FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Breaking silos in digital development

A guidance note for development practitioners in agriculture, resilience, nutrition, and WSSH

Purpose of this Guidance Note

This note aims to help USAID mission staff, advisors and implementing partners deliver digital solutions that holistically meet a variety of program participant needs, by breaking persistent silos in digital solutions design, deployment and delivery.

How to Use this Document

Click the buttons in the sidebar to navigate through the different sections

View blue boxes for additional context to prompting questions

3. Landscape

Avoid wasted expenditure and service duplication by coordinating your program with what already exists.

Understand the digital ecosystem in context

Is there a USAID digital ecosystem country assessment? Is there an overarching national digital strategy for the country?

Who might be your silo-breaking allies; champions that foster cooperation, communication, and the sharing of resources to overcome silos and drive holistic approaches? What learning networks are, or could be, in place to assist with this community-building?

To what extent are the foundational prerequisites for effective bundling, interoperability and horizontal products in place, from an ecosystem perspective? These may include digital or foundational infrastructure, digital literacy, trust, service provider technical skills, dynamic and competitive markets, and strong data and consumer welfare protections.

Landscape existing solutions and activities

What shared infrastructure (digital building blocks, products & services or delivery channels) exist that could be reused, leveraged, augmented or coordinated with?

Once potential digital interventions are aligned with the project or activity results, which should you keep, which should you cut? What are the strengths and weaknesses of existing infrastructure, products & services and delivery channels? Can this be assessed via the Digital Principles Matrix?

> You should look to identify the existing components that program participants really trust and engage with, even if these are typically applied contexts outside your own. One useful resource for solution landscaping is the **Digital Impact Exchange**.
>
> As an example of what may occur absent this step: an **mHealth ecosystem assessment in Malawi** found that community workers are forced to manage multiple devices, with new devices being issued for different programs. This adds administrative burden for the community workers, wasted expense for the program, less coherent bird's eye analysis, and ultimately solutions that less effectively improve the health of Malawians.

Sidebar

1 What are silo-busting digital solutions and why do they matter?

2 How do we identify opportunities for silo-busting digital solutions?

3 How do we inclusively, equitably and sustainably operationalize a silo-breaking digital solution?

Bundling

Interoperability

Horizontal products

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Icons

Redirect to another section of the guidance note

Link to suggestions for how solutions could break silos more effectively

Actionable tip, with external resources to consider

Click underlined text to redirect to external documents or other sections of the guidance note

Executive Summary

Fragmented digital solutions formulated in silos can result in poor user experiences, entrenched information blockages, constrained uptake and artificially limited scope - ultimately stifling the positive potential of digital solutions to improve agriculture, resilience, nutrition and water, security, sanitation and hygiene (WSSH) in low and middle income countries. Three mechanisms can advance digital solutions that more holistically meet individuals' cross-sectoral needs:

Bundling refers to the practice of providing complementary products to a single program participant, where the products in combination deliver more value than if they were used separately.

Interoperability refers to the ability of different systems, technologies, or software to seamlessly communicate, exchange data, and work together effectively.

A horizontal product refers to a good or service that is designed to be applicable across various industries or sectors, addressing a multi-faceted set of program participant needs.

To address this fragmentation, development practitioners need to identify opportunities to break silos. This requires:

Whole-of-participant empathy, identified through human-centered design processes that deeply understand the participant beyond their sector siloed needs.

An honest self-assessment of one's own silos, understanding that some silos are more important than others in terms of addressing participant needs holistically, but remaining realistic and pragmatic about which silos are within your purview to break.

A comprehensive landscaping of adjacent solutions and influences, to ensure that processes are not duplicative, and that activities draw from the very best information, processes and blueprints available, even if they are typically applied in other sectors.

(Or just draw from this list of low-hanging opportunities to break silos for resilience and food security practitioners!)

Breaking silos effectively requires drawing on best practice to maximize effectiveness of the activity while minimizing risk.

When **bundling:**
- Provide truly complementary products and services at the right price
- Deliver digital components in a low-tech, hybrid and participatory manner
- Be conscious of market distortions, vendor lock-in and their impacts on participants

When **interoperating:**
- Let use cases and context guide data harmonization and technology decisions
- Cultivate deep buy-in amongst all partners, including program participants
- Mitigate data-related risks through gold standard governance and cybersecurity

When delivering **horizontal products:**
- Create reusable blueprints for parallel initiatives in other sectors
- Encourage information to diffuse beyond direct program participants
- Navigate potential trade-offs between sectors

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What are silo-breaking digital solutions and why do they matter?

After reading this section, you will understand:

- The consequences of a siloed approach to the development of digital solutions, and the opportunities of applying a silo-breaking lens to address diverse end-user needs
- Three commonly employed mechanisms for silo-breaking in the development of digital solutions
- Why leveraging shared infrastructure is essential for the development and deployment of silo-breaking digital solutions

Estimated reading time: 15 minutes

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What are silo-busting digital solutions and why do they matter?

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How do we inclusively, equitably and sustainability operationalize a silo-breaking digital solution?

*Bundling*

Interoperability

Horizontal products

Persistent silos are stifling the potential of digital solutions

Digital technologies have the potential to improve lives in low and middle-income countries by broadening access to information, goods, and services. However, most digital development solutions are designed, developed, and deployed in silos. These separate compartments result in narrow solutions that operate in isolation from other systems, sectors or platforms, lacking integration and interoperability. This results in fragmented user experiences, entrenched information blockages, constrained uptake and artificially limited scope - ultimately stifling the positive potential of digital solutions in low and middle income countries. Breaking digital solution silos - through **bundling offerings**, making solutions **interoperable** or leveraging **horizontal products** - can result in more efficient and impactful interventions. However, siloes are challenging to overcome, and new integrations can pose real risks, including data governance, market structure and consumer welfare concerns.

This guidance note aims to help donors and implementing partners break the right silos in a risk-aware manner, to ultimately deliver silo-breaking digital solutions that holistically address program participant needs across agriculture, nutrition, resilience and water security, sanitation and hygiene (WSSH).

People lead multi-faceted, busy lives, with needs and wants that extend beyond traditional sectoral or organizational silos. **Caroline's fictional story** - based loosely on a composite of anonymized real experiences - provides an example.

Caroline is a **32-year old small-scale producer.** She has two children; one who has just finished school and recently moved to the city, and another who is much younger - still in kindergarten. She lives on a small plot of land located a two-hour drive from the nearest city…
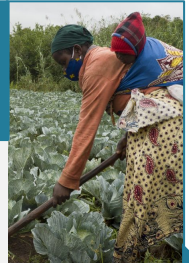
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Caroline's story, continued…

She prepares the land on her plot manually, but the **labor-intensive nature of the work means that she can only plant a few square meters at one time**. She purchases crop seeds from a retailer in the nearby town, using **mobile money on her low-end feature phone** (connected via 2G or 3G) to complete the transaction. However, when her harvest fails, which is more common due to increasingly dry summers, she has a much smaller pot of money and must economize across many different purchase decisions. A new local microfinance institution offers a short-term solution, but the initiative **utilizes a competitor mobile money service that she is less familiar with**, and does not trust.

Caroline typically uses **part of each harvest to feed herself and her family**. The remainder she sells at a nearby market. The proceeds are primarily used to finance food, transport, health, schooling and education costs for her family, and purchase further farm inputs. Her eldest son is often sickly, and the doctor in the city suspects he has been drinking contaminated water. However, the doctor **does not have access to her son's health records** from the rural clinic near the farm, so his diagnosis may not be correct. As an aside, when Caroline visits the clinic, she uses a paper health clinic ID to register.

Occasionally, government extension officers will provide training on how to maximize harvests and provide free fertilizer. **She registers at these trainings using a different ID card to the clinic card**. These visits are irregular, and so she often relies on advice from her aunt when she has farm-related questions. She also listens to the radio for **both entertainment and for the weekly agricultural Q&A program**, although sometimes the radio advice differs from what her aunt or the extension workers suggest.

Photo credit: International Fertilizer Development Centre, 2022

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While digital solutions can be transformative, those designed and deployed in siloes ineffectively address these needs

Limitations of siloed digital solutions

Artificially limited scope
Siloed solutions miss the "low-hanging fruit" of providing useful products that meet needs in adjacent sectors.

Advisory delivered to Caroline doesn't include nutrition information or climate-smart information on best agricultural practice for increasingly harsh summer weather.

While fertilizer provision is helpful, she also needs finance to buy inputs, particularly when her crop fails. Beyond the farm, she also needs goods to support her family that are as crucial as fertilizer such as books, soap, medicine and other goods.

Fragmented user experiences
There are additional transaction costs when solutions and services do not "talk" to each other, as users need to re-enter information or engage with multiple different solutions.

Uncoordinated extension advice across radio, family and government extension workers may result in conflicting advice, reducing the likelihood of successful harvest for Caroline.

Requiring separate identity verification documents for accessing different services increases Caroline's administrative burden; including the transport and time costs of keeping these documents up to date. It also increases the risk of identity theft.

Entrenched information blockages
Siloed products for planners, developers and users only include a subset of the available data and information, which limits the ability to rapidly identify and address individual needs.

Caroline's son is unable to visit doctors in the city and at home with confidence that they have up-to-date information on his medical history, and medical practitioners will be unable to confidently treat him.

Policymakers will not have a holistic view of waterborne parasites impacting agricultural systems, and will be unable to provide early warnings to communities and practitioners without data-sharing systems that cross geographic and organizational boundaries.

Missed opportunities to leverage trust
Building trust in digital solutions is typically a time-consuming process. Integrating new initiatives with existing digital channels that are already trusted can more efficiently reach users.

Caroline has grown accustomed to using one mobile money service to make and receive payments. The new microfinance institution utilizes an unfamiliar mobile money solution, so Caroline is less likely to take up the offer - she does not yet trust the new solution.

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More holistic digital solutions can deliver better value and impact among program participants

The Challenge

Policies and initiatives that have a laser focus on solving specific issues in the sector or even single value chains means that opportunities to address important issues that affect many areas - including the ones small-scale producers face daily - are missed.

Small-scale producers, like Caroline, struggle with a range of problems including a lack of resources to try new farming methods, information on the harmful effects of climate change, and its impact on the nutritional value of the food she produces.

The Intervention
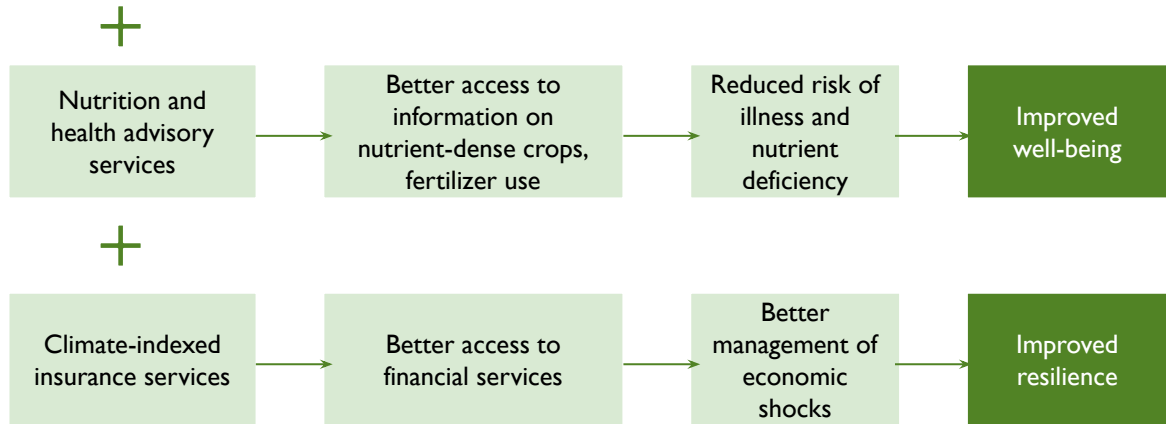
| Agronomic advisory services | → | Better access to timely information on planting and harvesting | → | Better agricultural production | → | Improved income |

This is impactful, but by expanding the intervention, far more impact is possible

+

| Nutrition and health advisory services | → | Better access to information on nutrient-dense crops, fertilizer use | → | Reduced risk of illness and nutrient deficiency | → | Improved well-being |

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| Climate-indexed insurance services | → | Better access to financial services | → | Better management of economic shocks | → | Improved resilience |

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Three mechanisms can advance digital solutions that more holistically meet individual needs

These mechanisms are prominent examples, but there may be other mechanisms for breaking silos.
They are also not mutually exclusive; a silo-breaking solution may include two or more of these mechanisms.

Bundle offerings	Make solutions **interoperable**	Deliver **horizontal** products

Bundling refers to the practice of providing complementary products to a single program participant, where the products in combination deliver more value than if they were used separately.

For Caroline, a bundle of drought-resistant seeds, finance, insurance and climate-smart advisory would meet multiple needs and increase the benefits of each product. For example, the purchase of seeds is likely to be more valuable when combined with agricultural advisory.

Bundling would also help Caroline take-up products that she is likely less willing to pay for (such as insurance and advisory), by cross-subsidizing the costs with goods that she is willing to pay for (such as inputs and credit).

Interoperability refers to the ability of different systems, technologies, or software to seamlessly communicate, exchange data, and work together effectively.

For Caroline, interoperability of health records would allow her son to visit different doctors, confident that they have access to all relevant information. This would also allow WSSH and public health practitioners and policymakers to track the spread of waterborne disease.

Interoperability across multiple financial channels would also allow clients of the microfinance institution to utilize whichever mobile money solution they trust and prefer.

A horizontal product refers to a good or service that is designed to be applicable across various industries or sectors, addressing a multi-faceted set of program participant needs.

For Caroline, an advisory service that includes nutrition, agricultural and climate information - delivered through a single channel that she trusts - would be a useful horizontal solution.

Similarly, an e-commerce marketplace that allowed her on-demand access to agricultural inputs alongside other necessities - like food and soap - would reduce her transaction and search costs.

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Common across these mechanisms is leveraging existing or shared infrastructure to design, develop and deploy solutions

Sharing infrastructure substantially lowers design, development and delivery costs associated with meeting multifaceted needs across silos, for both program participants and development practitioners. Sharing infrastructure accelerates the integration of content across various programs. It not only eliminates the need to repeatedly establish trust with participants — who already have familiarity with certain aspects of your solution — but also allows for the deployment of infrastructure genuinely tailored to participants' needs, rather than relying on typical infrastructure within your silo. In this context, "infrastructure" refers to any or all of the core components of a digital development solution, as outlined below.

Digital building blocks

Digital building blocks are modular components that can be combined in different ways to develop digital solutions. Blocks may include protocols and specifications, software code and developer kits, application programming interfaces (APIs), artificial intelligence (AI) models, or reusable platforms. Building blocks may be open source or proprietary.

See Fast-Tracking Development: A Building Blocks Approach for Digital Public Goods for more information.

Products and services

Shared product and service infrastructure is the intellectual property, content, frameworks, blueprints or service models that are repackaged and sharable for use across sectoral, organizational or other silos.

For example, Farm Radio International created re-usable "radio resource packs" - a template that helps local radio stations structure their educational radio content. This blueprint is used to inform programming across agricultural, nutrition and other sectors.

Delivery channels

Mobile networks, radio stations, agent networks, e-commerce platforms and online streaming platforms are examples of delivery channels that could be shared.

For example, Kuza One sources and trains rural young people to provide last-mile bundled service delivery to SSPs. Agribusiness, agtechs, donors and governments partner with Kuza to use this agent network to deliver products and services.

Shared infrastructure may build upon or reference the following concepts

CONCEPT	EXAMPLE
Digital Public Infrastructure are the foundational digital systems - identity, payments and data exchange - provided by the public sector	India Stack comprises open APIs and digital public assets designed to universally facilitate identity verification, data sharing, and payments across India, thereby enabling economic activities at a population-wide scale.
A **Digital Public Good** is a digital resource or service that is open and freely available to all. It is typically used to promote social welfare and equality.	DHIS2 is a free, open-source, fully customizable platform for collecting, analyzing, visualizing, and sharing aggregate and individual-data for district-level, national, regional, and international system and program management in health, education, and other domains.
Modularity refers to a design approach that separates a digital system into smaller parts (modules) that can be used independently or combined in innovative ways.	MOSIP (Modular Open Source Identity Platform) is a digital ID platform designed to provide a foundational framework for building identity solutions. This modularity enables governments and organizations to configure only the necessary components, ensuring flexibility and adaptability.
Open source refers to software with a publicly available source code that allows users to use, view, modify, and distribute the code freely.	The programming language Python is an open-source project. This means its source code is publicly accessible, and developers around the world can contribute to its development, propose changes, fix bugs, or use the language freely in their own projects.
Open data is freely available to the public, accessible, and can be used, reused, and redistributed by anyone without restrictions.	Global Open Data for Agriculture and Nutrition advocates for open data across hardware and software that have agricultural and nutrition applications, convening partnerships to overcome licensing, cost or incentive barriers that may prohibit open data.

KEY CONCLUSIONS

*What are silo-breaking digital solutions
and why do they matter?*

Silos act as barriers by limiting the ability to meet diverse user needs, causing fragmented user experience, obstructing information flows, missing opportunities to build trust and increase user adoption and ultimately create impact by providing users with the range of products and services they need.

Bundling, interoperability and horizontal products are three commonly employed silo-breaking mechanisms for digital solution development

Leveraging shared or existing infrastructure is essential for optimizing efficiency, reducing costs and accelerating development and deployment of silo-breaking solutions.

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How do we identify opportunities for silo-breaking digital solutions?

After reading this section, you will understand:

- The "low hanging fruit" opportunities where silo-breaking can be considered across common agriculture, nutrition, resilience and WSSH activities.
- A four-step process for systematically identifying silo-breaking opportunities in your own work.

Estimated reading time: 15 minutes

I want to…

…start by learning about the **"low hanging fruit" opportunities** for considering silo-breaking for agriculture, nutrition, resilience and WSSH

and then read about **the four-step process** for systematically identifying silo-breaking opportunities in my own work

…skip straight to **the four-step process** for systematically identifying silo-breaking opportunities in my own work

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Many opportunities exist for silo-breaking across agriculture, nutrition, resilience and WSSH activities (1/3)

The table below presents guidance on where silo-breaking opportunities lie. If you're working on programs mentioned in the first column, read the row to learn more about how you could overcome persistent silos.

If you're working on…	Then consider…	In order to…	Example in practice	Mechanism at play
Providing digital information and advisory to program participants in one sector	Combining content with informational content from adjacent sectors, and leveraging existing channels to deliver a more comprehensive package of advisory services	Reduce the administrative burden for program participants, while providing relevant information and advice that meets multiple needs	Since 2012, Digital Green has adapted their video-based extension advisory offering to go beyond agriculture, to include health, climate and nutrition messaging. The intervention leveraged the existing trust between program participants and Digital Green to provide specific information on, for example, the importance of handwashing with soap and the benefits of dietary diversity, to great effect. For example, at least 60% of respondents who had received information on each piece of nutritional advice reported trying it.[1]	Delivering horizontal products
Improving access to goods and services for program participants through e-commerce	Leveraging existing trusted online and/or agent networks to facilitate digital transactions and delivery through trusted intermediaries	Accelerate uptake through trust while reducing the transaction costs of accessing the digital delivery channel	In 2019, Jumia expanded its e-commerce platform by introducing an agricultural product portfolio alongside existing categories like home & office supplies, appliances, and technology. The organization promoted this new offering in secondary cities through below-the-line initiatives, including a roadshow, dedicated promotional flyers, and leveraging their on-the-ground sales agent network, JForce. Customers were able to access top-selling agricultural items for up to 55% cheaper than local, offline competitors, according to the firm, due in part to Jumia's existing infrastructure, which was developed selling products in another sector.[2]	Delivering horizontal products

[1] Kadiyala et al., 2016. Adapting Agriculture Platforms for Nutrition: A Case Study of a Participatory, Video-Based Agricultural Extension Platform in India. Available here.
[2] Bendal et al., 2022. Expanding online marketplaces across secondary cities – lessons from Côte d'Ivoire. Available here.

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Many opportunities exist for silo-breaking across agriculture, nutrition, resilience and WSSH activities (2/3)

If you're working on…	Then consider…	In order to…	Example in practice	Mechanism at play
Addressing the affordability of goods and services among low-income communities	Bundling with adjacent products, and charging a lower per-product price than when sold individually	Provide goods and services that meet more than one need at a price that is commercially sustainable for the provider and affordable to the buyer	Apollo Agriculture is a Kenyan digital agriculture platform that combines M-PESA-based loans for input purchases with agronomic training, insurance coverage, and real-time farm information through a mobile application. By bundling these services, Apollo has reached over 100,000 smallholder farmers. The involvement of trusted local intermediaries has been instrumental in overcoming adoption barriers and building trust among farmers.	Bundling offerings
Providing data-driven informational tools for policymakers, planners and researchers	Combining datasets from adjacent sectors with a friendly, accessible user interface	Surface insights that arise from cross-sectoral data in an easy-to-use tool, which will allow for data-informed, tailored policymaking, program design or implementation	In 2022, the United Nations Development Programme (UNDP) and India's State Government of Telangana launched Data in Climate Resilient Agriculture (DiCRA), a web platform that provides easy-to-use satellite data on socio-economic, environmental and infrastructural parameters. The initiative has over 3,500 users - primarily researchers and policymakers - and is in the process of expanding to six other Indian states. The platform is entirely open source, and is listed on the Digital Public Goods Registry.	Delivering horizontal products; Making solutions interoperable

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If you're working on…	Then consider…	In order to…	Example in practice	Mechanism at play
Running programs that collect meaningful data that should be reused by different parties	Using open-source software, open standards, digital public goods or protocols that have interoperability and reuse embedded	Ensure that just-in-time data is accessible wherever needed, while surfacing insights that will only arise from layered, cross-sectoral data	DHIS2 is a free and open-source web-based application, initially designed for data collection, storage, visualization and interoperability in the health sector. It was piloted by health practitioners at the Universities of Cape Town and Oslo in 1991, and since grown to operate in more than 100 low and middle income countries. While it was initially designed for health data management, it is sector-agnostic software, and is now being used for agricultural, education and social protection information systems.	Making solutions interoperable
Programs that require G2P payments, digital ID verification or data exchange	Leveraging existing digital public infrastructure or piloting an infrastructure approach to data management and exchange	Minimize administrative burden, choice overload and exclusion risk on individuals and organizations utilizing these services, and reduce reliance on costly commercial providers	X-Road is an open-source data exchange layer that facilitates the secure sharing of data between organizations, and is typically used for public sector interoperability. In 2018, the Brazilian states of Mato Grosso and Amapá implemented a customized instance of X-Road (known as X-Via) to facilitate the sharing of their citizen identification data across all ministries and departments, including those responsible for agriculture, nutrition, resilience and WSSH.	Making solutions interoperable

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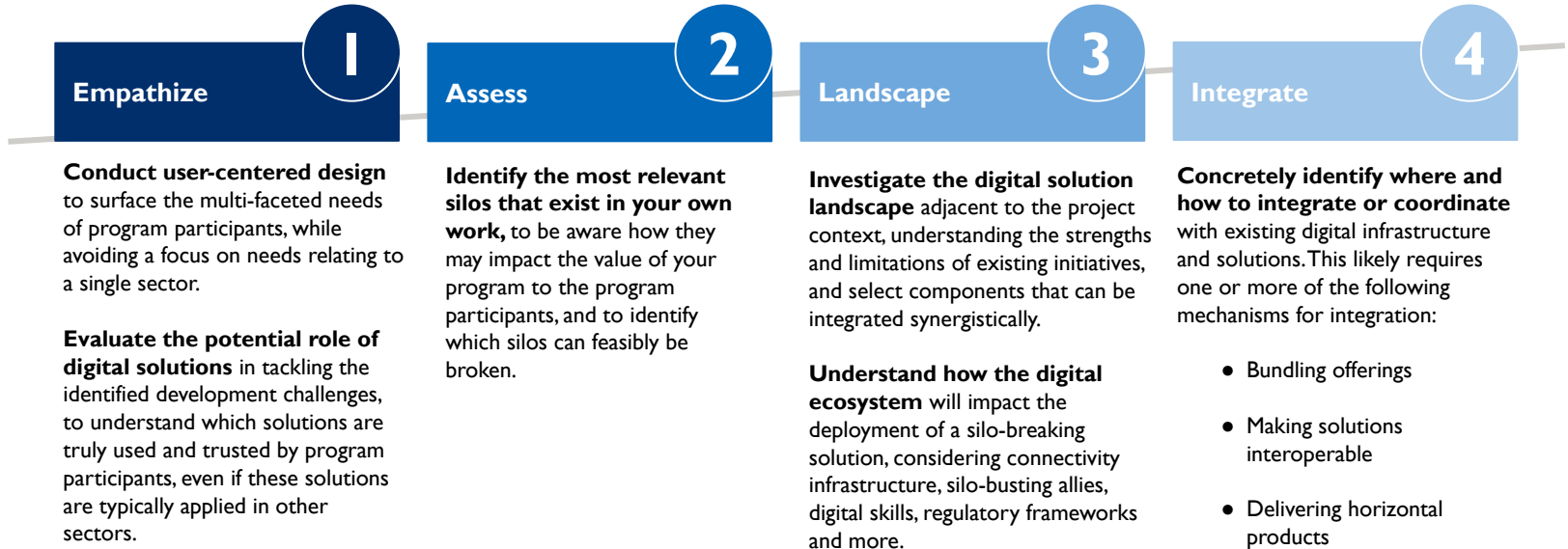How do we inclusively, equitably and sustainably operationalize a silo-breaking digital solution?

Bundling

Interoperability

Horizontal products

Four high-level steps can more systematically identify and advance silo-breaking opportunities

This human-centered approach can be used at the project conception phase to identify where, how and with whom the silo-breaking should take place. This guide provides prompting questions to assist with actioning each step, complete with links to relevant external resources.

① Empathize	② Assess	③ Landscape	④ Integrate

Conduct user-centered design to surface the multi-faceted needs of program participants, while avoiding a focus on needs relating to a single sector.

Evaluate the potential role of digital solutions in tackling the identified development challenges, to understand which solutions are truly used and trusted by program participants, even if these solutions are typically applied in other sectors.

Identify the most relevant silos that exist in your own work, to be aware how they may impact the value of your program to the program participants, and to identify which silos can feasibly be broken.

Investigate the digital solution landscape adjacent to the project context, understanding the strengths and limitations of existing initiatives, and select components that can be integrated synergistically.

Understand how the digital ecosystem will impact the deployment of a silo-breaking solution, considering connectivity infrastructure, silo-busting allies, digital skills, regulatory frameworks and more.

Concretely identify where and how to integrate or coordinate with existing digital infrastructure and solutions. This likely requires one or more of the following mechanisms for integration:

- Bundling offerings

- Making solutions interoperable

- Delivering horizontal products

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I Empathize

*Human-centric design must understand the **whole** participant - not just their sector-siloed needs*

Empathize with and alongside program participants

Who are your program participants? Are their perspectives directly included in the design, through the best practices of human-centred design?

Are there accessible datasets and other research inputs on your program participant segment, even from other sectors, which help you understand their context, lives and requirements?

Is the project team well-positioned to understand the whole participant, across all their identities? Would it help to crowd-in more diverse perspectives?

How will your needs assessment incorporate considerations related to gender, people living with disabilities, children, or other disenfranchised or marginalized populations who might either engage with or benefit from the digital intervention? Do you need to consider personas or archetypes?

Identify the relevant development challenges

What are the sets of interacting development challenges that matter in the lives of an individual, or household?

What is the role of digital in addressing these interacting challenges?

Have you consulted the Digital for RFS planning tool and/or the Addressing the Principles for Digital Development in Project and Activity Design to assist with answering the questions above?

> For example, a silo-breaking approach to address the needs of a small-scale agricultural producer would be to understand their priorities beyond their productivity needs, considering their dreams and aspirations across all their key life facets and beyond just their role as a farmer.

> Foundational constraints may include device access, trust in digital solutions, digital literacy or access to connectivity, among others.

> It is important not to view the development challenge with a sector-siloed lens. For example, the challenge of agricultural productivity is intrinsically linked to nutrition, which in turn is intrinsically linked to climate resilience.

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2 Assess

Created a shared understanding of persistent silos impacting program design and implementation from the outset

Evaluate the silos most relevant to your work

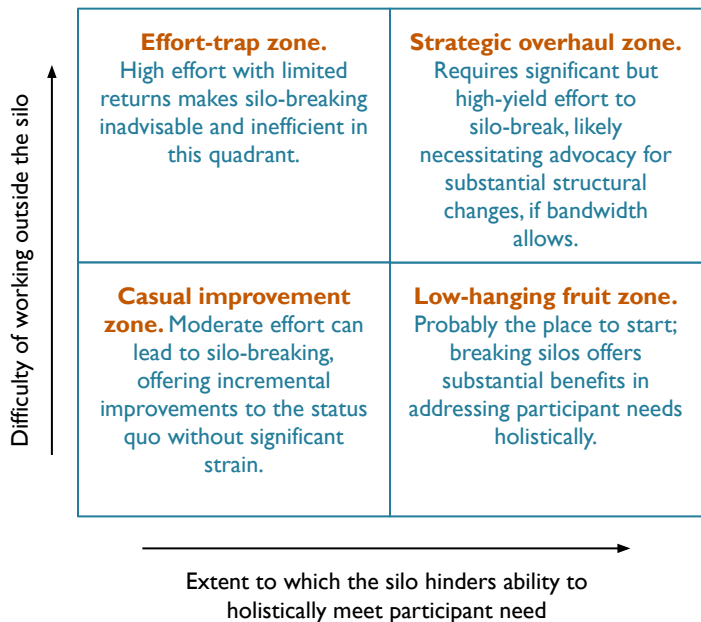What silos do you and your colleagues typically work in? In which silos does your programming typically sit?

Which of these silos can be overcome fairly easily; where are the low-hanging fruit? Which are harder to shift?

Which silos are most harmful in terms of understanding and meeting your program participant needs holistically?

A list of common silos and their reasons for persistence is presented on the next page.

The matrix alongside provides a simple framework for categorizing silos. For example, high-level funding designations that restrict efforts to implement cross-sectoral programming may fall into the **strategic overhaul** zone, while project silos that just require better intra-departmental communication may fall into the **casual improvement** or **low-hanging fruit** zones.

Feasibility-Value Matrix for Silo-Breaking

Difficulty of working outside the silo →

Effort-trap zone. High effort with limited returns makes silo-breaking inadvisable and inefficient in this quadrant.

Strategic overhaul zone. Requires significant but high-yield effort to silo-break, likely necessitating advocacy for substantial structural changes, if bandwidth allows.

Casual improvement zone. Moderate effort can lead to silo-breaking, offering incremental improvements to the status quo without significant strain.

Low-hanging fruit zone. Probably the place to start; breaking silos offers substantial benefits in addressing participant needs holistically.

Extent to which the silo hinders ability to holistically meet participant need →

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2 Assess (continued)

A list of common silos is presented below. However, yours may not be on this list. Workshop with colleagues to come to a shared understanding.

Silo type	Description	Common reasons for persistence
Sectoral	Isolation of sectors, hindering cross-sector collaboration and integration.	Team roles and responsibilities, expertise, organizational set-up, funding designation
Departmental	Barriers between departments, limiting communication and coordination within an organization.	Budget allocations, communication flows, organizational set-up
Data	Segregation of data, impeding access and sharing across different systems or departments.	Information and resource sharing, skills, security restrictions
Geographic	Separation based on geographic locations, creating disconnected operations and decision-making.	Team roles and responsibilities, expertise, departmental set-up
Technological	Division caused by different technologies or systems, resulting in inefficient data exchange and interoperability challenges.	Organizational norms, security restrictions
Project/Activity	Independent projects with limited integration, leading to duplication of efforts and missed opportunities for synergy.	Organizational norms, management expectations
Funding	Funding allocated separately for specific projects or sectors, causing fragmented approaches and hindered holistic strategies.	Organizational norms, expertise, funding "tags"

Note: *Certain silos within USAID exist due to both organizational structure and the manner in which funding is allocated. Funding is generally tied to a sectoral use based on Congressional earmarks, directives and the budget framework used by USAID, known as the Foreign Assistance Standardized Program Structure and Definitions.*

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2 Assess (continued)

Even with development organizations' tendency toward siloing funding and departmental structures by sectors, examples from two USAID local missions show that individual initiative can provide a successful start to breaking these silos.

In Zimbabwe, recurring outbreaks of measles, cholera, and mumps not only posed a grave health threat, but also limited productivity and food security in the agricultural sector as farmers and laborers were less able to engage in productive work. Addressing this multifaceted challenge fell under the jurisdiction of two USAID offices in the country—agriculture, managed by the Economic Growth (EG) office, and health, managed by a dedicated office. The complexity was compounded by the substantial disparity in budgets, with the Health office commanding a budget 12 times larger than that of the Economic Growth office.

Recognizing the need for a unified approach, the Office Director of USAID's Economic Growth office in Zimbabwe proposed the integration of health and agriculture training programs, employing a Training of Trainers model. This approach equipped trainers to deliver both healthcare and agricultural education as required. Leveraging projectors, this hybrid training method not only curtailed various training-related expenses, such as participant identification and venue selection but also fostered symbiotic outcomes. By enhancing the health of individuals, the initiative bolstered their capacity to engage in agriculture, thus addressing both the immediate health crisis and long-term agricultural sustainability.

Inspiration for this approach was drawn from successful collaboration experiences in Bangladesh. Here, training sessions across multiple sectors were carefully segmented. A typical three-hour session began with an hour dedicated to aquaculture, followed by an hour focused on nutrition—a figurative "break" from the primary topic—before concluding with agriculture. This strategic inclusion of nutrition not only imparted vital knowledge but also promoted inclusivity, as it attracted the participation of fishermen's wives, expanding the reach of health education.

These two examples provide an important example for USAID mission staff regarding the relatively quick wins of breaking departmental or sectoral siloes in USAID's work. It requires individuals to take the initiative to build relationships across USAID offices, and with other country stakeholders working in tangential areas.

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3 Landscape

Avoid wasted expenditure and service duplication by coordinating your program with what already exists.

Understand the digital ecosystem in context

Is there a USAID digital ecosystem country assessment? Is there an overarching national digital strategy for the country?

Who might be your silo-breaking allies; champions that foster cooperation, communication, and the sharing of resources to overcome silos and drive holistic approaches? What learning networks are, or could be, in place to assist with this community-building?

To what extent are the foundational prerequisites for effective bundling, interoperability and horizontal products in place, from an ecosystem perspective? These may include digital or foundational infrastructure, digital literacy, trust, service provider technical skills, dynamic and competitive markets, and strong data and consumer welfare protections.

Landscape existing solutions and activities

What shared infrastructure (digital building blocks, products & services or delivery channels) exist that could be reused, leveraged, augmented or coordinated with?

Once potential digital interventions are aligned with the project or activity results, which should you keep, which should you cut? What are the strengths and weaknesses of existing infrastructure, products & services and delivery channels? Can this be assessed via the Digital Principles Matrix?

You should look to identify the existing components that program participants really trust and engage with, even if these are typically applied contexts outside your own. One useful resource for solution landscaping is the **Digital Impact Exchange**.

As an example of what may occur absent this step: an **mHealth ecosystem assessment in Malawi** found that community workers are forced to manage multiple devices, with new devices being issued for different programs. This adds administrative burden for the community workers, wasted expense for the program, less coherent bird's eye analysis, and ultimately solutions that less effectively improve the health of Malawians.

4 Integrate

Identify which integration mechanisms are suitable for your program. The next section provides guidance on how to employ each of these mechanisms in your own design and implementation.

Is your program providing goods and services that have clear complements?

Would the provision of these complementary goods and services as a package more holistically meet participant needs, increasing uptake of the offering?

Would the package enable a lower per-product price, overcoming affordability constraints?

If yes, consider …

Bundling offerings

Are you looking to remove the transaction costs of duplicated systems?

Is your program generating meaningful data? Do you need access to better data from elsewhere?

Could your data be used for other purposes, or be combined with data to generate new insights?

If yes, consider …

Making solutions **interoperable**

Is there an existing model, blueprint or delivery channel - perhaps primarily active in another sector - that could be re-used to deliver a combined service that meets multiple needs of participants in one activity?

If yes, consider …

Delivering **horizontal** products

KEY CONCLUSIONS

*How do we identify opportunities
for silo-breaking digital solutions?*

Utilize a user-centered approach to uncover multifaceted needs, and evaluate digital solutions from a range of sectors to identify trustworthy and effective strategies.

Recognize and analyze existing silos in your work and their potential impacts, while being cognizant of how these may influence the perceived value of your activities to program participants.

A landscape analysis aids in understanding the digital context of a particular region, pinpointing foundational prerequisites and identifying opportunities to leverage existing digital interventions and knowledge to build user trust.

FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

3

How do we inclusively, equitably and sustainably operationalize a silo-breaking digital solution?

After reading this section, you will understand:

- The concept of bundling, interoperability, horizontal delivery with real-world examples and case studies.
- Key lessons derived from these case studies, highlighting practical considerations.
- Where to look for additional practical guidance.

Estimated reading time: 40 minutes

How to read this section

This section is intended to be a **companion piece for program design and implementation.** It is for readers who have a preliminary sense of what participant needs a program is looking to address, which existing building blocks, products or delivery channels will help address those needs more holistically, and what integration mechanisms may be used to break persistent silos.

It sets out **nine actionable lessons** drawn from **six case studies** that successfully bundle offerings, make solutions interoperable or deliver horizontal products. Each lesson is generally applicable for most silo-breaking solutions, but is detailed under the mechanism for integration where it is most likely to be relevant.

Under each lesson learned, it provides a series of **prompting questions that program and activity designers and implementers should consider**. The orange and green boxes contain illustrative answers to these questions from the case studies. The yellow boxes present actionable tips based on best practices, typically providing links to external resources.

At the end of each sub-section, a **breaking better** considers how the case study examples could endeavor to break silos even more effectively, by applying the four-part framework set up in Section 2 (Empathize, Assess, Landscape, Integrate).

Prompting questions to assist with integrating the lesson into program design or implementation

Silo breaking consideration #1

Prompting question #1

Prompting question #2

Considerations for answering the prompting questions, as experienced in **case study 1**

Actionable tip with links to further resources, based on case studies and best practices

Considerations for answering the prompting questions, as experienced in **case study 2**

Considering **bundled offerings** in program design and implementation

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Bundling refers to the practice of providing complementary products to program participants, where the products in combination deliver more value than if they were used separately.

Estimated time to read this section: 13 minutes

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Introduction: Bundled Offerings

This section presents two illustrative case studies on bundled products, accompanied by three lessons gleaned from these cases. For details of the case studies, click on the blue boxes. To explore the key lessons and associated guiding questions for enhancing your program's design and implementation, select the green boxes.

Case study | *ACRE Africa*

Discover how ACRE Africa uses bundling to break silos. By partnering with trusted delivery agents and leveraging low-tech channels, they bundle insurance with everyday goods and services for small-scale producers. The result? A win-win where farmers gain essential insurance coverage, partners meet objectives, and ACRE Africa remains commercially viable. *Read more*.

How could ACRE Africa break silos more effectively?

Case study | *BaKhabar Kissan*

Discover how BaKhabar Kissan (BKK) is transforming Pakistan's AgriTech landscape. By leveraging advanced data analytics and strategic partnerships, BKK offers bundled personalized advisories to an extension network of over 2 million farmers. However, as BKK strives for precision and growth, challenges emerge, illuminating the intricate journey of scaling bundled solutions. Dive in to understand BKK's digital innovation journey and its transformative impact on agriculture. *Read more*.

Key Lesson | *Provide truly complementary products and services at the right price*

Read More ➡

Key Lesson | *Deliver digital components in a low-tech, hybrid and participatory manner*

Read More ➡

Key Lesson | *Be conscious of market distortions and vendor lock-in*

Read More ➡

Case study: ACRE Africa

ACRE Africa uses bundling to provide weather-based index insurance to small-scale producers (SSPs) on a commercially viable basis, increasing resilience to economic and climate shocks.

ACRE Africa designs weather-based index insurance products for SSPs. Unlike traditional indemnity-based insurance, which relies on post-harvest damage assessments, ACRE Africa provides automated payouts to policyholders via mobile money (M-PESA in particular), when specific weather parameters deviate significantly from historical patterns. They also employ a picture-based insurance approach, where farmer-issued smartphone photos are used to automatically inform claims. This approach eliminates the need for lengthy and costly claims verification processes. ACRE Africa primarily serves rural farmers cultivating under two acres of land, whose agricultural activities contribute to around three-quarters of the average household income supporting approximately seven people. The company was spun out of Kilimo Salama, an NGO funded by the Syngenta Foundation and the Global Index Insurance Facility.

While insurance is a valuable driver of resilience to intersecting climate, food security, livelihood and nutritional challenges, ACRE Africa faced several barriers to making it accessible to farmers. SSPs often lack knowledge and understanding of insurance products, leading to a lack of trust and unfamiliarity with how it works. Even where there was existing knowledge, insurance was perceived as an unnecessary luxury for resource-constrained SSPs; premiums that would make the provision profitable for the insurer were typically unaffordable for the farmer. These barriers hindered the widespread adoption of insurance among farmers who could benefit from its protective measures.

To overcome persistent trust and affordability barriers, ACRE Africa charges trusted distribution partners to bundle digitally-enabled

insurance with complementary products already sold to SSPs. ACRE Africa partners with organizations that both provide goods and services to SSPs through existing distribution channels and have the incentive to encourage SSP resilience. These organizations pay ACRE Africa for the right to provide ACRE's parametric insurance products to SSPs at no or low cost; alongside complementary products that SSPs already receive, such as seeds and fertilizer. Partner organizations include agribusinesses, which typically have large sales agent networks and who value the fact that insurance payouts allow SSPs to purchase more agricultural inputs. They also include public organizations like KALRO in Kenya, who support widespread extension advisory networks that leverage digital tools to collect data and deliver advisory. These partners value intrinsic and development benefits of greater rural resilience. Ultimately, the model means SSPs receive insurance at low cost, partner organizations achieve commercial and developmental goals, and ACRE Africa is commercially sustainable.

The model has been successful in rapidly expanding access to insurance across Kenya, Tanzania and Rwanda. Since its establishment in 2014, ACRE's coverage of smallholder farmers has grown by 519%. Its service is also highly additive: 89% of the farmers had not accessed insurance services like ACRE Africa's before working with the company.[1] Bundling as a business model was integral to these outcomes, as it allowed farmers to engage with the insurance products along their normal daily journey, and gauge the benefits themselves - driving up adoption.

Lessons learned include more about ACRE Africa's journey, including price experiments, identifying peer-to-peer sales agents, and more…

[1] MercyCorps AgriFin, 2020. ACRE Africa Farmer Insights. Available here.

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Case study: BaKhabar Kissan

BaKhabar Kissan leverage partnerships with mobile networks, weather service stations and micro insurers to expand their services beyond agronomic advisory to a comprehensive bundled offering

BaKhabar Kissan (BKK), is an agricultural knowledge platform with the mission to transform uninformed smallholder farmers into empowered individuals. BKK started off as an advisory service, providing smallholder farmers with information on various crops and livestock via their digital platform. However, they realized traditional agronomic advisory services were not necessarily localized enough to empower farmers with actionable recommendations; particularly as it related to accessing inputs and accurate weather updates.

Recognizing the limitations of traditional advisory services, BKK diversified its offerings, creating a bundled digital solution. BKK invested significant time and effort into cultivating strategic partnerships with three major MNOs, as well as financial institutions, insurance, input and logistics providers to extend their outreach and amplify their impact. BKK collaborates with financial institutions to improve financial inclusion for farmers, ensuring they have access to the capital. Insurance providers mitigate risk for farmers and protect them against unforeseen events (e.g. natural disasters or crop failures). Input providers ensure farmers are able to access quality seeds, fertilizer, pesticides and farming equipment. BKK created a subsidiary company, WeatherWalay, to enable farmers to receive precise nowcasts and forecasts. This bundled service offering is available to smallholder farmers via mobile app on a subscription basis. By providing a comprehensive bundled platform, BKK ensures that farmers are able to enhance their overall productivity by addressing multiple requirements.

BKK embodied the concept of being a 'value adding service provider' to motivate for successful partnerships. Partnerships with input providers and financial institutions enhance BKK's customer reach by gaining access to costly-to-reach farmers. Gaining this access without spending resources and time on marketing and distribution of products, partners provide their services at a discounted price. BKK collects rich individual-level data on farmers when they complete their subscription to the mobile app. This ensures that BKK, together with their partners can utilize data to generate real-time farm insights to better grasp customer needs, and offer tailored assistance and resources. This amplifies farmer yields and profitability whilst ensuring efficient resource allocation on behalf of service providers.

Providing a bundled service offering has allowed BKK to scale its services through inclusive design. BKK's partnerships with service providers are funded through commissions. By bundling a multitude of services and reducing individual operational costs, BKK are able to free up resources that can be reinvested in making their mobile app more inclusive. Literacy rates in Pakistan amongst rural populations, particularly amongst smallholder farmers are low.[1] BKK reinvested funding to incorporate IVR technology.[2] Low-literacy farmers are now able to receive advisory information on crops, weather, and modern farming techniques via IVR using one platform – the BKK mobile app. This has resulted in BKK scaling their reach significantly, with a subscriber based of more than 2 million farmers nationwide.[3]

Lessons learned include more about cultivating partnerships, building farmer trust, and more…

1 Genesis Analytics, 2023. Stakeholder consultation with a BaKhabar Kissan representative.
2 **IVR** Interactive Voice Response
3 Genesis Analytics, 2023. Stakeholder consultation with a BaKhabar Kissan representative.

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Lesson learned: Provide truly complementary products and services at the right price (even if that price is $0)

The most effective bundles provide program participants with goods and services that increase the value of adjacent products while simultaneously overcoming price barriers to accessing these complementary products.

Considerations: complimentary products

What products are complementary to the goods and services that my program intends to provide?

What set of products will deliver greater developmental value to the program participant when used together?

ACRE Africa's insurance products have limited impact unless delivered alongside advisory on best agricultural practice.
According to a study from MercyCorps Agrifin, amongst ACRE Africa's participants that received a full bundle of insurance and the advisory intervention, 70% spoke of improvements in their way of farming, 57% in farm production, 47% in farm revenue and 67% in overall quality of life because of ACRE Africa's support. However, only 20-32% of the respondents who received just insurance mentioned changes in the outcomes above.[1] Evidently, advisory interventions empower farmers with best practices whilst insurance offers the confidence to implement those practices. As farmers witness increased productivity and income, they recognize the value of protecting these interventions, amplifying the demand for agriculture insurance.

BKK leverages partnerships with Jazz (Pakistan's largest mobile network operator) to deliver hyper-local weather-based climate advisory alongside traditional agricultural inputs like seeds and pesticide.
Whilst building relationships with network operators have taken BKK seven years to solidify, they are now able to more widely broadcast weather updates to farmers via SMS, as a complement to the typical package of agricultural inputs. Weather-based advisory is modulated by real-time weather conditions, for example, farmers are advised to delay the application of pesticides if imminent rain is forecast. Farmers subscribe to receive these updates via the BKK mobile app, with the fee subtracted from their mobile airtime balance.

Lesson learned: Provide truly complementary products and services at the right price (even if that price is $0)

The most effective bundles provide program participants with goods and services that increase the value of adjacent products while simultaneously overcoming price barriers to accessing these complementary products.

Considerations: price points and affordability

If there is limited willingness to pay for a product, can this component be commercially cross-subsidized through the margin of a complementary product on a commercially viable basis?

Can the margin be partially donor- or government-subsidized?

Have you experimented to establish how price impacts uptake, and why?

ACRE Africa cross-subsidizes insurance (a product for which there is limited willingness to pay) through a partially donor-funded model

The insurance product was initially entirely donor-funded, but transitioned to a partially donor-funded model through experimentation. In the initial iteration of the ACRE Africa (then Kilimo Salama) parametric insurance product, the premium was paid for entirely by the Syngenta Foundation, the non-profit donor wing of the agro-chemical firm Syngenta. As such, the product was entirely free for farmers.

However, qualitative interviews revealed that this approach was met with distrust from some farmers, who doubted the quality of the insurance product as it was offered for free. Syngenta Foundation then changed their approach - splitting the additional premium halfway between themselves and the farmer, driving up trust and uptake while still keeping the product relatively affordable.[1]

[1] Ideas42, no date. Kilimo Salama – Index-based Agriculture Insurance. Available here.

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Lesson learned: Deliver digital components in a low-tech, hybrid and participatory manner

Program participants have varying levels of trust, access, skills and literacy with respect to digital solutions. Activities must be designed inclusively, particularly when digital acts as a key facilitator or enabler of multiple offerings in a silo-busting bundle.

Considerations: digital access and uptake

Have you concretely identified the foundational constraints to digital access, and designed for these constraints? For example, does the digital channel or service require agents, learning groups or other human intervention to effectively drive adoption? Does the delivery channel consider the specific needs and dynamics of women, persons with disabilities and other marginalized populations?

Trusted local stockists and well-respected "champion" farmers act as sales agents for ACRE Africa, circumnavigating trust and connectivity barriers to adoption.
ACRE offers selected stockists and champion farmers - selected according to criteria that includes age, influence in the local community, digital literacy and agricultural experience - the opportunity to work as peer-to-peer sales agents. These agents are incentivized on a commission basis, and are able to leverage their existing relationships to encourage adoption of the bundle. They explain the value proposition to the farmer and, if necessary, support customer sign-up via low-tech channels like USSD, IVR or SMS.

BKK needed the trust of farmers via their advisory services in order to ensure uptake of weather advisory services.
BKK placed considerable effort in establishing a reputation as a leading advisory platform before incorporating weather services into their solution offering. By adopting a participatory approach, BKK utilized its collaborative platform for multi-way communication and feedback. This feedback mechanism allowed BKK to refine content, ensuring it's tailored to region-specific needs and subsequently played a role in deepening the trust of farmers.[1]

TIP: Persons with disabilities can face an entirely different set - and wide variety of - user experience and technology accessibility challenges. Consider consulting An inclusive digital economy for people with disabilities, a ILO report, which presents an overview of good principles for inclusive digital transformation for persons with disabilities. If working with agriculture as a sectoral focus, consider consulting the GSMA toolkit for considering persons with disabilities in digital agriculture. Although developed within a sectoral silo, it provides a useful framework potentially replicable for adjacent work.

[1] Saeed. 2019. The "Digital Hub for Agriculture" is Now a Community of 3M Subscribers. Available here.

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Lesson learned: Be conscious of market distortions, vendor lock-in and their impacts on participants

Bundled offerings run the risk of becoming dominant, controlling a significant portion of the market and becoming a gatekeeper. This market dominance can result in affordability or quality challenges for program participants later on. It can also increase barriers to entry for small-scale entrepreneurship, potentially stifling innovation in the broader ecosystem.

Considerations: competition dynamics

What is the state of competition in the markets relevant to your solution? Is it characterized by concentration or competition?

How established is the competition policy and consumer protection legislation in context? Are there laws or regulations that are specific to the digital economy? Are there well-capacitated enforcement bodies?

Is there a risk of inadvertently disadvantaging smaller firms that only produce one of the products in the bundle that your program offers? Are there other trade-offs between convenience and scale on one hand, and innovation and market competition on the other?

Bundling can create trade-offs between short-run convenience and long-run affordability.
The convenience and lower per-product pricing of a bundled offering incentivizes customers to switch to the bundled offer. This may lead to dominant market offerings, and in turn, raises the barriers to entry for other small-scale entrepreneurs looking to enter the market. The convenience and savings of a bundled offering can suit the program participant in the short run but the absence of meaningful competition, the dominant firm is incentivized to cut quality and raise prices. In BKK's instance, the subscription nature of the service allows farmers to exit the solution with ease, should they not be fully satisfied or it becomes unaffordable. Moreover, while they are the dominant provider in the market, their target users have a price sensitivity which prevents substantial increases in BKK's offer as they would price out their demand.

TIP: Many LMICs will not have well-capacitated competition enforcers to identify and mitigate market distortion and vendor lock-in harms, exacerbating the importance of considering these issues for program designers. Consider consulting Promoting Fair Competition in the Digital Economy, a USAID note, which provides useful guidance on how to identify and mitigate competition risks in program design.

¹ Safaricom. 2022. Safaricom Crosses 30 Million Monthly Active M-PESA Customer. Available here.

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Considerations: vendor lock-in

To what extent is your solution dependent on a single vendor?

Do these dependencies give rise to significant risks?

Are there significant costs involved when switching to an alternative service? How can these costs be mitigated?

ACRE Africa is reliant on M-PESA for payouts, but aims to mitigate the consequences of vendor lock-in through a long-run strategic partnership.
M-PESA's large customer footprint and recognizable brand, particularly in rural areas, means it is the preferred partner to deliver digital insurance payments; ACRE Africa has limited alternatives for delivering payouts at scale. Over 30 million Kenyan citizens use Safaricom's M-PESA app each month.[1]

This gives rise to platform reliance risk and the potential for a vendor to offer a degraded service or engage in price hikes on transaction fees. If this occurs, this increases ACRE's costs, which may negatively impact their sustained ability to deliver products to program participants at affordable prices. However, ACRE Africa and Safaricom are invested in a years long strategic partnership that provides growing revenue to both parties, minimizing the likelihood of market conduct issues by a vendor.[2]

[1] Safaricom. 2022. Safaricom Crosses 30 Million Monthly Active M-PESA Customer. Available here.
[2] GSMA, 2020. Growing agri insurance: ACRE Africa's experience of innovative partnerships. Available here.

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Breaking better: ACRE Africa

Building on the key lessons learned, the table below provides high-level indications of how ACRE Africa could offer an even more effective solution, applying the four steps set out in Section 2.

1

Empathize
Understand the whole participant - not just their sector-siloed needs

2

Assess
Identify silos that are most constraining for addressing participant needs

3

Landscape
Avoid waste by coordinating with what already exists

4

Integrate
Identify the mechanism for coordination, and implement accordingly

ACRE Africa understood the challenges SSPs faced in adopting insurance products, namely knowledge and affordability constraints.

By its nature as an insurance product, ACRE broke out of the traditional agricultural silo to offer a resilience-focused product

ACRE Africa relies on partner extension agent and sales agent networks to deliver low-tech, hybrid solutions that were most appropriate for reaching their target group

Cross-subsidized bundling allows ACRE Africa to offer insurance at low to no cost to the farmer

Status quo

Opportunities to break silos better

Deeper empathy could have included understanding the breadth, depth and variety of constraints for different types of SSPs (by considering their gender, age, location, crop farmed) which could help to identify additional opportunities to reach SSPs and better tailor services.

More work to address knowledge constraints may improve awareness about the value of insurance to improve uptake of insurance in other sectors, such as healthcare.

Including complementary programs around digital literacy in the offering would have improved the silo-breaking nature. Building digital literacy means that SSPs can engage more gainfully in the wider digital ecosystem.

ACRE could explore downstream partnerships and integrations. For example, making their data available to government agencies or donors to feed into disaster and risk monitoring and planning.

KEY CONCLUSIONS

*Considering **bundled offerings** in program design and implementation*

The success of <u>Acre Africa</u> underscores bundling as a powerful mechanism in rapidly expanding access to vital services. It also fosters holistic growth by addressing diverse needs effectively as seen in the case of the <u>BaKhabar Kissan</u>.

Implementing <u>cross-subsidization or partial subsidies</u>, often from governmental or donor sources, can boost product uptake and foster trust by aligning with the financial capacities of participants. Additionally, <u>pilot phases</u> are instrumental in fine-tuning pricing strategies for better outcomes and efficiency.

From a <u>market dynamics perspective</u>, a proactive analysis is essential in averting the formation of monopolies, thereby fostering a market environment that nurtures competition and innovation. Moreover, early intervention against <u>vendor lock-in</u> risks proves vital in preventing potential complications such as diminished quality and price increments.

As evidenced by the synergy between ACRE Africa and Safaricom, establishing <u>strategic alliances</u> creates an environment that safeguards users' interests and builds trust, facilitated by alignment with reputable organizations.

Considering **interoperability** in program design and implementation

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Interoperability refers to the ability of different systems, technologies, or software to seamlessly communicate, exchange data, and work together effectively.

Estimated time to read this section: 11 minutes

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Introduction: Interoperability

This section presents two illustrative case studies on interoperability in practice, accompanied by three lessons gleaned from these cases. For details of the case studies, click on the blue boxes. To explore the key lessons and associated guiding questions for enhancing your program's design and implementation, select the green boxes.

Case study | *DHIS2 and the Malawian National Agricultural Information System*

Malawi's National Agricultural Management Information System (NAMIS) offers insight into the tangible benefits of interoperability in information systems. Harnessing the DHIS2 platform, NAMIS seamlessly integrates agricultural, climatic, and demographic data. This unified approach equips stakeholders with real-time, precise information, fortifying food security and enhancing climate resilience in Malawi. *Read more*.

How could the NAMIS break silos more effectively?

Case study | *X-Road and the Colombian Digital Citizen Folder*

Colombia's Digital Citizen Folder revolutionizes access to key government services. This platform consolidates a fragmented system of 8,000 web pages into a centralized, standardized online portal, powered by the X-Road platform. Despite its successes, the endeavor faces implementation challenges, from steep technical learning curves to alignment with local security legislation, offering insights into the nuances of interoperability of government services at scale. *Read more*.

Key Lesson | *Let use cases and context guide data harmonization and technology decisions*

Read More →

Key Lesson | *Cultivate deep buy-in amongst all partners, including program participants*

Read More →

Key Lesson | *Mitigate data-related risks through gold standard governance and cybersecurity*

Read More →

Case study: DHIS2 and Malawi's agricultural information system

The National Agricultural Management Information System (NAMIS) provides an interoperable information system that harmonizes agricultural, climate and demographic data to deliver accurate, timely information to an array of stakeholders.

The system serves five interrelated and cross-sectoral functions that aim to protect food security, enhance productivity, foster climate resilience, and improve income generation for Malawians. It offers policymakers timely early warning alerts on climate risks and potential food shortages, provides customized information to Agricultural Extension Development Officers (AEDOs) for dissemination to farmers, aids in resource allocation through the identification and follow-up with lead farmers who willingly provide assistance with advisory messaging, tracks market indicators such as input and crop prices, and facilitates animal and livestock tracking to enable effective disease control and management.

To enable these functions, the system efficiently organizes disparate data collected by various stakeholders. This includes the collection of nationwide weather station readings by Agricultural Extension Development Officers (AEDOs) using customized tablet devices equipped with rainfall data collection tools, as coordinated by the Ministry of Agriculture. AEDOs also collect information on staple foods stored in households during bi-weekly rapid assessments. In addition, data on farmers benefiting from government and NGO agricultural support programs, as well as crop types and farm sizes, are obtained through estimate surveys conducted by the National Food Reserve Agency. Lastly, satellite data provided by the Department of Climate Change and Meteorological Services, along with demographic data, are incorporated into the system.

The system was built in DHIS2, a freely available open source web platform for interoperable data capture, management, analysis and visualization. DHIS2's capabilities have been iterated since its inception in 1991. Primarily, it provides templated metadata packages to accelerate data standardization across different datasets, and a freely available and well-documented API to push and pull data across systems. Other capabilities include hierarchical data flows to control data access based on permissions, the flexibility to build custom dashboards to meet bespoke data reporting and visualization requirements, in-built security features such as audit logs and OWASP encryption and online and offline data collection on mobile, tablet or computer devices.

The development of the system capitalized on the existing expertise with DHIS2 from the interoperable information system existent in the health sector. With support from the University of Malawi, the Bill and Melinda Gates Foundation and Development Gateway, the NAMIS was built upon the country's extensive experience in utilizing DHIS2 for its National Health Information System (HMIS) - OneHealth. The development roadmap for NAMIS includes integration with the One Health platform to create a single health information system that includes agricultural, animal and climate parameters relevant to public health alongside more traditional health information.

Lessons learned include more about the NAMIS's journey, including identifying priority use cases, selecting fit-for-purpose technology, and more…

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Case study: X-Road in Colombia

Colombia's Digital Citizen Folder is a one-stop-shop web platform that facilitates access to a directory of government services from different departments, enabled by digital identity verification.

Prior to the launch of the Digital Citizen Folder, access to key government documents and services was an unstructured hybrid of different in-person and online channels. Public service information was highly fragmented; services were spread over 8,000 web pages belonging to different public institutions. This fragmented approach limited accessibility of valuable documents, such as education credentials, proof of residence, tax certificates and birth certificates. Easy access to these documents is critical for livelihoods in a variety of sectors. For example, farmers may need proof of residence to receive subsidized agricultural inputs, and migrant workers need proof of identity to access healthcare and other public services.

In 2021, the Colombian Ministry of Information and Communication Technologies launched the service, centralizing and standardizing access to key government services. As of November 2021, the online portal received over 9 million visits and 126,715 sign-ups for the digital authentication service. Uptake increased further in 2022, when the service was enabled for the beneficiaries of the Solidarity Income (Ingreso Solidario) program - a nationwide cash transfer program providing social grants to 4,085,000 households. Citizens can use the service to check if they are beneficiaries and assess the status of their payment. The launch was under the institutional framework for the advancement of digital services in Colombia entitled Digital Citizen Services initiative (Servicios Ciudadanos Digitales), and the design process was supported by bilateral consultations with the UK's Government Digital Services (GDS) team.

The Digital Citizen Folder is underpinned by a flexible interoperability technology called X-Road. X-Road is an open-source data exchange platform that enables secure and standardized communication between different organizations and information systems. Originally developed in Estonia, X-Road has gained international recognition as a robust and scalable solution for interconnecting government agencies, businesses, and service providers. The system is invisible to the end user, providing a centralized database on the back-end of web platforms, where users can view this data according to their permissions and queries. See Box 40 of the World Bank's ID4D Practitioner's Guide for more detail on this technology.

However, there were key implementation challenges in Colombia - some of which are still ongoing. The technical nature of the digital infrastructure presented a steep learning curve for the Ministry, although X-Road helps to overcome this with a free online course called "X-Road Academy", which provides five modules for prospective users. In addition, alignment with local data security legislation proved challenging. The previous digital certificate model involved sharing user data like usernames and passwords, which X-Road's security standards did not allow. As such, custom system modifications were required to align with Colombia's national security requirements. Finally, the work of convening, convincing and supporting other government institutions to onboard their services onto the platform remains ongoing. Some resistance is met due to the change management and data standardization procedures that these entities themselves need to undergo.

Lessons learned include more about the Colombian DCF's journey, including technical capacitation, data governance challenges, and more…

¹ Tuulas. Year unavailable. *Launching citizen-oriented digital services in Colombia.* Available here.

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Lesson learned: Let use cases and context guide data harmonization and technology selection decisions

There are many technologies and data standards that enable secure and real-time collection, sharing and analysis of data across different organizations, with varying strengths and weaknesses. Selection decisions should be led by the context and use cases.

Considerations: use case and user journeys

What will the newly interoperable data be used for? What problem does interoperating solve?

Who are the users of the solution, what are their roles and journeys, and what permissions should be granted to each role?

Which user journeys and use cases should be prioritized, in what order?

Centering the conceptual framework for the Malawian NAMIS on four key archetypes focused the approach on priority use cases based on the needs of each archetype.
Multiple diagnostic studies uncovered issues with fragmented agricultural, nutrition and climate data in Malawi, resulting in no comprehensive view at farm, district or regional levels, and duplicative, disparate efforts to address the gaps. However, where to start (i.e., which data to merge, with what data standards and for whose use) was not immediately evident. Stakeholders had varying data priorities. For example, the Ministry of Agriculture, Irrigation, and Water Development (MoAIWD) was primarily concerned with digitizing and interoperating the Agricultural Market Information System (AMIS) and the Agricultural Production Estimate Survey (APES), while the Department of Climate Change and Meteorological Services wanted to prioritize triangulating weather station climate data with extension officer-collected information rainfall data.

To focus the approach, Development Gateway, the Bill and Melinda Gates Foundation, and MoAIWD collaborated to create a conceptual framework for the NAMIS. This framework centered a user journey analysis, selecting extension officers, district crop officers, division economists and planning directors as key user archetypes, and anchoring the priority use cases on these users. Priority user selection and consequent approach was based upon 75 qualitative interviews with relevant stakeholders. This prioritization ultimately landed on a phased, focused approach: (1) digitizing the AMIS and APES, (2) integrating data from other surveys (e.g., post-harvest loss surveys) and (3) integrating data from outside the MoAIWD.

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Considerations: Data and technology

What underlying digital tool or infrastructure works best for you in context?

What technologies are already used and trusted? Are these technologies open source or proprietary?

Where and in what format is data stored? What are the data and metadata standards for harmonization?

Malawi uses DHIS2 as the backbone of its agricultural information system largely because of its success in the country's health information system, OneHealth.
Despite the imperative to interoperate agriculture, nutrition and climate data, it was unclear what software would best facilitate this interoperability. Custom-build solutions were considered, but high costs and poor previous experiences with unfinished custom software for the water and sanitation sector meant this option was dismissed. Licensing existing proprietary software was also considered, but dismissed due to high cost and capability deficits. Ultimately, an open source solution was preferred, thanks to a lack of license costs and a fully functional starting point for developers. DHIS2 stood out as the optimal open source solution, as it was already used in the health sector, and the University of Malawi had strong technical capacity to support implementation. It also opened the possibility of further interoperability across the agricultural, nutrition, climate *and* health information systems down the line.

TIP: Achieving harmonization requires aligning all key stakeholders on a particular set of data standards (see next slide for how Malawi's NAMIS looks to achieve data standard alignment across multiple stakeholders). In many cases, data standards will already exist. As an example, see a list of data standards in agriculture. Identify the most appropriate standard by researching what standards comparative initiatives use, and test the standards with stakeholders in your context.

TIP: When deciding between open source and proprietary technologies, see Open Source and Proprietary Solutions, a text from UNESCO that provides definitions and crowd-sourced perspectives on the debate.

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Lesson learned: Cultivate deep buy-in amongst all partners, including program participants

Sharing, combining or coordinating data, products, goods and services requires a shared commitment as to why doing so brings value to each organization and the program participants that they serve, and clarity on the roles for each partner.

Considerations: partnerships

What roles do you need to include to design and implement the proposed solution?

Where are the current capacity gaps, and which partners could most effectively fill them?

How might the political economy or organizational inertia impact willingness to break silos?

What other barriers to effective silo-breaking partnerships may arise?

How will you receive, manage and action program participant feedback in the implementation phase?

The Malawian Ministry of Agriculture, Irrigation, and Water Development (MoAWD) uses a code of conduct and MOUs to enforce multi-stakeholder alignment of data and M&E standards to the NAMIS framework. The third phase of the NAMIS initiative involves the integration of data systems external to the MoAWD within the NAMIS framework. For example, this process includes integrating data from the Integrated Financial Management Information System, managed by the Ministry of Finance, Economic Planning and Development (MoFEPD). This integration allows officials from MoAWD to access financial data directly from NAMIS, rather than submitting a manual request for access to the MoFEPD. This integration requires harmonization of data standards, such as which questions to ask, what data categories to collect, what to name the different data elements, and what format to store the data. Formal documentation increases the likelihood of long-run alignment.

Colombia's DCF was informed by a partnership with the United Kingdom's Government Digital Services (GDS) team. Colombia's Ministry of Information Technologies and Communications approached GDS after determining the UK as a global leader in digitized government. Facilitated by a peer-to-peer MOU, the GDS team provided a technical review of the legacy government platform, and made recommendations focused on setting up a "secure-by-default" one-stop-shop for digital public services.

TIP: Multi-stakeholder alignment for an interoperable solution is a function of a maturing interoperability ecosystem, political will, and a clearly articulated value proposition. Consult Section 6 of Interoperability is More Than Technology, a King's Fund study which assesses interoperability in the context of healthcare, to learn about change management approaches that can assist with achieving interoperable systems.

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Lesson learned: Mitigate data-related risks through gold standard governance and cybersecurity

The process of breaking data silos introduces a higher risk of data misuse. As data is shared across multiple organizations, variations in policies, personnel, and familiarity with the shared data can lead to privacy, security and other data rights challenges.

Considerations: cybersecurity

What are the potential threats to the data security of the system, and what safeguards are in place to protect against these threats? Is the technology suitable for deterring threats?

What safeguards are in place to ensure integrity and quality control of data, while mitigating against data misuse and privacy breaches?

X-Road provides free training resources and instructional documentation to aid the secure set-up of the data exchange platform in Colombia. A common capacity gap is in the technical expertise to set up and customize the system to meet unique case requirements, which hinders the platform's security; this learning curve is cited as a key initial barrier to the implementation of the Colombia DCF. To address this gap, X-Road recommends ensuring each team has capacity across five key capabilities (public key infrastructure, service integrations, linux server maintenance, technical architecture and project management) before leveraging their solution. These gaps may be filled by engaging listed X-Road technology partners or making internal hires. The organization also provides free short courses on X-Road Academy, to facilitate rapid upskilling, if required.

TIP: Consider consulting a cybersecurity or data governance expert when considering a large-scale activity that involves interoperability to reduce risk, particularly if the activity involves sensitive data such as health records or digital identifiers. Experts will look to optimize the technical set-up of the system, and ask questions such as:

- How does the interoperability work? Is it web-based, API-based or via a public-private key?
- What are the user login requirements? For example, does it enforce two-factor authentication and complex passwords?
- Where is the server stored? Is it on-premise, on-cloud or on-device?
- Are there transparent audit logs in place?
- Is there a response plan for cybersecurity incidents, such as malware instances?
- Are there encryption mechanisms in place to protect sensitive data during transmission and storage?
- Is the system regularly updated with security patches?

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Considerations: data governance

What regulation and legislation governs the use of data in country context?

Are data sources and subjects providing informed consent? Are they receiving just compensation for their data? Is the purpose of the data collection transparent? Do governance frameworks include channels of recourse if data is misused?

TIP: Given the complexity of justly managing a variety of shared datasets in a silo-breaking solution, consider experimenting with a participant-centric governance model. For example, the Farmer-Centric Data Governance report, funded by USAID and BMGF, provides an overview of user-centric approaches to data governance that place farmers and their communities at the center of data gathering initiatives. More generally, many solutions and interventions are experimenting with data governance models that more explicitly protect participant data rights. This includes the Data Institutions program run by the Open Data Institute, which looks to support organizations to more inclusively steward data.

Custom modifications to the X-Road platform allowed the Digital Citizen Folder to meet national data governance requirements.
Compliance with national data regulation materially impacts whether or not an interoperable solution is implemented. To comply with Colombian regulation, the Colombian Digital Citizen Folder (DCF) needed Colombia's certification authority (ONAC) to accredit that DCF conformed to national law regarding digital identity certification procedures. This accreditation process required sharing sensitive user data with external accreditation professionals, such as passwords and usernames, which the standard X-Road package did not allow. However, as X-Road is an open source, modular and customisable platform, DCF developers were able to make custom modifications to facilitate the narrow sharing of user data with ONAC, to align with the national data security requirement.[1]

[1] Tuulas. Year unavailable. *Launching citizen-oriented digital services in Colombia.* Available here.

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Breaking better: Malawi's NAMIS

Building on the key lessons learned, the table below provides high-level indications of how the Malawian NAMIS could offer an even more effective solution, applying the four steps set out in Section 2.

1

Empathize
Understand the whole participant - not just their sector-siloed needs

2

Assess
Identify silos that are most constraining for addressing participant needs

3

Landscape
Avoid duplication by coordinating with what already exists

4

Integrate
Identify the mechanism for coordination, and implement accordingly

Conceptual framework was informed by designing with the users of the system using HCD principles, informing where to start

Institutional data and information silos across multiple ministries were overcome, as well as sectoral silos (namely agriculture, nutrition and climate)

Selecting DHIS2 as the underlying technology was partially driven by its success in the country's health information system

NAMIS focused on digitizing priority data systems within MoAIWD and interoperating with internal and then external data in a phased sequence

Status quo

Opportunities to break silos better

User archetypes were formulated using job descriptions as the primary identity factor. However, overlaying considerations of gender, age and other spheres could have improved accessibility of the system, and impacted which use cases were selected as priorities.

While the system noted the health information system as an avenue for future interoperation (and thus silo-breaking), there may be other relevant spheres to have considered, such as social development or education.

There were limited opportunities to landscape more effectively. Comprehensive landscaping of agricultural, nutrition and climate data systems, their level of digitization and interoperability, and the IT capacity of different departments were conducted.

Confirming an internal proof of concept first is a strong approach. External stakeholders should clearly be included throughout to demonstrate the value of the initial phase and to rapidly onboard any lessons learned.

KEY CONCLUSIONS

*Considering **interoperability** in program design and implementation*

Taking a page from the DHIS2 initiative in Malawi and X-Road in Colombia, we see the immense potential in crafting interoperable systems that are shaped by regional specifics and practical needs.

Leveraging existing alliances and collaborative efforts, we can nurture a unified approach to selecting technology and fostering system growth, sharing both expertise and experiences.

Early on, it's crucial to spot and tackle capacity gaps, teaming up with organizations that can strengthen the foundation of the project.

As we break down data silos, aligning with adaptable and flexible data governance strategies becomes essential. These strategies should resonate well with the prevailing national regulations and legislations, creating a secure data landscape.

Considering **horizontal products** in program design and implementation

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A **horizontal product** refers to a good or service that is designed to be applicable across various industries or sectors, addressing a multi-faceted set of program participant needs.

Estimated time to read this section: 11 minutes

Introduction: Horizontal Products

This section presents two illustrative case studies on the efficacy of bundled products, accompanied by three pivotal lessons gleaned from these and other studies. For detailed insights on the case studies, click on the blue boxes. To explore key lessons and associated guiding questions for enhancing your program's design and implementation, select the green boxes.

Case study | *Integrating Nutrition and Agriculture Extension at Digital Green*

Digital Green's transformative shift from solely agricultural advisory to include MIYCN content showcases the potential of trusted platforms in promoting holistic well-being. Employing a participatory video model, the initiative results in behavior changes in targeted areas like hygiene and child care. This highlights the versatile applicability of a proven model and underscores the power of horizontal delivery in community-based interventions. *Read more*.

How could Digital Green break silos more effectively?

Case study | *Farm Radio International and the Adosanté program*

The Adosanté initiative repurposed a radio-led communication model, originally successful in agriculture, to effectively deliver crucial information on sexual, reproductive health (SRH), and nutrition in Burkina Faso. Introducing the "Uliza system," an interactive voice response (IVR) technology, the initiative made radio broadcasts more engaging, enabling real-time feedback, surveys, and data collection on both SRHR and nutrition for young women. *Read more*.

Key Lesson | *Create reusable blueprints for parallel initiatives in other sectors*

Read More ➡

Key Lesson | *Encourage information to diffuse beyond direct program participants*

Read More ➡

Key Lesson | *Navigate potential trade-offs between sectors*

Read More ➡

Case study: Nutrition and agriculture extension by Digital Green

Digital Green is adapting its participatory video model of agricultural advisory to integrate maternal infant, youth and child nutrition (MIYCN) messaging.

Digital Green is a trusted source of information for many rural communities in India, and is exploring leveraging that trust to deliver multi-sectoral programming. The organization is a non-profit organization that spun out of Microsoft Research India in 2008. The organization pioneered the use of low-cost participatory videos and facilitated discussions with women's self-help groups to improve agricultural extension services. It recently experimented with the potential of this approach to deliver behavior change communication (BCC) related to maternal, infant, and young child nutrition (MIYCN) in Odisha, India - in addition to its typical agricultural advisory. To implement this project, Digital Green partnered with two organizations: the Voluntary Association for Rural Reconstruction and Appropriate Technology (VARRAT), and the USAID-funded Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project, which provides technical assistance for MIYCN-related messaging. The pilot targeted 30 intervention villages, purposefully selected to prioritize those with active self-help groups already involved in the Digital Green program.

Digital Green employs a common fourfold approach to develop and deliver content to program participants.
- *Mobilization and Situational Analysis:* Self-help groups are engaged to collectively identify the needs of the community. Program personnel are selected from within the community and receive training on video production, dissemination, data management, and documentation.

- *Participatory Content Identification and Local Video Production:* Community members contribute to the identification of content relevant to improving agricultural or nutritional practices. Low-cost videos are produced, featuring local community members speaking in the local dialect. These videos highlight personal experiences and the benefits of adopting best practices. Content is reviewed by experts before approval for screening.
- *Dissemination through Group Discussions:* Videos are shared with self-help groups, who use them as a basis for mediated instruction. During screenings, the mediator pauses the video strategically, encouraging viewers to discuss, question, and reflect on the content.
- *Follow-up Visits:* Mediators make follow-up visits to encourage and monitor the adoption of disseminated practices.

In this MIYCN pilot, a wide range of nutrition, WSSH and health topics was integrated into the video messaging, with positive behavior change and knowledge transfer. For example, the majority of women's groups had greater awareness about the importance of using soap to wash hands. Moreover approximately 8% more mothers started giving fluids other than breast milk to their child at the age of 6 months. More mothers also became aware that their child should wear sandals to protect them from worm infestations. Many other metrics were tracked - for more information please see the endline assessment here.

Lessons learned include more about the Digital Green journey, including encouraging information diffusion, managing sector trade-offs, and more…

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[1] Kadiyala, Morgan, Cyriac, Margolies and Roopnaraine. 2016. *Adapting Agriculture Platforms for Nutrition: A Case Study of a Participatory, Video-Based Agricultural Extension Platform in India.* Available here.

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Case study: Farm Radio International and the Adosanté program

The Adosanté initiative created bespoke radio programming aimed at improving knowledge of both sexual and reproductive health and nutrition for young women in Burkina Faso.

The project borrowed a blueprint to radio-led communication proven successful in delivering agricultural information to rural communities. Historically, Farm Radio International provided radio resource packs to partner stations, containing scripts and broadcast notes developed with expert content partners around agricultural advisory. These packs were translated into local languages. Strong impact indicated that the same model could be used for broader varieties of informational dissemination. In this instance, radio resource packs developed in consultation with Helen Keller International were used as the basis of serialized radio dramas that encouraged discussions between caregivers and youth on nutritional, sexual and reproductive health needs. The dramas covered various areas such as family planning, STDs, pregnancies, contraception, and understanding the food groups for proper nutrition. The program also directed listeners to external resources, including free HIV testing, family planning sessions, and a toll-free health hotline. It also encouraged the formation of community listening groups.

Farm Radio International also utilized the "Uliza system" for interactive radio, which leverages IVR technology. Listeners can call a particular number and choose from a menu of options to answer questions posed by the broadcaster, making the programming more engaging. This system also allows for tracking engagement, conducting surveys, and quantitative data collection, and is operated by Viamo.

The Uliza system is free to use. Farm Radio International experimented with charging a small fee, but this directly reduced uptake of the technology. In addition, some (often rural women) faced difficulties with the system, because it required using the keypad on a phone, which in turn requires foundational and digital literacy.

The impact of the Adosanté initiative was significant, with 440 episodes produced and reaching 4.2 million people. The engagement through the Uliza system resulted in 76,000 interactions. The project had a positive effect on discussions about sexual and reproductive health and nutrition, with a significant increase in the number of parents discussing these issues with their children. Additionally, 83% of teenagers surveyed expressed their intention to use contraception in the future. The initiative produced 64 mini-series, which were rebroadcast even after the project ended. It also established 72 community listening groups, consisting of 1,389 members, including 415 adolescent girls.

This broad reach is partially attributable to a wide variety of consortium partners working in tandem. The Adosanté initiative was a project funded by Global Affairs Canada and implemented by Helen Keller International, Marie Stopes Burkina Faso and Farm Radio International. The project ran from 2018 to 2021.

Lessons learned include more about the Farm Radio International journey, including radio blueprints, inclusive message delivery, and more…

[1] Farm Radio International. 2017. *Women and telephones: Bridging the gender digital divide using simple solutions.* Available here.

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Lesson learned: Create reusable blueprints for parallel initiatives in other sectors

Creating standardized approaches that can be replicated for more cross-sectoral content is valuable for holistically addressing participant needs, but be careful to leave some room for iteration and innovation.

Considerations: templatization

What elements of the solutions could be templatized and documented such that they could easily be understood and reused by others in adjacent sectors?

Can certain sectors or department within an organization learn from one another? Is there one sector that has already developed leverageable models and approaches?

Is your blueprint sufficiently flexible to tailor for context, iterate and innovate?

Farm Radio International (FRI) leverages its radio resource packs to help local radio stations deliver educational radio programming across many different sectors, including agriculture and nutrition.
FRI replicates the radio-led behavior change model that has proven successful with agricultural extension in most of its programming, with sufficient scope to tailor for context and to iterate and innovate over time. The process of conducting formative research, creating radio resource packs with trusted expert content partners, identifying radio stations to disseminate the content and supporting the capacity building of these radio stations through training remains a standard project process, and could also be replicated by other organizations. FRI also has a stream of work dedicated to radio innovation, which looks to augment classic radio programming that arises from the process above, called the Digital Innovation (DI) Discovery team (previously "The Hangar"). It was from this structure that the interactive radio approach through IVR (Uliza, discussed here) was conceptualized.

Digital Green's work is in conducting, refining and adapting its community-based video content model across multiple sectors.
Digital Green conducts a variety of activities - some of which follow well-established blueprints, and others which are far more experimental. Its community-based video content model, which has proven remarkably successful in disseminating behavior-changing information to difficult to reach rural areas, is its core blueprint. In more recent years, the team has complemented the video & mediator model with a multi-channel approach, including WhatsApp, SMS and IVR. This reflects the well-documented rapid rise in mobile device penetration, and was accelerated by the COVID-19 pandemic. In particular, WhatsApp has emerged as the channel of choice for many dialogues through its combination of low data costs, "groups" functionality and network effects from its critical mass of users in India.

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Lesson learned: Encourage information to diffuse beyond direct program participants

Community discussions provide the most valuable insights on addressing holistic needs. Also, in cross-sectoral programming, not every piece of content may directly apply to all participants, but it may hold value for others in their social networks. Both features make designing for diffusion even more important for silo-breaking solutions.

Considerations: information diffusion

Through what channels does information spread in the communities in which you work?

Are there elements of the good or service provided that would be useful for broader community members to learn?

What other spillovers or knock-on effects may arise through strong information diffusion?

Digital Green mediators encourage community participants to share information and video content organically through their own social networks.
About half of self-help group respondents in the MIYCN trial in Odisha confirmed they had shared information from any of the MIYCN videos they viewed with at least one person. About a third of those people shared the information with another person in a chain. Information diffusion was most common between spouses and from daughter-in-law to mother-in-law, although there were many diverse pathways. Unsurprisingly, information that required simple steps - such as the benefits of handwashing with soap, and the importance of iron acid supplementation - were most commonly diffused.

Collaborating with government frontline workers boosted demand for public health services, creating the unexpected spillover effect of supply-side challenges for local government.
Harmonized messaging is crucial to prevent program participants from receiving conflicting guidance from various service providers, particularly regarding vital subjects like nutrition. Public healthcare workers enthusiastically embraced the Digital Green program, recognizing MICYN videos as valuable job aids. Diffusion of Digital Green's MICYN videos alongside traditional frontline health information sharing led to a notable surge in demand for nutrition-based public health advisory. However, public frontline workers faced capacity constraints in meeting this heightened demand, leading to frustration in some communities.

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Considerations: information diffusion for inclusion

Could the learnings from your program be culturally or socially embedded through discussions, learning groups or other participatory activities?

How might the diffusion of information to first, second and third degree connections work? Is there any likelihood that particular populations, such as women or people with disabilities, might be excluded?

Finding that radio programming women listening to the Adosanté initiative's programming struggled to use the IVR system, FRI created community listening groups, such that digitally literate community members could share knowledge of the system. In Niangoloko, in western Burkina Faso, a community listening group was led by a literate man, who noted that the women in the group did not engage with the interactive IVR (Uliza) system. This was primarily due to widespread illiteracy: women were not able to remember, write down and key in the relevant telephone number when encouraged to do so by the program host. To address this, he wrote down the number of the Uliza system on pieces of paper, and shared them with women in the listening group. When the Uliza system was utilized, women then matched the shapes (i.e., digits) on the pieces of paper to the digits on the keypads of the phones.

Encouraging community information diffusion is built into the Digital Green approach, through the formation of mediated group learning sessions. In particular, the organization recognizes that social and cultural norms inhibit the variety of spaces available for women to speak frankly, listen, challenge and ultimately engage in the intellectual process so critical for learning. Moreover, there is an acknowledgment that exacerbating existing gender stereotypes of household roles and economic power may harm participants. As such, these mediated self-help groups are targeted to women in particular.

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Lesson learned: Navigate potential trade-offs between sectors

Sectors with more perceived importance, ease of implementation, or resource availability may be unduly prioritized. If this bias results in the deprioritization of sectors where women, persons with disabilities or other marginalized people hold power or otherwise derive value, this can exacerbate exclusion.

Considerations: sector trade-offs

How might the integration of new sectoral content impact the program participants? Are there any potential unintended consequences or challenges that need to be addressed?

Are stakeholders involved in the formulation of the multi-sectoral product more experienced or otherwise biased to a particular sector?

How can lessons learned and feedback be incorporated to continually improve the product and address any trade-offs identified?

Program personnel at Digital Green found that nutritional content was more challenging to integrate compared to agriculture, stifling the initial integration of the two pieces of advisory. This was primarily due to the abstract nature of nutrition and its longer and more complex cause-and-effect relationships. This differed from simpler, more tangible outcomes in agriculture. For example, content producers noted that in agriculture programming, farmers would directly ask for information related to a particular problem, such as pests or weather. However, in the equivalent content identification phase for nutrition, community members had much less clarity on what specific nutrition problems they were facing, and thus found it difficult to articulate their specific nutrition-related needs. To address this, more intentional time and effort was spent on surfacing nutritional needs during the mediated dissemination discussions, where demands and curiosities would arise in a more organic manner. Absent this intentional process tailoring aimed at extracting difficult to identify information in a particular sector, the agricultural programming would have been much richer and clearer than its nutritional counterpart.

When Digital Green integrated nutrition and women's health content, this increased the risk of women engaging less in the community learnings. As part of the nutrition and health discussions around pregnancy and breastfeeding, some women reported feeling shy, embarrassed or ashamed if any men (including the discussion mediator) were present. Feeling safe to speak is at the heart of the participatory discussion model across any sector, so the integration of content that shifts this dynamic must be done in a sensitive manner. However, it should be noted that many women also noted willingness to open up over time, and Digital Green is now more aware of matching women mediators when possible and appropriate.

Breaking better: Digital Green

*Building on the key lessons learned, the table below provides high-level indications of how Digital
Green could offer an even more effective solution, applying the four steps set out in Section 2.*

1

Empathize
Understand the whole
participant - not just their
sector-siloed needs

2

Assess
Identify silos that are most
constraining for addressing
participant needs

3

Landscape
Avoid waste by
coordinating with what
already exists

4

Integrate
Identify the mechanism for
coordination, and
implement accordingly

Digital Green's MIYCN pilot built
upon deep knowledge of
communities built from
agricultural advisory engagement

Sectoral content silos were
broken by adding nutrition,
WSSH and health topics to the
model, and it traverses
civil-public silos through
collaborating with government
frontline health workers

Digital Green collaborated with
local nutrition experts to
develop the additional content. It
also sought to create synergies
with public health messaging

Digital Green's process
blueprint, participatory video
and mediator model is applied
horizontally (i.e., used to deliver
goods or services across
multiple sectors)

Status quo

Opportunities to break silos better

The initiative could have
foregrounded participant needs as
mothers and women better,
forecasting potential shyness or
embarrassment on sensitive
topics, particularly when men
were included in learning groups

The activity was dependent on
USAID funding explicitly for
agriculture and nutrition
purposes, so Digital Green could
explored other sources of
unrestricted funding to
complement the USAID funds.

Much of the nutrition content was
created from scratch. While this
meant that it was highly
contextually appropriate, the
program may scale quicker and be
less time-intensive to create if it
drew lightly on existing
informational content

Digital Green has a proven
horizontal product that is
leveraged effectively. The initiative
should continue to build
partnerships to leverage this
model more widely, across other
key development sectors

60

KEY CONCLUSIONS

*Considering **horizontal products** in program design and implementation*

Leveraging tried-and-tested frameworks, both the Digital Green and Adosanté initiative remarkably transformed existing communication blueprints into dynamic platforms for widespread community education and behavioral change in health and nutrition sectors.

When it comes to fostering seamless integration across various sectors, think adaptable templates crafted from verified models. These are not just rigid frameworks but a canvas for innovation, ready to evolve with changing trends and needs.

Imagine achieving comprehensive outreach by tapping into existing community information channels. This approach ensures that the message deeply resonates with community members.

A balanced approach is vital to prevent the undue prioritization of sectors, recognizing and amalgamating the strengths of diverse sectors to create a harmonized strategy.

FEED THE **FUTURE**
The U.S. Government's Global Hunger & Food Security Initiative

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Appendix

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Case Study Selection

The selection of the case studies was undertaken to showcase digital solutions that holistically address participant needs, effectively breaking silos in their design, deployment, and delivery processes. For each integration mechanism - bundling, interoperability, and horizontal delivery - we anchored our selection around two case studies, ensuring broad representation.

*Our choices were directed by a **dual-layered criteria framework**, categorized as primary and secondary, to capture both foundational principles and nuanced aspects of integration. While the primary layer establishes the core tenets of silo-breaking solutions, the secondary layer dives deeper into the dynamics that influence their successful implementation. Each selected case study is emblematic of best practices in the field. This rigorous selection, backed by comprehensive desktop research and consultations with domain experts, ensures that every case study presents invaluable insights and key lessons for the reader.*

Primary Layer	
Criteria	**Description**
Silo Breaking	The case study should explicitly demonstrate how the solution disrupts and breaks entrenched silos. ❏ Does the case study exemplify the disruption of traditional silos?
Sector Focus	The case study should reflect integration across priority areas, namely: nutrition, agriculture, resilience, and WSSH. ❏ Which priority sectors does this case study incorporate and how are they interconnected?
Key Digital Role	The case study should speak to the use of digital tools or platforms to facilitate integration within the specified sectors. ❏ How does digital technology serve as a catalyst for integration in this case study?

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Case Study Selection

Secondary Layer	
Criteria	**Description**
Geographical Representation	The case studies selected should include a range of geographic locations ❏ Which geographical context does this solution cater to? ❏ How does the solution capture the unique challenges and successes specific to its operational region?
Comprehensive Needs Analysis	The case studies should begin with a thorough examination of participant needs spanning the target sectors. ❏ How did the solution's design process address intersecting needs across sectors?
Sustainability and Scalability	The case study case should highlight long-term viability of the silo-breaking solution and demonstrate potential for replication in varied settings. ❏ How does the case study showcase the initiative's long-term viability and potential for replication?
Generalizability	The case study should not only detail success but also allow for generalize lessons to be extracted to guide other initiatives. ❏ What lessons does the case study distil, and how can they guide future initiatives?

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Stakeholder contributions

Name	Organization	Name	Organization	Name	Organization
Amol Jadhav	AgTech Network	Matt Manning	DevGlobal	Vincent Shaw	Independent HIS Specialist
Leslie Arathoon	AgTech Network	Swetha Kolluri	DiCRA	David Eaves	University College London
Natalia Pshenichnaya	AgTech Network	Abdoulaye Ndiaye	DigiFi	Jesus Melendez Vicente	IREX
Wietske Kropff	Alliance Bioversity-CIAT	Manoj Maharjan	Digital Broadcast Initiative	Dan Zook	IFS Advisors
Rita Larok	AVSI	Vineet Singh	Digital Green	Emily Silvia	J-PAL
Justin Ahmed	Beanstalk AgTech	Caroline Montpetit	Farm Radio International	Carolyn Florey	Mercy Corps
Joshua Murima	Briter Bridges	Ian Pringle	Farm Radio International	Shelley Spencer	Strategic Impact Advisors
Stanley Karanja	CGIAR	Alloysius Attah	Farmerline	Abdoulaye Dia	USAID
Martin Kropff	CGIAR	Lily Akorfa Keledorme	Farmerline	Osagie Aimiuwu	USAID
Anand Varghese	DAI	Worlali Senyo	Farmerline	Harry Ngoma	USAID
Inta Plostins	DAI	Thomas Kemper	EC Joint Research Centre	Melissa Schweisguth	USAID
Ritesh Datta	DAI	Ahmed Javed	GSMA	Jose Arias	USAID
Talia Dweck	DAI	Matt Strickland	GSMA	Josh Templeton	USAID
Wayan Vota	Deloitte	Panos Loukos	GSMA	Tewodros Hailegeberel	USAID
Winnie Awuor	Development Gateway	Linda Raftree	Independent Consultant	Petteri Kivimäki	X-Road

Bibliography

Resources to effectively use existing and/or shared digital infrastructure

Fast-Tracking Development: A Building Blocks Approach for Digital Public Goods offers an exploration into the concept of digital building blocks and their role as public goods in addressing major developmental challenges.

UNDP Digital Public Infrastructure Resource Hub offers a collection of material centred on the organization's strategic approach to digital transformation and DPI. The site showcases best practices, strategies, and collaborative efforts, sputlighting UNDP's emphasis on building partnership, supporting government-led digital initiatives, and advocating for human rights in the digital space.

Digital Public Good Registry is a helpful resource for those aiming to navigate and contribute to the digital public goods landscape. This platform offers a comprehensive list of verified DPGs. It also connects DPG product owners to resources, opportunities and activities within the broader Digital Public Good Alliance (DPGA) ecosystem.

Resources for identifying opportunities to silo-break

Field Guide to Human-Centered Design by IDEO.org offers an in-depth exploration of human-centered design tailored for the social sector. It equips practitioners with 57 actionable design methods and real-world case studies showcasing the approach in action. This guide serves as a tool to help practitioners better understand their target audience, refine their brainstorming session, and cultivate innovative human-centred solutions.

Resilient Rural Women: Applying Personas and Insights for Climate-Smart Innovation, is a presentation deck which clearly illustrates how to design and develop personas and archetypes, through a comprehensive analysis of diverse motivations, behaviours, and needs of rural women.

The Digital for Resilience and Food Security (RFS) Planning Tool offers a streamlined framework for assessing the applicability of digital technology across various scenarios. For a deeper dive into implementation specifics, the tool also provides contacts of expert resources, ensuring users have access to specialized guidance when needed.

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Integrating Digital Principles into USAID Projects: A How-To Note provides an insightful guide on infusing the Principles for Digital Development into USAID project and activity design. The note includes a background on the Digital Principles, a design integration checklist, prioritisation worksheet, and a comprehensive guide contextualising each principle for USAID projects, complete with sample design questions.

Digital Ecosystem Country Assessment (DECA) Toolkit serves as a foundational guide for conducting an in-depth assessment of a country's digital ecosystem landscape. Structured over five months, the assessment encompasses comprehensive research, interviews, and detailed report crafting. For those looking to understand the nuances of a digital ecosystem in a specific context, this resource proves very helpful.

Digital Principles Maturity Matrix introduces an interactive evaluation tool designed to ensure alignment with the Principles for Digital Development across all project stages. It serves as a dynamic rubric, which comprises specific activity-linked statements, empowering donors to maximize the Digital Principles' potential while offering explicit guidance on assessment priorities to potential partners.

Digital Impact Exchange provides a comprehensive, one-stop-shop for digital e-government solutions across various sectors and Sustainable Development Goals. This portal is helpful in providing use cases, technical building blocks, and access to a repository of over 500 trusted digital products.

mHealth Ecosystem Assessment Report in Malawi, a technical analysis, points out the importance of evaluating existing solutions and their implications. The study showed how community workers in Malawi struggled with the management of multiple devices, each issued for different programs. This resulted in increased administrative strain for community workers, wasted program expenses and fragmented analysis. This analysis serves to highlight the inefficiencies of not holistically considering the landscape of interventions.

An Inclusive Digital Economy for People with Disabilities is an ILO report highlighting the foundational principles for fostering a digitally inclusive environment for persons with disabilities. The report showcases exemplary initiatives by corporations, public sector entities, and civil society organisations, illustrating progressive steps in this domain.

The GSMA's Inclusivity Toolkit for Digital Agriculture provides concrete recommendations to amplify digital agricultural solutions, emphasising inclusivity for people with disabilities. While aimed at organisations developing digital agricultural services, its framework can also be adapted to other sectors, ensuring broader inclusivity for individuals with disabilities.

Bibliography

Resources for identifying opportunities to silo-break

The Competition in the Digital Economy: A Development Brief speaks to enhancing digital economic activities by promoting competition within the digital ecosystem. The brief provides a roadmap for understanding, navigating, and addressing challenges of competition within the digital landscape. Furthermore, the brief provides illustrative examples to offer a comprehensive understanding.

The GSMA's Inclusivity Toolkit for Digital Agriculture provides concrete recommendations to amplify digital agricultural solutions, emphasising inclusivity for persons with disabilities. While aimed at organisations developing digital agricultural services, its framework can also be adapted to other sectors, ensuring broader inclusivity for individuals with disabilities.

The Inclusive Digital Design Toolkit provides guidance to USAID staff and implementing partners on how to design inclusive digital technology interventions in Feed the Future activities. Recognizing the diverse backgrounds of program participants, including their gender, age, education, and social norms, this toolkit emphasizes support for marginalized groups, intersectionality, and robust local engagement.

Resources for better bundled offerings

Product Design Case Studies for Financial Inclusion is a report that highlights the prevailing gap between the offerings of financial institutions and the actual needs of users. This report emphasises the importance of bespoke financial product designs through case studies. An example of these case studies is covered in slide 35.

The Competition in the Digital Economy: A Development Brief speaks to enhancing digital economic activities by promoting competition within the digital ecosystem. The brief provides a roadmap for understanding, navigating, and addressing challenges of competition within the digital landscape. Furthermore, the brief provides illustrative examples to offer a comprehensive understanding. Addressing potential competition impacts is particularly important when considering bundled offerings, because of the potential to concentrate markets.

Bibliography

Resources for effective interoperating

UNDP and Telangana's DiCRA Initiative is a digital public good offering accessible satellite data on socio-economic, environmental, and infrastructural factors. Boasting over 3,500 users, mainly researchers and policymakers, the open-source platform is set to expand across six additional Indian states.

DHIS2 is an open-source web application originally conceptualized for health data collection by experts from the Universities of Cape Town and Oslo in 1991. From its health sector roots, it has expanded its reach to over 100 low and middle-income countries and diversified its applications to manage data in agriculture, education, and social protection sectors.

In a 2018 case study, the Brazilian states of Mato Grosso and Amapá demonstrated the adaptability of X-Road by launching a tailored version, X-Via, to seamlessly share citizen identification data across ministries, including agriculture, nutrition, resilience, and WSSH.

Malawi Supports Small-Scale Agriculture and Promotes Food Security Using Climate Data in DHIS2, is an article, that provides an in-depth look into the transformative role of DHIS2 in elevating small-scale agriculture and fortifying food security. Through DHIS2, Malawi's National Agricultural Management Information System (NAMIS) integrated climate, demographic, and agricultural data, benefiting over 150,000 households. This case study highlights the benefits of system interoperability.

ID4D Practitioner's Guide offers an insightful examination into ID system interoperability, outlining its types and benefits. While highlighting its advantages, the guide also addresses potential privacy and data security risks, offering mitigation strategies.

The NAMIS Conceptual Framework Guide presents a detailed methodology for deploying Malawi's National Agriculture Management Information System (NAMIS). While it's tailored to a specific interoperable system, its foundation in user journey analysis and emphasis on specific user archetypes provides key lessons in user-centric design when it comes to interoperability.

Open Source vs. Proprietary Solutions: A UNESCO Insight is a valuable resource for those grappling with the choice between open source and proprietary technologies. This document offers clear definitions and gathers crowd-sourced viewpoints on the ongoing debate. It succinctly breaks down the terms associated with free and open source (FOSS) and proprietary software, weighing the pros and cons of each to guide informed decision-making.

Bibliography

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Standards and Data Exchange in Agriculture is an insightful article that delves into the crucial role of norms, standards, and data exchange formats within the digital agricultural sector. Additionally, it provides a detailed list of prominent data standards, serving as a valuable resource for those navigating agricultural data integration.

The Open Data Institute's Data Institutions Program is dedicated to fostering more inclusive data stewardship. It assists in the establishment of new data institutions and enhances the efficacy of existing ones in data stewardship. The program's multifaceted approach includes pioneering research, advisory services, training, early-stage support, tool development, and advocacy. Their website also offers a comprehensive view of their ongoing research and projects in this domain.

Participatory Data Stewardship: Empowering People in Data Usage is an in-depth report that introduces a transformative framework aimed at involving individuals in the decision-making processes surrounding their data. Grounded in the analysis of over 100 case studies, the report showcases various methods to achieve participatory decision-making in designing and utilising data-driven systems. It's an essential read for businesses, developers, and policymakers seeking to champion ethical data practices.

The Farmer-Centric Data Governance report explores participatory data governance strategies that prioritise farmers and their communities in data collection endeavours. The report offers insightful lessons around participatory data governance, outlining actionable principles, recommendations, and insights for readers.

This is a list of technology partners offered by X-Road to assist in the secure setup and optimization of their data platforms.

X-Road Academy offers free courses on open-source data exchange, enabling quick upskilling for anyone interested in utilising the X-Road Data Exchange Layer.

Bibliography

Resources for better horizontal products and services

Expanding Online Marketplaces Across Secondary Cities – Lessons from Côte d'Ivoire: Practical Thinking on Investing for Development is an impact study on Jumia's E-Commerce Growth in Côte d'Ivoire. the study illustrates how, in 2019, Jumia broadened its digital marketplace by adding an agricultural product section, complementing its existing offerings like home & office supplies, appliances, and technology.

Digital Green's website presents a series of pilot projects aimed at refining health and nutrition communication strategies for rural communities. The case studies highlight cross sectoral integration of health and nutrition information through a video-based extension approach.

Adapting Agriculture Platforms for Nutrition: A Case Study of a Participatory, Video-Based Agricultural Extension Platform in India is research paper that reports on the potential of integrating maternal, infant and young child nutrition (MIYCN) interventions within agriculture programs. The paper offers valuable lessons on leveraging existing models and platforms within one sector for enhanced outreach within another sector.

Women and Telephones: Bridging the Gender Digital Divide Using Simple Solutions, is an article that showcases FarmRadio's bespoke radio programming utilized to improve the knowledge of both sexual and reproductive health and nutrition for young women in Burkina Faso.