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for ICEGOV
community

Inclusion by Design or by Assumption?

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What this study did and what it found

ICEGOV 2025 paper

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What I did

- Usability testing with users with functional illiteracy
- Tasks mapped to digital literacy framework
- Compared with policy assumptions (NDLF, CBN)

What I found

- Users succeeded in familiar contexts, failed in apps
- Difficulties were consistent and predictable
- Policy does not require these issues to be tested

Agenda

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- 01 A pattern I couldn't ignore
- 02 Studying what was actually happening
- 03 Where policy assumptions fall short
- 04 What this work leads to

01

This started with a
pattern I couldn't ignore

“Call Khadijah, she studied Computer Science”

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For years, I was the unofficial tech support for the people around me.

Educated people. Professionals. Family members

Using smartphones everyday

Struggling in ways nobody had named

Two examples stayed with me

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A senior official

High-level. Politically connected.

Calls me because he can't send a large audio file on WhatsApp.

Not illiterate. Not unfamiliar with phones.

But the system isn't working for him.

My aunties

They send voice notes.

Because typing is difficult.

Not because they can't read at all.

Because the interface isn't designed for how they interact.

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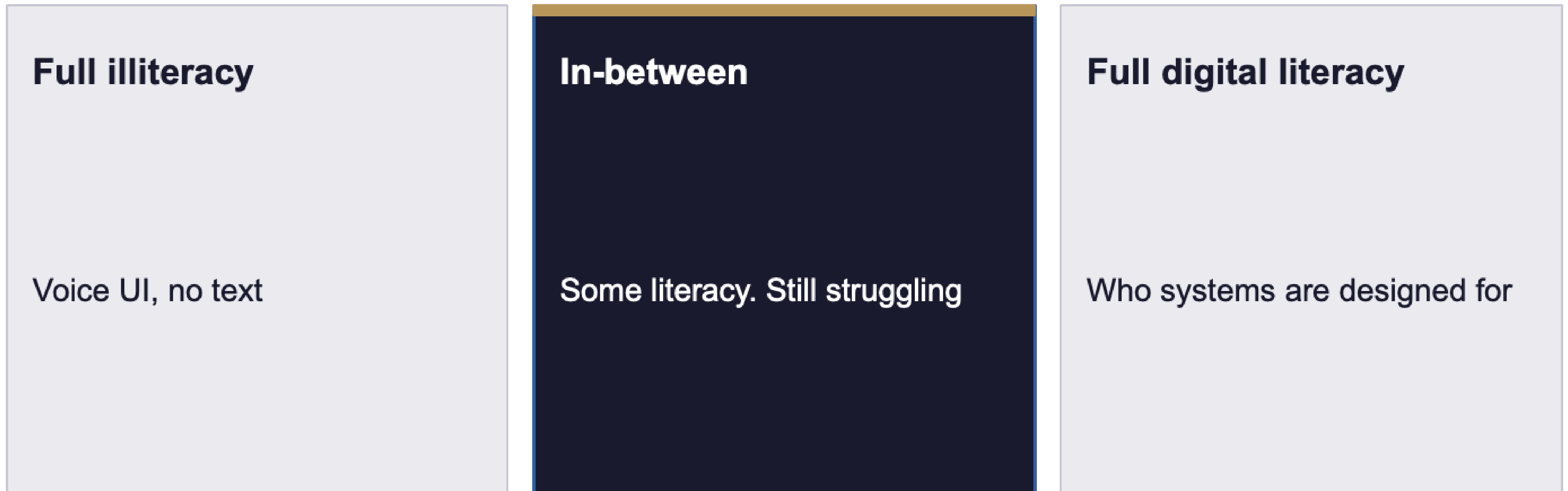
Publish.

Why do people who should be able to use these systems still struggle?

The story behind the paper

People who seem capable still struggle, and no one has named why

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Policy and Design address the extremes. The middle is invisible.

This is not a niche group, it's a large part of the population

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30%

Nigeria

classified as low literate

18%

England

adults aged 16 to 65 in England
had literacy at or below level 1
(PIAAC)

02

I studied what happens
when real users try to
complete real tasks

UK FCDO's Commonwealth Scholarship · PhD Aston University · Human-Computer Interaction for Development

I studied what happens when real users try to complete real tasks

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01

Map to a literacy framework

Map participant interactions against the Digital Literacy Global Framework (DLGF) to identify consistent failure patterns.

02

Usability testing

Observe 50+ participants completing real tasks (transferring money, completing checkouts, applying filters) across Nigeria.

03

Pattern analysis

Analyse errors across users to distinguish interface problems from assumption-driven design gaps.

Even defining this group was difficult from the start

- There was no established term for the group I was studying.
- People repeatedly asked what I meant.
- This required developing and refining a working definition and assessment approach.

This is not about illiteracy

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Functional Illiteracy

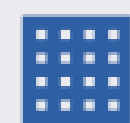
A condition where adults can read and/or write to some extent, but experience difficulties in comprehending, applying, or acting on written information in meaningful ways.

Mohammed et al., 2023



Not complete illiteracy

They can decode text.
That's not the barrier.



Distinct interaction patterns

Different from both fully literate
and fully illiterate users.

30%

Not a niche

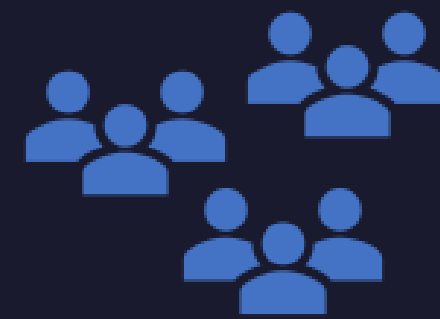
Up to 30% in Nigeria.
Significant everywhere.

We avoid this issue because we assume literacy equals capability

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Functional Illiteracy

“Isn’t that term derogatory?”



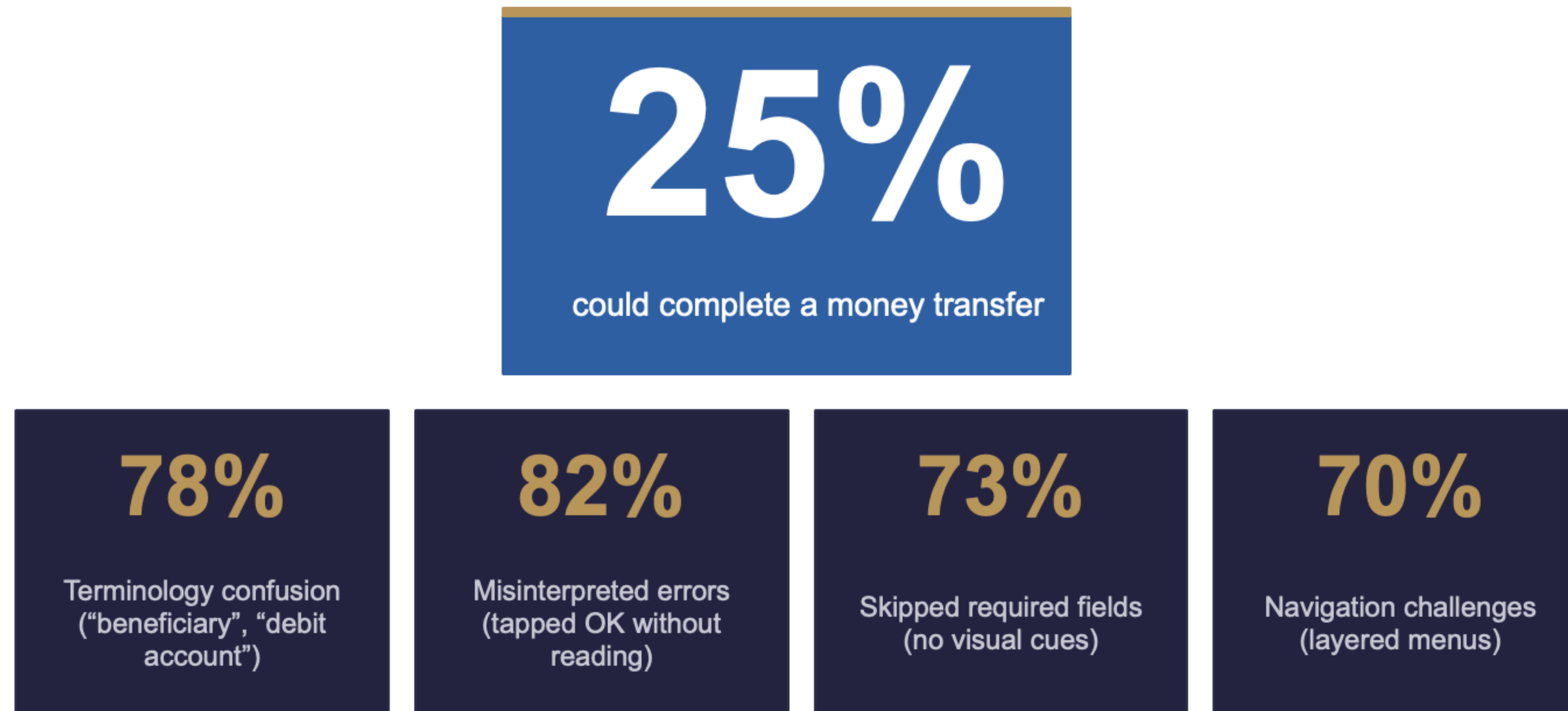
Assumption: literacy = capability

Avoidance instead of engagement

People who could complete tasks via USSD struggled to do the same on mobile apps

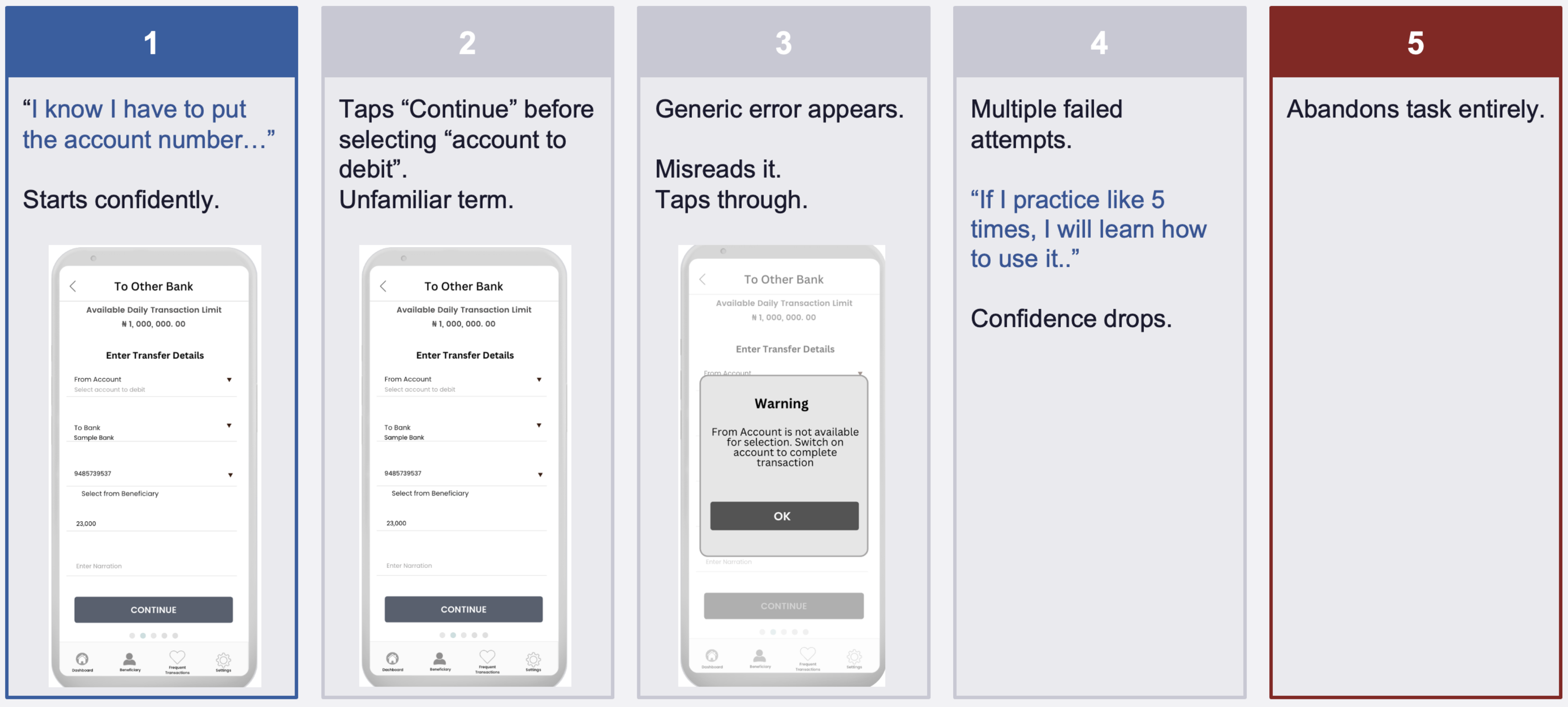
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85% had completed these tasks via USSD before, successfully.



These breakdowns followed the same pattern again and again

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When we redesigned with real evidence, we found significant improvement in interaction

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40%

improvement in task success

50%

reduction in errors

So, the design problem was solvable. But something still didn't add up.

~~‘How do we design better interfaces?’~~

‘Why are these patterns not being accounted for in how systems are designed and deployed in the first place?’

This isn't only a design problem. It's also a governance problem.

03

Where Policy Assumptions fall short

I approached this by combining usability evidence with policy analysis

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Compared user barriers with policy expectations to reveal where inclusion breaks down.

My usability evidence

Observed user behaviour during real task execution in Nigerian mobile banking apps

Policy documents analysis

Policy assumptions from NDLF and CBN frameworks, mapped against this interaction evidence

Policy assumes access and skills are enough but they are not

Access solves it	Skills training solves it	Nigeria 2030 targets
Give people devices and connectivity, and systems will work for them.	Improve digital literacy scores and inclusion follows.	95% digital literacy. With up to 30% adults considered functionally illiterate.

But what the interaction data shows is that access + skills ≠ systems that work.

Our evidence shows that interaction barriers persist even when access and skills are present

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NDLF Competency	What policy assumes	What we observed
Devices & Software	Users can operate hardware and software	<i>100% could unlock phones, open apps, initiate tasks — no issue here</i>
Information Literacy	Users can search, filter, evaluate digital content	<i>Only 20% could view transaction history; many misread or abandoned</i>
Problem Solving	Users can plan and execute multi-step tasks	<i>Only 25% completed a transfer; most skipped fields or got stuck in forms</i>

No one is required to test whether these systems actually work

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Policy dimension	NDLF (2023)	CBN (2021)
Usability standards	⚠ Mentions “inclusive content” only	⚠ Mentions “menu-driven interface” only
User testing required	✗	✗
Institutional responsibility	✗	✗
Enforcement	✗	⚠ Backend only
Inclusivity framing	⚠ Training & skills focus	⚠ Access & education only

Training users doesn't fix systems that weren't designed for them

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Reality

Skills don't transfer when interfaces differ

Policy Assumption

Better-trained users can overcome poor system design

... So, are we institutionalising exclusion through training systems?

So what needs to change?

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01

Contextualise frameworks

Reflect real usage patterns, not just global models.

02

Make usability a policy requirement

Require testing with real users, not just technical compliance

03

Shift accountability to systems, not users

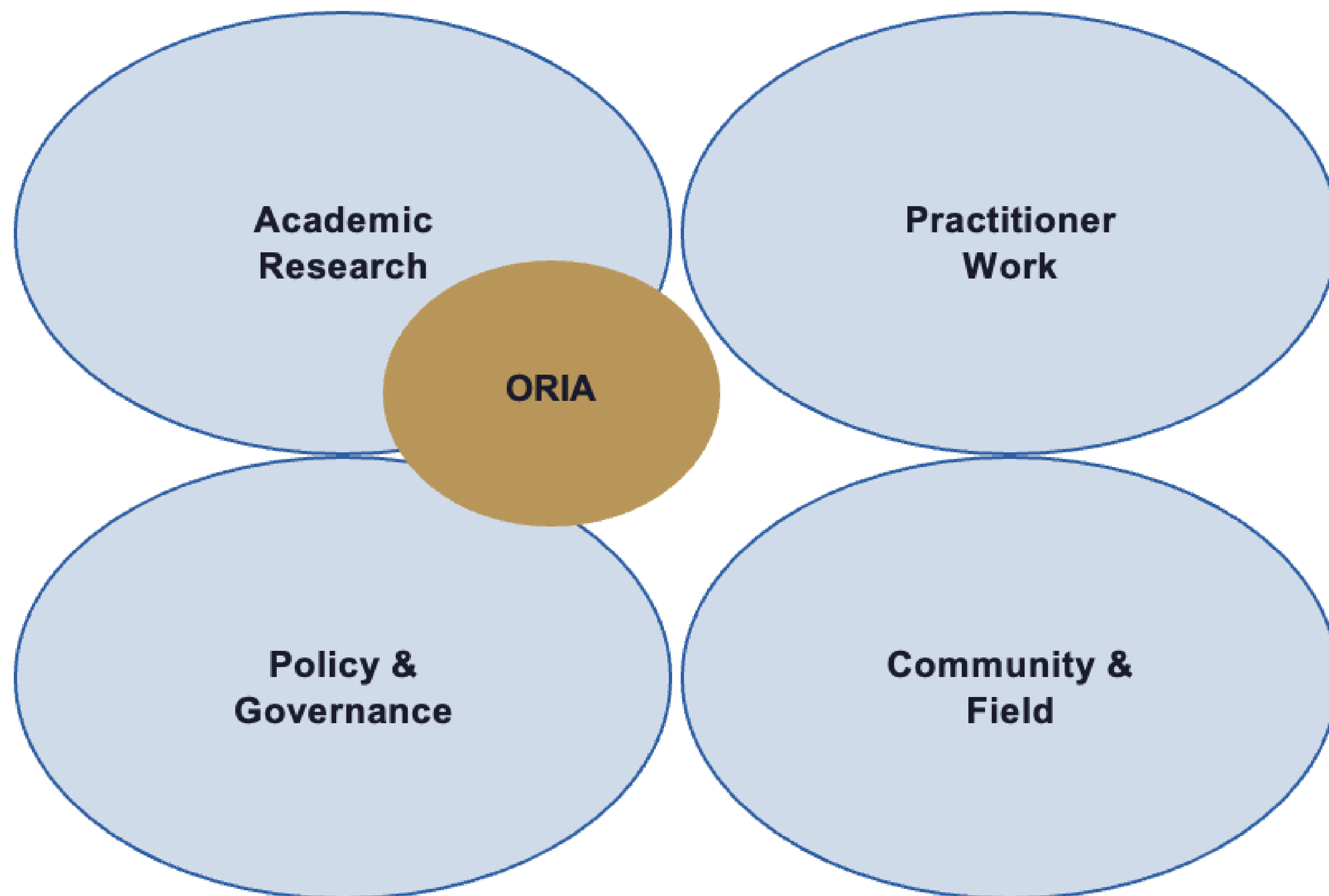
Move from training users → ensuring systems actually work.

04

What this work leads to

This work is moving beyond research into practice

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That's the space this work is now moving into

Even with clear evidence, turning this into action is still difficult

Getting people to care

The challenge is not just identifying the problem. Because this group sits in between categories, it remains largely invisible. Digital literacy is seen as the goal but without literacy, there is no digital literacy.

Embedding evidence into decisions

We do not yet have clear ways of integrating this kind of interaction evidence into decision-making. Even when the evidence is clear, it doesn't always translate into action.

Even with clear evidence, turning this into action is still difficult

If you're in policy

Access and skills are not enough. Make usability a requirement

If you're a researcher

Interaction evidence is a legitimate governance indicator, not just research output

If you're a practitioner

The assumptions in your systems are documentable, and therefore fixable

If we want digital systems to work in practice, we must move beyond designing for assumed users and start embedding real interaction evidence into how decisions are made.

If our models don't reflect reality, then improving access and skills alone won't solve the problem.

