

# Building Rwanda's Digital Backbone for Agriculture

**Designing Scalable Systems that Transform Economies**

*Innovating Rwanda's Agro-Input Supply Chain through Technology and Trust*

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Presenter | [solution-polaris.com](https://solution-polaris.com)



# Transforming Rwanda's Agro- Input Subsidies

Overcoming systemic barriers to empower millions of farmers with a secure, transparent, and efficient digital solution.



Millions Of Farmers Depend On **Government Subsidies** For Fertilizers And Seeds



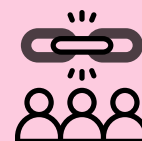
Existing **Paper-Based System** Caused Delays And Inefficiencies



**Fraud Risks** And Loopholes Undermined Subsidy Distribution



Previous Costly IT Projects **Failed To Deliver**, Wasting Resources



**Loss Of Trust** Eroded Confidence In The Subsidy Program



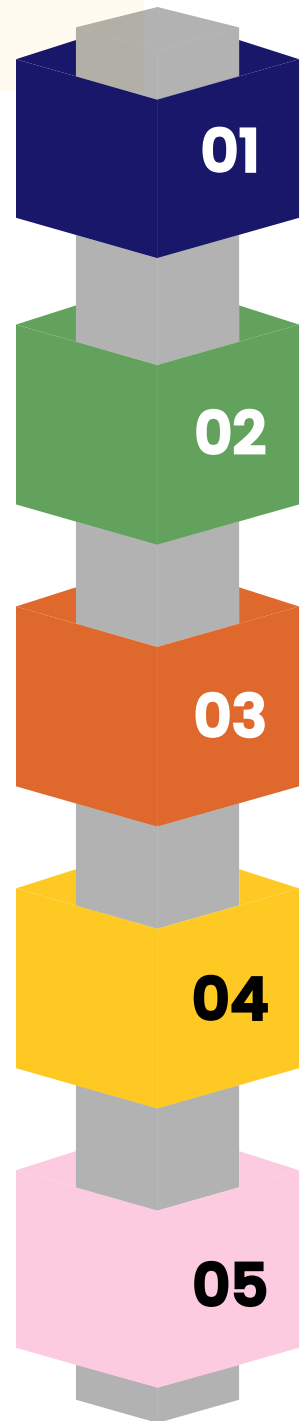
Instead of creating another isolated IT system, the vision was to build a **national digital backbone**—a fresh, unified platform designed from scratch without legacy code. This powerful ecosystem seamlessly connects importers, suppliers, distributors, agro-dealers, and remote farmers. It offers practical access for rural users while enabling comprehensive government oversight, unifying the entire agricultural value chain on a single, traceable platform.

# Building a National Digital Backbone from Zero

A unified ecosystem connecting every player in the agricultural value chain without legacy constraints

# From Zero to a Unified Ecosystem

Using land size, crop type, and soil data to recommend optimal farming inputs



## Self-Registration

Farmers can register themselves instantly. No paperwork and no intermediaries. A simple USSD code gives every farmer a digital identity in the system.

## Linked to Land Records

The platform connects directly to Rwanda's national land database. It verifies ownership automatically and links each farmer to their actual plots.

## Smart Input Calculation

Using land size, crop type, and soil data, the system automatically calculates what each farmer needs. Fertilizers, seeds, and other inputs are recommended using the best agronomic models.

## From Harvest to Market

When the season ends, the same platform connects farmers to markets, buyers, and cooperatives. It turns harvest into real income opportunities.

## Financial Inclusion Engine

With digital records, verified land data, and transaction history, farmers can finally access credit and financial products built on trust and evidence, not guesswork.

# Transforming Agro-Input Distribution with Speed and Transparency

Digitally accelerating Rwanda's fertilizer supply chain to eliminate fraud and enhance real-time oversight



Achieved **speed** by reducing processing time from weeks to minutes



Eliminated **ghost beneficiaries** and missing stock to prevent fraud



Enabled **real-time tracking** of fertilizer movement and demand hotspots



Brought full **transparency** and traceability to a vital economic sector



Dramatically improved operational **efficiency** and government **accountability**

# Building Trust and Inclusion with the SNS Platform

How the Smart Nkunganire System Transformed Rwanda's Agricultural Finance by 2019

**Restored trust** through fully traceable transactions, enhancing transparency.

Enabled banks to assess **agricultural risks** accurately using real data instead of guesswork.

**Financial inclusion** expanded as previously invisible farmers proved land ownership and activities.

Unlocked critical **access to credit** for farmers by validating their agricultural profiles.

By 2019, SNS became a **national pillar** embedded in Rwanda's agricultural and financial systems.

# Key Impact Metrics (Smart Nkunganire System)

2.4M

## Farmers Registered

Farmers actively registered and benefiting from the system

1,900

## Agro-Dealers

Authorized dealers distributing agricultural inputs nationwide

800+

## Agronomists

Professionals providing technical guidance and extension support

36+

## National Suppliers

Registered agro-input suppliers integrated into the system

131,380+  
metric tons

## Agri-Inputs Distributed (per year)

Total volume of seeds, fertilizers, and other inputs distributed

85,145,000,000  
RWF

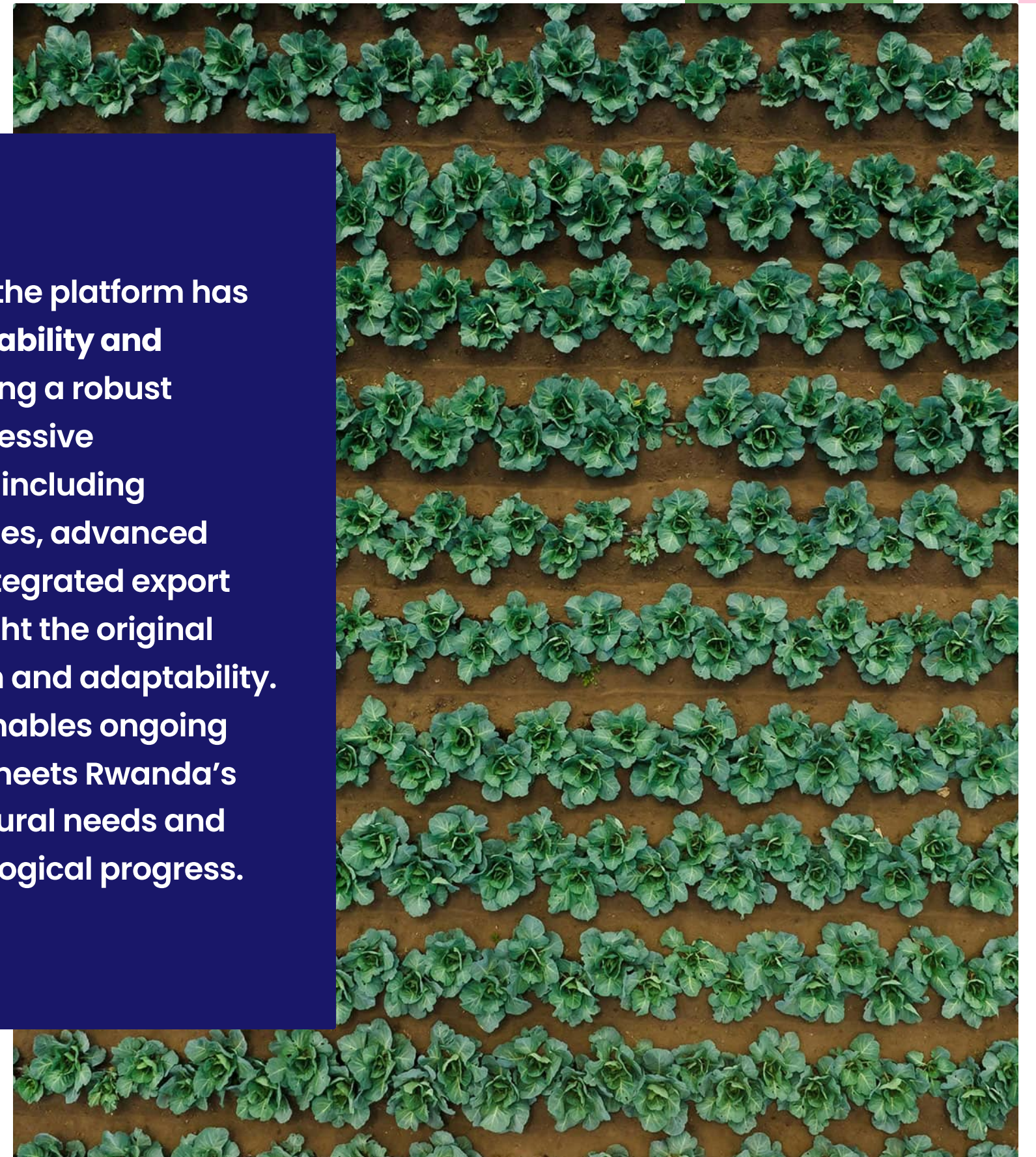
## Value of Agro-Inputs Distributed (per year)

Estimated market value of subsidized agro-inputs managed through the platform

# Building on a Strong, Scalable Foundation

Continuous innovation drives Rwanda's agricultural transformation by enhancing a proven platform.

Since its launch, the platform has demonstrated **stability and scalability**, forming a robust foundation. Successive enhancements—including expanded modules, advanced analytics, and integrated export tracking—highlight the original design's strength and adaptability. This solid base enables ongoing innovation that meets Rwanda's evolving agricultural needs and supports technological progress.



★★★★☆

**We used to guess. Now we measure. Technology unlocks data, and data trains models that get closer to the truth with every iteration. If you want outcomes that last, invest in technology. For this, I am the right person.**

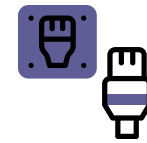
**Lionel Ngendakuriyo**

High Potential Partner

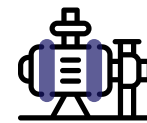


# The Next Frontier: Data-Driven Agriculture and Smart Financing

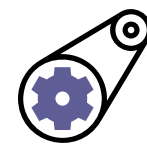
Harnessing the Smart Nkunganire System to boost efficiency, transparency, and national food security



The platform's greatest value lies in its **data**, driving smarter decisions and innovations



The **Smart Nkunganire System** acts as a dynamic data engine powering new agricultural possibilities



Data foundation enhances **efficiency** and **transparency** across the agricultural value chain



These innovations support efforts to secure **food security** for the nation

# Digital Wallets: Unlocking Targeted Micro-Loans for Farmers

Empowering Rwandan farmers with focused funds to boost cultivation, productivity, and national self-sufficiency



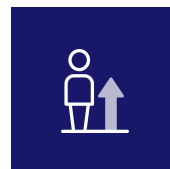
Provide farmers access to **micro-loans** exclusively for agro-inputs like **fertilizers and seeds**



Restrict loan usage to essential cultivation needs, ensuring funds directly enhance productivity



Minimize lender risk by controlling loan allocation and usage strictly on farming inputs



Maximize value for farmers by enabling focused investments that increase crop yields and harvests



Support Rwanda's ambition for agricultural self-sufficiency through improved cultivation practices



Drive sustainable rural development by empowering farmers with targeted financial tools

# Banking Opportunity: De-Risking Agriculture through Data

Harnessing transparency and analytics to unlock confident lending and transform agricultural finance

Earn interest while turning a traditionally uncertain sector into a growth and innovation opportunity



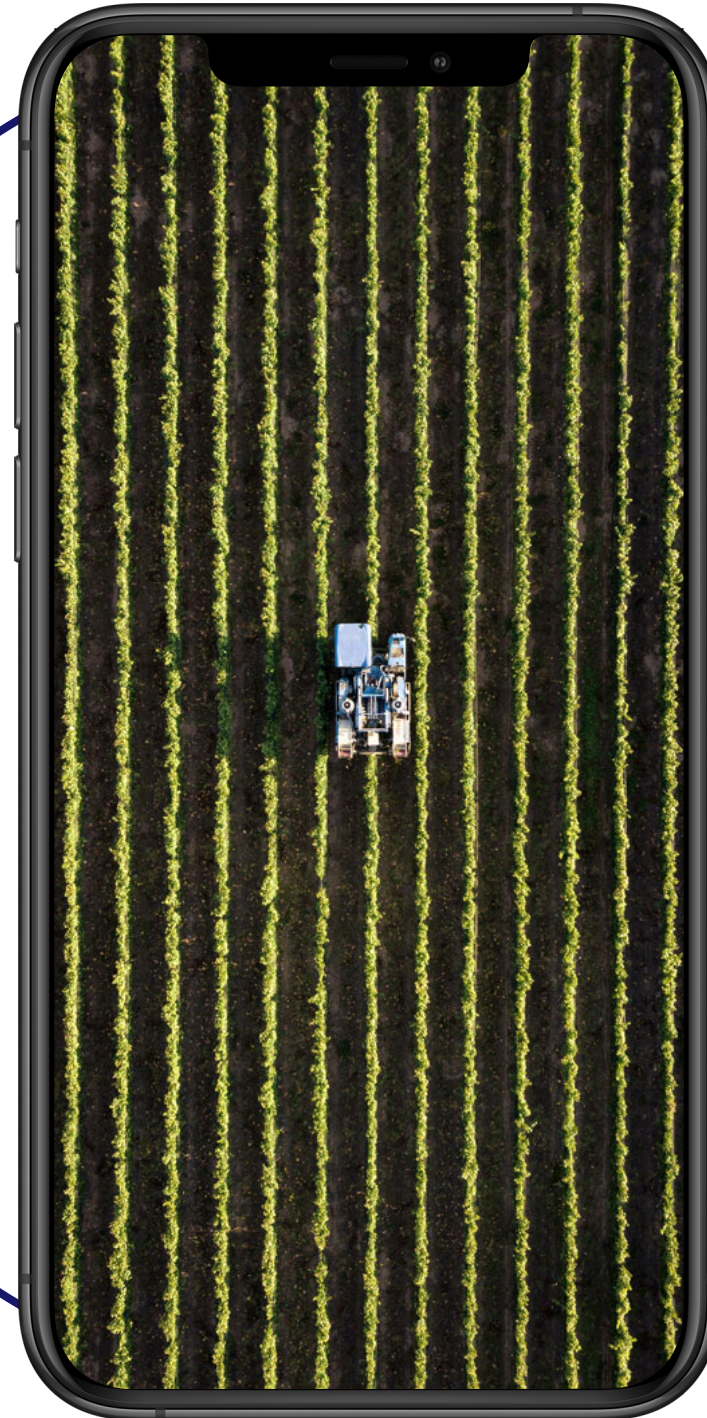
Lead sector transformation by enabling supply-chain transparency and analytics



Reduce lending risk through traceable transactions and rich historical data



Unlock new lending opportunities in agricultural microfinance with data-driven insights



# Unlocking End-to-End Supply Chain Intelligence

Harnessing data to empower smarter interventions and accelerate Rwanda's agricultural progress

## Full Visibility Across the Value Chain

See every movement from supplier to farmer in real time.  
No gaps, no guesswork — just clarity across the chain.

01

## Data That Drives Precision and Accountability

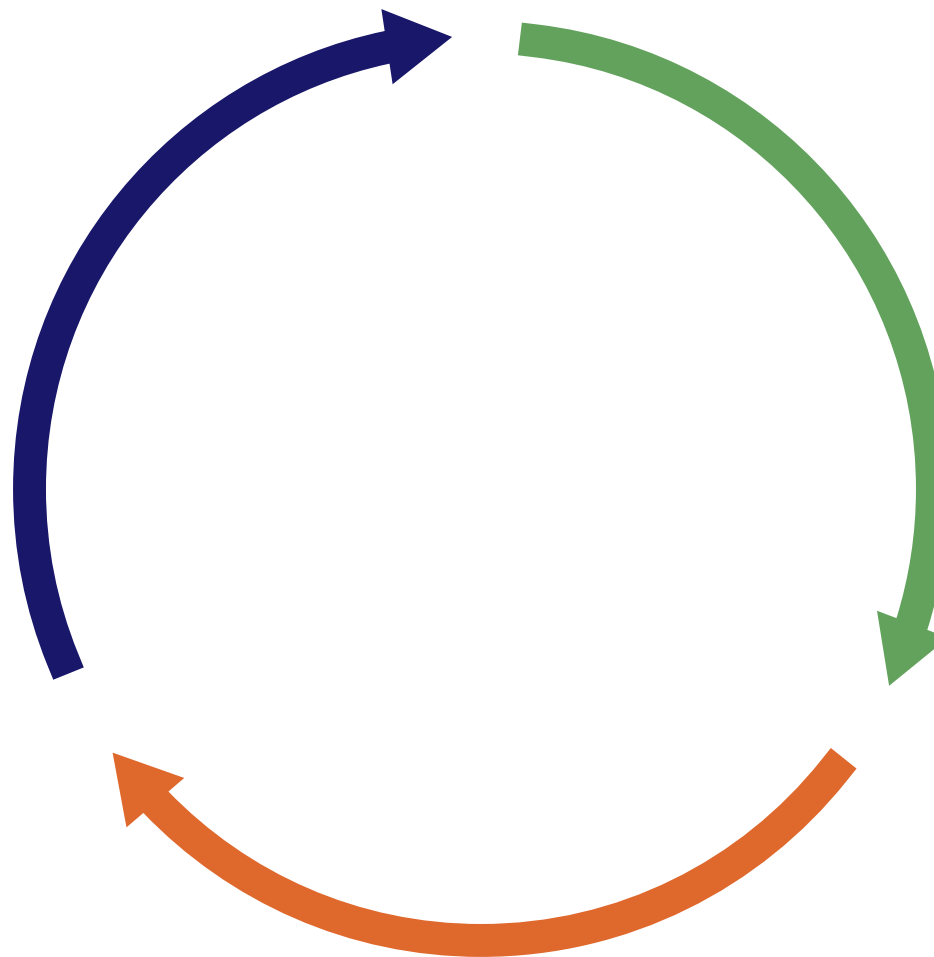
Each transaction leaves a digital footprint, turning supply chains into measurable systems. Decision-makers can track input flow, detect bottlenecks, and ensure that every bag of fertilizer or seed reaches the right farmer. Transparency builds trust, and trust fuels efficiency.

03

## Intelligence That Powers Growth and Innovation

With accurate, traceable data, stakeholders can forecast demand, optimize logistics, and design better financing and market strategies. The platform becomes more than a tracking tool — it becomes an intelligence engine that continuously improves how the agricultural economy works.

02



# Empowering Farmers to Secure Rwanda's Food Future

Harnessing people-centered technology for sustainable growth and national self-sufficiency

Build systems that **empower farmers** and enhance their capabilities

Drive **agricultural efficiency** through innovative, people-centered technology

Advance Rwanda toward **true food security** and national self-sufficiency

Focus on **sustainable growth** that balances innovation with community needs

Maintain a clear, unwavering vision despite ongoing innovation development

01

02

03

04

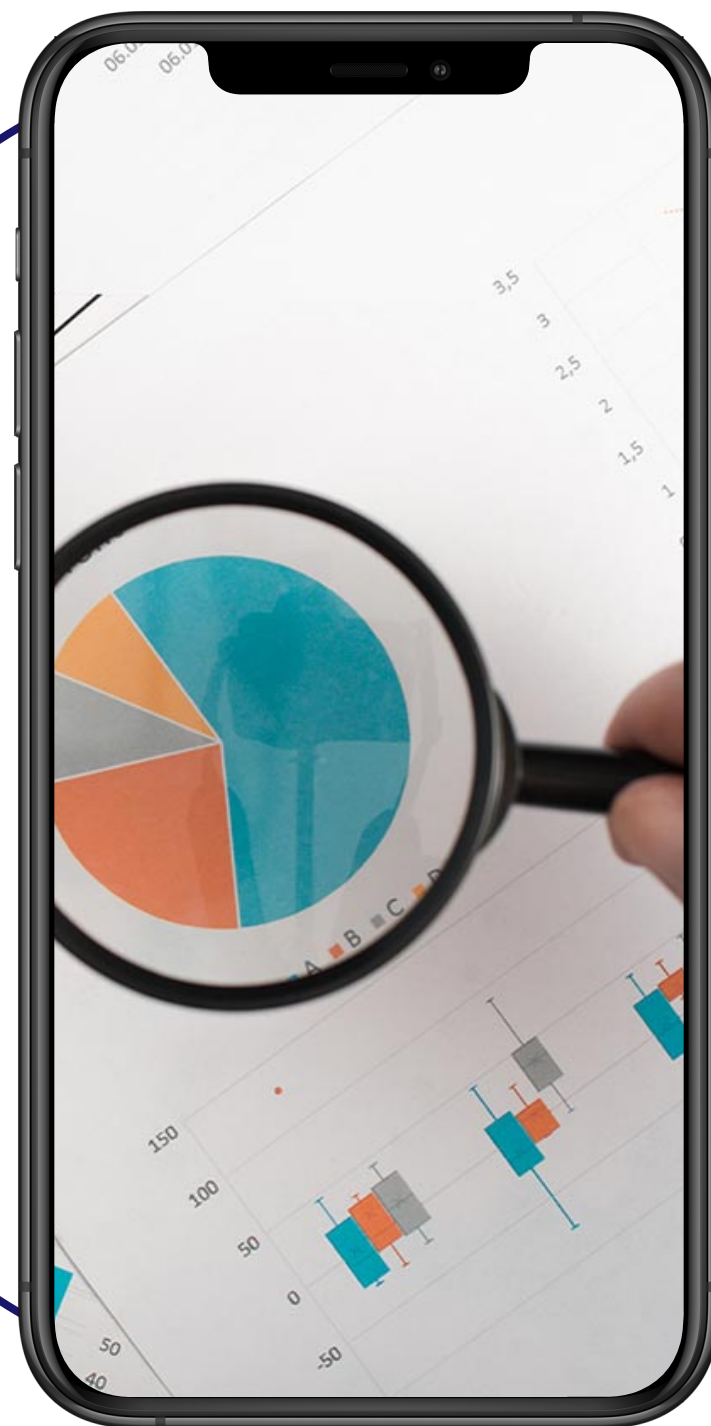
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# Empower Data-Driven Change Across Sectors

Harness tailored systems and full-stack expertise to transform healthcare and beyond

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Working beyond healthcare: agriculture,  
social security, pension, tax infrastructure



Tailor-made systems are essential; generic  
solutions can't capture needed data or  
enforcement

Full stack expertise from data models  
to AI and policy is critical

Built from scratch, becoming a truly data-  
driven organization

# Leading Complex Digital Transformations for National Impact

Focused on building sustainable systems that solve structural challenges and create measurable value for governments, institutions, and citizens. The Smart Nkunganire System demonstrated how inclusive design, solid architecture, and data-driven intelligence can transform inefficiency into national advantage. I bring **strategic clarity, technical precision, and disciplined delivery** to every challenge, ready to partner in designing next-generation national digital platforms that connect people, power economies, and make transformation measurable.

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