PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ
FACULTAD DE CIENCIAS E INGENIERÍA
INGENIERÍA DE TELECOMUNICACIONES

ICT REPORT FOR SUSTAINABLE HUMAN DEVELOPMENT IN RURAL AREAS

Report - Laboratory 3 Session 2

Report Nº: 3

Schedule : 1TEL07

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NOTA	

Introduction

Effective local governance is essential for the sustainable development of rural communities, yet a significant gap between citizens and local governments persists in rural Peru due to the lack of accessible and transparent communication channels.

Willarikuy, which means 'claim' in Quechua, is a civic engagement platform specifically designed for Peruvian rural communities that allows citizens to report issues, track requests, and access municipal information in a transparent manner. The platform integrates multiple communication channels (SMS, mobile app -coming soon/probably- and web) to guarantee universal accessibility, regardless of digital literacy level or connectivity availability.

The project is inspired by successful cases such as Ushahidi (Kenya) and Open311 (USA/Canada), but innovates by incorporating elements from the Peruvian context: multilingual support (Spanish, Quechua, Aymara), integration with Rondas Campesinas as technology intermediaries, and partnerships with community radio stations for mass outreach.

This proposal presents the complete platform design, including stakeholder mapping, technical architecture, data flow, ethical and sustainability considerations, implementation plan, and financial model, with the aim of transforming local governance in Peru's rural areas through accessible and inclusive technology.

Stakeholder Mapping

Stakeholder	Key Necesities	Potential ICT Solutions	Role in Implementation
Rural Population	Limited devices, low digital literacy, intermittent power/connectivity, language barriers (Quechua/Aimara)	SMS/USSD (*311#) -toll-free number-, community radio integration, multilingual support	End-users; feedback providers; validators of solutions; community ambassadors
Gobierno Local	Policy gaps, limited monitoring	Dashboard for case	Primary implementers or

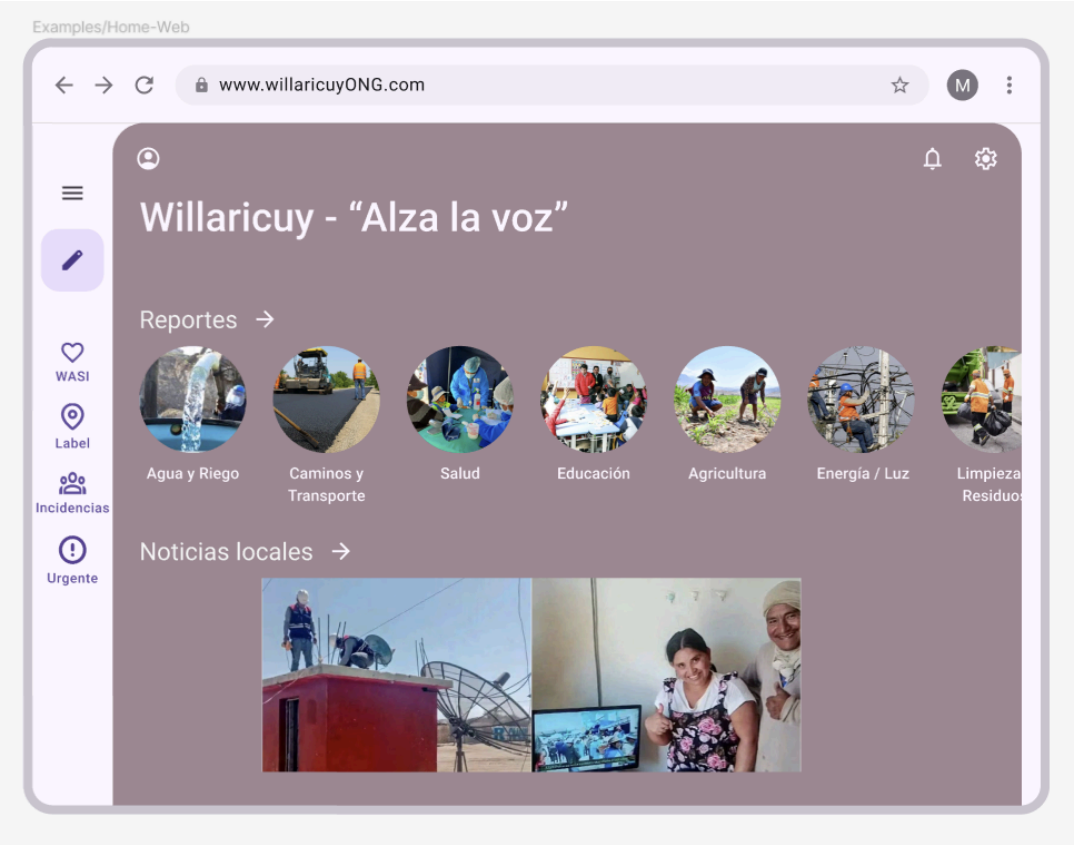
	tools	management, automated reporting, real-time tracking system, public transparency portal, SMS notifications to officials	deployers, on boarding process; case managers; decision-makers; budget allocators
Investors (Fondos de Desarrollo)	Measurable impact metrics, scalability potential, alignment with SDGs, financial sustainability, risk mitigation	Impact dashboard with SDG indicators, automated quarterly reports, API for data extraction, financial projections platform	Funders; strategic advisors; external validators; scalability enablers
Rondas Campesinas	Recognition of authority, tools for verification, communication with dispersed communities, conflict resolution support	Mobile app for field verification, photo/audio evidence upload, community voting module, WhatsApp integration	Intermediaries; validators; community mobilizers; cultural mediators
Telecom Providers	Market expansion to rural areas, brand reputation, data insights on rural connectivity	Usage analytics for coverage planning, success stories for marketing, subsidized SMS gateway partnership	infrastructure enablers; subsidy providers (reduced SMS costs), connectivity improvers
Universities	Research opportunities, field sites, impact evaluation, student engagement, publication potential	Open data API for researchers, survey integration, anonymized datasets	Evaluators, researchers, volunteers, innovation labs, credibility validators

The system architecture implements a modular design that ensures offline functionality and intelligent synchronization. Data flow progresses from multiple input channels (SMS, mobile app—coming soon) through processing and validation layers, to routing systems that distribute reports to appropriate municipal departments. The tracking system maintains complete transparency of the process, while the feedback loop ensures continuous communication with citizens.

Platform Design (Figma Mockups)

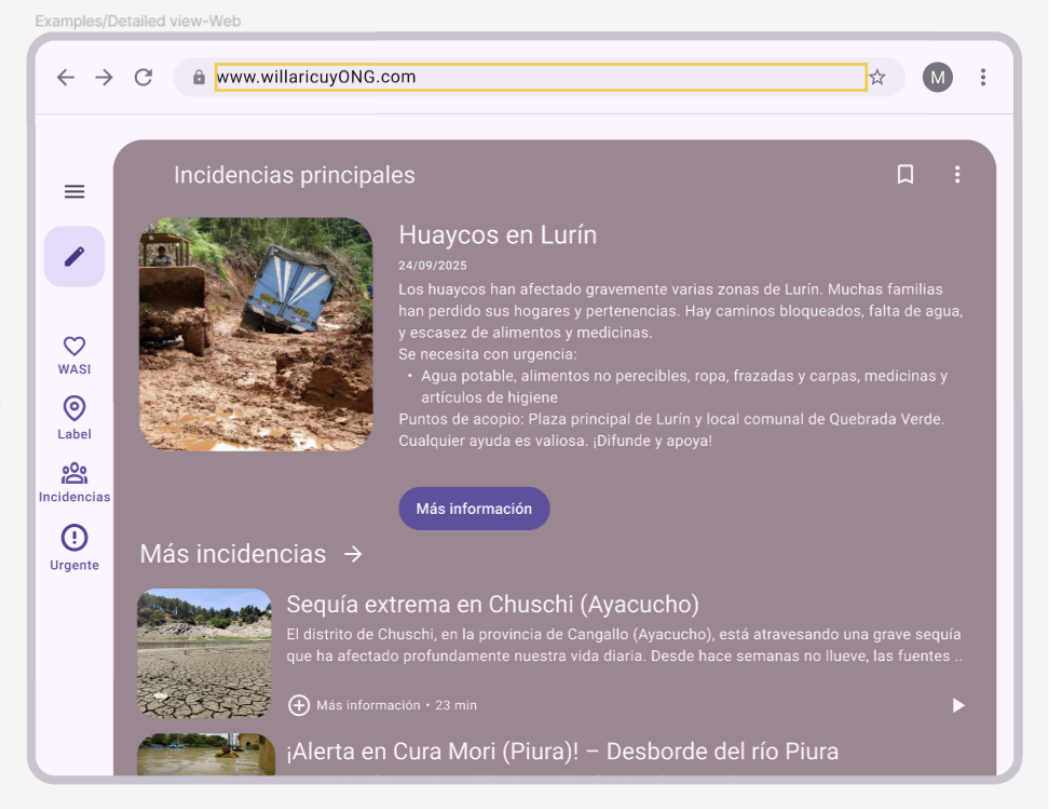
Reporting

The “Reportes” categories (Water & Irrigation, Roads & Transport, Health, Education, Agriculture, Energy, Waste Management) enable users to create structured reports by topic. In the “Huaycos en Lurín” example, the report includes a description of the event, urgent needs (water, non-perishable food, clothes, medicine), and drop-off points for aid. This ensures that every incident is documented with clear, actionable details.

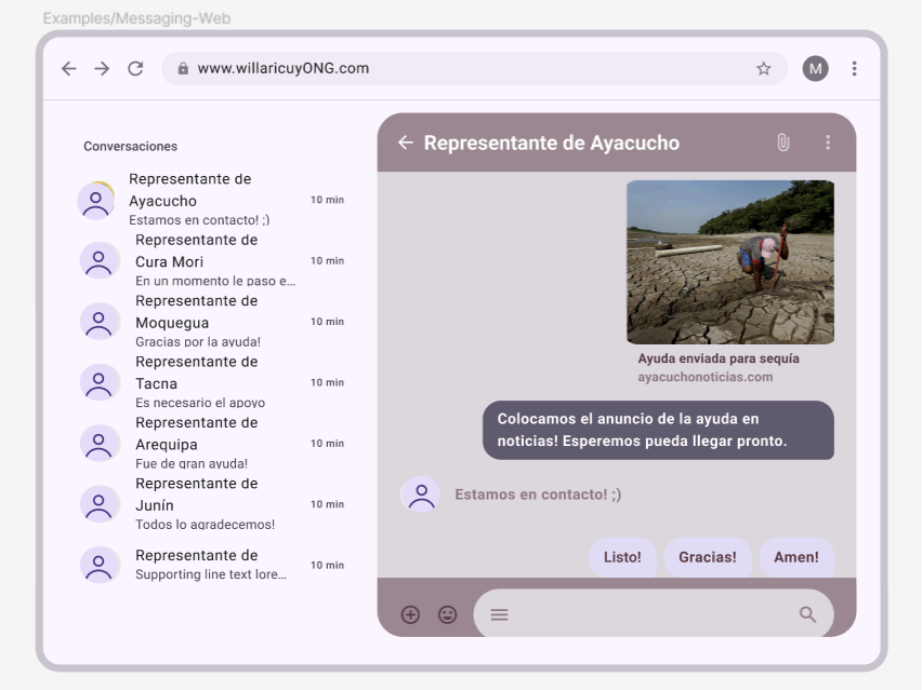


Tracking

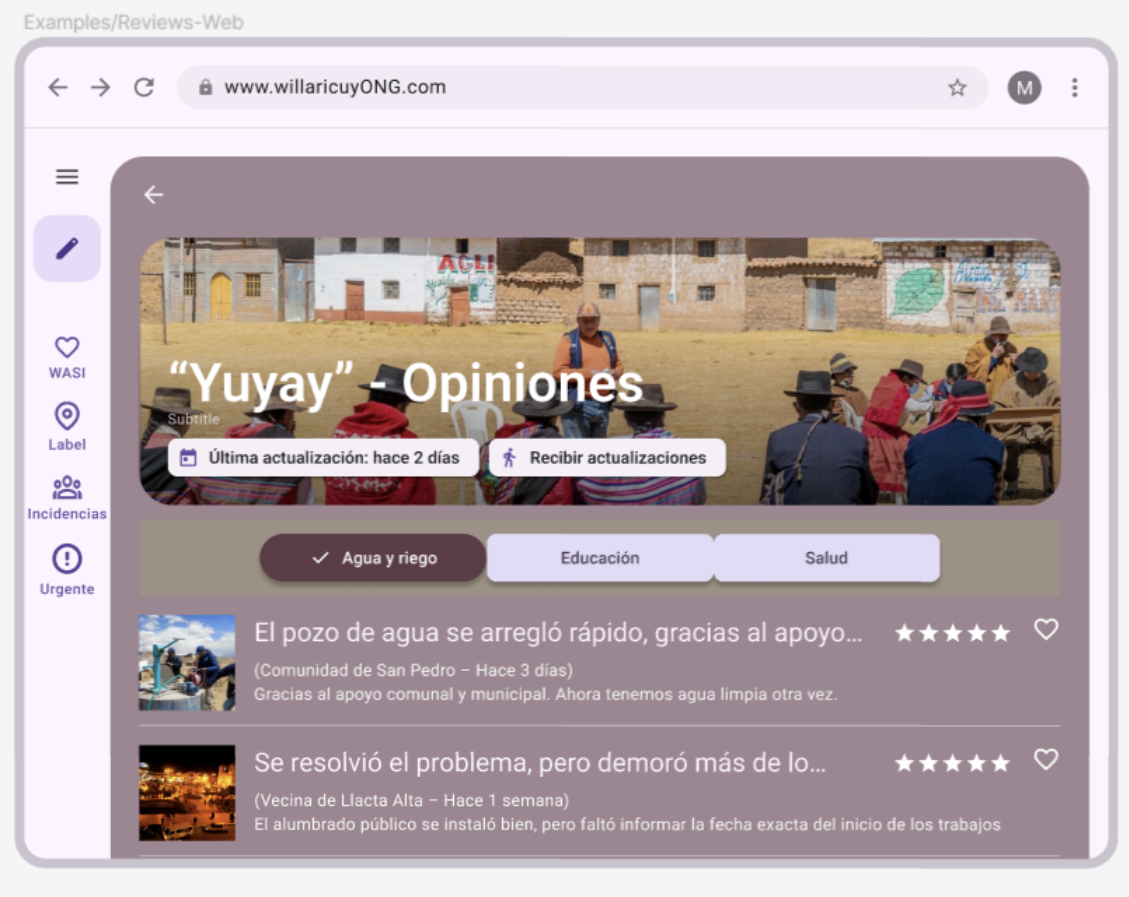
Each report card includes a “Más información” button that lets users follow up on an incident. Reports are also displayed under “Más incidencias,” sorted by recency (e.g., “23 min ago”), which indicates that citizens can track updates in real time. In addition, the messaging mockup (Representante de Ayacucho) shows direct communication with local representatives, providing status updates and confirmations to citizens.



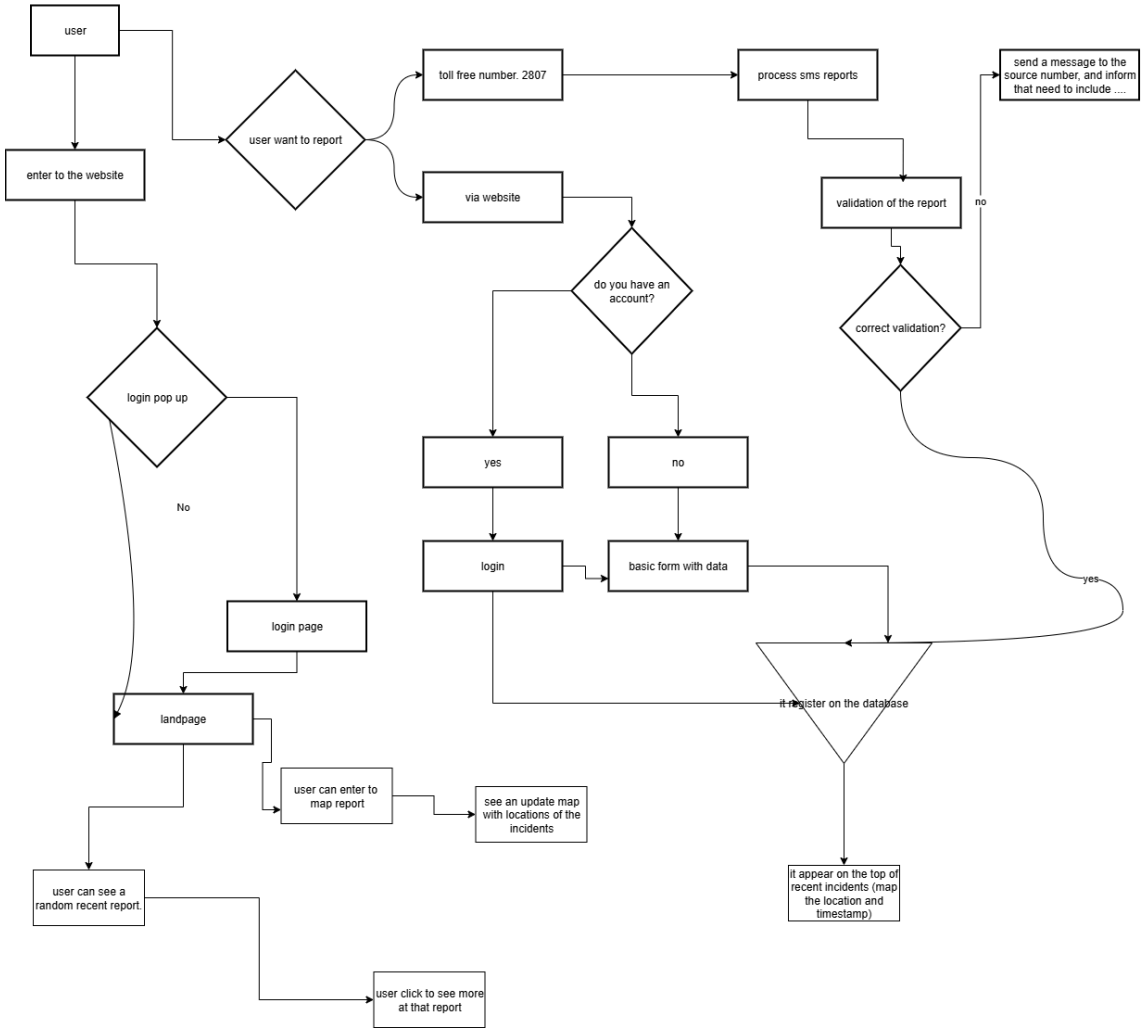
This messaging screen shows how the platform enables tracking and direct communication between citizens and local representatives. Each conversation is clearly labeled by region and marked with recent timestamps, allowing real-time updates on emergencies or requests. Quick-reply options such as “Ready!”, “Thanks!”, or “Amen!” lower participation barriers and foster inclusion for users with low digital literacy, while the identification of verified representatives ensures transparency and trust in the interaction.



This screen highlights the community feedback and evaluation feature of the platform. Under the section *“Yuyay – Opiniones”*, users can leave reviews once an incident has been addressed, giving both written comments and star ratings. For example, citizens acknowledge when issues like water wells are fixed quickly or point out delays in services such as public lighting. Categories like *Water & Irrigation*, *Education*, and *Health* allow filtering of opinions, while update labels (e.g., *Last updated: 2 days ago*) ensure transparency and accountability. This functionality not only strengthens citizen participation but also feeds into analytics, helping local governments measure performance, service quality, and community satisfaction in a systematic way.


Examples/Reviews-Web
www.willaricuyONG.com
M
WASI
Label
Incidencias
Urgente
“Yuyay” - Opiniones
Subtitle
Última actualización: hace 2 días
Recibir actualizaciones
Agua y riego
Educación
Salud
El pozo de agua se arregló rápido, gracias al apoyo...
(Comunidad de San Pedro – Hace 3 días)
Gracias al apoyo comunal y municipal. Ahora tenemos agua limpia otra vez.
Se resolvió el problema, pero demoró más de lo...
(Vecina de Llacta Alta – Hace 1 semana)
El alumbrado público se instaló bien, pero faltó informar la fecha exacta del inicio de los trabajos

Approximate DataFlow:



The diagram shows the complete flow of the citizen reporting process on the Willarikuy local governance platform. It is designed to be accessible both via the website and via SMS (toll-free), facilitating interaction for users with different levels of digital literacy.

Flow

Login and Entry

- The user logs into the platform, either through the website or by sending a report via SMS.
- If the user logs in via the web and wants to report an incident, a login window appears.

Authentication and Registration

- If the user does not have an account, they are taken to a registration page where they fill out a basic form with the necessary information.

- If they have an account, they simply log in.
- Once authenticated, they can access the report map.
- Reporting Process (SMS and Web)
- By SMS, the report is processed on the platform: the information received is validated.
- If the validation is unsuccessful, the user is informed that they must enter more information.
- If it is successful, the report is recorded in the database.

Viewing and Monitoring

- All valid reports appear above the recent incidents, showing their location and timestamp on the map.
- The user can navigate the map to view different incidents and select one to see expanded details.
- From the main page, any user can view a recent report at random or directly access the interactive map.

Feedback

- The process incorporates validation, organized registration, and direct feedback to the user in case of errors in the submitted report.
- Incidents are made public in the system, facilitating municipal transparency and citizen oversight.
- This workflow prioritizes accessibility, modularity (web/SMS), traceability, and transparency, allowing both registered and new users to easily participate and track issues reported in the rural community. The diagram represents the step-by-step process a citizen follows to report an incident on the local governance platform, either via the web or via SMS (toll-free number):
- The user accesses the website or wishes to report via SMS.
- If they access the website, a login window appears. If they do not have an account, they fill out a simple form; if they do, they log in normally.
- They can then access the report map, view recent incidents, and click to view details.
- If the report arrives via SMS, the system validates the information received. If any data is missing, the user receives a message requesting the missing information.
- If the report is valid, it is recorded in the database and appears on the map of recent incidents with the location and time.
- This flow allows any user to review reports, view the updated map, and follow up on reported incidents.

- Thus, the system facilitates participation and transparency, allowing reports to be submitted and reviewed both online and by SMS, and providing public visibility and traceability of community issues.

Ethical and sustainability considerations

We do things the right way and keep them simple: we ask for clear permission (informed consent), take only the data we truly need, protect it (encryption, limited access, activity logs), and let people see how issues move through the system with easy ways to give feedback or appeal. We design so everyone can use it—multiple languages, simple wording, works offline or with slow internet, and on any device. We watch for bias or misuse and reduce it (limits on spam, basic verification, human review for sensitive cases, and ways to report problems). We also care for the environment by choosing low-energy options, processing data on the device when possible, using efficient servers, buying gear that can be repaired, and planning proper e-waste recycling. To keep the service reliable over time, we work “offline-first,” write simple how-to guides, train local teams, plan the full cost of running the system, and follow well-known service guides (like ITIL for daily operations and COBIT for decision-making). We use open standards/APIs and some open-source tools when safe, always with strong privacy checks. We track results with community-agreed indicators, review big changes for ethical impact, and make sure the community has real ownership through data agreements, options to host locally, and a clear exit/transition plan.

Integration with Governance Frameworks

We align with widely used playbooks so the service is easy to run and easy to trust: COBIT tells us who decides what and how we measure value; ITIL guides day-to-day work (help desk, changes, service levels) with clear RACI roles (who is Responsible, Accountable, Consulted, Informed) and a simple list of systems and settings (an inventory of “what we have” and “how it’s configured”). For standards, ISO 27001 keeps information secure, ISO 27701 covers privacy, ISO 31000 manages risks with a living risk list, and ISO 22301 helps us keep services running during disruptions. We publish key numbers and service promises (SLAs = what users can expect), use open standards like Open311 (a common format to report local issues), and run regular reviews and audits so policies, processes, and evidence stay in sync and keep improving.

Feasibility Analysis

This solution is practical and easy to implement. We use proven, inexpensive technology, such as web and Android apps that work offline or with limited data, as well as open formats so reports are easy to create and follow. The system can be installed on a small server or municipal computer and is designed in adaptable modules.

The way it works is natural and resembles how local teams already do things, with clear roles for everyone. In addition, there will be cascading training (where some train others) and simple guides so staff can use it seamlessly.

Regarding money, the idea is to deploy the platform step by step to avoid spending a lot upfront. By using open source software, we avoid paying for licenses, and operating expenses are predictable. Furthermore, by responding more quickly and avoiding rework, the system gradually pays for itself.

Regarding legislation, privacy is safeguarded and clear rules for data protection are established with partners. We can quickly test with pre-built modules and then expand it by region.

We know there are risks, such as slow internet, not everyone using the platform, or staff turnover. That's why the design works offline, local leaders are supported, regular training will be provided, and there will be a plan to keep the system running long-term.

In short, it's a realistic proposal designed to work well with the communities' current needs.

Conclusions

The proposal presented demonstrates that it is possible to strengthen local governance in rural communities in Peru through an inclusive, accessible, and sustainable platform like Willarikuy. The modular design, the integration of diverse channels (SMS, app, and web), and the adaptation to local realities (multilingual, offline support, participation in peasant patrols, and community radio stations) ensure that connectivity, digital literacy, and resource limitations do not pose a barrier to citizen participation.

Furthermore, the project aligns with international best practice frameworks (COBIT, ITIL, ISO) and complies with ethical standards for privacy, security, and transparency, ensuring trust and sustainability over time. The feasibility analysis confirms that the solution is technically, operationally, financially, and legally viable, provided it is implemented progressively and with strong community involvement.

Overall, Willarikuy represents a transformative tool for bridging the gap between local governments and rural citizens, promoting more participatory, transparent, and efficient management that directly contributes to sustainable human development.