

GUIDE TO HUMAN-CENTRED AND INCLUSIVE DIGITAL DESIGN

Leave no one behind in the digital transition



Authorship

This guide was led by YUX team in close collaboration with Enabel.

About YUX

YUX is a design and technology organisation committed to making experience design accessible across Africa. By empowering African talents and organisations through human-centred design, YUX helps create digital products and services that are rooted in local needs, cultures, and identities. Its vision is to foster a continent where design drives innovation, inclusion, and sustainability.

About Enabel

Enabel is the Belgian agency for international cooperation. With our partners, we develop ideas and implement projects addressing urgent global challenges, such as climate change, social and economic inequalities, demographic trends, peace and security.

Funding

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Technology is not an end in itself – it is a means in service of people. Innovation is not simply about building the most high-performing solution. It means ensuring that the solution is accessible to someone living in the most remote village, understandable by someone who never had access to school, and adapted to someone whose world was not designed with their disability in mind. For innovation to be meaningful, it must shatter invisible ceilings without becoming a new barrier. This guide rests on a deep conviction: technology must adapt to the realities of the field, not the other way around.

The 5 pillars of commitment

To transform this vision into impact, you must systematically explore five essential dimensions that define the inclusive maturity of your project:



Gender equity

Technology must not reinforce power imbalances. Tools must be designed to guarantee women's autonomy, protect their privacy, and adapt to their constraints of time and access to devices.



Education & digital literacy

We speak the language of the user. We simplify pathways and use the power of audio and pictograms so that knowledge and services are accessible regardless of literacy level.



Disability inclusion

Disability should not be seen as a limitation of the individual, but as the result of barriers created by society, the environment, and digital tools when they are not accessible. Universal standards must be applied so that every interface is readable, audible, and usable by all.



Intersectionality (the cross-cutting lens)

This is the heart of our compass. We recognise that no one belongs to a single category. A woman with a disability in a rural area faces specific compounding barriers that a siloed approach cannot resolve. We design for these "critical profiles," because a solution that works for them will, by definition, be a better solution for everyone.



Rurality and connectivity

Design for the "last mile." The absence of 4G or electricity must not mean the absence of rights or services. Solutions must be resilient, data-light, and capable of working offline.

Our philosophy of action



Why this guide?

This guide is not a static control manual. It is a dynamic compass, designed to support you in a journey of continuous progress, helping you measure precisely how far you have come while identifying the next concrete “small step” toward a more just and equitable digital solution.

This is the result of a collaboration between Enabel’s Innovation Hub and a group of innovators across Africa working with the Data Governance in Africa initiative and the Wehubit programme, and YUX Design. Enabel’s Innovation Hub’s mission is centered on identifying, supporting, and scaling digital social innovations that bridge social disparities and reduce digital divides. It aims to ensure that digital and data-driven innovations are not only effective but also foster inclusion and equity, addressing gender inequalities, the rural-urban divide, connectivity gaps, and other forms of social exclusion. By ensuring digital tools foster genuine inclusion across critical sectors like climate, agriculture, education, and e-health, the Enabel Innovation Hub works to prevent tech solutions from unintentionally widening existing inequalities.

The Data Governance in Africa and Wehubit innovations worked on creating a framework that turns inclusion into core design principles. Through collaborative mapping sessions, critical barriers were identified across four key axes: gender, disability, rurality, and education. The insights, documented use cases, and best practices shared during these sessions in combination with a literature review directly shaped the practical tips and recommendations found in these next few pages.

The assessment of your project’s inclusiveness is based on the compass test, an interactive self-evaluation tool that lets you pinpoint your level of progress on key themes such as gender, rurality, and accessibility. This comprehensive diagnostic, structured around four major sections: physical and financial accessibility, inclusive design and user experience, adoption and support, and responsible data and ethics.

This Guide is designed for flexible use: it can be consulted independently or serve as a detailed companion to your test results. To reflect the reality of the field , it is structured around three progression levels – beginner, intermediate, and expert – and offers detailed analyses across specific dimensions (such as digital literacy, unstable connectivity, or cultural norms on device sharing) as well as a practical checklist to guide your operational interventions. While the test is a valuable tool for quantifying your impact and shaping your scale-up strategy, using this guide requires no complex technical prerequisites. Its goal is to make digital inclusion concepts accessible and usable by every team member, from design to technical development.

[French](#)

[English](#)

PHYSICAL & FINANCIAL ACCESSIBILITY

How to ensure that infrastructure and cost do not become invisible walls.



Connectivity: resilience in the face of the network

Focus: low bandwidth, offline mode, network audit.



Beginner level

Minimise requests. Avoid loading Google Fonts or external scripts that block display when the network is slow. Every time a user opens an app or website, their phone must send requests to servers on the internet to download page elements: text, images, typefaces (Google Fonts), and tracking tools. If your site, app, or webapp requires 50 different elements to display, the phone must make 50 round trips over the network. In rural areas or with a poor connection, each round trip takes time and risks dropping out.

Impact

The display-blocking problem: by default, a phone will refuse to display a site's text until it has successfully downloaded the requested typeface (e.g. Google Fonts). If the network slows or drops mid-download, the user is stuck staring at a blank page for 30 seconds and leaves thinking the site is broken.

Loading unnecessary external scripts or heavy fonts consumes data from the user's plan (often very limited), without delivering any real added value

→ Technical tip

- Reduce the number of requests the phone makes to the internet to display a page.
- Avoid downloading special typefaces (Google Fonts) or secondary tools that freeze the screen.
- Using fonts already built into the phone allows immediate display, even on 2G.
- Ask your developers to use system fonts (Arial/sans serif) and to load heavy scripts only after the main text has displayed.
- Manually compress your images (using free tools like Squoosh) before uploading them.



Intermediate level

in the field, internet connectivity comes and goes without warning. A connectivity indicator is a small visual signal (usually at the top of the screen) that discretely tells the user whether they are connected or not. If the connection drops while filling in a form, the app must not crash or display an incomprehensible technical error (like "Error 503" or "Connection failed"). It must display a reassuring, clear message: "You are offline. Your changes have been saved on your phone."

Impact

For a low-literacy or low-digital user, seeing a page freeze or a blunt error message causes major frustration. Their first reaction will be: "I broke something" or "Everything I've typed for the last 15 minutes is gone." Closing the app and never opening it again is a real risk.

Users who squeeze every free minute between tasks will not try again if the tool makes them lose their progress at the slightest network drop.

→ UX / Technical tip

- Create a visual system that detects network outages and gently notifies the user that their data is safe on their device, rather than crashing the page.
- A gentle, clear message prevents the user from abandoning their journey out of stress and never coming back.
- Ask your developers to use automatic network status detection (Offline/Online) and link it to a local auto-save running in the background.

Expert level

Deploy SMS/USSD gateways. For critical functions (payment, alerts), allow execution without any mobile data. An SMS/USSD gateway is a technological bridge that allows a user to interact with an application or server without using the internet (no 3G/4G/5G, no Wi-Fi, no smartphone needed).

SMS (Short Message Service): everyone knows it. The user sends a keyword by text (e.g. BALANCE) to a short number, and the server automatically replies by SMS.

USSD (Unstructured Supplementary Service Data): these are the codes that start with a hash or asterisk (e.g. *144#). Entering the code instantly displays an interactive text menu on the phone screen, letting the user make choices (1 to pay, 2 to register, etc.).

Impact

In rural areas or among low-income populations, not everyone owns a recent Android or iOS smartphone. Many still use feature phones (basic button handsets). If your innovation is only accessible via a mobile app, you immediately exclude a huge portion of your target audience.

Buying an internet pass is a luxury or a one-off action for many users. If a user has to spend mobile credit just to check whether they received a payment or a health alert, they will prefer to stop using your service. Women and people with disabilities statistically have less individual access to smartphones or their own data budget within a household. USSD and SMS give them total autonomy on any available phone at home. Enabling zero-data execution means that for the vital actions of the service (receiving an agricultural weather alert, paying, validating a registration), the service must work even when the user's internet plan is completely empty (0 MB).

→ Technical tip

- Make the vital actions of your project (alerts, payments, follow-ups) accessible via simple text technologies (SMS or codes like *144#) that require no internet plan and no smartphone.
- In rural areas or for economically vulnerable populations, mobile data is a heavy cost and the 3G/4G network is unreliable. USSD and SMS work on the oldest and cheapest handsets on the market, ensuring that women and unconnected users can access essential services with full autonomy.
- Ask your team to couple your site or app with an SMS USSD integration tool (via a telecom aggregator) to design an alternative Zero Data text-based pathway.

→ Specific lens

- **RURALITY:** conduct a coverage audit. If the village only has 2G, your app must load only plain text.
- **EDUCATION:** don't rely on loading bars. If something doesn't load within 3 seconds, the user thinks it's broken and gives up. Source: Google Next Billion Users Research on UX behaviours in limited connectivity, and Principles of the Digital Alliance for Development (DIAL/USAID). Doherty's ergonomic law sets 3 seconds as the critical threshold for novice users to perceive a system failure.



Device access: surviving on older hardware

Focus: RAM/Storage, Android 8, short sessions for women, energy.

Beginner level: storage frugality

Video drains the battery and fills storage. Prioritise compressed audio or text. Video is the heaviest digital format – it should be avoided as much as possible inside the app or website, especially if it auto-plays. To explain a concept or share information, rely on plain text (for those who can read) or short, heavily compressed audio files (for people with low literacy or visual impairments).

Impact

Immediate storage saturation: entry-level phones (often less than 16 GB total storage) are permanently saturated by the Android OS and the WhatsApp app. If your app requires video downloads or fills the cache with heavy video files, the device will saturate. The user will have no choice but to delete your app to free up space. Watching a 3-minute HD video can consume 50 to 100 MB of data. For a low-income user, that represents a significant portion of their daily budget.

→ Technical tip

- Ask users: “How much space is left on your phone?” If it’s less than 500 MB, your app must be tiny.
- Avoid integrating heavy videos into your interface. Replace animated visual explanations with simple text, lightweight illustrations, or short, highly compressed audio clips.
- For key messages, record short voice notes in compressed format (.mp3 or light .ogg) and use still images or pictograms to illustrate your points.

Intermediate level: processor optimisation

RAM (Random Access Memory) is the phone’s short-term memory – it’s what allows the app to run. Modern smartphones often have 4, 6, or 8 GB of RAM. In contrast, entry-level or second-hand smartphones often have 1 GB or less. Avoiding heavy background processing means ensuring your app doesn’t ask the phone to analyse data, load huge lists, or run complex calculations while the user is simply trying to read text or tap a button. If the app saturates this limited memory, the entire phone starts lagging or shuts down abruptly.

Impact

Women and rural populations often use older phones (running Android 8 or earlier, like Android Go). If your software requires the performance standards of a modern smartphone, you create a discriminatory technological barrier that effectively excludes the most vulnerable. On older Android systems, as soon as RAM is full, the OS force-closes the app to protect the phone. The user is ejected to their home screen and loses their entire session history.

In off-grid rural areas, recharging a phone requires a trip to a market or a paid solar kiosk. If the app pushes the processor to its limits, the device will overheat and drain the battery in minutes, depriving the user of their only means of communication for the rest of the day.

→ Design tip

- Minimise the workload on the phone’s processor and memory. Prevent the app from running complex calculations or loading too much information simultaneously in the background.
- Reduce forced backlighting and cut GPS processes as soon as they are no longer strictly necessary.
- If your app needs to display a list (e.g. 200 cooperatives in a region), don’t load all 200 profiles into memory at once. Load them 10 at a time as the user scrolls.
- Make sure the app destroys and frees the memory from previous screens as soon as the user navigates away.

Expert level: securing the shared smartphone

A multi-user architecture is a software design approach that accounts for the fact that a phone or tablet does not always belong to a single person. Enabling clean sign-out means ensuring that with a single tap, the app closes the current session, clears the screen, and blocks access to the data just entered. The phone can then be immediately handed to a neighbour, brother, or wife, without that person being able to browse, modify, or even see what the previous user did.

Impact

In rural areas or low-income households, buying an individual smartphone is uncommon. The phone is very often a collective asset (managed by the head of the household, shared within a cooperative, or lent between neighbours).

If your app keeps the session open by default with no simple sign-out option, personal data remains visible to anyone who picks up the phone.

This is a critical intersectionality point between gender and rurality. If a woman uses an app to manage her own money or access health information, and she cannot securely close her session before returning the phone to her partner, this jeopardises her financial autonomy and may, in certain contexts, expose her to family tensions or reprisals.

→ Technical tip

- Place a clearly visible “Sign out” button, represented by a universal pictogram (e.g. a door with an arrow), accessible from any screen in one tap.
- When the user taps sign out, the app’s code must immediately clear short-term local memory (global variables, sessionStorage, and authentication tokens such as JWT tokens). Nothing should remain in the phone’s memory.
- If the user forgets to sign out and sets the phone down, the app must detect inactivity and automatically close the session after a short delay (e.g. 2 or 3 minutes).

→ Specific lens

- GENDER: design “flash sessions.” A woman may be interrupted at any moment. The tool must continuously save the state of data entry so she can resume exactly where she left off.
- DISABILITY: verify that the app does not require complex gestures (pinching, shaking) that older phones handle poorly and that are impossible for certain motor impairments.



Financial accessibility: the real cost of the service

Focus: Low incomes, shared access points, payment methods.

Beginner level

Total transparency means eliminating financial uncertainty for the user. Before a user taps a button that triggers a download, update, or content load (such as a PDF, a long audio message, or a series of images), the app must clearly and in advance display the amount of mobile data (in kilobytes or megabytes) that will be consumed. The message must be explicitly worded or recorded in audio: “Warning: this action will use approximately X MB of your internet plan. Do you wish to continue?”

Impact

In rural areas or among low-income populations, internet data is not unlimited; it is purchased in small daily or weekly “passes” that are extremely precious. When a user doesn’t know how much a tool will cost in credit, they fear their plan draining all at once. Out of caution, they often close the app rather than risk losing their credit.

For a micro-entrepreneur or a woman managing a tight family budget, 50 MB of data represents a real financial choice. If the app consumes this resource in the background without warning, the user will feel tricked. This instantly destroys trust.

Providing information upfront allows the user to plan — they can wait until they are near a free Wi-Fi hotspot, or borrow a device, rather than immediately consuming their own resources.

→ Technical tip

- Before sending content to the phone, the server must measure the exact file size (e.g. an agricultural advisory sheet of 2.4 MB).
- Just before the download, intercept the user’s tap to display a confirmation window showing the size in MB.
- If the action is heavy, the dialogue box can suggest an alternative: “This document is 5 MB. Would you like to download the text-only version (50 KB)?”

Intermediate level

Sharing equipment breaks with the classic “one smartphone per person” model. Instead of requiring every beneficiary to own, buy, or maintain an individual device to use your service, the project provides and funds a pool of shared devices. These devices (tablets, smartphones, e-readers, computers, payment terminals) become communal assets, installed permanently in strategic locations or carried by field agents, allowing dozens of people to use the service in turn.

Impact

For low-income populations, buying a minimally adequate smartphone represents several weeks or months of income. Forcing individual device use is the fastest way to exclude the most disadvantaged. In a rural household with only one smartphone, it is almost always held by the man (the head of the household). If your project requires a smartphone for agricultural training or microloan management, women may only have very limited access, under their partner’s supervision.

Owning a digital tool means having regular electricity access, paying for repairs (cracked screens, worn batteries, software issues), and managing viruses. Pooling transfers this logistical and financial burden from the vulnerable user to the project structure.

→ Technical tip

- If your project requires farmers or patients to submit data, they should not be the ones equipped. Provide a robust tablet to field agents (community workers, agricultural advisors, nurses) who make village rounds and have users fill in forms on-site.
- Install shared devices in existing, trusted local structures: women’s centres, rural town halls, agricultural cooperatives, schools, or health clinics.
- A shared device must never be left unsupervised. It must be managed by a trained local digital mediator who handles device security, helps less-educated people navigate, and ensures equitable access (for example, by reserving time slots exclusively for women) and data privacy.

 Expert level

You can configure local Wi-Fi hotspots (not connected to the wider web but broadcasting your services) for 100% free access. This also means adapting the economic model of your solution to the real consumption habits of vulnerable populations.

Pay-per-use is the rejection of the blocking monthly or annual subscription model. The user pays only for the exact fraction of the service they consume at a given moment (e.g. only for consulting a single weather advisory, or submitting a single form).

Data gifting is a mechanism where a partner covers the cost of internet access on behalf of the user. Either the site is open-access (zero-rating), or the system detects the user's action and automatically credits a small mobile data allowance to their SIM card so they can complete their process at no cost.

Impact

Rural populations or those in the informal sector (often a majority of women) do not have a fixed monthly salary. They manage their money day by day. A standard subscription, even if statistically cheaper annually, requires a large upfront payment that is impossible for them. Exclusion from essential services due to lack of credit: if a user urgently needs to access a platform (health advice, administrative declaration) but their SIM has zero data balance, they are completely blocked. Data gifting instantly removes this financial wall at the critical moment.

→ Technical tip

- Configure your payment gateway to accept very small per-transaction amounts. The interface must be seamless: one tap on "Consult" triggers an instant Mobile Money validation for a negligible cost.
- Work with local telecom operators (Orange, MTN, Moov, etc.) to use their data sponsoring systems. When the user connects to the project's app, the code sends a background request to the operator indicating the traffic generated by that phone number should be billed to the project's account, not the user's plan.
- You can program your server so that after each key step completed (e.g. finishing a training module or validating a profile), the operator's API automatically sends a 100 MB data bonus to the user's number as motivation and compensation for their time.

→ Specific lens

- RURALITY: plan for solar charging stations at your deployment points. Electricity is a major hidden financial cost.
- EDUCATION: simplify payment. Mobile Money must be integrated in one tap, as bank card systems are insurmountable barriers for many.



Field checklist / Quiz

- ☐ Does my app weigh less than 15 MB (equivalent to 3 high-resolution photos)?
- ☐ If the user runs out of battery, can they complete their process on a neighbour's phone without risk to their privacy?
- ☐ Have I banned heavy videos from the interface in favour of compressed audio formats for people with low literacy?
- ☐ Is there a fast and complete sign-out button that clears the phone's memory if the device is lent or shared within the household?
- ☐ Does my tool use external fonts or scripts that freeze the screen or show a blank page if the connection drops at startup?
- ☐ Have I tested the service during peak network hours (typically evenings in the village)?
- ☐ Can a user with a cracked screen still tap my buttons?
- ☐ Is the user told in advance the exact number of megabytes (MB) they will consume before launching a heavy action?
- ☐ Has my app been tested on a phone running Android 8 or lower without overheating the device or draining the battery in 5 minutes?
- ☐ Do the vital functions of the project (alerts, payments, registrations) have an internet-free alternative accessible via SMS or USSD code?

Notes



INCLUSIVE DESIGN & USER EXPERIENCE (UX)

Goal: ensure the tool adapts to people – languages, disability, gender – not the other way around.



Design methodology (people first)

Focus: targeted research, safe spaces for women, involvement of DPOs, prototyping.



Beginner level

Designing for vulnerable profiles (people without formal schooling, rural women, people with disabilities) requires understanding their daily constraints of time, noise, light, and mental load. Observing them in their real environment allows you to design an interface adapted to their actual habits, not what you imagine them to be. These methods can be carried out with very little budget. The most important thing is to understand your users and their environment. For instance, to consult women, create women-only speaking circles with a local female facilitator – it's the only way to identify hidden barriers (e.g. "I don't dare use the app in front of my husband"). Work with locals fixers, preferably not authority figures, when doing observations or assessments. People will hesitate to tell outsiders or perceived experts that they don't understand something, they are more likely to share real feedback with insiders

Impact

By going to the market, the team will realise that a female trader holds her phone with one hand, often while carrying something, under blinding sunlight, in the middle of noise. Designing text in a tiny font then becomes an obvious problem.

By observing a user in a rural health clinic, you immediately notice if they are intimidated by the device, if they ask their child for help, or if they hide their screen. These behavioural details cannot be invented in a meeting room.

→ Technical tip

- Identify the specific gathering points and living spaces relevant to your 4 dimensions and target groups.
- Gender: women's economic interest groups (GIEs), tontines, maternal health centres, water points.
- Rurality & Education: fields during breaks, loumas (markets), under the palaver tree after prayers.
- Disability: local Disabled People's Organisations (DPOs) and people with disabilities. For many people with disabilities, isolation and lack of access to support communities is a big challenge. Designing with users who do have access to support communities in mind, may leave out the others even more that's why you have to address those two profile types.
- Before asking questions, try to build a relationship of trust with the community. If you arrive without having engaged with them beforehand, they will be suspicious.
- By observing how people hold their phones and use WhatsApp voice messages, you'll be conducting what is called shadowing – passive observation – which can sometimes evolve into active observation given the local context. Your passive presence may spark curiosity; a brief conversation can put people at ease if they need it.
- After conducting observations, you can gather more information through individual or group interviews. Don't arrive with a rigid 50-question questionnaire. Ask open-ended questions: "Show me the app you use most often. Why do you like it? What's difficult for you when you receive an SMS?" Your posture – reassuring but neutral – will be the most important factor. Be mindful of bias, which can emerge quickly.



Intermediate level

Rapid prototyping involves simulating a mobile app using simple sheets of paper or pieces of cardboard cut to smartphone size. You draw buttons, icons, and text for your future screens by hand. When you meet with the user, you place the sheet in front of them and give a clear instruction (e.g. “You want to send money to your sister – where do you tap?”). If they place their finger on a drawing, you remove that sheet and place the “next page” in front of them, as if they were navigating on a real phone.

This rapid prototyping should also be done with people with disabilities, involved from the very start – observe how a visually impaired person uses their screen, or how someone with a motor disability handles their phone in everyday life. You can contact local Disabled People’s Organisations to make them design partners.

Impact

Faced with a real smartphone, a low-literacy or marginalised user is often afraid of making a mistake or breaking the device. Paper completely defuses this stress. The user engages with the exercise in a relaxed way.

If the user hesitates for more than 3 seconds, looks away, or puts their finger in the wrong place, you have your answer: your design is not intuitive. You don’t need to wait until the app is coded to find out.

Correcting an error on paper takes 10 seconds with a pencil and eraser. Correcting the same error once the app is built in code can take much longer.

→ Technical tip

- Cut 10 cardboard rectangles. Draw your main user journey with thick markers. Test it with your target audience, make sure to include people from different genders, ages, (digital) literacy level’s socio-economic backgrounds, and include people with disabilities. Try to reach these people in the places where they would naturally use your app . Note every hesitation as a point to fix.
- Schedule a visit with a local DPO. Ask 2 or 3 members to complete a standard action on their own phone (e.g. send a WhatsApp message, make a call). Watch their fingers, listen to their accessibility tools, and learn their habits.



Expert level

Integrating expertise internally means recruiting, employing, or formally integrating into the project team (as designers, field officers, or UX testers) people who share the reality of your end users: women from cooperatives, young people who grew up in rural areas, or people with disabilities. We move here from a purely consultative approach (“I ask my target group for their opinion”) to a structural one (“My target group has a seat at the decision-making table”). This is the highest level of inclusive maturity.

Impact

When consulting vulnerable populations, the power dynamic can be skewed. Sometimes, out of politeness or shyness in front of “experts from the capital,” users won’t say the tool is complicated or incomprehensible. Speech can be instantly freed when people who look like them are part of the team.

The choice of words in local languages, colours, and visual metaphors (e.g. the icon chosen to represent a “market” or “savings”) will immediately be relevant and rooted in local codes.

→ Technical tip

- Integrate into the project team at least one person from the target rural area. Their role: validate every interface choice, translate user journeys, and ensure the realism of usage scenarios. By centring their perspective, you will avoid tokenism.
- If you cannot hire full-time, create a permanent working group (compensated for their time) with local women leaders and DPO representatives. This group should be able to give frequent feedback on app mockups.
- Allocate part of your personnel budget to recruit local facilitators or designers from target communities. Give them a central voice in feature and architecture decisions.

→ Specific lens

- EDUCATION & LITERACY: do not ask users for their opinion while looking at a complex digital mockup on a computer – it intimidates them and skews their responses. Drawing screens on simple cardboard sheets disconnects the fear of technology. It’s the only way to get honest feedback and see where an unschooled person genuinely hesitates, before spending a single budget on code.

Gender-responsive design: safety & autonomy

Focus: privacy, locking, discreet notifications, gender roles.

Beginner level

Designing for gender means understanding that a rural woman often accesses the internet via her husband's, brother's, or son's phone, or that her own screen is visible to everyone in her household. If your project touches on empowerment topics (such as a financial tontine, a violence reporting space, or reproductive health tracking), the graphical interface on the phone must be neutral. The name displayed under the app icon and the logo itself must look like an ordinary tool so as not to arouse a third party's curiosity. If your app deals with sensitive topics (sexual health, savings), the icon must not reveal the content at first glance on the home screen. A discreet design removes this psychological barrier, guarantees safety, and lets the user exercise their right to privacy with confidence.

Impact

If a woman downloads an app that explicitly displays "Women's Autonomous Savings" or "Maternal Health Rights," her safety and privacy may be compromised.

For many rural women, building a small digital savings account (via Mobile Money or a microfinance app) is the only way to protect their capital for their children's healthcare or to grow their small business. If the app reveals this activity on the home screen, this financial autonomy is immediately threatened.

→ Technical tip

- In the code's configuration files, separate the project's official name from the name displayed under the icon on the phone. Use neutral, short terms such as: "My Space," "The Notebook," "Pro Tool," or "Tracker."
- Avoid overly explicit logos (women's silhouettes, giant currency symbols, medical symbols). Use abstract geometric shapes, a simple gradient, or a stylised letter that gives no hint about the app's content.
- Ensure the splash screen opens to a neutral interface and requests a PIN code or a discreet graphical double-validation before revealing the true nature of the services.

Intermediate level

At the intermediate level, we go beyond hiding the app on the home screen; we secure its use in real time. By default, when an app sends a notification, Android or iOS displays a text preview directly on the phone's lock screen (e.g. "Your tontine of 15,000 FCFA is ready"). Anyone glancing at the phone lying on a table can read it. The instruction is to hide this content.

An emergency exit button is a visual element (such as a small red cross or an emergency exit icon) permanently present in a corner of the app. If the user is viewing private information and someone suddenly enters the room, a single tap on this button instantly closes the app, clears the recent history, and returns the phone to the home screen or a completely neutral page.

Impact

In low-income households, the family phone passes from hand to hand (children playing, the partner making a call). An explicit notification appearing at an inopportune moment instantly breaks the confidentiality the user was working to maintain.

The exit button responds to a field reality where women's freedom to use technology is sometimes monitored. Having to press the "Back" button three times to close an app is too slow. An instant mechanism gives them back control over their own privacy.

→ Technical tip

- Program your push notifications to hide sensitive content by default on the lock screen. Add a fast-close icon (visible and accessible) on all critical screens of the app.
- In code, when creating notifications, set their visibility level to `VISIBILITY_PRIVATE` or `VISIBILITY_SECRET`. The phone will then only display "An update is available" or "New message" without ever revealing the actual text or sender on the lock screen.
- The exit button must trigger a function that destroys the current activity, clears the stack of open background screens, and redirects to a blank neutral interface or cleanly closes the app in the background.

Expert level

Images are powerful vectors of social change. Naturally depicting women piloting an agricultural drone, leading a cooperative, or mastering a Mobile Money app creates a strong role model (role modelling). This reinforces users' autonomy and confidence in the tool and their own skills, while contributing to shifting cultural perceptions within the rural community.

Illustrations should depict women:

- Leading (driving a tractor, operating an agricultural drone).
- Deciding (chairing a meeting, approving a budget).
- Negotiating (brokering a contract, managing a tontine).
- Teaching (explaining how to use an app to others, validating skills).

Impact

For a woman living in a rural area, seeing an illustration of a woman like herself mastering a complex tool or leading a project creates a powerful mental shift: "If she can do it, then I can too." This strengthens her sense of personal efficacy and her engagement with your service.

Your tools are often seen by those around users (partners, children, neighbours). Naturally and positively depicting women in positions of power or technical competence gradually contributes to shifting the village's social norms. If a woman sees herself represented only as a "passive beneficiary" or a "mother" in your illustrations, she will feel less like an actor in the project and be less inclined to use your service to develop her own capital or skills.

→ Technical tip

- Go through all the images and illustrations in your project and count: how many times is a woman shown making a decision? How many times is a man shown learning? The ratio should be balanced, or even slightly tilted in favour of women, who represent your target group, to "compensate" for existing biases.
- In each scene, the female user must be active. If the illustration shows a training, she is the one asking the question or handling the tablet, not the man beside her.
- Avoid clichés (the woman always with her baby on her back, always at home). Show her in her workplace, in the field, at the market, or in a training centre, with a confident posture.

→ Specific lens

- **GENDER & PRIVACY:** in rural areas, smartphones are predominantly shared tools, lent or monitored within the family. If your app touches on empowerment (savings, rights, health), apply the "Visual Camouflage" rule. The icon on the home screen must be ordinary (e.g. a geometric logo named "My Notebook") to protect the user from surveillance by those around her and guarantee safe navigation.
- **GENDER & INTERSECTIONALITY:** women with disabilities make up the majority of people with disabilities in the world, primarily in rural areas. They are most often dependent on other family members and generally have less access to education, healthcare, employment, etc. Creating inclusive digital products by addressing the intersectional themes of gender and disability is therefore fundamental to avoid perpetuating discrimination and to reduce isolation and inequality.



Universal accessibility

Focus: WCAG, contrast, touch zones, audio/keyboard navigation.

Beginner level

Elderly users, people with visual impairments (presbyopia, cataracts), or motor difficulties (tremors) abandon interfaces when buttons require watchmaker-level precision. High contrast is essential for screens to remain readable under direct sunlight in rural settings. Simple fonts also help people with low literacy to decipher text. Universal accessibility means not assuming all your users have perfect eyesight and steady hands.

Impact
Many users in rural areas suffer from uncorrected presbyopia or cataracts, or from slight tremors related to age or physical fatigue (agricultural work). Buttons that are too small or text that is too light make the tool frustrating and unusable for them.

In the village, apps are often used outdoors (at the market, in the field, in front of a community centre). The sun’s glare on the screen drastically reduces visibility. If your contrast is already low at the office, your app becomes literally invisible in full sunlight.

→ Technical tip

- Your app’s buttons must not be small, narrow text links. They must be wide, bold, and well-spaced. If you cannot tap one with the pad of a large thumb without hitting the adjacent button, the ergonomics need to be revised.
- In code, a button’s tap target must measure at minimum 48×48 dp (density-independent pixels) on mobile devices (e.g. Android), equivalent to approximately 9 mm × 9 mm on the physical screen. The space between two tappable buttons must be at least 8 dp.
- Use a free contrast checker (Color Contrast Checker). The contrast ratio between text and background colour must be at least 4.5:1 for normal text (WCAG AA standard). Absolutely avoid light grey text on a white background.
- Lock the app’s typeface to highly readable standards such as Sans-Serif, Roboto, Open Sans, or Inter.

Intermediate level

in full sunlight, colour nuances fade. If the only way to understand that a button means “Confirm” is that it is green, many users will miss it. The instruction is to double up colour with a text label or explicit pictogram (a checkmark ✓, a cross ✗, an exclamation mark !). If you use video elements or animations (even short ones), sound must not be required to understand the message. Adding clean subtitles or pictograms allows the content to be read.

Impact
In the field, between sun glare, cracked or yellowed smartphone screens, and colour blindness, colours in an interface are anything but reliable. A user who confuses red and green will be blocked by a message such as: “The green button confirms your payment; the red button cancels it.”

A deaf or hard-of-hearing user is completely excluded by an unsubtitled video. But the same is true for an able-bodied user in a noisy market or in a shared space where they don’t want to disturb others (and have no earphones). Subtitling solves all three problems at once.

→ Technical tip

- Never create an error button using only red. Use a red background and add a warning sign icon inside it.
- Ask your designers to display the app mockup in black and white (greyscale mode). If the interface remains perfectly understandable and you can always tell where to tap, your design is accessible.
- For videos, do not artisanally embed large text directly into the image. Use standard subtitle formats that adapt to the phone screen size, or use the native transcription feature of the hosting platform.

 Expert level

WCAG 2.1 compliance. Your code must be “clean” so that screen readers (TalkBack/VoiceOver) can read each button aloud to blind users. WCAG 2.1 (Web Content Accessibility Guidelines) are the international standards of digital accessibility. For developers, a site or app must not only look good visually – it must be machine-readable. A blind or severely visually impaired person uses their smartphone via a screen reader (TalkBack on Android, VoiceOver on iPhone). This vocal tool reads aloud everything the user touches. Having clean code means ensuring every button, image, or tappable area has a hidden text label in the code. If a developer places a button with just a magnifying glass icon but forgets to give it a name in the code, the screen reader will say “Button, unlabelled” or “Button 45.” The blind user is then unable to know what that button does.

Impact

In rural areas, people with visual disabilities are among the most marginalised populations. Technology (particularly voice synthesis) is a historic opportunity for them to access information (health, courses, market prices) without depending on others. If the code contains errors, some users might stop using it.

A blind user navigating an interface not coded to WCAG standards finds themselves lost in an incomprehensible vocal labyrinth. After two or three “Unnamed button” prompts, they uninstall the app.

→ Technical tip

- For visually impaired users, make sure developers systematically integrate ARIA attributes in the code so that screen readers (TalkBack) vocally and precisely describe each action (e.g. translating a simple graphic icon into “Button: Confirm my credit”). Align your teams with the official W3C WAI ARIA Guidelines.
- The screen reader reads the page top to bottom, left to right. The code must be structured so the voice reads elements in the logical order of the screen, without skipping sections.
- Help your developers build skills in accessibility so they can themselves recreate the experience of a user with TalkBack or VoiceOver and verify that navigation remains accessible.

→ Specific lens

- **DISABILITY & MATERIAL INCLUSION:** accessibility is not an end-of-project option. Apply button size rules (minimum 48×48 dp) from day one to include people with tremors or age-related vision loss. Above all, require clean code: every button must be named invisibly in the background so that vocal screen readers (TalkBack) can guide blind users in the village.



Languages & literacy

Focus: local languages, multimodality (audio/pictograms), comprehension testing.

 Beginner level

Language is one of the most invisible barriers for urban teams. Using an official language (such as French) or technical jargon immediately excludes a large portion of the rural population, particularly women. Using the language in which people negotiate, joke, and live daily (e.g. Wolof, Pulaar, or Mandinka in Senegal) helps avoid long sentences, legal jargon, or complex technical terms (such as “input optimisation” or “financial solvency”), even if the interface temporarily remains in the official language. Use words grounded in everyday speech.

Real-life icons: visual abstraction is a barrier. A graph with curves or pie charts in percentages means nothing to someone who has not been to school. To show an increase in harvest, it’s better to draw three large ears of maize next to a single small one.

Impact
In rural intervention areas, the illiteracy rate (especially in the official language) remains high, and it disproportionately affects women. If your app requires fluent literacy in formal official language to make a choice, you immediately exclude less-educated communities. Faced with overly complex vocabulary or academic-style graphs, the user feels a psychological barrier. Conversely, seeing everyday symbols (a familiar farming tool, a rice bag, a local coin) creates an immediate connection and reassures them of their ability to use the tool.

→ **Technical tip**

- Drastically simplify your texts by adopting local vocabulary. Replace all abstract data graphs with illustrations of familiar physical objects to express quantities or choices.
- Take each piece of text in your app and read it aloud. Would a market trader use this word? If the answer is no, replace it. (E.g. replace “Select your input” with “Choose your seed.”)
- Many standardised digital icons mean nothing in the field. A “floppy disk” icon for save, or a “filing cabinet” for archives, are abstract concepts. Use local physical objects instead.
- If you need to express a quantity, replace abstract numbers or loading bars with cumulative object representations (e.g. harvest bag icons to express a volume).

 Intermediate level

Audio is the universal access key for populations with low formal literacy, particularly rural communities that master oral communication but not written language. Hearing a familiar, warm human voice with a local accent removes the fear of technology, creates strong confidence in the project, and enables 100% autonomous navigation without needing to rely on anyone else.

Multimodal (Text + Audio): written text must never be the only way to access information. Next to each title, paragraph, or important button, the app must display a small universal speaker icon. Tapping it triggers the audio playback of the text shown on screen. Modern phones have built-in synthetic voices. But these technologies translate local African languages very poorly or speak them with a strange metallic accent. The instruction is to record real people (local community workers, actors) who speak naturally, with the right intonations and the right local accent.

Impact
A person who can neither read nor write is instantly blocked by a purely text-based interface. Thanks to a speaker button in the local language, they listen to the app talk to them. They regain total autonomy and no longer need to ask their husband or child to read for them. In rural areas, technology sometimes generates mistrust. A robotic, cold voice reinforces the impression that the tool comes “from somewhere else” and is complex. Hearing a warm human voice that speaks Wolof, Serer, or Mandingo with familiar local expressions immediately humanises the app. The user feels respected, safe, and understood.

→ **Technical tip**

- Don’t entrust recordings to a random engineer. Recruit native speakers from the intervention area. Record short files (one sentence per file) in a standard format.
- To prevent these audio files from filling the phone’s memory, ask developers to compress them to .ogg or .mp3 mono at 32 or 64 kbps. One audio sentence should only weigh a few dozen kilobytes (KB).
- In code, each text element of the interface must be linked to its corresponding audio file. When the user taps the speaker, the code plays the associated sound.

 Expert level

A Voice User Interface (VUI) lets the user navigate the app and fill in forms simply by speaking to the phone, instead of typing on a virtual keyboard. Rather than writing their name, village, or a sale amount, the user taps a “Microphone” button (like on WhatsApp), records their answer aloud, and the app understands, translates, and processes the information automatically.

Impact

The standard alphabetical keyboard is a double barrier: it requires literacy in the official language AND knowledge of the key layout. A VUI completely eliminates this wall. Since orality is the historical and dominant mode of communication in rural areas, speaking to the app is the most natural gesture possible.

Women, who often manage micro-businesses or agricultural activities alongside domestic tasks, use their phones in complex conditions (hands occupied, children to care for). Being able to dictate information while walking or working saves precious time and reduces cognitive load.

→ Technical tip

- Place a voice recording button next to every critical input field.
- Standard tools (such as Google’s or Apple’s voice API) do not recognise, or recognise very poorly, local African languages or their regional variants. Developers must connect the app to AI models specialised in “low-resource languages,” such as models developed by the Masakhane community or specialised West African solutions.
- If automatic voice-to-text conversion is too complex or unstable due to the network, the app can simply record the user’s audio response, compress it, and send it as-is to the project’s server. A human agent or central system can listen to it later. This ensures the user is never left stuck.

→ Specific lens

- RURALITY & ORALITY: written text and administrative jargon are major exclusion walls for isolated populations, particularly women. Go all-in on multimodality: replace abstract graphs with real-life images (a rice bag rather than a gauge) and integrate a speaker button next to every text to broadcast a real local human voice. Orality restores dignity and total autonomy to users with low formal education.



Field checklist / Quiz

- ☐ Is my app understandable by someone who never finished school?
- ☐ Have I tested my translation with a resident of an isolated rural area?
- ☐ Can I complete the main action with one hand (while the other holds a tool or a child)?
- ☐ Does the female user have a fast-exit button to instantly close the app if needed?
- ☐ If I step outside and use my app in full sunlight in the middle of a market, does the text remain perfectly readable or do the contrasts fade?
- ☐ If I lend my phone to a family member, can they see my private data without my consent?
- ☐ If I set my phone screen to black and white, can I still tell where to tap, or was the information relying solely on colour (e.g. green/red button without an icon)?
- ☐ Are the app name and logo on the home screen neutral enough to protect the privacy of a woman who shares her phone with those around her?
- ☐ Are my buttons large and spaced enough for an elderly person or someone with tremors to tap without hitting the adjacent button?
- ☐ Do the audio features use a warm, local human voice (Wolof, Pulaar...) or a cold robotic synthetic voice that drives users away?
- ☐ Can a deaf user, or a trader in an extremely noisy market, understand 100% of my videos thanks to clear subtitles?
- ☐ Do my illustrations show women in positions of leadership and technical mastery, or do they reinforce passive stereotypes?
- ☐ For blind users, has the app been developed taking screen reader users into account, with all images having descriptions (alt text)?



ADOPTION & SUPPORT

Goal: build the trust and skills so the tool is not just available, but genuinely used.



Trust and relay strategies

Focus: community leaders, inclusion champions, field agents.



Beginner level

In rural settings, the introduction of an unfamiliar digital tool naturally generates mistrust (fear of scams, of surveillance, of cultural disruption).. The village chief, the imam, the priest, the president of the Women's Promotion Group (GPF), or the cooperative president can act as safety filters. If these authorities test, understand, and publicly validate the tool, collective mistrust diminishes.

Impact

Apprehension towards technology is real (concerns about data security or loss of familiar reference points). If a project is introduced in a purely technical way, it may generate suspicion. But if a trusted local figure — such as the village chief or a women's representative — takes the initiative to present the tool and explain its concrete benefits (for instance for harvest management), that initial suspicion gives way to genuine interest.

In many rural areas, women's access to innovations or training must be socially validated. If the president of the women's group uses the app publicly, the cultural barrier collapses. Husbands will let their wives use the tool without resistance.

→ Technical tip

- Never start with a general training session. Meet with leaders in small groups to explain the project's objectives, gather their views, and show them a private demonstration.
- Link the launch of the tool to key moments in community life.

Intermediate level

We move here from passive validation by local authorities to an active peer-to-peer transmission model – a powerful method for sustaining the use of a technology in the field. A member of the target community becomes a local digital champion: they are a bit more at ease with a phone, very dynamic, respected by their peers, and eager to pass on knowledge. Community health workers can also be mobilised as connectors depending on your innovation.

The action is to stop sending an engineer or trainer from the capital to teach the whole village. Instead, the project team intensively trains a small group of local ambassadors. Once trained, they take over and teach their neighbours, cooperative colleagues, or women in their neighbourhood at their own pace.

Impact

When the ambassador shows how to use an app, villagers often think: “He can do it because he’s educated and comes from the city, but I’ll never manage.” When it’s the next-door neighbour or the farmer from the field next door who handles the tool with ease, the shift happens: “If she can do it, the tool must be made for people like me.”

After training sessions when experts leave, small usage problems often arise – a forgotten PIN, a blocked account, etc. If the local ambassador lives in the same village, they can drop by in the evening after work to lend a hand.

The local digital expert uses exact expressions, cultural metaphors, and local languages to explain the app. They know which point will trip up their peers because they share their daily life.

→ Technical tip

- Ask women’s groups or cooperative management committees to designate their own “ambassadors” (e.g. 2 women and 2 men per locality). Don’t necessarily choose the most educated, but the most patient and pedagogically gifted.
- Give them in-depth training. Provide them with simple visual tools (such as laminated sheets with large drawings of the screens) to help them explain the app to others.
- To keep champions motivated without a permanent salary budget, value their role: give them an official badge, a project t-shirt, or offer them a monthly data plan for their own testing. They gain prestige and leadership in their community.

Expert level

At the expert level, you formalise the champion role. Last-mile ambassadors become the official extension of your team in the field. Integrate permanent feedback mechanisms. The action is to set up a direct communication channel (e.g. a dedicated discussion group, a helpline, or a mini-interface in the app) so that ambassadors relay field realities in real time: “The latest update is crashing Android 7 phones in the village,” “Women don’t understand the new pictogram for savings,” “The network has been completely down in our area for three days.” In return, these ambassadors receive fair compensation (financial remuneration, equipment grants, or substantial internet plans).

Impact

Development apps are often launched, then the technical team stops listening. If a bug blocks users, the innovation dies in silence because villagers have no way to contact the developers. The ambassador network creates a permanent feedback loop.

By fairly compensating or strongly valuing these ambassadors within the community, the innovation directly injects value into the local economy. It creates vocations, builds local digital skills, and offers a rewarding social status, especially for young people and women in the village

→ Technical tip

- Establish a clear charter with the ambassador (e.g. 4 hours per week dedicated to assistance, one monthly refresher mini-session in their group).
- Create an ultra-simple channel for them. For example, a free SMS/WhatsApp reporting number where they can send a simple voice note: “Hello, this is the ambassador from Tamba, the validation button is no longer responding this morning.”

- Include from the outset in the budget lines the entry “Allowances/Incentives for community relay agents.” High-level inclusion has a cost, and that cost is the key to the project’s sustainability.

→ Specific lens

- EDUCATION & INTERGENERATIONAL LEARNING: when recruiting your champions, don’t bet exclusively on young graduates just because they are more comfortable with smartphones. In rural areas, age equals respect. If an 18-year-old tries to explain an app to a village elder or an older female trader, cultural barriers may block the learning. Try to create champion pairs: one young person for technical fluency and one elder or female leader for social legitimacy and empathetic listening.
- DISABILITY & LAST-MILE REPRESENTATION: be as inclusive as possible to broaden your user base. For instance, integrate active members of local Disabled People’s Organisations or people with disabilities who are recognised within their community. These users will have first-hand knowledge of the barriers faced by disabled users, whether blind or with reduced mobility. This is why it is equally important to train champions from disability communities so they can in turn share their knowledge.

Training & onboarding

Focus: human mediation, tutorials, training materials.

Beginner level

Onboarding is how you welcome a new user for their first steps in the app. At the beginner level, treat any text-based document (PDF guide, printed booklet, long on-screen explanatory text) as a learning barrier. Text-based guides exclude populations with low literacy and intimidate novice users. Making concrete comparisons with local life and organising practical workshops where each participant carries out the main action with their own hands will benefit the continued use of your innovation.

Impact

Distributing a user manual in French in a rural cooperative to people with low literacy can lead to non-use of the innovation. Web and mobile concepts were born in highly urbanised cultures. Explaining that a 4-digit PIN “encrypts the local session” means nothing to a user. Telling him: “These 4 digits are the padlock on your tontine box — if you give away the key, anyone can take the money” creates an instant, powerful, lasting mental image.

→ Technical tip

- During a demonstration, the trainer must not handle the phone themselves. They place the smartphone or tablet in the learner’s hands and guide them only by voice: “Tap the maize cob... Great. Now tap the padlock...”
- Before going into the field, list the app’s technical concepts and find their physical equivalent: the PIN/ Password = the padlock on the box or the house key; form validation = the handshake that seals a deal at the market.
- If you need to leave a physical support after your departure, use a single laminated sheet containing only screenshots of the app connected by arrows, with no explanatory text.

Intermediate level

Long theoretical formats discourage users. By leveraging informal digital channels already adopted by populations (like WhatsApp) and anchoring practice in real situations, long-term adoption is made easier. At this level, you create pocket tools the user can take home or consult on their own phone.

Impact

Someone who attends a market demonstration may forget half the steps once they get home. If that person has received a 30-second mini-video on their WhatsApp, they can replay it at their own pace in the evening. Even better: they can show it to their family, turning the household into a space of digital mutual support.

The strongest psychological barrier for a novice or low-literacy user is the fear of “breaking the device” or making an irreversible mistake. By having them handle the smartphone from the very first minute under a trainer’s supportive gaze, confidence is built through action, not theory.

→ Technical tip

- Film with a simple smartphone. Frame tightly on hands manipulating the app. Export the video in a lightweight resolution (compressed MP4, under 5 MB) so it can be sent in one tap, even on a degraded 3G network in the village.
- Don’t say: “I’m going to show you how the menu works.” Say: “Here is your challenge for today: you need to successfully register your first tontine of 2,000 FCFA on this screen. You have 5 minutes, it’s your turn — don’t hesitate to think out loud!”
- Print large posters with a maximum of 3 steps in giant images. Laminate them so they resist dust, water, and repeated handling.

Expert level

Integrated in-app onboarding means learning no longer depends on a physical poster or an on-site facilitator. The app itself takes the new user through the experience from the very first opening. The action is to create a guided welcome scenario driven by an interactive local human voice. When the user connects for the first time, the app greys out the entire screen except for the first button to press, and a voice automatically activates: “Welcome. To start recording your harvests, place your finger on the large yellow button at the bottom of your screen.” Once the user acts, the next step lights up and the voice continues its guidance.

Impact

In rural areas, many people cannot free themselves to attend collective training sessions at the village centre. An integrated vocal onboarding allows them to learn to use the tool at home, at whatever time they choose, at their own pace, and in complete privacy.

Two years after the project launches, new users will want to join the platform. If training depends on human workshops, they must be organised frequently to keep deployment going. With an integrated audio guide, the innovation is capable of training its own users at zero additional cost.

→ Technical tip

- Use standard code libraries (such as Intro.js for web or Tutorial Coach Mark for Flutter/Android) to darken the screen and visually highlight the target element.
- Link each visual step to a short audio file in the user’s language. The code must wait for the user’s action (the tap) to cut the current audio, move to the next screen, and trigger the next audio step.
- The user must be able to skip the tutorial if they already know the app, or tap a “Repeat” button if ambient noise prevented them from hearing the vocal instruction clearly.

→ Specific lens

- VISUAL DISABILITY & AUTONOMOUS LEARNING: this integrated interactive audio guide must not be confused with accessibility screen readers (TalkBack). In-app onboarding is a voice you integrate to help an able-bodied person with low literacy. To include disability, ensure this vocal guide automatically turns off if the app detects the user has already activated TalkBack or VoiceOver on their smartphone. Two different voices speaking simultaneously would make the interface completely cacophonous and unusable for a blind person.
- RURALITY: organise training sessions at natural gathering spots (under the palaver tree, at the cooperative) to avoid creating location-related stress.

Social & emotional safety

Focus: online harassment, gender-based violence (GBV), confidentiality.

Beginner level

In rural areas, digital safety plays out at the level of the family unit and human relationships to prevent social problems. In the village, the concept of a digital secret (such as a password or PIN) is often poorly understood because living spaces are highly collective. Users are frequently tricked by phishing SMS messages (e.g. “You’ve won a prize — give us your code”). They need to learn to protect their access the same way they protect their physical money.

Impact
If a person signs up on a savings or health app without knowing exactly who has access to the data, they will fear that their social circle or village leaders might discover their private information. This social anxiety is the primary reason women reject digital tools.

Out of naivety or family pressure, a user can easily give their secret code to a family member to help them with a task. If that person accesses sensitive data (health history, personal microloan), it can cause serious family conflicts or gender-based violence (GBV).

→ Technical tip

- Create a registration screen where the explanation of access rights takes the form of a very simple visual table or a sentence read aloud by the app: “Your health data is secure: ONLY YOU and the DOCTOR can see it. No one else in the village has access.”
- During onboarding or demonstrations, use roleplay or sketch scenarios to show what happens if they give out their PIN: “If you give away your code, it’s like letting your wallet open on the table.”
- Integrate a visible message in the interface reminding users: “No agent or app ambassador will ever ask for your secret code by SMS or phone call.”
- Users should not be asked for an email address or a phone number to register, as they may not have their own



Intermediate level

We establish here an “external safety net,” essential for managing crisis situations where the app itself is no longer accessible or becomes a danger to the user. An external reporting channel means that to get help in a serious situation (online harassment, identity theft, blackmail, violence), the user does not need to open the app, navigate through menus, or fill in a complex form.

Impact
In the event of online harassment or a threat (for example, a third party using their data for blackmail in the village), the emotional burden is immense. Asking a person with low literacy to write a formal complaint in the app is an insurmountable barrier. A voice note sent via WhatsApp in their local language allows them to speak up immediately.

In the event of phone loss or theft, if they want to report it and block their account, they can use any available phone to contact the service via a phone call or a WhatsApp voice message.

→ Technical tip

- Move support to a universal communication tool already mastered and installed on all phones: a standard phone line for voice calls, paired with a standard WhatsApp Business account. The user can thus send a simple voice note or make a direct call to speak with a trained human.
- Depending on your project, train the managers of this line in sensitive GBV listening and share this number on all your physical village materials so it remains accessible at all times. The number must be easy to memorise.
- There should be physical reporting places who understand online harassment, GBV and cybercrime and the context of the tool as well. If something goes wrong, especially relating to online tools, survivors might prefer reporting to a trusted person rather than to another online hotline or tool. For example, existing reporting points (health workers, district staff, parasocial workers) should be made aware of the tool and the risks that may come with it.

Expert level

Anticipate the risks of violence and integrate women’s safety not as a corrective afterthought, but as a structural element of technical design. A social impact audit conducted by experts (sociologists, women’s rights NGOs) during the design phase will scrutinise every feature (alerts, SMS, payment receipts, screen sharing) to detect potential “negative side effects” of the technology on power dynamics within the household or village

Impact
In some rural areas, a woman’s sudden access to financial autonomy or land management through technology may be perceived by a partner or community as a loss of control. If the husband inadvertently receives or discovers an SMS saying: “Congratulations, you have received 25,000 FCFA into your account,” it could trigger an immediate crisis or physical violence.

Anticipating this risk means designing the app discreetly: for example, sending coded or hyper-neutral SMS alerts (“Your technical update has been validated” instead of mentioning money), or completely disabling automatic notifications on the home screen so that activity remains invisible unless the user deliberately opens the app with a password.

→ Technical tip

- Organise a one-day workshop bringing together your developers and GBV field experts. Analyse the female user’s journey from a vulnerability lens: “If her husband looks at the phone at this exact moment, what does he see? What happens?”
- Program the app so it does not save visual receipts or compromising images directly in the phone’s photo gallery, but only in an internal, encrypted, code-protected database.

→ Specific lens

- GENDER & ONLINE HARASSMENT: never underestimate the impact of even a minor data leak. In rural areas, the simple fact that a woman’s phone number is publicly visible on a community directory or a poorly configured app group can expose her to online harassment, unwanted calls, or village rumours. Lock the visibility of female users’ phone numbers by default in the code. Nothing should be public without explicit, repeated, and understood consent.
- RURALITY & SOCIAL DATA SOVEREIGNTY: in isolated rural settings, rumours spread like wildfire and can destroy a family’s social reputation within hours. At the expert level, ensure that servers storing your sensitive data (especially those relating to women’s health or financial disputes) are hosted on sovereign local or highly secure infrastructures, in strict compliance with national data protection laws (e.g. CDP in Senegal). Never let this data transit through unsecured third-party servers in plain text: the technical security of your servers is the first line of defence for the physical safety of your female users in the village.

Field checklist / Quiz

- ☐ If I stop all training tomorrow, is there a person in the village capable of helping others use the tool?
- ☐ Can a user with no formal education learn the basics of the tool in under 15 minutes?
- ☐ Do my trainers use concrete real-life analogies (like the tontine padlock to explain a PIN) rather than computer jargon?
- ☐ Does the interface explicitly and vocally tell the user who has access to their information (e.g. "Only the doctor can see this") before they confirm registration?
- ☐ Is my emergency reporting channel (helpline or WhatsApp line) accessible at all times?
- ☐ Have local Disabled People's Organisations been contacted and/ or have users with disabilities been included in local champion training sessions?
- ☐ Have I explained to women how to protect their session if they share their phone?
- ☐ Have I audited my push notifications and SMS to ensure no explicit message could put a woman in danger if her partner intercepts the phone?
- ☐ Do my "Inclusion Champions" pair a young person (for technical fluency) with an elder or group leader (for social legitimacy) to respect village codes of respect?
- ☐ Do my trainers resemble my users (same language, same background, same gender)?

Notes



DATA, RESPONSIBILITY & ETHICS

Goal: ensure data protects the user and that data sharing does not create new invisible forms of discrimination

Data is not neutral. It carries the imprint of those who collected it, the contexts in which it was produced, and the decisions that chose what to measure – and what to ignore. In tech-for-impact projects, this reality takes on a critical dimension: if your algorithms were trained on data that

excluded rural women, elderly people, or populations with low formal education, they will reproduce those exclusions at scale, automatically and in silence. This chapter gives you the tools to break this cycle – from ethical data collection to the participatory governance of your impact.



Data sovereignty & minimisation

Focus: data sovereignty, right to erasure, transparency.



Beginner level

This sub-chapter tackles the fundamental principle of data protection: Data Minimisation (collect as little as possible) combined with demystifying consent.

- Minimisation: data frugality requires asking one question when building the app. Review with developers the level of data being collected: “If I delete this field, does my app stop working?” If the answer is no, the field can be deleted.
- Oral explanation of purpose: for every piece of information requested, the tool must justify its utility in a simple, audible way. Nothing is recorded “just in case,” and this is clearly communicated to the user.

Impact

Reducing vulnerability in the event of a breach: in rural areas, the security of local project databases is rarely foolproof. If a server is hacked or a password leaks, the impact on users is proportional to what you stored. For example a first name and a phone number leaking does not mean low risk, especially in areas with small populations where mobile money is used.

Accelerating the journey and reducing suspicion: filling in a long form on a keyboard can be exhausting for people with low literacy. Moreover, asking for personal data (such as income or marital status) without valid reason immediately raises community suspicion. A form reduced to 2 fields (e.g. First name + Mobile Money number) takes 10 seconds to fill in and reassures the user.

→ Technical tip

- Review the database. Remove requests for continuous precise GPS geolocation, full family names (a pseudonym or first name is often enough), or scanned identity documents if the project does not legally require them.
- Next to the registration checkbox, add a “Speaker” button that clearly states: “By registering, we only keep your phone number to send you your receipts by SMS. No one else can use it.”
- Configure the system not to record search history or geographic positions after the user’s session closes.

Intermediate level

Here we move into technical and legal action by establishing two pillars of GDPR (and local legislation such as the AU Data Policy Framework): strict management of internal access (who sees what within the project) and the right to erasure.

Just because an agent works for your project does not mean they have the right to see everything. A software developer, an accountant, a field investigator, or an intern cannot have the same access rights. Securing access means compartmentalising the system: the field worker only sees beneficiaries in their area, the accountant sees transactions but not medical files, and no one can export the entire database onto a USB drive without senior authorisation.

Data deletion is the power given to the user to say: “I no longer want to use your service; I want you to erase my name, number, and history from your systems forever.” The action requires setting up a simple process to execute this deletion on demand.

Impact

The social proximity between field agents and populations is very strong. If a project agent who is too curious (or poorly intentioned) can freely access a women's tontine revenue or a list of aid beneficiaries, they can use this information for personal, political, or social pressure purposes. Compartmentalisation protects users from indiscretion within the teams themselves.

→ Technical tip

- Configure the database so that default access is set to “denied.” Only grant access line by line, function by function, according to the employee’s exact role. Remove the shared “general administrator” account.
- Design an ultra-simple form accessible in the settings. To avoid manipulation errors by people with low literacy, double the request with a clear visual confirmation: Screen 1: tap “Leave the service and erase my data” / Screen 2: “Are you sure? If you confirm, all your recorded data will be permanently deleted and you will not be able to recover it.” Button [Yes, erase] / [No, cancel].
- Ask developers to ensure the tap on “Delete” triggers a genuine deletion or a total, irreversible anonymisation on the server, not just a visual hide on screen.

Expert level

Here we reach legal and technical excellence: the guarantee that vulnerable populations’ data cannot be scattered, but is protected by a national and international legal shield.

Local data sovereignty means that digital information collected from citizens (names, phone numbers, financial transactions, medical records) must not be stored on just any server abroad (e.g. on unsecured or non-sovereign cloud services in the US or Asia) without legal oversight. The action is to host this data either physically within the intervention country (on national servers or state-approved data centres), or on highly secure infrastructures that strictly respect both national data protection legislation (such as the CDP in Senegal, the CIL in Burkina Faso, or the APDP in Benin) and the most protective international standards such as GDPR.

Impact

Protecting populations from invisible exploitation: few users know the value of their behavioural data (sales habits, movements, contact networks). If your innovation uses non-sovereign cloud tools, this data can be siphoned by international data brokers for advertising or political profiling purposes. Sovereign storage blocks this digital exploitation.

If a data breach occurs and harms a community, national data protection laws allow the responsible organisation to be held accountable and local victims’ rights to be defended locally. If data is lost on an unknown server on the other side of the world, the user has absolutely no recourse.

→ Technical tip

- Your developers must verify the geographic location of servers before selecting one. Prioritise servers located on the African continent, and ideally sovereign local infrastructures certified by the country’s state digital agency.
- Before releasing the app to production, the project must submit a processing declaration to the local Personal Data Protection Authority (e.g. the CDP in Senegal or Rwanda). This legal process forces the technical team to audit their own vulnerabilities.
- Even if the server is local, data must be stored in encrypted form. If an intruder gains physical or digital access to the server, any extracted files will be completely unreadable.

→ Specific lens

- RURALITY & CONNECTIVITY (CHAPTER 1 REMINDER): requesting less data is not just an ethical requirement – it is also a technical obligation in low-coverage areas. Every unnecessary text field, profile image, or identity document requested adds weight to the app’s network request. By limiting the registration form to the strict minimum, you allow the app to complete registration successfully, even with an unstable connection.
- EDUCATION & DATA MANAGEMENT: in rural areas, a user with no formal education or who is not comfortable with complex app menus will never manage to find the data deletion form on their own, even if it is well coded. To ensure this right is not fictional, train your Inclusion Champions and field agents in this procedure. They must be capable of accompanying, without judgement or reluctance, anyone who comes to them for help with erasing their data from the platform.



Unbiased algorithms and AI

Focus: fairness in intelligent systems, inclusion of minorities in data.



Beginner level

Major AI models (such as ChatGPT for text, or computer vision tools for image recognition) are not “neutral.” They learned to “think” and recognise the world by analysing billions of data points coming predominantly from the internet — that is, from Western or highly connected urban contexts. Context-blind AI: for a standard AI, a “residence” is a brick house with a tiled roof, a “farmer” uses an air-conditioned tractor, and the “correct accent” is the one spoken in the capital. Outside this frame, AI makes gross errors.

Impact

If your innovation uses an image recognition AI to validate agricultural subsidy applications (e.g. verifying a field’s condition from a photo) and this AI was trained on American or European farms, it will reject traditional polyculture plots, mistaking them for wasteland. Standard voice recognition tools fail when faced with strong local accents. If access to a service depends on an untested voice command, you are building an invisible wall for an entire section of the population.

→ Technical tip

- Take the transcription or translation tool you plan to use. Have it tested by 5 people (elders, women, young people). If the system asks them to repeat three times or translates incorrectly, remove it from the onboarding or support process.
- If your app includes an automatic intelligent module (e.g. to detect plant diseases from leaf photos), submit photos taken with low-quality smartphones, under midday sun, by local farmers could be tricky. If the AI only performs well on perfect laboratory photos and not on real conditions it is useless in the field.
- Never let an algorithm make a final exclusion decision (refusing credit, rejecting a registration). AI must only be an assistant. If it issues a negative assessment, the case must be reviewed by a human project agent.



Intermediate level

Here we enter into the engine of artificial intelligence: the training data (dataset). This is the step where inclusion quotas are applied directly into the machine. An AI knows nothing on its own; it only learns from what it is shown. If you train it on 1,000 examples of validated credit applications but 900 are urban male traders and only 100 are rural female farmers, the AI will deduce a simple mathematical rule: “To be a reliable profile, you must be an urban man.” The audit consists of counting who is represented in your data. The rebalancing action consists of forcing parity and territorial representativeness in the dataset so that the algorithm learns equitably.

Impact
Historically, urban men had earlier access to smartphones, Mobile Money accounts, and property titles. If a country’s raw historical data is used without correction, the AI will consider these past inequalities as the “norm” to follow. It will reject women’s applications not out of malice but out of pure biased statistical logic.

If an agricultural AI assistant has never “seen” photos of millet or cowpea crops managed by women’s cooperatives, it will be completely unable to analyse them correctly. Rebalancing ensures no one is left in the blind spot of the technology.

→ Technical tip

- Before launching a model’s training, ask developers to produce a distribution graph: what is the percentage of women? The percentage of rural users? The average age?
- If your profiles of rural women are a minority (e.g. only 15% of the database), ask engineers to use technical rebalancing techniques. Profiles can be artificially duplicated or algorithms like SMOTE (Synthetic Minority Over-sampling Technique) can be used to create equivalent synthetic profiles. The goal is to reach a ratio close to 50/50 in the machine’s learning phase.
- When evaluating app performance, do not settle for a global success score (e.g. “Our AI is 92% reliable”). Request the detailed score by subgroup: what is the reliability specifically for the group “Rural unschooled women”? If this score drops to 50%, the system is not ready.



Expert level

Explainability (XAI) is fundamental for making AI transparent. An application must not stop at an arbitrary refusal, but must systematically justify its decision. For example, instead of simply displaying “Application rejected,” it must provide a clear, accessible explanation (e.g. “Your application is rejected because your plot is too small”), ideally via an understandable audio or text message.

Impact
In rural areas, the lack of digital culture can lead users to perceive AI as a divine, magical, or arbitrary entity. If the machine says “No” without explanation, the user may feel helpless. Understanding the “Why” allows them to correct their situation (e.g. fix an error in their file) and maintains a relationship of dignified trust.

Algorithms make mistakes. If AI denies a woman access to a digital tontine because it misinterpreted a photo of her identity document due to poor smartphone photo quality, explainability allows the field agent to immediately see where the system went wrong. Without it, the error remains invisible and the exclusion becomes permanent.

→ Technical tip

- Use simple, naturally explainable algorithms (such as decision trees or logistic regressions) to achieve similar performance.
- Clearly explain which decisions/interactions are AI/Automated, and which ones are programmed by humans. Sometimes users will disregard or distrust certain messaging because they assume it’s AI while it’s not, or vice versa.
- If using a complex model is unavoidable, use standard mathematical libraries such as SHAP (SHapley Additive exPlanations) or LIME. These tools analyse the AI’s calculation after the fact and isolate the variables that carried the most weight in the decision.

- Translate these abstract mathematical data into comprehensible sentences. The code must automatically generate feedback adapted to orality.

→ Specific lens

- **EDUCATION & SKILL STEREOTYPES:** if your project uses AI to generate educational content (such as training illustrations or audio summaries), analyse the results very closely. Generative AI models suffer from massive cultural biases: if you ask it for the image of an “agricultural expert,” it will almost always generate a white man in a suit. If you ask for “a woman in a village,” it will often depict her in a miserable way. Actively correct your prompts to force the AI to represent local, empowering, and inclusive role models.
- **RURALITY & EXCLUSION BY ECONOMIC MODEL:** beware of the payment data trap. If your algorithm evaluates farmers’ reliability based solely on the regularity of their monthly income, it will automatically exclude rural populations. In rural areas, the economy is cyclical, aligned with harvests (income comes in once or twice a year, not every month-end). Integrate local seasonal variables into the machine’s logic, otherwise your AI will not facilitate access to services for everyone.

Impact monitoring and indicators: the inclusion KPI

Focus: disaggregated data (gender, disability, area), continuous feedback.

Beginner level

We touch here on the heart of strategic steering: moving away from the illusion of “big numbers” that mask inequalities, towards a culture of disaggregated data from day one. Moving beyond the global “number of users”: in project engineering, there is a fondness for massive KPIs such as: “Our app has 5,000 registered users.” It’s a flattering but blind metric. If out of those 5,000 people there are 4,900 literate urban men and only 100 women, the project is a glaring failure in terms of inclusion.

At the beginner level, no complex servers are needed. The action asks field teams, during follow-up visits or village workshops, to keep a physical logbook. For each group of users encountered, figures are disaggregated according to the desired inclusion types: by gender, age group, education level, and visible or self-declared disability status.

Impact

If you do not specifically count marginalised profiles, they disappear from reports. Teams imagine everything is going well because the download curve is climbing, when in fact women or elderly people are silently abandoning the tool due to a technical barrier that no one took the time to measure.

→ Technical tip

- Pocket dashboard: provide your field agents or partners with an ultra-simple tracking grid during village visits.
- Behaviour observation (Shadowing): don’t just ask “Who uses the app?” Also note “How?” If 8 out of 10 users hand their phone to a young person to perform the action for them, write in your report: “80% usage dependency.” This is a major inclusion indicator.
- Ban non-disaggregated reports: systematically refuse activity reports that aggregate people under the generic term “beneficiaries.” Require the separation of gender and vulnerability data.

Intermediate level

We move from manual logbook collection to analytical automation: the app’s code takes over to map inequalities in real time. At the beginner level, teams counted by hand in the field. At the intermediate level, developers are asked to configure the system to calculate and sort this data automatically.

Automation means structuring the dashboard (Back-Office or Dashboard) so it never again displays a single global figure. The dashboard must integrate dynamic filters allowing the audience to be segmented in one click: “Show me only the activity of women aged 45+ in rural areas over the past 30 days.”

Impact

An app can show an 80% registration rate among women in the village (thanks to the efforts of field facilitators). But by activating the activity filter on your dashboard, you discover that these same women represent only 5% of users who actually tap the final transaction button. Automation lets you see this dropout immediately and sheds light on a usage, cost, or access issue.

Being able to instantly export a graph showing the evolution of service penetration in isolated rural areas versus urban areas scientifically proves the inclusive value of the project, far beyond mere declarations of intent.

→ Technical tip

- Structured database storage: ensure that the basic demographic variables (Gender: M/F, Zone: Urban/Rural, Age group) collected minimally at registration are indexed in the database to allow rapid queries.
- Design a dashboard with an integrated cross-filtering panel.
- Configure the dashboard to highlight (e.g. in red or orange) the subgroups whose usage rate falls below a critical threshold. If the activity of “rural elders” drops by 40% in one week, the dashboard must visually alert the project manager.

 Expert level

We reach the culmination of the approach: the transition from a top-down monitoring approach (observing the user) to a participatory, bottom-up governance model (where the user becomes the judge and co-designer of the technology). The action is to return to the areas where your innovation is used, bring together the most vulnerable users (those with low educational levels, isolated women, elderly people, people with disabilities), and report back to them on results. The data is presented to them accessibly, and a debate space is opened in the form of a community discussion where it is they who analyse failures, explain blockages, and dictate the improvements to be coded for the next version.

Impact

A dashboard may show stable app usage, but only a co-evaluation session will make the figures speak and reveal the human reality behind the data.

Asking the opinion of someone traditionally excluded from decision-making circles (such as a non-literate rural smallholder) to guide an app’s development budget radically changes their posture. They no longer see themselves as a passive “beneficiary” or a number in a database, but as a partner. This strengthens long-term community ownership of the tool.

→ Technical tip

- Do not arrive with PowerPoint slideshows filled with complex graphs. Translate your statistics into physical materials understandable by everyone.
- If you bring the whole village into the same room, speech will be monopolised by male notables or young graduates. To obtain honest feedback, organise separate evaluation circles: one circle for women only, one for elders, and a specific space for people with disabilities.

- Co-evaluation must not be a public relations exercise
Make firm commitments: every blockage identified by the community must be translated into a priority modification ticket in the developers’ requirements list.

→ Specific lens

- DISABILITY & SENSITIVE SELF-DECLARATION: during your manual field data collection, never ask in a frontal or blunt way: “Who here has a disability?” In many rural communities, disability is a taboo subject, sometimes associated with intense social stigma. Use the method of functional questions (Washington Group Questions): ask discreetly whether the user experiences “a lot of difficulty seeing, even with glasses” or “walking or climbing stairs.” This allows you to identify the accessibility need without ever labelling or hurting the user.
- DISABILITY & ACCESSIBILITY OF VOICE: at the expert level, when designing these co-evaluation sessions, logistical accessibility must be impeccable, otherwise your disability KPIs will remain skewed. Cover the full range of physical and communication barriers for the workshop: fund adapted transport so that a person with reduced mobility can leave their home and get to the meeting venue, recruit a local sign language interpreter if deaf participants are attending, and ensure the chosen venue (often a school or community building) has no insurmountable steps. A co-evaluation that physically excludes people with disabilities produces a false ethical validation.



Field checklist / Quiz

- ☐ Does my system make the same decisions for a rural woman as for an urban man?
- ☐ Can a user find out in under 30 seconds what is done with their data?
- ☐ Before deploying an intelligent module (voice, visual, or text), have I tested it with 5 people from isolated rural areas to ensure the AI understands their accent and environment?
- ☐ If the algorithm makes a judgement error, does the user have a direct-access button to freeze the decision and have their case re-evaluated by a human relay committee?
- ☐ If my app refuses a service or subsidy to a producer, is the interface capable of instantly and orally explaining the “Why” of that decision?
- ☐ If I delete this field from my registration form (e.g. last name, marital status, geolocation), does my app stop working? If the answer is no, have I deleted it to protect the user?

Notes

- ☐ In the event of the user’s phone being stolen, is their sensitive data protected by an in-app password?
- ☐ Am I able to say precisely which specific demographic uses my service each month?
- ☐ Can a female user with low literacy request permanent deletion of all her data through a simple, visual process backed by an audio confirmation in her local language?
- ☐ Have my engineers mathematically rebalanced our datasets to prevent minority profiles (such as rural women) from being penalised by the historical over-representation of urban men?
- ☐ Is my database hosted on sovereign servers (local or GDPR-compliant) and has my processing been formally declared to the national authority (e.g. CDP in Senegal)?
- ☐ Have I planned an annual field workshop to present our statistical results in a visual and metaphorical way to the most marginalised users so they can dictate the corrections to be made?

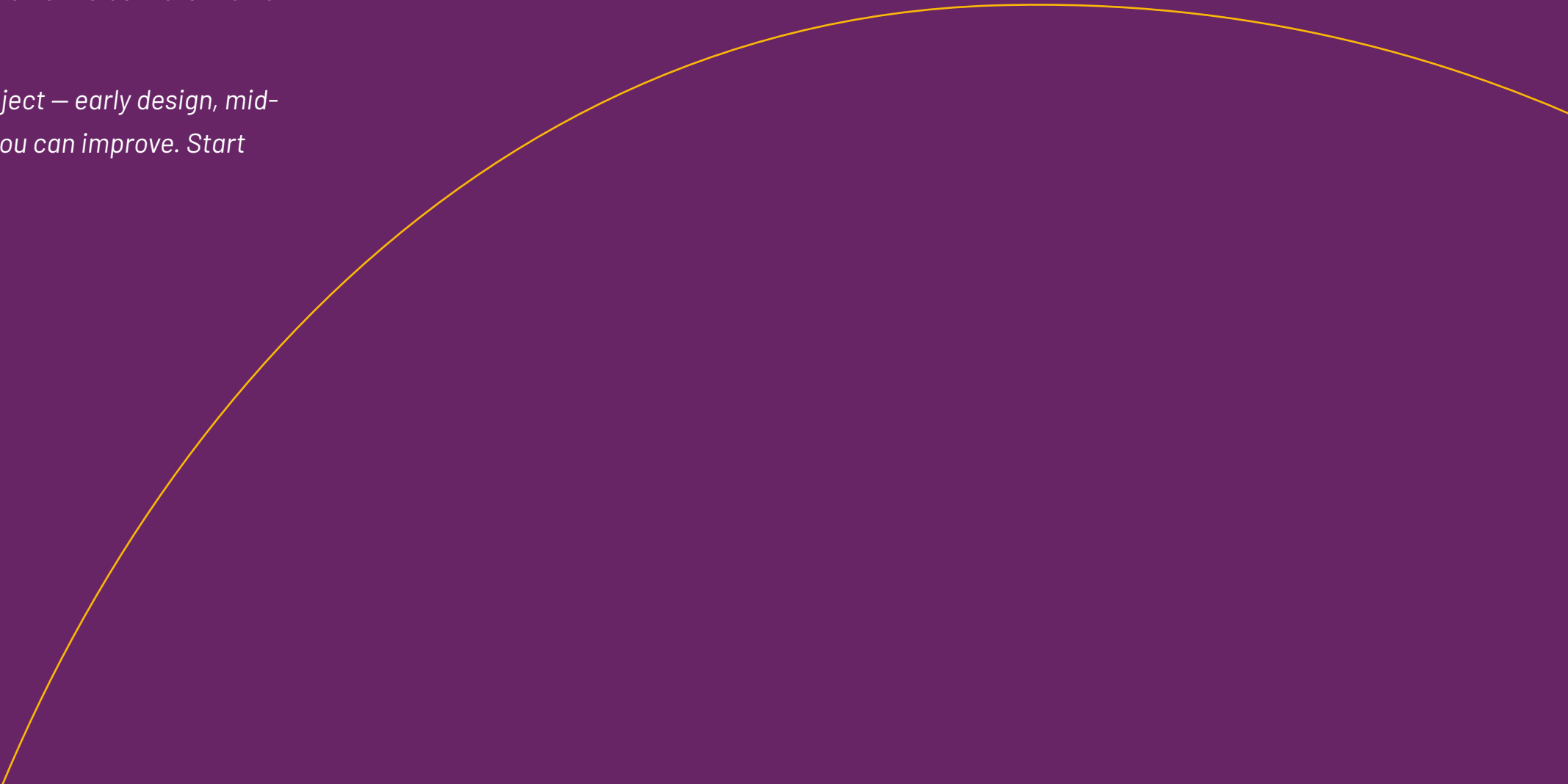
CONCLUSION

This guide brings together everything you need to make your digital solution more inclusive – from the way you design your first screens to the way you collect and protect your users’ data.

Keep it close. Open it when you’re about to make a design decision, when you’re preparing a field visit, when a new feature is on the table, or simply when you need a reminder of who you’re building for.

For best results, use it alongside the compass test: the questionnaire will show you where you stand today, and this guide will give you concrete steps to move forward. Together, they form a complete toolkit for teams who want inclusion to be more than a good intention.

There’s no perfect starting point. Wherever you are in your project – early design, mid-development, or already deployed – there’s always one thing you can improve. Start there.





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**DATA
GOVERNANCE
IN AFRICA**