

From Invisible to Findable: Placing Micro-Enterprises on Public Digital Infrastructure in Indonesia

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ABSTRACT

A micro-enterprise with no entry on a public digital map is, to anyone who does not already know it, effectively unfindable. This article reports a community engagement programme in Tiroang ward, Pinrang Regency, South Sulawesi, that placed fifteen such enterprises on that map and completed a business profile for each. The work proceeded in four stages: observation, on-site enumeration and verification, assisted listing and profile completion, and a publication check with every enterprise visited at its own premises. Seven profile fields were completed for every listing: business name, street address, map pin, category, contact number, opening hours and photographs. The article makes two arguments that the original field report did not. First, an output placed on public digital infrastructure is unusually auditable: unlike a poster, a booklet or a training session, any reader can search the business name and inspect the result without the authors' cooperation, which makes this class of engagement output self-verifying in a literature that rarely offers verifiable evidence at all. Second, a listing is a beginning rather than a result. Five profile fields were left empty, the free performance data that the platform returns to a claimed profile were never read, and no follow-up established whether the listings remained accurate. The enterprise also acquires a digital identity on infrastructure it does not control. No measure of customer enquiries, visits or sales was taken, and none is claimed.

Keywords: micro-enterprise digitalisation; digital visibility; search costs; location-based platforms; community engagement evaluation

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1. Introduction

Micro and small enterprises carry a share of the Indonesian economy that is easy to state and hard to absorb. Government reporting places their contribution at approximately 60 per cent of gross domestic product and roughly 97 per cent of employment (Kementerian Koordinator Bidang Perekonomian Republik Indonesia, 2025). These are not marginal firms operating at the edge of the economy; in aggregate they are the economy that most Indonesians work in. Policy has accordingly treated their digital adoption as a national objective, with the communications ministry setting a target of thirty million enterprises using digital technology and reporting approximately twenty-seven million as having done so (Kementerian Komunikasi dan Informatika Republik Indonesia, 2024).

Those adoption figures, however, aggregate activities of very unequal consequence. Opening a social media account, joining a marketplace, accepting a digital payment code and appearing on a public map are counted together, yet they solve different problems. Research on Indonesian micro-enterprise readiness finds that the binding constraints are organisational and human rather than technological, and that readiness varies sharply with the owner's own capability (Anatan & Nur, 2023). The underlying issue is familiar from the digital inequality literature: once

access ceases to be the discriminating variable, what separates users is the skill to convert access into benefit (Hargittai, 2002; van Deursen & van Dijk, 2019). An enterprise may hold a smartphone, use it daily, and still not appear anywhere that a stranger would look for it.

The specific problem this article addresses is older than the internet and was formalised long before it. Stigler (1961) argued that information about where to buy and at what price is costly to acquire, that buyers therefore search only up to the point where the expected gain no longer covers the effort, and that sellers who are expensive to find are simply left out of that search. Bakos (1997) extended the argument to electronic markets, showing that reductions in buyer search cost change which sellers are considered at all. A public digital map is an instrument of exactly this kind. It lowers the cost of discovering that a business exists, of locating it, of knowing whether it is open and of reaching it by telephone before travelling. An enterprise absent from that map does not merely have weaker promotion; it falls outside the consideration set of every potential customer who does not already know it by word of mouth.

Indonesian community engagement practice has recognised this and a body of reported work now exists on placing enterprises on public maps, usually through training, socialisation or technical assistance with registration (Fujiono et al., 2023; Ramadhany et al., 2023; Safitri & Nugroho, 2025). The pattern across these accounts is consistent. They report that an activity occurred and that participants responded well; they rarely report what state the enterprise was left in, who controls the resulting record, or whether anything about it persisted (Nugroho et al., 2023). This mirrors the wider weakness of the Indonesian engagement literature, which is organised around delivery rather than around verifiable change and which consequently yields little that a later programme can learn from (Silfiani et al., 2026).

That weakness is worth dwelling on, because the present case offers an unusual escape from it. Most engagement outputs are difficult for a reader to check: a training session leaves no trace, a booklet sits in a drawer, a poster may or may not still be on the wall. A listing on a public map is different in kind. It is hosted by a third party, it is addressable by name from anywhere in the world, and it persists independently of the programme that created it. Whether this programme did what it says it did is, uniquely, something a reader can establish without the authors' cooperation. An engagement literature that struggles to evidence its claims has in this class of output a form of evidence it does not usually possess, and the methodological implication deserves to be stated rather than left implicit.

The reverse of that property also deserves statement. A listing is hosted infrastructure, and an enterprise that acquires its digital identity there acquires it on terms set by the platform owner, which may change and over which the enterprise has no influence. The platform literature treats this asymmetry between the control a platform exercises and the dependence it creates among those who build on it as a defining feature rather than an incidental risk (de Reuver et al., 2018), and the competitive advantage small firms derive from platforms is contingent on capabilities the firms themselves must hold (Cenamor et al., 2019). Visibility obtained this way is real and it is also borrowed.

This article reports a programme conducted in Tiroang ward, Tiroang District, Pinrang Regency, South Sulawesi, in which fifteen micro and small enterprises operating without any entry on a public digital map were visited, enumerated, listed, and given a completed business profile. The original field report on which this article draws recorded the delivery. The article develops that record in two directions the report did not take: it treats the listing as an auditable artefact and

sets out what a reader can check; and it examines what the listing does not yet do, which is a question about the fields left empty, the data never read and the follow-up never made.

2. Method of Implementation

2.1. Setting and partners

Tiroang District lies in Pinrang Regency on the western coast of South Sulawesi. The programme was conducted in Tiroang ward, where commercial activity is carried on largely by owner-operated enterprises trading from premises on or near the main roads: clothing and general retail, food preparation, and small service businesses. These are enterprises of a size at which the proprietor is also the manager, the bookkeeper and frequently the only employee, and at which any task that is not immediately necessary to today's trade tends not to be done.

The partners were the enterprise owners themselves, each approached individually at their own premises, and the ward administration, which was informed of the programme and facilitated access. No intermediary organisation, cooperative or business association was involved, which is a consequential feature of the design: the programme had no standing body through which to return later.

2.2. Design

The programme followed an assisted-adoption design delivered on site rather than a classroom design. The reasoning was that the obstacle to appearing on a public map is not primarily a knowledge obstacle. Creating a listing requires an account, a device with sufficient capacity, the patience to work through a multi-step interface, a photograph taken at the premises and a physical presence at the location so that the map pin can be placed accurately. A session explaining how to do this leaves all of those requirements with the owner; a visit discharges them. The programme therefore ran as four sequential stages, set out in Figure 1, with each stage producing an output that the next stage consumed.

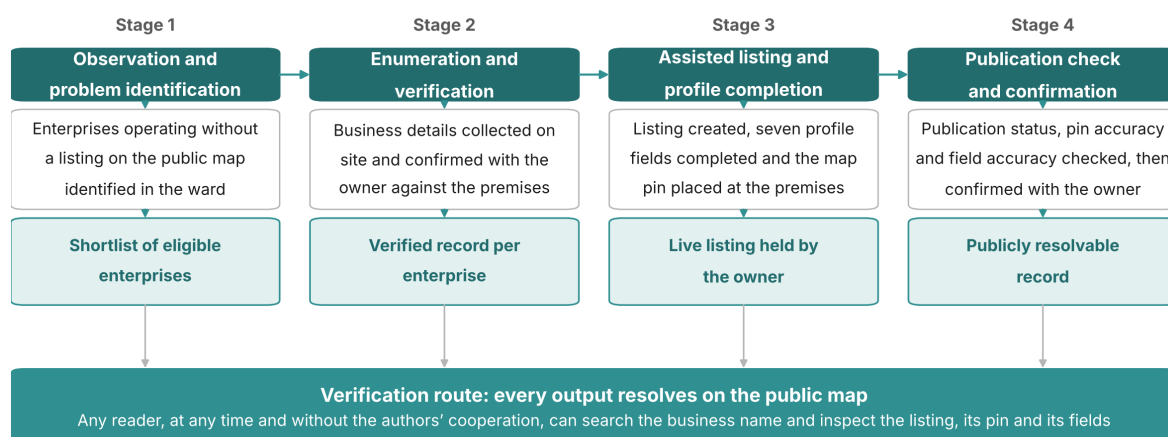


Figure 1. The four-stage implementation sequence and its verification route

Source: Authors' construction, 2026.

2.3. Enterprise selection

Enterprises were identified during the first stage by walking the commercial frontage of the ward and searching the public map for each business observed. An enterprise was eligible if it was

trading, if no entry for it could be found on the map, and if the owner was present and willing to take part. Fifteen enterprises met these conditions and all fifteen were carried through to a completed listing.

That the completion rate was total should be read carefully rather than as a measure of success. The denominator is the shortlist, and the shortlist was itself defined partly by willingness: an owner who declined, or who was absent when the team called, did not enter it. The figure of fifteen therefore describes the enterprises the programme worked with and says nothing about the proportion of the ward's enterprises that remain unlisted, which was not established.

2.4. Evaluation approach

No instrument measuring knowledge, attitude or intention was administered, and the programme accordingly makes no claim of that kind. Nor was any measure taken of customer enquiries, visits, turnover or sales, either before or after the intervention. Readers should treat every commercial benefit discussed in this article as a mechanism the listing makes possible, never as an effect the programme observed.

What was evaluated was the state of the artefact. For each enterprise the team confirmed that the listing had published and was publicly retrievable, that the map pin corresponded to the premises, and that each completed field matched what the owner confirmed on site. This is a weaker claim than an impact claim and a much stronger one than an attendance count, and it has the property that makes it worth reporting: it can be checked by a third party. A reader who doubts this account can search the business names and inspect the listings. No comparable route exists for verifying that a workshop improved anybody's understanding.

2.5. Ethical considerations

Participation was voluntary and each owner was told what a listing is, that it would be publicly visible, and what information would appear on it before any record was created. Consent to publish the enterprise's own trading information name, address, category, opening hours and contact number is implicit in the owner's decision to place that information on a public map, and the information is in any case public by the nature of the artefact. Consent to appear in an academic article is a separate matter and was not separately obtained.

The figures nonetheless include documentation of the activities. Figures 2 to 4 are photographs taken during the activities and show team members and enterprise owners at their premises, and Figure 6 reproduces one published listing as it appears to any user of the public map, including the trading name, address and contact number that the owner chose to publish. Figure 5 is a schematic of a profile's structure drawn by the authors, not an image of any particular enterprise's listing.

3. Results

3.1. The condition before the programme

The observation stage established the same condition at every enterprise examined: the business was trading and known to its immediate neighbourhood, and it did not exist on the public map. Table 1 sets out what that absence costs, decomposed into the distinct barriers it creates, because the decomposition is what determines which profile fields matter. Figure 2 documents the observation stage.



Figure 2. Observation and identification of the problems faced by micro and small enterprises

Source: Programme documentation, 2026.

Table 1. The barriers created by absence from the public map, and the profile field that removes each

Barrier	How it presented in the ward	Profile field that addresses it	Consequence if unaddressed
Not discoverable	A consumer searching for the type of goods sold returned no result for the enterprise	Business name; business category	The enterprise is outside the consideration set of anyone who does not already know it
Not locatable	Directions were given by landmark and relayed verbally	Street address; map pin	A customer willing to travel cannot reliably arrive
Not reachable in advance	No published number; contact depended on personal acquaintance	Contact number	Stock, price and availability cannot be checked before travelling
Hours unknown	Opening times known locally but recorded nowhere	Opening hours	A journey may be wasted, which deters the next attempt
Offer cannot be judged	Nothing visible to a prospective customer until arrival	Photographs	The customer bears all the uncertainty, and resolves it by not going

Source: Observation stage field records, Tiroang ward. Notes: The barriers are analytical categories applied by the authors to the recorded observations; they were not presented to owners as a questionnaire, 2026.

3.2. Enumeration and verification

Each eligible enterprise was then visited for enumeration. Trading name, address, category of business, contact number and opening hours were recorded and read back to the owner against the premises, so that what was about to be published had been confirmed by the person it describes. This step is unglamorous and it is the step that determines whether the resulting record is worth anything: a listing carrying a wrong number or wrong hours is worse than no listing, because it converts a customer who would have asked a neighbour into a customer who has been actively misdirected. Figure 3 documents the enumeration and verification visits.



Figure 3. Enumeration and verification of enterprise data

Source: Programme documentation, 2026.

3.3. Listing creation and profile completion

Listings were created at the premises, with the owner present and using the owner's own account, so that the record would belong to the enterprise rather than to the programme. Seven fields were completed for every one of the fifteen listings: business name, street address, map pin, business category, contact number, opening hours and photographs of the premises. Figure 4 documents the assisted listing at the premises. Figure 5 sets out what that profile contains and, equally importantly, what it does not.



Figure 4. Assisted placement of the business location and completion of the business profile on Google Maps

Source: Programme documentation, 2026.

One published listing on the public map Claimed by the enterprise, which the profile-management indicator confirms	
COMPLETED FOR EVERY LISTING what the consumer gains	LEFT EMPTY what is forgone
Name found by name	Description what is sold is unstated
Address found on arrival	Products items not searchable
Map pin routing from anywhere	Website no route to ordering
Category found by category	Payments payment methods unknown
Phone call before travelling	Updates no new information
Hours no wasted journey	
Photos offer seen in advance	
Capability now held by the enterprise Edit its own details · read the free performance data on how it was found · respond to reviews · post updates	

Figure 5. Anatomy of the completed business profile: fields completed, fields left empty

Source: Authors' construction from the programme records, 2026.

3.4. Publication and ownership of the record

At the final stage each listing was checked for publication and retrievability. The distinction that matters here is one the engagement literature on this subject generally passes over. A place can be added to a public map by anyone; a business profile is claimed, and only a claimed profile carries the right to edit the record, respond to what others write about the business, and read the performance data the platform returns. An enterprise that appears on the map without holding the profile is visible but not in charge of what is visible. Figure 6 shows one published profile as it is retrieved on the public map.

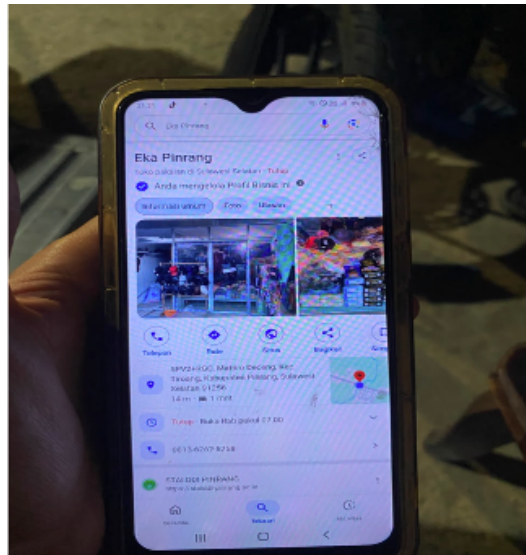


Figure 6. A business profile published on Google Maps after the programme

Source: Programme documentation, 2026.

The programme worked through the owners' own accounts precisely to avoid that outcome, and the documentation records at least one listing displaying the profile-management indicator, which confirms the record was claimed rather than merely added. Whether every one of the fifteen reached that state was not separately tabulated, and the article does not assert that it did. Establishing it would take a single additional column in the programme's own records, and its absence is the clearest example of a finding that was within reach and was not captured.

3.5. Summary of status change

Table 2. Status before and after the programme, with verification evidence

Dimension	Before	After	Verification evidence
Presence on the public map	No entry retrievable for any of the fifteen enterprises	Fifteen published listings, each retrievable by business name	Direct search of the public map by any reader
Positional accuracy	Location conveyed verbally by landmark	Map pin placed at the premises during the on-site visit	Pin position inspected against the street address
Profile completeness	No published business information of any kind	Seven fields completed for every listing	Fields visible on the published listing

Dimension	Before	After	Verification evidence
Control of the record	No record existed to control	Listing created through the owner's own account; profile-management indicator observed in the documentation	Programme records; indicator visible to the account holder
Reachability before travel	Contact depended on personal acquaintance	Published number and opening hours on every listing	Fields visible on the published listing

Source: Programme records and inspection of the published listings, 2026.

Notes: Each row records a change in the state of a public record, not a change in knowledge, customer numbers or trade. No such measure was taken.

3.6. What was recorded and what was not

Because the central argument of this article concerns what engagement reporting should contain, it would be inconsistent to leave the gaps in this programme's own record implicit. Table 3 states them directly. Several of the omissions could have been closed at no cost beyond a column in a spreadsheet, which is itself the finding.

Table 3. Transparency of the programme record

Item	Status	Why it matters
Number of enterprises listed	Recorded (fifteen)	The headline output, and independently checkable
Publication and retrievability	Recorded for every listing	Distinguishes a created record from a live one
Seven profile fields completed	Recorded for every listing	Determines what a consumer can actually do with the listing
Profile claimed by the owner	Partially recorded	Determines whether the enterprise, or nobody, controls the record
Sector composition of the fifteen	Not recorded	Would show which kinds of enterprise this design reaches
Owner age, sex and prior platform use	Not recorded	Would show whether assistance substitutes for, or builds on, existing skill
Enterprises in the ward still unlisted	Not recorded	Would convert fifteen from a count into a coverage rate
Platform performance data after listing	Not read	Freely returned to a claimed profile; the only direct evidence of being found
Accuracy and survival after the cycle	Not established	A listing that goes stale misdirects the customers it attracts

Source: Authors' audit of the programme records, 2026.

4. Discussion

4.1. Why being findable is the binding constraint

It is tempting to describe what happened here as promotion, and the original field report largely did. The framing is too weak. Promotion presupposes that a prospective customer already knows the enterprise exists and must be persuaded to prefer it. The enterprises in this programme had

not reached that stage: for any consumer outside their immediate neighbourhood they were not disfavoured options but absent ones.

Stigler's (1961) account explains why this is decisive rather than merely unfortunate. Search is costly, buyers search only until the expected return falls below the effort, and sellers who are expensive to find are excluded before any comparison of price or quality takes place. Bakos (1997) showed that lowering search cost does not simply make an existing market more efficient it changes which sellers enter the comparison at all. Table 1 decomposes the enterprises' absence into five distinct barriers, and what is instructive is that the seven completed fields map onto them almost one to one. A map listing is not a marketing message. It is the removal of a set of specific, mechanical obstacles between a willing buyer and a willing seller.

This also explains why on-site assistance outperformed the classroom alternative that much of the prior Indonesian work adopted (Fujiono et al., 2023; Ramadhany et al., 2023). Several of the requirements for creating a listing placing the pin accurately, photographing the premises, confirming the address against the building can only be discharged at the location. A session held elsewhere transfers those tasks to an owner who, by the nature of a one-person business, has no slack in which to perform them. In the terms of technology acceptance research, what the visit supplied was facilitating conditions rather than information (Venkatesh et al., 2003), and co-production theory predicts exactly this: an outcome requiring capability on both sides will not be produced by investing in one side only (Ostrom, 1996).

4.2. An engagement output that a reader can check

The methodological contribution of this case has little to do with marketing and much to do with evidence. Community engagement reporting is persistently weak in a specific way: the claims it makes are not of a kind that a reader can test (Silfiani et al., 2026). A session was held, participants were enthusiastic, understanding reportedly improved. None of this survives contact with a sceptical reader, because none of it left anything behind that the reader can reach.

A listing on public digital infrastructure is different in three respects. It is hosted by a third party with no stake in the programme's reputation. It is addressable from anywhere by name. And it persists independently of the team that created it. The consequence is that the central factual claim of this article that fifteen enterprises that had no entry on the public map now have published listings carrying seven completed fields is falsifiable by anyone with a connection and a few minutes. The authors have no power to prevent that check, which is precisely what makes the claim worth making.

The generalisable point is not about maps. It is that engagement programmes should prefer, where the task allows, outputs that live on public infrastructure rather than outputs that live in the programme's own account of itself. A public record, a published dataset, an entry in a registry and a listing on a map all share the property that they can be inspected by a stranger. A certificate of attendance does not.

4.3. A listing is a beginning, not a result

Against that, the article should be clear about how much of the available ground this programme did not take. Five profile fields were left empty, and they are not decorative. Without a description or a product list, the enterprise is findable by name and category but not by what it actually sells, which is how most commercial searching is done. Without payment attributes, a customer cannot

tell whether a transfer or a payment code will be accepted. Without a link onward, the listing is a terminus rather than a route to an order.

More consequential still is what was not read. A claimed profile returns performance data at no cost: how often the listing appeared in search, what terms produced it, how many people requested directions or placed a call. This is the only direct evidence that a listing is doing the thing it was created to do, it requires no instrument, no questionnaire and no fieldwork, and it was available to every one of the fifteen enterprises. The programme did not look. A single return visit some weeks later, reading that panel with each owner, would have converted this article from a report of fifteen artefacts into a report of whether being findable made any difference — and would have taught the owners to read it for themselves.

The information systems literature has a settled vocabulary for the gap this leaves. Adoption and continued use are distinct outcomes governed by different mechanisms, and continuance turns on whether the user's experience confirms the expectation that prompted adoption in the first place (Bhattacharjee, 2001). A listing created with assistance and never revisited is an adoption event with nothing attached to it. Where a business association or cooperative exists, the return visit can be institutionalised through it; in Tiroang no such body was involved, which is a design weakness as much as a circumstance.

4.4. The cost of borrowed visibility

A last consideration cuts against the programme's own framing. The enterprises now hold a digital identity on infrastructure owned by a company whose terms they did not negotiate and cannot influence. Interface changes, policy changes, suspensions and the treatment of competing listings are all decided elsewhere. The platform literature treats this asymmetry of control and dependence as constitutive rather than incidental (de Reuver et al., 2018), and work on small firms competing through platforms finds that the advantage they obtain is conditional on capabilities the firm itself must develop (Cenamor et al., 2019).

This is not an argument against the programme. For an enterprise previously invisible to everyone beyond walking distance, a borrowed storefront is better than none. But it reframes what should be regarded as the durable gain. The listing may not last; the owner's ability to create, claim, correct and read one is the part that transfers, including to whatever replaces the platform. Programmes of this kind should be designed and reported with that distinction in view, and development policy more broadly has long been warned against mistaking the artefact for the capability (Walsham, 2017).

4.5. Limitations

The limitations are considerable. No standardised instrument was administered, so no finding about knowledge, attitude or intention is reported. No measure of customer enquiries, footfall, turnover or sales was taken before or after, so no commercial effect is claimed anywhere in this article; the benefits discussed are mechanisms the listing makes possible, not outcomes observed. The fifteen enterprises were a convenience shortlist and not a sample, so nothing here supports inference to the ward, the district or Indonesian micro-enterprises generally. The denominator is unknown: how many enterprises in the ward remain unlisted was not established, so fifteen is a count and not a coverage rate. Whether every profile was claimed by its owner was not separately tabulated. There was no follow-up, so persistence and continued accuracy are unknown. Finally,

the programme ran over two field days, which is sufficient to create a record and insufficient to establish a practice.

5. Conclusion

Fifteen micro and small enterprises in Tiroang ward that could not be found by anyone who did not already know them now hold published listings on a public digital map, each carrying seven completed fields and each created through the owner's own account. That is the whole of what this programme established, and it is stated here without extension because no measure of trade, enquiries or customer numbers was taken.

Two points are offered for use beyond this case. The first concerns evidence. An engagement output placed on public infrastructure can be verified by any reader without the authors' cooperation, which is a standard of proof the Indonesian engagement literature rarely meets and could meet far more often than it does. Where a programme can choose between an output that lives in a public record and one that lives in its own report, the first should be preferred, and the report should tell the reader how to check it. The second concerns ambition. Creating a listing is the cheapest part of the work and the part this programme completed. The fields left empty, the free performance data never read, and the absence of any return visit are together the difference between an enterprise that has been registered and an enterprise that has been equipped.

For programmes that follow, three changes would cost almost nothing. Record, for each enterprise, whether the owner holds the claimed profile, and establish how many enterprises in the area remain unlisted so that the output becomes a coverage rate. Complete the description, product and payment fields during the same visit, since the marginal effort is minutes and the gain is searchability by what is actually sold. And schedule one return visit at eight to twelve weeks to read the platform's own performance panel with each owner which both answers the question this article cannot answer and leaves the owner able to answer it alone thereafter.

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