the archive without proper consent	Community consent protocol with attribution and licensing payouts, support for collective IP registration, no scraping
The insurance incentive proves too weak	Fall back to the collective *kelurahan* route, which already works for citizen health coverage

Source: Authors' analysis, drawing on the failure modes documented in Part II.

3.6 Beyond the Pilot

The mechanism travels even though the content is local. Authenticate the process, teach the public to value it, and tie certification to protection, none of that is specific to Pekalongan, while every motif, story and course in the platform is. Scaling follows the geography of the decline traced in Part II, first the other Central Java centres, then East and West Java and Yogyakarta, each with its own association to anchor on. Some of what the pilot cannot do, only policy can. The pilot is designed to hand policy the evidence that transparent, mandatory labelling of imitation batik-motif cloth, batik as local content in the schools of the regencies artisans actually come from, artisans named in the vulnerable-worker categories that insurance subsidies recognise, and public procurement that specifies process-made batik. A pilot that proves the mechanism gives each ask a working example.

The larger claim travels furthest. Make the human work visible, let its value reach the people who do it, and put a floor under them while the market adjusts. If that works for a craft the world has recognised as heritage, it is a template for the work the same wave reaches next.

4. Conclusion

This report opened with Ibu Parokah at the wax pots of a Kauman workshop, a woman who learned the craft at home after the tea factory and now supports her household on it. Batik, she said, is like painting, and it ought to be preserved. Suppose the platform does what it sets out to do. What changes for her? The weeks she spends on a single cloth stop being invisible at the point of sale, because the passport shows a buyer the handwork a print hides and lets them pay for it knowingly. The premium that visibility earns is tied by written commitment to the wage she is paid, so the value reaches her hands rather than stopping at the workshop door. She gains the employment insurance she told us she would take if it were offered, and the better seating her aching back has needed for years. The group sessions she could host might even give one of her granddaughters, none of whom wanted the canting, a reason to sit down beside her, not out of duty but because the craft is finally worth choosing. None of this is promised. It is what the pilot exists to test.

What that single workshop would prove is meant to travel. This report set out to ask how *batik tulis* can be sustained as viable and dignified work for the next generation, and its response has been to make the value of the human hand visible to the buyer and payable to the maker, rather than to ask her to work faster or undercut a price she can never win. *Batik tulis* is only the earliest and most visible case. When a machine learns to imitate a skilled hand faster than wages, rules and protections can adjust, the same reckoning arrives for every kind of work the technology reaches next.

Indonesia honours batik in festivals and museums, yet has let its makers walk away in their tens of thousands, and the distance between the honour and the livelihood is what this report has tried to close. When machines learn to imitate a skill, who bears the cost? A country that learns to protect its hands, and not only its heritage, has begun to answer it.

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Field research

Personal communications

Resource person	Role
Danya Adhalia	Founder of the textile-and-fashion documentation initiative Cipta Garis Temurun
M. Fauzi Hidayat	Chair, Paguyuban Kampung Batik Kauman (PKBK); hand-drawn-batik entrepreneur, Kauman
Akrom	Operator, Kauman communal batik-wastewater plant (IPAL)
Parokah	Batik-tulis artisan, Kauman
Syamsul Huda	Treasurer-General, ASEPHI (national handicraft producers' and exporters' association); owner, Batik Perada
Aditya Dimas Wahyu Sasongko	Head of programme, D3 Kriya Batik, Universitas Pekalongan (UniKAL)
Rizki Lestari	Lecturer, D3 Kriya Batik, UniKAL
Dr. Ira Adriati	Art scholar, Faculty of Art and Design (FSRD), Institut Teknologi Bandung

Not a personal communication

The anonymous student survey (n = 11 of a 17-student census, July 2026) is the team's own primary data, with no individual author.

Use of artificial intelligence

We used Claude (Anthropic) in preparing this proposal. In Parts I and II, it helped us locate candidate statistics, policies and literature, each of which we checked against its original source before use. In Part III, it helped us brainstorm and stress-test solution options against our field findings. It also assisted in translating Indonesian interview material and in improving the clarity and flow of our own drafts, each passage reviewed and revised by us. The diagrams and interface mockups were rendered with Claude from our own designs, data and layouts; the interface screens show illustrative placeholder details. The research design, the fieldwork in Indonesia in July 2026 (six interviews and a student survey conducted in person by the team), the data analysis, and all arguments and conclusions are our own.

ANNEXE

Annexe 1. Batik cap process in the workshop. Personal documentation captured during field work.

Annexe 2. Batik tulis process in the workshop. Personal documentation captured during field work.

Annexe 3. Batik workshop. Personal documentation captured during field work.

Annexe 4. A traditional batik workshop setup, featuring the wajan (wok) used to melt malam (wax) and canting tools prepared for hand-drawn batik tulis. Personal documentation captured during field work.

Annexe 5. Bayu with the lecturers of the Kriya Batik Programme Study at Universitas Pekalongan

Annexe 6. Bayu with Pak Fauzi (Chair of PKBK)

Annexe 7. Bayu and Zhafran with Dr. Ira Adriati