



# SDG BLOCKCHAIN ACCELERATOR

## ROADMAP TEMPLATE

(Why does this challenge matter? Describe the setting and key stakeholders. Explain why this challenge is important in your specific country or regional context. Describe the affected communities or sectors, any existing efforts to solve the issue, and the roles of key stakeholders involved (e.g., government, private sector, civil society.)

## Challenge Definition

This section sets the foundation for understanding the development problem your solution aims to address. Be clear and concise, focusing on the problem itself, the environment in which it exists, and the intended outcomes of addressing it.

### UNDP Challenge Summary

(Briefly describe the real-world development challenge being addressed. Provide a summary of the development challenge submitted by the UNDP Country Office. Focus on the nature of the problem rather than the solution. This should be written in a way that is easily understandable to external stakeholders. Please include any relevant data and statistics that highlight the urgency and significance of this challenge.)

The growing global crisis of electronic waste (e-waste) generation poses serious environmental, health, and resource-related challenges, particularly to low- and middle-income countries. Each year, the world generates over 62 million tonnes of e-waste, only 22.3 per cent of which is formally collected and recycled. E-waste contains toxic substances, such as lead, mercury and cadmium, which pose serious health risks when improperly handled, while also resulting in the loss of valuable raw materials, such as gold, copper, and rare earth metals.

In Georgia, these global patterns are reflected in acute form in underserved regions like Zugdidi, where the absence of a centralised, municipality-led e-waste management system has created a growing environmental and public health concern. Informal disposal is widespread, with devices often ending up in household waste or left to accumulate at homes – exposing residents to toxic substances and harmful emissions.

Although UNDP Accelerator Lab Georgia's recent pilot initiative in Zugdidi showed that people are willing to dispose of e-waste responsibly, their ability to do so is severely limited, manifesting a classic "intention-action gap". The absence of formal collection and recycling infrastructure, combined with limited municipal technical capacity and a lack of user-oriented reward systems, all contribute to the problem. Furthermore, the absence of reliable data on the volume of e-waste generated and collected in Zugdidi impedes accurate assessment of the problem's severity and scale. These structural gaps ultimately constrain the scalability and sustainability of such initiatives. As a result, establishing a community-led governance system for an environmental initiative in a context marked by these deep-rooted constraints is likely to face significant barriers: at best, limiting public engagement, and at worst, undermining the initiative's sustainability over time.

This challenge is further compounded by low public trust in local government. According to the 2024 *Caucasus Barometer* survey by the Caucasus Research Resource Center (CRRC), 30 per cent of Georgians express distrust in local government, with an additional 27 per cent remaining neutral. Additionally, as our previous pilot initiative in Zugdidi revealed, engagement in municipal initiatives tends to be particularly limited among vulnerable groups, such as internally displaced persons (IDPs), further highlighting the persistence of the "intention-action gap" as it pertains to sustainable e-waste management. There is a clear need for a well-designed incentivisation scheme for Zugdidi residents, alongside parallel efforts to build trust between users and relevant stakeholders and to establish an inclusive and sustainable governance model.

Finally, our previous pilot demonstrated that weak incentives for private sector involvement present a major obstacle to achieving meaningful participation. Consultations with our partner Producer Responsibility Organisation (PRO), *Wasteless*, revealed that companies in Georgia's technology retail industry show limited engagement in Environmental, Social, and Governance (ESG) initiatives aimed at enhancing corporate reputation. Further, by failing to consistently monetise the value of used devices (through trade-in programs), they miss out on a key opportunity to turn e-waste into a revenue stream. Low private sector engagement highlights the need for stronger financial incentives to drive responsible participation.

Taken together, these factors – limited infrastructure, lack of reliable data on e-waste volumes, weak municipal capacity, low public trust, and limited private sector engagement – create a systemic barrier to addressing the e-waste challenge in Zugdidi and similar regions. Without intervention, this issue will continue to undermine both environmental sustainability and community health.

## Local Context

Building a sustainable e-waste management system is a priority stipulated in Georgia's national commitments through multiple legislative instruments, such as the Waste Management Code (2015) and Resolution No. 326 of Georgian Government on Technical Regulation on Management of Waste from Electric and Electronic Equipment. However, implementation of the Extended Producer Responsibility (EPR) regulations remains limited at the municipal level, where technical and institutional capacity is often lacking.

This is particularly evident in Zugdidi, a city in western Georgia and the capital of the Samegrelo-Zemo Svaneti region. Following the conflict in Abkhazia in the 1990s, Zugdidi became home to a large population of internally displaced persons (IDPs), many of whom continue to live in settlements with limited services. As the closest city to the Administrative Boundary Line (ABL), Zugdidi also holds strategic importance for the state, yet continues to face infrastructure and development challenges.

In underserved regions like Zugdidi, the lack of a formal e-waste management system has created an urgent environmental and public health challenge, despite growing demand for electronics and clear public willingness to dispose of devices responsibly. Discarded electronics are often dumped with household waste or left to accumulate in homes. Many residents keep broken or outdated devices stored in drawers or closets, unaware that these can slowly release toxic substances such as lead, mercury, and flame retardants into the indoor environment. This prolonged exposure, especially in small or poorly ventilated homes, poses potential long-term health risks, particularly for children and vulnerable groups. In addition to these risks, the absence of a formal e-waste system means valuable materials are lost, along with opportunities to create green jobs and build a circular economy model in line with Georgia's sustainable development goals. Internally displaced persons (IDPs), who often reside in settlements lacking proper waste disposal infrastructure, are particularly affected by the absence of safe disposal options and limited involvement in municipal initiatives.

Despite a demonstrated willingness among residents to dispose of e-waste responsibly, the absence of infrastructure, public incentives, and trust in local governance creates a persistent gap between intention and action – undermining public health, disproportionately affecting vulnerable communities, and hindering the implementation of Georgia's legislative commitments to sustainable e-waste management.

Against this backdrop, some efforts have been made to promote more sustainable e-waste practices. A key stakeholder in this regard has been the Producer Responsibility Organisation (PRO), *Wasteless*, which is the sole authorised non-profit legal entity in Georgia, responsible for managing waste from electrical and electronic equipment. *Wasteless* transfers collected waste to local contractors for analysis and decomposition, while exporting non-recyclable materials. In Zugdidi, *Wasteless* has several e-waste collection bins located at local technology retail stores. As part of UNDP Accelerator Lab Georgia's previous pilot in Zugdidi, *Wasteless* signed five additional MOUs with the local library, technology park, two schools, and an NGO representing Zugdidi's IDP population (IDP Women's Association "Consent"). The new stakeholders were actively involved in popularising the initiative by raising awareness within their target audience and monitoring the collection process. The experiment proved that building a community-driven governance system around e-waste management in Zugdidi has great potential, as the local civil sector is quite active and community leaders are successful at mobilising broader community support and participation. However, due to the changing national political context and the weakening role of the civil society, stakeholders from this sector may have more limited space for engagement, suggesting the need for building a self-sustaining e-waste management system in Zugdidi. Encouragingly, some stakeholders, such as the local library and technology park, have expressed interest in staying involved by raising awareness and engaging youth, helping to foster lasting community commitment.

Meanwhile, the private sector – particularly technology retailers and producers – has yet to play a meaningful role. Consultations with *Wasteless* revealed that companies in Georgia's technology retail industry show limited engagement in ESG initiatives or circular economy practices. Weak financial incentives and lack of consumer pressure have contributed to low uptake of trade-in programs or take-back schemes, limiting private sector contribution to a functioning e-waste system.

The Zugdidi Municipal Government has also emerged as a willing partner. A municipal representative actively participated in community consultations and workshops and expressed readiness to formalise collaboration through an MOU with *Wasteless*. Although the short timeline of the Accelerator Lab's pilot prevented the agreement from being finalised, such an MOU would enable the placement of *Wasteless* e-waste collection bins in public spaces, including municipal buildings, schools, and community centers, marking a critical first step toward establishing a visible, accessible, and community-integrated local e-waste collection network.

Building on these early partnerships and community engagement, there is a clear opportunity to co-design a scalable, inclusive model for e-waste management that could be replicated in other underserved regions of Georgia.

## Relevance to UNDP CO Priorities and Resource Mapping

(How does this project align with the overall objectives of the UNDP Country Office? Is it building on an existing initiative, or is it a new standalone project? If the project builds on an existing initiative, please provide further details, including a description of the original project, its donors, scope,

scale and any other relevant information. Additionally, is there any co-financing available, whether in the form of funding, human resources, or other types of project support?)

The proposed initiative is part of the UNDP Georgia Country Office's ongoing efforts to support the development of sustainable waste management practices in Georgia. More particularly, it is a next step in UNDP Georgia Accelerator Lab's 2024 pilot initiative in Zugdidi, which explored behavioural and community-driven approaches to electronic waste management in collaboration with PRO *Wasteless*, UNDP's Conflict Prevention and Recovery Portfolio, and the UNDP Zugdidi Project Office. As UNDP Georgia's in-house R&D unit, the Accelerator Lab applies local knowledge, innovation, and collaborative problem-solving to tackle complex challenges such as circularity and urban sustainability. In Zugdidi, the Lab addressed key barriers like the lack of formal infrastructure for e-waste collection, limited public awareness, and fragmented individual disposal practices. Through behavioural experiments – including the placement of e-waste bins in schools, IDP settlements, Zugdidi Library, and the TechPark, as well as targeted messaging and educational sessions – the project identified what motivates or hinders responsible disposal.

Findings showed that environment-focused messaging and strong community leadership, particularly from institutions like the local library, significantly boosted engagement. However, the experiment also revealed that infrastructure alone was not enough to drive behaviour change, as the absence of meaningful incentives and limited trust in proper e-waste handling remained strong barriers; one-off educational sessions in schools had limited impact, and engaging private sector actors (particularly technology retailers) without clear incentives proved more challenging than anticipated. The insights gathered from the experiment inspired a shift towards exploring more locally-driven, needs- and asset-based approaches to e-waste management in Zugdidi, leading us to consider blockchain technology as a potential solution to address the remaining challenges that constrained the project's scalability and long-term sustainability.

UNDP's role moving forward is envisioned to centre on facilitating systems change by convening diverse actors, supporting behavioural insights and participatory design approaches, and strengthening local capacity to deliver equitable environmental services. By catalysing private sector engagement and showcasing new forms of value creation, UNDP would help demonstrate scalable circular economy practices tailored to local realities. The initiative aligns closely with the Country Office's broader priorities on inclusive innovation, climate action, and governance transformation, and will serve as a testbed for models that can be adapted and scaled across other regions in Georgia.

The Accelerator Lab's activities, including the 2024 e-waste pilot initiative in Zugdidi, have been supported by funding from the Federal Ministry for Economic Cooperation and Development of Germany and the Qatar Fund for Development. However, UNDP Headquarters does not anticipate continued funding for Accelerator Labs beyond 2025, which will constrain our operational capacity unless alternative resources are secured. While exact contributions are still being defined, *Wasteless* has expressed interest in co-financing the initiative by investing in specific components, such as purchasing a smart bin, contributing to the creation and valuation of the initial token, and supporting awareness-raising efforts. In the coming months, the Accelerator Lab Georgia plans to pursue resource mobilisation with new donors, while also seeking access to post-acceleration funding opportunities offered by the SDG Blockchain Accelerator programme.

## Expected Impact (from CO perspective)

(Outline the intended outcomes from the Country Office's perspective. What would a successful pilot enable (e.g., policy change, improved service delivery, community empowerment, systems improvement, or scaled innovation)? Keep the focus on measurable or meaningful change.)

From the UNDP Georgia Country Office's perspective, a successful pilot would help develop a practical, evidence-based initial framework that lays the groundwork for addressing key challenges in e-waste management in Zugdidi – such as limited infrastructure, gaps in data on e-waste volumes, constrained municipal capacity, low public trust, and minimal private sector engagement.

Such a pilot would firstly demonstrate how existing e-waste collection infrastructure in Zugdidi can be used more effectively, while also testing ways to expand it. By engaging additional technology retail companies as partners, the pilot could support the placement of new collection bins in more visible and convenient locations across the city. Impact would be measured by the number of new bins installed, the number of retailers engaged, and increases in e-waste collected at these locations. This would not only improve access to safe disposal options but also provide early insights into what types of locations and partnerships are most effective. In turn, these learnings could help inform future decisions around scaling up infrastructure and improving service delivery in similar underserved areas.

The success of the pilot would also be reflected in better e-waste service delivery by generating data on collection patterns in Zugdidi. Even at a small scale, having more accurate information on where, how often, and how much e-waste is being collected would help local stakeholders better understand the scope of the issue. Over time, these insights could support more informed municipal planning and help lay the groundwork for future implementation of Extended Producer Responsibility (EPR) regulations by identifying practical needs and gaps in the current system and providing the evidence and institutional readiness needed for enforcement. Monitoring indicators, such as the number of municipal plans or policies referencing this data, or progress toward establishing EPR frameworks, would help assess how effectively the pilot supports evidence-based decision-making.

A successful pilot would also help rebuild public trust in local e-waste management by making the system more transparent and inclusive. By using blockchain technology to decentralise management and introduce an incentive-based reward system, the pilot could empower all residents – including vulnerable groups like IDPs – to participate actively and see tangible benefits from responsible disposal. This approach would help bridge the “intention-action gap” by making the process more trustworthy and rewarding. Impact would be measured not only through participation rates, but also through user feedback collected via surveys during the pilot, offering insights into public perceptions of fairness, accessibility, and trust. Over time, greater public confidence and participation could foster stronger collaboration among residents, civil society, and private sector stakeholders, helping to establish a more inclusive and resilient e-waste management system.

Lastly, a successful pilot would engage the technology retail industry more meaningfully in e-waste management by demonstrating the benefits of their participation. By creating financial incentives and showcasing how responsible disposal can become a revenue opportunity, companies may be encouraged to take a more active role. This increased private sector involvement could help expand

collection infrastructure, improve recycling rates, and strengthen the circular economy locally. Over time, building these partnerships would contribute to a more sustainable and collaborative approach to e-waste management in Zugdidi.

While lasting change in the system will take ongoing commitment, this pilot aims to set the foundation by developing an evidence-based framework, improving data collection, expanding community participation, and strengthening partnerships among local authorities, residents, and the private sector. These learnings will help guide future policy decisions, improve services, and support the possibility of scaling up successful approaches.

## Target SDGs and SDG Indicators

(List up to three specific Sustainable Development Goal (SDG) indicators that your challenge and proposed solution will directly contribute to. Be specific and focus on the indicators your work actively addresses, rather than those it only indirectly supports.)

### SDG 12.4.2

**Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment.**

The pilot directly contributes to SDG Indicator **12.4.2**, which tracks the amount of hazardous waste generated per capita and the proportion of hazardous waste properly treated. By improving e-waste collection infrastructure and leveraging digital tools, the pilot enables more accurate data gathering on the volume of hazardous e-waste collected and responsibly disposed of in Zugdidi. This enhanced data transparency supports better monitoring of hazardous waste management, helping local stakeholders understand and reduce improper disposal while promoting safe treatment practices in line with SDG 12.4.2.

### SDG 11.6.1

**Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated by cities.**

The pilot contributes directly to this indicator by expanding and optimising e-waste collection infrastructure through partnerships with local retailers and deploying accessible collection points. This increases the proportion of e-waste that is safely collected and managed, rather than being disposed of with household waste or stored at home. Additionally, the project improves local infrastructure, promotes community-led governance, and strengthens local capacities to reduce and manage e-waste. Together, these efforts foster a more resilient and sustainable urban environment by supporting safer waste handling, better service delivery, and enhanced community participation.

### SDG 17.17.2

**Amount of funding mobilised through public-private partnerships.**

The pilot fosters collaboration between local authorities, community organisations, businesses, and the national EPR organisation, *Wasteless*, to build a decentralised solution for e-waste management. This multi-stakeholder partnership mobilises new financial resources by engaging private sector retailers and impact investors through an innovative incentive and token-based funding model. Tracking the amount of funding generated via these public-private partnerships will provide

measurable evidence of progress toward this indicator, while demonstrating how cross-sector collaboration can address shared environmental challenges effectively.

## User & Problem Mapping

Understanding the users and stakeholders affected by the challenge is essential for building impactful and context-aware solutions. This section helps articulate who the primary users are, what they aim to achieve, and which other actors are involved or impacted.

### Primary User Persona

*(Describe the key user or beneficiary of your solution. Include relevant characteristics such as role, environment, goals, and challenges they face. This helps keep the solution user-centered.)*

The primary users of our solution are public users – specifically, Zugdidi residents – who are willing but currently unable to dispose of their electronic waste responsibly. This group includes individuals from diverse socio-economic backgrounds, with a significant portion living in underserved areas and IDP settlements. Their goals include protecting their health, maintaining clean households and neighborhoods, and contributing to environmentally responsible practices. However, they face multiple challenges: limited access to formal e-waste collection infrastructure, low levels of awareness about the risks of improper disposal, lack of financial incentives to engage in sustainable e-waste disposal practices, and a general lack of trust in local institutions. Many store unused or broken electronic devices at home due to a lack of clear, accessible alternatives. Despite these barriers, they have shown openness to participating in community-led initiatives when provided with transparent processes and accessible options. Further, consultations with residents highlighted that the availability of clear, transparent platforms combined with tangible incentives would be crucial to mobilising greater engagement. Their behaviour is shaped by practical constraints, not apathy, making them ideal partners in a user-centered platform designed to reward responsible action and promote sustainable habits.

The second key user group consists of technology retailers, ranging from large electronics chains to small tech repair shops, who are expected to integrate e-waste drop-off services (through placement of Wasteless e-waste bins) and token redemption programs into their customer engagement strategies. Retailers aim to attract and retain customers and unlock new revenue streams through green branding and circular economy participation. However, they face challenges such as limited awareness of the direct business benefits associated with e-waste management programs and the need for a simple and trackable system to facilitate participation. Through the platform, public users can bring their old electronics to participating retailers and earn \$RELOOP tokens (upon disposal in Wasteless bins) redeemable at partner stores, creating a mutually beneficial relationship. Additionally, while municipal governments are not immediate users, they are envisioned as future stakeholders who will leverage real-time data from the system to improve e-waste collection, increase transparency, and support local SDG localisation efforts, once adoption by retailers and residents is well established.

## User Story

(Frame the user needs in a simple narrative format that links the user, their goal, and the value the solution delivers. Use the format: "As a [user], I want to [goal], so that [value].")

As a public user, I want to dispose of their old electronics at a convenient location, so that I can earn rewards and ensure my waste is handled safely and responsibly.

As a retailer, I want to partner with a trusted Producer Responsibility Organisation (PRO) like Wasteless, so that I can attract more customers, strengthen my brand's sustainability image, and create a new loyalty channel that rewards responsible disposal and recycling.

### Future users:

As a municipal government, I want access to transparent, verifiable e-waste collection data, so that I can track progress toward SDG targets, improve local waste policies, and build public trust in environmental programs.

## Key Stakeholders/Partners

(Please list all the partners involved in this project. List all relevant parties who will interact with, benefit from, or influence the solution (this may include government agencies, NGOs, community members, or tech partners.))

**Wasteless:** Key stakeholder and primary e-waste management partner responsible for collection, transportation, recycling, and data reporting. Wasteless, as a PRO, plays a central role in ensuring proper handling of e-waste and providing critical insights to improve system effectiveness.

**Retail partners:** Large and small retailers (e.g., electronics stores, supermarkets), who provide convenient drop-off points and engage customers through reward programs. Their participation is essential for broadening access and incentivising responsible disposal.

**Municipal government authorities:** Future users of the platform who will leverage real-time data to inform policy decisions, improve e-waste management, and support SDG localisation efforts.

**Technology partners:** Creative Operations, Cardano blockchain ecosystem contributors (e.g., Aiken for smart contracts, Blocktrust for wallet integration, and other Web3 service providers).

**NGOs and environmental organisations:** Supporting public awareness campaigns, community mobilisation, and sustainability advocacy. Their involvement helps build trust, educate residents, and foster long-term behavioural change.

**Community members / public users:** Individuals (mostly residents of Zugdidi) who participate by responsibly disposing of e-waste and engaging with the token reward system. Their active involvement drives the platform's impact and sustainability.

**Crowdfunding and investment partners:** Organisations and individuals funding system expansion, token liquidity, and reward pools. Their backing is crucial to ensuring the platform's growth and viability.

## Solution Overview

This section describes your proposed solution in a clear and structured way. Focus on what the solution is, how it works, and how it uses blockchain and Cardano tools to deliver impact.

### Solution Summary

(Provide a description of your solution and explain how it addresses the development challenge. Highlight its uniqueness and relevance.)

**Phase 1 - Initial MVP - onboarding users & having a listing of available bins (Sprint-based)**

**Phase 2 - More functionality for retailers, expanding tokenisation among public and retailers**

**Phase 3 - Governance and Investment tokens**

Our proposed solution is a blockchain-powered e-waste management platform built on Cardano, designed to motivate responsible disposal of electronics while creating transparent value loops for residents, retailers, and local authorities.

**Phase 1** (MVP – 18th August 2025): Build on Acclab.s e-waste work in Zugdidi by developing a user-friendly platform that lists drop-off points and instantly rewards residents with spendable Eco-Credit tokens upon depositing unwanted electronics. These tokens can be redeemed at local participating shops or for discounts, creating immediate, tangible incentives for participation.

**Phase 2:** Expand tokenisation to include retailer-focused incentives such as tokenised gift cards and loyalty schemes, scaling e-waste collection with the engagement of Wasteless and other retail partners. This phase strengthens the retail ecosystem's role in driving sustainable behaviour by providing them a retailer portal.

**Funded Phase 3:** Transition to a Decentralised Autonomous Organisation (DAO) model, enabling community governance and introducing investment tokens. The DAO can integrate mechanisms like "E-Waste Futures," where importers pre-pay for recycling obligations through tokenised instruments sold to ESG funds or impact investors. This unlocks upfront capital to cover collection, transportation, and responsible recycling costs.

A public blockchain dashboard will display real-time statistics – devices collected, rewards issued, and environmental benefits – ensuring transparency for citizens, businesses, and municipal authorities, while aligning with SDG localisation goals.

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### Solution Summary

In Phase 1 (until 30 September 2025), the goal is to build on Acclab e-waste work in Zugdidi and create a blockchain-based e-waste management platform as a technical solution. It will motivate Zugdidi residents to bring unwanted electronics to certified drop-off points by instantly awarding them spendable Eco-Credit tokens usable at local shops and for local discounts (the said tokens will be fully redeemable in the following phase of the pilot, once funding is secured). Once tested with the local residents, the pilot moves to **Phase 2**. The second phase implies devising financial incentive schemes for local retailers (e.g., tokenised gift cards) and scaling up of the collection of e-waste with the engagement of Wasteless.

In the longer-term perspective, as an overarching goal, the solution aims to create a blockchain-powered e-waste management platform operating as a DAO - an organisation represented by rules encoded as a computer program, that is transparent, controlled by its members, and operates without a central authority. DAOs are built on blockchain technology and use smart contracts to automate decision-making and manage finances. DAO e-waste management process can be further developed to include importers pre-paying small "E-Waste Futures" that are tokenised and sold to impact investors or ESG funds, releasing immediate capital to cover the full cost of collection, transport and responsible recycling. A public dashboard will show real-time totals of devices collected, rewards issued, and environmental benefits achieved, keeping the process transparent for citizens, businesses and city officials.

## Core Functionalities

(List the key features or capabilities of your solution with descriptions. These should align with the user needs and the challenge described earlier.)

- Feature 1 - description
- Feature 2 - description
- Feature 3 - description

### Feature 1

Eco-Credit rewards system: Residents earn blockchain-based Eco-Credit tokens instantly when they drop off e-waste at certified collection points. Tokens are redeemable at participating local retailers for goods, services, or discounts, creating immediate incentives for sustainable behaviour.

### Feature 2

Retailer incentive tools: Retailers access a dashboard to manage tokenised gift cards, loyalty rewards, and promotional campaigns that encourage customer participation in e-waste recycling while boosting local commerce.

### Feature 3

Public transparency dashboard: A real-time, blockchain-backed dashboard displays data on devices collected, rewards issued, and environmental impact, ensuring trust and accountability for citizens, businesses, and municipal authorities.

### Feature 4

Future DAO governance layer: A planned governance model enabling stakeholders to propose, vote on, and fund new recycling initiatives, supported by smart contracts and Cardano-native tokens for investment and operational decision-making.

## Tech Stack Overview

(Briefly list the main tools, technologies and external integrations used to build your solution. Mention front-end and back-end elements, data sources, etc.)

**Blockchain layer:** Cardano blockchain for token minting (Eco-Credit tokens), smart contract logic (Plutus/Aiken), and metadata tagging for SDG alignment.

**Identity & verification:** Atala PRISM for verifiable credentials to confirm certified retailers and drop-off points.

**Front-end:** React.js interface for residents and retailers, optimised for mobile-first interaction.

**Back-end:** Node.js/Express server for API handling, with PostgreSQL for off-chain data storage and integration.

**Wallet integration:** compatible Cardano light wallet for token transactions.

**Mapping & geolocation:** Mapbox API for locating certified e-waste drop-off points.

**Analytics:** Integration with blockchain explorers and analytics tools for environmental and transaction reporting.

## Cardano-Specific Elements

(Describe how your solution leverages the Cardano blockchain (e.g., use of verifiable credentials (VCs), token minting, Plutus smart contracts, metadata tagging, etc.))

Our solution integrates multiple Cardano-native capabilities to ensure trust, transparency, and incentive alignment:

**Token minting (native assets):** Eco-Credit tokens are minted on the Cardano blockchain as native assets, eliminating the need for custom token contracts and ensuring low transaction fees. These tokens function as both rewards for citizens and incentive instruments for retailers.

**Plutus smart contracts:** Smart contracts automate reward issuance upon verified drop-off of e-waste, manage tokenised gift card creation for retailers, and in future phases govern DAO voting and fund allocation for recycling initiatives.

**Verifiable credentials (Atala PRISM):** Retailers and certified collection points are issued blockchain-based verifiable credentials confirming their legitimacy. Residents can scan and verify these credentials instantly, ensuring they interact only with trusted partners.

**Metadata tagging for SDG tracking:** Each token transaction includes metadata tags referencing relevant UN SDGs, such as responsible consumption/production (SDG 12) and climate action (SDG 13). This enables transparent impact reporting for donors, ESG funds, and municipalities.

**Decentralised governance preparation:** The long-term DAO model will leverage Cardano's governance ecosystem to enable stakeholder proposals, voting, and fund disbursement through transparent, on-chain mechanisms.

**Low-cost, eco-friendly transactions:** Cardano's proof-of-stake consensus ensures low-carbon operations aligned with the project's environmental mission, while also keeping transaction fees minimal for all participants.

## Prototype Plan (Sprint-Based)

This section outlines your team's rapid prototyping plan. The goal is to build a functional and demonstrable version of the solution within 10 working days, with user feedback integrated.

### Prototype Goal

(State what your team aims to build and validate during the sprint. Keep it focused, achievable, and linked to the broader MVP vision.)

The prototype aims to build and validate a functional blockchain-based rewards flow for e-waste collection, focusing on user onboarding, verified drop-off, and automated token rewards. During the Sprint, the system will enable residents to locate certified e-waste collection points within participating retailers, verify their drop-off via QR code scanning and photographic proof, and receive \$RELOOP tokens in their digital wallet once the disposal is confirmed (through manual verification). This specific phase will demonstrate the technical feasibility of integrating Cardano-native token minting, QR-based verification, and a simple user interface for interaction.

### Expected Outputs

(List the minimum outputs required for a successful prototype. These should be specific, measurable, and demo-ready.)

- One working interaction (e.g., VC issuance, token minting)
  - On-chain or hashed output with SDG metadata
  - User interface (form, display, interaction)
  - Stakeholder feedback (minimum 3 sessions)
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- Working interaction for user drop-off, including QR code scanning, image submission, and verification process.

- Successful on-chain minting of \$RELOOP tokens upon verified deposit.
- SDG-linked metadata recorded on-chain for each transaction.
- User-facing interface to view collection points, submit drop-off evidence, and track token balance.
- At least three structured stakeholder feedback sessions with users (Zuggidi residents) and PRO Wasteless to guide improvements, preceded by internal testing.

## Sprint Timeline

(Break down the 10-day sprint into tasks and outcomes. Use this as a working plan for the team to stay aligned and focused. The table below is just an example. Please feel free to adapt the tasks and outcomes based on your solution's specific needs and development approach.)

Day	Description	Outcome
1	Define prototype scope, user stories, and SDG-linked impact indicators	Agreed scope, success metrics, and SDG mapping documented
2	Map full user flow (drop-off → verification → token minting) & design UX	Figma wireframes and interaction flow diagrams ready
3	Build core UI for collection point listing, QR scan, and photo submission	Functional frontend screens in React
4	Integrate Cardano chain (wallet connection, token minting, metadata tagging). The tokens will be fully redeemable in the following phase of the pilot, once funding is secured.	\$RELOOP token test minting completed on testnet
5	Internal QA of full flow, fix critical issues	Working clickable flow end-to-end
6-7	Conduct stakeholder testing with residents and Wasteless, preceded by internal testing	Usability feedback and improvement list created
8-9	Implement feedback, improve UI/UX, refine verification & reward logic	Polished, stable, and demo-ready prototype
10	Record demo, finalise documentation, submit final prototype	All deliverables complete and submission sent

## Success Metrics & Milestones

Tracking progress throughout the accelerator is key to building momentum and measuring real impact.

Below is a set of baseline success metrics that all teams are expected to work toward during the sprint, MVP refinement, and pilot-readiness phases. These ensure a consistent level of development and stakeholder engagement across all projects.

Teams are also encouraged to define additional metrics that are specific to their solution, context, and strategic goals. These custom metrics can relate to: social or environmental impact, technical milestones, community adoption, strategic partnerships, innovation outcomes.

## Sprint Phase

Focus: Rapid prototyping, initial user testing, and validation of core functionality.

Category	Baseline Metric	Project Specific Target
User consultations - Week 1	Conduct at least one initial user consultation session with Zugdidi residents and PRO Wasteless	Reach out to Zugdidi youth to conduct an online collaborative brainstorming workshop on youth and general public priorities (motivators & barriers) influencing participation in a reward-based e-waste management system to inform solution design and onboard youth volunteers for the manual verification process.
Blockchain Interaction	Implement at least one blockchain function (token minting, VC issuance, or on-chain hash)	Mint \$RELOOP tokens on Cardano testnet upon verified e-waste drop-off, with SDG-linked metadata tagging
User Interface	At least one working UI screen or flow (form, dashboard, or display)	Fully functional UI for listing collection points, scanning QR codes, uploading drop-off photos, and viewing rewards
Stakeholder Testing	Minimum 3 testing/feedback sessions with relevant users or stakeholders	Test with at least 2 groups: local residents and Wasteless team
SDG Integration	Integrate SDG logic or tags into metadata, UI, or outputs, focused on actively addressed indicators	Tag blockchain transactions with SDG 11 (Sustainable Cities) and SDG 12 (Responsible Consumption & Production)
Demo Readiness	Demo link or video walkthrough prepared and submitted by Day 10	Public demo showing end-to-end flow: drop-off → verification → token issuance → reward redemption
Strategic partnerships	Bring at least one strategic partner on board	Fully involve PRO Wasteless in both the Sprint design and implementation phases → task Wasteless with engaging two electronics retail companies to secure their agreement on MVP testing arrangements and related logistics.

## Post-Sprint Refinement

Focus: Iterating based on feedback, improving functionality, and aligning with pilot opportunities.

Focus Area	Baseline Metric	
Feedback Integration	Minimum two user- or stakeholder-driven changes implemented in logic or UX.	Integrate retailer suggestions for easier drop-off validation, and add photo verification improvements based on user tests.
MVP Stabilisation	Functional testing completed with consistent results and no major blockers.	Achieve 95%+ successful token issuance on verified drop-offs across 10 consecutive test transactions
Stakeholder Alignment	At least one follow-up session with CO or stakeholder to discuss next steps.	Conduct a joint planning session with Wasteless and the Zugdidi community representatives to define a pilot launch roadmap.

## Pilot Readiness

Focus: Preparing the solution for deployment and scaling.

Goal Area	Suggested Metric
Institutional Buy-In	<ul style="list-style-type: none"> <li>- CO expresses interest in pilot exploration; early MoU or agreement in discussion.</li> <li>- National partner commitment formalized through an MoU between Creative Operations and PRO Wasteless</li> </ul>
Solution Readiness	<ul style="list-style-type: none"> <li>- MVP tested in an extended or external environment; improvements implemented.</li> <li>- Reviewing the flow (user journey process mapping).</li> <li>- Youth volunteers onboarded.</li> <li>- Exploration of affordable resources and technology for an early pilot.</li> </ul>
Sustainability Path	<ul style="list-style-type: none"> <li>- Initial plan for post-program ownership or funding drafted.</li> <li>- 3 pilot phases outlined.</li> </ul>

	<ul style="list-style-type: none"> <li>- Financial sustainability opportunities explored + one proposal submission completed by Solution Maker.</li> <li>- Co-financing opportunities discussed with PRO Wasteless.</li> <li>- Pilot discussed internally within the UNDP Georgia Country Office with ongoing initiatives, focusing on environment and local development for potential synergies.</li> </ul>
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## Cumulative Tracking Suggestions

Consider using a simple dashboard or milestone tracker across the weeks to monitor:

- % completion of prototype milestones
- % of users tested
- % of stakeholder feedback items received & integrated
- % SDG contribution implemented in technical flow
- Progress toward pilot validation (e.g., 0-100 scale)

## MVP Planning Table

After the prototype sprint, you'll begin shaping the full MVP. This table helps identify what's already been built, what needs improvement, and how each component will evolve into a pilot-ready version.

Component	Prototype Status	Improvement for MVP
UI/UX	Basic form and drop off built	Responsive layout, photo upload experience, Live QR Code scanning]
Blockchain	Token minting tested for \$RELOOP rewards	Automated QR Code verification, wallet integration and on-chain metadata.
SDG Tags	Filterable SDG Tags	Visual Impact tracker for collected e-waste
Feedback	Stakeholder, user sessions	Users and group testing with PRO Wasteless

## Risk & Assumptions

Every project has uncertainties. Use this table to proactively identify key risks and assumptions and describe how your team plans to address them.

Risk/Assumption	Description	Risk Level	Risk Mitigation Strategy

Limited Cardano experience	The team lacks deep technical knowledge of Cardano-specific components such as Plutus contracts.	Low	Pair devs with Cardano mentors.
Low user engagement	Users may not participate in testing or provide meaningful feedback.	Medium	Pre-schedule testing calls with committed participants (Zugdidi youth and their parents) and give out certificates to youth as a reward for participating in a sustainability-focused activity.
Manual verification delays	Manual verification may slow down token reward allocation.	Medium	Batch verification and incentivised youth volunteers (receiving participation certificate) to speed verification.
Retailer onboarding resistance	Some retailers may be hesitant to adopt the technology.	Medium	Start with early adopters and build success case studies with more incentives for retailers, looking at solving some of their key problems. Actively engage Wasteless in negotiations with electronics retail industry representatives.
Token volatility risk	If \$RELOOP tokens become volatile, users may lose confidence in its value.	Low	Fix token to a stable token, and limit redemption cycles based on available liquidity to buy back the token.
Fundraising delays	If funds are not secured on time, further development of the pilot will be delayed.	High	Look into and apply for funding opportunities with new donors, co-financing options, as well as post-acceleration funding opportunities offered by the SDG Blockchain Accelerator programme.

## Team Profile

This section provides a comprehensive overview of the individuals and organizations behind the development and implementation of the proposed solution. It highlights the complementary expertise of both the Solution Makers and the Challenge Owners, underscoring the collaborative foundation of the accelerator.

## Solution Makers

Introduce the team behind the solution, highlighting relevant skills and backgrounds that contribute to your ability to execute this project successfully.

### Team Name

Creative Operations (Nairobi, Kenya)

### Team Members & Roles

(Briefly list team members and their core roles or responsibilities)

- Fabian Owuor - Solution Architect
- Joyce Kyalo - Lead Developer

## Challenge Owners

The Country Office or institutional partners who defined the development challenge and provided critical context, feedback and collaboration throughout the accelerator.

Challenge Owner Organization Name:

UNDP Georgia - Accelerator Lab (Tbilisi, Georgia)

### Team Members & Roles:

(List key representatives and their roles)

Khatuna Sandroshvili - Innovation Specialist/AccLab Lead and Head of Experimentation

Nita Gegeshidze - Head of Exploration

Mariami Dangadze - Head of Solutions Mapping

### Area of Focus:

(Brief statement summarizing the thematic area, e.g., financial inclusion, public service transparency)

Inclusive e-waste management leveraging circular economy models, decentralised governance, and public-private collaboration to promote sustainable environmental and economic outcomes.

## Notes & Insights

Use this section to capture key learnings, challenges, or insights discovered during prototyping. This could include quotes from stakeholders, reflections on usability, or ideas for future iterations.

(Examples:

- "Users found the onboarding form too long."

- "Stakeholders appreciated transparent SDG contribution."
- "Potential opportunity to integrate with local registry in next phase."

The prototype development phase included intensive consultations with the key stakeholders on the ground.

An online user consultation session held on August 1st brought together Zugdidi youth for a collaborative brainstorming workshop, during which they identified key priorities for both the general public and youth user groups.

#### **Youth priorities:**

- Hands-on learning opportunities and gamified approaches to recycling for awareness raising.
- Practical rewards that cater to their needs (e.g., bookstore vouchers, gaming passes, tech gadgets).

#### **General public (e.g. their parents and family members) priorities:**

- Tangible rewards for participation.
- Simple, user-friendly platform for e-waste disposal.
- Special interest in household appliances (kitchen appliances, larger items - fridges, washing machines, etc.)
- Awareness of the importance of e-waste recycling and rewards.

Georgia Team (UNDP Georgia Accelerator Lab) also reached out to **PRO Wasteless** at the onset of the prototype design process and engaged them in weekly discussions with the extended team of UNDP Georgia/AcClab Team, Creative Operations, AltFinance Lab, and EMURGO Labs. The consultations with PRO Wasteless covered both immediate activities, as well as longer-term systemic problem solution evolution perspectives at the national scale.

The key questions raised by PRO Wasteless have been as follows:

- How are roles, responsibilities and mandates distributed among the stakeholders?
- How will the legislative obligations for Wasteless as a PRO be reflected in the DAO platform?
- What are the ownership structures and rights in the partnership?
- How are intellectual property (IP) rights and data ownership handled?
- Who will be responsible for services and promotions under this initiative?
- Is there a long-term agreement in place or envisaged between the involved parties?
- What lessons or best practices can be shared from similar collaborations, if any?

Other points raised by PRO Wasteless also included:

- Infrastructure alignment (e.g. smart bins)
- Compliance with e-waste recycling mandates.
- Scalable, sustainable systems that reinforce the circular economy.
- Alignment with environmental goals.
- Transparent processes for community partnerships and results-driven accountability.
- Efficient coordination of e-waste collection, verification, and processing.
- Alignment with government regulations for e-waste recycling.
- A sustainable system to manage and scale recycling operations.
- Mitigation of competition from informal collectors.
- Long-term funding stability.

In addition, the consultations covered the needs of other potential parties to be engaged in the DAO platform, summarised below:

#### **Retailers (small- to medium-sized businesses and large chains)**

- Financial returns or visible benefits from participation (not simply PR value).
- Clarity on costs (e.g., subscription fees) and potential revenues from token programs.
- Opportunities to attract new customers and retain current ones through trade-in and tokenisation schemes.
- Affordable pilot participation costs.
- Insights into bin usage and user engagement (data).
- Competitive differentiation, eco-aware branding aspirations, and supply chain alignment.
- Coordination at scale.

#### **Token investors**

- Assurance of returns and growth potential.
- Trust in the value of the tokens.
- Clear understanding of token lifecycle and usage.

## **Pilot Vision & Scalability Plan**

This section looks beyond the prototype to outline the long-term vision for piloting and scaling your solution.

### **Pilot Vision (6-12 months)**

*(Describe what success would look like in a real-world pilot. What key outcomes would you aim to demonstrate?)*

Success for the pilot would mean demonstrating a functional, trusted, and scalable e-waste collection and reward system that actively engages retailers, the public, and potential municipal stakeholders. By the end of the 6–12 month period, the platform would have at least 10 active retail collection points integrated with QR-based verification, over 500 verified public users depositing e-waste, and \$RELOOP tokens circulating as rewards that can be redeemed for goods or services. Manual verification processes would be refined to handle scale, with initial automation features (through smart bins) explored and potentially implemented. Data from the blockchain would provide transparent reporting on collected volumes, verified transactions, and SDG-aligned impact metrics.

The pilot would also secure municipal interest and at least one MoU for expanded adoption, proving the model's potential for nationwide replication.

## Target Users or Communities for Pilot

(Indicate who will benefit from the pilot deployment, specific regions, stakeholder groups, or institutions.)

Retail partners: Initially mid-sized retailers partnered with Wasteless, with expansion to smaller community shops acting as e-waste drop-off points.

Public users: Local residents in the pilot region motivated by environmental impact and token rewards.

## Scalability Plan

(Explain how you envision scaling the solution after the pilot. What elements are reusable or adaptable across contexts?)

Beyond the pilot, our focus is on scaling the platform both geographically and functionally to ensure long-term impact and sustainability. Building on the initial implementation in Zugdidi, we aim to use the insights and data gathered during the pilot to engage additional municipalities for platform adoption and integration into local waste management strategies. This would serve as a key step toward expanding the model beyond Zugdidi to other underserved regions in Georgia facing similar e-waste challenges.

We also see strong potential to grow the network of retail partners beyond the original 10 pilot locations. By demonstrating value for retailers, such as increased consumer count, improved sustainability branding, and participation in a circular economy, we anticipate broader interest from both national chains and smaller local tech shops. This expansion will be driven by stakeholder feedback and performance data, helping us tailor the incentives and user experience to what works best in real-world settings.

On the technical side, we plan to continuously refine the platform based on user feedback collected during the pilot, particularly from residents and retail partners. Early manual verification processes will be streamlined and gradually automated to ensure scalability. Additional user features, such as improved wallet access, clearer reward tracking, and localised engagement tools, will also be introduced.

Ultimately, the pilot serves as a proof of concept not only for technical functionality but for building trust, partnerships, and behavioural change. Its success lays the groundwork for replicating the model across and beyond Georgia (e.g., in Kenya, East Africa), adapting to new contexts, and contributing to national goals on e-waste reduction, circular economy practices, and SDG localisation.

## Support Needed

(Briefly outline any technical, policy, or funding support required to move forward with a pilot or scale-up.)

To advance the pilot initiative in Zugdidi and support future scale-up, a combination of technical and funding support is required. The Accelerator Lab's current activities are funded through 2025 by the Federal Ministry for Economic Cooperation and Development of Germany and the Qatar Fund for Development. However, the anticipated cessation of UNDP core funding for Accelerator Labs post-2025 poses a significant operational challenge. Therefore, we are actively seeking alternative funding sources, including some contributions from Wasteless, which has expressed intent to co-finance some of the key project components. For longer-term success, however, additional financial support would be required to scale the platform to additional municipalities, expanding the retail partner network, and enhancing the platform based on user feedback during the pilot phase. While actively engaging in resource mobilisation with new donors, UNDP Georgia Accelerator Lab plans to also seek access to the post-acceleration funding opportunities offered by the SDG Blockchain Accelerator programme.

As for the technical support, we are building the solution in three phases. The second phase of the pilot entails offering generated tokens to ordinary users. We need to build the solution in a user-friendly way so that users can easily receive tokens and have automatically created wallets that they do not necessarily need to login into. This phase looks at DAO and investment tokens. We need help in structuring them in a way that investments are not diluted and the bond tokens are available for users and especially retailers. The primary focus of technical support would be on ensuring a seamless user experience, particularly for users with limited or no prior knowledge of blockchain technology.

## Sustainability & Business Model (optional)

If relevant, describe how the solution can be sustained over time (financially, operationally, or institutionally).

### Business or Funding Model

(Will your solution generate revenue, rely on grants, or operate through public partnerships?)

The proposed blockchain-powered e-waste management platform adopts a hybrid funding model that combines revenue generation, private sector partnerships, and limited public support for financial sustainability.

- Revenue generation: The introduction of the “Eco-Credit” token system incentivises participation and drives value creation. Residents earn tokens for responsible e-waste disposal, redeemable for goods or services, drawing local retailers into the economic ecosystem. Retailers benefit from increased engagement and customer loyalty, creating a feedback loop that sustains their financial contributions to the initiative.

- Private sector partnerships: The collaboration with a PRO, such as Wasteless, anchors the solution to the EPR framework. This ensures funding from corporations obligated to manage waste under regulatory requirements, reducing dependence on municipal budgets.
- Public Partnerships and grants: While the platform encourages private sector involvement, it will likely rely on financial support from development organisations to fund the pilot phase and scale initial awareness campaigns. Over time, this reliance is expected to decrease as private investment and system-generated revenues grow.

## Key Resources & Partnerships

*(What ongoing resources (e.g., cloud services, development talent, regulatory access) are needed to maintain and grow the solution?)*

To operate and scale the solution effectively, several ongoing resources and key partnerships will be critical:

- Technical resources:
  - **Cloud computing platforms:** Reliable and scalable cloud infrastructure to host the blockchain platform. We could look at using AWS or other known cloud solutions.
  - **Development talent:** Continuous improvement and maintenance of the platform require skilled blockchain developers. We will need 2 more dedicated developers for frontend and backend during the next development cycles.
- Regulatory access:
  - Government support: Collaboration with PRO Wasteless and municipal authorities for approval and oversight of collection points and ensuring proper e-waste disposal policies.
  - Compliance: Adherence to EPR guidelines and other waste management regulations.
- Partnerships with:
  - PRO Wasteless:
    - As a key partner, PRO Wasteless plays a central role in facilitating token-backed collection and supporting the operational design of the pilot. Their engagement includes negotiating with and bringing on board technology retail companies, as well as providing logistical support (e-waste collection, transportation, etc.), as per their mandate. Their involvement also entails co-financing specific components, such as the smart bin deployment, initial token issuance, and public awareness efforts, as well as helping ensure the platform aligns with circular economy principles and EPR frameworks.
  - Local retailers:
    - Strategic partnerships with retailers are crucial for creating a network for Eco-Credit redemption. Retailers' sustained participation ensures the value of the token system.
  - Educational & community engagement efforts:
    - Funding for awareness campaigns to educate residents on the importance of e-waste management and incentivise long-term engagement.

## Long-Term Ownership / Maintenance

(Who will manage and maintain the solution after the pilot, your team, a partner, or a public agency?)

Long-term ownership and maintenance of the solution will rely on a multi-stakeholder governance model. This structure ensures the gradual transition of responsibilities and builds capacity among involved entities:

- Initial management by the Project Team: During the pilot phase, the core development team will manage operations, ensuring the blockchain platform functions as intended and achieves set benchmarks.
- Partnerships for maintenance post-pilot:
  - Private sector ownership: Over time, elements of the platform, particularly the Eco-Credit network, can be handed over to private entities such as retailers and Wasteless for operational management.
  - Public agency oversight: Municipalities and public waste management agencies can maintain oversight responsibilities, ensuring alignment with government policies and SDG objectives.
- Shared responsibility model: A hybrid of public-private collaboration would ensure robust long-term management. Wasteless can act as the primary operational organisation responsible for scaling the solution with local community and retailers' active engagement.

## Deliverables Checklist

Use the checklist below to ensure all relevant final materials are prepared and submitted for review.

These are the suggested key outputs from the prototype sprint, not all items may apply to every team or solution, so please adapt as needed based on your project's scope and stage.

Please link all deliverables in a dedicated shared folder for your team for easy access by the program team and stakeholders.

- Prototype demo link
- Source code / GitHub repo
- Documentation / ReadMe
- SDG metadata logic
- Feedback summary
- Video walkthrough
- Feedback from Country Office
- Next steps agreed (e.g., pilot planning?)

# Team Reflection

Use this space to share key takeaways and reflections from both the Challenge Owner and Solution Maker teams. This dual perspective helps document alignment, evolution of understanding, and mutual growth during the accelerator journey.

## Challenge Owner's Perspective

(Examples from the Challenge Owner's Perspective:

- "We gained a deeper understanding of how blockchain can be applied to solve complex development issues within our country context."
- "Collaborating closely with technical teams helped us refine our challenge statement and prioritize features for maximum community impact."
- "This experience helped us develop internal capacity for innovation-focused partnerships, which we intend to scale."

- We learned a great deal about blockchain technology itself and gained a deeper understanding of how multiple stakeholder perspectives can be taken into account in building a blockchain-powered solution for waste management in underserved areas like Zugdidi with great potential for self-sustainability.
- Creative Operations colleagues were very patient and engaging when answering our questions. Working with them has been an extremely enriching experience, both intellectually and professionally, for us as an R&D unit within UNDP Georgia, as it has offered us new ways of thinking about how we can use technology in system design for long-term impact.
- Bringing PRO Wasteless on board from early on in the joint discussions with Creative Operations proved crucial in several key ways:
  - It allowed for smoother cross-country collaboration between UNDP Georgia Accelerator Lab and Creative Operations, as Wasteless provided invaluable insights on the local Georgian context, Wasteless' operations, and their legal obligations as an EPR organisation.
  - It ensured alignment on shared goals from the outset: Creative Operations colleagues actively engaged in asking thoughtful questions and collaborating with the Wasteless team to fine-tune the strategy and refine the solution, as needed.
  - Being familiar with the details of the initiative from early on makes Wasteless partners uniquely positioned to lead communication with electronics retailers. Their established social capital and credibility makes them a trusted local partner capable of effectively engaging retail companies, explaining the initiative, and securing their participation in the incentive scheme.
- Conducting baseline user research through an online collaborative brainstorming workshop with Zugdidi youth proved extremely helpful in two ways:
  - We gained valuable insights into the motivators and barriers influencing participation in a reward-based e-waste management system among local youth and the general public (their parents and family members).
  - We successfully onboarded youth volunteers to support MVP testing, with a particular focus on the manual verification process for collected e-waste.
- Taking advantage of the resources and guidance offered by the extended pool of partners (Creative Operations, EMURGO Labs, UNDP AltFinLab) in the framework of the SDG Blockchain Accelerator programme has proved extremely helpful in shaping the design and implementation of the Sprint.

## Solution Maker's Perspective

(Examples from the Solution Maker's Perspective:

- This was our first deep dive into Cardano, and while our team had limited prior experience, the process has expanded our capabilities in smart contracts, token minting, and DAO governance. Cardano offers ease-of-use features—such as straightforward access to test tokens—but as a relatively new platform for us, it remains a continuous learning journey.
- During user testing, we realized that ease of use was just as critical as trust and transparency. Many non-technical users found wallet setup and management challenging, especially those unfamiliar with blockchain. To address this, we refined our approach to make onboarding seamless while still allowing access to tokens through simple wallet integrations. We layered the token model into three categories: user tokens for everyday interactions, retailer tokens structured as bond tokens, and investor tokens for funding flows. This structure balances accessibility with regulatory clarity, ensuring that all stakeholders—whether users, retailers, or investors—can interact with the platform without friction.
- We've learned how important it is to incentivize users. Like most emerging technologies, blockchain adoption often requires an initial push before it can reach mainstream use—especially in areas like e-waste management. Driving adoption in e-waste management requires more than just technology—it requires changing user behavior. Incentives provide that crucial bridge, making it easier for people to shift from old habits to sustainable, blockchain-enabled solutions.
- Rather than a short-term project, we're building a self-sustaining system designed to scale, adapt, and thrive without constant intervention.
- "We've gained valuable insights from the UNDP team and their reports, which have significantly shaped our approach. Their expertise and experience have provided us with a more grounded and realistic outlook on the solution.